

# Notice to Contractors,

# **P**ROPOSAL,



# **S**PECIAL **P**ROVISIONS

FOR CONSTRUCTION ON Project No: 16-75 Widen Runway 12/30 and Airfield Electrical Upgrades FEDERAL PROJECT: AIP 03-06-0265-12-2017

> TURLOCK MUNICIPAL AIRPORT IN MERCED COUNTY, CALIFORNIA

Development Services Department/ Engineering Division

Phone: (209) 668-5599, Extension 4430 Contact Person: Michael G. Pitcock, P.E.

## Michael G. Pitcock, PE

Development Services Director/City Engineer

Proposals shall be delivered to Turlock, California at or before 2:00 PM PDT on, August 16, 2017 at the office of the City Engineer, Development Services: Engineering Division 156 S. Broadway, Suite 150 Turlock, CA 95380

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## CITY OF TURLOCK, CALIFORNIA Notice To Contractors

Sealed proposals will be received by the City Engineer of the City of Turlock, Development Services/Engineering Division, 156 S. Broadway, Suite 150, Turlock, California 95380, until 2:00 PM PDT on, August 16, 2017 for:

#### City Project No. 16-75 Widen Runway 12/30 and Airfield Electrical Upgrades Federal Project: AIP 03-06-0265-12-2017

In accordance with and as described and provided in the plans, specifications and the proposed form of contract therefore, all of which are on file in the office of the City Engineer, and to which special reference is hereby made.

The airport improvements for Turlock Municipal Airport Include:

- Removal of existing improvements including partial runway pavements
- Grading and drainage improvements
- Construct lime-stabilized subgrade
- Construct aggregate base course
- Construct Hot Mix Asphalt runway surfacing
- Provide and install new airfield electrical vault and equipment
- Coordinate installation of electrical and communications system service extensions
- Provide and install runway and taxiway edge lights and signs
- Install new runway and taxiway pavement markings

A Pre-Bid meeting will be held on August 2, 2017, 2:00 PM at Turlock City Hall, 156 S. Broadway Turlock, CA 95380. Prime contractors who intend to bid on the project are required to attend. Subcontractors and suppliers may attend but are not required to do so. The purpose of the pre-bid meeting is to review the project scope and schedule, federal requirements as well as give potential DBE subcontractors a chance to discuss sub-contracting opportunities with the prime contractors who intend to bid.

Proposals are required to be complete and for the entire work, materials and improvements unless the contrary is indicated in the specifications. No verbal, telegraphic, electronic mail, facsimile, or telephone Proposals shall be considered.

In accordance with the provisions of California Business and professions Code, Section 7028, Contractor shall possess one of the following Contractor license(s) at the time of bid and for the duration of the contract:

1. A-General Engineering Contractor

Failure to possess the specified license(s) shall render the Bid as non-responsive, shall act as a bar to award of the contract to any Bidder not possessing said license(s) at the time of Bid opening and shall result in the forfeiture of the security of said Bidder. Furthermore, any Bidder or Contractor not so licensed shall be subject to all legal penalties imposed by law, including, but not limited to, any appropriate disciplinary action by the Contractor's License Board.

This Project includes funding from the Federal Airport Improvement Program (AIP) and as such, requires compliance with the Federal Provisions detailed within Division 3 of the Specifications. Furthermore, the following provisions are incorporated by their references:

Buy American Preference, (Reference: 49 USC § 50101) Foreign Trade Restriction, Davis-Bacon Requirements, Affirmative Action Requirement, Government Wide Debarment and Suspension, Government Wide Requirements for Drug-Free Workplace Act of 1988.

Each proposal must be accompanied by cash, cashier's check, or check certified by a responsible bank, or by a bid bond, the proposed form of which is on file in the office of the City Engineer of said City and to which special reference is hereby made in a sum not less than ten percent (10%) of the total amount bid, payable to the City of Turlock as liquidated damages in the case the bidder is awarded the contract and fails within ten (10) days after the date of mailing to him by the City Engineer of a notice of award of the contract and that the contract is ready for signature to execute the above-mentioned written contract and file with the City Engineer satisfactory insurance certificates as required by the terms of said contract and satisfactory bonds as required by law for the faithful performance of said contract and for the protection of material, men and laborers. Special reference is hereby made to Sections 5100, et. seq., of the Public Contracts Code of the State of California and to the proposed forms for said bonds now on file in the office of the said City Engineer for further particulars regarding bonds.

Pursuant to Section 1773 of the Labor Code, the general prevailing wage rates in the county Merced in which the work is to be done have been determined by the Director of the California Department of Industrial Relations. These wages are set forth in the General Prevailing Wage Rates for this project, available at 156 S. Broadway St, Turlock, CA 95380 and available from the California Department of Industrial Relations' Internet web site at http://www.dir.ca.gov/DLSR/PWD.

Attention is directed to the Federal minimum wage rate requirements in the Bid book. The federal wage rates can be found at the following website: <u>http://www.wdol.gov/dba.aspx</u> If there is a difference between the minimum wage rates predetermined by the Secretary of Labor and the general prevailing wage rates determined by the Director of the California Department of Industrial Relations for similar classifications of labor, the Contractor and subcontractors shall pay not less than the higher wage rate. The Department will not accept lower State wage rates not specifically included in the Federal minimum wage determinations. This includes "helper" (or other classifications based on hours of experience) or any other classification not appearing in the Federal wage determinations. Where Federal wage determinations do not contain the State wage rate determination otherwise available for

use by the Contractor and subcontractors, the Contractor and subcontractors shall pay not less than the Federal minimum wage rate, which most closely approximates the duties of the employees in question.

Bidders' attention is directed to the insurance requirements in the contract. It is highly recommended that bidders confer with their respective insurance carriers or brokers to determine in advance of bid submission the availability of insurance certificates and endorsements prescribed and provided herein. If an apparent low bidder fails to comply strictly with the insurance requirements, that bidder may be disqualified from award of the contract.

No proposal will be considered unless made on forms furnished by the City Engineer of said City at his office of said City. Each proposal must be sealed, and the envelope containing the same must be addressed to the City Engineer of the City of Turlock and must be plainly marked. Each proposal shall clearly identify the bidders name and address on the sealed envelope.

Each bid shall separately state in figures the price offered for the approximate quantity of each item set forth and shall also state in words and figures the total contract price. Quantities set forth in the proposal form and in the specifications are approximate only, being given as a basis for comparison of bids, and the City of Turlock does not expressly or implied agree that the actual amount of work or materials will correspond therewith, but reserves the right to increase or decrease the amount of any class or portion of the work or materials as may be deemed necessary by the City Engineer.

Proposals may not be withdrawn for a period of ninety (90) days after the time fixed for opening of proposals. The City Council of the City of Turlock reserves the right to reject any and all proposals or any part thereof and to waive any errors or informalities in any proposals and to set and act as sole judge of the merit and qualifications of the equipment, supplies or services offered.

At the request and expense of Contractor, pursuant to Division 2, Part 5, Section 22300, et. seq., of the Public Contracts Code, securities equivalent to any funds withheld as retention from progress payments made under this contract may be deposited with the City of Turlock or with a State or Federally chartered bank as escrow agent, who shall pay such moneys to Contractor upon completion of the contract.

Copies of the Contract Documents, including Instructions to Bidders, Bid Proposal forms, Plans and Specifications, may be downloaded from the engineering division's web site or purchased for a non-refundable fee of **one hundred fifty dollars**, **(\$150.00)** at the Office of the City Engineer, 156 S. Broadway, Ste. 150, Turlock, CA 95380, Phone (209) 668-5520. For additional information, go to **http://www.cityofturlock.org/capitalprojects** 

The U.S. Department of Transportation (DOT) provides a toll-free "hotline" service to report bid rigging activities. Bid rigging activities can be reported Mondays through Fridays, between 8:00 a.m. and 5:00 p.m., Eastern Time, Telephone No. 1-800-424-9071. Anyone with knowledge of possible bid rigging, bidder collusion, or other fraudulent activities should use the "hotline" to report these activities. The "hotline" is part of the DOT's continuing effort to identify and investigate highway construction contract fraud and is operated under the direction of the DOT Inspector General. All information will be treated confidentially and caller anonymity will be respected.

No contractor or subcontractor may be listed on a bid proposal for a public works unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5. No contractor or subcontractor may be awarded a contract for public work on a public works unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.

This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. The contractors and subcontractors must furnish electronic certified payroll records to the Labor Commissioner.

The contractor shall post job site notices prescribed by regulation. (*See* 8 Calif. Code Reg. §16451(d) for the notice that previously was required for projects monitored by the CMU.)

DATED: \_\_\_\_\_

CITY OF TURLOCK

By: \_

Michael G. Pitcock, PE Development Services Director / City Engineer

### DIVISION 1 PROPOSAL

#### Project No. 16-75

#### Widen Runway 12/30 and Airfield Electrical Upgrades AIP 03-06-0265-12-2017

City of Turlock, California

DATED:\_\_\_\_\_

To: The Honorable City Council of the City of Turlock, California:

NAME OF BIDDER:	
BUSINESS ADDRESS:	
PLACE OF RESIDENCE:	

Bids are to be submitted for the entire work. The amount of the bid for comparison purposes will be the total of all items. The bidder shall set forth for each unit basis item of work a unit price and a total for the item, and for each lump sum item a total for the item, all in clearly legible figures in the respective spaces provided for that purpose.

In the case of unit basis items, the amount set forth under the "Item Total" column shall be the product of the unit price bid and the estimated quantity for the item. In case of discrepancy between the unit price and the total set forth for a unit basis item, the unit price shall prevail except as provided in (a) or (b), as follows:

(a) If the amount set forth as unit price is unreadable or otherwise unclear, or is omitted, or is the same as the amount as the entry in the item total column, then the amount set forth in the item total column for the item shall prevail and shall be divided by the estimated quantity for the item and the price thus obtained shall be the unit price;

(b) (Decimal Errors) If the product of the entered unit price and the estimated quantity is exactly off by a factor of ten, one hundred, etc., or one-tenth, or one-hundredth, etc. from the entered total, the discrepancy will be resolved by using the entered unit price or item total, whichever most closely approximates percentage wise the unit price or item total in the Department's Final Estimate of cost.

The Contractor shall submit the following at the time of Bid in order for the Bid to be considered responsive:

- Completed Proposal, pages 5 34;
- Information Required of Bidder;
- Bidder's Bond;
- Bidders List of Subcontractors Part 1;
- Equal Employment Opportunity Certification;
- Public Contract Code Statements;
- Noncollusion Affidavit;
- Debarment and Suspension Certification;
- Certification Regarding Lobbying;
- Certification of Nonsegregated Facilities;
- Buy American Certificate;
- Trade Restriction Certificate;
- Local Agency DBE Commitment;
- DBE Information Good Faith Efforts
- Bidders List of Subcontractors Part 2;

In accordance with the annexed Notice to Contractors, the undersigned, as bidder, declares that he has carefully examined the location of the proposed work, the plans, specifications and technical requirements therefore, and the proposed forms of contract and bonds mentioned or referred to in said Notice and on file in the office of the City Engineer of the City of Turlock, together with the prevailing rate of per diem wages for each craft or type of workmen needed to execute said contract; and he proposes and agrees that if this proposal is accepted, he will furnish all labor, materials, equipment, plant transportation, service, sales taxes, permit fees and other costs necessary to complete the construction in strict conformity to the plans and specifications and he will enter into a written contract with the City of Turlock in the form of contract on file in the Office of the City Engineer for such purposes, and that he will execute and/or provide all bonds and insurance certificates required by law and/or by said contract and/or mentioned in said Notice to Contractors all in accordance with and subject to all applicable laws, and that he will take in full payment therefore the following unit prices, to wit:

	SCHEDULE OF BID ITEMS									
No.	SPEC.	CIVIL ITEM DESCRIPTION	QTY	UNIT	UNIT PRICE	EXT. TOTAL				
1	GP-105	Mobilization (3% Max)	1	LS						
2	M-005-7.1	Airport Safety and Security	1	LS						
3	M-102-3.1	Construction Staking and Layout	1	LS						
4	M-103-3.1	Contractor Quality Control	1	LS						
5	M-105-4.1	Removal of Miscellaneous Improvements	1	LS						
6	M-145-5.1	Excavation Cut-Off Wall	2,990	LF						
7	M-150-4.1	Asphalt Concrete Removal by Milling (+/- 3")	10,350	SY						
8	M-150-4.2	Place, Blend, Compact Millings at Runway Shoulders	6,500	SY						
9	M-150-4.3	Apply Dust Palliative/Stabilizer Compacted Millings	6,500	SY						
10	M-215-5.1	Pre-Emergent Herbicide Application	19,000	SY						
11	M-215-5.2	Post Emergent Herbicide Application	1,500	LF						
12	M-220-7.1	Riprap Construction	25	SY						
13	P-101-5.1	Surface Preparation	1	LS						
14	P-101-5.2	Crack Sealing	1,500	LF						
15	P-151-4.1	Clearing and Grubbing	16.0	AC						
16	P-152-4.1	Unclassified Excavation	19,000	СҮ						
17	P-155-8.1	Lime-treated Subgrade	18,800	SY						
18	P-155-8.2	Lime (6%)	420	TON						
19	P-156-5.1	Storm Water Pollution Prevention Plan (SWPPP)	1	LS						
20	P-208-5.1	Crushed Aggregate Base Course (5")	12,300	SY						
21	P-403-8.1	Bituminous Surface Course	3,500	TON						
22	P-603-5.1	Bituminous Tack Coat	12	TON						
23	P-620-5.1	Runway and Taxiway Marking (with beads)	28,000	SF						
24	D-701-5.1	24-inch RGRCP, Class V	330	LF						
25	D-705-5.1	4-inch Perforated Edge Drain Pipe	3,200	LF						
26	D-705-5.2	8-inch Schedule 80 PVC Outlet Pipe	300	LF						
27	D-705-5.3	6-inch Schedule 80 PVC Outlet Pipe	1,400	LF						
28	D-705-5.4	4-inch Schedule 80 PVC Outlet Pipe	500	LF						
29	D-751-5.1	Catch Basins	1	EA						
30	D-752-5.1	Miscellaneous Drainage Structures (Dry Wells)	1	EA						
31	T-910-6.1	Hydro-Mulch	16	AC						

	SCHEDULE OF BID ITEMS									
					Estimated	Total Item				
No.	SPEC.	ELECTRICAL ITEM DESCRIPTION	QTY	UNIT	UNIT PRICE	ESTIMATED COST				
32	L-107-5.1	L-807, Style 1-A, Size 2 Wind Cone	1	EA						
33	L-107-5.2	Segmented Circle Marker System	1	EA						
34	L-108-5.1	No. 8 AWG L-824C Cable, installed in duct bank or conduit	10,500	LF						
25	L 100 F 2	Bare Counterpoise Wire, installed in trench, duct bank or conduit,								
35 L-108-5.2		including ground rods and ground connectors	6,400	LF						
36	L-108-5.3	Ground Conductor in Conduits, #6 THWN	7,550	LF						
37	L-109-5.1	Airport Transformer Vault and Foundation in Place	1	LS						
38	l-109-5.2	Electrical Service Connection and Utility Coordination Fee	1	LS						
39	l-109-5.3	Electrical Utility Fees	1	LS						
40	L-110-5.1	4-4 Inch Schedule 40 PVC Duct, Trenched, Concrete Encased	160	LF						
41	L-110-5.2	4-4 Inch Schedule 40 PVC Duct, Trenched, Un-encased	250	LF						
42	L-110-5.3	1-2 Inch Schedule 40 PVC Duct, Trenched, Un-encased	3,700	LF						
43	L-110-5.4	2-2 Inch Schedule 40 PVC Duct, Trenched, Un-Encased	2,710	LF						
44	L-110-5.5	2-2 Inch Schedule 40 PVC Duct, Trenched, Concrete Encased	300	LF						
45	L-110-5.6	4-2 Inch Schedule 40 PVC Duct, Trenched, Un-Encased	440	LF						
10		1-3 Inch and 2-4" inch Schedule 40 PVC Ducts for Utility Service,								
46	L-110-5.7	Trenched	160	LF						
47	L 110 E 9	2-2 Inch and 2-4" inch Schedule 40 PVC Ducts for Utility Service,								
+7	L-110-5.0	Trenched	410	LF						
48	L-115-5.1	Electrical J-box-Handhole – Precast ID 4'x4'x4' – Used as a pullbox	9	EA						
49	L-115-5.2	L-867 Electrical Junction Base – Used as a splice can	2	EA						
50	L-115-5.3	TID Vault per Detail 1/E8.2	1	EA						
F 1		TID Transformer Pad and Bollards per Details 1, 2 and 3, Drawing								
51	L-115-5.4	E8.1	1	EA						
52	L-115-5.5	AT&T Pullboxes	2	EA						
53	L-125-5.1	Taxiway Edge Light – LED, On New Base	40	EA						
54	L-125-5.2	L-861 Runway Edge Light – LED, On New Base - (color per plan)	27	EA						
55	L-125-5.3	L-861SE Runway Threshold Light, Red/Green, On new Base.	12	EA						
56	L-125-5.4	New L-858 Size 1, 2 Module Sign, LED, New Sign Pad Installed	3	EA						
57	L-130-5.1	TVSS Installed	1	LS						
L	1			Total Bid		•				

Total Bid

Amount is:

Dollars

and

Cents

:			
DRESS:			
	(Number)	(St	reet)
	(City)	(State)	(ZIP)

#### NOTE: CONTRACTOR WILL BE REQUIRED TO LIST THEIR LICENSE NUMBER, EXPIRATION DATE, AND APPROPRIATE STATEMENT REGARDING PERJURY AND SIGNED BY INDIVIDUAL AUTHORIZED TO DO SO. FAILURE TO INCLUDE THE ABOVE ITEMS MAY CAUSE SAID CONTRACTOR'S BID TO BE REJECTED.

	, Contractor's License #	, Class
(Company's Name)		

Expires\_\_\_\_\_\_. This information is true, is provided as per Section 7028.15 of the Business and Professions Code, and is made herein under penalty of perjury.

X\_\_

(Bidder's Signature)

(Date)

If the proposal is accepted and the undersigned shall fail to contract as aforesaid and fail to file with the City insurance certificates as required by said contract, within fourteen (14) days after the bidder has received notice from the City Engineer or his representative of the City of Turlock that the contract has been awarded to bidder and is ready for signature, the City of Turlock may, at its option, determine that the bidder has abandoned his contract, and thereupon this proposal and the acceptance thereof shall be null and void.

Also accompanying this proposal is an affidavit of non collusion and questionnaire to general contractors, a statement of proposed sub contractors, if any, the address of mill, shop or office of any sub contractor, and a statement of work to be performed by sub contractors.

The names and addresses of persons interested in the foregoing proposal as principals are as follows:

(**IMPORTANT NOTICE**: If bidder or other interested person is a corporation, state legal name of corporation, also names of the president, secretary, treasurer, and manager thereof; if a partnership, state true name of firm, also names of all individual co partners composing firm; if bidder or other interested person is an individual, state first and last name in full.)

Licensed in a	accordance with an act providing for	for the registration of Contractors
License No.	Expiratio	ion Date

DATED:\_\_\_\_\_, 20\_\_\_\_

Address:\_\_\_\_\_

Phone:\_\_\_\_\_

X\_\_\_\_\_\_Signature of Bidder

NOTE: If bidder is a corporation, the legal name of the corporation shall be set forth above together with the signature of the officers authorized to sign contracts on behalf of the corporation; if bidder is a co partnership, the true name of the firm shall be set forth above together with the signature of the partner or partners authorized to sign contracts in behalf of the co partnership; and, if bidder is an individual, his signature shall be placed above. If a signature is by an agent other than an officer of a corporation or a member of the partnership, a Power of Attorney must be on file with the City Clerk prior to opening or submitted with the bid; otherwise, the bid will be disregarded as irregular and unauthorized.

#### AFFIDAVIT

The undersigned bidder, being first duly sworn, deposes and says that he/she are the party making the foregoing proposal or bid, that this bid is genuine and not collusive or sham, that said bidder has not colluded, conspired, connived or agreed, directly or indirectly, with any other person or bidder, to put in a sham bid, or that said other person shall refrain from bidding, and has not in any manner sought by collusion to secure any advantage against the said City or any person interested in said improvement, for him/herself or any other person.

X Signature of Bidder Jurat (Government Code Section 8202) State of California County of \_\_\_\_\_ Subscribed and sworn to (or affirmed) before me on this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_ by \_\_\_\_\_\_ proved to me on the basis of satisfactory evidence to be the person(s) who appeared before me. (AFFIX SEAL) NOTARY PUBLIC SIGNATURE NOTARY PUBLIC PRINTED NAME

#### **INFORMATION REQUIRED OF BIDDER**

The b	oidder	is	required	to	provide	the	following	information.	Additional	sheets	may	be	attached	if
neces	sary.													

Contractor's mailing address:

Contractor's telephone number:\_\_\_\_\_

Number of years experience as a contractor in construction work or installation work similar to that required in these specifications:

Name of person who inspected the site of the proposed work for your firm:

Date of Inspection:\_\_\_\_\_

List at least four projects completed as of recent date:

#### **BIDDER'S BOND**

#### KNOW ALL MEN BY THESE PRESENTS:

That we \_\_\_\_\_\_\_BIDDER, and \_\_\_\_\_\_

SURETY a corporation duly organized under the laws of the State of \_\_\_\_\_

and duly licensed to become sole Surety on bonds required and authorized by the State of California, as SURETY, are held and firmly bound unto the City of Turlock, hereinafter called the City, in the penal sum of TEN PERCENT (10%) OF THE TOTAL AMOUNT OF THE BID of the Bidder above named, submitted by said Bidder to the City, for the work described below, for the payment of which sum in lawful money of the United States, well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents. In no case shall the liability of the Surety hereunder exceed the sum

Dollars ( \$\_\_\_\_\_).

THE CONDITION OF THIS OBLIGATION IS SUCH THAT, whereas the bidder has submitted the above-mentioned bid to the City for certain construction specifically described as follows for which bids are to be opened at Engineering Division, Development Services Department, City Hall, 156 S. Broadway Suite 150, Turlock, California, on

\_\_\_\_\_, \_\_\_\_, 20\_\_\_, at\_\_\_\_\_ (day) (date) (time)

#### for Project No. 16-75, "Widen Runway 12/30 and Airfield Electrical Upgrades, AIP 03-06-0265-12-2017"

NOW, THEREFORE, if the aforesaid Bidder is awarded the contract and, within the time manner required under the specifications after the prescribed forms are presented to him for signature, enters into a written contract in the prescribed form in accordance with the bid, and files the two bonds with the City, one to guarantee faithful performance and the other to guarantee payment for labor and materials as required by law, then obligation shall be null and void; otherwise, it shall be and remain in full force and virtue.

In the event suit is brought upon this bond by the Obligee and judgment is recovered, the Surety shall pay all costs incurred by the Obligee in such a suit, including a reasonable attorney's fee to be fixed by the court.

as

as

IN WITNESS WHEREOF, we have hereunto set our hands and seals on this \_\_\_\_\_\_day of \_\_\_\_\_\_, 201\_.

BIDDER

\_\_\_\_(SEAL)

(Bidder's Name and Corporate Seal)

(Signature)

(Print Name and Title)

#### (ATTACH ACKNOWLEDGMENT OF BIDDER)

SURETY

\_(SEAL)

(Surety's Name and Corporate Seal)

(Signature)

(Print Name and Title)

(ATTACH ACKNOWLEDGMENT OF SURETY'S ATTORNEY-IN-FACT)

#### NOTE: ATTACH CERTIFIED COPY OF POWER OF ATTORNEY

### SUB-CONTRACTORS City Project No. 16-75 Widen Runway 12/30 and Airfield Electrical Upgrades, AIP 03-06-0265-12-2017

Prime Contractor	DIR NUMBER.	
Time Contractor.	DIRTIGUIDER	

The bidder is required to provide the following information concerning his sub-contractors in accordance with Sections 4100 et. seq., inclusive, of the California Public Contracts Code. Sub-contractors listed below must be properly licensed under the laws of the State of California for the type of work which they are to perform. List all sub-contractors who will furnish work in excess of one-half (1/2) of one percent (1%) of the prime contractor's total bid or ten thousand dollars (\$10,000), whichever is greater. Do not list alternate sub-contractors for the same work.

IF NO SUBCONTRACTORS WILL FURNISH WORK, THEN WRITE "NONE" BELOW IN THE SPACE PROVIDED.

Name	License Number	Dir Number	Address	Work Items to be Performed and
				Percent of Item

#### **SUB-CONTRACTORS** City Project No. 16-75

#### Widen Runway 12/30 and Airfield Electrical Upgrades, AIP 03-06-0265-12-2017

Prime Contractor:\_\_\_\_\_ DIR NUMBER:\_\_\_\_\_

#### IF NO SUBCONTRACTORS WILL FURNISH WORK, THEN WRITE "NONE" BELOW IN THE SPACE PROVIDED.

Name	License Number	Dir Number	Address	Work Items to be Performed and
				Percent of Item

#### (THE BIDDER'S EXECUTION ON THE SIGNATURE PORTION OF THIS PROPOSAL SHALL ALSO CONSTITUTE AN ENDORSEMENT AND EXECUTION OF THOSE CERTIFICATIONS WHICH ARE A PART OF THIS PROPOSAL)

#### EQUAL EMPLOYMENT OPPORTUNITY CERTIFICATION

The bidder	,
proposed subcontractor	, hereby
certifies that he has,	has not, participated in a previous contract or subcontract subject to
the equal opportunity clause	s, as required by Executive Orders 10925, 11114, or 11246, and that,
where required, he has filed v	with the Joint Reporting Committee, the Director of the Office of Federal
Contract Compliance, a Fee	deral Government contracting or administering agency, or the former
President's Committee on Eq	ual Employment Opportunity, all reports due under the applicable filling
requirements.	

**Note:** The above certification is required by the Equal Employment Opportunity Regulations of the Secretary of Labor (41 CFR 60-1.7(b) (1)), and must be submitted by bidders and proposed subcontractors only in connection with contracts and subcontracts which are subject to the equal opportunity clause. Contracts and subcontracts which are exempt from the equal opportunity clause are set forth in 41 CFR 60-1.5. (Generally only contracts or subcontracts of \$10,000 or under are exempt.)

Currently, Standard Form 100 (EEO-1) is the only report required by the Executive Orders or their implementing regulations.

Proposed prime contractors and subcontractors who have participated in a previous contract or subcontract subject to the Executive Orders and have not filed the required reports should note that 41 CFR 60-1.7(b) (1) prevents the award of contracts and subcontracts unless such contractor submits a report covering the delinquent period or such other period specified by the Federal Highway Administration or by the Director, Office of Federal Contract Compliance, U.S. Department of Labor.

Signature

#### Public Contract Code Section 10285.1 Statement

In conformance with Public Contract Code Section 10285.1 (Chapter 376, Stats. 1985), the bidder hereby declares under penalty of perjury under the laws of the State of California that the bidder has \_\_\_\_\_, has not \_\_\_\_\_been convicted within the preceding three years of any offenses referred to in that section, including any charge of fraud, bribery, collusion, conspiracy, or any other act in violation of any state or Federal antitrust law in connection with the bidding upon, award of, or performance of, any public works contract, as defined in Public Contract Code Section 1101, with any public entity, as defined in Public Contract Code Section 1100, including the Regents of the University of California or the Trustees of the California State University. The term "bidder" is understood to include any partner, member, officer, director, responsible managing officer, or responsible managing employee thereof, as referred to in Section 10285.1.

Note: The bidder must place a check mark after "has" or "has not" in one of the blank spaces provided. The above Statement is part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Statement. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

Signature

Date

#### Public Contract Code Section 10162 Questionnaire

In conformance with Public Contract Code Section 10162, the Bidder shall complete, under penalty of perjury, the following questionnaire:

Has the bidder, any officer of the bidder, or any employee of the bidder who has a proprietary interest in the bidder,

ever been disqualified, removed, or otherwise prevented from bidding on, or completing a federal, state, or local

government project because of a violation of law or a safety regulation?

Yes No

If the answer is yes, explain the circumstances in the following space.

#### Public Contract Code 10232 Statement

In conformance with Public Contract Code Section 10232, the Contractor, hereby states under penalty of perjury, that no more than one final unappealable finding of contempt of court by a federal court has been issued against the Contractor within the immediately preceding two year period because of the Contractor's failure to comply with an order of a federal court which orders the Contractor to comply with an order of the National Labor Relations Board.

Note: The above Statement and Questionnaire are part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Statement and Questionnaire.Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

Signature

#### NONCOLLUSION AFFIDAVIT

(Title 23 United States Code Section 112 and Public Contract Code Section 7106) To the CITY OF TURLOCK DEPARTMENT DEVELOPMENT SERVICES.

In conformance with Title 23 United States Code Section 112 and Public Contract Code 7106 the bidder declares that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

Note: The above Noncollusion Affidavit is part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Noncollusion Affidavit.

Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

Signature

#### DEBARMENT AND SUSPENSION CERTIFICATION

#### TITLE 49, CODE OF FEDERAL REGULATIONS, PART 29

The bidder, under penalty of perjury, certifies that, except as noted below, he/she or any other person associated therewith in the capacity of owner, partner, director, officer, manager:

- is not currently under suspension, debarment, voluntary exclusion, or determination of ineligibility by any Federal agency;
- has not been suspended, debarred, voluntarily excluded or determined ineligible by any Federal agency within the past 3 years;
- does not have a proposed debarment pending; and
- has not been indicted, convicted, or had a civil judgement rendered against it by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past 3 years.

If there are any exceptions to this certification, insert the exceptions in the following space.

Exceptions will not necessarily result in denial of award, but will be considered in determining bidder responsibility. For any exception noted above, indicate below to whom it applies, initiating agency, and dates of action.

Notes: Providing false information may result in criminal prosecution or administrative sanctions. The above certification is part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Certification.

Signature

#### **CERTIFICATION REGARDING LOBBYING**

The bidder or offeror certifies by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

- (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the Bidder or Offeror, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
- (3) The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

Signature

#### CERTIFICATION OF NONSEGREGATED FACILITIES (CONTRACTORS/SUBCONTRACTORS)

(A Certification of Nonsegregated Facilities must be submitted prior to the award of a contract or subcontract exceeding \$10,000 which is not exempt from the provisions of the Equal Opportunity Clause.)

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 the 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 further that he will not maintain or provide for his employees any segregated facilities at any of his establishments, and the he will not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The federally assisted construction contractor agrees that a breach of this certification is a violation of the Equal Opportunity Clause in this contract. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, sex 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 subcontract exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity Clause, and that he will retain such certifications in his files.

Signature

#### **BUY AMERICAN CERTIFICATE**

#### Certificate of Buy American Compliance for Manufactured Products

(Non-building construction projects, equipment acquisition projects)

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

□ Bidder or offeror hereby certifies that it will comply with 49 USC § 50101 by:

- a) Only installing steel and manufactured products produced in the United States, or;
- b) Installing manufactured products for which the FAA has issued a waiver as indicated by inclusion on the current FAA Nationwide Buy American Waivers Issued listing, or;
- c) Installing products listed as an Excepted Article, Material or Supply in Federal Acquisition Regulation Subpart 25.108.

By selecting this certification statement, the bidder or offeror agrees:

- 1. To provide to the Owner evidence that documents the source and origin of the steel and manufactured product.
- 2. To faithfully comply with providing US domestic product
- 3. To furnish US domestic product for any waiver request that the FAA rejects
- 4. To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the FAA determines justified.
- □ The bidder or offeror hereby certifies it cannot comply with the 100% Buy American Preferences of 49 USC § 50101(a) but may qualify for either a Type 3 or Type 4 waiver under 49 USC § 50101(b). By selecting this certification statement, the apparent bidder or offeror with the apparent low bid agrees:
  - 1. To the submit to the Owner within 15 calendar days of the bid opening, a formal waiver request and required documentation that support the type of waiver being requested.
  - 2. That failure to submit the required documentation within the specified timeframe is cause for a non-responsive determination may result in rejection of the proposal.
  - 3. To faithfully comply with providing US domestic products at or above the approved US domestic content percentage as approved by the FAA.
  - 4. To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the FAA determines justified.

#### **Required Documentation**

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

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

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

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

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

Signature

#### TRADE RESTRICTION CERTIFICATE

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

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

This certification concerns a matter within the jurisdiction of an agency of the United States of America and the making of a false, fictitious, or fraudulent certification may render the maker subject to prosecution under Title 18, United States Code, Section 1001.

The Offeror/Contractor must provide immediate written notice to the Owner if the Offeror/Contractor learns that its certification or that of a subcontractor was erroneous when submitted or has become erroneous by reason of changed circumstances. The Contractor must require subcontractors provide immediate written notice to the Contractor if at any time it learns that its certification was erroneous by reason of changed circumstances.

Unless the restrictions of this clause are waived by the Secretary of Transportation in accordance with 49 CFR 30.17, no contract shall be awarded to an Offeror or subcontractor:

- (1) who is owned or controlled by one or more citizens or nationals of a foreign country included on the list of countries that discriminate against U.S. firms published by the U.S.T.R. or
- (2) whose subcontractors are owned or controlled by one or more citizens or nationals of a foreign country on such U.S.T.R. list or
- (3) who incorporates in the public works project any product of a foreign country on such U.S.T.R. list;

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

The Offeror agrees that, if awarded a contract resulting from this solicitation, it will incorporate this provision for certification without modification in all lower tier subcontracts. The contractor may rely on the certification of a prospective subcontractor that it is not a firm from a foreign country

included on the list of countries that discriminate against U.S. firms as published by U.S.T.R, unless the Offeror has knowledge that the certification is erroneous.

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

Signature

### Exhibit 15-G Local Agency Bidder DBE Commitment (Construction Contracts)

NO	OTE: PLEASE REFER TO INS	TRUCTIONS ON	THE REVERSE SIDE OF 1	THIS FORM
LOCAL AGENC	CY:	LOCATIO	N:	
PROJECT DESC	CRIPTION:			
TOTAL CONTR	ACT AMOUNT: \$			
BID DATE:				
BIDDER'S NAM	ИЕ:			
CONTRACT DE	BE GOAL:			
CONTRACT ITEM NO.	ITEM OF WORK AND DESCRIPTION OR SERVICES TO BE SUBCONTRACTED OR MATERIALS TO BE PROVIDED (or contracted if the bidder is a DBE)	DBE CERT NO. AND EXPIRATION DATE	NAME OF EACH DBE (Must be certified on the date bids are opened - include DBE address and phone number)	DOLLAR AMOUNT DBE
For Local Agency to Complete:       Local Agency Contract Number:       Federal-aid Project Number:		Total Claimed DBE Participation	\$%	
Federal Share:				
Contract Award Date:		Signature of Bidder Date (Area Code) Tel. No.		
Print Name Local Agency Re	Signature	Date	Person to Contact (P	Please Type or Print)
(Area Code) Telephone Number:		Local Agency Bidder DBE Commitment (Construction Contracts) (Rev 6/26/09)		

Distribution: (1) Original – Local agency files

#### INSTRUCTIONS - LOCAL AGENCY BIDDER DBE COMMITMENT (CONSTRUCTION CONTRACTS)

#### ALL BIDDERS:

PLEASE NOTE: This information may be submitted with your bid. If it is not, and you are the apparent low bidder or the second or third low bidder, it must submitted and received as specified in the Special Provisions. Failure to submit the required DBE commitment will be grounds for finding the bid nonresponsive The form requires specific information regarding the construction contract: Local Agency, Location, Project Description, Total Contract Amount, Bid Date, Bidder's Name, and Contract DBE Goal.

The form has a column for the Contract Item Number and Item of Work and Description or Services to be Subcontracted or Materials to be provided by DBEs. Prime contractors shall indicate all work to be performed by DBEs including, if the prime is a DBE, work performed by its own forces, if a DBE. The DBE shall provide a certification number to the Contractor and expiration date. Enter the DBE prime's and subcontractors' certification numbers. The form has a column for the Names of DBE contractors to perform the work (who must be certified on the date bids are opened and include the DBE address and phone number).

IMPORTANT: Identify **all** DBE firms participating in the project regardless of tier. Names of the First-Tier DBE Subcontractors and their respective item(s) of work listed should be consistent, where applicable, with the names and items of work in the "List of Subcontractors" submitted with your bid.

There is a column for the DBE participation dollar amount. Enter the Total Claimed DBE Participation dollars and percentage amount of items of work submitted with your bid pursuant to the Special Provisions. (If 100% of item is not to be performed or furnished by the DBE, describe exact portion of time to be performed or furnished by the DBE.) See Section "Disadvantaged Business Enterprise (DBE)," of the Special Provisions (construction contracts), to determine how to count the participation of DBE firms.

Exhibit 15-G must be signed and dated by the person bidding. Also list a phone number in the space provided and print the name of the person to contact.

**Local agencies** should complete the Local Agency Contract Award, Federal-aid Project Number, Federal Share, Contract Award Date fields and verify that all information is complete and accurate before signing and filing.
# Exhibit 15-H DBE Information —Good Faith Efforts DBE Information - Good Faith Efforts

# AIP 03-06-0265-12-2017

The <u>\_</u>City of Turlock has\_established a 4% triennial goal for Disadvantaged Business Enterprise (DBE) participation for public works projects. For this project, the City of Turlock has *not* established a race or gender-*conscious* DBE participation goal. The City of Turlock uses race and gender-neutral measures to facilitate participation by DBEs and Small Businesses. The information provided herein shows that a good faith effort was made.

Lowest, second lowest and third lowest bidders shall submit the following information to document adequate good faith efforts. Bidders should submit the following information even if the "Local Agency Bidder DBE Commitment" form indicates that the bidder has met the DBE goal. This will protect the bidder's eligibility for award of the contract if the administering agency determines that the bidder failed to meet the goal for various reasons, e.g., a DBE firm was not certified at bid opening, or the bidder made a mathematical error.

Submittal of only the "Local Agency Bidder DBE Commitment" form may not provide sufficient documentation to demonstrate that adequate good faith efforts were made.

The following items are listed in the Section entitled "Submission of DBE Commitment" of the Special Provisions:

A. The names and dates of each publication in which a request for DBE participation for this project was placed by the bidder (please attach copies of advertisements or proofs of publication):

Publications	Dates of Advertisement

B. The names and dates of written notices sent to certified DBEs soliciting bids for this project and the dates and methods used for following up initial solicitations to determine with certainty whether the DBEs were interested (please attach copies of solicitations, telephone records, fax confirmations, etc.):

Names of DBEs Solicited	Date of Initial	Follow Up Methods and Dates
	Solicitation	

C. The items of work which the bidder made available to DBE firms including, where appropriate, any breaking down of the contract work items (including those items normally performed by the bidder with its own forces) into economically feasible units to facilitate DBE participation. It is the bidder's responsibility to demonstrate that sufficient work to facilitate DBE participation was made available to DBE firms.

Items of Work	Bidder Normally	Breakdown of	Amount	Percentage
	Performs Item	Items	(\$)	Of
	(Y/N)			Contract

D. The names, addresses and phone numbers of rejected DBE firms, the reasons for the bidder's rejection of the DBEs, the firms selected for that work (please attach copies of quotes from the firms involved), and the price difference for each DBE if the selected firm is not a DBE:

Names, addresses and phone numbers of rejected DBEs and the reasons for the bidder's rejection of the DBEs:

Names, addresses and phone numbers of firms selected for the work above:

E. Efforts made to assist interested DBEs in obtaining bonding, lines of credit or insurance, and any technical assistance or information related to the plans, specifications and requirements for the work which was provided to DBEs:

F. Efforts made to assist interested DBEs in obtaining necessary equipment, supplies, materials or related assistance or services, excluding supplies and equipment the DBE subcontractor purchases or leases from the prime contractor or its affiliate:

G. The names of agencies, organizations or groups contacted to provide assistance in contacting, recruiting and using DBE firms (please attach copies of requests to agencies and any responses received, i.e., lists, Internet page download, etc.):

Name of Agency/Organization	Method/Date of Contact	Results
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H. Any additional data to support a demonstration of good faith efforts (use additional sheets if necessary):

## NOTE: USE ADDITIONAL SHEETS OF PAPER IF NECESSARY.

# BIDDER'S LIST OF SUBCONTRACTORS (DBE and NON-DBE)- PART II

The bidder shall list all subcontractors who provided a quote or bid but were not selected to participate as a subcontractor on this project. This is required for compliance with Title 49, Section 26 of the Code of Federal Regulations. Photocopy this form for additional firms.

Firm Name/ Address/ City, State, ZIP	Phone/ Fax	Annual Gross Receipts	Description of Portion of Work to be Performed	Local Agency Use Only (Certified DBE?)
Name	Phone	< \$1 million		YES
		<\$5 million		NO
Address		< \$10 million		If YES list DBE #:
	Fax	< \$15 million	_	
City State ZIP		> \$15 million		Age of Firm (Yrs.)
				-
Name	Phone	< \$1 million		YES
		< \$5 million		NO
Address	-	< \$10 million		If YES list DBE #:
	Fax	 < \$15 million		
City State ZIP	-	> \$15 million		Age of Firm (Yrs.)
Name	Phone	< \$1 million		YES
		< \$5 million		
Addrass	-	< \$10 million		If VES list DRE #:
Autress	Fax	< \$15 million		IJ TES USI DBE #.
City State 71D	Гах	< \$15 million		A go of Firm (Vrs.)
		> \$13 mmon		Age of Film (115.)
Name	Phone	< \$1 million		YES
		<\$5 million		NO
Address	1	< \$10 million		If YES list DBE #:
	Fax	< \$15 million		
City State ZIP	1	> \$15 million		Age of Firm (Yrs.)

# **DIVISION 2**

## FOR PUBLIC IMPROVEMENT

#### Project No. 16-75

## Widen Runway 12/30 and Airfield Electrical Upgrades AIP 03-06-0265-12-2017

#### RECITALS

A City has taken appropriate proceedings to authorize construction of the public work and improvements herein provided and execution of this contract.

B A notice was duly published for bids for the contract for the improvement hereinafter described.

C On \_\_\_\_\_\_, 20\_\_\_, after notice duly given, the City Council of the City of Turlock awarded the contract for the construction of the improvements hereinafter described to Contractor, which Contractor said Council found to be the lowest responsible bidder for said improvements.

D City and Contractor desire to enter into this Agreement for the construction of said improvements.

#### **IT IS AGREED AS FOLLOWS:**

#### **1. SCOPE OF WORK:**

Contractor shall perform the work described briefly as follows:

The work consists, in general, of: Construct Runway Widening and Airfield Electrical Upgrades at Turlock Municipal Airport, and furnishing all necessary labor, materials, tools, equipment and incidentals needed to perform the improvements as shown on the contract plans complete and in place. This work shall be completed in accordance with the Standard Specifications, standard Drawings and these Special Provisions.

The aforesaid improvements are further described in the plans, specifications and technical requirements for such project, copies of which are on file in the office of the City Engineer, and which are incorporated herein by reference as if set forth fully herein.

#### 2. THE CONTRACT:

The complete contract consists of the following documents: This agreement, the notice to contractors, the contractor's accepted proposal, general conditions, special provisions, plans and detailed drawings, addendums, faithful performance bond, labor and materials bond, and any and all supplemental agreements amending, decreasing, or extending the work contemplated or which may be required to complete the work in a substantial and acceptable manner. The current edition of the "City of Turlock Standard Specifications and Drawings" is hereby incorporated as a part of the contract.

All rights and obligations of City and Contractor are set forth and described in the contract.

All of the above named documents are intended to incorporate the terms of the others so that any work called for in one and not mentioned in the other, or vice versa, is to be executed the same as if mentioned in all said documents. The documents comprising the complete contract will hereinafter be referred to as the "contract". In case of any dispute, the decision of the City Engineer shall be final.

#### 3. SCHEDULE:

All work shall be performed in accordance with the schedule approved by the City Engineer and under his direction.

#### 4. EQUIPMENT & PERFORMANCE OF WORK:

Contractor shall furnish all tools, equipment, facilities, labor and materials necessary to perform and complete in good workmanlike manner the work of general construction as called for and in the manner designated in and in strict conformity with the plans and specifications for said work, which said specifications are entitled, "General Conditions and Special Provisions for City Project No. 16-75, Widen Runway 12/30 and Airfield Electrical Upgrades, AIP 03-06-0265-12-2017.

The equipment, apparatus, facilities, labor and material shall be furnished, and said work performed and completed as required in said plans and specifications under the direction and supervision, and subject to the approval of the City Engineer of said City, or City Engineer's designated agent.

#### 5. CONTRACT PRICE:

City shall pay, and Contractor shall accept in full payment for the work above agreed to be done, an amount not to exceed \_\_\_\_\_\_ and XX/100ths Dollars (\$\_\_\_\_\_\_.). Said amount shall be paid in installments as hereinafter provided.

#### 6. TIME FOR PERFORMANCE:

The time fixed for the commencement of such work is within ten (10) working days after the "Notice to Proceed" has been issued. The work on this project, including all punch list items, shall be completed on or before the expiration of one hundred twenty three (123) working days beginning on the first day of work or no later than the tenth day after the "Notice to Proceed" has been issued.

#### 7. RIGHTS OF CITY TO INCREASE WORKING DAYS:

If such work is not completed within such time, the City Engineer shall have the right to increase the number of working days in the amount the City Engineer may determine will best serve the interests of the City, and if the City Engineer desires to increase said number of working days, the City Engineer shall have the further right to charge the Contractor and deduct from the final payment for the work the actual cost of engineering, inspection, superintendence, and other overhead expenses which are directly chargeable to Contractor, and which accrue during the period of such extension, except that the cost of the final service and preparation of the final estimates shall not be included in such charges; provided, however, that no extension of time for completion of such work shall ever be allowed unless requested by Contractor at least twenty (20) calendar days prior to the time herein fixed for the completion thereof, in writing, with the City Engineer. In this connection, it is understood that the City Engineer shall not consider any such requests if not filed within the time herein prescribed.

## 8. OPTION OF CITY TO TERMINATE AGREEMENT IN EVENT OF FAILURE TO COMPLETE WORK:

If Contractor shall have refused or failed to prosecute the work, or any severable part thereof, with such diligence as will ensure its completion within the time specified or any extensions thereof, or shall have failed to complete said work within such time if Contractor should be adjudged a bankrupt, or if Contractor should make a general assignment for the benefit of Contractor's creditors, or if a receiver should be appointed in the event of Contractor's insolvency, or if Contractor or any subcontractor should violate any of the provisions of this agreement, the City Engineer or the City Council may give written notice to Contractor and Contractor's sureties of its intention to terminate this agreement, and unless within five (5) days after the serving of such notice such violation shall cease and satisfactory arrangements for the correction thereof made, this agreement may, at the option of City, upon the expiration of said time, cease and terminate.

#### 9. DELAY DAMAGES:

In the event the Contractor, for any reason, shall have failed to perform the work herein specified to the satisfaction of the City Engineer within the time herein required, the City may, in accordance with Section 7203 of the Public Contract Code, in lieu of any other of its rights authorized by paragraph 8 of this agreement, deduct from payments or credits due Contractor after such breach, a sum equal to two thousand three hundred and no/100ths Dollars (\$2,300.00) for each calendar day beyond the date herein provided for the completion of such work. This deduction shall not be considered a penalty but shall be considered as delay damages. The aforementioned rate of deduction is an amount agreed to by the Contractor and the City as reasonably representing additional construction engineering costs incurred by the City if the Contractor fails to complete the work within the contract time. However, any deduction assessed as delay damages shall not relieve the Contractor from liability for any damages or costs resulting from delays to other contractors on the project or other projects caused by a failure of the assessed Contractor to complete the work within the contract time. Due account shall be taken of any time extensions granted to the Contractor by the City. Permitting the Contractor to continue work beyond the contract completion date shall not operate as a waiver on the part of the City of any of its rights under the contract nor shall it relieve the Contractor from liability for any damages or costs resulting from delays to other contractors on the project or other projects caused by a failure of the assessed Contractor to complete the work within the contract time.

#### **10. PERFORMANCE BY SURETIES:**

In the event of any termination as hereinbefore provided, City shall immediately give written notice thereof to Contractor and Contractor's sureties, and the sureties shall have the right to take over and perform the agreement; provided, however, that if the sureties within five (5) days after giving them said notice of termination, do not give the City written notice of their intention to take over the performance of the agreement and do not commence performance thereof within five (5) days after notice to the City of such election, City may take over the work and prosecute the same to completion by contract or by any other method it may deem advisable for the account, and at the expense of Contractor and the sureties shall be liable to City for any excess cost or damages occasioned City thereby; and, in such event, City may, without liability for so doing, take possession of and utilize in completing the work such materials, appliances, plant and other property belonging to Contractor as may be on the site of the work and necessary therefor.

#### 11. DISPUTES PERTAINING TO PAYMENT FOR WORK:

Should any dispute arise respecting the true value of any work done, of any work omitted, or of any extra work which Contractor may be required to do, or respecting the size of any payment to Contractor during the performance of this contract, such dispute shall be decided by the City Engineer, and the decision of the latter shall be final and conclusive.

#### 12. **PERMITS, COMPLIANCE WITH LAW:**

Contractor shall, at Contractor's expense, obtain all necessary permits and licenses for the construction of each improvement, give all necessary notices and pay all fees and taxes required by law, except those City fees set forth in the Special Provisions Section 1.

#### **13.** SUPERINTENDENCE BY CONTRACTOR:

Contractor shall give personal superintendence to the work on said improvement or have a competent foreman or superintendent satisfactory to the City Engineer on the work at all times during progress, with authority to act for him.

#### 14. INSPECTION BY CITY:

Contractor shall at all times maintain proper facilities and provide safe access for inspection by City to all parts of the work and to the shops wherein the work is in preparation.

## 15. EXTRA AND/OR ADDITIONAL WORK AND CHANGES:

Should City at any time during the progress of said work request any alterations, deviations, additions, or omissions from said specifications or plans or other contract documents, it shall be at liberty to do so, and the same shall in no way affect or make void the contract, but will be added to or deducted from the amount of said contract price as the case may be, by fair and reasonable valuation. Request for such change must be made in writing signed by the City Engineer, shall be accompanied by plans and specifications for such purpose, shall be accepted in writing by Contractor and Contractor's surety.

In the event work is performed or materials furnished in addition to those set forth in Contractor's bid and the specifications herein, said work and materials shall be paid for at the unit price therein contained. Said amount shall be paid in installments as hereinafter provided.

#### 16. CHANGE OF CONTRACT PRICE:

The contract price may only be changed by a contract change order. The value of any work covered by a contract change order for an adjustment in the contract price will be determined in the City's sole discretion as follows:

- (a) If the work performed is on the basis of unit prices contained in the contract documents, the change order will be determined in accordance with the provisions in Section 4-1.05, "Changes and Extra Work", of the Caltrans Standard Specifications; or
- (b) If the work performed is not included on the engineers estimate associated with a unit price, the change order will be by a mutually agreed lump sum; or
- (c) If the change order is not determined as described above in either 16 (a) or 16 (b), the change order will be determined on the basis of force account in accordance with the provisions below.

# FORCE ACCOUNT

For work paid by force account, the Engineer compares the City's records to the Contractor's daily force account work report. When the Engineer and the Contractor agree on the contents of the daily force account work reports, the Engineer accepts the report and the City pays for the work. If the records differ, the City pays for the work based only on the information shown on the City's records.

If a subcontractor performs work at force account, accept an additional 2 percent markup to the total cost of that work paid at force account, including markups specified as below, as reimbursement for additional administrative costs.

The markups specified in labor, materials, and equipment includes compensation for all delay costs, overhead costs, and profit.

If an item's unit price is adjusted for work-character changes, the City excludes the Contractors cost of determining the adjustment.

Payment for owner-operated labor and equipment is made at the market-priced invoice submitted.

## Labor

Labor payment is full compensation for the cost of labor used in the direct performance of the work plus a 5 percent markup. Force account labor payment consists of:

- 1. Employer payment to the worker for:
  - 1.1. Basic hourly wage
  - 1.2. Health and welfare
  - 1.3. Pension
  - 1.4. Vacation

- 1.5. Training
- 1.6. Other State and federal recognized fringe benefit payments
- 2. Labor surcharge percentage in *Labor Surcharge and Equipment Rental Rates* current during the work paid at force account for:
  - 2.1. Workers' compensation insurance
  - 2.2. Social security
  - 2.3. Medicare
  - 2.4. Federal unemployment insurance
  - 2.5. State unemployment insurance
  - 2.6. State training taxes
- 3. Subsistence and travel allowances paid to the workers
- 4. Employer payment to supervisors, if authorized

The 5 percent markup consists of payment for all overhead costs related to labor but not designated as costs of labor used in the direct performance of the work including:

- 1. Home office overhead
- 2. Field office overhead
- 3. Bond costs
- 4. Profit
- 5. Labor liability insurance
- 6. Other fixed or administrative costs that are not costs of labor used in the direct performance of the work

# Materials

Material payment is full compensation for materials the Contractor furnishes and uses in the work. The Engineer determines the cost based on the material purchase price, including delivery charges, except:

- 1. A 5 percent markup is added
- 2. Supplier discounts are subtracted whether the Contractor takes them or not
- 3. If the Engineer believes the material purchase prices are excessive, the City pays the lowest current wholesale price for a similar material quantity
- 4. If the Contractor procured the materials from a source the Contractor wholly or partially own, the determined cost is based on the lower of the:

4.1. Price paid by the purchaser for similar materials from that source on Contract items

- 4.2. Current wholesale price for those materials
- 5. If the Contractor does not submit a material cost record within 30 days of billing, the determined cost is based on the lowest wholesale price:
  - 5.1. During that period
  - 5.2. In the quantities used

# Equipment Rental

Equipment rental payment is full compensation for:

1. Rental equipment costs, including moving rental equipment to and from the change order work site using its own power.

- 2. Transport equipment costs for rental equipment that cannot be transported economically using its own power. No payment is made during transport for the transported equipment.
- 3. 5 percent markup.

If the Contractor wants to return the equipment to a location other than its original location, the payment to move the equipment must not exceed the cost of returning the equipment to its original location. If the Contractor uses the equipment for work other than work paid by force account, the transportation cost is included in the other work.

Before moving or loading the equipment, obtain authorization for the equipment rental's original location.

The Engineer determines rental costs:

- 1. Using rates in Labor Surcharge and Equipment Rental Rates:
  - By classifying equipment using manufacturer's ratings and manufacturer-1.1. approved changes.
  - Current during the work paid by force account. 1.2.
  - 1.3. Regardless of equipment ownership; but the City uses the rental document rates or minimum rental cost terms if:
    - 1.3.1. Rented from equipment business the Contractor does not own.
    - 1.3.2. The Labor Surcharge and Equipment Rental Rates hourly rate is \$10.00 per hour or less.
- 2. Using rates established by the Engineer for equipment not listed in *Labor Surcharge and Equipment Rental Rates.* The Contractor may submit cost information that helps the Engineer establish the rental rate; but the City uses the rental document rates or minimum rental cost terms if:
  - 2.1. Rented from equipment business the Contractor does not own.
  - 2.2. The Engineer establishes a rate of \$10.00 per hour or less.
- 3. Using rates for transport equipment not exceeding the hourly rates charged by established haulers.

Equipment rental rates include the cost of:

- 1. Fuel 7. 2. Oil 8. Depreciation 3. Lubrication 9. Storage 4. 10. Supplies Insurance 5. Small tools that are not consumed by use
- 6. Necessary attachments
- The City pays for small tools consumed by use. The Engineer determines payment for small tools consumed by use based on Contractor-submitted invoices.

The Engineer may authorize rates in excess of those in the Labor Surcharge and Equipment Rental Rates if:

- Repairs and maintenance
- Incidentals 11.

- 1. The Contractor submits a request to use rented equipment
- 2. Equipment is not available from the Contractors normal sources or from one of the Contractors subcontractors
- 3. Rented equipment is from an independent rental company
- 4. Proposed equipment rental rate is reasonable
- 5. The Engineer authorizes the equipment source and the rental rate before the Contractor uses the equipment

## Equipment on the Job Site

For equipment on the job site at the time required to perform work paid by force account, the time paid is the time:

- 1. To move the equipment to the location of work paid by force account plus an equal amount of time to move the equipment to another location on the job site when the work paid by force account is completed
- 2. To load and unload equipment
- 3. Equipment is operated to perform work paid by force account and:
  - 3.1. Hourly rates are paid in 1/2-hour increments
  - 3.2. Daily rates are paid in 1/2-day increments

## Equipment Not On the Job Site Required for Original-Contract Work

For equipment not on the job site at the time required to perform work paid by force account and required for original-Contract work, the time paid is the time the equipment is operated to perform work paid by force account and the time to move the equipment to a location on the job site when the work paid by force account is completed.

The minimum total time paid is:

- 1. 1 day if daily rates are paid
- 2. 8 hours if hourly rates are paid

If daily rates are recorded, equipment:

- 1. Idled is paid as 1/2 day
- 2. Operated 4 hours or less is paid as 1/2 day
- 3. Operated 4 hours or more is paid as 1 day

If the minimum total time exceeds 8 hours and if hourly rates are listed, the City rounds up hours operated to the nearest 1/2-hour increment and pays based on the hours shown the following table. The table does not apply when equipment is not operated due to breakdowns, in which case rental hours are the hours the equipment was operated.

Едир	ment Kentai
	Hours
Hours	Hours
operate	paid
d	_
0.0	4.00
0.5	4.25
1.0	4.50
1.5	4.75
2.0	5.00
2.5	5.25
3.0	5.50
3.5	5.75
4.0	6.00
4.5	6.25
5.0	6.50
5.5	6.75
6.0	7.00
6.5	7.25
7.0	7.5
7.5	7.75
≥8.0	hours
	used

# Fauinment Rental

## Equipment Not On the Job Site Not Required for Original-Contract Work

For equipment not on the job site at the time required to perform work paid by force account and not required for original-Contract work, the time paid is the time:

- To move the equipment to the location of work paid by force account plus an 1. equal amount of time to return the equipment to its source when the work paid by force account is completed
- 2. To load and unload equipment
- 3. Equipment is operated to perform work paid by force account

## Non-Owner-Operated Dump Truck Rental

Submit the rental rate for non-owner-operated dump truck rental. The Engineer determines the payment rate. Payment for non-owner-operated dump truck rental is for the cost of renting a dump truck, including its driver. For the purpose of markup payment only, the non-owneroperated dump truck is rental equipment and the owner is a subcontractor.

The above markups shall constitute full compensation for all home office overhead, field office overhead, bond costs, profit, labor liability insurance, and other fixed or administrative costs that are not costs specifically designated as cost or equipment rental as stated above. The total payment made as provided above shall be deemed to be the actual cost of the work and shall constitute full compensation therefor.

When extra work to be paid for on a force account basis is performed by a subcontractor, approved in conformance with the provisions in Section 5-1.13, "Subcontracting," an additional markup of 2 percent will be added to the total cost of that extra work including all markups specified in this Section. The additional 2 percent markup shall reimburse the Contractor for additional administrative costs, and no other additional payment will be made by reason of performance of the extra work by a subcontractor.

## **17.** CHANGE OF CONTRACT TIME:

The contract time may only be changed by a contract change order. The value of any work covered by a contract change order for an adjustment in the contract time will be determined as follows:

- (a) Additional working days will be awarded where the amount of time is mutually agreed upon by Contractor and Engineer; or
- (b) Additional working days will be awarded where Contractor is prevented from completing any part of the work identified on the critical path and:
  - a. where the delay is caused by acts of public enemy, fire, floods, tsunamis, earthquakes, epidemics, quarantine restrictions, strikes, labor disputes, shortage of materials and freight embargos, provided that Contractor shall notify Engineer in writing of the causes of delay within 15 days from the beginning of that delay; or
  - b. where the delay is caused by actions beyond the control of Contractor; or
  - c. where the delay is caused by actions or failure to act by Engineer.

Contractor shall not be entitled to an adjustment in contract time for delays within the control of Contractor. Delays resulting from and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

#### **18.** INSPECTION AND TESTING OF MATERIALS:

Contractor shall notify City a sufficient time in advance of the manufacture of production materials to be supplied by Contractor under this contract in order that City may arrange for mill or factory inspection and testing of same.

Any materials shipped by Contractor from factory prior to having satisfactorily passed such testing and inspection by City's representative or prior to the receipt of notice from such representative that such testing and inspection will not be required shall not be incorporated on the job of said improvement. Contractor shall also furnish City, in triplicate, certified copies of all factory and mill test reports upon request.

#### **19. PERMITS AND CARE OF THE WORK:**

Contractor has examined the site of the work and is familiar with its topography and condition,

location of property lines, easements, building lines, and other physical factors and limitations affecting the performance of this agreement. Contractor, at Contractor's expense, shall obtain any permission necessary for any operations conducted off the property owned or controlled by City. Contractor shall be responsible for the proper care and protection of all materials delivered and work performed until completion and final acceptance.

#### **20. OTHER CONTRACTS:**

City may award other contracts for additional work, and Contractor shall fully cooperate with such other Contractors and carefully fit Contractor's own work to that provided under other contracts as may be directed by the City Engineer. Contractor shall not commit or permit any act which will interfere with the performance of work by any other Contractor.

## 21. PAYMENTS TO CONTRACTOR:

Payments are to be made to the Contractor in accordance with the provisions of Section 9 of the General Conditions of said specifications in legally executed and regularly issued warrants of the city, drawn on the appropriate fund or funds as required by law and order of the City Council thereof. The Contractor shall be administered a progress payment approximately every 30 calendar days from the time work begins according to the payment schedule furnished by the City Engineer at the time work begins.

Pursuant to Division 2, Part 5, Section 22300, *et seq.*, of the Public Contracts Code, the Contractor may request the right to substitute securities for any moneys withheld by the City of Turlock to ensure the performance required of the Contractor under the contract, or that the City of Turlock make payment of retentions earned directly into an escrow account established at the expense of the Contractor.

## 22. CONTRACT SECURITY:

Concurrently with the execution hereof, Contractor shall furnish on the forms provided (1) a surety bond in an amount equal to at least one hundred percent (100%) of the contract price as security for the faithful performance of this contract; and (2) a separate surety bond in an amount equal to at least one hundred percent (100%) of the contract price as security for the payment of all persons performing labor and furnishing materials in connection with this contract. Sureties on each of said bonds thereof shall be satisfactory to the City.

## 23. INDEMNIFICATION:

**Indemnity for Professional Liability**: When the law establishes a professional standard of care for Contractor's Services, to the fullest extent permitted by law, Contractor shall indemnify, protect, defend, and hold harmless City and any and all of its elective and appointive boards, officers, officials, agents, employees or volunteers from and against any and all losses, liabilities, damages, costs, and expenses, including legal counsel's fees and costs but only to the extent the Contractor (and its Subcontractors) are responsible for such damages, liabilities and costs on a comparative basis of fault between the Contractor (and its Subcontractors) and the City in the performance of professional services under this Agreement. Contractor shall not be obligated to defend or indemnify City for the City's own negligence or for the negligence of others.

**Indemnity for other than Professional Liability:** Other than in the performance of professional services and to the full extent permitted by law, Contractor shall indemnify, defend, and hold harmless City and any and all of its elective and appointive boards, officers, officials, agents, employees or volunteers from and against any liability (including liability for claims, suits, actions, arbitration proceedings, administrative proceedings, regulatory proceedings, losses, expenses or costs of any kind, whether actual, alleged or threatened, including legal counsel's fees and costs, court costs, interest, defense costs, and expert witness fees), where the same arise out of, are a consequence of, or are in any way attributable to, in whole or in part, the performance of this Agreement by Contractor or by any individual or agency for which Contractor is legally liable, including, but not limited to, officers, agents, employees, or subcontractors of Contractor.

#### 24. CONTRACTOR'S INSURANCE:

Contractor shall not commence work under this Agreement until Contractor has obtained City's approval regarding all insurance requirements, forms, endorsements, amounts, and carrier ratings, nor shall Contractor allow any subcontractor to commence work on a subcontract until all similar insurance required of the subcontractor shall have been so obtained and approved. Contractor shall procure and maintain for the duration of this Agreement insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by Contractor, its agents, representatives, employees or subcontractors. Failure to maintain or renew coverage or to provide evidence of renewal may constitute a material breach of contract.

(a) <u>Minimum Scope of Insurance</u>: Coverage shall be at least as broad as:

(1) Insurance Services Office Commercial General Liability coverage (occurrence Form CG 00 01) with additional insured endorsements (form CG 20 10 for ongoing operations and CG 20 37 for products/completed operations), to be approved by the City of Turlock.

(2) Insurance Services Office Form CA 00 01 covering Automobile Liability, Code 1 (any auto).

(3) Workers' Compensation insurance as required by the State of California and Employer's Liability Insurance.

(4) Insurance Service Office Form CP 00 20 with Causes of Loss – Special Form CP 10 30 covering Builder's Risk (Course of Construction) insurance covering all risks of loss less policy exclusions.

- (5) Surety bonds as described below.
- (6) Errors and Omissions/Professional Liability Insurance (if *Design/Build*).
- (b) <u>Minimum Limits of Insurance</u>: Contractor shall maintain limits no less than:

(1) General Liability (including operations, products and completed operations): \$1,000,000 per occurrence for bodily injury, personal injury and property damage. If Commercial General Liability Insurance or other form with a general aggregate limit is used, either the general aggregate limit shall apply separately to this project/location or the general aggregate limit shall be twice the required occurrence limit.

(2) Automobile Liability: \$1,000,000 per occurrence for bodily injury and property damage.

- (3) Workers' Compensation: As statutorily required by the State of California.
- (4) Employer's Liability: \$1,000,000 per accident for bodily injury or disease.

(5) Builder's Risk: Completed value of the project with no coinsurance penalty provisions.

(6) Errors and Omissions/Professional Liability: \$1,000,000 per claim as needed for design/build.

- (c) <u>Deductibles and Self-Insured Retentions</u>: Upon request of City, any deductibles or selfinsured retentions must be declared to and approved by City. At the option of City, either: (1) the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects City, its elective and appointive boards, officers, agents, employees, and volunteers; or (2) Contractor shall provide a financial guarantee satisfactory to City guaranteeing payment of losses and related investigations, claim administration and defense expenses.
- (d) <u>Other Insurance Provisions</u>: The commercial general liability policy shall contain, or be endorsed to contain, the following provisions:

(1) City, its elective and appointive boards, officers, agents, employees, and volunteers are to be covered as additional insureds with respect to liability arising out of work or operations performed by or on behalf of Contractor, including materials, parts or equipment furnished in connection with such work or operations, which coverage shall be maintained in effect for at least three (3) years following the completion of the work specified in the contract. General liability coverage can be provided in the form of an endorsement to Contractor's insurance (at least as broad as CG 20 10 for ongoing operations and CG 20 37 for products/completed operations), or as a separate Owners and Contractors Protective Liability policy providing both ongoing operations and completed operations coverage.

(2) For any claims related to this project, Contractor's insurance coverage shall be primary insurance as respects City and any insurance or self-insurance maintained by City shall be excess of Contractor's insurance and shall not contribute with it.

(3) In the event of cancellation, non-renewal, or material change that reduces or

restricts the insurance coverage afforded to City under this Agreement, the insurer, broker/producer, or Contractor shall provide City with thirty (30) days' prior written notice of such cancellation, non-renewal, or material change.

(4) Coverage shall not extend to any indemnity coverage for the active negligence of the additional insured in any case where an agreement to indemnify the additional insured would be invalid under Subdivision (b) of Section 2782 of the Civil Code.

- (e) <u>Builder's Risk (Course of Construction) Insurance</u>: City shall be named as loss payee.
- (f) <u>Acceptability of Insurers</u>: Insurance is to be placed with insurers with a current A.M. Best's rating of no less than A:VII or with an insurer to which the City has provided prior approval.
- (g) <u>Verification of Coverage</u>: Consultant shall furnish City with original certificates and amendatory endorsements or copies of the applicable policy language effecting coverage required by this clause. All certificates and endorsements are to be received and approved by City before work commences. However, failure to obtain the required documents prior to the work beginning shall not waive Contractor's obligation to provide them. City reserves the right, at any time, to require complete, certified copies of all required insurance policies and endorsements.
- (h) <u>Waiver of Subrogation</u>: With the exception of professional liability, Contractor hereby agrees to waive subrogation which any insurer of Contractor may acquire from Contractor by virtue of the payment of any loss. The commercial general liability policy and workers' compensation policy shall be endorsed to contain a waiver of subrogation in favor of City for all work performed by Contractor, its agents, employees, independent contractors and subcontractors. Contractor agrees to obtain any endorsement that may be necessary to effect this waiver of subrogation.
- (i) <u>Subcontractors</u>: Contractor shall include all subcontractors as insureds under its policies or shall furnish separate certificates and endorsements for each subcontractor. All coverages for subcontractors shall be subject to all of the requirements stated herein.
- (j) <u>Surety Bonds</u>: Contractor shall provide a Performance Bond and a Payment Bond.

## 25. **PROOF OF CARRIAGE OF INSURANCE:**

Contractor shall furnish City concurrently with the execution hereof, satisfactory proof of carriage of the insurance required, and that Contractor shall give City at least sixty (60) days prior notice of the cancellation of any policy during the effective period of this contract.

## 26. WAGES & HOURS OF EMPLOYMENT:

In the performance of this contract, eight (8) hours shall be the maximum hours of labor on any calendar day, and the minimum wages of compensation of persons performing labor in the execution of this agreement shall be the current prevailing scale of wages determined by the Director of the Department of Industrial Relations for the community.

The Contractor shall forfeit as penalty to the City, Twenty-five and no/100ths Dollars (\$25.00) to be paid to the City of Turlock for each workman employed in the execution of this agreement by him or by any subcontractor, for each calendar day during which any workman is required or permitted to labor more than eight (8) hours, in violation of provisions of Article 3, Chapter 1, Part 7, a Division 2, of the Labor Code of the State of California, and all amendments thereto.

#### 27. EMERGENCY - ADDITIONAL TIME FOR PERFORMANCE - PROCUREMENT OF MATERIALS:

If, because of war or other declared national emergency, the Federal or State Government restricts, regulates, or controls the procurement and allocation of labor or materials, or both, and if solely because of said restrictions, regulations or controls, Contractor is through no fault of the Contractor, unable to perform this agreement, or the work is thereby suspended or delayed, any of the following steps may be taken.

(a) City may, pursuant to resolution of the Council, grant Contractor additional time for the performance of this agreement, sufficient to compensate in time, for delay or suspension.

To qualify for such extension in time, Contractor within ten (10) days of Contractor's discovering such inability to perform, shall notify City Engineer in writing thereof, and give specific reasons therefore; City Engineer shall thereupon have sixty (60) days within which to procure such needed materials or labor as is specified in this agreement, or permit substitution, or provide for changes in the work in accordance with other provisions of this agreement.

Substituted materials, or changes in the work, or both, shall be ordered in writing by City Engineer, and the concurrence of the Council shall not be necessary. All reasonable expenses of such procurement incurred by the City Engineer shall be defrayed by the Contractor; or

- (b) If such materials or labor cannot be procured through legitimate channels within sixty (60) days after the filing of the aforesaid notice, either party may, upon thirty (30) days' written notice to the other, terminate this agreement. In such event, Contractor shall be compensated for all work executed upon a unit basis in proportion to the amount of the work completed, or upon a cost-plus-ten-percent (10%) basis, whichever is the lesser. Materials on the ground, in process of fabrication or in route upon the date of notice of termination specially ordered for the project and which cannot be utilized by Contractor, shall be compensated for by City at cost, including freight, provided the Contractor shall take all steps possible to minimize this obligation; or
- (c) City Council, by resolution, may suspend this agreement until the cause of inability to perform is removed but for a period of not to exceed sixty (60) days.

If this agreement is not canceled, and the inability of Contractor to perform continues without fault on Contractor's part, beyond the time during which the agreement may have been suspended, as herein above provided, City Council may further suspend this agreement, or either party hereto may, without incurring any liability, elect to declare this agreement terminated upon the ground of impossibility of performance. In the event City declares this agreement terminated, such declaration shall be authorized by the City Council by resolution, and Contractor shall be notified in writing thereof within five (5) days after the adoption of such resolution. Upon such termination, Contractor shall be entitled to proportionate compensation at the agreement rate for such portion of the agreement as may have been performed, or

(d) City may terminate this agreement, in which case Contractor shall be entitled to proportionate compensation at the agreed rate for such portion of the agreement as may have been performed. Such termination shall be authorized by resolution of the Council. Notice thereof shall be forthwith given in writing to Contractor, and this agreement shall be terminated upon receipt by Contractor of such notice.

In the event of the termination provided in this sub-paragraph (d), none of the covenants, conditions or provisions hereof shall apply to the work not performed, and City shall be liable to Contractor for the proportionate compensation last herein mentioned.

#### 28. **PROVISIONS CUMULATIVE:**

The provisions of this agreement are cumulative, and in addition to and not in limitation of, any other rights or remedies available to City.

#### **29. TAXES:**

Contractor shall cooperate with City to the full extent possible to maximize the local allocation of California sales and use tax to the City. Such cooperation shall include but not be limited to:

(a) Use Tax Direct Payment Permits. Contractor shall apply for, obtain and utilize, to the maximum extent reasonable, a California Use Tax Direct Payment Permit.

(b) Purchases of \$500,000 or More. Contractor shall require vendors and suppliers located outside California from whom Contractor makes purchase of \$500,000 or more to allocate the use tax to the City.

Additional information regarding use tax and the Permit can be found in the State of California Board of Equalization, Sales and Use Tax Regulations, Regulation 1699.6, Use Tax Direct Payment Permits, or on the web site for the Board of Equalization at http://www.boe.ca.gov/sutax/sutprograms.htm

#### **30.** NOTICES:

All notices shall be in writing and delivered in person or transmitted by certified mail, postage prepaid.

Notices required to be given to City shall be addressed as follows:

# City of Turlock City Engineer 156 S. Broadway, Suite 150 Turlock, CA 95380-5454

Notices required to be given to Contractor shall be addressed as follows:

Notices required to be given sureties of Contractor shall be addressed as follows:

#### **31.** CITY CONTRACT ADMINISTRATOR:

The City's contract administrator and contact person for this Agreement is:

Name of City Employee Department 156 S. Broadway, Suite \_\_\_\_ Turlock, California 95380-5456 or 244 N. Broadway Turlock, California 95380-4737 Telephone: (209) 668-\_\_\_\_ E-mail: \_\_\_\_\_@turlock.ca.us

#### **32.** INTERPRETATION:

As used herein, any gender includes each other gender, the singular includes the plural and vice versa.

#### **33.** ANTITRUST CLAIMS:

The Contractor or subcontractor offers and agrees to assign to the City all rights, title and interest to any causes of action under Section Four of the Clayton Act and the Cartwright Act concerning antitrust claims.

#### 34. USE OF CITY PROJECT NUMBER:

The Contractor or subcontractor agrees to use the aforementioned City project number on all maps, drawings, submittals, billing, and written correspondence that involve City staff or contracted consultants. Nothing in this section shall preclude the Contractor or subcontractor from using their own project numbers for their own internal use.

**IN WITNESS WHEREOF**, three identical counterparts of this agreement, consisting of a total of 21 pages, each of which counterparts shall for all purposes be deemed an original of said agreement, have been duly executed by the parties hereinabove named, on the day and year first herein above written.

# CONTRACTOR

# CITY OF TURLOCK, a municipal corporation

By:	By:
2	Gary Soiseth, Mayor
Print Name	or
	Gary R. Hampton, City Manager
Address:	
	Date:
Phone:	APPROVED AS TO SUFFICIENCY:
Date:	By
Federal Tax ID or Social Security No:	Michael G. Pitcock, P.E., Development Services Director / City Engineer
	APPROVED AS TO FORM:
	Bv:
	Phaedra A. Norton, City Attorney
Attach Contractor's Seal Here	ATTEST:
	By:
	Jenniner Land, City Cierk

#### BOND FOR FAITHFUL PERFORMANCE

#### KNOW ALL BY THESE PRESENTS:

That							, as	s Principal	, and
						incorpo	rated uno	der the la	ws of
the State of _			, and	d author	rized to execute	bonds a	nd under	rtakings as	s sole
Surety, in the	State of	California	, and held	and firm	mly bound unto	the City	of Turlo	ck, a mun	icipal
corporation	of	the	State	of	California,	in	the	sum	of
					Dollars	(\$		) fo	or the
payment ther	eof, we	ll and trul	ly to be r	nade, sa	aid Principal and	d Surety	bind the	emselves,	their
administrators	s, succes	sors and as	ssigns, joir	ntly and	severally, firmly	by these	e presents	5.	

The condition of the foregoing obligation is such that: Whereas the above bounden Principal has entered, or is about to enter, into a certain contract with the City of Turlock, entitled "Agreement for City Project No. 16-75, Widen Runway 12/30 and Airfield Electrical Upgrades, AIP 03-06-0265-12-2017, a true and correct copy of which agreement is presently on file in the office of the City Clerk of the City of Turlock, which said agreement is hereby referred to and made a part hereof.

NOW, THEREFORE, if the above bounden Principal shall well and truly perform the work contracted to be performed under said contract, then this obligation shall be void, otherwise to remain in full force and effect.

No prepayment or delay in payment and no changes, extension, addition or alteration of any provision of said contract or in any plans and specifications referred to herein, and no forbearance on the part of the City shall operate to release the Surety from liability on this Bond, and consent to make such alterations without further notice to or consent by the Surety is hereby given, and the Surety hereby waives the provisions of Section 2819 of the Civil Code of the State of California.

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Dated this	day of	, 20
(Principal)		
By: X		
By: X		
(Surety)		
By: X		
By: X		
Address:		
(Zip)		
rnone:		
	(Attach Acknowledgr Both Principal's and S	nent Surety's
	Attorney In Fact)	Jurcey 5
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///		
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///		
///		
///		
///		

#### KNOW ALL BY THESE PRESENTS:

That			, a	s Principal, and
			, incorporated	under the laws
of the State of		and authorized	to execute bonds and	undertakings as
sole Surety, in the	e State of California,	, as Surety, are held and fi	irmly bound unto any a	and all material,
men, persons, c	ompanies or corpo	rations furnishing mater	ials, provisions, prov	ender or other
supplies used in,	upon, for or about	t the performance of the	e work contracted to	be executed or
performed under	the contract herein	nafter mentioned, and al	l persons, companies o	or corporations
renting or hiring	teams, or implement	nts or machinery, for or	contributing to said we	ork to be done,
and all persons w	vho perform work o	or labor upon the same, a	nd all persons who su	pply both work
and materials, an	d whose claim has r	not been paid by the Con	itractor, company, or	corporations in
the	just	and	full	sum
of				Dollars
(\$	) for pays	ment thereof, well and	truly to be made, said	d Principal and
Surety bind them	selves, their admini	strators, successors and a	ssigns, jointly and seve	erally, firmly by
these presents.				

The condition of the foregoing obligation is such that: Whereas the above bounden Principal has entered, or is about to enter, into a certain contract with the City of Turlock, entitled "Agreement for City Project No. 16-75, Widen Runway 12/30 and Airfield Electrical Upgrades, AIP 03-06-0265-12-2017, a true and correct copy of which agreement is presently on file in the office of the City Clerk of the City of Turlock, which said agreement is hereby referred to and made a part hereof.

NOW, THEREFORE, if the above bounden Principal or said Principal's subcontractors, fail to pay for any materials, provisions provender or other supplies, or teams, used in, upon, for, or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or for amounts due under the Unemployment Insurance Act with respect to such work or labor, the Surety will pay for the same, in an amount not exceeding the sum specified in this bond, provided that any and all claims hereunder shall be filled and proceedings had in connection therewith as required by the provisions of Sections 5100, et. seq., inclusive, of the Public Contracts Code of the State of California, and any amendments thereof; provided, also, that in case suit is brought upon this bond, a reasonable attorney's fee shall be awarded by the court to the prevailing party in said suit, said attorney's fee to be fixed as costs in said suit, and to be included in the judgment therein rendered.

No prepayment or delay in payment and no change, extension, addition, or alteration of any provision of said contract or in said plans and specifications agreed to between the Principal and the City, and no forbearance on the part of the City, shall operate to release the Surety from liability on this bond, and consent to make such alterations without further notice to or consent by the Surety

is hereby given, and the Surety hereby waives the provisions of Section 2819 of the Civil Code of the State of California.

Dated this	day of	, 20
(Principal)		
By: X		
By: X		
(Surety)		
By: X		
By: X		
Address:		
(Zip) Phone:		
	(Attach Acknowledgment Both Principal's and Surety's Attorney In Fact)	
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# **DIVISION 3**

# FEDERAL CONTRACT PROVISIONS

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# FEDERAL CONTRACT PROVISIONS

# 3.1 General Requirement for Contracts

The Contractor must incorporate the following contract provisions in all federally-assisted procurement and contract documents, including all subcontracts. For purposes of determining requirements for contract provisions, the term **contract** includes subcontracts.

- 1) Physically incorporate these contract provisions (not simply by reference) in each contract funded under AIP;
- 2) The contractor shall require all subcontractors to insert these contract provisions in each contract and subcontract, and further require that the clauses be included in all subcontracts;
- 3) The contractor (or subcontractor) shall incorporate applicable requirements of these contract provisions by reference for work done under any purchase orders, rental agreements and other agreements for supplies or services;
- 4) The prime contractor shall be responsible for compliance with these contract provisions by any subcontractor, lower-tier subcontractor or service provider.
- 5) The Contractor (or subcontractor) shall not modify the provisions.
- 6) Subject to the applicability criteria noted in the specific contract provisions, these contract provisions apply to all work performed on the contract.

# 3.2 Failure to Comply with Provisions

The Contractor's failure to comply with the terms of these contract provisions may be sufficient grounds to:

- 1) Withhold progress payments or final payment;
- 2) Terminate the contract for cause;
- 3) Seek suspension/debarment; or
- 4) Take other action determined to be appropriate by the sponsor or the FAA.

# 3.3 Provisions for all Construction Contracts

The following contract provisions apply to all construction contracts.

# 3.3.1 Access to Records And Reports

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

# 3.3.2 Buy American

The contractor agrees to comply with 49 USC § 50101, which provides that Federal funds may not be obligated unless all steel and manufactured goods used in AIP funded projects are produced in the

United States, unless the FAA has issued a waiver for the product; the product is listed as an Excepted Article, Material Or Supply in Federal Acquisition Regulation subpart 25.108; or is included in the FAA Nationwide Buy American Waivers Issued list.

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

# 3.3.3 General Civil Rights Provisions

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

This provision binds the contractor and sub tier 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.

# 3.3.4 Civil Rights Title VI Assurances

Title VI of the Civil Rights Act of 1964, as amended, (Title VI) prohibits discrimination on the grounds of race, color, or national origin under any program or activity receiving Federal financial assistance. Sponsors must include appropriate clauses from the Standard DOT Title VI Assurances in all contracts and solicitations.

1) Title VI Solicitation Notice:

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

2) Title VI Clauses for Compliance with Nondiscrimination Requirements

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

- a. Compliance with Regulations: The contractor (hereinafter includes consultants) will comply with the Title VI List of Pertinent Nondiscrimination Acts And Authorities, as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.
- b. Non-discrimination: The contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor will not participate directly or indirectly in the discrimination prohibited by the Nondiscrimination Acts and Authorities, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR part 21.

- c. Solicitations for Subcontracts, Including Procurements of Materials and Equipment: In all solicitations, either by competitive bidding, or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the contractor of the contractor's obligations under this contract and the Nondiscrimination Acts And Authorities on the grounds of race, color, or national origin.
- d. Information and Reports: The contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the sponsor or the Federal Aviation Administration to be pertinent to ascertain compliance with such Nondiscrimination Acts And Authorities and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish the information, the contractor will so certify to the sponsor or the Federal Aviation Administration, as appropriate, and will set forth what efforts it has made to obtain the information.
- e. Sanctions for Noncompliance: In the event of a contractor's noncompliance with the Non-discrimination provisions of this contract, the sponsor will impose such contract sanctions as it or the Federal Aviation Administration may determine to be appropriate, including, but not limited to:
  - I. Withholding payments to the contractor under the contract until the contractor complies; and/or
- II. Cancelling, terminating, or suspending a contract, in whole or in part.
- III. Incorporation of Provisions: The contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant thereto. The contractor will take action with respect to any subcontract or procurement as the sponsor or the Federal Aviation Administration may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the contractor may request the sponsor to enter into any litigation to protect the interests of the sponsor. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.
- 3) List Pertinent Authorities

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

• Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d et seq., 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin);

• 49 CFR part 21 (Non-discrimination In Federally-Assisted Programs of The Department of Transportation—Effectuation of Title VI of The Civil Rights Act of 1964);

• The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);

• Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 et seq.), as amended, (prohibits discrimination on the basis of disability); and 49 CFR part 27;

• The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 et seq.), (prohibits discrimination on the basis of age);

• Airport and Airway Improvement Act of 1982, (49 USC § 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);

• The Civil Rights Restoration Act of 1987, (PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);

• Titles II and III of the Americans with Disabilities Act of 1990, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131 – 12189) as implemented by Department of Transportation regulations at 49 CFR parts 37 and 38;

• The Federal Aviation Administration's Non-discrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);

• Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures non-discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;

• Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);

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

# 3.3.5 Disadvantaged Business Enterprise

**Contract Assurance (§ 26.13)** - The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy, as the recipient deems appropriate.

**Prompt Payment (§26.29)** - The prime contractor agrees to pay each subcontractor under this prime contract for satisfactory performance of its contract no later than 10 days from the receipt of

each payment the prime contractor receives from the City of Turlock. The prime contractor agrees further to return retainage payments to each subcontractor within {specify the same number as above} 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 City of Turlock. This clause applies to both DBE and non-DBE subcontractors.

The requirements of 49 CFR Part 26 apply to this contract. It is the policy of the City of Turlock, to practice nondiscrimination based on race, color, sex or national origin in the award or performance of this contract. The Owner encourages participation by all firms qualifying under this solicitation regardless of business size or ownership.

Refer to Special Provisions, Section 2.04 for complete City of Turlock DBE compliance requirements.

# 3.3.6 Energy Conservation Requirements

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

# 3.3.7 Federal Fair Labor Standards Act

All contracts and subcontracts that result from this solicitation incorporate by reference the provisions of 29 CFR Part 201, the Federal Fair Labor Standards Act (FLSA), with the same force and effect as if given in full text. The FLSA sets minimum wage, overtime pay, recordkeeping, and child labor standards for full and part time workers.

The contractor has full responsibility to monitor compliance to the referenced statute or regulation. The contractor must address any claims or disputes that arise from this requirement directly with the U.S. Department of Labor – Wage and Hour Division

# 3.3.8 Occupational Safety and Health Act

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

# 3.3.9 Trade Restriction Certification

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

1) is not owned or controlled by one or more citizens of a foreign country included in the list of countries that discriminate against U.S. firms as published by the Office of the United States Trade Representative (U.S.T.R.);

- 2) has not knowingly entered into any contract or subcontract for this project with a person that is a citizen or national of a foreign country included on the list of countries that discriminate against U.S. firms as published by the U.S.T.R; and
- 3) has not entered into any subcontract for any product to be used on the Federal on the project that is produced in a foreign country included on the list of countries that discriminate against U.S. firms published by the U.S.T.R.

This certification concerns a matter within the jurisdiction of an agency of the United States of America and the making of a false, fictitious, or fraudulent certification may render the maker subject to prosecution under Title 18, United States Code, Section 1001.

The Offeror/Contractor must provide immediate written notice to the Owner if the Offeror/Contractor learns that its certification or that of a subcontractor was erroneous when submitted or has become erroneous by reason of changed circumstances. The Contractor must require subcontractors provide immediate written notice to the Contractor if at any time it learns that its certification was erroneous by reason of changed circumstances.

Unless the restrictions of this clause are waived by the Secretary of Transportation in accordance with 49 CFR 30.17, no contract shall be awarded to an Offeror or subcontractor:

(1) who is owned or controlled by one or more citizens or nationals of a foreign country included on the list of countries that discriminate against U.S. firms published by the U.S.T.R. or

(2) whose subcontractors are owned or controlled by one or more citizens or nationals of a foreign country on such U.S.T.R. list or

(3) who incorporates in the public works project any product of a foreign country on such U.S.T.R. list;

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

The Offeror agrees that, if awarded a contract resulting from this solicitation, it will incorporate this provision for certification without modification in all lower tier subcontracts. The contractor may rely on the certification of a prospective subcontractor that it is not a firm from a foreign country included on the list of countries that discriminate against U.S. firms as published by U.S.T.R, unless the Offeror has knowledge that the certification is erroneous.

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

# 3.3.10 Veteran's Preference

In the employment of labor (excluding executive, administrative, and supervisory positions), the contractor and all sub-tier contractors must give preference to covered veterans as defined within Title 49 United States Code Section 47112. Covered veterans include Vietnam-era veterans, Persian Gulf veterans, Afghanistan-Iraq war veterans, disabled veterans, and small business concerns (as

defined by 15 U.S.C. 632) owned and controlled by disabled veterans. This preference only applies when there are covered veterans readily available and qualified to perform the work to which the employment relates.

# 3.4 Additional Provisions for Contracts Exceeding \$2,000

The following contract provisions apply to all construction contracts exceeding \$2,000.

# 3.4.1 Copeland Anti-Kickback Act

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

# 3.4.2 Davis Bacon Requirements

1. Minimum Wages

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

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR Part 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: *Provided*, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed 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 Federal Aviation Administration if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant, sponsor, or owner, as the case may be, for transmission to the Federal Aviation Administration. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH–347 is available for this purpose from the Wage and Hour Division Web site at *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 Federal Aviation Administration if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit them to the applicant, sponsor, or owner, as the case may be, for transmission to the Federal Aviation Administration, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and

social security numbers to the prime contractor for its own records, without weekly submission to the sponsoring government agency (or the applicant, sponsor, or owner).

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

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

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

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

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

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

(iii) The contractor or subcontractor shall make the records required under paragraph (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 that is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

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

5. Compliance with Copeland Act Requirements.

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

6. Subcontracts.

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

7. Contract Termination: Debarment.

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

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

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

9. Disputes Concerning Labor Standards.

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

10. Certification of Eligibility.

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

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

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

# 3.5 Texting while Driving (For Contracts Exceeding \$3,000)

In accordance with Executive Order 13513, "Federal Leadership on Reducing Text Messaging While Driving" (10/1/2009) and DOT Order 3902.10 "Text Messaging While Driving" (12/30/2009), the 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.

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

# 3.6 Additional Provisions for Contracts Exceeding \$10,000)

The following contract provisions apply to all construction contracts exceeding \$10,000.

## 3.6.1 Notice of Requirement for Affirmative Action

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

Timetables

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

Goals for female participation in each trade: 6.9%

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

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

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

4. As used in this notice and in the contract resulting from this solicitation, the "covered area" is California, Stanislaus County, Merced County, City of Turlock.

# 3.6.2 Equal Employment Opportunity (E.E.O.)

### A. EQUAL OPPORTUNITY CLAUSE

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

(1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identify or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

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

(3) The contractor will send to each labor union or representative of workers with which 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, and of the rules, regulations, and relevant orders of the Secretary of Labor.

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

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

(7) The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: *Provided, however*, That in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering

agency the contractor may request the United States to enter into such litigation to protect the interests of the United States.

### **B. EQUAL OPPORTUNITY SPECIFICATION**

- 1. As used in these specifications:
  - a. "Covered area" means the geographical area described in the solicitation from which this contract resulted;
  - b. "Director" means Director, Office of Federal Contract Compliance Programs (OFCCP), U.S. Department of Labor, or any person to whom the Director delegates authority;
  - c. "Employer identification number" means the Federal social security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941;
  - d. "Minority" includes:

(1) Black (all) persons having origins in any of the Black African racial groups not of Hispanic origin);

(2) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin regardless of race);

(3) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and

(4) American Indian or Alaskan native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

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

3. If the contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors shall be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each contractor or subcontractor participating in an approved plan is individually required to comply with its obligations under the EEO clause and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other contractors or subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.

4. The contractor shall implement the specific affirmative action standards provided in paragraphs 7a through 7p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered construction contractors performing

construction work in a geographical area where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. Goals are published periodically in the Federal Register in notice form, and such notices may be obtained from any Office of Federal Contract Compliance Programs office or from Federal procurement contracting officers. The contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.

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

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

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

a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the contractor's employees are assigned to work. The contractor, where possible, will assign two or more women to each construction project. The contractor shall specifically ensure that all foremen, superintendents, and other onsite supervisory personnel are aware of and carry out the contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

c. Maintain a current file of the names, addresses, and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source, or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the contractor by the union or, if referred, not employed by the contractor, this shall be documented in the file with the reason therefore along with whatever additional actions the contractor may have taken.

d. Provide immediate written notification to the Director when the union or unions with which the contractor has a collective bargaining agreement has not referred to the contractor a minority person or female sent by the contractor, or when the contractor has other information that the union referral process has impeded the contractor's efforts to meet its obligations.

e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and

apprenticeship and trainee programs relevant to the contractor's employment needs, especially those programs funded or approved by the Department of Labor. The contractor shall provide notice of these programs to the sources compiled under 7b above.

f. Disseminate the contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination, or other employment decisions including specific review of these items with onsite supervisory personnel such a superintendents, general foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

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

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

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

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

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

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

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

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

p. Conduct a review, at least annually, of all supervisor's adherence to and performance under the contractor's EEO policies and affirmative action obligations.

8. Contractors are encouraged to participate in voluntary associations, which assist in fulfilling one or more of their affirmative action obligations (7a through 7p). The efforts of a contractor association, joint contractor union, contractor community, or other similar groups of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through 7p of these specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the contractor. The obligation to comply, however, is the contractor's noncompliance.

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

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

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

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

13. The contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 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).

# 3.6.3 Prohibition of Segregated Facilities

- 1. The Contractor agrees that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The Contractor agrees that a breach of this clause is a violation of the Equal Opportunity clause in this contract.
- 2. "Segregated facilities," as used in this clause, means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees, that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, sex, or national origin because of written or oral policies or employee custom. The term does not include separate or single-user rest rooms or necessary dressing or sleeping areas provided to assure privacy between the sexes.
- 3. The Contractor shall include this clause in every subcontract and purchase order that is subject to the Equal Opportunity clause of this contract.

# 3.6.4 Recovered Materials

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

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

The contractor has procured \$10,000 or more of a designated item using Federal funding during the previous fiscal year.

The list of EPA-designated items is available at <a href="https://www.epa.gov/epawaste/conserve/tools/cpg/products/">www.epa.gov/epawaste/conserve/tools/cpg/products/</a>.

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

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

## 3.6.5 Termination of Contract

### **Termination for Convenience (Construction & Equipment Contracts)**

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

- 1. Contractor must immediately discontinue work as specified in the written notice.
- 2. Terminate all subcontracts to the extent they relate to the work terminated under the notice.
- 3. Discontinue orders for materials and services except as directed by the written notice.
- 4. Deliver to the owner all fabricated and partially fabricated parts, completed and partially completed work, supplies, equipment and materials acquired prior to termination of the work and as directed in the written notice.
- 5. Complete performance of the work not terminated by the notice.
- 6. Take action as directed by the owner to protect and preserve property and work related to this contract that Owner will take possession.

Owner agrees to pay Contractor for:

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

documented expenses sustained prior to the effective date of termination in performing work and furnishing labor, materials, or equipment as required by the contract documents in connection with uncompleted work;

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

reasonable and substantiated expenses to the contractor directly attributable to Owner's termination action

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

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

### Termination for Default (Construction)

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

### Termination for Default (Equipment)

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

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

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

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

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

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

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

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

# 3.7 Debarment and Suspension (For Contracts Exceeding \$25,000)

# 3.7.1 Certification of Offerer/Bidder Regarding Debarment

By submitting a bid/proposal under this solicitation, the bidder or offeror certifies that neither it nor its principals are presently debarred or suspended by any Federal department or agency from participation in this transaction.

# 3.7.2 Certification of Lower Tier Contractors Regarding Debarment

The successful bidder, by administering each lower tier subcontract that exceeds \$25,000 as a "covered transaction", must verify each lower tier participant of a "covered transaction" under the project is not presently debarred or otherwise disqualified from participation in this federally assisted project. The successful bidder will accomplish this by:

Checking the System for Award Management at website: http://www.sam.gov

1. Collecting a certification statement similar to the Certificate Regarding Debarment and Suspension (Bidder or Offeror), above.

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

If the FAA later determines that a lower tier participant failed to disclose to a higher tier participant that it was excluded or disqualified at the time it entered the covered transaction, the FAA may pursue any available remedies, including suspension and debarment of the non-compliant participant.

### 3.8 Additional Provisions for Contracts Exceeding \$100,000)

The following contract provisions apply to all construction contracts exceeding \$100,000.

### 3.8.1 Contract Work Hours and Safety Standards Acts Requirements

1. Overtime Requirements.

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

2. Violation; Liability for Unpaid Wages; Liquidated Damages.

In the event of any violation of the clause set forth in paragraph (1) of this clause, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1) of this clause, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1) of this clause.

3. Withholding for Unpaid Wages and Liquidated Damages.

The Federal Aviation Administration (FAA) or the Owner shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph 2 of this clause.

4. Subcontractors.

The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraphs (1) through (4) and also a clause requiring the subcontractor to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1) through (4) of this clause.

# 3.8.2 Certification Regarding Lobbying

The bidder or offeror certifies by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

- (4) No Federal appropriated funds have been paid or will be paid, by or on behalf of the Bidder or Offeror, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (5) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
- (6) The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

# 3.9 Additional Provisions For Contracts Exceeding \$150,000

The following contract provisions apply to all construction contracts exceeding \$150,000.

## 3.9.1 Breach of Contract Terms

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

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

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

### 3.9.2 Clean Air/Water Pollution Control

Contractor agrees to comply with all applicable standards, orders, and regulations issued pursuant to the Clean Air Act (42 U.S.C. § 740-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. § 1251-1387). The Contractor agrees to report any violation to the Owner immediately upon discovery. The Owner assumes responsibility for notifying the Environmental Protection Agency (EPA) and the Federal Aviation Administration.

Contractor must include this requirement in all subcontracts that exceeds \$150,000.

### END OF FEDERAL CONTRACT PROVISIONS

### **DIVISION 4**

### FAA GENERAL PROVISIONS

#### Section <u>Title</u>

- Section 10 Definition of Terms.
- Section 20 Proposal Requirements and Conditions.
- Section 30 Award and Execution of Contract.
- Section 40 Scope of Work.
- Section 50 Control of Work.
- Section 60 Control of Materials.
- Section 70 Legal Regulations and Responsibility to the Public.
- Section 80 Prosecution and Progress.
- Section 90 Measurement and Payment.
- Section 100 Contractor Quality Control Program.
- Section 105 Mobilization

#### FAA 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 AIRPORT IMPROVEMENT PROGRAM (AIP)**. A grant-in-aid program, administered by the Federal Aviation Administration (FAA).

**10-05 AIR OPERATIONS AREA (AOA)**. For the purpose of these specifications, the term air operations area (AOA) shall mean any area of the airport used or intended to be used for the landing, takeoff, or surface maneuvering of aircraft. An air operation area shall include such paved or unpaved areas that are used or intended to be used for the unobstructed movement of aircraft in addition to its associated runway, taxiway, or apron.

**10-06 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 INTERNATIONAL (ASTM)**. Formerly known as the American Society for Testing and Materials (ASTM).

10-08 AWARD. The Owner's notice to the successful bidder of the acceptance of the submitted bid.

**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, must 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: Advertisement, Contract Form, Proposal, Performance Bond,

Payment Bond, any required insurance certificates, Specifications, 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 CONTRACTORS' LABORATORY.** The Contractor's quality control organization in accordance with the Contractor Quality Control Program.

**10-18 CONSTRUCTION SAFETY AND PHASING PLAN (CSPP).** The overall plan for safety and phasing of a construction project developed by the airport operator, or developed by the airport operator's consultant and approved by the airport operator. It is included in the invitation for bids and becomes part of the project specifications.

**10-19 DRAINAGE SYSTEM**. The system of pipes, ditches, and structures by which surface or subsurface waters are collected and conducted from the airport area.

**10-20 ENGINEER**. The individual, partnership, firm, or corporation duly authorized by the Owner to be responsible for engineering, inspection and observation of the contract work and acting directly or through an authorized representative.

**10-21 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.

**10-22 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.

**10-23 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 or her duly authorized representative.

**10-24 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.

**10-25 FORCE ACCOUNT.** Force account work is planning, engineering, or construction work done by the Sponsor's employees.

**10-26 INSPECTOR**. An authorized representative of the Engineer assigned to make all necessary inspections and/or observation of tests of the work performed or being performed, or of the materials furnished or being furnished by the Contractor.

**10-27 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.

**10-28 LABORATORY**. The official testing laboratories of the Owner or such other laboratories as may be designated by the Engineer. Also referred to as "Engineer's Laboratory" or "quality assurance laboratory."

**10-29 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.

**10-30 MAJOR AND MINOR CONTRACT ITEMS**. A major contract item shall be any item that is listed in the proposal, the total cost of which is equal to or greater than 20% of the total amount of the award contract. All other items shall be considered minor contract items.

**10-31 MATERIALS**. Any substance specified for use in the construction of the contract work.

**10-32 NOTICE TO PROCEED (NTP)**. A written notice to the Contractor to begin the actual contract work on a previously agreed to date. If applicable, the Notice to Proceed shall state the date on which the contract time begins.

**10-33 OWNER**. The term "Owner" shall mean the party of the first part or the contracting agency signatory to the contract. Where the term "Owner" is capitalized in this document, it shall mean airport Sponsor only.

**10-34 PASSENGER FACILITY CHARGE (PFC).** Per 14 CFR Part 158 and 49 USC § 40117, a PFC is a charge imposed by a public agency on passengers enplaned at a commercial service airport it controls."

**10-35 PAVEMENT**. The combined surface course, base course, and subbase course, if any, considered as a single unit.

**10-36 PAYMENT BOND**. The approved form of security furnished by the Contractor and his or her surety as a guaranty that the Contractor will pay in full all bills and accounts for materials and labor used in the construction of the work.

**10-37 PERFORMANCE BOND**. The approved form of security furnished by the Contractor and his or her surety as a guaranty that the Contractor will complete the work in accordance with the terms of the contract.

**10-38 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.

**10-39 PROJECT**. The agreed scope of work for accomplishing specific airport development with respect to a particular airport.

**10-40 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.

**10-41 PROPOSAL GUARANTY**. The security furnished with a proposal to guarantee that the bidder will enter into a contract if his or her proposal is accepted by the Owner.

10-42 RUNWAY. The area on the airport prepared for the landing and takeoff of aircraft.

**10-43 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.

**10-44 SPONSOR**. A Sponsor is defined in 49 USC § 47102(24) as a public agency that submits to the FAA for an AIP grant; or a private Owner of a public-use airport that submits to the FAA an application for an AIP grant for the airport.

**10-45 STRUCTURES**. Airport facilities such as bridges; culverts; catch basins, inlets, retaining walls, cribbing; storm and sanitary sewer lines; water lines; underdrains; electrical ducts, manholes, hand holes, 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.

10-46 SUBGRADE. The soil that forms the pavement foundation.

**10-47 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.

**10-48 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%, 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.

**10-49 SURETY**. The corporation, partnership, or individual, other than the Contractor, executing payment or performance bonds that are furnished to the Owner by the Contractor.

**10-50 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, aircraft parking areas, and terminal areas.

**10-51 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.

**10-52 WORKING DAY**. A working day shall be any day other than a legal holiday, Saturday, or Sunday on which the normal working forces of the Contractor may proceed with regular work for at least six (6) hours toward completion of the contract. When work is suspended for causes beyond the

Contractor's control, it will not be counted as a working day. Saturdays, Sundays and holidays on which the Contractor's forces engage in regular work will be considered as working days.

### **END OF SECTION 10**

### SECTION 20 PROPOSAL REQUIREMENTS AND CONDITIONS

### 20-01 ADVERTISEMENT (NOTICE TO BIDDERS). See Notice to Contractors.

**20-02 QUALIFICATION OF BIDDERS**. Each bidder shall furnish the Owner satisfactory evidence of his or 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 or 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 bidder's last fiscal year. Such statements or reports shall be certified by a public accountant. At the time of submitting such financial statements or reports, the bidder shall further certify whether his or her financial responsibility has changed, the bidder shall qualify the public accountant's statement or report to reflect the bidder's true financial condition at the time such qualified statement or report is submitted to the Owner.

Unless otherwise specified, a bidder may submit evidence that he or she 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 specified above.

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. Documented record of Contractor default under previous contracts with the Owner.

d. Documented record of unsatisfactory work on previous contracts with the Owner.

**20-05 INTERPRETATION OF ESTIMATED PROPOSAL QUANTITIES.** An estimate of quantities of work to be done and materials to be furnished under these specifications is given in the proposal. It is the result of careful calculations and is believed to be correct. It is given only as a basis for comparison of proposals and the award of the contract. The Owner does not expressly, or by

implication, agree that the actual quantities involved will correspond exactly therewith; nor shall the bidder plead misunderstanding or deception because of such estimates of quantities, or of the character, location, or other conditions pertaining to the work. Payment to the Contractor will be made only for the actual quantities of work performed or materials furnished in accordance with the plans and specifications. It is understood that the quantities may be increased or decreased as hereinafter provided in the subsection 40-02 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. Bidders shall satisfy themselves as to the character, quality, and quantities of work to be performed, materials to be furnished, and as to the requirements of the proposed contract. The submission of a proposal shall be prima facie evidence that the bidder has made such examination and is satisfied as to the conditions to be encountered in performing the work and as to the requirements of the proposed contract, plans, and specifications.

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

**20-07 PREPARATION OF PROPOSAL**. The bidder shall submit his or her proposal on the forms furnished by the Owner. All blank spaces in the proposal forms 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 they propose to do for each pay item furnished in the proposal. In case of conflict between words and numerals, the words, unless obviously incorrect, shall govern.

The bidder shall sign the proposal correctly and in ink. If the proposal is made by an individual, his or 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 or her authority to do so and that the signature is binding upon the firm or corporation.

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

A responsible bidder has the ability to perform successfully under the terms and conditions of a proposed procurement, as defined in 49 CFR § 18.36(b)(8). This includes such matters as Contractor integrity, compliance with public policy, record of past performance, and financial and technical resources.

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

**a.** If the proposal is on a form other than that furnished by the Owner, or if the Owner's form is altered, or if any part of the proposal form is detached.

**b.** If there are unauthorized additions, conditional or alternate pay items, or irregularities of any kind that make the proposal incomplete, indefinite, or otherwise ambiguous.

**c.** If the proposal does not contain a unit price for each pay item listed in the proposal, except in the case of authorized alternate pay items, for which the bidder is not required to furnish a unit price.

**d.** If the proposal contains unit prices that are obviously unbalanced.

**e.** If the proposal is not accompanied by the proposal guaranty specified by the Owner.

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

**20-10 BID GUARANTEE**. Each separate proposal shall be accompanied by a 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.

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

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

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

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

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

**b.** Evidence of collusion among bidders. Bidders participating in such collusion shall be disqualified as bidders for any future work of the Owner until any such participating bidder has been reinstated by the Owner as a qualified bidder.

**c.** If the bidder is considered to be in "default" for any reason specified in the subsection 20-04 titled ISSUANCE OF PROPOSAL FORMS of this section.

#### **END OF SECTION 20**

### SECTION 30 AWARD AND EXECUTION OF CONTRACT

**30-01 CONSIDERATION OF PROPOSALS**. After the proposals are publicly opened and read, they will be compared on the basis of the summation of the products obtained by multiplying the estimated quantities shown in the proposal by the unit bid prices. If a bidder's proposal contains a discrepancy between unit bid prices written in words and unit bid prices written in numbers, the unit 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 20-09 titled IRREGULAR PROPOSALS of Section 20.

**b.** If the bidder is disqualified for any of the reasons specified in the subsection 20-14 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 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 30-07 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 specified in the subsection 30-01 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 contract bonds as specified in the subsection 30-05 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 the signed contract to the Owner, along with the

fully executed surety bond or bonds specified in the subsection 30-05 titled REQUIREMENTS OF CONTRACT BONDS of this section, within 14 calendar days from the date mailed or otherwise delivered to the successful bidder.

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

**30-08 FAILURE TO EXECUTE CONTRACT**. Failure of the successful bidder to execute the contract and furnish an acceptable surety bond or bonds within the 14 calendar day period specified in the subsection 30-06 titled EXECUTION OF CONTRACT of this section shall be just cause for cancellation of the award and forfeiture of the proposal guaranty, not as a penalty, but as liquidation of damages to the Owner.

### **END OF SECTION 30**

### **SECTION 40 SCOPE OF WORK**

### 40-01 INTENT OF CONTRACT. The intent of the contract is to provide for construction and

completion, in every detail, of the work described. It is further intended that the Contractor shall furnish all labor, materials, equipment, tools, transportation, and supplies required to complete the work in accordance with the plans, specifications, and terms of the contract.

**40-02 ALTERATION OF WORK AND QUANTITIES**. The Owner reserves 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% (total cost being based on the unit prices and estimated quantities in the awarded contract). Alterations that do not exceed the 25% 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% 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.

Supplemental agreements shall be approved by the FAA and shall include all applicable Federal contract provisions for procurement and contracting required under AIP. Supplemental agreements shall also 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 non-performed, the Contractor shall be paid for all work performed toward completion of such item prior to the date of the order to omit such item. Payment for work performed shall be in accordance with the subsection 90-04 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, the Engineer may order the Contractor to proceed with Extra Work as provided in the subsection 90-05 titled PAYMENT FOR EXTRA 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 defined in the subsection 10-48 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.

**a.** It is understood and agreed that the Contractor shall provide for the free and unobstructed movement of aircraft in the air operations areas (AOAs) of the airport with respect to his or her own operations and the operations of all subcontractors as specified in the subsection 80-04 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 70-15 titled CONTRACTOR'S RESPONSIBILITY FOR UTILITY SERVICE AND FACILITIES OF OTHERS in Section 70.

**b.** With respect to his or her own operations and the operations of all subcontractors, the Contractor shall provide marking, lighting, and other acceptable means of identifying personnel, equipment, vehicles, storage areas, and any work area or condition that may be hazardous to the operation of aircraft, fire-rescue equipment, or maintenance vehicles at the airport.

c. 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 be responsible for the repair of any damage caused by the Contractor's equipment and personnel. The Contractor shall furnish, erect, and maintain barricades, warning signs, flag person, and other traffic control devices in reasonable conformity with the Manual on Uniform Traffic Control Devices (MUTCD) (<u>http://mutcd.fhwa.dot.gov/</u>), unless otherwise specified. The Contractor shall also construct and maintain in a safe condition any temporary connections necessary for ingress to and egress from abutting property or intersecting roads, streets or highways.

**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 40-07 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 used in the work as otherwise provided for in the contract and shall remain the property of the Owner when so used in the work.

**40-07 RIGHTS IN AND USE OF MATERIALS FOUND IN THE WORK**. Should the Contractor encounter any material such as (but not restricted to) sand, stone, gravel, slag, or concrete slabs within the established lines, grades, or grading sections, the use of which is intended by the terms of the contract to be either embankment or waste, the Contractor may at his or 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 the Contractor's own temporary construction on site; or,
- d. Use such material as intended by the terms of the contract.

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

Should the Engineer approve the Contractor's request to exercise option a., b., or c., the Contractor shall be paid for the excavation or removal of such material at the applicable contract price. The Contractor shall replace, at his or 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 use of such material used in the work or removed from the site.

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

It is understood and agreed that the Contractor shall make no claim for delays by reason of his or 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.

**40-08 FINAL CLEANUP**. Upon completion of the work and before acceptance and final payment will be made, the Contractor shall remove from the site all machinery, equipment, surplus and discarded materials, rubbish, temporary structures, and stumps or portions of trees. The Contractor shall cut all brush and woods within the limits indicated and shall leave the site in a neat and presentable condition. Material cleared from the site and deposited on adjacent property will not be considered as having been disposed of satisfactorily, unless the Contractor has obtained the written permission of 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 or her opinion, result in a finished product having a level of safety, economy, durability, and workmanship acceptable to the Owner, the Engineer will advise the Owner of his or her determination that the affected work be accepted and remain in place. In this event, the Engineer will document the determination and recommend to the Owner a basis of acceptance that will provide for an adjustment in the contract price for the affected portion of the work. The Engineer's determination and recommended contract price adjustments will be based on sound engineering judgment and such tests or retests of the affected work as are, in the Engineer's opinion, needed. Changes in the contract price shall be covered by contract change order or supplemental agreement as applicable.

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

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 execution 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 sound engineering judgment in his or her determinations as to acceptance of work that is not in strict conformity, but will provide a finished product equal to or better than that intended by the requirements of the contract, plans and specifications.

The 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 advisory circulars (ACs); contract general provisions shall govern over plans, cited standards for materials or testing and cited ACs. If any paragraphs contained in the Special Provisions conflict with General Provisions or Technical Specifications, the Special Provisions shall govern.

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

### LIST OF SPECIAL PROVISIONS

### (See Special Provisions)

**50-04 COOPERATION OF CONTRACTOR**. The Contractor will be supplied with five copies each of the plans and specifications. The Contractor 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 shall cooperate with the Engineer and his or 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 or 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 or 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 the 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 or 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 because of the presence and operations of other Contractors working within the limits of the same project.

The Contractor shall arrange his or her work and shall place and dispose of the materials being used so as not to interfere with the operations of the other Contractors within the limits of the same project. The Contractor shall join his or 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 their own or the Contractor's guidance shall be preserved by the Contractor. In case of negligence on the part of the Contractor, or their 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 execution and control of the work contracted for under these specifications.

The Contractor must give copies of survey notes to the Engineer for each area of construction and for each placement of material as specified to allow the Engineer to make periodic checks for conformance with plan grades, alignments and grade tolerances required by the applicable material specifications. All surveys must be provided to the Engineer prior to commencing work items that will cover or disturb the survey staking as set by the Contractor's surveyor. Survey(s) and notes shall be provided in the following format(s): photo copies of field notes for level elevations and/or point text files or AutoCAD drawings. In the case of error, on the part of the Contractor, their surveyor, employees or subcontractors, resulting in established grades, alignment or grade tolerances that do not concur with those specified or shown on the plans, the Contractor is solely responsible for correction, removal, replacement and all associated costs at no additional cost to the Owner.

Construction Staking and Layout includes but is not limited to:

a. Clearing and Grubbing perimeter staking

- b. Rough Grade slope stakes at 100-foot stations
- c. 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 (maximum) for the following section locations:

- **a.** Runway minimum five (5) per station
- **b.** Taxiways minimum three (3) per station
- c. Holding apron areas minimum three (3) per station
- d. Roadways minimum three (3) per station

Base Course blue tops at 25-foot stations and 25-foot offset distance (maximum) for the following section locations:

- **a.** Runway minimum five (5) per station
- **b.** Taxiways minimum three (3) per station
- **c.** Holding apron areas minimum three (3) per station

#### Pavement areas:

**a.** Edge of Pavement hubs and tacks (for string line 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.

e. Fence lines at 100-foot stations minimum.

**f.** Electrical and Communications System locations, lines and grades including but not limited to duct runs, connections, fixtures, signs, lights, Visual Approach Slope Indicators (VASIs), Precision Approach Path Indicators (PAPIs), Runway End Identifier Lighting (REIL), Wind Cones, Distance Markers (signs), pull boxes and manholes.

g. Drain lines, cut stakes and alignment on 25-foot stations, inlet and manholes.

**h.** Painting and Striping layout (pinned with 1.5 inch PK nails) marked for paint Contractor. (All nails shall be removed after painting).

**i.** Laser, or other automatic control devices, shall be checked with temporary control point or grade hub at a minimum of once per 400 feet per pass (that is, paving lane).

The establishment of Survey Control and/or reestablishment of survey control shall be by a State Licensed Land Surveyor.

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 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 are authorized to notify the Contractor or his or 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 a decision.

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

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

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.

**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 50-02 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 70-14 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 established by the Engineer. Work done contrary to the instructions of the Engineer, work done beyond the lines shown on the plans or as established by the Engineer, except as herein specified, or any extra work done without authority, will be considered as unauthorized and will not be paid for under the provisions of the contract. Work so done may be ordered removed or replaced at the Contractor's expense.

Upon failure on the part of the Contractor to comply with any order of the Engineer made under the provisions of this subsection, the Engineer will have authority to cause unacceptable work to be remedied or removed and replaced and unauthorized work to be removed and 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 or her hauling equipment and shall correct such damage at his or her own expense.

**50-12 MAINTENANCE DURING CONSTRUCTION**. The Contractor shall maintain the work during construction and until the work is accepted. Maintenance shall constitute continuous and effective work prosecuted day by day, with adequate equipment and forces so that the work is maintained in satisfactory condition at all times.

In the case of a contract for the placing of a course upon a course or subgrade previously constructed, the Contractor shall maintain the previous course or subgrade during all construction operations.

All costs of maintenance work during construction and before the project is accepted shall be included in the unit prices bid on the various contract items, and the Contractor will not be paid an additional amount for such work.

**50-13 FAILURE TO MAINTAIN THE WORK**. Should the Contractor at any time fail to maintain the work as provided in the subsection 50-12 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 execution of the project the Contractor substantially completes a usable unit or portion of the work, the occupancy of which will benefit the Owner, the Contractor may request the Engineer to make final inspection of that unit. If the Engineer finds upon inspection that the unit has been satisfactorily completed in compliance with the contract, the Engineer may accept it as being complete, and the Contractor may be relieved of further responsibility for that unit. Such partial acceptance and beneficial occupancy by the Owner shall not void or alter any provision of the contract.

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

If, however, the inspection discloses any work, in whole or in part, as being unsatisfactory, the Engineer will 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 for work or materials not clearly provided for in the contract, plans, or specifications or previously authorized as extra work, the Contractor shall notify the Engineer in writing of his or her intention to claim such additional compensation before the Contractor begins the work on which the Contractor bases the claim. If such notification is not given or the Engineer is not afforded proper opportunity by the Contractor for keeping strict account of actual cost as required, then the Contractor hereby agrees to waive any claim for such additional compensation. Such notice by the Contractor and the fact that the Engineer has kept account of the cost of the work shall not in any way be construed as proving or substantiating the validity of the claim. When the work on which the claim

for additional compensation is based has been completed, the Contractor shall, within 10 calendar days, submit a written claim to the Engineer who will present it to the Owner for consideration in accordance with local laws or ordinances.

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

## 50-17 COST REDUCTION INCENTIVE. Not Used.

## **END OF SECTION 50**

#### SECTION 60 CONTROL OF MATERIALS

**60-01 SOURCE OF SUPPLY AND QUALITY REQUIREMENTS**. The materials used in the work shall conform to the requirements of the contract, plans, and specifications. Unless otherwise specified, such materials that are manufactured or processed shall be new (as compared to used or reprocessed).

In order to expedite the inspection and testing of materials, the Contractor shall furnish 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 advisory circular (AC) 150/5345-53D, 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 for the certified equipment part number.

•EQUIPMENT NAME	•CITED FAA SPECIFICATIONS	•EFFECTIVE AC
Wind Cones	L-807	150/5345-46
Airport Lighting Control Panel	L-890	150/5345-3
Cable Connectors	L-823	150/5345-26
Underground Electrical Cable	L-824	150/5345-7
Isolation Transformers	L-830	150/5345-47
Runway and Taxiway Signs	L-858	150/5345-44
Circuit Selector Switch	L-847	150/5345-5
Runway and Taxiway Medium Intensity Edge Lights	L-861	150/5345-46
Light Base	L-867	150/5345-42

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:

**60-02 SAMPLES, TESTS, AND CITED SPECIFICATIONS**. Unless otherwise designated, all materials used in the work shall be inspected, tested, 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, quality assurance tests in accordance with the cited standard methods of ASTM, American Association of State Highway and Transportation Officials (AASHTO), Federal Specifications, Commercial Item Descriptions, and all other cited methods, which are current on the date of advertisement for bids, will be made by and at the expense of the Engineer.

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

The Contractor shall employ a testing organization to perform all Contractor required Quality Control 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. Reports will be furnished in PDF electronic format.

**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, the Contractor 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 or 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 acceptance of the material or assembly.

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

**a.** The Engineer shall have the cooperation and assistance of the Contractor and the producer with whom the Engineer 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. An Engineer's field office is not required.

**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 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 Storage 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 or 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 use in the work.

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

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

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

#### **END OF SECTION 60**

#### SECTION 70 LEGAL REGULATIONS AND RESPONSIBILITY TO PUBLIC

**70-01 LAWS TO BE OBSERVED**. The Contractor shall keep fully informed of all Federal and state laws, all local laws, ordinances, and regulations and all orders and decrees of bodies or tribunals having any jurisdiction or authority, which in any manner affect those engaged or employed on the work, or which in any way affect the conduct of the work. The Contractor shall at all times observe and comply with all such laws, ordinances, regulations, orders, and decrees; and shall protect and indemnify the Owner and all his or 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 the Contractor or the Contractor's employees.

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

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

**70-04 RESTORATION OF SURFACES DISTURBED BY OTHERS**. The Owner reserves the right to authorize the construction, reconstruction, or maintenance of any public or private utility service, FAA or National Oceanic and Atmospheric Administration (NOAA) facility, or a utility service of another government agency at any time during the progress of the work. To the extent that such construction, reconstruction, or maintenance has been coordinated with the Owner, such authorized work (by others) is indicated as follows:

#### None

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

Should the Owner of public or private utility service, FAA, or NOAA facility, or a utility service of another government agency be authorized to construct, reconstruct, or maintain such utility service or facility during the progress of the work, the Contractor shall cooperate with such Owners by arranging and performing the work in this contract to facilitate such construction, reconstruction or maintenance by others whether or not such work by others is listed above. When ordered as extra work by the Engineer, the Contractor shall make all necessary repairs to the work which are due to such authorized work by others, unless otherwise provided for in the contract, plans, or specifications. It is understood and agreed that the Contractor shall not be entitled to make any claim for damages due to such authorized work by others or for any delay to the work resulting from such authorized work.

**70-05 FEDERAL AID PARTICIPATION**. For Airport Improvement Program (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 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 FAA Administrator, 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 or 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 or her health or safety.

**70-07 PUBLIC CONVENIENCE AND SAFETY**. The Contractor shall control his or her operations and those of his or 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 or her own operations and those of his or her subcontractors and all suppliers in accordance with the subsection 40-05 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 80-04 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 (AOAs) shall be a maximum of 18 inches high. Unless otherwise specified, barricades shall be spaced not more than 4 feet apart. Barricades, warning signs, and markings shall be paid for under subsection 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 on Uniform Traffic Control Devices.

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 advisory circular (AC) 150/5340-1L, Standards for Airport Markings.

The Contractor shall furnish, erect, and maintain markings and associated lighting of open trenches, excavations, temporary stock piles, and the Contractor's 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 150/5370-2F, Operational Safety on Airports During Construction.

The Contractor shall identify each motorized vehicle or piece of construction equipment in reasonable conformance to AC 150/5370-2F.

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 removal is directed by the Engineer.

Open-flame type lights shall not be permitted.

**70-09 USE OF EXPLOSIVES**. When the use of explosives is necessary for the execution 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 or 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 execution of the work, resulting from any act, omission, neglect, or misconduct in manner or method of executing the work, or at any time due to defective work or materials, and said responsibility shall not be released until the project has been completed and accepted.

When or where any direct or indirect damage or injury is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work, or in consequence of the non-execution thereof by the Contractor, the Contractor shall restore, at his or 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 the Contractor 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 or her contract considered necessary by the Owner for such purpose may be retained for the use of the Owner or, in case no money is due, his or her surety may be held until such suits, actions, or claims for injuries or damages shall have been settled and suitable evidence to that effect furnished to the Owner, except that money due the Contractor will not be withheld when the Contractor produces satisfactory evidence that he or she is adequately protected by public liability and property damage insurance.

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

**70-13 OPENING SECTIONS OF THE WORK TO TRAFFIC**. 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 or her own estimate of the difficulties involved in arranging the work to permit such beneficial occupancy by the Owner as described below:

## See Construction Safety Phasing Plan and Plan Sheets

Upon completion of any portion of the work listed above, such portion shall be accepted by the Owner in accordance with the subsection 50-14 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 or her expense.

The Contractor shall make his or 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 (see Special Provisions).

Contractor shall refer to the approved Construction Safety Phasing Plan (CSPP) 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 50-14 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 or 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, seeding, and sodding furnished under the contract, and shall take adequate precautions to protect new tree growth and other important vegetative growth against injury.

**70-15 CONTRACTOR'S RESPONSIBILITY FOR UTILITY SERVICE AND FACILITIES OF OTHERS**. As provided in the subsection 70-04 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 their operations to prevent the unscheduled interruption of such utility services and facilities.

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

## See Cover Sheet of Plans

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

It is further understood and agreed that the Contractor shall, upon execution of the contract, notify the Owners of all utility services or other facilities of his or her plan of operations. Such notification shall be in writing addressed to THE PERSON TO CONTACT as provided in this subsection and subsection 70-04 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 provided, it shall be the responsibility of the Contractor to keep such individual Owners advised of changes in their plan of operations that would affect such Owners.

Prior to beginning the work in the general vicinity of an existing utility service or facility, the Contractor shall again notify each such Owner of their plan of operation. If, in the Contractor's opinion, the Owner's assistance is needed to locate the utility service or facility or the presence of a representative

of the Owner is desirable to observe the work, such advice should be included in the notification. Such notification shall be given by the most expeditious means to reach the utility owner's PERSON TO CONTACT no later than two normal business days prior to the Contractor's commencement of operations in such general vicinity. The Contractor shall furnish a written summary of the notification to the Engineer.

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

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

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

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

## 70-15.1 FAA FACILITIES AND CABLE RUNS. Not Used

**70-16 FURNISHING RIGHTS-OF-WAY**. The Owner will be responsible for furnishing all rightsof-way upon which the work is to be constructed in advance of the Contractor's operations.

**70-17 PERSONAL LIABILITY OF PUBLIC OFFICIALS**. In carrying out any of the contract provisions or in exercising any power or authority granted by this contract, there shall be no liability upon the Engineer, his or 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 or her surety, or both, such overpayment as may be sustained, or by failure on the part of the Contractor to fulfill his or her obligations under the contract. A waiver on the part of the Owner of any breach of any part of the contract shall not be held to be a waiver of any other or subsequent breach.

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

**70-19 ENVIRONMENTAL PROTECTION**. The Contractor shall comply with all Federal, state, and local laws and regulations controlling pollution of the environment. The Contractor shall take necessary precautions to prevent pollution of streams, lakes, ponds, and reservoirs with fuels, oils, 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 or her operations, any building, part of a building, structure, or object that is incongruous with its surroundings, the Contractor shall immediately cease operations in that location and notify the Engineer. The Engineer will immediately investigate the Contractor's finding and the Owner will direct the Contractor to either resume operations or to suspend operations as directed.

Should the Owner order suspension of the Contractor's operations in order to protect an archaeological or historical finding, or order the Contractor to perform extra work, such shall be covered by an appropriate contract change order or supplemental agreement as provided in the subsection 40-04 titled EXTRA WORK of Section 40 and the subsection 90-05 titled PAYMENT FOR EXTRA WORK of Section 90. If appropriate, the contract change order or supplemental agreement agreement shall include an extension of contract time in accordance with the subsection 80-07 titled DETERMINATION AND EXTENSION OF CONTRACT TIME of Section 80.

## **END OF SECTION 70**

#### SECTION 80 EXECUTION AND PROGRESS

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

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

Should the Contractor elect to assign his or 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.

**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 15 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. The Contractor shall not commence any actual construction prior to the date on which the notice to proceed is issued by the Owner.

**80-03 EXECUTION AND PROGRESS**. Unless otherwise specified, the Contractor shall submit their 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 their operations to provide such additional materials, equipment, and labor necessary to meet the revised schedule. Should the execution of the work be discontinued for any reason, the Contractor shall notify the Engineer at least 24 hours in advance of resuming operations.

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

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

When the work requires the Contractor to conduct his or her operations within an AOA of the airport, the work shall be coordinated with airport operations (through the Engineer) at least 48 hours prior to commencement of such work. The Contractor shall not close an AOA until so authorized by the Engineer and until the necessary temporary marking and associated lighting is in place as provided in the subsection 70-08 titled BARRICADES, WARNING SIGNS, AND HAZARD MARKINGS of Section 70.

When the contract work requires the Contractor to work within an AOA of the airport on an intermittent basis (intermittent opening and closing of the AOA), the Contractor shall maintain constant

communications as specified; immediately obey all instructions to vacate the AOA; immediately obey all instructions to resume work in such AOA. Failure to maintain the specified communications or to obey instructions shall be cause for suspension of the Contractor's operations in the AOA until the satisfactory conditions are provided. The following AOA 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:

# See Construction Safety Phasing Plan and Item M-005 of the Civil Technical Specifications.

Contractor shall be required to conform to safety standards contained in AC 150/5370-2F, 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 Construction Safety and Phasing Plan (CSPP) and the provisions set forth within the current version of AC 150/5370-2. The CSPP included within the contract documents conveys minimum requirements for operational safety on the airport during construction activities. The Contractor shall prepare and submit a Safety Plan Compliance Document that details how it proposes to comply with the requirements presented within the CSPP.

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

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

No deviation or modifications may be made to the approved CSPP unless approved in writing by the Owner or Engineer.

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

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

Any person employed by the Contractor or by any subcontractor who violates any operational regulations or operational safety requirements and, in the opinion of the Engineer, does not perform his work in a proper and skillful manner or is intemperate or disorderly shall, at the written request of the Engineer, be removed 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 execution of the work, the Engineer may suspend the work by written notice until compliance with such orders.

All equipment that is proposed to be used on the work shall be of sufficient size and in such mechanical condition as to meet requirements of the work and to produce a satisfactory quality of work. Equipment

used on any portion of the work shall 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, the Contractor may request authority from the Engineer to do so. The request shall be in writing and shall include a full description of the methods and equipment proposed and of the reasons for desiring to make the change. If approval is given, it will be on the condition that the Contractor will be fully responsible for producing work in conformity with contract requirements. If, after trial use of the substituted methods or equipment, the Engineer determines that the work produced does not meet contract requirements, the Contractor shall discontinue the use of the substitute method or equipment and shall complete the remaining work with the specified methods and equipment. The Contractor shall remove any deficient work and replace it with work of specified quality, or take such other corrective action as the Engineer may direct. No change will be made in basis of payment for the contract items involved nor in contract time as a result of authorizing a change in methods or equipment under this 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 the Owner may deem necessary, due to unsuitable weather, or such other conditions as are considered unfavorable for the execution 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 or 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. The Contractor shall take every precaution to prevent damage or deterioration of the work performed and provide for normal drainage of the work. The Contractor shall erect temporary structures where necessary to provide for traffic on, to, or from the airport.

**80-07 DETERMINATION AND EXTENSION OF CONTRACT TIME**. The number of calendar 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 or 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 or 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 six (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 50-15 titled FINAL ACCEPTANCE of Section 50.

(5) The Contractor will be allowed one (1) week in which to file a written protest setting forth his or 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 20-05 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 non-work days. All calendar days elapsing between the effective dates of the Owner's orders to suspend and resume all work, due to causes not the fault of the Contractor, shall be excluded.

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

**c.** When the contract time is a specified completion date, it shall be the date on which all contract work shall be substantially complete.

If the Contractor finds it impossible for reasons beyond his or her control to complete the work within the contract time as specified, or as extended in accordance with the provisions of this subsection, the Contractor may, at any time prior to the expiration of the contract time as extended, make a written request to the Owner for an extension of time setting forth the reasons which the Contractor believes will justify the granting of his or 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 what 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 supporting documentation justify the work was delayed because of conditions beyond the control and without the fault of the Contractor, the Owner may extend the time for completion by a change order that adjusts the contract time or completion date. 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 80-07 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 or her surety. Such deducted sums shall not be deducted as a penalty but shall be considered as liquidation of a reasonable portion of damages including but not limited to additional engineering services that will be incurred by the Owner should the Contractor fail to complete the work in the time provided in their contract.

Schedule	Liquidated Damages Cost	Allowed Construction Time
Base Bid	\$2,300.00 per day	123 Working Days

The maximum construction time allowed is 123 working days. Permitting the Contractor to continue and finish the work or any part of it after the time fixed for its completion, or after the date to which the time for completion may have been extended, will in no way operate as a wavier on the part of the Owner of any of its rights under the contract.

**80-09 Default and termination of contract**. The Contractor shall be considered in default of his or 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 and/or materials to assure completion of work in accordance with the terms of the contract, or

**c.** Performs the work unsuitably or neglects or refuses to remove materials or to perform anew such work as may be rejected as unacceptable and unsuitable, or

- d. Discontinues the execution of the work, or
- **e.** Fails to resume work which has been discontinued within a reasonable time after notice to do so, or
  - f. Becomes insolvent or is declared bankrupt, or commits any act of bankruptcy or insolvency, or
  - g. Allows any final judgment to stand against the Contractor unsatisfied for a period of 10 days, or
  - **h.** Makes an assignment for the benefit of creditors, or
  - i. For any other cause whatsoever, fails to carry on the work in an acceptable manner.

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

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

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

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

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

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

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

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

**80-11 WORK AREA, STORAGE AREA AND SEQUENCE OF OPERATIONS**. The Contractor shall obtain approval from the 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 or her work in such a manner as to ensure safety and a minimum of hindrance to flight operations. All Contractor equipment and material stockpiles shall be stored a minimum or 500 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 250 feet of an active runway at any time.

#### **END OF SECTION 80**

#### SECTION 90 MEASUREMENT AND PAYMENT

**90-01 MEASUREMENT OF QUANTITIES**. All work completed under the contract will be measured by the Engineer, or his or 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 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 inch.

The term "ton" will mean the short ton consisting of 2,000 lb 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 for the materials hauled, provided that the body is of such shape that the actual contents may be readily and accurately determined. All vehicles shall be loaded to at least their water level capacity, and all loads shall be leveled when the vehicles arrive at the point of delivery.

When requested by the Contractor and approved by the Engineer in writing, material specified to be measured by the cubic yard may be weighed, and such weights will be converted to cubic yards 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 or ton. When measured by volume, such volumes will be measured at 60°F (16°C) or will be corrected to the volume at 60°F (16°C) using ASTM D1250 for asphalts or ASTM D633 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 or hundredweight.

Timber will be measured by the thousand feet board measure (MFBM) actually incorporated in the structure. Measurement will be based on nominal widths and thicknesses and the extreme length of each piece.

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 90-05 titled PAYMENT FOR EXTRA 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 gauge, unit weight, section dimensions, etc., such identification will be considered to be nominal weights or dimensions. Unless more stringently controlled by tolerances in cited specifications, manufacturing tolerances established by the industries involved will be accepted.

Scales 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 1/2% 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% 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 km) 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%.

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 execution thereof, subject to the provisions of the subsection 70-18 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 40-02 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 or 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 40-03 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 non-perform such contract item.

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

In addition to the reimbursement hereinbefore provided, the Contractor shall be reimbursed for all actual costs incurred for the purpose of performing the omitted contract item prior to the date of the Engineer's order. Such additional costs incurred by the Contractor must be directly related to the

deleted contract item and shall be supported by certified statements by the Contractor as to the nature the amount of such costs.

**90-05 PAYMENT FOR EXTRA WORK**. Extra work, performed in accordance with the subsection 40-04 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.

**90-06 PARTIAL PAYMENTS**. Partial payments will be made to the Contractor at least once each month as the work progresses. Said payments will be based upon estimates, prepared by the Engineer, of the value of the work performed and materials complete and in place, in accordance with the contract, plans, and specifications. Such partial payments may also include the delivered actual cost of those materials stockpiled and stored in accordance with the subsection 90-07 titled PAYMENT FOR MATERIALS ON HAND of this section. No partial payment will be made when the amount due to 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 contracts no later than 30 days after the Contractor has received a partial payment. The Owner must ensure prompt and full payment of retainage from the prime Contractor to the subcontractor within 30 days after the subcontractor's work is satisfactorily completed. A subcontractor's work is satisfactorily completed when all the tasks called for in the subcontract have been accomplished and documented as required by the Owner. When the Owner has made an incremental acceptance of a portion of a prime contract, the work of a subcontractor covered by that acceptance is deemed to be satisfactorily completed.

From the total of the amount determined to be payable on a partial payment, 5 percent of such total amount will be deducted and retained by the Owner until the final payment is made, except as may be provided (at the Contractor's option) in the subsection 90-08 titled PAYMENT OF WITHHELD FUNDS of this section. The balance, 95 percent, of the amount payable, less all previous payments, shall be certified for payment. Should the Contractor exercise his or her option, as provided in the subsection 90-08 titled PAYMENT OF WITHHELD FUNDS of this section, no such percent retainage shall be deducted.

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.

The Owner may retain an amount not less than twice the contract value or estimated cost, whichever is greater, of the work remaining to be done. The remainder, less all previous payments and deductions, will then be certified for payment to the Contractor.

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

No partial payment shall bind the Owner to the acceptance of any materials or work in place as to quality or quantity. All partial payments are subject to correction at the time of final payment as provided in the subsection 90-09 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 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 any time prior to use in the work.

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

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

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

The Contractor shall bear all costs associated with the partial payment of stored or stockpiled materials in accordance with the provisions of this 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 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 50-15 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 the Contractor's objections to the final estimate which are based on disputes in measurements or computations of the final quantities to be paid under the contract as amended by change order or supplemental agreement. The Contractor and the Engineer shall resolve all disputes (if any) in the measurement and computation of final quantities to be paid within 30 calendar days of the Contractor is 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 50-16 titled CLAIMS FOR ADJUSTMENT AND DISPUTES of Section 50.

After the Contractor has approved, or approved under protest, the Engineer's final estimate, and after the Engineer's receipt of the project closeout documentation required in subsection 90-11 Project Closeout, 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 50-16 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.

#### 90-10 CONSTRUCTION WARRANTY.

**a.** In addition to any other warranties in this contract, the Contractor warrants that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, workmanship, or design furnished, or performed by the Contractor or any subcontractor or supplier at any tier.

**b.** This warranty shall continue for a period of one year from the date of final acceptance of the work. If the Owner takes possession of any part of the work before final acceptance, this warranty shall continue for a period of one year from the date the Owner takes possession. However, this will not relieve the Contractor from corrective items required by the final acceptance of the project work.

**c.** The Contractor shall remedy at the Contractor's expense any failure to conform, or any defect. In addition, the Contractor shall remedy at the Contractor's expense any damage to Owner real or personal property, when that damage is the result of:

(1) The Contractor's failure to conform to contract requirements; or

(2) Any defect of equipment, material, workmanship, or design furnished by the Contractor.

**d.** The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for one year from the date of repair or replacement.

**e.** The Owner will notify the Contractor, in writing, within seven (7) days after the discovery of any failure, defect, or damage.

**f.** If the Contractor fails to remedy any failure, defect, or damage within 14 days after receipt of notice, the Owner shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense.

**g.** With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall: (1) Obtain all warranties that would be given in normal commercial practice; (2) Require all warranties to be executed, in writing, for the benefit of the Owner, as directed by the Owner, and (3) Enforce all warranties for the benefit of the Owner.

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

**90-11 PROJECT CLOSEOUT.** Approval of final payment to the Contractor is contingent upon completion and submittal of the items listed below. The final payment will not be approved until the Engineer approves the Contractor's final submittal. The Contractor shall:

**a.** Provide two (2) copies of all manufacturers warranties specified for materials, equipment, and installations.

**b.** Provide weekly payroll records (not previously received) from the general Contractor and all subcontractors.

c. Complete final cleanup in accordance with subsection 40-08, FINAL CLEANUP.

d. Complete all punch list items identified during the Final Inspection.

e. Provide complete release of all claims for labor and material arising out of the Contract.

**f.** Provide a certified statement signed by the subcontractors, indicating actual amounts paid to the Disadvantaged Business Enterprise (DBE) subcontractors and/or suppliers associated with the project.

g. When applicable per state requirements, return copies of sales tax completion forms.

h. Manufacturer's certifications for all items incorporated in the work.

i. All required record drawings, as-built drawings or as-constructed drawings.

j. Project Operation and Maintenance (O&M) Manual.

k. Security for Construction Warranty.

1. Equipment commissioning documentation submitted, if required.

#### **END OF SECTION 90**

#### 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 here 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, their 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 and accepted 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.

Paving projects over \$250,000 shall have a Quality Control (QC)/Quality Assurance (QA) workshop with the Engineer, Contractor, subcontractors, testing laboratories, and Owner's representative and the FAA prior to or at start of construction. The workshop shall address QC and QA requirements of the project specifications. The Contractor shall coordinate with the Airport and the Engineer on time and location of the QC/QA workshop.

#### 100-02 DESCRIPTION OF PROGRAM.

**a.** General description. The Contractor shall establish a Quality Control Program to perform quality control 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.

**b.** Quality Control Program. The Contractor shall describe the Quality Control Program in a written document that shall be reviewed and approved by the Engineer prior to the start of any production, construction, or off-site fabrication. The written Quality Control Program shall be submitted to the Engineer for review and approval at least 7 calendar days before the pre-construction

conference. The Contractor's Quality Control Plan and Quality Control testing laboratory must be approved in writing by the Engineer prior to the Notice to Proceed (NTP).

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
- 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 is deemed 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 used for specific inspection and testing functions for different items of work. If an outside organization or independent testing laboratory is used for implementation of all or part of the 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, as a minimum, consist of the following 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 five (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 one of the following requirements:

(1) Professional Engineer with one (1) year of airport paving experience.

(2) Engineer-in-training with two (2) years of airport paving experience.

(3) An individual with three (3) years of highway and/or airport paving experience, 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 five (5) years of highway and/or airport paving experience.

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 two (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 two (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 subsection 100-06.

(2) Performance of all quality control tests as required by the technical specifications and subsection 100-07.

(3) Performance of density tests for the Engineer when required by the technical specifications.

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), Program Evaluation and Review Technique (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 (for example, mix designs, material certifications) and shop drawings required by the technical specifications. The listing can be developed in a spreadsheet format and shall include:

- a. Specification item number
- b. Item description
- c. Description of submittal
- d. Specification paragraph requiring submittal
- e. Scheduled date of submittal

**100-06 INSPECTION REQUIREMENTS.** 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 subsection 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 used to ensure the quality of aggregates and other mix components, and to adjust and control mix proportioning to meet the approved mix design and other requirements of the technical specifications. All equipment used in proportioning and mixing shall be inspected to ensure its proper operating condition. The 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 used to ensure the quality of all materials and workmanship. All equipment used in placing, finishing, and compacting shall be inspected to ensure its proper operating condition and to ensure that all such operations are in conformance to the technical specifications and are within the plan dimensions, lines, grades, and tolerances specified. The 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 American Association of State Highway and Transportation Officials (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 D3665. 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 subsection 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. 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
- (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
- (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 use 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 here 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 or her authorized representative to the Contractor or his or 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

#### SECTION 105 MOBILIZATION

**105-1 DESCRIPTION.** This item shall consist of work and operations, but is not limited to, work and operations necessary for the movement of personnel, equipment, material and supplies to and from the project site for work on the project except as provided in the contract as separate pay items.

**105-1.1 Posted notices.** Prior to commencement of construction activities the Contractor must post the following documents in a prominent and accessible place where they may be easily viewed by all employees of the prime Contractor and by all employees of subcontractors engaged by the prime Contractor: Equal Employment Opportunity (EEO) Poster "Equal Employment Opportunity is the Law" in accordance with the Office of Federal Contract Compliance Programs Executive Order 11246, as amended; Davis Bacon Wage Poster (WH 1321) - DOL "Notice to All Employees" Poster; and Applicable Davis-Bacon Wage Rate Determination. These notices must remain posted until final acceptance of the work by the Owner.

**105-2 BASIS OF MEASUREMENT AND PAYMENT.** Based upon the contract lump sum price for "Mobilization" partial payments will be allowed as follows:

- **a.** With first pay request, 25%.
- **b.** When 25% or more of the original contract is earned, an additional 25%.

**c.** When 50% or more of the original contract is earned, an additional 40%.

**d.** After Final Inspection, Staging area clean-up and delivery of all Project Closeout materials as required by 90-11, the final 10%.

#### **END OF SECTION 105**

#### END OF FAA GENERAL PROVISIONS
## **DIVISION 5**

## SPECIAL PROVISIONS

## City Project No: 16-75

## Widen Runway 12/30 and Airfield Electrical Upgrades, AIP 03-06-0265-12-2017

## SECTION 1 SPECIFICATIONS AND PLANS

#### **SPECIAL NOTES:**

1. Official bid documents including plans and specifications are available online at <u>http://www.cityofturlock.org/capitalprojects</u>. All bids submitted for this project must conform to the requirements of the official bid documents, including plans and specifications.

#### **1.01 SPECIFICATIONS:**

The work described herein shall be done in accordance with the current City of Turlock Standard Specifications and the 2010 Edition of the State of California, Department of Transportation Standard Specifications and Standard Plans (with exception that English units are to be used in place of metric), the FAA standard specifications and in accordance with the following Special Provisions.

The Contract Documents are complementary; what is required by one is as binding as if required by all.

It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be provided whether or not specifically called for at no additional cost to City.

Clarifications and interpretations of the Contract Documents shall be issued by Engineer.

In case of conflict or discrepancy between any of the Contract Documents, the order of documents listed below shall be the order of precedence, with the first item listed having the highest precedence.

- 1. Contract Change Order (Modifications or changes last in time are first in precedence).
- 2. Addenda to Contract Agreement
- 3. Contract Agreement
- 4. Permits
- 5. Special Provisions
- 6. Technical Specifications
- 6. Notice Inviting Bids and Instructions to Bidders
- 7. Project Drawings
- 8. City of Turlock Standard Specifications
- 9. Caltrans Standard Specifications

- 10. City of Turlock Standard Drawings
- 11. Caltrans Standard Plans
- 12. Federal Provisions FAA General Provisions, FHWA, etc.

With regards to discrepancies or conflicts between written dimensions given on drawings and the scaled measurements, the written dimensions shall govern.

With regards to discrepancies or conflicts between large-scale drawings and small-scale drawings, the larger scale shall govern.

With regards to discrepancies or conflicts between detailed drawings and referenced standard drawings or plans, the detailed drawings shall govern.

In the event where provisions of codes, safety orders, contract documents, referenced manufacturer's specifications or industry standards are in conflict, the more restrictive and higher quality shall govern.

Should it appear that the work to be done or any of the matters relative thereto are not sufficiently detailed or explained in these specifications, the special provisions, or the plans, the Contractor shall apply to the Engineer in writing for such further explanations as may be necessary and shall conform to them as part of the contract. All responses from the Engineer shall also be in writing. In the event of any doubt or question arising respecting the true meaning of these specifications, the special provisions or the plans, reference shall be made to the Engineer, whose decision thereon shall be final.

#### 1.02 CONTRACTOR'S RESPONSIBILITY:

The Contractor shall examine carefully the site of the work and the plans and specifications therefore. The Contractor shall investigate to their satisfaction as to conditions to be encountered, the character, quality and quantity of surface, subsurface materials or obstacles to be encountered, the work to be performed, materials to be furnished, and as to the requirements of the bid, plans and specifications of the contract.

#### 1.03 COMPLETENESS AND ACCURACY OF PLANS AND SPECIFICATIONS:

Pursuant to the California Public Contract Code, the bidder is required to review architectural or engineering plans and specifications prior to submission of a bid, and report any errors and omissions noted by Contractor to the architect, engineer or owner five days prior to the bid opening date.

## SECTION 2 PROPOSAL REQUIREMENTS AND CONDITIONS

#### 2.01 GENERAL:

The Contractor's attention is directed to the "Notice to Contractor" for the date, time and location of the Pre-Bid meeting, if applicable.

The bidder's attention is directed to the provisions in Proposal for this bid for the requirements and conditions which the bidder must observe in the preparation of and the submission of the bid.

The bidder's bond shall conform to the bond form in the Bid book for the project and shall be properly filled out and executed. The bidder's bond form included in that book must be used.

In conformance with Public Contract Code Section 7106, a Noncollusion Affidavit is included in the Bid book. Signing the Bid book shall also constitute signature of the Noncollusion Affidavit.

The contractor, sub recipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of Title 49 CFR (Code of Federal Regulations) part 26 in the award and administration of US DOT assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy, as the recipient deems appropriate. Each subcontract signed by the bidder must include this assurance. Failure of the bidder to fulfill the requirements of the Special Provisions for submittals required to be furnished after bid opening, including but not limited to escrowed bid documents, where applicable, may subject the bidder to a determination of the bidder's responsibility in the event it is the apparent low bidder on a future public works contracts.

## 2.02 EXISTING UTILITIES, FACILITIES, AND SITE CONDITIONS:

The actual sizes, locations and materials of existing utilities and facilities shown on the plans may vary from what is shown on the plans. Attention is directed to the possible existence of underground facilities not indicated on the plans or in the special provisions. Contractor shall be responsible for verifying the locations and nature of the existing utilities, protecting them from damage and notifying Engineer of their location and nature.

Contractor shall examine carefully the site of the work. It is assumed that Contractor has investigated and is satisfied as to the conditions to be encountered as to the character, quality and quantities of work to be performed.

Although the City of Turlock's soil conditions are homogenous and sandy in nature, various subsurface conditions such as hardpan, and ground water may be encountered. The City of Turlock will not be held responsible in any way for the type and character of subsurface conditions encountered. If a subsurface report is desired by Contractor, it will be Contractor's responsibility and expense to verify the subsurface conditions by boring or other means necessary prior to bidding and/or performing work. Attention is directed to Section 5.22, "Preservation of Property," of these special provisions during boring and other miscellaneous operations.

Full compensation for furnishing all labor, materials, tools, equipment (including dewatering devices), and incidentals, and for doing all the work involved with and/or in verifying existing utilities, facilities, site and subsurface conditions as specified above, shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefore

#### 2.03 FEDERAL LOBBYING RESTRICTIONS:

Section 1352, Title 31, United States Code prohibits Federal funds from being expended by the recipient or any lower tier sub recipient of a Federal-aid contract to pay for any person for influencing

or attempting to influence a Federal agency or Congress in connection with the awarding of any Federalaid contract, the making of any Federal grant or loan, or the entering into of any cooperative agreement.

If any funds other than Federal funds have been paid for the same purposes in connection with this Federal-aid contract, the recipient shall submit an executed certification and, if required, submit a completed disclosure form as part of the bid documents.

A certification for Federal-aid contracts regarding payment of funds to lobby Congress or a Federal agency is included in the Bid book. Standard Form - LLL, "Disclosure of Lobbying Activities," with instructions for completion of the Standard Form is also included in the Bid book. Signing the Bid book shall constitute signature of the Certification.

The above referenced certification and disclosure of lobbying activities shall be included in each subcontract and any lower-tier contracts exceeding \$100,000. All disclosure forms, but not certifications, shall be forwarded from tier to tier until received by the Engineer.

The Contractor, subcontractors and any lower-tier contractors shall file a disclosure form at the end of each calendar quarter in which there occurs any event that requires disclosure or that materially affects the accuracy of the information contained in any disclosure form previously filed by the Contractor, subcontractors and any lower-tier contractors. An event that materially affects the accuracy of the information reported includes:

- (1) A cumulative increase if \$25,000 or more in the amount paid or expected to be paid for influencing or attempting to influence a covered Federal action; or
- (2) A change in the person(s) or individual(s) influencing or attempting to influence a covered Federal action; or
- (3) A change in the officer(s), employees(s), or Member(s) contacted to influence or attempt to influence a covered Federal Action.

## 2.04 DISADVANTAGED BUSINESS ENTERPRISES (DBE):

Under 49 CFR 26.13(b):

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

Take necessary and reasonable steps to ensure that DBEs have opportunity to participate in the contract (49 CFR 26).

To ensure equal participation of DBEs provided in 49 CFR 26.5.

Make work available to DBEs and select work parts consistent with available DBE subcontractors and suppliers.

Meet the DBE goal shown elsewhere in these special provisions or demonstrate that you made adequate good faith efforts to meet this goal.

It is your responsibility to verify that the DBE firm is certified as DBE at date of bid opening. For a list of DBEs certified by the California Unified Certification Program, go to:

http://www.dot.ca.gov/hq/bep/find\_certified.htm

All DBE participation will count toward the California Department of Transportation's federally mandated statewide overall DBE goal.

Credit for materials or supplies you purchase from DBEs counts towards the goal in the following manner:

- 1. 100 percent counts if the materials or supplies are obtained from a DBE manufacturer.
- 2. 60 percent counts if the materials or supplies are obtained from a DBE regular dealer.
- 3. Only fees, commissions, and charges for assistance in the procurement and delivery of materials or supplies count if obtained from a DBE that is neither a manufacturer or regular dealer. 49 CFR 26.55 defines "manufacturer" and "regular dealer."

You receive credit towards the goal if you employ a DBE trucking company that performs a commercially useful function as defined in 49 CFR 26.55(d)(1) through (4) and (6).

#### DBE Commitment Submittal

Submit Local Agency Bidder DBE Commitment (Construction Contracts), Exhibit 15-G, form, included in the Bid book.

Submit written confirmation from each DBE stating that it is participating in the contract. Include confirmation with the DBE Commitment form. A copy of a DBE's quote will serve as written confirmation that the DBE is participating in the contract.

If you do not submit the DBE Commitment form with the proposal, the City finds your bid nonresponsive.

#### Good Faith Efforts Submittal

If you have not met the DBE goal, complete and submit the DBE Information - Good Faith Efforts, Exhibit 15-H, form with the bid showing that you made adequate good faith efforts to meet the goal. Only good faith efforts directed towards obtaining participation by DBEs will be considered.

If your DBE Commitment form shows that you have met the DBE goal or if you are required to submit the DBE Commitment form, you must also submit good faith efforts documentation within the specified

time to protect your eligibility for award of the contract in the event the Agency finds that the DBE goal has not been met.

Good faith efforts documentation must include the following information and supporting documents, as necessary:

- 1. Items of work you have made available to DBE firms. Identify those items of work you might otherwise perform with its own forces and those items that have been broken down into economically feasible units to facilitate DBE participation. For each item listed, show the dollar value and percentage of the total contract. It is your responsibility to demonstrate that sufficient work to meet the goal was made available to DBE firms.
- 2. Names of certified DBEs and dates on which they were solicited to bid on the project. Include the items of work offered. Describe the methods used for following up initial solicitations to determine with certainty if the DBEs were interested, and the dates of the follow-up. Attach supporting documents such as copies of letters, memos, facsimiles sent, telephone logs, telephone billing statements, and other evidence of solicitation. You are reminded to solicit certified DBEs through all reasonable and available means and provide sufficient time to allow DBEs to respond.
- 3. Name of selected firm and its status as a DBE for each item of work made available. Include name, address, and telephone number of each DBE that provided a quote and their price quote. If the firm selected for the item is not a DBE, provide the reasons for the selection.
- 4. Name and date of each publication in which you requested DBE participation for the project. Attach copies of the published advertisements.
- 5. Names of agencies and dates on which they were contacted to provide assistance in contacting, recruiting, and using DBE firms. If the agencies were contacted in writing, provide copies of supporting documents.
- 6. List of efforts made to provide interested DBEs with adequate information about the plans, specifications, and requirements of the contract to assist them in responding to a solicitation. If you have provided information, identify the name of the DBE assisted, the nature of the information provided, and date of contact. Provide copies of supporting documents, as appropriate.
- 7. List of efforts made to assist interested DBEs in obtaining bonding, lines of credit, insurance, necessary equipment, supplies, and materials, excluding supplies and equipment that the DBE subcontractor purchases or leases from the prime contractor or its affiliate. If such assistance is provided by you, identify the name of the DBE assisted, nature of the assistance offered, and date assistance was provided. Provide copies of supporting documents, as appropriate.
- 8. Any additional data to support demonstration of good faith efforts.

The Agency may consider DBE commitments of the 2nd and 3rd bidders when determining whether the low bidder made good faith efforts to meet the DBE goal.

## SECTION 3 AWARD AND EXECUTION OF CONTRACT

#### 3.01 GENERAL:

The Contractor's attention is directed to the provisions in the Contract for the requirements and conditions concerning award and execution of contract.

The contract shall be executed by the successful bidder and shall be returned, together with the contract bonds and insurance, to the City so that it is received within 10 working days after the bidder has received the contract for execution. Failure to do so shall be just cause for forfeiture of the proposal guaranty. The executed contract documents shall be delivered to the following address:

Attention: Yolanda Gardini City of Turlock, Engineering Division 156 S Broadway, Suite 150 Turlock, CA 95380

Bid protests are due in writing by the fifth calendar day after the bid opening and are to be delivered to the following address:

Michael G. Pitcock, PE 156 S Broadway Suite 150 Turlock, CA 95380

The award of the contract, if it be awarded, will be to the lowest responsible bidder whose bid complies with all the requirements prescribed.

# SECTION 4 BEGINNING OF WORK, TIME OF COMPLETION AND LIQUIDATED DAMAGES

Attention is directed to Section 6 "Time For Performance" of the Contract.

At no time shall construction begin prior to the issuance of the Notice to Proceed. Any work performed prior to the Notice to Proceed shall be done at the Contractor's own risk and payment will not be made therefor.

The Contractor shall follow the sequence of construction and progress of work as specified in Section 5.23, "Order of Work," of these Special Provisions.

Should the Contractor choose to work on a Saturday, Sunday or Legal Holiday as defined in Section 5.16 "Working Hours," of these Special Provisions, the Contractor shall reimburse the City of Turlock the actual cost of engineering, inspection, testing, superintendent, and/or other overhead expenses which are directly chargeable to the contract. Should such work be undertaken at the request of the City, reimbursement will not be required.

Attention is directed to Section 9 "Liquidated Damages" of the Contract.

A pre-construction meeting will be held between Contractor and City prior to the beginning of construction. The exact time and place of this conference will be determined by City after award of the construction contract.

City shall furnish to Contractor five hard copies of the Contract Documents and plans. Contractor may produce additional copies as needed at Contractor's expense.

## **SECTION 5 GENERAL**

#### 5.01 LABOR NONDISCRIMINATION:

Attention is directed to the following Notice that is required by Chapter 5 of Division 4 of Title 2, California Code of Regulations.

# NOTICE OF REQUIREMENT FOR NONDISCRIMINATION PROGRAM (GOV. CODE, SECTION 12990)

Your attention is called to the "Nondiscrimination Clause", set forth in Section 7 1.01A(4), "Labor Nondiscrimination," of the Caltrans Standard Specifications, which is applicable to all nonexempt state contracts and subcontracts, and to the "Standard California Nondiscrimination Construction Contract Specifications" set forth therein. The Specifications are applicable to all nonexempt state construction contracts and subcontracts of \$5,000 or more.

#### 5.02 **PREVAILING WAGE:**

Attention is directed to Section 7-1.02K "Labor Code," of the Caltrans Standard Specifications.

Pursuant to Section 1773 of the Labor Code, the general prevailing wage rates in the county Stanislaus in which the work is to be done have been determined by the Director of the California Department of Industrial Relations. These wages are set forth in the General Prevailing Wage Rates for this project, available at 156 S. Broadway St, Turlock, CA 95380 and available from the California Department of Industrial Relations' Internet web site at http://www.dir.ca.gov/DLSR/PWD.

Attention is directed to the Federal minimum wage rate requirements in the Bid book. If there is a difference between the minimum wage rates predetermined by the Secretary of Labor and the general prevailing wage rates determined by the Director of the California Department of Industrial Relations for similar classifications of labor, the Contractor and subcontractors shall pay not less than the higher wage rate. The Department will not accept lower State wage rates not specifically included in the Federal minimum wage determinations. This includes "helper" (or other classifications based on hours of experience) or any other classification not appearing in the Federal wage determinations. Where Federal wage determinations do not contain the State wage rate determination otherwise available for use by the Contractor and subcontractors, the Contractor and subcontractors shall pay not less than the Federal minimum wage rate, which most closely approximates the duties of the employees in question.

## 5.03 BUY AMERICA REQUIREMENTS:

Attention is directed to the "Buy America" requirements of the Surface Transportation Assistance Act of 1982 (Section 165) and the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) Sections 1041(a) and 1048(a), and the regulations adopted pursuant thereto. In conformance with the law and regulations, all manufacturing processes for steel and iron materials furnished for incorporation into the work on this project shall occur in the United States; with the exception that pig iron and processed, pelletized and reduced iron ore manufactured outside of the United States may be used in the domestic manufacturing process for such steel and iron materials. The application of coatings, such as epoxy coating, galvanizing, painting, and other coating that protects or enhances the value of steel or iron materials shall be considered a manufacturing process subject to the "Buy America" requirements.

A Certificate of Compliance as contained in the Proposal information will be furnished in compliance with the Division 3 Federal Contract Provisions ,

#### 5.04 REMOVAL OF ASBESTOS AND HAZARDOUS SUBSTANCES:

When the presence of asbestos or hazardous substances are not shown on the plans or indicated in the specifications and the Contractor encounters materials which the Contractor reasonably believes to be asbestos or a hazardous substance as defined in Section 25914.1 of the Health and Safety Code, and the asbestos or hazardous substance has not been rendered harmless, the Contractor may continue work in unaffected areas reasonably believed to be safe. The Contractor shall immediately cease work in the affected area and report the condition to the Engineer in writing.

In conformance with Section 25914.1 of the Health and Safety Code, removal of asbestos or hazardous substances including exploratory work to identify and determine the extent of the asbestos or hazardous substance will be performed by separate contract.

If delay of work in the area delays the current controlling operation, the delay will be considered a right of way delay and the Contractor will be compensated for the delay in conformance with the provisions in Section 8 1.07, "Delays," of the Caltrans Standard Specifications.

#### 5.05 SUBCONTRACTOR AND DISADVANTAGED BUSINESS ENTERPRISE RECORDS:

Use each DBE subcontractor as listed on the List of Subcontractors form and the Local Agency Bidder DBE Commitment (Construction Contracts), Exhibit 15-G, forms unless you receive authorization for a substitution.

The Agency requests the Contractor to:

- 1. Notify the Engineer of any changes to its anticipated DBE participation
- 2. Provide this notification before starting the affected work

Maintain records including:

- 1. Name and business address of each 1st-tier subcontractor
- 2. Name and business address of each DBE subcontractor, DBE vendor, and DBE trucking company, regardless of tier

3. Date of payment and total amount paid to each business

If you are a DBE contractor, include the date of work performed by your own forces and the corresponding value of the work.

Before the 15th of each month, submit a Monthly DBE Trucking Verification form.

If a DBE is decertified before completing its work, the DBE must notify you in writing of the decertification date. If a business becomes a certified DBE before completing its work, the business must notify you in writing of the certification date. Submit the notifications. On work completion, complete a Disadvantaged Business Enterprises (DBE) Certification Status Change, Exhibit 17-O, form. Submit the form within 30 days of contract acceptance.

Upon work completion, complete a Final Report – Utilization of Disadvantaged Business Enterprises (DBE), First-Tier Subcontractors, Exhibit 17-F, form. Submit it within 90 days of contract acceptance. The Agency withholds \$10,000 until the form is submitted. The Agency releases the withhold upon submission of the completed form.

## 5.06 PERFORMANCE OF DISADVANTAGED BUSINESS ENTERPRISES:

DBEs must perform work or supply materials as listed in the Local Agency Bidder DBE Commitment (Construction Contracts), Exhibit 15-G, included in the Bid.

Do not terminate or substitute a listed DBE for convenience and perform the work with your own forces or obtain materials from other sources without authorization from the Agency.

The Agency authorizes a request to use other forces or sources of materials if it shows any of the following justifications:

- 1. Listed DBE fails or refuses to execute a written contract based on plans and specifications for the project.
- 2. You stipulated that a bond is a condition of executing the subcontract and the listed DBE fails to meet your bond requirements.
- 3. Work requires a contractor's license and listed DBE does not have a valid license under Contractors License Law.
- 4. Listed DBE fails or refuses to perform the work or furnish the listed materials.
- 5. Listed DBE's work is unsatisfactory and not in compliance with the contract.
- 6. Listed DBE is ineligible to work on the project because of suspension or debarment.
- 7. Listed DBE becomes bankrupt or insolvent.
- 8. Listed DBE voluntarily withdraws with written notice from the Contract
- 9. Listed DBE is ineligible to receive credit for the type of work required.
- 10. Listed DBE owner dies or becomes disabled resulting in the inability to perform the work on the Contract.
- 11. Agency determines other documented good cause.

Notify the original DBE of your intent to use other forces or material sources and provide the reasons. Provide the DBE with 5 days to respond to your notice and advise you and the Agency of the reasons why the use of other forces or sources of materials should not occur. Your request to use other forces or material sources must include:

- 1. 1 or more of the reasons listed in the preceding paragraph
- 2. Notices from you to the DBE regarding the request
- 3. Notices from the DBEs to you regarding the request

If a listed DBE is terminated, make good faith efforts to find another DBE to substitute for the original DBE. The substitute DBE must perform at least the same amount of work as the original DBE under the contract to the extent needed to meet the DBE goal.

The substitute DBE must be certified as a DBE at the time of request for substitution.

Unless the Agency authorizes (1) a request to use other forces or sources of materials or (2) a good faith effort for a substitution of a terminated DBE, the Agency does not pay for work listed on the Local Agency Bidder DBE Commitment (Construction Contracts), Exhibit 15-G, form unless it is performed or supplied by the listed DBE or an authorized substitute.

#### 5.08 SUBCONTRACTING:

No subcontract releases the Contractor from the contract or relieves the Contractor of their responsibility for a subcontractor's work.

If the Contractor violates Pub Cont Code § 4100 et seq., the City may exercise the remedies provided under Pub Cont Code § 4110. The City may refer the violation to the Contractors State License Board as provided under Pub Cont Code § 4111.

The Contractor shall perform work equaling at least 50 percent of the value of the original total bid with the Contractor's own employees and equipment, owned or rented, with or without operators. Each subcontract must comply with the contract.

Each subcontractor must have an active and valid State contractor's license with a classification appropriate for the work to be performed (Bus & Prof Code, § 7000 et seq.).

At the pre-construction meeting, prior to starting work, Contractor shall submit a complete listing of subcontractors and the value of the work each subcontractor will perform. This list shall contain all information identified on Exhibit 12-G of the Local Assistance Procedures Manuel.

Before subcontracted work starts, submit a Subcontracting Request form.

Do not use a debarred contractor; a current list of debarred contractors is available at the Department of Industrial Relations' Web site.

Upon request by the Engineer, immediately remove and not again use a subcontractor who fails to prosecute the work satisfactorily.

## 5.09 PROMPT PROGRESS PAYMENT TO SUBCONTRACTORS:

A prime contractor or subcontractor shall pay any subcontractor not later than 10 days of receipt of each progress payment in accordance with the provision in Section 7108.5 of the California Business and Professions Code concerning prompt payment to subcontractors. The 10 days is applicable unless a longer period is agreed to in writing. Any delay or postponement of payment over 30 days may take place only for good cause and with the agency's prior written approval. Any violation of Section 7108.5 shall subject the violating contractor or subcontractor to the penalties, sanction and other remedies of that section. This requirement shall not be construed to limit or impair any contractual, administrative, or judicial remedies otherwise available to the contractor or subcontractor in the event of a dispute involving late payment or nonpayment by the prime contractor, deficient subcontract performance, or noncompliance by a subcontractor.

## 5.10 PROMPT PAYMENT OF FUNDS WITHHELD TO SUBCONTRACTORS::

The agency shall hold retainage from the prime contractor and shall make prompt and regular incremental acceptances of portions, as determined by the agency, of the contract work, and pay retainage to the prime contractor based on these acceptances. The prime contractor, or subcontractor, shall return all monies withheld in retention from a subcontractor within 30 days after receiving payment for work satisfactorily completed and accepted including incremental acceptances of portions of the contract work by the agency. Federal law (49CFR26.29) requires that any delay or postponement of payment over 30 days may take place only for good cause and with the agency's prior written approval. Any violation of this provision shall subject the violating prime contractor or subcontractor to the penalties, sanctions and other remedies specified in Section 7108.5 of the Business and Professions Code. These requirements shall not be construed to limit or impair any contractual, administrative, or judicial remedies otherwise available to the prime contractor or subcontractor in the event of a dispute involving late payment or nonpayment by the prime contractor, deficient subcontract performance, or noncompliance by a subcontractor.

#### 5.11 PAYMENTS:

Attention is directed to Section 19, "Payments to Contractor," of the Contract.

At the end of each month the Contractor shall submit a proposed progress invoice. The invoice shall delineate each bid item, the amount of work performed for the invoice period (previous month) and the total amount of work performed to date. A sample invoice with all of the required items will be given to the Contractor at the pre-construction meeting.

The Engineer will review the progress invoice and after any changes the Engineer makes, will issue an official invoice for the Contractor to sign. The Contractor shall sign the official invoice and return to the Engineer. After the Engineer receives the signed, official invoice, the progress payment will be processed.

Retention in the amount of 5% of the progress payment amount shall be held from all progress payments. Retention will be released 35 days after the Notice of Completion has been filed, insofar as no stop notices were filed.

## 5.13 GUARANTY:

Attention is directed to Section 9-4, "Guaranty," of the City of Turlock Standard Specifications.

## 5.14 PUBLIC SAFETY:

In addition to any other measures taken by Contractor pursuant to the provisions of the Standard Specifications and the General Conditions, Contractor shall comply with the provisions of FAA Advisory Circular AC 150/5370-10G Operational Safety on Airports During Construction and Item M-005 Airport Safety and Security.

At the end of each working day, if a difference of 0.30 feet exists between the elevation of the existing pavement and the elevation of any excavation within 2 feet of the traveled way, material shall be placed and compacted against the vertical cuts adjacent to the traveled way. During excavation operations, native material may be used for this purpose, however, once the placing of the structural section commences, structural material shall be used. The material shall be placed to the level of the elevation of the top of the existing pavement and tapered at a slope of 4:1 or flatter to the bottom of the excavation. Treated base shall not be used for the taper. Full compensation for placing the material on a 4:1 slope, regardless of the number of times it is required, and subsequent removing or reshaping of the material to the lines and grades shown on the plans shall be considered as included in the cost for other contract items of work and no additional compensation will be allowed therefore.

Personal vehicles of Contractor's employees shall not be parked on the traveled way or shoulders, including any section closed to public traffic. Whenever vehicles or equipment are parked on the shoulder within 6 feet of a traffic lane, the shoulder area shall be closed with traffic cones or portable delineators placed on a taper in advance of the parked vehicles or equipment and along the edge of the pavement at 25 foot intervals to a point not less than 25 feet past the last vehicle or piece of equipment.

## 5.15 SOUND CONTROL REQUIREMENTS:

Sound control shall be in accordance with Section 7 1.01I, "Sound Control Requirements," of the Caltrans Standard Specifications and these special provisions.

The noise level from Contractor's operations, between the hours of 9:00 p.m. and 6:00 a.m., shall not exceed 86 dba at a distance of 50 feet. This requirement in no way relieves Contractor from responsibility for complying with local ordinances regulating noise level.

Said noise level requirements shall apply to all equipment on the job or related to the job, including but not limited to trucks, transit mixers or transient equipment that may or may not be owned by Contractor. The use of loud sound signals shall be avoided in favor of light warnings except those required by safety law for the protection of personnel.

Full compensation for conforming to the requirements of this section shall be considered as included in the prices paid for the various contract items of work involved and no additional compensation will be allowed therefore.

## 5.16 WORKING HOURS:

Contractor's working hours shall be between 7:00 a.m. and 5:00 p.m., Monday through Friday, excluding legal holidays.

Unless otherwise specified, the contractor shall not work outside the above-mentioned working hours without prior written consent of Engineer. Contractor shall notify Engineer 48 hours prior to beginning work.

Designated legal holidays are: January 1st, the third Monday in January, the third Monday in February, the last Monday in May, July 4th, the first Monday in September, November 11th, Thanksgiving Day, the day after Thanksgiving, and December 25th. When a designated legal holiday falls on a Sunday, the following Monday shall be a designated legal holiday. When a designated legal holiday falls on a Saturday, the preceding Friday shall be a designated legal holiday.

## 5.17 UNDERGROUND SERVICE ALERT REQUIREMENTS:

Contractor shall contact Underground Service Alert of Northern California at least 48 hours in advance of any construction activity, will or could damage or affect any underground utility or subsurface improvement, and obtain an inquiry identification number. Contractor shall notify Underground Service Alert in the event of change in the project limits or change in original work previously shown on the plans or indicated in the specifications. Contractor shall not commence construction prior to City Inspector receiving City's notice from USA North regarding this construction activity.

## 5.18 DUST CONTROL:

Dust Control shall conform to the provisions in Section 10, "Dust Control", of the Standard Specifications and these special provisions.

Full compensation for Dust Control will be considered as included in the various contract items of work requiring Dust Control, as determined by Engineer, and no separate payment will be made therefor.

## 5.19 WATERING:

Watering shall be in accordance with Section 17, "Watering," of the Caltrans Standard Specifications.

Full compensation for Watering will be considered as included in the various contract items of work requiring Watering, as determined by Engineer, and no separate payment will be made therefor.

## 5.20 USE OF HYDRANTS FOR CONSTRUCTION PURPOSES:

City will permit the use of a hydrant for construction purposes provided that the following are abided by:

1. A spanner wrench shall be the only type of wrench used on fire hydrants.

- 2. Contractor shall be liable for the damages to or loss of all hydrants and associated water lines and equipment which result from the use of this equipment.
- 3. Water shall only be used within City limits.
- 4. The vehicle must be approved by Engineer for approved backflow device.
- 5. Contractor shall pay a deposit on a water meter provided by the City. After the project ended the Contractor shall return the meter to the City for the release of the deposit.

However, use of city hydrants does not exempt Contractor from providing a water truck where hydrants cannot be utilized due to unsafe working conditions as deemed by Engineer.

## 5.21 PROGRESS SCHEDULE:

Contractor shall furnish City with a Critical Path Method progress schedule. The progress schedule shall show the construction activities extending for the duration of the working days. Any deviation from the outline must be approved by Engineer. Contractor shall not be allowed to start construction activities until the progress schedule is accepted by Engineer.

## 5.22 PRESERVATION OF PROPERTY:

The work performed in connection with various existing facilities shall be in accordance with Section 7-8, "Preservation of Property," of the Standard Specifications and these special provisions.

Due care shall be exercised to avoid injury or damage to existing improvements or facilities, utility facilities, adjacent property, and roadside trees, shrubs and other plants that are to remain in place.

Roadside trees, shrubs and other plants that are not to be removed and pole lines, fences, signs, markers and monuments, buildings and structures, conduits, pipelines under or above aground, sewer and water lines, sprinkler systems above or below ground, all roadway facilities, and any other improvements or facilities within or adjacent to the right-of-way shall be protected from injury or damage, and if ordered by Engineer, Contractor shall provide and install suitable safeguards, approved by Engineer, to protect such objects from injury or damage. If such objects are injured or damaged by reason of Contractor's operations they shall be replaced or restored at Contractor's expense. The facilities shall be replaced or restored to a condition as good or better as when Contractor entered upon the work, or as good as required by the specifications accompanying the contract, if any such objects are a part of the work being performed under the contract. Engineer may make or cause to be made such temporary repairs as necessary to restore to service any damaged facility. The cost of such repairs shall be borne by Contractor and may be deducted from any moneys due or to become due to Contractor under the contract.

The fact that any underground facility is not shown upon the plans shall not relieve Contractor of his responsibility under Section 2.02, "Existing Utilities and Facilities", of these provisions. It shall be Contractor's responsibility, pursuant thereto, to ascertain the location of such underground improvements or facilities that may be subject to damage by reason of his operations.

Full compensation for furnishing all labor materials, tools, equipment, and incidentals, and for doing all the work involved in protecting or repairing property as specified above, shall be considered as included

in the prices paid for the various contract items of work and no additional compensation will be allowed therefore.

## 5.23 ORDER OF WORK:

Order or work shall be in accordance with the phasing plan as shown in the drawings and the approved Airport Safety and Phasing Plan. The general sequence of the work will be:

Phase 1 – Infrastructure. All work to include the construction of electrical duct banks, storm drain and grading be completed within in 66 calendar days. A maximum of 45 night closures between the hours of 8:00 PM and 6:00 AM will be provided for all work within the Runway Safety Area.

Phase 2 – Runway Widening and Lighting. Runway pavement removal and replacement, electrical installations, and initial pavement markings. All specified work within the Runway Safety Area will be completed during a 60-calendar day runway closure.

Phase 3 – Commissioning and remaining work. Commissioning of all airfield and utility electrical improvements, seeding, final runway, taxiway pavement markings, clean-up, and punch list items to be completed within 45 days.

All work is to be completed within 171 calendar days.

## 5.24 AS-BUILTS:

When the job is complete, Contractor shall provide City with as-built drawings. These as-built drawings shall show any and all differences (revisions, additions, etc.) between the signed improvement plans and the installed improvements. The Contractor shall identify all utilities that are located in the field. The as-builts will consist of redlined signed improvement plans. The NOC will not be issued until acceptable as-builts have been received by the Engineer.

## 5.25 SURVEYING:

Construction survey staking shall be provided by the contractor in accordance with the FAA General Provisions and Item M-102 Construction Staking and Layout contained in the technical specifications.

Contractor shall protect all survey stakes and markers during construction. If survey stakes and/or markers are damaged or destroyed during the course of construction, by vandalism or by any other means, Contractor may submit a request to have the survey re-staked. If re-staking is required, Contractor shall be back charged at the fully burdened hourly rate for the survey crew and shall fully reimburse City for all necessary materials and equipment.

## 5.26 TESTING:

Unless otherwise noted, City of Turlock will supply all acceptance testing. Coordination of said testing is the responsibility of Contractor through the project's inspector. The Contractor shall provide at least 24 hours' notice to the Engineer in advance of needing acceptance testing. If the Contractor request testing and the Contractor is not ready for the testing to occur, the Contractor shall be back charged the cover the cost of the testing firm.

At sites chosen by the project inspector, City's testing laboratory will conduct all tests. Contractor shall supply any necessary equipment and or labor required to obtain all samples for the completion of the testing process.

All Quality Control Testing will be the responsibility of the Contractor in accordance with the FAA general Provisions Section 60 and 100. A Contractor Quality Control Program will be furnished by the Contractor in accordance with Item M-103, Contractor Quality Control.

## 5.27 SUBMITTALS:

General submittals shall be made in accordance with Section 5.30, "Internet Based Construction Management System," of these special provisions. If a physical copy of a submittal is required, the following shall apply.

Before making submittals, Contractor shall ensure that products and materials will be available in the quantities and in the time required by the Contract and the approved outline of construction activity. Each submittal shall clearly identify, by highlighting, arrows or other defined and permanent mark, the products and materials proposed for use.

All Submittals shall be made to Engineer by Contractor, including those generated by subcontractors and suppliers. Contractor shall carefully review all subcontractor and supplier submittals before submitting to Engineer for review. Submittals received from sources other than Contractor's office shall be returned without action. If a submittal contains extraneous information, unmarked options or is incomplete, it will be returned to Contractor for correction and require re-submittal.

Submittals will be processed by Engineer within ten (10) working days after receipt from Contractor. Engineer will review submittals for general conformance with the Contract Documents and standards. Such review by Engineer shall not relieve Contractor or any subcontractor of any responsibility for full compliance with the Contract Documents. Unless specifically authorized to do so by Engineer, Contractor shall not procure, manufacture, or fabricate any part of the contract work until submittals related to said contract work have been favorably reviewed by Engineer.

Contractor shall deliver five copies of each submittal to Engineer. Each submittal shall contain, at a minimum, the following information:

1. Title page including the following information:

Project Number and Name. Name of Contractor. Name of subcontractor (if applicable). Description of item. Item Number on Bid Schedule. Date of Submittal. Contractor's initials and date indicating approval of item for submittal to Engineer. 2. Index Sheet (For submittals containing information on multiple components. Each component shall be cross-identified with reference to a divider tab number).

3. Divider Tabs (For submittals containing information on multiple components. Tab numbers shall correspond to the index sheet for each component in the submittal).

4. The brochure, product data sheet or catalog cut (For each component in the submittal, separated by their respective divider tabs).

5. For shop drawings, Contractor shall submit five (5) clean, low background reproducible prints. Shop drawings larger than 11 x 17 in. shall be rolled, not folded.

6. Submittals that involve engineering computations or original design work shall show the name, the California State registration number, seal, and signature of the Professional Engineer certifying that such computations or design work are correct and in conformance with applicable standards, codes and accepted engineering practices.

7. For product samples, Contractor shall submit two (2) representative samples, one of which may be retained for the duration of the project or indefinitely at the discretion of Engineer. Although a reasonable attempt will be made to maintain the samples in good condition, neither City nor its representative will be responsible for the condition of the samples if returned to Contractor.

8. For material samples, unless a specific quantity is called for in the contract documents, Contractor shall submit a representative sample of the material, which may be retained for the duration of the project or indefinitely at the discretion of Engineer.

9. Certificates of compliance shall be submitted by Contractor to Engineer for those materials and products for which no sample and test results are specified. Certificates of compliance shall include the following information:

Statement that the product complies with the respective contract specifications.

Producer's name and address, product trade name and catalog number (if applicable), place of product origin, quantity of product to be furnished, and related contract plans and specification section numbers.

A certified copy of test results pertaining to the product from a certified independent testing laboratory. At the option of Engineer certified test results shall be signed and sealed by a Professional Engineer licensed to practice in the state of California.

Contractor shall submit Material Safety Data Sheets (MSDS) for all materials used or stored on the site that possess a MSDS, including materials used by Contractor for maintenance of equipment.

## 5.28 NOTICE OF POTENTIAL CLAIM:

Attention is directed to Section 5-1.43 "Potential Claims and Dispute Resolution," of the Caltrans Standard Specifications.

#### 5.29 PRESERVATION OF EXISTING MONUMENTS:

Preservation of existing monuments shall be Contractor's responsibility. Contractor shall notify Engineer of all monuments that may/will be disturbed by construction operations. Engineer will tie off said monuments and provide Contractor a notice to proceed.

Once Contractor is finished with its construction operations, Engineer will relocate the monuments. Contractor shall install a monument will with concrete collar at each location which shall conform to the provisions in Section 22-1 "Survey Monuments" and Drawing M-1 "Monument Detail", of the Standard Specifications and these special provisions.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals, and for doing all the work involved with protecting existing monuments as specified above, shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefore.

## 5.30 INTERNET BASED CONSTRUCTION MANAGEMENT SYSTEM:

#### General

The Engineer and Contractor shall utilize Virtual Project Manager (http://www.virtual-pm.com/), herein after called VPM, for submission of all data and documents (unless specified otherwise in this Section) throughout the duration of the Contract. VPM is an electronic project management system accessible through the Internet used to create, share, and review construction management documentation. VPM is provided by the Engineer at no cost to the Contractor. VPM will be made available to all Contractors' personnel, subcontractor personnel, suppliers, consultants, Engineer, and any of Engineer's representatives or agents. The joint use of this system is to facilitate electronic exchange of information, automation of key processes, electronic notification of project activity, and overall management of contract documentation. VPM shall be the primary means of project information submission and management.

The Engineer will establish the Contractor's access to VPM by enabling access and assigning user profiles to Contractor personnel, including subcontractors and suppliers, as requested by Contractor. All authorized personnel shall have an individual user profile; no joint-use or shared user profiles will be allowed. Each user profile shall be assigned to a user group and have specific permission settings and privileges based on the user's need within VPM. Entry of information exchanged and transferred between the Contractor and its subcontractors and suppliers on VPM shall be the responsibility of the Contractor.

The Contractor shall use computer hardware and software that meets the requirements of the VPM system. As recommendations are modified by VPM, the Contractor will upgrade their system(s) to meet or exceed the recommendations. Upgrading of the Contractor's computer systems will not be justification for a cost or time modification to the Contract. The Contractor shall ensure its own connectivity to VPM through their internet service provider.

The Contractor shall be responsible for the validity of the information they place in VPM, for the training of their personnel to understand and utilize VPM, as well as the provision and accessibility of adequate

resources to connect with VPM. Accepted users shall be knowledgeable in the use of computers, including Internet browsers, email programs, and the Portable Document Format (PDF) document type. The Contractor shall utilize the existing forms in VPM to the maximum extent possible. If a form does not exist in VPM the Contractor must include their own form or a form provided by the Engineer as an attachment to a submittal, RFI, or other document within VPM. Note that only the following file types are accepted as attachments to documents within VPM: PDF files, Microsoft Word (DOC) files, Microsoft Excel (XLS) files, picture files (JPG, TIFF, BMP, JPEG, etc.). PDF documents will be created through electronic conversion prior to uploading, such as through a "print to file" feature or "save as pdf" feature, rather than optically scanned whenever possible.

Contractor shall provide a list of key VPM personnel for the Engineer's acceptance. The list shall include the following information: first name, last name, address, title, office phone number, cell phone number, and email address. The Engineer is responsible for adding and removing users from the system and establishing read, write, and approval permission levels.

#### Company Documents

This area is reserved for general documentation not related to a specific project. Only the Engineer shall post content in this area. Examples of content found in this area are: the City of Turlock Standard Specifications and Drawings, the 2010 Caltrans Standard Specifications, and the 2010 Caltrans Standard Plans. All files are in PDF format.

#### Project Summary

The project summary tab provides an overall summary of the project. It includes the current weather, the working days remaining and a summary of work for the past week. The summary of work is generated from the City's project inspector and the daily logs. This tab is for information only and the Contractor shall not take any action here.

#### <u>Task Manager</u>

The project schedule the Contractor submits is converted into a format that is uploaded by the Engineer into the task manager tab. The Contractor is responsible for providing schedule updates to the Engineer whenever the work progress in a manner different than the approved schedule.

#### Change Order Manager

The change order manager tab shall be used to track project change orders. Any potential change orders shall be tracked as a Request for Information (RFI) in the RFI tab. Once the Engineer agrees that a RFI will result in a contract change order, a new contract change order shall be created by the Engineer in the change order manager tab. The Engineer will finalize the contract change order through this tab. Once the change order is finalized, the Engineer will present the contract change order at a City Council meeting. After City Council approval the Engineer will make payment on the contract change order.

#### <u>Transmittals</u>

The transmittal tab shall be used to communicate general project information amongst all parties as well as used by the Contractor in the submission of certified payroll reports. The Engineer will upload the project-specific information including: bid documents, conformed plans, conformed specifications and the Notice to Proceed to the transmittal tab.

The Contractor shall submit certified payroll reports on a weekly basis through the transmittal tab. Each week shall have a separate transmittal where all the certified payroll reports and statements of non-performance for each contractor shall be posted.

#### <u>Submittals</u>

All submittals shall be submitted through the submittal tab. The preferred document type is PDF.

Before making submittals, the Contractor shall ensure that products and materials will be available in the quantities and in the time required by the Contract and the approved schedule of activities. Each submittal shall be legible and clearly identify, by highlighting, arrows or other defined and permanent mark, the products and materials proposed for use.

All submittals shall be generated from the prime contractor and any submittals that are uploaded by subcontractors or suppliers will not be reviewed. Contractor shall carefully review all subcontractor and suppliers submittals before submitting it to the Engineer for review. If a submittal contains extraneous information, unmarked options or is otherwise incomplete, it will be rejected and the Contractor shall make corrections and upload the resubmittal. Any resubmittal shall be made to the same transmittal item in VPM.

Submittals shall be processed by the Engineer within ten working days after upload to VPM. The Engineer will review submittals for general conformance with the Contract Documents and standards. Such review by the Engineer shall not relieve the Contractor of any responsibility for full compliance with the Contract Documents. Unless specifically authorized to do so by the Engineer, the Contractor shall not procure, manufacture, or fabricate any part of the contract work until submittals related to said contract work have been approved by the Engineer.

Each submittal shall have a unique title that is comprised of the item followed by a comma and the section of the specifications that reference the item (e.g. Minor Concrete, Section 8.01). The submittal type shall either be project materials or project information. The submittal description shall be used to identify any pertinent information or list a description of the item being submitted.

Certificates of compliance shall be submitted through the submittal tab. The submittal type shall be "certificate of compliance".

The Contractor shall submit progress invoices on the last working day of the month through the transmittal tab (select "progress invoice" for the type). The Engineer will review the submitted content and if found acceptable the Engineer will upload an official invoice for the Contractor to sign. The Contractor shall sign in blue ink and upload the signed invoice to the same transmittal where the Engineer will then process for payment.

#### <u>RFIs</u>

The RFI tab shall be used to request information from the Contractor to the Engineer. The Contractor shall create a RFI upon recognition of any event or question of fact arising from the contract work. The RFI type for this submittal shall be "Request for Information." The Engineer will also utilize the RFI tab

in a similar manner when there is a question for the Contractor; this RFI type shall be "Response Required."

The Engineer will respond to a RFI submitted by the Contractor within five days. The Contractor shall proceed with the work unless otherwise ordered. The Contractor may protest the Engineer's response by submitting a claim in accordance with Section 5.28 "Notice of Potential Claim" of the special provisions.

If the Engineer states the RFI leads to a change in scope, change in conditions, differing site conditions or extra work; a contract change order will be issued.

#### Daily Logs

The daily log tab is used by the City to document the activities of the work, any correspondence or direction given in the field, safety concerns and general comments about the project. The Contractor may view the contents of this tab for reference purposes. The information entered into the daily log tab is used to populate the project summary tab.

#### WSWD

The weekly statement of working days will be posted to the WSWD tab. VPM automatically generates the WSWD from the information entered into the daily log tab. The WSWD shows the working days and non-working days charged for the reporting week, any time adjustments, a work completion date with the remaining working days left in the contract and the controlling activities for the week.

The Contractor will be allowed 15 days from the last working day of the weekly statement to protest in writing the correctness of the statement. The Contractor shall submit a transmittal stating what is being protested and the reasons for protest. The Engineer will respond to the protest. The Contractor may protest the Engineer's response by submitting a claim in accordance with Section 5.28 "Notice of Potential Claim" of the special provisions.

#### 5.31 BUSINESS LICENSE:

Contractor shall obtain a City of Turlock business license prior to issuance of the Notice to Proceed. The cost of the business license is fifty cents per thousand dollars in revenue. Business Licenses are obtained through the Finance Division at Turlock City Hall, 156 S. Broadway, Suite 114. Additional information can be found on the City's website at http://ci.turlock.ca.us/doingbusinessinturlock/businesslicenses/newbusinesslicense.asp.

Full compensation for obtaining a business license as specified above shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed therefore.

#### END OF SPECIAL PROVISIONS

## **DIVISION 6**

## CIVIL TECHNICAL SPECIFICATIONS

Section	Title
Item M-005	Airport Safety and Security
Item M-102	Construction Staking and Layout
Item M-103	Contractor Quality Control
Item M-105	Removal of Miscellaneous Improvements
Item M-145	Excavation Cut-Off wall
Item M-150	Asphaltic Concrete Removal, Pavement Milling
Item M-215	Herbicide Application _
Item M-220	Herbicide Application _
Item P-151	Clearing and Grubbing
Item P-152	Excavation, Subgrade and Embankment
Item P-153	Controlled Low Strength Material (CLSM)
Item P-155	Lime Treated Subgrade
Item P-156	Temporary Air / Water Pollution, Soil Erosion and Siltation Control
Item P-208	Aggregate Base Course
Item P-403	Hot Mix Asphalt (HMA) Pavements
Item P-603	Bituminous Tack Coat
Item P-610	Structural Portland Cement Concrete
Item P-620	Runway and Taxiway Marking.
Item D-701	Pipe for Storm Drains and Culverts
Item D-705	Pipe Underdrains for Airports
Item D-751	Manholes, Inlets, Outlets and Other Drainage Structures
Item D-752	Miscellaneous Drainage Structures
Item T-910	Hydro Mulch

No: CO45886

OFCA

Expires 12/31/2018

#### ITEM M-005 AIRPORT SAFETY AND SECURITY

#### **005-1 DESCRIPTION**

**005-1.1 GENERAL**. The Contractor shall be required to carry out his operations in a manner that will cause a minimum of interference with air traffic, and shall be required to cooperate with the FAA, the Owner, the flight schools, and other Contractors working in the area. All work shall be completed in accordance with the Airport Construction and Phasing Plans, the FAA Advisory Circular 150/5370-2F or current series, the requirements of the City of Turlock, and any or all sections of these Contract Documents.

The Contractor shall be required to hold weekly airfield coordination meetings with Airport Operations. Additionally, the Contractor shall meet with Airport Operations prior to the start of each shift to discuss the day's anticipated work activities.

All vehicles shall have flashing yellow lights in accordance with the Supplementary Conditions. All vehicles shall be required to have the headlights and flashing yellow lights on at all times while on the airfield.

The Contractor shall be required to supply, place, maintain, move and store the items listed herein, **as appropriate**, to facilitate construction and protect air traffic. Keep on site an adequate extra supply of these items.

#### 005-2 MATERIALS

**005-2.1 RED WARNING LIGHTS.** Warning lights on barricades or hazard markers shall be steady burn or flashing red lights meeting the requirements of the AC 150/5370-2F.

**005-2.2 WARNING MARKERS.** Warning markers shall be the type and size detailed on the plans. Markers shall be equipped with red warning lights per paragraph 005-2.1.

#### 005-2.3 TEMPORARY RUNWAY/TAXIWAY CLOSED DEVICES. (Not Used)

**005-2.4 LOW AND MEDIUM LEVEL BARRIER SYSTEMS.** Low level barriers shall be eight (8) feet long, ten (10) inches high and ten (10) inches wide, and shall have reflective sheeting on both sides. The color shall be safety orange and white. The composition shall be high impact, UV resistant, high density polyethylene plastic. There shall be mounting brackets for 2 lights per barricade with an integrated flag mounting bracket per barricade. The barrier shall be capable of interlocking and shall be ballasted with water to prevent movement by jet blast. Each barricade section shall be equipped with red flashing solar lights. Barricades shall be in accordance with the requirements of AC 150/5370-2F.

**005-2.5 VACUUM SWEEPER.** Vacuum Sweeper shall be Tymco, Model HSP-600 or Elgin Model Crosswind, or approved equal.

**005-2.6 SAFETY AREA SUPPORT**. Reinforced structural steel plates, precast slabs or other approved material necessary to cover open excavation in the Runway Safety Area shall conform to Paragraph 005-5.1(1)I(i).

**005-2.7 SECURITY CHECK POINTS AND CONTROLLED CROSSINGS.** Provide as shown on the plans, as detailed within this specification, or as directed by the Engineer, all items necessary to control access to the Air Operations Area (AOA) and control crossings at active taxiways.

#### 005-3 RESPONSIBILITIES

**005-3.1 CONTROL REQUIREMENTS.** The Contractor's responsibilities for work areas within the airport security (perimeter) fence are as follows:

1) The Contractor shall be held responsible for controlling his employees, subcontractors, and their employees. The Contractor must maintain a sign-in sheet, kept on a daily basis, recording the names and company of all employees working on the job site. A copy shall be given to airport management each day or as requested.

Contractor and subcontractors provide to airport management a letter verifying ten-year background on their foreman who will be responsible for the job site. This letter needs only to verify employment/unemployment status.

The job foreman and sub-foreman will be responsible for escorting their employees while on the job site, assuring that no breeches of the airport security program occur. The construction area must be clearly spelled out on a diagram or map.

Job foreman shall be responsible for assuring that the construction site is secure from unlawful intrusions by unauthorized individuals at the end of each day by exercising security awareness and oversight and locking gates when used.

2) The Contractor shall rebuild, repair, restore, and make good at his own expense all injuries or damages to any portion of the work occasioned by his use of these facilities before completion and acceptance of his work.

3) The Contractor shall submit to the Engineer in writing a detailed work plan for each construction phase. The work plan shall include, but not be limited to, temporary electrical facilities, installation sequence of underground electrical and storm sewer systems, paving sequence, installation sequence of electrical items, maintenance of airfield electrical and NAVAID power and control circuits. This plan shall be submitted 10 calendar days prior to the start of each construction phase. No work within the construction phase may commence until the phase work plan is approved.

4) The Contractor shall submit to the Engineer in writing a plan, by construction phase, for controlling construction equipment and vehicular movements, including material haul roads, in the Air Operations Area (AOA). This plan shall be submitted at the Pre-Construction Meeting and prior to each construction phase. No work may commence until this plan is approved by Airport Operations.

5) Paved surfaces shall be kept clear at all times and specifically must be kept free from all debris which might damage aircraft (FOD – Foreign Object Debris).

6) The Contractor shall prepare a list of supervisory personnel intended for the work. The list shall be submitted prior to or at the Pre-Construction Meeting. The list shall be prepared on the Contractor's company letterhead and signed by the company representative who is authorized to sign.

7) The Contractor shall ensure that no personnel or equipment enters the active movement areas or their associated Object Free Areas without the appropriate Airport Operations escort, except at pre-approved crossing points approved by Airport Operations, per paragraph 005-3.2 and 3.8.

8) The Contractor will be required to coordinate his work to assure satisfy clearance requirements for arrival and departure of scheduled aircraft, and in compliance with FAA Advisory Circular 150/5370-2F concerning operational safety on airports during construction.

9) The Contractor shall notify the Engineer or Airport Operations in sufficient time prior to the end of each shift that will allow Operations personnel to inspect the work area for any safety problems that will require the Contractor to correct before they leave.

**005-3.2 VEHICLE AND PEDESTRIAN CONTROL.** Vehicle and access routes for airport construction shall be controlled as necessary to prevent inadvertent or unauthorized entry of persons, vehicles or animals onto air operation areas. No vehicle shall enter the AOA except at predetermined locations. The amount of construction traffic will require a flag person to control traffic crossing taxiways and other aircraft movement areas. Contractor personnel who operate vehicles in the AOA shall comply with the Airport Operations rules and regulations for vehicle marking, lighting, and operation. Failure to comply may result in contract noncompliance assessments, as listed in Table 1.

**005-3.3 CONTROL AND WARNING DEVICES.** During construction operations near active taxiways or runways the Contractor shall furnish and maintain medium and low level barricades equipped with red warning lights along the edges of the runway and taxiway safety areas to warn construction equipment to stay clear of the active airfield pavement as well as warn pilots of areas having construction hazards. The Contractor shall furnish and maintain warning markers with red warning lights along the edges of the runway safety area as designated and detailed on the plans. The Contractor shall maintain warning lights and red warning flags around all equipment, stockpiles, or other areas as directed by the Engineer and Airport Operations.

The Contractor shall provide the phone numbers of its responsible personnel, including the project superintendent, and each responsible personnel, from the electrical, paving and safety Contractor, each of whom may be contacted in an emergency. Personnel shall be on call 24 hours per day for maintaining construction hazard lighting and barricades. The Contractor shall employ watchmen to maintain and service all traffic control equipment. The project superintendent, foreman and on-site manager for the Contractor and all sub-Contractors shall have cell phones.

**005-3.4 VEHICLE MARKING AND IDENTIFICATION.** All permitted vehicles operating in the AOA shall display in full view above the vehicle a 3' x 3' or larger, orange and white checkerboard flag,

each checkerboard color being 1' square. Any vehicle operating on the AOA shall be equipped with a flashing amber (yellow) dome-type light, mounted on top of the vehicle and of such intensity to conform to local codes for maintenance and emergency vehicles. All vehicles operating within the airfield boundary which are approved for unescorted access shall be identified with a painted sign on each side of the vehicle bearing the Contractor's name conforming to the requirements below:



Rented or leased vehicles cannot be granted unescorted access unless the above signage is placed on it. All vehicles with unescorted access must have available for inspection, when entering the Restricted area or while in the Restricted area, the current registration and proof of insurance for the vehicle.

Vehicles making only occasional visits to the job site are exempt from the identification requirements contained above provided that the Airport Operations Manager is notified and a properly identified vehicle escorts them into, through, and out of the airport secured area. These and other vehicles needing intermittent identification may be marked with tape or with magnetically attached markers that are commercially available to meet identification size and content requirements.

**005-3.5 VEHICLE TRAFFIC AND OPERATIONS.** When any vehicle other than those approved for use in the AOA is required to travel to or from the work area or over any portion of the work area, shall be escorted by a vehicle properly identified to operate in the area and be provided with a flag on a staff attached to the vehicle. All construction vehicles/equipment shall have automatic signaling devices to sound an alarm when moving in reverse. All equipment shall be operated within the approved speed limits.

All vehicles and/or construction equipment operating inside the active AOA, but outside of the designated haul roads, shall be escorted by Airport Operations, who will maintain radio contact with the UNICOM. Crossing the active runway shall not be permitted. Vehicular traffic routes which must cross an active taxiway shall be coordinated in advance (at least 48 hours) with Airport Operations to ensure that proper Notice to Airmen (NOTAMs) are in place. These prearranged traffic routes must be controlled by flag persons as detailed on the plans. Aircraft *always* have the right-of-way. Construction equipment shall *always* yield to aircraft. Construction vehicle traffic shall *never* cross an active taxiway unless escorted by Airport Operations or at the pre-approved crossing points while crossing guards are stationed.

At such a pre-approved taxiway crossing point, the Contractor shall have a flag person stationed on each side of the crossing point to monitor aircraft movement and to direct construction traffic. The flag person shall be equipped with handheld signs or flags to assist in directing construction traffic. For nighttime construction operations, the flag person shall also be equipped with lighted wands and light plants on each side of the taxiway. In addition, one vacuum sweeper and one water truck shall be dedicated to and stationed full time at each active taxiway crossing to maintain the surface of the taxiway free from construction traffic debris. Mud and other material tracked onto taxiway surfaces shall be removed by hand if necessary to achieve its complete removal.

Prior to entering any work site within the AOA, the Contractor will physically meet with Airport Operations to brief each other on the intended activities. The Contractor must also arrange a physical inspection of the work area with Airport Operations prior to leaving any area that has been closed for work, or that has been used for a crossing point or haul route by the Contractor.

**005-3.6 VEHICLE PARKING.** All vehicles shall be parked and serviced in the designated staging and employee parking areas shown on the plans. The Contractor is responsible for transporting his/her employees from these areas to the jobsite.

**005-3.7 RADIO COMMUNICATIONS.** The control of vehicular activity on the AOA is of the highest importance. This requires coordination with airport users. The Contractor shall have no direct contact with aircraft. All communications with aircraft shall be coordinated through Airport Operations. However, the Contractor's supervisory personnel shall have an aviation radio available to monitor UNICOM frequency of 122.8. The Contractor shall properly train his/her personnel, particularly flag persons, on the proper procedures for monitoring radio frequencies.

**005-3.8 AIRPORT SECURITY REQUIREMENTS.** The airport is operated in strict compliance with Federal, state and local rules and regulations, which prohibits unauthorized persons or vehicles in the AOA. Equipment and personnel will be restricted to the work area defined on the plans. Any violations by Contractor's personnel will subject the Contractor to the contract noncompliance assessments imposed by the Aviation Department.

Airport restricted areas are fenced and must remain fenced at all times. The Contractor shall construct any required temporary security fences and/or gates according to specifications set by Airport Operations. Temporary fencing and gates must be approved by the Airport Operations before any of the regulated perimeter security fences may be altered. The gates will remain closed and locked, or if used continuously for ingress and egress, the Contractor will provide approved guards to monitor access to the property and be trained by Airport Operations. The Contractor shall provide the guard with a roster of his personnel and ensure that each individual has adequate identification. That individual shall be responsible for maintaining a log of the suppliers entering the AOA, company name, driver name, time in and out, and provide security information as to areas they are permitted to be in and the most direct route giving access to and from the job site. This information shall be kept by the job foreman and provided by airport management to FAA Security upon request. This information shall be retained until the job is completed. Contractor locks are not permitted on any airport gate. Gates will be staffed at all times during shift working hours and will be secured when there is no activity at that location. Any non-staffed gate found to be unlocked, will result in a contract noncompliance assessment (deduction) in accordance with Section 005-3.10 which will be deducted from the next month's construction progress estimate. The Contractor will be responsible for a 24-hour advance notification to Airport Operations regarding the scheduling of the use of the various security check point gates. There shall be a communication system for emergency responses, security breaches, accidents, etc.

Entrance to the airfield is subject to strict security regulations. All vehicles must meet minimum identification requirements and have proof of insurance on file with the Airport Operations.

The Contractor shall restrict passage into the Security Area to authorized persons, vehicles and equipment displaying his identification or that of the Airport. Should the Contractor wish to allow visitors, vendors or delivery through his access point, he shall provide an escort in accordance with escort procedures.

The Contractor shall be responsible to provide at his own cost an authorized escort with a Security Badge for all vehicles that do not operate on a daily basis within the AOA. Escorted vehicles shall not be left unattended. The escort shall remain with the escorted vehicle at all times while on the AOA and shall be escorted back and forth to the point of entry. There will be no exceptions to this requirement.

The Contractor is required to submit a plan on how he/she will safely operate within the AOA. This plan shall be submitted and approved by the Airport Operations before the commencement of any construction. The Contractor is required to prepare, submit for approval and maintain during construction a plan for managing Security Badges of his/her employees, sub-Contractors or any other party recommended by the Contractor for badging. This plan shall be submitted to Airport Operations prior to the Pre-Construction Meeting.

The Contractor will contact Airport Operations ten (10) days prior to start of construction to submit the necessary airport security information for all vehicles and personnel required inside the restricted area during construction.

**005-3.9 VIOLATION OF RESPONSIBILITIES.** Any violation of 005-3.1 - 005-3.8 shall be considered a violation of the Contract itself and shall be sufficient cause for halting the work without extending the time limit of the job.

**005-3.10 NOTICE OF VIOLATIONS.** Due to both the safety and security precautions necessary at Turlock Municipal Airport, failure of the Contractor to adhere to the prescribed requirements/regulations has consequences that may jeopardize the health, welfare and lives of the customers and employees at Turlock Municipal Airport, as well as the Contractor's own employees. Therefore, if the Contractor is found to be in non-compliance with the security, airfield

badging/licensing and airfield safety requirements by Airport Operations personnel, Turlock Municipal Airport will issue Notices of Violation (NOV). The Contractor may appeal the NOV, however appeals must be made in writing, and within four (4) calendar days of the offending incident, to the Airport Manager. The appeal would need to state, in sufficient detail, why the NOV/circumstances is unwarranted. A final and binding decision of the appeal will be made by the Airport Manager within ten (10) working days of receipt of the appeal. The Contractor will then be notified of this decision in writing. No further appeals to the specific NOV will be considered or accepted.

The City of Turlock has the option to issue warnings on the first offense if the incident justifies it. Individuals involved in a non-compliance violation may be required to surrender their security badge and be escorted off the AOA pending investigations of the matter and the outcome of the possible appeal. A Notice of Violation will result in a Non-conformance Contract Adjustment (Deduction) for security and badging non-conformance as follows:

First Offence	\$1,000.00
Second Offence	\$5,000.00
Each Additional Offence	\$15,000.00

Should any violation caused by the Contractor result in costs incurred by the City of Turlock, the City shall recover the total of those expenses from the Contractor. The costs will be determined by the Aviation Department and shall consist of the following:

- a. Labor hours of Airport personnel or consultants which were devoted to investigate and resolve the violation, including overhead and labor burden markups.
- b. Expenses for materials or equipment necessary to make the situation temporarily or permanently safe.
- c. Work by others, either contracts or services or by airlines, which were performed in order to rectify the situation.
- d. Monetary sanctions assessed by the FAA, TSA or others.

Incursions are a VERY serious violation and are defined as any entrance onto an active runway, taxiway, taxilane or apron that may or may not subject any aircraft or crash fire rescue vehicle to yield, stop or change direction to avoid the sudden entrance.

The Airport's Notice of Violation (NOV) program also applied to all security badge holders and the companies they work for. Airport NOVs can result in the suspension or revocation of a company's or individual's privilege to do work at the Airport. Responsibilities for security badge holders and their companies are communicated through the badge application process.

## **005-4 COORDINATION OF CONSTRUCTION ACTIVITIES**

**005-4.1 WORK SCHEDULING AND ACCOMPLISHMENT.** The Contractor shall contact the Engineer and Airport Operations each day before beginning work to coordinate the status and nature of

work to be done that day. Access to work sites within the AOA will require daily coordination with Airport Operations prior to gaining access. The Contractor shall also report to the Engineer at the end of each day to schedule the work he plans to do on the following day.

Violations of any coordination requirements shall be considered a violation of the Contract itself and shall be sufficient cause for halting the work without extending the time limit of the job.

## 005-5 SAFETY REQUIREMENTS

**005-5.1 GENERAL.** The Contractor shall meet the following requirements when working within the airport perimeter (security) fence. Before entering upon or crossing any runway or taxiway, the Contractor shall receive proper clearance from the Airport Operations. Emergencies and operating conditions may necessitate sudden changes, both in airport operations and in the operations of the Contractor. Aircraft operations shall always have priority over any and all of the Contractor's operations. Should runways or taxiways be required for the use of aircraft and should Airport Operations deem the Contractor to be too close to active runways or taxiways the Contractor shall suspend his operations, remove his personnel, plant, equipment, and materials to a safe distance and stand by until the runways and taxiways are no longer required for use by aircraft. There will be no compensation for delays or inefficiencies due to these changes.

The Contractor shall ensure that no personnel or equipment enters into the active aircraft movement areas or their associated Object Free Area without the appropriate Airport Operations escort. Throughout the duration of the job, any practice or situation that Airport Operations or the Engineer determines to be unsafe or a hindrance to regular airport operations shall be immediately rectified.

(1) The following publications contain definitions/descriptions of critical airport operating areas. The areas defined below pertain to airfield safety requirements and are referenced throughout the Contract Documents. Copies of Advisory Circulars may be found at the FAA website: <u>http://www.faa.gov/airports\_airtraffic/airports/resources/advisory\_circulars/</u>

and FARs can be found at: <u>http://www.faa.gov/regulations\_policies/faa\_regulations</u>.

- (a) Advisory Circular 150/58370-2F, "Operational Safety on Airports During Construction" Sets forth guidelines to assist airport operators in complying with the requirements of federally funded construction projects.
- (b) FAR Part 77, "Objects Affecting Navigable Airspace," Current Edition: Establishes standards for determining obstructions to navigable airspace. Civil airport imaginary surfaces are defined in the publication. It also sets forth requirements for notice of certain proposed construction or alteration. Notice of construction provides a basis for recommendations for identifying the construction or alteration in accordance with AC 70/7460-1, "Obstruction Marking and Lighting," Current Edition.

(c) AC 150/5300-13, "Airport Design" Current Edition: Establishes design, operational and maintenance standards for airports. Standard terms used in the contract plans and specifications are defined below:

(i) Runway Safety Area (RSA) - The defined surface surrounding the runway over which aircraft should, in dry weather, be able to cross at normal operating speeds without incurring significant damage. A safety area is graded, drained and compacted. It is free of any holes, trenches, humps or other significant surface variations or objects, other than those which must be there because of their essential aeronautical function. The safety area requires the capability of supporting maintenance, firefighting, and rescue vehicles under normal (dry) conditions.

# Prior to opening or re-opening a runway, the Runway Safety Area (RSA) must comply with the following:

1) The area(s) shall be able to support an aircraft at normal operating speeds without the aircraft incurring significant damage.

2) For the first 200 feet beyond the runway ends, the longitudinal grade of the RSA is between 0 and 3 percent, with any slope being downward from the runway ends. For the remainder of the RSA, the maximum allowable downward grade is 5 percent and the maximum allowable upward grade shall not penetrate the 20:1 approach surface from the end of the runway, as defined in FAR Part 77. However, limitations on longitudinal grade changes are plus or minus 2 percent per 100 feet.

3) For the RSA during construction (200 feet from runway centerline and up to 200 feet from the runway ends), the transverse grade from the edge of the runway pavement is 1.5 to 5 percent downward. For areas beyond 200 feet from the runway ends, the maximum allowable transverse grade shall be 5%, upward or downward. Transverse grade changes should be warped smoothly.

4) The maximum permissible drop-off at the edge of the runway, taxiway or apron pavement is 3 inches.

(ii) Object Free Area (OFA) - An area on the ground centered on a runway, taxiway, or taxilane centerline provided to enhance the safety of aircraft operations by having the area free of objects, except for objects that need to be located in the OFA for air navigations or aircraft ground maneuvering purposes.

(iii) Obstacle Free Zone (OFZ) – The OFZ is the airspace below 150 feet above the established airport elevation and along the runway and extended runway centerline that is required to be clear of all objects, except for frangible visual NAVAIDs that need to be located in the OFZ because of their function, in order to provide clearance protection for aircraft landing or taking off from the runway, and for missed approaches. The OFZ is subdivided as follows:

1) Runway OFZ. The airspace above a surface centered on the runway centerline.

2) Inner-approach OFZ. The airspace above a surface centered on the extended runway centerline. It applies to runways with an approach lighting system.

3) Inner-transitional OFZ. The airspace above the surfaces located on the outer edges of the runway OFZ and the inner-approach OFZ. It applies to runways with approach visibility minimums lower than <sup>3</sup>/<sub>4</sub>-statute mile.

(iv) Taxiway Safety Area (TSA) – A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway.

(2) The Contractor shall acquaint his supervisors and employees with the airport and operations that are inherent to Laughlin Bullhead International Airport and shall conduct his/her construction activities to conform to all routine and emergency air traffic requirements and guidelines for safety specified herein. The Contractor shall be responsible for providing all safety devices as required for the protection of his personnel.

(3) Protection of all persons shall be provided throughout the progress of the work. The work shall proceed in such a manner as to provide safe conditions for all workers and personnel. The sequence of operations shall be such that maximum protection is afforded to ensure that personnel and workers in the work area are not subject to any dangerous conditions. The Contractor must provide safety measures to guard against injury.

(4) During the performance of this contract, the airport facility shall remain in use to the maximum extent possible. Use of areas near the Contractor's work will be controlled to minimize disturbance to the Airport's operation. The Contractor shall not allow employees, subcontractors, suppliers, or any other unauthorized person to enter or remain in any airport area which would be hazardous to persons.

(5) All work to be performed which is too close to an active runway, taxiway or apron under operational conditions shall be performed when the runway, taxiway or apron is not in use. Such work shall not be accomplished without prior permission from Airport Operations. Requested closings shall be directed to the Airport Operations in writing at least 48 hours in advance so that the proper Notice-to-Airmen (NOTAM) may be issued. Only Airport Operations have the authority to open or close runways or taxiways.

(6) The Contractor shall be aware of the following types of safety problems and/or hazards. These problems or hazards shall not be permitted. Should any of these problems or hazards arise during construction, the Contractor shall immediately rectify/correct the problem or hazard to the satisfaction of the Engineer and Airport Operations Personnel:

(a) Trenches, holes, or excavations on or adjacent to any open runway or in safety areas.

(b) Unmarked/unlighted holes or excavation in any apron, open taxiway, open taxilane, or related safety area.

(c) Mounds or piles of earth, construction materials, temporary structures, or other objects in the vicinity of any open runway, taxiway, taxilane, or in a related safety, approach, or departure area.

(d) Vehicles or equipment (whether operating or idle) on any open runway, taxiway, taxilane, or in any related safety, approach, or departure area.

(e) Vehicles, equipment, excavations, stockpiles, or other materials which could degrade or otherwise interfere with electronic signals from radios or electronic navigational aids (NAVAIDS).

(f) Runway surfacing projects resulting in excessive lips greater than 1 inch for runways and exceeding 3 inches for edges between the old shoulder and new surfaces at runway edges and ends.

(g) Unmarked utility, NAVAID, weather service, runway lighting, or other power or signal cables that could be damaged during construction.

(h) Objects (whether or not marked or flagged) or activities anywhere on or in the vicinity of the airport which could be distracting, confusing, or alarming to pilots during aircraft operations.

(i) Unflagged/unlighted low visibility items (such as tall cranes, drills, and the like) anywhere in the vicinity of active runways, or in any approach or departure area.

(j) Misleading or malfunctioning obstruction lights or unlighted/unmarked obstructions in an approach to any open runway.

(k) Inadequate approach/departure surfaces needed to assure adequate landing/takeoff clearance over obstructions or work or storage areas.

(l) Inadequate, confusing or misleading (to user pilots) marking/lighting of runways, taxiways, or taxilanes, including displaced or relocated thresholds.

(m) Water, dirt, debris, or other transient accumulation which temporarily obscures pavement marking, pavement edges, or derogates visibility of runway/taxiway marking or lighting.

(n) Inadequate or improper methods of marking, barricading, and lighting of temporarily closed portions of AOA.

(o) Trash or other materials with foreign object damage (FOD) potential, whether on runways, taxiways, or aprons, or in related safety areas.

(p) Inadequate barricading or other marking which is placed to separate construction or maintenance areas form open aircraft operating areas.

(q) Failure to control vehicle and human access to open aircraft operating areas.

(r) Construction/maintenance activities or materials which could hamper the response of aircraft rescue and firefighting (ARFF) equipment from reaching all aircraft or any part of the runway/taxiway system, runway approach and departure areas, and aircraft parking locations.

(s) Bird attractants on airport, such as edibles (food scraps, etc.), miscellaneous trash, or ponded water.

(7) The Contractor shall conduct activities so as not to violate any safety standards contained herein. The Contractor shall inspect all construction and storage areas as often as necessary and promptly take all steps needed to prevent/remedy any unsafe or potentially unsafe conditions/activities discovered.

(8) Before actual commencement of construction activity, the Contractor shall notify Airport Operations and the Engineer in writing of his intentions to begin construction, stating the proposed time, date, and work area in order for the appropriate Notice-to-Airmen (NOTAM) to be issued. Only Airport Operations have the authority to open or close runways or taxiways and to issue NOTAMs. In order to properly communicate these closures Airport Operation must receive these requests 48 hours prior to the scheduled closure. Upon completion of work and return of all related areas to standard conditions, the Contractor shall again notify Airport Operations and the Engineer in writing, and describe the area that is complete and available for normal airport operations.

(9) Debris. Debris, waste and loose material or any other FOD (including dust and dirt) capable of causing damage to aircraft landing gear, propellers or being ingested in jet engines shall not be allowed on active aircraft movement areas or adjacent infield areas. Materials observed to be within these areas shall be removed immediately and/or continuously by the Contractor. The Contractor shall be required to have a sweeping machine and operator on site, ready at all times during construction activity. Where travel on or across runways, ramp areas, taxiways, or aircraft aprons is required, the Contractor shall provide adequate personnel and equipment to keep such surfaces clear of debris at the discretion of the Engineer. Closed pavements shall be swept clean prior to reopening to aircraft traffic. Exposed earth in excavation areas within 75 feet of the centerline immediately adjacent to active taxiways shall be covered to prevent dust from jet blast. Cover material shall be weighted to prevent movement from jet blast.

(10) Flag persons. In accordance with the specifications, the Contractor shall furnish, at his own expense, flag persons as necessary to control his traffic unless otherwise directed by the Engineer.

(11) Trenches, Excavations and Stockpiled Material. Open trenches or excavations exceeding 3" in depth and 3" in width or stockpiled material will not be permitted within the limits of restricted areas

of operational runways or taxiways. Covering for open trenches or excavations shall be of sufficient strength to support the weight of the heaviest aircraft operating on the runway or taxiway.

(12) Construction in Proximity to Active Runways and Taxiways.

Runway Sides: If appropriate construction/maintenance NOTAM has been issued, construction is permissible as close as 200 feet from the centerline of the active runway provided that all Airport Operations and FAA criteria are met. The 200 feet shall be clearly marked in the infield areas with approved barricades at 10-foot intervals. Runway Ends: No work will be permitted within 300 feet of the active runway threshold.

Taxiway Sides. If appropriate construction/maintenance NOTAM has been issued, construction is permissible as close as the dimensions shown on the Construction Restriction Plan provided that all Airport Contractor and FAA criteria are met. This dimension(s) shall be clearly marked in the infield areas using approved barricades at 10-foot intervals. Personnel and equipment working within taxiway Object Free Areas (OFA) must at all times be able to give way to taxiing aircraft.

(13) Equipment Height Restrictions.

Maximum permissible equipment height varies by location and by construction phase. Maximum equipment height requirements are shown on the Construction Safety Phasing Plan (CSPP) and shall not be exceeded unless prior approval is obtained from the Engineer. Atop all equipment booms shall be mounted the white and orange checkered flag described in Paragraph 005-3.4. The top ten feet (10') of these booms shall be painted fluorescent orange and they shall be equipped with a red obstruction light. Any crane erections shall be coordinated with Airport Contractor and the Engineer during every shift.

(14) Miscellaneous.

(a) Open flame, welding or torch cutting Contractor are prohibited unless adequate fire and safety precautions have been taken and the procedure has been approved by the Engineer.

(b) All materials and equipment when not in use shall be placed in approved areas where they will not constitute a hazard to aircraft Contractor and not penetrate clearance height restrictions as shown on the Construction Restriction Plan(s). All equipment shall be parked in the appropriate area(s) when not in use.

(c) The Contractor shall provide Airport Operations with a current list of all employees working on the airport. The list shall be maintained current by the Contractor and subcontractors.

(d) For emergencies involving life safety (injuries, fires, security breaches, etc.), the Contractor shall immediately call the office of the airport director at (928) 754-2134 and as soon as possible notify the Engineer.
**005-5.2 CLOSED RUNWAY AND TAXIWAY MARKING AND LIGHTING.** Closed runway and taxiway markings shall be as shown on the plans. Closed runway and taxiway marking and lighting materials shall be approved for use by the Engineer prior to placement. Construction activities shall not begin until the layout of such marking and lighting has been approved by the Engineer.

**005-5.3 HAZARD MARKING.** Hazard-marking barricades, flashers, etc. should be used: to identify and define the limits of construction making them visible to aircraft, personnel, or vehicles; to identify hazards such as open manholes, small areas under repair, stockpiled material, waste areas, etc.; to prevent aircraft from taxiing onto a closed runway for takeoff; and to identify FAA, airport, and National Weather Service facilities, cables, power lines, instrument landing system (ILS) critical areas, and other sensitive areas to prevent damage, interference, and facility shutdown. Traffic Cones shall not be used at any time on the Air Operations Area. Hazardous areas, in which no part of an aircraft may enter, should be indicated by the use of barricades marked with diagonal, alternating orange and white reflective stripes. During reduced visibility or night hours, the barricades should be supplemented with flashing red lights. The intensity of the lights and spacing for barricades, flags, and lights should be adequate to delineate the hazardous area without ambiguity. The Contractor shall have a designated person on call 24 hours a day for emergency maintenance of airport hazard lighting and barricades.

**005-5.4 CONSTRUCTION AREA MARKING AND LIGHTING.** Low profile barriers, and warning flags shall be provided and erected by the Contractor as shown on the plans or as directed by the Engineer. All construction areas, including closed runways and taxiways, should be clearly and visibly separated from active air operation areas. Hazard areas, facilities, cables, and power lines should also be clearly identified by the Contractor. The Contractor is responsible for maintaining the condition and visibility of all markers identifying above-mentioned areas and that marking and lighting aids remain in place. Appropriate barriers, lights and signs should be used as necessary to clearly separate all construction/maintenance areas from other parts of the AOA. All barricades, temporary markers, flag lines supports, and other objects placed and left in safety areas on any open runway, taxiway, or taxilane should be: as low as possible to the ground; of low mass; easily collapsible upon contact with an aircraft or any of its components; weighted down or sturdily attached to the surface to prevent displacement from prop wash, jet blast, wing vortex, or other surface wind currents; and if affixed to the surface, frangible at ground level.

**005-5.5 CONSTRUCTION NEAR NAVIGATIONAL AIDS.** Construction materials and equipment shall not be placed or parked where they may interfere with the line-of-sight of the ATCT and navigational aids in operation. The Engineer shall determine if any materials or equipment will cause any type of interference.

**005-5.6 CONSTRUCTION SITE ACCESS AND HAUL ROADS.** The Contractor will not be permitted to use any access or haul roads other than those designated on the contract drawings. The Contractor should submit specific proposed ingress and egress routes associated with specific construction activities to the Engineer for evaluation and approval prior to commencing construction activities. Aircraft Rescue and Firefighting (ARFF) right-of-way on access roads, haul roads, taxiways, and runways shall not be impeded at any time.

**005-5.7 TRENCHES AND EXCAVATIONS.** Gaps or holes between paving lanes, open trenches or excavations are not permitted within an operational runway safety area. Coverings for open trenches or excavations such as reinforced structural steel plates, precast slabs or other methods should be of sufficient strength to meet the requirements of the RSA found in Paragraph 005-5.1(1)(c). Open trenches and excavations at the construction site outside of the RSA should be prominently marked with red or orange flags, as approved by the Engineer, and lighted with yellow light units during hours of restricted visibility or darkness.

Excavations and open trenches may be permitted up to the edge of structural taxiways provided the drop-off is adequately signed, marked, and lighted and the appropriate NOTAM is issued.

# 005-5.8 CONSTRUCTION MATERIALS STOCKPILING AND EQUIPMENT STORAGE.

There shall not be any equipment storage in the active runway and active taxiway safety areas or in the infield areas. The Contractor shall remove the concrete paver and other equipment from the active runway and Taxiway Object Free Areas (OFA) including the infields (staging on apron areas will be allowed with prior approval of the Engineer) prior to re-opening the runway or taxiway each day. Stockpiled material or equipment should not be stored near aircraft turning areas or operational movement areas, aprons, or excavations and trenches. Stockpiled materials shall not be stored near NAVAIDs, visual or approach aids, nor shall they obstruct the ATCT's line of sight to any runway or taxiway. The Contractor shall ensure that stockpiled construction materials and equipment do not cause degraded or hazardous conditions to airport Contractor safety. This includes determining and verifying that stockpiled materials and equipment are stored or parked at an approved location, that they are properly stowed to prevent foreign object debris (FOD), attraction by wildlife, or obstruction of the AOA either by their proximity to NAVAIDs or to aircraft movement areas.

**005-5.9 OTHER LIMITATIONS ON CONSTRUCTION.** Open flame welding or torch cutting Contractor are prohibited unless adequate fire and safety precautions are provided and have been approved for use by the Engineer. Under no circumstances should flare pots be used near aircraft turning areas.

**005-5.10 FOREIGN OBJECT DEBRIS (FOD) MANAGEMENT.** Waste and loose materials will not be left or placed on or near active aircraft movement areas. Materials tracked onto these areas shall be continuously removed during the construction project. Waste or loose materials which would attract wildlife shall be carefully controlled and removed on a continuous basis. End of day operations should have all equipment, hand tools, materials, and operational necessities stowed away, safe and secured in accordance with the plan.

## 005-6 METHOD OF MEASUREMENT

**005-6.1** All items specified in this section will be measured as one lump sum.

## 005-7 BASIS OF PAYMENT

**005-7.1** Airport safety and security shall be paid for at the contract lump sum price in a proportionate manner, on the basis of current estimates. This price shall constitute full compensation for furnishing

material and equipment, including but not limited to flagpersons, temporary gates, warning markers, lighted runway closure markers, temporary drainage items, low level barriers, other traffic control devices and necessary equipment, safety area support material, and other material and equipment list herein, and the maintenance thereof and all other labor, materials, equipment, tools and incidentals necessary to accomplish this item.

Payment will be made under:

Item M-005-7.1 Airport Safety and Security – per lump sum

#### **ITEM M-102 CONSTRUCTION STAKING AND LAYOUT**

#### **102-1 DESCRIPTION**

**102-1.1** This item of work includes all layout and staking required to successfully construct the entire project consistent with General Provisions, Section 50-06, Special Provisions and Technical Specifications during the full term of the project.

The Contractor is responsible to provide all layout and staking as indicated in the Technical Specifications for each item, as well as any other layout and staking not specifically listed, but necessary to control the work. The Contractor shall provide both electronic and hard copies of the surveys to the Engineer in such format as determined by the Engineer. These submittals shall be made on a timely basis. These submittals shall be made by a State of California Licensed Land Surveyor.

The Contractor shall submit his plan for staking and layout as required in the General Provisions, Section 50-06, for review and approval to the Engineer at least five (5) calendar days prior to the preconstruction meeting.

## **102-2 METHOD OF MEASUREMENT**

**102-2.1** Contractor Construction and Staking and Layout will be measured for payment by the lump sum as a single complete unit of work.

#### **102-3 BASIS OF PAYMENT**

**102-3.1** Contractor Construction Staking and Layout shall be paid for as a lump sum item.

Payment will be made under:

Item M-102-3.1 Contractor Construction Staking and Layout – per lump sum

## ITEM M-103 CONTRACTOR QUALITY CONTROL

## **103-1 DESCRIPTION**

**103-1.1** This item covers all work associated with, establishing, providing and maintaining a Contractor Quality Control Program consistent with General Provisions, Section 100 and the Technical and Special Provisions specifications during the full term of the project. This item shall also include all work necessary to prepare and maintain the Critical Path Construction Schedule required by the Special Provisions.

The Contractor shall be responsible to conduct all Quality Control Testing as indicated in the Technical Specifications for each item, as well as any other test not specifically listed, but necessary to control the Work. The Engineer's Quality Assurance test results will be made available to the Contractor as additional information. The Contractor shall not rely on the Engineer's Quality Assurance Testing as part of the Contractor's Quality Control Program.

The Contractor shall submit his plan for Quality Control Testing as required in General Provisions, Section 100, for review and approval to the Engineer at least five (5) calendar days prior to the preconstruction meeting.

## **103-2 METHOD OF MEASUREMENT.**

**103-2.1** Contractor Quality Control will be measured for payment by the lump sum as a single complete unit of work.

#### **103-3 BASIS OF PAYMENT**

**103-3.1** Contractor Quality Control shall be paid for as a lump sum item.

Payment will be made under:

Item M-103-3.1 Contractor Quality Control – per lump sum.

# ITEM M-105 REMOVAL OF MISCELLANEOUS IMPROVEMENTS

# **105-1 Description**

**104-1.1** The work under this section shall consist of the removal, wholly or in part, and satisfactory disposal of all structures and obstructions within the project limits which have not been designated on the project plans or specified in the special provisions to remain, except for those structures and obstructions which are to be removed and disposed of under other items of work in the contract. The work shall also include salvaging of designated materials where required and backfilling the resulting cavities.

Existing structures, pavement, and other existing improvements which are to become an integral part of the planned improvements shall remain even though not specifically noted.

Materials removed and not designated to be salvaged or incorporated into the work shall become the property of the contractor.

## **105-2 Construction Requirements**

**105-2.1 General.** Culverts and other structures in use by traffic shall not be removed until satisfactory arrangements have been made to accommodate the traffic.

Operations necessary for the removal of an existing structure or obstruction, which may damage new construction, shall be completed prior to commencing the new work.

Items designated to be salvaged shall be carefully stockpiled or stored by the Contractor at locations designated in the special provisions or as directed by the Engineer.

Items which are to be salvaged or reused in the new construction and are damaged or destroyed as a result of the Contractor's operations shall be repaired or replaced by the Contractor at his expense.

Holes, cavities, tranches and depressions resulting from the removal of structures or obstructions, except in areas to be excavated, shall be backfilled with suitable materials which shall be compacted to a density of not less than 95 percent of the maximum density as determined in accordance with the requirements of ASTM D-698 for areas that will not be under pavement, and 100 percent of ASTM D-698 for areas that will be under pavement.

**105-2.2 Removal Of Pipe.** All pipe which has been designated for removal on the plans shall not be re-used in the work. All existing pipe shall become the property of the Contractor and removed from the site.

Existing pipe to be partially removed shall be cut with straight and smooth edges on a plan perpendicular to the center line of the pipe.

**105-2.3 Pavement Cutting.** Existing pavement to be removed shall be saw cut by a device capable of making a neat, straight and smooth cut without damaging adjacent pavement that is not to be removed. The Engineer's decision as to the acceptability of the cutting device and manner of operation will be final.

**105-2.4 Pavement Matching.** Existing pavements which are to be matched, shall be trimmed to a neat true line with straight vertical edges free from irregularities with equipment specifically designed for this purpose. The existing pavement shall be cut and trimmed after placement of required aggregate

base course and just prior to placement of the asphalt pavement. The trimmed edges shall be painted with a light coating of asphalt cement or emulsified asphalt immediately prior to placing the new asphalt pavement. No extra payment will be provided for these items and all costs incurred in performing this work shall be incidental to those items for which direct payment is made.

**105-2.5 Removal Of Bituminous Pavements.** Unless otherwise specified. removals of bituminous pavements as shown on the plans shall be accomplished by a method approved by the Engineer. The contractor shall submit a demolition plan for approval prior to the start of construction. If the removal of bituminous pavements is to be accomplished by milling, the contractor shall haul, spread and compact the millings at the locations shown on the plans. If removal of bituminous materials is to be accomplished by other means, the contractor shall remove the pavement from airport property and dispose of it offsite in accordance with the local laws and regulations.

**105-2.6 Miscellaneous Removals.** Miscellaneous removals to include but not limited to direct buried or concrete encased electrical ducts, abandoned cables, electrical handholes, junction boxes, sign bases, concrete pads, edge lights, wind cones or wind tees, fencing or other items designated for removal on the plans shall be accomplished as indicated on the plans or as specified in other sections. All removed materials shall become property of the Contractor and be disposed of off-site.

# **105-3 METHOD OF MEASUREMENT**

Removal of miscellaneous improvements will be measured by the lump sum.

# **105-4 BASIS OF PAYMENT**

**105-4.1** Payment for removal of miscellaneous improvements will be made by the lump sum, which price shall include all excavation and subsequent backfill incidental to the removals, compaction of subgrade or base materials resulting from the work and the salvaging, hauling, storing and disposing of all materials as provided herein.

Payment will be made under:

Item M-105-4.1 Removal of Miscellaneous Improvements - per lump sum

## **ITEM M-145 EXCAVATION CUT-OFF WALL**

# DESCRIPTION

**145-1.1** This section shall consist of the construction of an excavation cut-off wall in accordance with these specifications and in reasonably close conformity with the lines and grades shown on the plans.

# MATERIALS

**145-2.1 CONTROLLED LOW STRENGTH MATERIAL (CLSM**). Controlled low strength material shall conform to the requirements of Section P-153.

## **CONSTRUCTION METHODS**

**145-3.1 EXCAVATION.** The Contractor shall excavate a longitudinal trench at the location, and of such width and depth as detailed on the plans. A full depth saw-cut in accordance with Section P-104 shall be made on the side adjacent to the asphalt pavement which will remain in-place. The trench shall be carefully excavated without damage to the existing base and pavement on the side to remain in place. Trench walls shall be vertical.

**145-3.2 BACKFILLING.** The trench shall be backfilled as close as possible behind the excavation. Material for backfill shall meet the requirements of Section P-153. The completed trench shall be allowed to cure for a minimum of 48 hours prior to any grading work (this requirement does not include milling of the asphalt pavement to be removed). There shall be no separate payment for CLSM backfill, but shall be considered subsidiary to payment for the work item.

## METHOD OF MEASUREMENT

**145-4.1** The trench shall be measured in linear feet in place, completed, and approved. It shall be measured along the centerline of the trench.

# **BASIS OF PAYMENT**

**145-5.1** Payment will be made at the contract unit price per lineal foot of trench. These prices shall fully compensate the Contractor for furnishing all materials and for all preparation, excavation, spoil removal and backfilling, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item 145-5.1 Excavation Cut-Off Wall - per lineal foot

## END ITEM P-145

# ITEM M-150 ASPHALTIC CONCRETE REMOVAL, PAVEMENT MILLING AND DUST PALLIATIVE

## **150-1 DESCRIPTION**

**150-1.1** This item shall consist of saw cutting and the removal of asphaltic concrete pavement by use of milling equipment as shown on the plans, and shall include the placing, compacting, and the application of a stabilizing agent of the milled/recycled material at locations as shown on the plans or as directed by the Engineer. The surface of pavement after milling shall be uniformly grooved. The grade shall not deviate from a 16-foot straight edge by more the 3/8 inch measured parallel or perpendicular to the taxiway centerline.

## **150-2 CONSTRUCTION METHODS**

**150-2.1 PAVEMENT REMOVAL.** Existing runway and taxiway pavement to be removed shall be cut by a device capable of making a neat, straight and smooth cut without damaging adjacent pavement that is not to be removed. The Engineer's decision as to the acceptability of the cutting device and manner of operation shall be final.

**150-2.2 PAVEMENT MATCHING.** Existing runway and connecting taxiway pavements that are to be matched by shall be saw cut to a neat true line with straight vertical edges free from irregularities without damaging adjacent pavement that is not to be removed. The pavement cut locations shall be as shown on the plans.

**150-2.3 MILLING OF EXISTING PAVEMENT.** This work shall consist of removal of asphaltic concrete pavement by milling in accordance with these specifications and in conformity with the lines, grades and typical sections as shown on the plans or as designated by the Engineer.

The milling equipment for removing the pavement shall be a commercially designated and manufactured machine capable of performing the work in a manner satisfactory to the Engineer. The machine shall be power-operated and self-propelled, and shall have sufficient power, traction and stability to remove a thickness of bituminous surface to a specified depth and provide a uniform profile and cross slope. The machine shall be capable of accurately and automatically establishing profile grades within  $\frac{1}{2}$  inch along each edge of the machine by referencing from the existing pavement by means of a laser with two-directional control (longitudinal and transverse slopes). The machine shall have an automatic system for controlling grade and cross slope. The machine shall be equipped with a means to effectively control dust generated by the milling operation. The material shall be milled/recycled to maximum size of  $1\frac{1}{2}$ -inch. The surface resulting from the milling operation shall be in accordance with the plan grades, and shall be characterized by uniform, continuous longitudinal striations or other uniform patterns and shall be gouged on torn.

The Contractor is responsible for locating all milling hazards on and below the surface within the areas to be milled including areas requiring special milling. Special milling is not a separate pay item and shall be paid for as Asphalt Milling.

The milling cut depth shall be the depth indicated on the plans plus or minus 1/8 inch. The milling

machine shall have electronic grade control. The Contractor shall remove the milled material and sweep the area clean with a power pick-up broom to the satisfaction of the Engineer.

Asphalt pavement adjacent to manholes, valve boxes and other fixed objects that produce confined area shall be removed with milling equipment specifically designed to operate in constricted areas. The equipment shall be capable of removing asphalt concrete or cement treated base of the specified thickness without damage to, or displacement of the adjacent objects.

The Contractor shall be responsible for continually checking the milling operation to determine that the proper depth on milling has been achieved, that the proper profile and cross slope are achieved, and that the surface texture is (a) free from longitudinal ridges, and (b) has a uniform pattern.

The Contractor shall immediately notify the Engineer when the existing pavement thickness is found to be less than anticipated and breaking of the underlying material occurs.

The work shall result in a complete removal of the asphalt concrete surface course milled/pulverized to within the specified maximum particle size and to the specified depth for the area indicated by the plans including the areas immediately around and next to any individual hazard within the area to be milled. The edge of the milled area shall form a straight clean cut line.

**150-2.4 DEPOSITING MILLINGS**. The milled material shall be hauled to the areas as shown on the plans or directed by the Engineer. It shall be spread to a uniform loose depth so that when compacted, the layer will have a uniform thickness of three (3) inches over the designated areas as shown on the plans. Spreading shall be accomplished with motor graders or other approved means. All recycled materials shall be less the maximum particle size prior to compaction

**150-2.5 COMPACTION OF MILLINGS.** After depositing and spreading the recycled material within the areas adjacent to the runway and taxiway shoulders, the milled material shall be rolled with pneumatic tired rollers. The rollers shall have 100 psi per tire with a minimum of four thousand (4,000) pounds per tire. Rolling shall continue until a minimum of two coverages are made over the entire area. A coverage shall be considered as one pass of the roller in each direction. The finish surface of the compacted layer shall match the grade and slope of the existing taxiway pavement intended for overlay.

**150-2.6 APPLICATION OF DUST PALLIATIVE.** After spreading and compacting the milled material at the locations as shown on the plans, the material shall be blended with the Dust Palliative/Stabilizer to the satisfaction of the Engineer prior to rolling. See 150-2.6.15 for application rate.

**150-2.6.1** This item shall consist of the application of a commercial product that will provide a dust reduction and soil stabilization to the area specified within the project limits or as directed by the Project Manager or Engineer.

150-2.6.2 Dust palliative material shall be an acrylic polymer type as described below.

150-2.6.3 Product applied shall be Soil~Sement, Manufactured by Midwest Industrial Supply, Inc., Canton, Ohio or Approved Equal. Products shall be acrylic polymer types acrylic; acrylate, and acetate liquid polymers characterized by the following:

1.	Specific Gravity, 258C	1.0 - 1.15
2.	Active Solids Content	Min. 4096
3.	рН	4.0 - 9.5
4.	Odor Intensity	Slight
5.	Solubility in Water	Dilutable
6.	Brookfield Viscosity, 258C, cps	Max. 1500

**150-2.6.4** The emulsion shall be stable, i.e., shall not break when stored in clean closed containers at ordinary temperatures, excluding freezing or boiling, for a minimum of 3 months. It shall be miscible with water in all proportions. The sequestering agents shall make the preparation stable against hard water, thus permitting dilution of the emulsion with almost all types of water. The emulsion shall be non-corrosive to metal containers. The material shall penetrate into the soil surface and not form a skin at the surface.

**150-2.6.5** Environmental Criteria: Products shall not contain or emit chlorinated fluorocarbons (CFSs, Freons) or volatile organic compounds (VOCs).

HMIS rating shall be equal to or less than for each category: H=1; F=l; R=1; PPE=X.

150-2.6.6 Contractor shall provide a copy of the current Material Safety Data Sheet (MSDS) for each product proposed for use. The MSDS must include all chemical compounds present in concentrations greater than 0.1 %.

**150-2.6.7** Contractor shall provide certification that storm water runoff from treated will not contain concentrations that exceed water quality benchmark values of the parameters designated in Table 1 below (Source: Table 5 of the National Pollutant Discharge Elimination System Storm Water Multi-Sector General Permit for Industrial Activities or the Arizona surface water quality standards as defined in the Arizona Administrative Code, Title 18, Chapter 11). This certification can be documented by *all* of the following methods:

- 1. Conduct aquatic toxicity testing and provide full test data results.
- 2. Provide complete and accurate listing of chemical constituents (by percentage and quantity) that make up the product. This must include all proprietary chemical information.

Parameter Name	Benchmark	Level	Source
Biochemical Oxygen Demand (5)	30.0	mg/L	4
Chemical Oxygen Demand	120.0	mg/L	5
Total Suspended Solids	100.0	mg/L	7
Oil and Grease	15.0	mg/L	8
Nitrate + Nitrite Nitrogen	0.68	mg/L	7
Total Phosphorous	2.0	mg/L	6
рН	6.0 - 9.0	s.u.	4
Acrylonitrile (c)	7.55	mg/L	2
Aluminum, Total (pH 6.5-9)	0.75	mg/L	1
· · · ·		C	185

TABLE 1 — Parameter Benchmark Values

Parameter Name	Benchmark	Level	Source
Ammonia	19.0	mg/L	1
Arsenic, Total (c)	0.16854	mg/L	9
Benzene	0.01	mg/L	10
Beryllium, Total (c)	0.13	mg/L	2
Butyibenzyl Phthalate	3.0	mg/L	3
Cadmium Total (H)	0.0159	mg/L	9
Chloride	860.0	mg/L	1
Copper, total (H)	0.0636	mg/L	9
Dimethyl Phthalate	1.0	mg/L	11
Ethylbenzene	3.1	mg/L	3
Fluoranthene	0.42	mg/L	3
Fluoride	1.8	mg/L	6
Iron, Total	1.0	mg/L	12
Lead, Total (H)	0.0816	mg/L	1
Manganese	1.0	mg/L	13
Mercury, Total	10.0024	mg/L	1
Nickel, Total (H)	1.417	mg/L	1
PCB-1016 (c)	0.000127	mg/L	9
РСВ-1221 (с)	0.010	mg/L	10
PCB-1232 (c)	0.000318	mg/L	9
PCB-1242 (c)	0.00020	mg/L	10
PCB-1248 (c)	0.002544	mg/L	9
PCB-1254 (c)	0.10	mg/L	10
PCB-1260 (c)	0.000477	mg/L	9
Phenols, Total	1.0	mg/L	11
Pyrene (PAH, c)	0.01	mg/L	10
Sadznium, Total (*)	0.02385	mg/L	9
Silver, Total (H)	0.0318	mg/L	9
Toluene	10.0	mg/L	3
Trichloroethylene	0.0027	mg/L	3
Zinc, total (H)	0.065	mg/L	1

Sources:

- 1. "EPA Recommended Ambient Water Quality Criteria." Acute Aquatic Life Freshwater.
- 2. "EPA Recommended Ambient Water Quality Criteria." LOEL Acute Freshwater.
- 3. "EPA Recommended Ambient Water Quality Criteria." Human Health Criteria for Consumption of Water and Organisms.
- 4. Secondary Treatment Regulations (40 CFR 133).
- 5. Factor of 4 times BOD5 concentration North Carolina benchmark.
- 6. North Carolina storm water benchmark derived from NC Water Quality Standards.
- 7. National Urban Runoff Program (NURP) median concentration.

- 8. Median concentration of Storm Water Effluent Limitations Guideline (40 CFR Part 419).
- 9. Minimum Level (ML) based upon highest Method Detection Limit (MDL) times a factor of 3.18.
- 10. Laboratory derived Minimum Level (ML).
- 11. Discharge limitations and compliance data.
- 12. "EPA Recommended Ambient Water Quality Criteria." Chronic Aquatic Life Freshwater. Colorado Chronic Aquatic Life Freshwater -Water Quality Criteria.

#### Notes:

(\*) Limit established for oil and gas exploration and production facilities only. (c) carcinogen, (H) hardness dependent.

(PAH) Polynuclear Aromatic Hydrocarbon.

Assumptions: Receiving water temperature - 20 C. Receiving water hardness - CaCO3 100 mg/L. Receiving water salinity - 20 g/kg. Acute to Chronic Ratio (ACR) - 10.

**150-2.6.8** Dust palliative/stabilizers and their degradation products shall not be composed of any element, compound, mixture, or produce runoff with the characteristics identified under 36-2822 of the Arizona Hazardous Waste Management Act, emit or off gas during placement, use, or degradation of any hazardous chemical substance or mixture pursuant to Section 7 of the Federal Toxic Substances Control Act [15 U.S.C. §2606], be designated by rule an extremely hazardous chemical substance pursuant to the Arizona Environmental Quality Act, be prohibited for use by the Arizona Department of Environmental Quality, the Environmental Protection Agency, or any applicable law, rule or regulation.

**150-2.6.9** Dust palliatives/stabilizers, or their components and degradation products shall not be substances or composed of substances known to be, or reasonably anticipated to be, carcinogenic by the U.S. Department of Health and Human Services.

**150-2.6.10** Manufacturer shall provide independent verification and certification of performance and environmental claims by a recognized agency of the United States or Canadian Environmental Technology Verification programs for chemical dust suppressants. Failure to provide adequate proof of conformance to the criteria shall be considered grounds for rejection.

Application of the dust palliative/stabilizers in accordance with these specifications shall provide a stabilized surface, as defined herein and in accordance with the test methods provided for a minimum period from substantial completion of twelve (12) months; the warranty period.

**150-2.6.11** Weather Limitations: The surface temperature shall be 35<sup>o</sup> F and rising before any application and shall not be applied before, during or after a rainfall.

**150-2.6.12** Preparation of Surface: Moisten the existing surface and shape the designated area to the required grade, provide positive drainage.

150-2.5.13 Equipment: All equipment for the work shall be approved by the Engineer. The dust palliative shall be applied using a distribution vehicle equipped with computerized controls and

calibrated to ensure a controlled application method. The record of maintenance and calibration shall be submitted to the Engineer for review upon request.

**150-2.6.14** The Dust Palliative/Stabilizer, Soil~Sement®, (or Approved Equal) will be diluted at 6:1 (6 parts water to 1 part Soil~Sement® concentrate) for the 3"depth blended application. The Mixture of water and Soil~Sement® shall be applied at a concentrated rate of 0.36 gallons per square yard as recommended by the manufacturer.

**150-2.7** Final Rolling. After the stabilizing agent has been applied, the area shall be rolled for two additional coverages.

# **150-3 METHOD OF MEASUREMENT**

**150-3.1** Measurement for removal of pavement removal by milling will be by the square yard for the depth specified, measured in place. Measurement shall be made along the finish surface of the pavement to the nearest tenth of a foot and shall be computed to the nearest square yard.

**150-3.2** Measurement for depositing millings for stabilized shoulders will be by the square yard for the depth specified, measured in place. Measurement shall be made along the finished surface of the placement area to the nearest tenth of a foot and shall be computed to the nearest square yard.

**150-3.3** Measurement for the dust palliative/stabilizer will be by the square yard for the depth specified, measured in place. Measure shall be made along the finished surface to the nearest tenth of a foot and shall be computed to the nearest square yard.

# **150-4 BASIS OF PAYMENT**

**150-4.1 PAYMENT.** The accepted quantity of pavement removal by milling will be paid for at the contract unit price per square yard, which price shall be full compensation for removing the material in accordance with the contract. The accepted quantity of deposited millings will be paid for at the contract unit price per square yard, which will be full compensation for hauling, preparing the subgrade, placing and/or blending and compacting the material in accordance with the contract. The accepted quantity of dust palliative/stabilizer will be paid for at the contract unit price per square yard that will be full compensation for applying the material in accordance with the contract. These prices shall be full compensation for applying the material in accordance with the contract. These prices shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the item

Payment will be made under:

Item M-150-4.1	Asphaltic Concrete Removal by milling (+/-3" depth) - per square yard
Item M-150-4.2	Place, Blend and Compact Millings at Runway Shoulders - per square yard
Item M-150-4.3	Apply Dust Palliative/Stabilizer Compacted Millings - per square yard

## **ITEM M-215 - HERBICIDE APPLICATION**

## 215-1 DESCRIPTION

**215-1.1 DESCRIPTION.** This item shall consist of the furnishing and the application of postemergence and pre-emergence herbicide to the completed runway and taxiway shoulder subgrade and other such areas as directed by the Engineer.

## 215-2 MATERIAL

**215-2.1 MATERIAL.** The post-emergence herbicide furnished by the Contractor shall be Roundup or an approved equal (systemic herbicide). The pre-emergence herbicide furnished by the Contactor shall be Diuron 4L to be applied per manufacturers recommendations.

Both herbicides shall be applied at the maximum application rate recommended by the manufacturer.

## **215-3 APPLICATION**

#### 215-3.1 APPLICATION.

After all grading operations are completed at the specified density and moisture content and accepted by the Engineer, a pre-emergence herbicide will be applied to the newly completed subgrade or base course as shown on the plans in accordance with the licensed applicator's recommendations.

All herbicide application and handling shall be as recommended by the manufacturer and in accordance with the manufacturer's safety guidelines.

#### 215-4 METHOD OF MEASUREMENT

- **215-4.1** The pre-emergent herbicide application will be measured by the square yard.
- **215-4.2** The post-emergent herbicide application will be measured by the linear foot to the areas to be cracked as approved by the Engineer.

#### 215-5 BASIS OF PAYMENT

**215-5.1** Payment for the application of pre-emergence herbicide for base course preparation shall be made at the contract unit price per square yard. This price shall be full compensation for furnishing all separate applications, materials, and for all labor, equipment, tools and incidentals necessary to complete this item.

Payment will be made under:

Item M-215-5.1 Pre-emergent Herbicide Application – per square yard

## **ITEM M-220 RIPRAP CONSTRUCTION**

## DESCRIPTION

**220-1.1** Riprap construction shall consist of furnishing and placing stone underlain with a filter material of erosion control geosynthetic fabric. The depth and type of riprap shall be as shown on the plans.

## MATERIALS

**220-2.1** Stone shall be angular, sound, durable, hard, resistant to abrasion, free from laminations, weak cleavages, and undesirable weathering, leaching, exfoliation tendencies, and slaking, and of such character that it will not disintegrate from the action of air, water, or the conditions to be met in handling and placing. Stone shall be clean and free from deleterious impurities, including alkali, earth, clay, refuse and coatings. The apparent specific gravity shall be a minimum of 2.65 when tested in accordance with ASTM C-127 and the abrasion breakdown at 1,000 revolutions shall be 40 maximum when tested in accordance with ASTM C-131

The maximum size of stone shall be 150% of the indicated D-50 size and the minimum stone size shall be 50% of the indicated D-50 size.

220-2.2 Erosion control geosynthetic fabric shall meet the following requirements:.

Erosion control fabrics shall be a woven monofilament fabric or a nonwoven fabric consisting only of long chain polymeric filaments such as polypropylene or polyester formed into a stable network that the filaments retain their relative position to each other. The fabric material shall additionally conform to the physical properties shown below:

Property	Class B	Test Method
Grab tensile strength: lbs.	200 min.	ASTM D-4632
Elongation at break: %	15min., 115 max.	ASTM D-4632
Puncture Strength: lbs.	75 min.	ASTM D-4833
Burst Strength, psi	320 min.	ASTM D-3786
Trapezoidal tear: lbs.	50 min>	ASTM D-4533
Apparent opening size:	30-140.	ASTM D-4751
US Standard sieve size		
Ultraviolet Stability:%	70 min.	ASTM D-4355

**EROSION CONTROL GEOSYNTHETIC PROPERTIES** 

**220-2.3** The Contractor, at no additional cost, shall provide mechanical equipment, a sorting site, and labor needed to assist in checking riprap gradation.

## PREPARATION OF GROUND SURFACES

**220-3.1** The bed for placement of riprap shall be shaped and trimmed to provide even surfaces and shall be in accordance with Section P-152. Refer to the plans for size and depth.

## EROSION CONTROL GEOSYNTHETIC FABRIC PLACEMENT

**220-4.1** Fabric shall be placed at the locations shown on the project plans. The contractor shall provide a surface free of obstructions, depressions, debris, and soft yielding surfaces prior to placement of the fabric. The fabric shall be loosely laid (not in a stretched condition), aligned and placed with no fold over wrinkles.

The fabric shall be placed to provide a minimum 24-inch overlap for each joint. On horizontal joints, the uphill fabric shall overlap the downhill fabric. On vertical joints, the upstream fabric shall overlap the downstream fabric.

**220-4.2** Bedding material shall be placed uniformly on the fabric to depth of 3-inches and shall be free of mounds, dips and windrows. Bedding material shall not be compacted. Bedding material shall meet the requirements of Class B Bedding as described in Section D-701.

## **RIPRAP PLACEMENT**

**220-5.1** Riprap shall be carefully placed on filter material consisting of the bedding material on erosion control geosynthetic fabric. Placement shall not damage the underlying geosynthetic fabric. If the Engineer determines that the placement of stone has damaged or displaced the filter material to the extent that it cannot function as intended, the Contractor, at his expense, shall remove the placed riprap stone and properly correct the damage to, and/or displacement of, the filter material. Such correction may include the removal of the filter material, re-grading the affected area, and subsequent replacement of the filter material and riprap stone as required by the Engineer.

Riprap shall be placed in a manner that will produce a dense, reasonably well-graded mass without segregation and with a minimum amount of voids. The larger stone shall be evenly distributed through the riprap mass. The individual placement of larger riprap stones may be required to obtain a uniform distribution of stone size. The riprap placement shall be supplemented by such hand methods as are required to obtain a uniform finished surface. Allowable tolerance from the slope lines and grades shown for the finished riprap surfaces shall not exceed a distance equal to 1/3 of the nominal D-50 size above or below the design surfaces. The final surface elevations shall be lower than any adjacent apron or pipe invert elevations and shall not obstruct the operation of adjacent structures. The flow line within riprap shall provide positive drainage with a minimum of ponding. Individual stones shall depress below the finished grades no lower than a distance equal to  $\frac{1}{2}$  of the nominal D-50 size. Special care shall be exercised in placing riprap within 3 feet of structures to avoid damage to such structures.

## METHOD OF MEASUREMENT

**220-6.1** The completed, in place riprap construction within the limits of the dimensions shown on the plans shall be measured by the square yard.

#### **BASIS OF PAYMENT**

**220-7.1** Payment for riprap will be made for the accepted complete in-place riprap construction at the contract unit price per square yard. Riprap construction shall include excavation, ground surface preparation, erosion control geosynthetic fabric, bedding material, riprap stone and backfilling. Payment for riprap construction shall be full compensation for furnishing all material, labor and equipment for riprap construction.

Payment will be made under:

Item m-220-7.1 Riprap Construction – per square yard

## **TESTING REQUIREMENTS**

ASTM C-127 Density, Relative Density (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 Angles Machine
- ASTM D-3786 Bursting Strength of Textile Fabrics

ASTM D-4355 Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus

ASTM D-4533 Trapezoid Tearing Strength of Geotextiles

ASTM D-4632 Grab Breaking Load and Elongation of Geotextiles

ASTM D-4751 Determining Opening Size of Geotextiles

ASTM D-4833 Index Puncture Resistance of Geomembranes and Related Products

## **END OF SECTION 220**

## **ITEM P-101 SURFACE PREPARATION**

#### DESCRIPTION

**101-1.1** This item shall consist of preparation of existing pavement surfaces for overlay, surface treatments, removal of existing pavement, and other miscellaneous items. The work shall be accomplished in accordance with these specifications and the applicable drawings.

## EQUIPMENT

**101-2.1** All equipment shall be specified here and in the following paragraphs or approved by the Engineer. The equipment shall not cause damage to the pavement to remain in place.

## CONSTRUCTION

## 101-3.1 Removal of existing pavement.

## a. Concrete pavement. Not Used.

**b.** Asphalt concrete pavement. Asphalt concrete pavement to be removed shall be cut to the full depth of the bituminous material around the perimeter of the area to be removed. The pavement shall be removed so the joint for each layer of pavement replacement is offset 1 foot from the joint in the preceding layer. This does not apply if the removed pavement is to be replaced with concrete or soil. If the material is to be wasted on the airport site, it shall be broken to a maximum size of 1.5 inches by milling and stockpiled at the locations shown on the plans. Removal of asphalt concrete pavement by milling shall be accomplished so that no contamination with underlying courses will be deposited in the stockpile locations shown.

101-3.2 Preparation of joints and cracks. Remove all vegetation and debris from cracks to a minimum depth of 1 inch. If extensive vegetation exists treat the specific area with a concentrated solution of a water-based herbicide approved by the Engineer. Fill all cracks, ignoring hairline cracks < 1/4 inch wide with a crack sealant per ASTM D6690. Wider cracks (over 1-1/2 inch wide, along with soft or sunken spots, indicate that the pavement or the pavement base should be repaired or replaced as stated below. Any excess joint or crack sealer on the surface of the pavement shall also be removed from the pavement surface.

**101-3.3 Removal of paint and rubber.** All paint and rubber over 1 foot wide that will affect the bond of the new overlay shall be removed from the surface of the existing pavement. Chemicals, high-pressure water, heater scarifier (asphaltic concrete only), cold milling, or sandblasting may be used. Any methods used shall not cause major damage to the pavement. Major damage is defined as changing the properties of the pavement or removing pavement over 1/8 inch deep. If chemicals are used, they shall comply with the state's environmental protection regulations. No material shall be deposited on the runway shoulders. All wastes shall be disposed of in areas indicated in this specification or shown on the plans.

## 101-3.4 Concrete spall or failed asphaltic concrete pavement repair.

a. Repair of concrete spalls in areas to be overlaid with asphalt. Not Used.

**b.** Asphaltic concrete pavement repair. The failed areas shall be removed as specified in paragraph 101-3.1b. All failed material including surface, base course, subbase course, and subgrade shall be removed. The base course and subbase shall be replaced if it has been infiltrated with clay, silt, or other material affecting the load-bearing capacity. Materials and methods of construction shall comply with the other applicable sections of this specification.

**101-3.5 Cold milling.** Milling shall be performed with a power-operated milling machine or grinder, capable of producing a finished surface that provides a good bond to the new overlay. The milling machine or grinder shall operate without tearing or gouging the under laying surface. The milling machine or grinder shall be equipped with automatic grade and slope controls. All millings shall be removed and disposed of Airport property, unless otherwise specified. If the Contractor mills or grinds deeper or wider than the plans specify, the Contractor shall replace the material that was removed with new material at no additional cost to the Owner. See Item M-150 for additional requirements.

## a. Patching. Not Used.

## b. Profiling, grade correction, or surface correction. Not Used.

**c. Clean-up.** The Contractor shall sweep the milled surface daily and immediately after the milling until all residual aggregate and fines are removed from the pavement surface. Prior to paving, the Contractor shall wet down the milled pavement and thoroughly sweep and/or blow the surface to remove any remaining aggregate or fines.

**101-3.6. Preparation of asphalt pavement surfaces.** Existing asphalt pavements indicated to be treated with a surface treatment shall be prepared as follows:

**a.** Patch asphalt pavement surfaces that have been softened by petroleum derivatives or have failed due to any other cause. Remove damaged pavement to the full depth of the damage and replace with new asphalt concrete similar to that of the existing pavement in accordance with paragraph 101-3.4.

**b.** Repair joints and cracks in accordance with paragraph 101-3.2.

**c.** Remove oil or grease that has not penetrated the asphalt pavement by scraping or by scrubbing with a detergent, then wash thoroughly with clean water. After cleaning, treat these areas with an oil spot primer.

**d.** Clean pavement surface immediately prior to placing the surface treatment 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.

**101-3.7 Maintenance**. The Contractor shall perform all maintenance work necessary to keep the pavement in a satisfactory condition until the full section is complete and accepted by the Engineer. The surface shall be kept clean and free from foreign material. The pavement shall be properly drained at all times. If cleaning is necessary or if the pavement becomes disturbed, any work repairs necessary shall be performed at the Contractor's expense.

## 101-3.8 Preparation of Joints in Rigid Pavement. Not Used.

**101–3.9 Preparation of Cracks in Flexible Pavement.** Widen crack with a router by removing a minimum of 1/16 inch from each side of crack as shown in the plans. Immediately before sealing, joints will be blown out with a hot air lance combined with oil and water-free compressed air.

## METHOD OF MEASUREMENT

**101-4.1 Lump Sum**. No separate measurement for payment will be made for items contained in sections 101-3.1, 101-3.3, 101-3.4, 101-3.5 or 101-3.6 above. The work covered by these section 1 shall be considered as a subsidiary obligation of the Contractor and covered under the other contract items.

**101-4.2 Crack Seal.** Measurement for payment for crack sealing asphalt concrete pavement shall be by the linear foot. Separate measurement for post emergent herbicide application will be as contained in Item M-215.

## **BASIS OF PAYMENT**

**101-5.1 Payment.** Payment shall be made at contract unit price for the unit of measurement as specified above. This price shall be full compensation for furnishing all materials and for all preparation, hauling, and placing of the material and for all labor, equipment, tools, and incidentals necessary to complete this item.

Item P-101-5.1	Surface Prepar	ation	per lump sum
Item P-101-5.2	Crack Seal	per line	ear foot

## MATERIAL REQUIREMENTS

ASTM D6690 Standard Specification For Joint And Crack Sealants, Hot Applied, For Concrete And Asphalt Pavements

# **ITEM P-151 CLEARING AND GRUBBING**

## **151-1 DESCRIPTION**

**151-1.1** This item shall consist of clearing and grubbing, including the disposal of materials, for all areas within the limits designated on the plans or as required by the Engineer.

# a. Clearing Not used.

**b.** Clearing and grubbing shall consist of clearing the surface of the ground of the designated areas of all trees, stumps, down timber, logs, snags, brush, undergrowth, hedges, heavy growth of grass or weeds, fences, structures, debris, and rubbish of any nature, natural obstructions or such material which in the opinion of the 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.

# **151-2 CONSTRUCTION METHODS**

**151–2.1 General.** The areas denoted on the plans to be cleared and grubbed shall be staked on the ground by the Engineer. The clearing and grubbing shall be done at a satisfactory distance in advance of the grading operations.

All spoil materials removed by clearing and grubbing shall be disposed of outside the Airport's limits at the Contractor's responsibility, except when otherwise directed by the Engineer. 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, the Contractor shall obtain and file with the Engineer permission in writing from the property owner for the use of private property for this purpose.

Blasting shall not be allowed.

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 to secure prompt action.

# 151-2.2 Clearing. Not used.

**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 will be constructed outside of paved areas. For embankments constructed outside of paved areas, all unsatisfactory materials shall be removed, but sound trees, stumps, and brush can be cut off flush with the original ground and allowed to remain. Tap

roots and other projections over 1-1/2 inches 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 shall be disposed of by removal from the site. The cost of removal is incidental to this item. The remaining or existing foundations, wells, cesspools, and like structures shall be destroyed by breaking down the materials of which the foundations, wells, cesspools, etc., are built to a depth at least 2 feet below the existing surrounding ground. Any broken concrete, blocks, or other objectionable material that cannot be used in backfill shall be removed and disposed of at the Contractor's expense. The holes or openings shall be backfilled with acceptable material and properly compacted.

All holes under embankment areas remaining after the grubbing operation shall have the sides of the holes flattened to facilitate filling with acceptable material and compacting as required in Item P-152. The same procedure shall be applied to all holes remaining after grubbing in areas where the depth of holes exceeds the depth of the proposed excavation.

Fences shall be removed and disposed of as 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 location designated by the Engineer if the fence is to remain the property of a local owner or authority.

# **151-3 METHOD OF MEASUREMENT**

**151–3.1** The quantities of clearing and grubbing as shown by the limits on the plans or as ordered by the Engineer shall be the number of acres or fractions thereof, of land specifically cleared and grubbed.

# **151-4 BASIS OF PAYMENT**

**151-4.1** Payment shall be made at the contract unit price per acre for clearing and grubbing. 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-151-4.1 Clearing and grubbing - per acre

# ITEM P-152 EXCAVATION, SUBGRADE, AND EMBANKMENT

## DESCRIPTION

**152-1.1** This item covers excavation, disposal, placement, and compaction of all materials within the limits of the work required to construct safety areas, runways, taxiways, aprons, and intermediate areas as well as other areas for drainage, building construction, parking, or other purposes in accordance with these specifications and in conformity to the dimensions and typical sections shown on the plans.

152-1.2 Classification. All material excavated shall be classified as defined below:

**a. Unclassified excavation.** Unclassified excavation shall consist of the excavation and disposal of all material, regardless of its nature.

**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, suitable for topsoil may be used on the embankment slope when approved by the Engineer.

## **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 and the Engineer notified per subsection 70-20. At the direction of the Engineer, the Contractor shall excavate the site in such a manner as to preserve the artifacts encountered and allow for their removal. Such excavation will be paid for as extra work.

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

If it is necessary to interrupt existing surface drainage, sewers or under-drainage, conduits, utilities, or similar underground structures, the Contractor shall be responsible for and shall take all necessary precautions to preserve them or provide temporary services. When such facilities are encountered, the Contractor shall notify the Engineer, who shall arrange for their removal if necessary. The Contractor, at his or her expense, shall satisfactorily repair or pay the cost of all damage to such facilities or structures that may result from any of the Contractor's operations during the period of the contract.

**152-2.2 Excavation.** No excavation shall be started until the work has been staked out by the Contractor and the Engineer has obtained from the Contractor, the survey notes of the elevations and measurements of the ground surface. All areas to be excavated shall be stripped of vegetation and topsoil. Topsoil shall be stockpiled for future use in areas designated on the plans or by the Engineer.

All suitable excavated material shall be used in the formation of embankment, subgrade, or other purposes 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 as directed by the Engineer. When the volume of excavation is not sufficient for constructing the embankments to the grades indicated, the deficiency shall be obtained from borrow areas.

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 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 as specified in paragraph 152-3.3.

**b. Undercutting.** Rock, shale, hardpan, loose rock, boulders, or other material unsatisfactory for safety areas, subgrades, roads, shoulders, or any areas intended for turf shall be excavated to a minimum depth of 12 inches below the subgrade or to the depth specified by the Engineer. Muck, peat, matted roots, or other yielding material, unsatisfactory for subgrade foundation, shall be removed to the depth specified. Unsuitable materials shall be disposed of at locations shown on the plans. The cost is incidental to this item. The excavated area shall be backfilled with suitable material obtained from the grading operations or borrow areas and compacted to specified densities. The necessary backfill will constitute a part of the embankment. Where rock cuts are made, backfill with select material. Any pockets created in the rock surface shall be drained in accordance with the details shown on the plans.

**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. All overbreak shall be graded or removed by the Contractor and disposed of as directed by the Engineer. The Engineer shall determine if the displacement of such material was unavoidable and his or her decision shall be final. 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; for example, the utility unless otherwise shown on the plans. All existing foundations shall be excavated at least 2 feet below the top of subgrade or as indicated on the plans, and the material disposed of as directed by the Engineer. All foundations thus excavated shall be backfilled with suitable material and compacted as specified.

e. Compaction requirements. The subgrade under areas to be paved shall be compacted to a depth of 8 inches and to a density of not less than 95 percent of the maximum density as determined by ASTM D698. The material to be compacted shall be within  $\pm 2\%$  of optimum moisture content before being rolled to obtain the prescribed compaction (except for expansive soils). Density test shall be taken by the contractor per 1,000 square yards of subgrade.

The in-place field density shall be determined in accordance with ASTM D1556 or ASTM D6938 using Procedure A, the direct transmission method, and ASTM D6938 shall be used to determine the moisture

content of the material. The machine shall be calibrated in accordance with ASTM D6938. 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.

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

Blasting shall not be allowed.

**f. Proof rolling.** After compaction is completed, the subgrade area shall be proof rolled with heavy pneumatic-tired roller having four or more tires abreast, each tire loaded to a minimum of 30,000 pounds (13.6 metric tons) and inflated to a minimum of 125 psi (0.861 MPa) in the presence of the Engineer. Apply a minimum of 2 coverages, or as specified by the Engineer, to all paved areas. A coverage is defined as the application of one tire print over the designated area. Soft areas of subgrade that deflect more than 1 inch or show permanent deformation greater than 1 inch shall be removed and replaced with suitable material or reworked to conform to the moisture content and compaction requirements in accordance with these specifications.

**152-2.3 Borrow excavation.** Borrow areas within the airport property are indicated on the plans. Borrow excavation shall be made only at these designated locations and within the horizontal and vertical limits as staked or as directed by the Engineer.

When borrow sources are outside the boundaries of the airport property, it shall be the Contractor's responsibility to locate and obtain the borrow sources, subject to the approval of the Engineer. The Contractor shall notify the Engineer at least 15 days prior to beginning the excavation so necessary measurements and tests can be made. All borrow pits shall be opened up to expose the various strata of acceptable material to allow obtaining a uniform product. All unsuitable material shall be disposed of by the Contractor. 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 ditches; for temporary levee construction; or for any other type as designed or as shown on the plans. The work shall be performed in sequence with the other construction. Intercepting ditches shall be constructed prior to starting adjacent excavation operations. All satisfactory material shall be placed in embankment fills; unsuitable material shall be placed in designated waste areas or as directed by the Engineer. All necessary work shall be performed true to final line, elevation, and cross-section. The Contractor shall maintain ditches constructed on the project to the required cross-section and shall keep them free of debris or obstructions until the project is accepted.

**152-2.5 Preparation of embankment area.** Where an embankment is to be constructed to a height of 4 feet or less, all sod and vegetative matter shall be removed from the surface upon which the embankment is to be placed. The cleared surface shall be broken up by plowing or scarifying to a minimum depth of 6 inches and shall then be compacted as indicated in paragraph 152-2.6. When the height of fill is greater than 4 feet (1.2 m), sod not required to be removed shall be thoroughly disked and recompacted to the density of the surrounding ground before construction of embankment.

Sloped surfaces steeper than one (1) vertical to four (4) horizontal shall be plowed, stepped, benched, or broken up so that the fill material will bond with the existing material. When the subgrade is part fill and part excavation or natural ground, the excavated or natural ground portion shall be scarified to a depth of 12 inches and compacted as specified for the adjacent fill.

No direct payment shall be made for the work performed under this section. The necessary clearing and grubbing and the quantity of excavation removed will be paid for under the respective items of work.

**152-2.6 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 layers shall be placed, to produce a soil structure as shown on the typical cross-section or as directed by the Engineer. Materials such as brush, hedge, roots, stumps, grass and other organic matter, shall not be incorporated or buried in the embankment.

Earthwork operations shall be suspended at any time when satisfactory results cannot be obtained because of rain, freezing, or other unsatisfactory weather conditions in the field. Frozen material shall not be placed in the embankment nor shall embankment be placed upon frozen material. Material shall not be placed on surfaces that are muddy, frozen, or contain frost. The Contractor shall drag, blade, or slope the embankment to provide surface drainage at all times.

The material in each layer shall be within  $\pm 2\%$  of optimum moisture content before rolling to obtain the prescribed compaction. To achieve a uniform moisture content throughout the layer, the material shall be moistened or aerated as necessary. 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 to achieve the specified embankment density.

Rolling operations shall be continued until the embankment is compacted to not less than 95% of maximum density for non-cohesive soils, and 90% of maximum density for cohesive soils as determined by ASTM D698. Under all areas to be paved, the embankments shall be compacted to a depth of 8inches and to a density of not less than 95 percent of the maximum density as determined by ASTM D698.

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 D1556 or ASTM 6938 using Procedure A, the direct transmission method, and ASTM D6938 shall be used to determine the moisture content of the material. The machine shall be calibrated in accordance with ASTM D6938. The Contractor's laboratory shall perform all density tests in the Engineer's presence and provide the test results upon completion to the Engineer for acceptance.

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

During construction of the embankment, the Contractor shall route all construction equipment evenly over the entire width of the embankment as each layer is placed. Layer placement shall begin in the deepest portion of the embankment fill. As placement progresses, the 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 by the Engineer and the finer material shall be used to fill the voids with 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 on the plans or 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 equipment by distribution of spalls and finer fragments of rock. The layer shall not be constructed above an elevation 4 feet below the finished subgrade.

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

**152-2.7 Finishing and protection of subgrade.** After the subgrade is substantially complete, the Contractor shall remove any soft or other unstable material over the full width of the subgrade that will not compact properly. All low areas, holes or depressions in the subgrade shall be brought to grade with suitable select material. Scarifying, blading, rolling and other methods shall be performed to provide a thoroughly compacted subgrade shaped to the lines and grades shown on the plans.

Grading of the subgrade shall be performed so that it will drain readily. The Contractor shall protect the subgrade from damage and limit hauling over the finished subgrade to only traffic essential for construction purposes. All ruts or rough places that develop in the completed subgrade shall be graded 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. The Contractor shall include the cost in the contract unit price for the pay of items of work involved. No payment will be made separately or directly for hauling on any part of the work.

**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 12-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 feet from true grade as established by grade hubs. Any deviation in excess of these amounts shall be corrected by loosening, adding, or removing materials; reshaping; and recompacting.

On safety areas, intermediate and other designated areas, the surface shall be of such smoothness that it will not vary more than 0.10 feet 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. Not Used.

## 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 by the Engineer.

**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 quantities shall be verified by the Engineer by means of field cross-sections taken by the contractor at intervals not exceeding 50 linear feet.

## **BASIS OF PAYMENT**

**152-4.1** "Unclassified excavation" payment shall be made at the contract unit price per cubic yard. This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-152-4.1 Unclassified Excavation - per cubic yard

# **TESTING REQUIREMENTS**

ASTM D698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft <sup>3</sup> (600 kN-m/m <sup>3</sup> ))
ASTM D1556	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft <sup>3</sup> (2700 kN-m/m <sup>3</sup> ))
ASTM D6938	Standard Test Methods for In-Place Density and Water Content of Soil and Soil- Aggregate by Nuclear Methods (Shallow Depth)

#### ITEM P-153 CONTROLLED LOW-STRENGTH MATERIAL (CLSM)

#### **153-1 DESCRIPTION**

**153-1.1** This item shall consist of furnishing, transporting, and placing a controlled low-strength material (CLSM) as flowable backfill in trenches or at other locations shown on the plans or as directed by the Engineer.

#### **153-2 MATERIALS**

#### **153-2.1 MATERIALS**

**a. Portland Cement.** Portland cement shall conform to the requirements of ASTM C 150 Type II. If for any reason, cement becomes partially set or contains lumps of caked cement, it shall be rejected. Cement salvaged from discarded or used bags shall not be used.

b. Flyash. Flyash shall conform to ASTM C 618, Class F.

**c. Fine Aggregate (Sand).** Fine aggregate shall conform to the requirements of ASTM C 33 except for aggregate gradation. Any aggregate gradation which produces performance characteristics of the CLSM specified herein will be accepted, except as follows.

Sieve Size	Percent Passing by	
	weight	
3/4 in	100	
No. 200	0 - 12	

**d. Water.** Water used in mixing shall be free of oil, salt, acid, alkali, sugar, vegetable matter, or other substances injurious to the finished product.

#### **153-3 MIX DESIGN**

**153-3.1 PROPORTIONS.** The contractor shall submit, to the Engineer, a mix design including the proportions and source of aggregate, fly ash, cement, water, and approved admixtures. No CLSM mixture shall be produced for payment until the Engineer has given written approval of the proportions. The proportions shall be prepared by a laboratory and shall remain in effect for the duration of the project. Laboratory costs are incidental to this item. The proportions shall establish a single percentage or weight for aggregate, fly ash, cement, water, and any admixtures proposed.

**a. Compressive Strength.** CLSM shall be designed to achieve a 28-day compressive strength of 100 to 200 psi when tested in accordance with ASTM D 4832. There should be no significant strength gain after 28 days.

**b.** Consistency. CLSM should be designed to achieve a consistency that will produce an approximate 8-inch diameter circular-type spread without segregation when tested by: (1) filling a 3-

inch inside diameter by 6-inch length flow cylinder (non-absorbent pipe) (2) strike off of the flow cylinder and start of lift within five seconds of filling and (3) by steady upward pull, lift the cylinder in a time period of between two and four seconds. Adjustments of the material proportions should be made to achieve proper solid suspension and flowable characteristics, however the theoretical yield shall be maintained at one cubic yard for the given batch weights.

#### **153-4 CONSTRUCTION METHODS**

## 153-4.1 PLACEMENT.

**a. Placement**. CLSM may be placed by any reasonable means from a mixing unit into the space to be filled. Agitation is required during transportation and waiting time. Placement shall be performed in such a manner that structures or pipes are not displaced from their desired final position and intrusion of CLSM into undesirable areas is avoided. The material shall be brought up uniformly to the fill line shown on the plans or as directed to the Engineer. Each placement of CLSM shall be as continuous an operation as possible. If CLSM is placed in more than one layer, the base layer shall be free of surface water and loose of foreign material prior to placement of the next layer.

**b.** Limitations of Placement. CLSM shall not be placed on frozen ground. Mixing and placing may begin when the air or ground temperature is at least 35 °F and rising. At the time of placement, CLSM shall have a temperature of at least 40 °F. Mixing and placement shall stop when the air temperature is 40 °F and falling or when the anticipated air or ground temperature will be 35 °F or less in the 24 hour period following proposed placement.

## **153-4.2 CURING AND PROTECTION**

**a. Curing.** The air in contact with the CLSM should be maintained at temperatures above freezing for a minimum of 72 hours. If the CLSM is subjected to temperatures below 32 °F, the material may be rejected by the Engineer if damage to the material is observed.

**b. Protection.** The CLSM shall not be subject to loads and shall remain undisturbed by construction activities for a period of 48 hours or until a compressive strength of 15 psi is obtained. The Contractor shall be responsible for providing evidence to the Engineer that the material has reached the desired strength. Acceptable evidence shall be based upon compressive tests made in accordance with paragraph 153-3.1a.

**153-4.3 Acceptance.** Acceptance of CLSM delivered and placed as shown on the plans or as directed by the Engineer shall be based upon mix design approval and batch tickets provided by the Contractor to confirm that the delivered material conforms to the mix design. The Contractor shall verify by additional testing, each 1,000 cubic yards of material used. Verification shall include confirmation of material proportions and tests of compressive strength to confirm that the material meets the original mix design and the requirements of CLSM as defined in this specification. Adjustments shall be made as necessary to the proportions and materials prior to further production.

## **153-5 METHOD OF MEASUREMENT**

**153-5.1 Measurement.** No separate measurement for CLSM will be made. Payment for backfilling trenches, structures, etc. shall be incidental to the specific work function.

## **153-8 BASIS OF PAYMENT**

**153-8.1 Payment.** : No separate payment for CLSM will be made. The cost for placing the material shall be included in the unit price for the specific work function.

#### **TESTING REQUIREMENTS**

ASTM D 4832 Standard Test Method for Preparation and Testing of Controlled Low Strength Material (CLSM) Test Cylinders

## MATERIAL REQUIREMENTS

ASTM C 33 Specification for Concrete Aggregates
ASTM C 150 Specification for Portland Cement
ASTM C 618 Specification for Coal Flyash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete
ASTM C 595 Specification for Blended Hydraulic Cements

## **ITEM P-155 LIME-TREATED SUBGRADE**

#### DESCRIPTION

**155-1.1** This item shall be used for soil modification to achieve specific needs that require strength gain to a specific level. This item shall consist of constructing one or more courses of a mixture of soil, lime, and water in accordance with this specification, and in conformity with the lines, grades, thicknesses, and typical cross-sections shown on the plans.

#### MATERIALS

**155-2.1 Lime.** Quicklime and hydrated lime, either high-calcium dolomitic, or magnesium lime, as defined by ASTM C51, shall conform to the requirements of ASTM C977. Lime not produced from calcining limestone shall not be permitted.

**155-2.2 Commercial lime slurry.** Commercial lime slurry shall be a pumpable suspension of solids in water. The water or liquid portion of the slurry shall not contain dissolved material in sufficient quantity naturally injurious or objectionable for the purpose intended. The solids portion of the mixture, when considered on the basis of "solids content," shall consist principally of hydrated lime of a quality and fineness sufficient to meet the following requirements as to chemical composition and residue.

**a. Chemical composition.** The "solids content" of the lime slurry shall consist of a minimum of 70%, by weight, of calcium and magnesium oxides.

**b. Residue.** The percent by weight of residue retained in the "solids content" of lime slurry shall conform to the following requirements:

Residue retained on a No. 6 (3360 micron) sieve = maximum 0.0%

Residue retained on a No. 10 (2000 micron) sieve = maximum 1.0%

Residue retained on a No. 30 (590 micron) sieve = maximum 2.5%

c. Grade. Commercial lime slurry shall conform to one of the following two grades:

Grade 1. The "dry solids content" shall be at least 31% by weight, of the slurry.

Grade 2. The "dry solids content" shall be at least 35%, by weight, of the slurry.

**155-2.3 Water.** Water used for mixing or curing shall be potable, reasonably clean and free of oil, salt, acid, alkali, sugar, vegetable, or other substances injurious to the finished product.

**155-2.4 Soil.** The soil for this work shall consist of inorganic natural materials on the site or selected materials from other sources; uniform in quality and gradation; and shall be approved by the Engineer. The soil shall be free of roots, sod, weeds, and stones larger than 2-1/2 inches (60 mm).

#### **COMPOSITION**

**155-3.1 Soil-lime mixture.** Ten days prior to the commencement of the work, the Contractor shall submit a soil-lime mixture, developed by the Contractor's laboratory, showing the amount of lime and water required per cubic yard (per cubic meter), and procedures for blending the lime/subgrade mixture for each type of existing soil. The soil-lime mixture shall

include process type and number of: lime applications, stages of mixing, slurry injection depths, mixing depths, and depths of compaction lifts. Also, the Contractor shall submit a list of equipment to be used and their relation to method of mix proportioning, spreading, pulverizing and compacting subgrade, slurry injection, jet slurry mixing, and other related work. The soil-lime mixture shall also contain amount of lime, either in sacks or pounds per cubic yard and the amount of water to be used, if slurry method is used. Use the ASTM D3551 laboratory test method when applicable. The Lime content should be sufficient to lower the Liquid Limit to less than 30 and the Plasticity Index to less than 10 and shall contain a minimum of 5.0% hydrated lime by dry weight of the dry soil and develop a minimum unconfined compressive strength of 150 psi per ASTM D5102 Procedure A, after a five day cure time..

**155-3.2 Tolerances.** At final compaction, the lime and water content for each course of subgrade treatment shall conform to the following tolerances:

Material	Tolerance
Lime	+ 0.5%
Water	+ 2%, -0%

#### WEATHER LIMITATIONS

**155-4.1 Weather limitation.** Do not construct subgrade when weather conditions detrimentally affect the quality of the materials. Do not apply lime unless the air temperature is at least 40°F and rising. Do not apply lime to soils that are frozen or contain frost. If the air temperature falls below 35°F, protect completed lime-treated areas by approved methods against the detrimental effects of freezing. Remove and replace any damaged portion of the completed soil-lime treated area with new soil-lime material in accordance with this specification.

## EQUIPMENT

**155-5.1 Equipment.** The equipment required shall include all equipment necessary to complete this item such as: grading and scarifying equipment, a spreader for the lime or lime slurry, mixing or pulverizing equipment, sheepsfoot and pneumatic or vibrating rollers, sprinkling equipment, and trucks.

## **CONSTRUCTION METHODS**

**155-6.1 General.** This specification is to construct a subgrade consisting of a uniform lime mixture which shall be free from loose or segregated areas. The subgrade shall be of uniform density and moisture content, well mixed for its full depth, and have a smooth surface suitable for placing subsequent courses. The Contractor shall be responsible to meet the above requirements.

Before beginning lime treatment, the subgrade shall be constructed as specified in Item P-152, Excavation, Subgrade and Embankment, and shaped to conform to the typical sections, lines, and grades

as shown on the plans. If the Contractor elects to use a cutting and pulverizing machine that will remove the subgrade material accurately to the secondary grade and pulverize the material at the same time, he will not be required to expose the secondary grade nor windrow the material. The machine must give visible indication at all times that it is cutting the material uniformly to the proper depth over the entire width of the cut.

If a cutting and pulverizing machine is not used, the material to be treated shall be excavated to the secondary grade (proposed bottom of lime treatment) and removed or windrowed to expose the secondary grade. The excavated material shall then be spread to the desired cross-section and uniformly mixed and compacted.

**155-6.2 Application.** Lime shall be spread only over an area where the initial mixing operations can be completed during the same work day. The application and mixing of lime with the soil shall be accomplished by the methods described as "Slurry Placing."

# a. Dry placing. Not Used.

**b.** Slurry placing. The lime shall be mixed with water in trucks with approved distributors and applied as a thin water suspension or slurry. Commercial lime slurry shall be applied with a lime percentage not less than that applicable for the grade used. The distribution of lime shall be by successive passes over a measured section of subgrade until the specified amount of lime has been spread. The amount of lime spread shall be the amount required for mixing to the specified depth that will result in the amount determined in the soil-lime mixture or as shown on the plans. The distributor truck shall continually agitate the slurry to keep the mixture uniform.

## 155-6.3 Mixing. The mixing procedure shall be

**a. Preliminary mixing.** The full depth of the treated subgrade shall be mixed with an approved mixing machine. Lime shall not be left exposed for more than six (6) hours. The mixing machine shall make two coverages. Water shall be added to the subgrade during mixing to provide a moisture content approximately 5% above the optimum moisture of the material and to ensure chemical action of the lime and subgrade. After mixing, the subgrade shall be lightly rolled to seal the surface and help prevent evaporation of moisture. The water content of the subgrade mixture shall be maintained at a moisture content above the optimum moisture content for a minimum of 48 hours or until the material becomes friable. During the curing period, the material shall be sprinkled as directed by the Engineer.

**b.** Final mixing. After the required curing time, the material shall be uniformly mixed by approved methods. If the mixture contains clods, they shall be reduced in size by blading, discing, harrowing, scarifying, or the use of other approved pulverization methods so that the remainder of the clods shall meet the following requirements when tested dry by laboratory sieves. After curing, pulverize lime treated material until soil particles pass a one inch sieve and 60% pass the No. 4 sieve. If resultant mixture contains clods, reduce their size by scarifying, or pulverization to meet specified gradation.

**155-6.4 Compaction.** Compaction of the mixture shall immediately follow the final mixing operation with no part of the mixture uncompacted more than 30 minutes after final mixing. The material shall be aerated or sprinkled as necessary to provide the optimum moisture content during compaction. The field density of the compacted mixture shall be at least 93% of the maximum density of laboratory specimens prepared from samples taken from the material in place. The specimens shall be compacted and tested in accordance with ASTM D698 to determine maximum density and optimum moisture
content. The in-place field density shall be determined in accordance with ASTM D1556 or ASTM D6938, Procedure A, direct transmission method. Testing frequency shall be a minimum of one compaction test per 1000 square yards of stabilized base or as directed by the Engineer.

The material shall be sprinkled and rolled as directed by the Engineer. All irregularities, depressions, or weak spots that develop shall be corrected immediately by scarifying the areas affected, adding or removing material as required, and reshaping and recompacting. The surface of the subgrade shall be maintained in a smooth condition, free from undulations and ruts, until other work is placed on it or the work is accepted by the Engineer.

The full depth of the material shown on the plans shall be compacted to remain firm and stable under construction equipment. All testing shall be done by the Contractor's laboratory in the presence of the Engineer and density test results shall be furnished upon completion to the Engineer for acceptance determination. Perform in-place density test to determine degree of compaction between 24 and 72 hours after final compaction and 24 hour moist cure period. If the material fails to meet the density requirements, it shall be reworked to meet the density requirements. The shape of the course shall be maintained smooth and shall conform to the typical section shown on the plans and the established lines and grades. If the material loses the specified stability, density, and finish before the next course is placed or the work is accepted by the Engineer, the material shall be recompacted and refinished by the Contractor, and the cost shall be incidental to this item.

**155-6.5 Finishing and curing.** After the final layer or course of lime-treated subgrade has been compacted, it shall be brought to the required lines and grades in accordance with the typical sections. The completed section shall then be finished by rolling, as directed by the Engineer, with a pneumatic or other suitable roller sufficiently light to prevent hairline cracking. The finished surface shall not vary more than 3/8 inch when tested with a 12 feet straightedge applied parallel with and at right angles to the pavement centerline. Any variations in excess of this tolerance shall be corrected by the Contractor in a manner satisfactory to the Engineer, and the cost shall be incidental to this item.

The completed section shall be moist-cured for a minimum of seven (7) days before further courses are added or any traffic is permitted, unless otherwise directed by the Engineer. Subsequent courses shall be applied within 14 days after the lime-treated subgrade is cured. If required.

Each layer of lime treated subgrade shall be maintained in a moist condition until the next layer of pavement structure is placed. If required, a fog seal for curing, in compliance with Item P-603, shall be furnished and applied to the surface of the final layer of the lime stabilized material as soon as possible after the completion of final rolling and before the temperature falls below  $40^{\circ}$  F. Curing seal shall be applied at a rate between 0.10 and 0.20 gallons per square yard of surface. The exact rate will be determined by the Engineer.

**155-6.6 Thickness control.** The thickness of the final lime-treated subgrade shall be not less than the thickness specified. Thickness shall be determined by depth tests or cores taken at intervals so that each test shall represent no more than 300 square yards. When the base deficiency is more than 1/2 inch, the Contractor shall correct such areas in a manner satisfactory to the Engineer. The Contractor shall replace the base material where borings are taken for test purposes. This cost shall be incidental to this item.

**155-6.7 Maintenance.** The Contractor shall protect and maintain the lime-treated subgrade from yielding until the lime-treated subgrade is covered by placement of the next layer. The cost of this maintenance shall be incidental to this item.

**155-6.8 Handling and safety.** The Contractor shall obtain and enforce the lime supplier's instructions for proper safety and handling of the lime to prevent physical eye or skin contact with lime during transport or application.

#### METHOD OF MEASUREMENT

155-7.1 Lime-treated subgrade shall be paid for by the square yard in the completed and accepted work.

**155-7.2** Lime shall be paid by the number of tons of Hydrated Lime, or the calculated equivalent, used in the completed and accepted work. "Calculated Equivalent" will be determined by the Engineer as follows:

**a.** Hydrated lime delivered to the project in dry form will be measured according to the actual tonnage either spread on the subgrade or batched on site into a slurry, whichever is applicable.

**b.** Lime delivered to the project in slurry form will be paid for on the basis of certified chemical composition tickets and batch weight tickets. The Owner shall reserve the right to have the dry lime content verified by an independent testing laboratory. If the chemical composition is reported on the basis of Pebble Quicklime, the equivalent hydrated lime will be determined in accordance with paragraph c. below.

**c.** If Pebble Quicklime is delivered to the project in dry form it will be measured for payment on the basis of the following formula:

(	Total Quicklime (CaO)(Tons) × % Purity × 1.32 Factor	)	+	(	Total Quicklime (CaO)(Tons) × % Impurities × 1.00 Factor	)	=	Equivalent Hydrated Lime Ca(OH) <sub>2</sub> (Tons)
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The above will apply whether the quicklime is spread dry (if allowed) or batched into a slurry.

#### **BASIS OF PAYMENT**

**155-8.1** Payment shall be made at the contract unit price per square yard for the lime-treated subgrade at the thickness specified. The price shall be full compensation for furnishing all material, except the lime, and for all preparation, delivering, placing and mixing these materials, and all labor, equipment, tools and incidentals necessary to complete this item.

**155-8.2** Payment shall be made at the contract unit price per pound (kg) of lime. This price shall be full compensation for furnishing, delivery, and placing this material.

Payment will be made under:

Item P-155-8.1 Lime-treated subgrade - per square yard

# TESTING REQUIREMENTS

ASTM D698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft <sup>3</sup> ) (600 kN-m/m <sup>3</sup> )
ASTM D1556	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand- Cone Method
ASTM D6938	Standard Test Method for In-Place Density and Water Content of Soil and Soil- Aggregate by Nuclear Methods (Shallow Depth)

# MATERIAL REQUIREMENTS

ASTM C51	Standard Terminology Relating to Lime and Limestone (as used by the Industry)
ASTM C977	Standard Specification for Quicklime and Hydrated Lime for Soil Stabilization
ASTM D3551	Standard Practice for Laboratory Preparation of Soil-Lime Mixtures Using Mechanical Mixer

# END OF ITEM P-155

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

#### **156-1 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 silt fences, berms, dikes, dams, sediment basins, fiber mats, gravel, mulches, grasses, slope drains, and other erosion control devices or methods, and the reporting of the results by means of obtaining coverage under the State of California State Water Resources Control Board National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activity, Order No. 2009-0009-DWQ, NPDES No. CAS000002 (CGP).

The temporary erosion control measures contained herein shall be coordinated with the permanent erosion control measures specified as part of this contract to the extent practical to assure economical, effective, and continuous erosion control throughout the construction period.

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

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

#### **156-2 MATERIALS**

**156-2.1 STORM DRAIN INLET PROTECTION.** Storm drain inlet protection may be constructed of filter fabric, fiber mats, or other materials that will adequately control erosion.

**156-2.2 Other.** All materials shall meet commercial grade standards and shall be approved by the Engineer before being incorporated into the project.

# **156-3 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 for pavement removal; grading; construction; paving; and structures at watercourses, and a preliminary stormwater pollution prevention plan (SWPPP) in compliance with the CGP. The Contractor shall also submit a proposed method of erosion and dust control 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 NPDES** This project shall comply with all requirements and conditions for water quality standards and is subject to the terms and conditions of State of California State Water Resources Control Board (SWRCB) National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activity, Order No. 2009-0009-DWQ, NPDES No. CAS000002 (CGP).

- A. Construction General Permit (CGP): General Permit For Discharge From Construction Activities
  - 1. General:

The contractor shall give attention to the effect of the contractor's operations upon the landscape, and shall take care to maintain natural surroundings undamaged.

The contractor shall be responsible to implement the requirements of the CGP as specified in the "General Permit For Storm Water Discharges Associated with Construction and Land Disturbance Activities", Order No. 2009-0009-DWQ as issued by the State Water Resources Control Board, effective July 1, 2010. That document is hereinafter referred to as the CGP. The work shall include providing, installing, maintaining, removing and disposing, of erosion control measures such as gravel filter berms, dikes, catch basin inlet protection, end-of-pipe filtering devices, silt fences, dams, sediment basins, netting, geotextile fabrics, straw base barriers, slope drains, seeding, stream stabilization, and other erosion control devices or methods.

No clearing, grubbing, earthwork, or other work elements affected by the erosion control requirements in the SWPPP, shall be started until the Permit Registration Documents (PRDs) have been uploaded to the State Multi-System Application and Reporting System (SMARTS) and a Waste Discharge Identification Number (WDID) has been issued for the project.

The Contractor shall work with the Owner to submit the PRDs and ensure that the WDID is issued prior to land disturbance.

# 2. Stormwater Pollution Prevention Plan (SWPPP)

The Contractor shall have a Qualified SWPPP Developer (QSD) prepare and revise, as necessary, a comprehensive stormwater pollution prevention plan (SWPPP), including descriptions of proposed measures to be implemented, a schedule detailing the proposed coordination of accomplishing the erosion control features in a timely and appropriate

manner, and site-specific diagrams indicating proposed locations where erosion control devices or measures may be required during successive construction stages.

The SWPPP shall include all information required in the CGP, including a site map; identification of receiving waters and wetlands impacted by the project; a list of potential pollutant sources; inspection schedule; any onsite or off-site material storage sites; additional or modified storm water, erosion, and sediment controls; procedures for maintaining temporary and permanent erosion control measures; a list of the contractor's "good housekeeping practices"; and other permit requirements stipulated in the CGP as well as other applicable state or local programs. The contractor shall coordinate with the Engineer on all such additional information.

The SWPPP shall also identify and address erosion control at on-site fueling operations, waste piles, material storage sites, and off-site dedicated asphalt and concrete plants, contractor-use areas, storage areas, and support activity locations which are used solely for the project and are covered by the CGP.

The SWPPP shall include the implementation of spill prevention and material management controls and practices to prevent the release of pollutants into any stormwater. The SWPPP shall also provide storage procedures for chemicals and construction materials; disposal procedures; cleanup procedures; the contractor's plans for handling such pollutants; and other pollution prevention measures as required.

The SWPPP shall specify the mechanism whereby revisions may be proposed by the contractor or the Engineer throughout the project and incorporated into the plan, including review and approval procedure. The QSD shall approve and sign each revision to the SWPPP before implementation. Any subsequent submittals required by the contractor to revise or update the SWPPP will require at least 48 hours for review. Contractors and subcontractors responsible for implementing all or portions of the SWPPP shall be listed in the draft SWPPP, along with the measures for which they are responsible.

The contractor shall submit two copies of the draft SWPPP to the City for review and approval. The finalized SWPPP shall meet the terms and conditions of the CGP, and be compatible with construction sequencing and maintenance of traffic plans.

3. Notice of Intent and Notice of Termination

After the Storm Water Pollution Prevention Plan (SWPPP) has been approved, the City will prepare the Permit Registration Documents (PRDs) including the NOI and fee.

Upon final acceptance by the Engineer and within 90 days of when construction is complete, the QSD shall complete the Notice of Termination (NOT) and Annual Report for the project via SMARTS.

### 4. Contractor's Qualified SWPPP Practitioner

The contractor shall designate a certified Qualified SWPPP Practitioner (QSP) responsible for implementing the SWPPP and the requirements of the CGP, including training the contractor and subcontractor staff and submitting the Annual Report(s). The QSP shall also be responsible for implementing, monitoring, and revising the approved SWPPP throughout the project, for making the required inspections, and for implementing any other permit requirements stipulated in the CGP.

5. Contractor's Responsibility for Work

The contractor shall give installation of permanent erosion control measures priority over reliance on temporary measures. Permanent erosion control measures and drainage structures shall be installed as soon as possible in the construction sequencing of the project, preferably concurrent with construction of the related sub-area or drainage device.

**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. Temporary erosion and pollution control measures will be used to correct conditions that develop during construction that were not foreseen during the design stage; that are needed prior to installation of permanent control features; or that are needed temporarily to control erosion that develops during normal construction practices, but are not associated with permanent control features on the project.

Where erosion may be a problem, pavement removal operations should be scheduled and performed so that grading operations and permanent erosion control features can follow immediately if project conditions permit; otherwise, temporary erosion control measures may be required.

The Engineer shall limit the area of pavement removal, excavation, borrow, and embankment operations in progress, commensurate with the Contractor's capability and progress in keeping the finish grading, and other such permanent control measures current with the accepted schedule. If seasonal limitations make such coordination unrealistic, temporary erosion control measures shall be taken immediately to the extent feasible and justified as directed by the Engineer.

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

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

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

Whenever construction equipment must cross watercourses at frequent intervals, 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 any waterways, impoundments or into natural or manmade channels.

**156-3.5 Installation, maintenance and removal of silt fences.** Silt fences shall extend a minimum of 16 inches and a maximum of 34 inches above the ground surface. Posts shall be set no more than 10 feet on center. Filter fabric shall be cut from a continuous roll to the length required minimizing joints where possible. When joints are necessary, the fabric shall be spliced at a support post with a minimum 12-inch overlap and securely sealed. A trench shall be excavated approximately 4 inches deep by 4 inches wide on the upslope side of the silt fence. The trench shall be backfilled and the soil compacted over the silt fence fabric. The Contractor shall remove and dispose of silt that accumulates during construction and prior to establishment of permanent erosion control. The fence shall be maintained in good working condition until permanent erosion control is established. Silt fence shall be removed upon approval of the Engineer.

# **156-4 METHOD OF MEASUREMENT**

**156-4.1** Temporary erosion and pollution control work required including compliance with CGP requirements will be performed as scheduled or directed by the Engineer. Completed and accepted work will be measured as one complete item of work in accordance with the plans and specifications and accepted by the Owner.

**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.

# **156-5 BASIS OF PAYMENT**

**156-5.1** Payment will be made at the contract lump sum amount for temporary air and water pollution, soil erosion and siltation control work including CGP compliance (SWPPP). This price shall be full

compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete this item.

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 for the various items.

Payment will be made under:

Item P-156-5.1 Temporary Air and Water Pollution, Soil Erosion and Siltation Control (SWPPP) – per lump sum.

#### MATERIAL REQUIREMENTS

ASTM D6461	Standard Specification for Silt Fence Materials
AC 150/5200-33	Hazardous Wildlife Attractants

#### **END OF ITEM P-156**

#### **ITEM P-208 AGGREGATE BASE COURSE**

**208-1.1** This item shall consist of a base course composed of course aggregate bonded with fine aggregate base. It shall be constructed on a prepared subgrade or subbase course per these specifications and shall conform to the dimensions and typical cross-section shown on the plans.

# MATERIALS

**208-2.1 Aggregate base.** The aggregate base material shall consist of both fine and coarse aggregate. Material shall be clean, sound, durable particles and fragments of stone or gravel, crushed stone, or crushed gravel mixed or blended with sand, screenings, or other similar materials produced from approved sources. The aggregate shall be free from lumps of clay, organic matter, and other objectionable materials or coatings.

Crushed aggregate shall consist of clean, sound, durable stones and rock crushed to specified size and shall be free from excess soft or disintegrated pieces, dirt, or other objectionable matter. The method used to produce the crushed gravel shall result in the fractured particles in the finished product as nearly constant and uniform as practicable.

The coarse aggregate portion, defined as the portion retained on the No. 4 sieve, shall not have a loss of greater than 50% when tested per ASTM C131. The sodium sulfate soundness loss shall not exceed 12%, or the magnesium sulfate soundness loss shall not exceed 18%, after five cycles, when tested in accordance with ASTM C88. The aggregate shall have at least 60% by weight of particles with at least two fractured faces and 75% with at least one fractured face per ASTM D5821. The area of each face shall be equal to at least 75% of the smallest mid-sectional area of the piece. When two fractured faces are contiguous, the angle between the planes of fractures shall be at least 30 degrees to count as two fractured faces. The aggregate shall contain no more than 15%, by weight, of flat, elongated, or flat and elongated particles per ASTM D4791. A flat particle is one having a ratio of width to thickness greater than three (3); an elongated particle is one having a ratio of length to width greater than three (3).

The fine aggregate portion, defined as the portion passing the No. 4 sieve, produced in crushing operations shall be incorporated in the base material to the extent permitted by the gradation requirements.

**a. Sampling and testing for initial aggregate base requirements**. Samples shall be taken by the Contractor in the presence of the Engineer. Material shall meet the requirements in paragraph 208-2.1 and 208-2.2. This sampling and testing will be the basis for approval of the aggregate base quality requirements

**208-2.2 Gradation requirement.** The gradation of the aggregate base material shall meet the requirements of the gradation given in the following table when tested per ASTM C117 and ASTM C136. The gradation shall be well graded from coarse to fine as defined by ASTM D2487 and shall not vary from the lower limit on one sieve to the high limit on an adjacent sieve or vice versa. The fraction of material passing the No. 200 sieve shall not exceed one-half the fraction passing the No. 40 sieve. The portion of the filler and binder, including any blended material, passing the No. 40 sieve shall have a liquid limit not more than 25 and a plasticity index not more than five (5) when tested per ASTM D4318.

Sieve Size	Design Range Percentage by Weight	Contractor's Final Gradation	Job Control Grading Band Tolerances for Contractor's Final Gradation Percent
2 inch (50 mm)			0
1-1/2 inch (38 mm)	100		±5
1 inch (25 mm)	70-100		$\pm 8$
3/4 inch (19 mm)	55-85		$\pm 8$
No. 4 (4.75 mm)	30-60		$\pm 8$
No. 40 (0.45 mm)	10-30		±5
No. 200 (0.075 mm)	5-15		±3

# **Requirements for Gradation of Aggregate Base**

The "Job Control Grading Band Tolerances for Contractor's Final Gradation" in the table shall be applied to "Contractor's Final Gradation" to establish a job control grading band. The full tolerance still applies if application of the tolerances results in a job control grading band outside the design range.

**a. Sampling and testing for gradation.** The Contractor shall take at least two aggregate base samples per lot to check the final gradation. Sampling shall be per ASTM D75. The lot will be consistent with the lot size used for density. The samples shall be taken from the in-place, un-compacted material in the presence of the Engineer. Sampling points and intervals will be designated by the Engineer.

# **CONSTRUCTION METHODS**

**208-3.1 Operations in pits and quarries**. All work involved in clearing and stripping pits and quarries, including handling of unsuitable material, shall be performed by the Contractor. All material shall be handled in a manner that shall secure a uniform and satisfactory base product. The base course material shall be obtained from sources that have been approved by the Engineer.

**208-3.2 Preparing underlying subgrade and/or subbase**. The underlying subgrade and/or subbase shall be checked and accepted by the Engineer before base course placing and spreading operations begin. Re-proof rolling of the subgrade or proof rolling of the subbase in accordance with P-152, at the Contractor's expense, may be required by the Engineer if the Contractor fails to ensure proper drainage or protect the subgrade and/or subbase. Any ruts or soft, yielding areas due to improper drainage conditions, hauling, or any other cause, shall be corrected before the base course is placed. To ensure proper drainage, the spreading of the base shall begin along the centerline of the pavement on a crowned section or on the high side of the pavement with a one-way slope.

**208-3.3 Production.** The aggregate shall be uniformly blended and, when at a satisfactory moisture content per paragraph 208-3.5, the approved material may be transported directly to the spreading equipment.

**208-3.4 Placing**. The aggregate base material shall be placed and spread on the prepared underlying subgrade and/or subbase and compacted in layers to the thickness shown on the plans. Work shall progress without interruption. The material shall be deposited and spread in lanes in a uniform layer without segregation to such loose depth that, when compacted, the layer shall have the specified thickness. The aggregate base course shall be constructed in layers of uniform thickness of not less than 3 inches nor more than 6 inches of compacted thickness. The aggregate as spread shall be of uniform grading with no pockets of fine or coarse materials. The aggregate, unless otherwise permitted by the Engineer, shall not be spread more than 2,000 square yards in advance of the rolling. Any necessary sprinkling shall be kept within these limits. Care shall be taken to prevent cutting into the underlying layer during spreading. No material shall be placed in snow or on a soft, muddy, or frozen course. The aggregate base material shall be spread by spreader boxes or other approved devices. This equipment shall have positive thickness controls that spread the aggregate in the required amount to avoid or minimize the need for hand manipulation. Dumping from vehicles that require re-handling shall not be permitted.

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

**208-3.5 Compaction**. Immediately upon completion of the spreading operations, compact each layer of the base course, as specified, with approved compaction equipment. The number, type, and weight of rollers shall be sufficient to compact the material to the required density. The moisture content of the material during placing operations shall be within  $\pm 2$  percentage points of the optimum moisture content as determined by ASTM D6938.

**208-3.6 Acceptance sampling and testing for density**. Aggregate base course shall be accepted for density on a lot basis. A lot will consist of one day's production if it does not exceed 2400 square yards (2000 sq m). A lot will consist of one-half day's production if a day's production is between 2400 and 4800 square yards (2000 and 4000 sq m). The Engineer shall perform all density tests.

Each lot shall be divided into two equal sublots. One test shall be made for each sublot and shall consist of the average of two random locations for density determination. Sampling locations will be determined by the Engineer on a random basis per ASTM D3665.

Each lot shall be accepted for density when the field density is at least 100% of the maximum density of laboratory specimens compacted and tested per ASTM D698. The in-place field density shall be determined per ASTM D6938 using Procedure A, the direct transmission method, and ASTM D6938 shall be used to determine the moisture content of the material. The machine shall be calibrated in accordance with ASTM D6938. If the specified density is not attained, the entire lot shall be reworked and/or recompacted and two additional random tests made. This procedure shall be followed until the specified density is reached.

**208-3.7 Surface tolerances.** After the course has been compacted, the surface shall be tested for smoothness and accuracy of grade and crown. Any portion lacking the required smoothness or failing in accuracy of grade or crown shall be scarified to a depth of at least 3 inches (75 mm), reshaped and recompacted to grade until the required smoothness and accuracy are obtained and approved by the

Engineer. Any deviation in surface tolerances shall be corrected by the Contractor at the Contractor's expense. The smoothness and accuracy requirements specified here apply only to the top layer when base course is constructed in more than one layer.

**a. Smoothness.** The finished surface shall not vary more than 3/8 inch when tested with a 12-foot straightedge applied parallel with and at right angles to the centerline. The straightedge shall be moved continuously forward at half the length of the 12-foot straightedge for the full length of each line on a 50-foot.

**b.** Accuracy. The grade and crown shall be measured on a 50-foot (15-m) grid and shall be within +0 and -1/2 inch of the specified grade.

**208-3.8 Thickness control.** The thickness of the base course shall be within +0 and -1/2 inch of the specified thickness as determined by depth tests taken by the Contractor in the presence of the Engineer. Tests shall be taken at intervals representing no more than 300 square yards per test. Where the thickness is deficient by more than 1/2 inch, the Contractor shall correct such areas at no additional cost by scarifying to a depth of at least 3 inches, adding new material of proper gradation, and the material shall be blended and recompacted to grade. The Contractor shall replace, at his expense, base material where depth tests have been taken. In lieu of test holes, the contractor may provide thickness determinations by field survey. Thickness determination by survey data will require elevations to be taken before and after placement of the base.

**208-3.9 Protection.** Perform construction when the atmospheric temperature is above 35°F. When the temperature falls below 35°F, protect all completed areas by approved methods against detrimental effects of freezing. Correct completed areas damaged by freezing, rainfall, or other weather conditions to meet specified requirements. When the aggregates contain frozen materials or when the underlying course is frozen or wet, the construction shall be stopped. Hauling equipment may be routed over completed portions of the base course, provided no damage results. Equipment shall be routed over the full width of the base course to avoid rutting or uneven compaction. The Engineer will stop all hauling over completed or partially completed base course when, in the Engineer's opinion, such hauling is causing damage. Any damage to the base course shall be repaired by the Contractor at the Contractor's expense.

**208-3.10 Maintenance.** The Contractor shall maintain the base course in a satisfactory condition until the full pavement section is completed and accepted by the Engineer. The surface shall be kept clean and free from foreign material and properly drained at all times. Maintenance shall include immediate repairs to any defects and shall be repeated as often as necessary to keep the area intact. Any base course that is not paved over prior to the onset of winter shall be retested to verify that it still complies with the requirements of this specification. Any area of base course that is damaged shall be reworked or replaced as necessary to comply with this specification.

Equipment used in the construction of an adjoining section may be routed over completed base course, if no damage results and the equipment is routed over the full width of the base course to avoid rutting or uneven compaction.

# THE CONTRACTOR SHALL REMOVE ALL SURVEY AND GRADE HUBS FROM THE BASE COURSES PRIOR TO PLACING ANY BITUMINOUS SURFACE COURSE.

#### METHOD OF MEASUREMENT

**208-4.1** The quantity of aggregate base course shall be measured by the number of square yards of material actually constructed and accepted by the Engineer as complying with the plans and specifications. Base materials shall not be included in any other excavation quantities.

# **BASIS OF PAYMENT**

**208-5.1** Payment shall be made at the contract unit price per square yards for aggregate base course. This price shall be full compensation for furnishing all materials and for all operations, hauling, placing, and compacting of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-208-5.1 Aggregate Base Course (5") - per square yard

#### **TESTING REQUIREMENTS**

ASTM C29	Standard Test Method for Bulk Density ("Unit Weight") and Voids in Aggregate
ASTM C88	Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C117	Standard Test Method for Materials Finer than 75- $\mu m$ (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C131	Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM D75	Standard Practice for Sampling Aggregates
ASTM D422	Standard Test Method for Particle-Size Analysis of Soils
ASTM D698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft <sup>3</sup> (600 kN-m/m <sup>3</sup> ))
ASTM D1556	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand- Cone Method
ASTM D1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft <sup>3</sup> (2700 kN-m/m <sup>3</sup> ))
ASTM D2167	Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D3665	Standard Practice for Random Sampling of Construction Materials

ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4718	Standard Practice for Correction of Unit Weight and Water Content for Soils Containing Oversize Particles
ASTM D4791	Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM D5821	Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate
ASTM D6938	Standard Test Method for In-Place Density and Water Content of Soil and Soil- Aggregate by Nuclear Methods (Shallow Depth)

# END OF ITEM P-208

# ITEM P-403 HOT MIX ASPHALT (HMA) PAVEMENTS (BASE, LEVELING OR SURFACE COURSE)

#### **403-1 DESCRIPTION**

**403-1.1** This item shall consist of a surface course composed of mineral aggregate and asphalt cement binder (asphalt binder) 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.

#### **403-2 MATERIALS**

**403-2.1 Aggregate.** Aggregates shall consist of crushed stone, crushed gravel, screenings, natural sand and mineral filler, as required. The aggregates should be free of ferrous sulfides, such as pyrite, that would cause "rust" staining that can bleed through pavement markings. The portion retained on the No. 4 sieve is coarse aggregate. The portion 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 films of matter that would prevent thorough coating and bonding with the bituminous material and 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 C131. The sodium sulfate soundness loss shall not exceed 12%, or the magnesium sulfate soundness loss shall not exceed 18%, after five cycles, when tested in accordance with ASTM C88. Clay Lumps and friable particles shall not exceed 1.0% when tested in accordance with ASTM C142.

Aggregate shall contain at least 50 percent by weight of individual pieces having two or more fractured faces and 65 percent by weight having at least one fractured face. The area of each face shall be equal to at least 75% 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 achieved by crushing.

The aggregate shall not contain more than a total of 8%, by weight, of flat particles, elongated particles, and flat and elongated particles, when tested in accordance with ASTM D4791 with a value of 5:1

**b.** Fine aggregate. Fine aggregate shall consist of clean, sound, tough, durable, angular shaped particles produced by crushing stone 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.

The fine aggregate, including any blended material for the fine aggregate, shall have a plasticity index of not more than six (6) and a liquid limit of not more than 25 when tested in accordance with ASTM D4318.

The soundness loss shall not exceed 10% when sodium sulfate is used or 15% when magnesium sulfate is used, after five cycles, when tested per ASTM C88.

Clay lumps and friable particles shall not exceed 1.0 percent, by weight, when tested in accordance with ASTM C142.

Natural (non-manufactured) 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. The fine aggregate shall not contain more than 15% natural sand by weight of total aggregates. If used, the natural sand shall meet the requirements of ASTM D1073 and shall have a plasticity index of not more than six (6) and a liquid limit of not more than 25 when tested in accordance with ASTM D4318.

The aggregate shall have sand equivalent values of 45 or greater when tested in accordance with ASTM D2419.

**c. Sampling.** ASTM D75 shall be used in sampling coarse and fine aggregate, and ASTM C183 shall be used in sampling mineral filler.

**403-2.2 Mineral filler.** If filler, in addition to that naturally present in the aggregate, is necessary, it shall meet the requirements of ASTM D242.

**403-2.3 Asphalt cement binder.** Asphalt cement binder shall conform to ASTM D6373 Performance Grade (PG) 70-10. The PAV aging temperature for PG 70-xx and above is specified at 110°C. A certificate of compliance from the manufacturer shall be included with the mix design submittal.

The supplier's certified test report with test data indicating grade certification for the asphalt binder shall be provided to the Engineer for each load at the time of delivery to the mix plant. A certified test report with test data indicating grade certification for the asphalt binder shall also be provided to the Engineer for any modification of the asphalt binder after delivery to the mix plant and before use in the HMA.

**403-2.4 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) Clay lumps and friable particles
- (4) Percent fractured faces
- (5) Flat and elongated particles

#### b. Fine aggregate:

- (1) Liquid limit and Plasticity index
- (2) Soundness
- (3) Clay lumps and friable particles
- (4) Percent natural sand
- (5) Sand equivalent

# c. Mineral filler.

**d. Asphalt binder.** Test results for asphalt binder shall include temperature/viscosity charts for mixing and compaction temperatures.

The certifications shall show the appropriate ASTM tests 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.

**403-2.5 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.

# 403-3 COMPOSITION

**403-3.1 Composition of mixture.** The HMA plant mix shall be composed of a mixture of wellgraded aggregate, filler and anti-strip agent if required, and asphalt binder. 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).

**403-3.2 Job mix formula.** No hot-mixed asphalt (HMA) for payment shall be produced until a JMF has been approved in writing by the Engineer. The asphalt mix design and JMF shall be prepared by an accredited laboratory that meets the requirements of paragraph 403-3.4. The HMA shall be designed using procedures contained in Asphalt Institute MS-2 Mix Design Manual, 7th Edition. ASTM D6926 shall be used for preparation of specimens using the manually held and operated hammer for the mix design procedure. ASTM D6927 shall be used for testing for Marshall stability and flow.

If material variability exceeds the standard deviations indicated, the JMF and subsequent production targets shall be based on a stability greater than shown in Table 1 and the flow 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 D4867, shall not be less than 75 when tested at a saturation of 70-80% or an anti-stripping agent shall be added to the HMA, as necessary, to produce a TSR of not less than 75 when tested at a saturation of 70-80%. If an anti-strip agent is required, it shall be provided by the Contractor at no additional cost to the Owner.

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

The submitted JMF shall be stamped or sealed by the responsible professional Engineer of the laboratory and shall include the following items 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 JMF.

**b.** Percent of asphalt cement.

c. Asphalt performance, grade, and type of modifier if used.

d. Number of blows per side of molded specimen.

e. Laboratory mixing temperature.

**f.** Laboratory compaction temperature.

**g.** Temperature-viscosity relationship of the PG asphalt cement binder showing acceptable range of mixing and compaction temperatures and for modified binders include supplier recommended mixing and compaction temperatures.

**h.** Plot of the combined gradation on the 0.45 power gradation curve.

**i.** Graphical plots of stability, flow, air voids, voids in the mineral aggregate, and unit weight versus asphalt content.

j. Specific gravity and absorption of each aggregate.

**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.** Anti-strip agent (if required).

 $\mathbf{p}$ . Date the JMF was developed. Mix designs that are not dated or which are from a prior construction season shall not be accepted.

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 JMF requirements specified in Tables 1 and 3.

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

The JMF 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 JMF must be submitted within 15 days and approved by the Engineer in writing before the new material is used. After the initial production JMF has been approved by the Engineer and a new or modified JMF is required for whatever reason, the subsequent cost of the Engineer's approval of the new or modified JMF 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 JMF.

The Marshall Design Criteria applicable to the project shall be as specified in Table 1.

Test Property	Value	
Number of blows	50	
Stability, pounds minimum	1000	
Flow, 0.01 inch	8-20	
Air voids (percent)	3.5	
Percent voids in mineral aggregate, minimum	See Table 2.	

Table 1. Marshall Design Criteria

Aggregate (See Table 3)	Minimum VMA
Gradation 2	15

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 C136 and ASTM C117.

The gradations in Table 3 represent the limits that shall determine the suitability of aggregate for use from the sources of supply, be well graded from coarse to fine and shall not vary from the low limit on one sieve to the high limit on the adjacent sieve, or vice versa.

Sieve Size	Percentage by Weight Passing Sieve	
1 inch		
3/4 inch	100	
1/2 inch	79-99	
3/8 inch	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:		
Stone or gravel	5.0-7.5	

Table 3. Aggregate - HMA Pavements

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

403-3.3 Reclaimed asphalt concrete (RAP). RAP shall not be used.

**403-3.4 Job mix formula (JMF) laboratory.** The Contractor's laboratory used to develop the JMF shall be accredited in accordance with ASTM D3666. 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.

**403-3.5 Test section.** Prior to full production, the Contractor shall prepare and place a quantity of HMA according to the JMF. The amount of HMA shall be sufficient to construct a test section a minimum of 400 feet long and 30 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 for this test section is an exposed construction joint at least four (4) hours old or whose mat has cooled to less than 160°F. The cold joint must be cut back using the same procedure that will be used during production in accordance with 403-4.12. 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 403-5.1 and 403-5.2. The test section shall be divided into equal sublots. As a minimum, the test section shall consist of three (3) sublots.

The test section shall be considered acceptable if the average mat density of the test section cores is greater than or equal to 96% and the average joint density of the test section cores is greater than or equal to 94%.

If the initial test section should prove to be unacceptable, the necessary adjustments to the JMF, 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 test 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 403-8.1.

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 JMF. If the 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 asphalt content determined in the same manner as for the original JMF tests.

Contractor will not be allowed to place the test section until the Contractor Quality Control Program, showing conformance with the requirements of paragraph 403-6.1, has been approved, in writing, by the Engineer.

# **403-4 CONSTRUCTION METHODS**

**403-4.1 Weather limitations.** The HMA 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.

Mat Thickness	Base (Minimum)	Temperature
	Degrees F	
3 inches or greater	40	
Greater than 2 inches but less than 3 inches	45	

Table 4. Surface Temperature Limitations of Underlying Course

**403-4.2 HMA plant.** Plants used for the preparation of HMA shall conform to the requirements of American Association of State Highway and Transportation Officials (AASHTO) M156 with the following changes:

**a.** Requirements for all plants include:

(1) Truck scales. The HMA 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, subsection 90-01.

In lieu of scales, and as approved by the Engineer, HMA weights may be determined by the use of an electronic weighing system equipped with an automatic printer that weighs the total HMA production and as often thereafter as requested by the Engineer.

(2) Testing facilities. The Contractor shall ensure laboratory facilities are provided at the plant for the use of the Engineer. The lab shall have sufficient space and equipment so that both testing representatives (Engineer's and Contractor's) can operate efficiently. The lab shall meet the requirements of ASTM D3666 including all necessary equipment, materials, and current reference standards to comply with the specifications and masonry saw with diamond blade for trimming pavement cores and samples. The plant testing laboratory shall have a floor space area of not less than 200 square feet, with a ceiling height of not less than 7-1/2 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°F  $\pm$ 5°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. In addition, the facility shall include the minimum:

(a) Adequate artificial lighting.

(b) Electrical outlets sufficient in number and capacity for operating the required testing equipment and drying samples.

(c) A minimum of two (2) Underwriter's Laboratories approved fire extinguishers of the appropriate types and class.

(d) Work benches for testing.

(e) Desk with chairs and file cabinet.

- (f) Sanitary facilities convenient to testing laboratory.
- (g) Exhaust fan to outside air.
- (h) Sink with running water.

Failure to provide the specified facilities shall be sufficient cause for disapproving HMA plant operations.

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.

(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. The HMA stored in storage and surge bins shall meet the same requirements as HMA loaded directly into trucks and may be permitted under the following conditions:

(a) Stored in non-insulated bins for a period of time not to exceed three (3) hours.

(b) Stored in insulated storage bins for a period of time not to exceed eight (8) hours.

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

**403-4.3 Hauling equipment.** Trucks used for hauling HMA shall have tight, clean, and smooth metal beds. To prevent the HMA from sticking to the truck beds, the truck beds shall be lightly coated with a minimum amount of paraffin oil, lime solution, or other material approved by the Engineer. Petroleum products shall not be used for coating truck beds. Each truck shall have a suitable cover to protect the mixture from adverse weather. When necessary, to ensure that the mixture will be delivered to the site at the specified temperature, truck beds shall be insulated or heated and covers shall be securely fastened.

403-4.3.1 Material transfer vehicle (MTV). A material transfer vehicle is not required.

**403-4.4 HMA pavers.** HMA pavers shall be self-propelled with an activated heated screed, capable of spreading and finishing courses of HMA 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 HMA 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.

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.

**403-4.4.1 Automatic grade control.** The HMA 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  $\pm 0.1\%$ .

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 (9 m) in length
- **b.** Taut stringline (wire) set to grade
- c. Short ski or shoe
- d. Laser control

**403-4.5 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 HMA. The number, type, and weight of rollers shall be sufficient to compact the HMA 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 their own expense.

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

**403-4.5.1 Density device.** The Contractor shall have on site a density gauge during all paving operations in order to assist in the determination of the optimum rolling pattern, type of roller and frequencies, as well as to monitor the effect of the rolling operations during production paving. The Contractor shall also supply a qualified technician during all paving operations to calibrate the density gauge and obtain accurate density readings for all new HMA. 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.

**403-4.6 Preparation of asphalt binder.** The asphalt binder shall be heated in a manner that will avoid local overheating and provide a continuous supply of the bituminous material to the mixer at a uniform temperature. The temperature of the unmodified asphalt binder delivered to the mixer shall be sufficient to provide a suitable viscosity for adequate coating of the aggregate particles, but shall not exceed 325°F when added to the aggregate. The temperature of modified asphalt binder shall be no more than 350°F when added to the aggregate.

**403-4.7 Preparation of mineral aggregate.** The aggregate for the HMA shall be heated and dried. The maximum temperature and rate of heating shall be such that no damage occurs to the aggregates. The temperature of the aggregate and mineral filler shall not exceed 350°F when the asphalt binder is

added. Particular care shall be taken that aggregates high in calcium or magnesium content are not damaged by overheating. The temperature shall not be lower than is required to obtain complete coating and uniform distribution on the aggregate particles and to provide a mixture of satisfactory workability.

**403-4.8 Preparation of HMA.** The aggregates and the asphalt binder shall be weighed or metered and introduced into the mixer in the amount specified by the JMF.

The combined materials shall be mixed until the aggregate obtains a uniform coating of asphalt binder and is thoroughly distributed throughout the mixture. Wet mixing time shall be the shortest time that will produce a satisfactory mixture, but not less than 25 seconds for batch plants. The wet mixing time for all plants shall be established by the Contractor, based on the procedure for determining the percentage of coated particles described in ASTM D2489, for each individual plant and for each type of aggregate used. The wet mixing time will be set to achieve 95% of coated particles. For continuous mix plants, the minimum mixing time shall be determined by dividing the weight of its contents at operating level by the weight of the mixture delivered per second by the mixer. The moisture content of all HMA upon discharge shall not exceed 0.5%.

**403-4.9 Preparation of the underlying surface.** Immediately before placing the HMA, the underlying course shall be cleaned of all dust and debris. A tack coat shall be applied in accordance with P-603, if shown on the plans.

**403-4.10 Laydown plan, transporting, placing, and finishing.** Prior to the placement of the HMA, 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 locations, and laydown temperature. The laydown plan shall also include estimated time of completion for each portion of the work (that is, milling, paving, rolling, cooling, etc.). Modifications to the laydown plan shall be approved by the Engineer.

The HMA shall be transported from the mixing plant to the site in vehicles conforming to the requirements of paragraph 403-4.3. Deliveries shall be scheduled so that placing and compacting of HMA 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.

The Contractor shall have the option to use a material transfer vehicle to deliver HMA to the paver.

The alignment and elevation of the paver shall be regulated from outside reference lines established for this purpose for the first lift of all runway and taxiway pavements. Successive lifts of HMA surface course may be placed using a ski, or laser control per paragraph 403-4.4.1, provided grades of the first lift of bituminous surface course meet the tolerances of paragraphs 403-5.2b(5) as verified by a survey. Contractor shall survey each lift of HMA surface course and certify to Engineer that every lot of each lift meets the grade tolerances of paragraph 403-5.2b(5) before the next lift can be placed.

The initial placement and compaction of the HMA shall occur at a temperature suitable for obtaining density, surface smoothness, and other specified requirements but not less than  $250^{\circ}$ F.

Edges of existing HMA pavement abutting the new work shall be saw cut and carefully removed as shown on the drawings and coated with asphalt 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 HMA mat. Unless otherwise permitted, placement of the HMA shall begin along the centerline of a crowned section or on the high side of areas with a one-way slope. The HMA shall be placed in consecutive adjacent strips having a minimum width of 12.5 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 one foot; however, the joint in the surface top course shall be at the centerline of crowned pavements. Transverse joints in one course shall be offset by at least 10 feet from transverse joints in the previous course.

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

On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the HMA may be spread and luted by hand tools.

Areas of segregation in the 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.

**403-4.11 Compaction of HMA.** After placing, the HMA 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 using a water soluble asphalt release agent approved by the Engineer.

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 HMA 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.

**403-4.12 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 HMA except when necessary to form a transverse joint. When necessary to form a transverse joint, it shall be made by means of placing a bulkhead or by tapering the course. The tapered edge shall be cut back to its full depth and width on a straight line to expose a

vertical face prior to placing the adjacent lane. In both methods, all contact surfaces shall be coated with an asphalt tack coat before placing any fresh HMA against the joint.

Longitudinal joints which are have been left exposed for more than four (4) hours; the surface temperature has cooled to less than 175°F; or are irregular, damaged, uncompacted or otherwise defective shall be cut back 3 inches to 6 inches to expose a clean, sound, uniform vertical surface for the full depth of the course. All cutback material shall be removed from the project. A asphalt tack coat or other product approved by the Engineer shall be applied to the clean, dry joint prior to placing any additional fresh HMA against the joint. Any laitance produced from cutting joints shall be removed by vacuuming and washing. The cost of this work shall be considered incidental to the cost of the HMA.

**403-4.13 Diamond grinding.** When required, diamond grinding shall be accomplished by sawing with saw blades impregnated with industrial diamond abrasive. The saw blades shall be assembled in a cutting head mounted on a machine designed specifically for diamond grinding that will produce the required texture and smoothness level without damage to the pavement. The saw blades shall be 1/8-inch wide and there shall be a minimum of 55 to 60 blades per 12 inches of cutting head width; the actual number of blades will be determined by the Contractor and depend on the hardness of the aggregate. Each machine shall be capable of cutting a path at least 3 feet wide. Equipment that causes ravels, aggregate fractures, spalls or disturbance to the pavement will not be permitted. The depth of grinding shall not exceed 1/2 inch and all areas in which diamond grinding has been performed will be subject to the final pavement thickness tolerances specified. Grinding will be tapered in all directions to provide smooth transitions to areas not requiring grinding. Areas that have been ground will be sealed with a P-608 surface treatment as directed by the Engineer. It may be necessary to seal a larger area to avoid surface treatment creating any conflict with runway or taxiway markings.

**403-4.14 Nighttime Paving Requirements.** 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 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.** A lighting plan must be submitted by the Contractor and approved by the Engineer prior to the start of any nighttime work.

# 403.5 MATERIAL ACCEPTANCE

**403-5.1 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 be accredited in accordance with ASTM D3666. 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.

**a. Hot mixed asphalt.** Plant-produced HMA shall be tested for air voids, stability and flow 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 D979.

A standard lot shall be equal to one day's production or 2000 tons whichever is smaller. If the day's production is expected to exceed 2000 tons, but less than 4000 tons, the lot size shall be 1/2 day's production. If the day's production exceeds 4000 tons, the lot size shall be an equal sized fraction of the day's production, but shall not exceed 2000 tons.

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

(1) **Sampling.** Each lot will consist of four equal sublots. Sufficient HMA 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 D3665. Samples will be taken in accordance with ASTM D979.

The sample of HMA 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 JMF.

(2) Testing. Sample specimens shall be tested for stability and flow in accordance with ASTM D6927. Air voids will be determined by the Engineer in accordance with ASTM D3203. One set of laboratory compacted specimens will be prepared for each sublot in accordance with ASTM D6926 at the number of blows required by paragraph 403-3.2, Table 1. Each set of laboratory compacted specimens will consist of three test specimens prepared from the same sample. The manual hammer in ASTM D6926 shall be used.

Prior to testing, the bulk specific gravity of each test specimen shall be measured by the Engineer in accordance with ASTM D2726 using the procedure for laboratory-prepared thoroughly dry specimens 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 sublot in accordance with ASTM D2041. The value used in the air voids computation for each sublot shall be based on theoretical maximum specific gravity measurement for the sublot.

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

(3) Acceptance. Acceptance of plant produced HMA for stability, flow, and air voids shall be determined by the Engineer in accordance with the requirements of paragraph 403-5.1.

**b.** In-place HMA. HMA placed in the field shall be tested for mat and joint density on a lot basis. A standard lot shall be equal to one day's production or 2000 tons whichever is smaller. If the day's production is expected to exceed 2000 tons, but less than 4000 tons, the lot size shall be 1/2 day's production. If the day's production exceeds 4000 tons, the lot size shall be an equal sized fraction of the day's production, but shall not exceed 2000 tons.

(1) Mat density. The lot size shall be the same as that indicated in paragraph 403-5.1a The lot shall be divided into four equal sublots. One core of finished, compacted HMA shall be taken by the Contractor from each sublot. Core locations will be determined by the Engineer on a random basis in accordance with procedures contained in ASTM D3665. Cores for mat density 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 HMA as defined in paragraph 403-5.1a. The lot shall be divided into four equal sublots. One core of finished, compacted HMA shall be taken by the Contractor from each sublot. Core locations will be determined by the Engineer on a random basis in accordance with procedures contained in ASTM D3665. All cores for joint density shall be taken 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 diamond core drill bit. Samples will be taken in accordance with ASTM D979. The minimum diameter of the sample shall be 5 inches. Samples that are 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. Laitance produced by the coring operation shall be removed immediately. The top most lift of bituminous material shall be completely bonded to the underlying layers of bituminous material. If any of the cores reveal that the surface is not bonded to the Engineer in accordance with paragraph 403-5.1b to determine the extent of any delamination. All delaminated areas shall be completely removed by milling to the limits and depth and replaced as directed by the Engineer at no additional cost.

(4) **Testing.** The bulk specific gravity of each cored sample will be measured by the Engineer in accordance with ASTM D2726. Samples will be taken in accordance with ASTM D979. The percent compaction (density) of each sample will be determined by dividing the bulk specific gravity of each sublot sample by the average bulk specific gravity of all laboratory prepared specimens for the lot, as determined in paragraph 403-5.1a(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 HMA for mat density will be determined by the Engineer in accordance with the requirements of paragraph 403-5.2b(1). Acceptance for joint density will be determined by the Engineer in accordance with the requirements of paragraph 403-5.2b(2).

c. Partial lots HMA. 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 sublot 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 sublot 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, that is, 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. 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, that is, n = 3.

#### 403-5.2 Acceptance criteria.

**a.** General. Acceptance will be based on the following characteristics of the HMA and completed pavement and test results:

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

Mat density will be evaluated for acceptance in accordance with paragraph 403-5.2b(1). Stability and flow will be evaluated for acceptance in accordance with paragraph 403-5.1. Joint density will be evaluated for acceptance in accordance with paragraph 403-5.2b(2).

Thickness will be evaluated by the Engineer for compliance in accordance with paragraph 403-5.2b(3). Acceptance for smoothness will be based on the criteria contained in paragraph 403-5.2b(4). Acceptance for grade will be based on the criteria contained in paragraph 403-5.2b(5).

The Engineer may at any time reject and require the Contractor to dispose of any batch of HMA 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. Acceptance of each lot of plant produced material for mat density shall be based on the average of all of the densities taken from the sublots. If the average mat density of the lot

so established equals or exceeds 96%, the lot shall be acceptable. If the average mat density of the lot is below 96%, the lot shall be removed and replaced at the Contractor's expense.

(2) Joint density. Acceptance of each lot of plant produced HMA for joint density shall be based on the average of all of the joint densities taken from the sublots. If the average joint density of the lot so established equals or exceeds 94%, the lot shall be acceptable. If the average joint density of the lot is less than 94%, the Contractor shall stop production and evaluate the method of compacting joints. Production may resume once the reason for poor compaction has been determined and appropriate measures have been taken to ensure proper compaction.

(3) Thickness. Thickness of each 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 sublot for density measurement. The maximum allowable deficiency at any point shall not be more than 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 thickness deficiency exceeds the specified tolerances, the lot or sublot shall be corrected by the Contractor at his expense by removing the deficient area and replacing with new pavement. The Contractor, at his expense, may take additional cores as approved by the Engineer to circumscribe the deficient area.

(4) Smoothness. The final surface shall be free from roller marks. After final rolling, but not later than 24 hours after placement, the surface of each lot shall be tested in both longitudinal and transverse directions for smoothness to reveal all surface irregularities exceeding the tolerances specified. The Contractor shall furnish paving equipment and employ methods that produce a surface for each pavement lot such that the finished surface course of the pavement shall not vary more than 1/4 inch (6mm) when evaluated with a 12-foot (3.7m) straightedge. When the surface course smoothness exceeds specification tolerances which cannot be corrected by diamond grinding of the surface course, full depth removal and replacement of surface course corrections shall be to the limit of the longitudinal placement. Corrections involving diamond grinding will be subject to the final pavement thickness tolerances specified. The Contractor shall apply a surface treatment per Item P-608 to all areas that have been subject to grinding as directed by the Engineer.

- a. Transverse measurements. Transverse measurements will be taken for each lot placed. Transverse measurements will be taken perpendicular to the pavement centerline each 50 feet (15m) or more often as determined by the Engineer.
  - 1) Testing shall be continuous across all joints, starting with one-half the length of the straightedge at the edge of pavement section being tested and then moved ahead one-half the length of the straightedge for each successive measurement. Smoothness readings will not be made across grade changes or cross slope transitions; at these transition areas, the straightedge position shall be adjusted to measure surface smoothness and not design grade or cross slope transitions. The amount of surface irregularity shall be determined by placing the freestanding (unleveled) straightedge on the pavement surface and allowing it to rest upon the two highest spots covered by its length, and measuring the maximum gap between the straightedge and the pavement surface in the area between these two high points. Deviations on final surface course > 1/4 inch (6mm) in transverse direction shall be corrected with diamond grinding per paragraph 403-4.13 or by removing and replacing full depth of surface course.

requiring grinding. The area corrected by grinding should not exceed 10% of the total area and these areas shall be retested after grinding.

- 2) The joint between lots shall be tested separately to facilitate smoothness between lots. The amount of surface irregularity shall be determined by placing the freestanding (unleveled) straightedge on the pavement surface, with half the straightedge on one side of the joint and the other half of the straightedge on the other side of the joint. Measure the maximum gap between the straightedge and the pavement surface in the area between these two high points. One measurement shall be taken at the joint every 50 feet (15m) or more often if directed by the Engineer. Deviations on final surface course > 1/4 inch (6mm) in transverse direction shall be corrected with diamond grinding per paragraph 403-4.13 or by removing and replacing full depth of surface course. Each measurement shall be recorded and a copy of the data shall be furnished to the Engineer at the end of each days testing.
- 3) Longitudinal measurements. Longitudinal measurements will be taken for each lot placed. Longitudinal tests will be parallel to the centerline of paving; at the center of paving lanes when widths of paving lanes are less than 20 feet (6m); and the third points of paving lanes when widths of paving lanes are 20 ft (6m) or greater. The finished surface shall not vary more than 1/4 inch (6mm) when evaluated with a 12foot (3.7m) straightedge. Smoothness readings will not be made across grade changes or cross slope transitions; at these transition areas, the straightedge position shall be adjusted to measure surface smoothness and not design grade or cross slope transitions. Testing shall be continuous across all joints, starting with one-half the length of the straightedge at the edge of pavement section being tested and then moved ahead onehalf the length of the straightedge for each successive measurement. The amount of surface irregularity shall be determined by placing the freestanding (unleveled) straightedge on the pavement surface and allowing it to rest upon the two highest spots covered by its length, and measuring the maximum gap between the straightedge and the pavement surface in the area between these two high points. Deviations on final surface course > 1/4 inch (6mm) in longitudinal direction will be corrected with diamond grinding per paragraph 403-4.13 or by removing and replacing full depth of surface course. Grinding will be tapered in all directions to provide smooth transitions to areas not requiring grinding. The area corrected by grinding should not exceed 10% of the total area and these areas shall be retested after grinding. The primary purpose of smoothness testing is to identify areas that may be prone to ponding of water which could lead to hydroplaning of aircraft. If the contractor's machines and/or methods are producing significant areas that need corrective actions then production should be stopped until corrective measures can be implemented. If corrective measures are not implemented and when directed by the Engineer, production shall be stopped until corrective measures can be implemented.

(5) Grade. Grade shall be evaluated on the first day of placement and then every day to allow adjustments to paving operations if measurements do not meet specification requirements. The Contractor must submit the survey data to the Engineer by the following day after measurements have been taken. The finished surface of the pavement shall not vary from the gradeline elevations and cross-sections shown on the plans by more than 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 2,000 square yards. When more than 15% of all the measurements within a lot are outside the specified tolerance, or if any one shot within the lot deviates 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. High point grinding will be limited to 15 square yard. 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 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. Areas in excess of 15 square yard will require removal and replacement of the pavement in accordance with the limitations noted above. Contractor shall apply a surface treatment per P-608 to all areas that have been subject to grinding.

**c. Density outliers.** If the tests within a lot include a very large or a very small value that appears to be outside the normal limits of variation, check for an outlier in accordance with ASTM E178, at a significance level of 5%, to determine if this value should be discarded.

#### 403-5.3 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 403-5.1. Only one resampling per lot will be permitted.

(1) A redefined mat density shall be calculated for the resampled lot. The number of tests used to calculate the redefined mat density 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 mat density for a resampled lot shall be used to evaluate the acceptance of that lot in accordance with paragraph 403-5.2.

c. Outliers. Check for outliers in accordance with ASTM E178, at a significance level of 5%.

403-5.4 Leveling course. Not Used.

# 403-6 CONTRACTOR QUALITY CONTROL

**403-6.1 General.** 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 403-6.3, 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 403-6.3 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.

**403-6.2 Contractor testing laboratory.** The lab shall meet the requirements of ASTM D3666 including all necessary equipment, materials, and current reference standards to comply with the specifications.

**403-6.3 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 asphalt content tests shall be performed per lot in accordance with ASTM D6307 or ASTM D2172 if the correction factor in ASTM D6307 is greater than 1.0. The asphalt content for the lot will be determined by averaging the test results.

**b.** Gradation. Aggregate gradations shall be determined a minimum of twice per lot from mechanical analysis of extracted aggregate in accordance with ASTM D5444 and ASTM C136, and ASTM C117.

**c. Moisture content of aggregate.** The moisture content of aggregate used for production shall be determined a minimum of once per lot in accordance with ASTM C566.

**d. Moisture content of HMA.** The moisture content of the HMA shall be determined once per lot in accordance with ASTM D1461 or AASHTO T329

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

**f. In-place density monitoring.** The Contractor shall conduct any necessary testing to ensure that the specified density is being achieved. A nuclear gauge may be used to monitor the pavement density in accordance with ASTM D2950.

**g.** 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.

**403-6.4 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.

**403-6.5 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, asphalt content, and VMA. The VMA for each sublot will be calculated and monitored by the Quality Control laboratory.

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, asphalt content, and VMA. The control charts shall use the JMF target values as indicators of central tendency for the following test parameters with associated Action and Suspension Limits:

Control Chart Limits For Individual Measurements		
Sieve	Action Limit	Suspension Limit
3/4 inch	±6%	<u>+</u> 9%
1/2 inch	±6%	±9%
3/8 inch	±6%	±9%
No. 4	±6%	±9%
No. 16	±5%	±7.5%
Control Chart Limits For Individual Measurements		
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Sieve	Action Limit	Suspension Limit
No. 50	±3%	±4.5%
No. 200	±2%	±3%
Asphalt Content	±0.45%	±0.70%
VMA	-1.00%	-1.5%

**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	
1/2 inch	11%	
3/8 inch	11%	
No. 4	11%	
No. 16	9%	
No. 50	6%	
No. 200 (	3.5%	
Asphalt Content	0.8%	

**c.** Corrective action. The 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.

**403-6.6 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.

## 403-7 METHOD OF MEASUREMENT

**403-7.1 Measurement.** Plant mix bituminous concrete pavement shall be measured by the number of tons of HMA used in the accepted work. Recorded batch weights or truck scale weights will be used to determine the basis for the tonnage.

## 403-8 BASIS OF PAYMENT

**403-8.1 Payment.** Payment for a lot of HMA meeting all acceptance criteria as specified in paragraph 403-5.2 shall be made at the contract unit price per ton for HMA. 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.

Payment will be made under:

Item P-403-8.1 HMA Surface Course - per ton

### **TESTING REQUIREMENTS**

AASHTO M156	Standard Specification for Requirements for Mixing Plants for Hot-Mixed, Hot- Laid Bituminous Paving Mixtures
ASTM C29	Standard Test Method for Bulk Density ("Unit Weight") and Voids in Aggregate
ASTM C88	Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C117	Standard Test Method for Materials Finer than 75- $\mu m$ (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C127	Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate
ASTM C131	Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C183	Standard Practice for Sampling and the Amount of Testing of Hydraulic Cement
ASTM C566	Standard Test Method for Total Evaporable Moisture Content of Aggregate by Drying
ASTM D75	Standard Practice for Sampling Aggregates
ASTM D979	Standard Practice for Sampling Bituminous Paving Mixtures

ASTM D1073	Standard Specification for Fine Aggregate for Bituminous Paving Mixtures
ASTM D1074	Standard Test Method for Compressive Strength of Bituminous Mixtures
ASTM D1461	Standard Test Method for Moisture or Volatile Distillates in Bituminous Paving Mixtures
ASTM D2041	Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
ASTM D2172	Standard Test Method for Quantitative Extraction of Bitumen from Bituminous Paving Mixtures
ASTM D2419	Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate
ASTM D2489	Standard Practice for Estimating Degree of Particle Coating of Bituminous- Aggregate Mixtures
ASTM D2726	Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures
ASTM D2950	Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods
ASTM D3203	Standard Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures
ASTM D3665	Standard Practice for Random Sampling of Construction Materials
ASTM D3666	Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials
ASTM D4125	Standard Test Methods for Asphalt Content of Bituminous mixtures by the Nuclear Method
ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4791	Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM D4867	Standard Test Method for Effect of Moisture on Asphalt Concrete Paving Mixtures
ASTM D5444	Standard Test Method for Mechanical Size Analysis of Extracted Aggregate
ASTM D5581	Standard Test Method for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus (6 inch-Diameter Specimen)
ASTM D6307	Standard Test Method for Asphalt Content of Hot-Mix Asphalt by Ignition Method
ASTM D6926	Standard Practice for Preparation of Bituminous Specimens Using Marshall Apparatus
ASTM D6927	Standard Test Method for Marshall Stability and Flow of Bituminous Mixtures

ASTM D6752	Standard Test Method for Bulk Spec Bituminous Mixtures Using Automatic	ific Gravity and Density of Compac Vacuum Sealing Method	cted
ASTM E11	Standard Specification for Woven Wire Test Sieve Cloth and Test Sieves		
ASTM E178	Standard Practice for Dealing with Out	tlying Observations	
AASHTO T030	Standard Method of Test for Mechanica	al Analysis of Extracted Aggregate	
AASHTO T110	Standard Method of Test for Moisture (HMA)	or Volatile Distillates in Hot Mix Asp	halt
AASHTO T275	Standard Method of Test for Bulk Spe Mix Asphalt (HMA) Using Paraffin-Co	ecific Gravity (Gmb) of Compacted ated Specimens).	Hot
Asphalt	Institute Asphalt Binder	Handbook MS	3-26

Asphalt Institute MS-2 Mix Design Manual, 7th Edition

# MATERIAL REQUIREMENTS

ASTM D242	Standard Specification for Mineral Filler for Bituminous Paving Mixtures
ASTM D946	Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction
ASTM D3381	Standard Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction
ASTM D4552	Standard Practice for Classifying Hot-Mix Recycling Agents
ASTM D6373	Standard Specification for Performance Graded Asphalt Binder

# END OF ITEM P-403

## **ITEM P-603 BITUMINOUS TACK COAT**

### 603-1 DESCRIPTION

**603–1.1** This item shall consist of preparing and treating a bituminous surface with bituminous material in accordance with these specifications and in reasonably close conformity to the lines shown on the plans.

## 603-2 MATERIALS

**603-2.1 Bituminous materials.** The bituminous material shall be emulsified asphalt indicated in ASTM D3628 as a bituminous application for tack coat appropriate to local conditions or as designated by the Engineer.

## 603-3 CONSTRUCTION METHODS

**603-3.1 Weather limitations.** The tack coat shall be applied only when the existing surface is dry and the atmospheric temperature is  $50^{\circ}$ F or above; the temperature has not been below  $35^{\circ}$ F for the 12 hours prior to application; and when the weather is not foggy or rainy. The temperature requirements may be waived when directed by the Engineer.

**603-3.2 Equipment.** The Contractor shall provide equipment for heating and applying the bituminous material.

Provide a distributor with pneumatic tires of such size and number that the load produced on the base surface does not exceed 65.0 psi of tire width to prevent rutting, shoving or otherwise damaging the base, surface or other layers in the pavement structure. Design and equip the distributor to spray the bituminous material in a uniform coverage at the specified temperature, at readily determined and controlled rates from 0.05 to 2.0 gallons per square yard, with a pressure range of 25 to 75 psi and with an allowable variation from the specified rate of not more than  $\pm 5\%$ , and at variable widths. Include with the distributor equipment a separate power unit for the bitumen pump, full-circulation spray bars, tachometer, pressure gauges, volume-measuring devices, adequate heaters for heating of materials to the proper application temperature, a thermometer for reading the temperature of tank contents, and a hand hose attachment suitable for applying bituminous material manually to areas inaccessible to the distributor. Equip the distributor to circulate and agitate the bituminous material during the heating process. If the distributor is not equipped with an operable quick shutoff 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 power blower suitable for cleaning the surfaces to which the bituminous tack coat is to be applied shall be provided.

**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 power blower 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 the overlying mixture is placed on the tacked surface.

The bituminous material including vehicle shall be uniformly applied with a bituminous distributor at the rate of 0.05 to 0.10 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.

After application of the tack coat, the surface shall be allowed to cure without being disturbed for the period of time necessary to permit drying and setting of the tack coat. This period shall be determined by the Engineer. The Contractor shall protect the tack coat and maintain the surface until the next course has been placed.

**603-3.4 Bituminous material Contractor's responsibility.** The Contractor shall provide a statement of source and character of the proposed bituminous material which must be submitted and approved by the Engineer before any shipment of bituminous materials to the project.

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 be provided to and approved by the Engineer before the bituminous material is applied. If the bituminous material does not meet the specifications, it shall be replaced at the Contractor's expense. Furnishing the vendor's certified test report for the bituminous material shall not be interpreted as a basis for final acceptance.

**603-3.5 Freight and weigh bills** The Contractor shall submit waybills and delivery tickets, during progress of the work. Before the final statement is allowed, file with the Engineer certified waybills and certified delivery tickets for all bituminous materials used in the construction of the pavement covered by the contract. Do not remove bituminous material from storage until the initial outage and temperature measurements have been taken. The delivery or storage units will not be released until the final outage has been taken.

## 603-4 METHOD OF MEASUREMENT

**603-4.1** The bituminous material for tack coat shall be measured by the ton. Volume shall be corrected to the volume at 60°F in accordance with ASTM D1250. The bituminous material paid for will be the measured quantities used in the accepted work, provided that the measured quantities are not 10% over the specified application rate. Any amount of bituminous material more than 10% over the specified application rate for each application will be deducted from the measured quantities, except for irregular areas where hand spraying of the bituminous material is necessary. Water added to emulsified asphalt will not be measured for payment.

## 603-5 BASIS OF PAYMENT

**603.5-1** Payment shall be made at the contract unit price per ton of bituminous material. This price shall be full compensation for furnishing all materials, for all preparation, delivery, and application of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-603-5.1 Bituminous Tack Coat - per ton

# MATERIAL REQUIREMENTS

ASTM D977	Standard Specification for Emulsified Asphalt
ASTM D1250	Standard Guide for Use of the Petroleum Measurement Tables
ASTM D2397	Standard Specification for Cationic Emulsified Asphalt
ASTM D3628	Standard Practice for Selection and Use of Emulsified Asphalts

# END ITEM P-603

### ITEM P-610 STRUCTURAL PORTLAND CEMENT CONCRETE

#### DESCRIPTION

**610-1.1** This item shall consist of plain structural Portland cement concrete (PCC), prepared and constructed in accordance with these specifications, at the locations and of the form and dimensions shown on the plans. This specification shall be used for all structural and miscellaneous concrete including signage bases.

### MATERIALS

**610-2.1 General.** Only approved materials, conforming to the requirements of these specifications, shall be used in the work. Materials may be subject to inspection and tests at any time during their preparation or use. The source of all materials shall be approved by the Engineer before delivery or use in the work. Representative preliminary samples of the materials shall be submitted by the Contractor, when required, for examination and test. Materials shall be stored and handled to ensure preservation of their quality and fitness for use and shall be located to facilitate prompt inspection. All equipment for handling and transporting materials and concrete must be clean before any material or concrete is placed in them.

The use of pit-run aggregates shall not be permitted unless the pit-run aggregate has been screened and washed, and all fine and coarse aggregates stored separately and kept clean. The mixing of different aggregates from different sources in one storage stockpile or alternating batches of different aggregates shall not be permitted.

**a. Reactivity.** Fine and Coarse aggregates to be used in all concrete shall be evaluated and tested by the Contractor for alkali-aggregate reactivity in accordance with both ASTM C1260 and C1567. Aggregate and mix proportion reactivity tests shall be performed for each project.

(1) Coarse and fine aggregate shall be tested separately in accordance with ASTM C1260. The aggregate shall be considered innocuous if the expansion of test specimens, tested in accordance with ASTM C1260, does not exceed 0.10% at 28 days (30 days from casting).

(2) Combined coarse and fine aggregate shall be tested in accordance with ASTM C1567, modified for combined aggregates, using the proposed mixture design proportions of aggregates, cementitious materials, and/or specific reactivity reducing chemicals. If lithium nitrate is proposed for use with or without supplementary cementitious materials, the aggregates shall be tested in accordance with Corps of Engineers (COE) CRD C662. If lithium nitrate admixture is used, it shall be nominal  $30\% \pm 0.5\%$  weight lithium nitrate in water.

(3) If the expansion of the proposed combined materials test specimens, tested in accordance with ASTM C1567, modified for combined aggregates, or COE CRD C662, 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 C33. 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 the following gradation shown in the table below when tested per ASTM C136.

Sieve Designation	Percentage by Weight Passing Sieves						
(square openings)	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

**610-2.2.1 Aggregate susceptibility to durability (D) cracking.** Aggregates that have a history of D-cracking shall not be used.

610-2.3 Fine aggregate. The fine aggregate for concrete shall meet the requirements of ASTM C33.

The fine aggregate shall be well graded from fine to coarse and shall meet the requirements of the table below when tested in accordance with ASTM C136:

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

Gradation For Fine Aggregate

Blending will be permitted, if necessary, 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, if the deficiency does not exceed 5% and is remedied by the addition of pozzolanic or cementitious materials other than Portland cement, as specified in paragraph 610-2.6, 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 C150 Type II.

If aggregates are deemed innocuous when tested in accordance with paragraph 610-2.1.a.1 and accepted in accordance with paragraph 610-2.1.a.3, higher equivalent alkali content in the cement may be allowed if approved by the Engineer and FAA. If cement becomes partially set or contains lumps of caked cement, it shall be rejected. Cement salvaged from discarded or used bags shall not be used.

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 use of the cement is granted. All 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 fresh, clean and potable; free from injurious amounts of oils, acids, alkalies, salts, organic materials or other substances deleterious to concrete.

**610-2.6 Admixtures and supplementary cementitious material.** The Contractor shall submit certificates indicating that the material to be furnished meets all of the requirements indicated below. In addition, the Engineer may require the Contractor to submit complete test data from an approved laboratory showing that the material to be furnished meets all of the requirements of the cited specifications. Subsequent tests may be made of samples taken by the Engineer from the supply of the material being furnished or proposed for use on the work to determine whether the admixture is uniform in quality with that approved.

**a. Air-entraining admixtures**. Air-entraining admixtures shall meet the requirements of ASTM C260 and shall consistently entrain the air content in the specified ranges under field conditions. The air-entrainment agent and any water reducer admixture shall be compatible.

**b.** Water-reducing admixtures. Water-reducing admixture shall meet the requirements of ASTM C494, Type A, B, or D. ASTM C494, Type F and G high range water reducing admixtures and ASTM C1017 flowable admixtures shall not be used.

**c. Other chemical admixtures**. The use of set retarding, and set-accelerating admixtures shall be approved by the Engineer. Retarding shall meet the requirements of ASTM C494, Type A, B, or D and set-accelerating shall meet the requirements of ASTM C494, Type C. Calcium chloride and admixtures containing calcium chloride shall not be used.

d. Lithium nitrate. Not Used.

**e.** Fly ash. Fly ash shall meet the requirements of ASTM C618, with the exception of loss of ignition, where the maximum shall be less than 6%. Fly ash for use in mitigating alkali-silica reactivity shall have a Calcium Oxide (CaO) content of less than 13%.]

**610-2.7 Premolded joint material.** Premolded joint material for expansion joints shall meet the requirements of ASTMD1751.

**610-2.8 Joint filler.** The filler for joints shall meet the requirements of Item P-605, unless otherwise specified.

**610-2.9 Steel reinforcement.** Reinforcing shall consist of Bar Mats conforming to the requirements of ASTM A184 or ASTM A704.

**610-2.10 Materials for curing concrete.** Curing materials shall conform to White-pigmented Liquid Membrane-Forming Compound, Type 2, Class B in accordance with ASTM C309.

# **CONSTRUCTION METHODS**

**610-3.1 General.** The Contractor shall furnish all labor, materials, and services necessary for, and incidental to, the completion of all work as shown on the drawings and specified here. All machinery and equipment used by the Contractor on the work, shall be of sufficient size to meet the requirements of the work. All work shall be subject to the inspection and approval of the Engineer.

**610-3.2 Concrete composition.** The concrete shall develop a minimum compressive strength of 3,000 psi in 28 days as determined by test cylinders made in accordance with ASTM C31 and tested in accordance with ASTM C39 unless shown otherwise on the plans. The concrete shall contain not less than 470 pounds of cement per cubic yard (280 kg per cubic meter). The concrete shall contain 5% of entrained air,  $\pm 1\%$ , as determined by ASTM C231 and shall have a slump of not more than 4 inches (100 mm) as determined by ASTM C143.

**610-3.3 Acceptance sampling and testing.** Concrete for each structure will be accepted on the basis of the compressive strength specified in paragraph 610-3.2. The concrete shall be sampled in accordance with ASTM C172. Concrete cylindrical compressive strength specimens shall be made in accordance with ASTM C31 and tested in accordance with ASTM C39. The Contractor shall cure and store the test specimens under such conditions as directed by the Engineer. The Engineer will make the actual tests on the specimens at no expense to the Contractor.

**610-3.4 Qualifications for concrete testing service.** Perform concrete testing by an approved laboratory and inspection service experienced in sampling and testing concrete. Testing agency must meet the requirements of ASTM C1077 or ASTM E329.

**610-3.5 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 the required, exact weight of aggregates is obtained.

**610-3.6 Consistency.** The consistency of the concrete shall be determined by the slump test specified in ASTM C143.

**610-3.7 Mixing.** Concrete may be mixed at the construction site, at a central point, or wholly or in part in truck mixers. The concrete shall be mixed and delivered in accordance with the requirements of ASTM C94.

**610-3.8 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  $40^{\circ}F$  ( $4^{\circ}C$ ) 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  $50^{\circ}F$  ( $10^{\circ}C$ ) nor more than  $100^{\circ}F$  ( $38^{\circ}C$ ). The Contractor shall be held responsible for any defective work, resulting from freezing or injury in any manner during placing and curing, and shall replace such work at his expense.

Retempering of concrete by adding water or any other material shall not be permitted.

The rate of delivery of concrete to the job shall be sufficient to allow uninterrupted placement of the concrete.

**610-3.9 Forms**. Concrete shall not be placed until all the forms and reinforcements have been inspected and approved by the Engineer. Forms shall be of suitable material and shall be of the type, size, shape, quality, and strength to build the structure as shown on the plans. The forms shall be true to line and grade and shall be mortar-tight and sufficiently rigid to prevent displacement and sagging between supports. The surfaces of forms shall be smooth and free from irregularities, dents, sags, and holes. The Contractor shall be responsible for their adequacy.

The internal form ties shall be arranged so no metal will show in the concrete surface or discolor the surface when exposed to weathering when the forms are removed. All forms shall be wetted with water or with a non-staining mineral oil, which shall be applied immediately before the concrete is placed. Forms shall be constructed so they can be removed without injuring the concrete or concrete surface. The forms shall not be removed until at least 30 hours after concrete placement for 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 the concrete has developed at least 60% of the design strength.

**610-3.10 Placing reinforcement.** All reinforcement shall be accurately placed, as shown on the plans, and shall be firmly held in position during concrete placement. Bars shall be fastened together at intersections. The reinforcement shall be supported by approved metal chairs. Shop drawings, lists, and bending details shall be supplied by the Contractor when required.

**610-3.11 Embedded items.** Before placing concrete, all embedded items shall be firmly and securely fastened in place as indicated. All embedded items shall be clean and free from coating, rust, scale, oil, or any foreign matter. The concrete shall be spaded and consolidated around and against embedded items. The embedding of wood shall not be allowed.

**610-3.12 Placing concrete.** All concrete shall be placed during daylight hours, unless otherwise approved. The concrete shall not be placed until the depth and condition of foundations, the adequacy of forms and falsework, and the placing of the steel reinforcing have been approved by the Engineer. Concrete shall be placed as soon as practical after mixing, but in no case later than one (1) hour after water has been added to the mix. The method and manner of placing shall avoid segregation and displacement of the reinforcement. Troughs, pipes, and chutes shall be used as an aid in placing concrete when necessary. The concrete shall not be dropped from a height of more than 5 feet (1.5 m). Concrete shall be deposited as nearly as practical in its final position to avoid segregation due to rehandling or flowing. Do not subject concrete to procedures which cause segregation. Concrete shall be placed on clean, damp surfaces, free from running water, or on a properly consolidated soil foundation.

**610-3.13 Vibration.** Vibration shall follow the guidelines in American Concrete Institute (ACI) Committee 309, Guide for Consolidation of Concrete. Where bars meeting ASTM A775 or A934 are used, the vibrators shall be equipped with rubber or non-metallic vibrator heads. Furnish a spare, working, vibrator on the job site whenever concrete is placed. Consolidate concrete slabs greater than 4 inches (100 mm) in depth with high frequency mechanical vibrating equipment supplemented by hand spading and tamping. Consolidate concrete slabs 4 inches (100 mm) or less in depth by wood tampers, spading, and settling with a heavy leveling straightedge. Operate internal vibrators with vibratory element submerged in the concrete, with a minimum frequency of not less than 6000 cycles per minute when submerged. Do not use vibrators to transport the concrete in the forms. Penetrate the previously placed lift with the vibrator when more than one lift is required. Use external vibrators on the exterior surface of the forms when internal vibrators do not provide adequate consolidation of the concrete. Vibrators shall be manipulated to work the concrete thoroughly around the reinforcement and embedded fixtures and into corners and angles of the forms. The vibration at any point shall be of sufficient duration to accomplish compaction but shall not be prolonged to where segregation occurs. Concrete deposited under water shall be carefully placed in a compact mass in its final position by means of a tremie or other approved method and shall not be disturbed after placement.

**610-3.14 Construction joints.** If the placement of concrete is suspended, necessary provisions shall be made for joining future work before the placed concrete takes its initial set. For the proper bonding of old and new concrete, provisions shall be made for grooves, steps, reinforcing bars or other devices as specified. The work shall be arranged so that a section begun on any day shall be finished during daylight of the same day. Before depositing new concrete on or against concrete that has hardened, the surface of the hardened concrete shall be cleaned by a heavy steel broom, roughened slightly, wetted, and covered with a neat coating of cement paste or grout.

**610-3.15 Expansion joints.** Expansion joints shall be constructed at such points and dimensions as indicated on the drawings. The premolded filler shall be cut to the same shape as the surfaces being joined. The filler shall be fixed firmly against the surface of the concrete already in place so that it will not be displaced when concrete is deposited against it.

**610-3.16 Defective work.** Any defective work discovered after the forms have been removed, which in the opinion of the Engineer cannot be repaired satisfactorily, shall be immediately removed and replaced at the expense of the Contractor. Defective work shall include deficient dimensions, or bulged, uneven, or honeycomb on the surface of the concrete.

**610-3.17 Surface finish.** All exposed concrete surfaces shall be true, smooth, and free from open or rough areas, depressions, or projections. All concrete horizontal plane surfaces shall be brought flush to the proper elevation with the finished top surface struck-off with a straightedge and floated. Mortar finishing shall not be permitted, nor shall dry cement or sand-cement mortar be spread over the concrete during the finishing of horizontal plane surfaces.

The surface finish of exposed concrete shall be a rubbed finish. If forms can be removed while the concrete is still green, the surface shall be wetted and then rubbed with a wooden float until all irregularities are removed. If the concrete has hardened before being rubbed, a carborundum stone shall be used to finish the surface. When approved, the finishing can be done with a finishing machine.

**610-3.18 Curing and protection.** All concrete shall be properly cured and protected by the Contractor. The concrete shall be protected from the weather, flowing water, and from defacement of any nature during the project. The concrete shall be cured by covering with an approved material as soon as it has sufficiently hardened. Water-absorptive coverings shall be thoroughly saturated when placed and kept saturated for at least three (3) days following concrete placement. All curing mats or blankets shall be sufficiently weighted or tied down to keep the concrete surface covered and to prevent the surface from being exposed to air currents. Wooden forms shall be kept wet at all times until removed to prevent opening of joints and drying out of the concrete. Traffic shall not be allowed on concrete surfaces for seven (7) days after the concrete has been placed.

**610-3.19 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.

**610-3.20 Cold weather placing.** When concrete is placed at temperatures below  $40^{\circ}$ F, the Contractor shall provide satisfactory methods and means to protect the mix from injury by freezing. The aggregates, or water, or both, shall be heated to place the concrete at temperatures between  $50^{\circ}$ F and  $100^{\circ}$ F.

Calcium chloride may be incorporated in the mixing water when directed by the Engineer. Not more than pounds (908 grams) of Type 1 nor more than 1.6 pounds (726 grams) 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  $50^{\circ}$ F until at least 60% of the designed strength has been attained.

**610-3.21 Hot weather placing.** Concrete shall be properly placed and finished with procedures previously submitted. The concrete-placing temperature shall not exceed 95°F when measured in accordance with ASTM C1064. Cooling of the mixing water and aggregates, or both, may be required to obtain an adequate placing temperature. A retarder meeting the requirements of paragraph 610-2.6 may be used to facilitate placing and finishing. Steel forms and reinforcement shall be cooled prior to concrete placement when steel temperatures are greater than 120°F. Conveying and placing equipment shall be cooled if necessary to maintain proper concrete-placing temperature. Submit the proposed materials and methods for review and approval by the Engineer, if concrete is to be placed under hot weather conditions.

**610-3.22 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 start until after final curing and shall be done only when the concrete is completely dry. The cleaning and filling shall be done with proper equipment to obtain a neat looking joint free from excess filler.

## METHOD OF MEASUREMENT

**610-4.1** Structural Portland cement concrete shall not be measured for separate payment, but shall be considered incidental to the pay item where it is used. No measurements or other allowances shall be made for forms, falsework, cofferdams, pumping, bracing, expansion joints, or finishing of the concrete. No deductions in yardage shall be made for the volumes of reinforcing steel or embedded items.

## **BASIS OF PAYMENT**

**610-5.1** No direct payment shall be made for structural Portland cement concrete and the cost shall be included with the cost of the applicable item where it is utilized.

## **TESTING REQUIREMENTS**

ASTM C31	Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C39	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C138	Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
ASTM C143	Standard Test Method for Slump of Hydraulic-Cement Concrete
ASTM C231	Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C666	Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing

- ASTM C1017 Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete
- ASTM C1064 Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete
- ASTM C1077 Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
- ASTM C1260 Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)
- ASTM C1567 Standard Test Method for Determining the Potential Alkali-Silica Reactivity of Combinations of Cementitious Materials and Aggregates (Accelerated Mortar-Bar Method)
- ASTM E329 Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection
- U.S. Army Corps of Engineers (USACE) Concrete Research Division (CRD) C662 Determining the Potential Alkali-Silica Reactivity of Combinations of Cementitious Materials, Lithium Nitrate Admixture and Aggregate (Accelerated Mortar-Bar Method)

#### MATERIAL REQUIREMENTS

- ASTM A184 Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement
- ASTM A185 Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete
- ASTM A615 Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
- ASTM A704 Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement
- ASTM A706 Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement
- ASTM A775 Standard Specification for Epoxy-Coated Steel Reinforcing Bars
- ASTM A934 Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars
- ASTM A1064 Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
- ASTM C33 Standard Specification for Concrete Aggregates
- ASTM C94 Standard Specification for Ready-Mixed Concrete
- ASTM C150 Standard Specification for Portland Cement
- ASTM C171 Standard Specification for Sheet Materials for Curing Concrete

ASTM C172	Standard Practice for Sampling Freshly Mixed Concrete
ASTM C260	Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C309	Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C494	Standard Specification for Chemical Admixtures for Concrete
ASTM C595	Standard Specification for Blended Hydraulic Cements
ASTM C618	Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM D1751	Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Asphalt Types)
ASTM D1752	Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction
ACI 305R	Hot Weather Concreting
ACI 306R	Cold Weather Concreting
ACI 309R	Guide for Consolidation of Concrete

# END OF ITEM P-610

## ITEM P-620 RUNWAY AND TAXIWAY MARKING

#### DESCRIPTION

**620-1.1** This item shall consist of the preparation and painting of numbers, markings, and stripes on the surface of runways, taxiways, and aprons, in accordance with these specifications and at the locations shown on the plans, or as directed by the Engineer. The terms "paint" and "marking material" as well as "painting" and "application of markings" are interchangeable throughout this specification.

#### MATERIALS

**620-2.1 Materials acceptance.** The Contractor shall furnish manufacturer's certified test reports for materials shipped to the project. The certified test reports shall include a statement that the materials meet the specification requirements. 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. All material shall arrive in sealed containers 55 gallons or smaller for inspection by the Engineer. Material shall not be loaded into the equipment until inspected by the Engineer.

**620-2.2 Marking materials.** Paint shall be waterborne in accordance with the requirements of paragraph 620-2.2a. Paint shall be furnished in yellow (33538 or 336550), white (37925) 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. The non-volatile portion of the vehicle for all paint types shall be composed of a 100% acrylic polymer as determined by infrared spectral analysis.

**620-2.3 Reflective media.** Glass beads shall meet the requirements for Federal Specification TT-B-1325D, Type I, gradation A. Glass beads shall be treated with all compatible coupling agents recommended by the manufacturers of the paint and reflective media to ensure adhesion and embedment.

Paint Color	Glass Beads, Type III, Gradation A
White	See Table 1
Yellow	See Table 1
Black	Not used

### **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 or meets the manufacturer's recommendations. Markings shall not be applied when

the pavement temperature is greater than 130°F. Markings shall not be applied when the wind speed exceeds 10 mph unless windscreens are used to shroud the material guns.

**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 waterblasting, or by other methods as required to remove all contaminants minimizing damage to the pavement surface. Use of any chemicals or impact abrasives during surface preparation shall be approved in advance by the Engineer. After the cleaning operations, sweeping, blowing, or rinsing with pressurized water shall be performed to ensure the surface is clean and free of grit or other debris left from the cleaning process.

Paint shall not be applied to Portland cement concrete pavement until the areas to be painted are clean of curing material. Sandblasting or high-pressure water shall be used to remove curing materials.

At least 24 hours prior to remarking existing markings, existing markings must be removed such that 75% of the existing markings are removed. After removal, the surface shall be cleaned of all residue or debris either with sweeping or blowing with compressed air or both.

Prior to the application of any markings, the Contractor shall certify in writing that the surface has been prepared in accordance with the paint manufacturer's requirements, that the application equipment is appropriate for the type of marking paint and that environmental conditions are appropriate for the material being applied. This certification along with a copy of the paint manufacturer's surface preparation and application requirements must be submitted and approved by the Engineer prior to the initial application of markings.

**620-3.4 Layout of markings.** The proposed markings shall be laid out in advance of the paint application. The locations of markings to receive glass beads shall be shown on the plans.

**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 spacing shall be within the following tolerances:

Dimension and Spacing	Tolerance
36 inch or less	$\pm 1/2$ inch
greater than 36 inch to 6 feet	$\pm 1$ inch
greater than 6 feet to 60 feet	$\pm 2$ inch
greater than 60 feet	$\pm 3$ inch

The paint shall be mixed in accordance with the manufacturer's instructions and applied to the pavement with a marking machine at the rate shown in Table 1. The addition of thinner will not be permitted. A period of 14 days shall elapse between placement of a bituminous surface course or seal coat and application of the paint. If temporary markings are required prior to the pavement cure period, markings shall be applied at 50 percent of the specified application rate and no glass beads will be required. White paint markings on new pavement will require an initial application at 50 percent of the specified application rate without glass beads prior to final markings.

Prior to the initial application of markings, the Contractor shall certify in writing that the surface has been prepared in accordance with the paint manufacturer's requirements, that the application equipment is appropriate for the marking paint and that environmental conditions are appropriate for the material being applied. This certification along with a copy of the paint manufactures application and surface preparation requirements must be submitted to the Engineer prior to the initial application of markings.

**620-3.6 Test strip.** Prior to the full application of airfield markings, the Contractor shall produce a test strip in the presence of the Engineer. The test strip shall include the application of a minimum of 5 gallons of paint and application of 35 lbs of Type I glass beads. The test strip shall be used to establish thickness/darkness standard for all markings. The test strip shall cover no more than the maximum area prescribed in Table 1 (e.g., for 5 gallons of waterborne paint shall cover no more than 575 square feet.

Paint Type	Paint Square feet per gallon, ft²/gal	Glass Beads, Type I, Gradation A Pounds per gallon of paint-lb/gal	Glass Beads, Type III Pounds per gallon of paint-	Glass Beads, Type IV Pounds per gallon of paint-
Waterborne	115 ft²/gal max	7 lb/gal min	10 lb/gəl min	NA
Type I or II			10 107 gai illili	1 17

# Table 1. Application Rates For Paint And Glass Beads

Glass beads shall be distributed upon the marked areas at the locations shown on the plans to receive glass beads immediately after application of the paint. A dispenser shall be furnished that is properly designed for attachment to the marking machine and suitable for dispensing glass beads. Glass beads shall be applied at the rate shown in Table 1. Glass beads shall not be applied to black paint or green paint. Glass beads shall adhere to the cured paint or all marking operations shall cease until corrections are made. Different bead types shall not be mixed. Regular monitoring of glass bead embedment should be performed.

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.

# 620-3.7 Application--preformed thermoplastic airport pavement markings. (Not Used)

## 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 including reflective media, 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, and price per lump sum for removal of existing pavement markings. This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-620-5.1-1 Runway and Taxiway Marking - per square foot

## **TESTING REQUIREMENTS**

ASTM C371	Standard Test Method for Wire-Cloth Sieve Analysis of Nonplastic Ceramic Powders
ASTM D92	Standard Test Method for Flash and Fire Points by Cleveland Open Cup Tester
ASTM D711	Standard Test Method for No-Pick-Up Time of Traffic Paint
ASTM D968	Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive
ASTM D1652	Standard Test Method for Epoxy Content of Epoxy Resins
ASTM D2074	Standard Test Method for Total, Primary, Secondary, and Tertiary Amine Values of Fatty Amines by Alternative Indicator Method
ASTM D2240	Standard Test Method for Rubber Property - Durometer Hardness
ASTM D7585	Standard Practice for Evaluating Retroreflective Pavement Markings Using Portable Hand-Operated Instruments
ASTM E1710	Standard Test Method for Measurement of Retroreflective Pavement Marking Materials with CEN-Prescribed Geometry Using a Portable Retroreflectometer
ASTM E2302	Standard Test Method for Measurement of the Luminance Coefficient Under Diffuse Illumination of Pavement Marking Materials Using a Portable Reflectometer
ASTM G154	Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials

# MATERIAL REQUIREMENTS

ASTM D476	Standard Classification for Dry Pigmentary Titanium Dioxide Products						
	40 CFR Determination and weight so	Part n of volatile 1 lids of surfac	60, matter ce coat	Appendix content, water ings	A-7, content, de	Method ensity, volume	24 solids,
29 CFR Part 1910.120	)0 Hazar	d Communic	cation				
FED	Beads (Glass S	SPEC Spheres) Reti	C ro-Ref	lective		TT-B-	1325D
American Associatio	n of State Standard Spec	Highway a dification for	and Glass	Fransportation Beads Used in P	Officials avement N	(AASHTO) larkings	M247
FED	Paint, Traffic	SPEC and Airfield	C Marki	ng, Waterborne	2	TT-P-	1952E
	Commercial Paint, Traffic,	I Solvent Bas	ltem ed	Desc	ription	A-A-	2886B
FED STD 595	Colors used in	n Governmei	nt Pro	curement			
AC 150/5340-1	Standards for	Airport Mar	kings				

## END OF ITEM P-620

## **ITEM D-701 PIPE FOR STORM DRAINS**

## 701-1 DESCRIPTION

**701–1.1** This item shall consist of the construction of storm drains in accordance with these specifications and in reasonably close conformity with the lines and grades shown on the plans.

## 701-2 MATERIALS

701-2.1 Materials shall meet the requirements shown on the plans and specified below.

**701-2.2 Pipe.** The pipe shall be RGRCP Class V and shall be in accordance with the following appropriate requirements:

ASTM C76 Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe

701-2.3 Concrete. Not used.

**701-2.4 Rubber gaskets.** Rubber gaskets for rigid pipe shall conform to the requirements of ASTM C443.

701-2.5 Joint mortar. Not used.

701-2.6 Joint fillers. Not used.

701-2.7 Plastic gaskets. Not used.

**701-2.8.** Controlled low-strength material (CLSM). Controlled low-strength material shall conform to the requirements of Item P-153. When CLSM is used all joints shall have gaskets.

# 701-3 CONSTRUCTION METHODS

**701-3.1 Excavation.** The width of the pipe trench shall be sufficient to permit satisfactory jointing of the pipe and thorough tamping of the bedding material under and around the pipe, but it shall not be less than the external diameter of the pipe plus 6 inches on each side. The trench walls shall be approximately vertical.

The Contractor shall comply with all current Federal, state and local rules and regulations governing the safety of men and materials during the excavation, installation and backfilling operations. Specifically, the Contractor shall observe that all requirements of the Occupational Safety and Health Administration (OSHA) relating to excavations, trenching and shoring are strictly adhered to. The width of the trench shall be sufficient to permit satisfactorily jointing of the pipe and thorough compaction of the bedding material under the pipe and backfill material around the pipe, but it shall not be greater than the widths shown on the plans trench detail. The trench bottom shall be shaped to fully and uniformly support the bottom quadrant of the pipe.

Where rock, hardpan, or other unyielding material is encountered, the Contractor shall remove it from below the foundation grade for a depth of at least 8 inch or 1/2 inch for each foot of fill over the top of the pipe (whichever is greater) but for no more than three-quarters of the nominal diameter of the pipe. The excavation below grade 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.

The excavation for pipes placed in embankment fill shall not be made until the embankment has been completed to a height above the top of the pipe as shown on the plans.

**701-3.2 Bedding.** Class B bedding shall consist of a bed of granular material having a thickness of at least 6 inches below the bottom of the pipe and extending up around the pipe to the spring line of the pipe. The layer of bedding material shall be shaped to fit the pipe up to the spring line of the pipe and shall have recesses shaped to receive the bell of bell and spigot pipe. Thoroughly compact the backfill material under the haunches of the pipe without displacing the pipe. The bedding material shall be sand or select sandy soil with 100% passing a 3/8 inch sieve and not more than 10% passing a No. 200 sieve. The bedding surface for the pipe shall provide a firm foundation of uniform density throughout the entire length of the pipe.

**a. Rigid pipe.** Pipe bedding shall be Class B Bedding. The layer of bedding material shall be shaped to fit the pipe for at least 10% of the pipe's vertical diameter and shall have recesses shaped to receive the bell of bell and spigot pipe..

**701-3.3 Laying pipe.** The pipe laying shall begin at the lowest point of the trench and proceed upgrade. The lower segment of the pipe shall be in contact with the bedding throughout its full length. Bell or groove ends of rigid pipes shall be placed facing upgrade.

701-3.4 Joining pipe. Joints shall be made with rubber gaskets.

**a. Concrete pipe.** Concrete pipe shall be bell and spigot. The method of joining pipe sections shall be so the ends are fully entered and the inner surfaces are reasonably flush and even.

**701–3.5 Backfilling.** Pipes shall be inspected before any backfill is placed; any pipes found to be out of alignment, unduly settled, or damaged shall be removed and relaid or replaced at the Contractor's expense.

Material for Pipe Backfill shall meet the requirements of Item P-153 CLSM.

Material for Trench Backfill shall be selected from the excavation.

When the top of the pipe is even with or below the top of the trench, the backfill shall be as detailed on the plans. Material shall be brought up evenly on each side of the pipe for the full length of the pipe.

When the top of the pipe is above the top of the trench, the backfill shall be as detailed on the plans, and shall be brought up evenly on each side of the pipe. The width of backfill on each side of the pipe for the portion above the top of the trench shall be equal to twice the pipe's diameter or 12 feet, whichever is less.

All CLSM for backfill shall achieve a 28 day compressive strength of 100 to 200 psi as per Item P-153 CLSM.

Trench Backfill shall be compacted to the density required under Item P-152.

It shall be the Contractor's responsibility to protect installed pipes and culverts from damage due to construction equipment operations. The Contractor shall be responsible for installation of any extra strutting or backfill required to protect pipes from the construction equipment.

## 701-4 METHOD OF MEASUREMENT

**701-4.1** The length of pipe shall be measured in linear feet of pipe in place, completed, and approved. It shall be measured along the centerline of the pipe from end or inside face of structure to the end or inside face of structure, whichever is applicable. The several classes, types and size shall be measured separately. All fittings shall be included in the footage as typical pipe sections in the pipe being measured.

**701-4.2** Work for the removal of rock shall be measured based on expended labor, equipment and materials plus a 15 percent allowance for overhead and profit. No payment shall be made for the cushion material placed for the bed of the pipe.

## 701-5 BASIS OF PAYMENT

**701-5.1** Payment will be made at the contract unit price per linear foot for each kind of pipe of the type and size designated. The price shall fully compensate the Contractor for furnishing all materials and for all preparation, excavation, and installation of these materials; and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item D-701-5.1 24 inch RGRCP, Class IV -- per linear foot

## MATERIAL REQUIREMENTS

ASTM C76	Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
ASTM C94	Standard Specification for Ready Mixed Concrete
ASTM C144	Standard Specification for Aggregate for Masonry Mortar
ASTM C150	Standard Specification for Portland Cement
ASTM C443	Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets

## END ITEM D-701

### **ITEM D-705 PIPE UNDERDRAINS FOR AIRPORTS**

## 705-1 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.

## 705-2 MATERIALS

705-2.1 GENERAL. Materials shall meet the requirements shown on the plans 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.

AASHTO M252	Standard Specification for Corrugated Polyethylene Drainage Pipe
ASTM F758	Standard Specification for Smooth-Wall Poly (Vinyl Chloride) (PVC) Plastic
	Underdrain Systems for Highway, Airport, and Similar Drainage

**705-2.3 ELASTOMERIC SEALS.** Elastomeric seals shall conform to the requirements of ASTM F 477

**705-2.4 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 C136.

## TABLE 1. GRADATION OF POROUS BACKFILL

Sieve Digestion	Percentage by Weight Passing Sieves		
(square openings)			
	Porous Material No. 1	Porous Material No. 2	
1-1/2 inch (38 mm)		100	
1 inch (25 mm)		90-100	
3/8 inch (9.5 mm	100	25-60	
No. 4 (4.75 mm)	95-100	5-40	
No. 8 (2.36 mm)		0-20	
No. 16 (1.18 mm)	45-80		
No. 50 (0.30 mm)	10-30		
No. 100 (0.15mm)	0-10		

When two courses of porous backfill are specified in the plans, the finer of the materials shall conform to particle size tabulated herein for porous material No. 1. The coarser granular materials shall meet the gradation give in the tabulation for porous material No. 2.

**705-2.5 GRANULAR MATERIAL.** Granular material used for backfilling shall conform to the requirements of ASTM D 2321 for Class IA, IB or II materials, or shall meet the requirements of AASHTO Standard Specification for Highway Bridges Section 30.

**705-2.6 FILTER FABRIC.** The filter fabric shall conform to the requirements of AASHTO M 288-99, Class 2.

## 705-2.7 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 <sup>-1</sup>	ASTM D 4491	0.80	
Accelerated Weathering	ASTM D 4355	70	
(UV Stability)	*500 hours exposure		
Strength Retained %	Ĩ		

## 705-3 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 that 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 materials, 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 materials 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 materials not required or acceptable for backfill shall be disposed of by the Contractor as direct 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 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. **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.

b. **ALL TYPES OF PIPE.** The upgrade end of pipelines, not terminating in a structure, shall be plugged or capped as approved by the Engineer.

Unless otherwise shown on the plans, a 4-inch bed of granular backfill materials shall be spread in the bottom of the trench throughout the entire length under all perforated pipe underdrains.

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.

c. **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 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 materials 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 materials 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 beaded 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**. When granular backfill is required, its placement in the trench and about the pipe shall be as shown on the plans. Special care shall be taken in placing the backfill. The granular backfill shall not contain a damaging amount of foreign matter, nor shall earth from the sides of the trench or from the windrow be allowed to filter into the backfill. When required by the Engineer, a template shall be used to properly place and keep separate the two sizes of backfill. The backfill shall be placed in loose layers not exceeding 6 inches in depth and compacted by hand and pneumatic tampers to the requirements as given for earth backfill. Backfilling shall be done in a manner to avoid injurious top or side pressure on the pipe. The granular backfill shall be made to the elevation of the trench, as shown on the plans. When perforated pipe is specified, granular backfill material shall be placed along the full length of the pipe. The position of the granular material shall be as shown on the plans. If the original material excavated from the trench is pervious and suitable, it shall be used in lieu of porous backfill No. 1.

When porous backfill is to be placed in paved or adjacent areas 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.

Whenever a granular subbase blanket course is to be used under pavements which extends several feet beyond the edge of paving to the outside edge of the underdrain trench, the granular backfill material over the underdrains shall be placed in the trench up to an elevation of 2 inches above the bottom surface of the granular subbase blanket course. Immediately prior to the placing of the granular subbase blanket course, the Contractor shall blade this excess trench backfill from the top of the trench onto the adjacent subgrade where it can be incorporated into the granular subbase blanket course. Any unsuitable material that remains over the underdrain trench shall be removed and replaced. The subbase material shall be placed to provide clean contact between the subbase material and the underdrain granular backfill material for the full width of the underdrain trench.

**c. DEFLECTION TESTING**. The Engineer may at any time, not withstanding 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 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.

## 705-4 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. Filter fabric and porous backfill will not be measured for payment.

## 705-5 BASIS OF PAYMENT

**705-5.1** Payment will be made at the contract unit price per linear foot for pipe underdrains of type, class, and size designated 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-705-5.1 Four (4) inch perforated HDPE	per linear foot
Item D-705-5.2 Eight (8) inch schedule 80 PVC outlet pipe	per linear foot
Item D-705-5.3 Six (6) inch schedule 80 PVC outlet pipe	per linear foot
Item D-705-5.4 Four (4) inch schedule 80 PVC outlet pipe	per linear foot

## MATERIAL REQUIREMENTS

AASHTO Standard Specification for Highway Bridges

## END OF ITEM P-705

## ITEM D-751 MANHOLES, INLETS, OUTLETS, AND OTHER STRUCTURES

## 751-1 DESCRIPTION

**751–1.1** This item shall consist of construction of manholes, inlets and outlets and other structures in accordance with these specifications, at the specified locations and conforming to the lines, grades, and dimensions shown on the plans or required by the Engineer.

## 751-2 MATERIALS

751-2.1 Brick. Not used.

**751-2.2 Mortar.** Mortar shall consist of one part Portland cement and two parts sand. The Portland cement shall conform to the requirements of ASTM C150, Type II. The sand shall conform to the requirements of ASTM C144.

**751–2.3 Concrete.** Plain and reinforced concrete used in structures, connections of pipes with structures, and the support of structures or frames shall conform to the requirements of Item P-610 with a minimum compressive strength of 4,000 psi.

**751-2.4 Precast concrete pipe manhole rings.** Precast concrete pipe manhole rings shall conform to the requirements of ASTM C478. Unless otherwise specified, the risers and offset cone sections shall have an inside diameter of not less than 36 inches nor more than 48 inches. There shall be a gasket between individual sections and sections cemented together with mortar on the inside of the manhole.

751-2.5 Corrugated metal. Not used.

**751-2.6 Frames, covers, and grates.** The castings shall conform to one of the following requirements:

a. ASTM A48, Class 35B: Gray iron castings

b. ASTM A47: Malleable iron castings

c. ASTM A27: Steel castings

d. ASTM A283, Grade D: Structural steel for grates and frames

e. ASTM A536, Grade 65-45-12: Ductile iron castings

f. ASTM A897: Austempered ductile iron castings

All castings or structural steel units shall conform to the dimensions shown on the plans and shall be designed to support the loadings, aircraft gear configuration and/or direct loading, specified.

Each frame and cover or grate unit shall be provided with fastening members to prevent it from being dislodged by traffic but which will allow easy removal for access to the structure.

All castings shall be thoroughly cleaned. After fabrication, structural steel units shall be galvanized to meet the requirements of ASTM A123.

**751–2.7 Steps.** The steps or ladder bars shall be gray or malleable cast iron or galvanized steel. The steps shall be the size, length, and shape shown on the plans and those steps that are not galvanized shall be given a coat of bituminous paint, when directed.

**751-2.8 Precast inlet structures.** Manufactured in accordance with and conforming to ASTM C1433.

## 751-3 CONSTRUCTION METHODS

## 751-3.1 Unclassified excavation.

**a.** The Contractor shall excavate for structures and footings to the lines and grades or elevations, shown on the plans, or as staked by the Engineer. The excavation shall be of sufficient size to permit the placing of the full width and length of the structure or structure footings shown. The elevations of the bottoms of footings, as shown on the plans, shall be considered as approximately only; and the Engineer may direct, in writing, changes in dimensions or elevations of footings necessary for a satisfactory foundation.

**b.** Boulders, logs, or any other objectionable material encountered in excavation shall be removed. All rock or other hard foundation material shall be cleaned of all loose material and cut to a firm surface either level, stepped, or serrated, as directed by the Engineer. All seams or crevices shall be cleaned out and grouted. All loose and disintegrated rock and thin strata shall be removed. Where concrete will rest on a surface other than rock, the bottom of the excavation shall not be disturbed and excavation to final grade shall not be made until immediately before the concrete or reinforcing is placed.

**c.** The Contractor shall do all bracing, sheathing, or shoring necessary to implement and protect the excavation and the structure as required for safety or conformance to governing laws. The cost of bracing, sheathing, or shoring shall be included in the unit price bid for the structure.

**d.** All bracing, sheathing, or shoring involved in the construction of this item shall be removed by the Contractor after the completion of the structure. Removal shall not disturb or damage finished masonry. The cost of removal shall be included in the unit price bid for the structure.

**e.** After excavation is completed for each structure, the Contractor shall notify the Engineer. No concrete or reinforcing steel shall be placed until the Engineer has approved the depth of the excavation and the character of the foundation material.

## 751-3.2 Brick structures. Not used.

**751-3.3 Concrete structures.** Concrete structures shall be built on prepared foundations, conforming to the dimensions and shape indicated on the plans. The construction shall conform to the requirements specified in Item P-610. Any reinforcement required shall be placed as indicated on the plans and shall be approved by the Engineer before the concrete is placed.

All invert channels shall be constructed and shaped accurately to be smooth, uniform, and cause minimum resistance to flowing water. The interior bottom shall be sloped to the outlet.

**751-3.4 Precast concrete structures.** Precast concrete structures shall conform to ASTM C478. Precast concrete structures shall be constructed on prepared or previously placed slab foundations conforming to the dimensions and locations shown on the plans. All precast concrete sections necessary to build a completed structure shall be furnished. The different sections shall fit together readily. Joints between precast concrete risers and tops shall be full-bedded in cement mortar and shall be smoothed to a uniform surface on both interior and exterior of the structure. The top of the upper precast concrete section shall be made for any connections for lateral pipe, including drops and leads that may be installed in the structure. The flow lines shall be smooth, uniform, and cause minimum

resistance to flow. The metal steps that are embedded or built into the side walls shall be aligned and placed at vertical intervals of 12 inches. When a metal ladder replaces the steps, it shall be securely fastened into position.

## 751-3.5 Corrugated metal structures. Not used.

**751-3.6 Inlet and outlet pipes.** Inlet and outlet pipes shall extend through the walls of the structures a sufficient distance beyond the outside surface to allow for connections. They shall be cut off flush with the wall on the inside surface of the structure, unless otherwise directed. For concrete structures, mortar shall be placed around these pipes to form a tight, neat connection.

**751-3.7 Placement and treatment of castings, frames, and fittings.** All castings, frames, and fittings shall be placed in the positions indicated on the plans or as directed by the Engineer, and shall be set true to line and elevation. If frames or fittings are to be set in concrete or cement mortar, all anchors or bolts shall be in place before the concrete or mortar is placed. The unit shall not be disturbed until the mortar or concrete has set.

After the frames or fittings have been set in final position, the concrete or mortar shall be allowed to harden for seven (7) days before the grates or covers are placed and fastened down.

## 751-3.8 Installation of steps. Not Used.

## 751-3.9 Backfilling.

**a.** After a structure has been completed, the area around it shall be backfilled with approved material, in horizontal layers not to exceed 8 inches in loose depth, and compacted to the density required in Item P-152. Each layer shall be deposited evenly around the structure to approximately the same elevation. The top of the fill shall meet the elevation shown on the plans or as directed by the Engineer.

**b.** Backfill shall not be placed against any structure until approved by the Engineer. For concrete structures, approval shall not be given until the concrete has been in place seven (7) days, or until tests establish that the concrete has attained sufficient strength to withstand any pressure created by the backfill and placing methods.

**c.** Backfill shall not be measured for direct payment. Performance of this work shall be considered an obligation of the Contractor covered under the contract unit price for the structure involved.

**d.** With the approval of the Engineer, Item P-153 Controlled Low Strength Material (CLSM) may be used for backfill for each individual structure.

**751-3.10 Cleaning and restoration of site.** After the backfill is completed, the Contractor shall dispose of all surplus material, dirt, and rubbish from the site. Surplus dirt may be deposited in embankments, shoulders, or as approved by the Engineer. The Contractor shall restore all disturbed areas to their original condition. The Contractor shall remove all tools and equipment, leaving the entire site free, clear, and in good condition.

## 751-4 METHOD OF MEASUREMENT

751-4.1 Manholes, inlets, outlets and other structures shall be measured by the unit.

## 751-5 BASIS OF PAYMENT

**751-5.1** The accepted quantities of manholes, inlets, outlets and other structures will be paid for at the contract unit price per each in place when completed. This price shall be full compensation for furnishing all materials and for all preparation, excavation, backfilling and placing of the materials; furnishing and installation of such specials and connections to pipes and other structures as may be required to complete the item as shown on the plans; and for all labor equipment, tools and incidentals necessary to complete the structure.

Payment will be made under:

Item D-751-5.1 Concrete Catch Basin with Apron - per each

#### MATERIAL REQUIREMENT

ASTM A27	Standard Specification for Steel Castings, Carbon, for General Application
ASTM A47	Standard Specification for Ferritic Malleable Iron Castings
ASTM A48	Standard Specification for Gray Iron Castings
ASTM A123	Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A283	Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates
ASTM A536	Standard Specification for Ductile Iron Castings
ASTM A897	Standard Specification for Austempered Ductile Iron Castings
ASTM C144	Standard Specification for Aggregate for Masonry Mortar
ASTM C150	Standard Specification for Portland Cement
ASTM C478	Standard Specification for Precast Reinforced Concrete Manhole Sections
ASTM C1433	Standard Specification for Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains, and Sewers

### END OF ITEM D-751

#### ITEM D-752 MISCELLANEOUS DRAINAGE STRUCTURES (DRY WELLS)

#### DESCRIPTION

**752-1.1** This item shall consist of miscellaneous drainage structures (Dry Wells) constructed in accordance with these specifications, at the specified locations and conforming to the lines, grades, and dimensions shown on the plans or required by the Engineer.

### MATERIALS

**752-2.1 Concrete.** concrete shall meet the requirements of Item P-610. **752-2.2 Structure.** Maxwell Plus Drainage System or approved equal.

#### **CONSTRUCTION METHODS**

#### 752-3.1 Unclassified excavation.

**a.** The contractor shall prepare all locations for dry well installation in accordance with Item P-152. The elevations of the bottoms of footings, as shown on the plans, shall be considered as approximate only; and the Engineer may approve, in writing, changes in dimensions or elevations of footings necessary to secure a satisfactory foundation.

**b.** Boulders, logs, or any other objectionable material encountered in excavation shall be removed. All rock or other hard foundation material shall be cleaned of all loose material and cut to a firm surface either level, stepped, or serrated, as directed by the Engineer. All seams or crevices shall be cleaned out and grouted. All loose and disintegrated rock and thin strata shall be removed. When concrete will rest on a surface other than rock, the bottom of the excavation shall not be disturbed and excavation to final grade shall not be made until immediately before the concrete or reinforcing steel is placed.

**c.** The Contractor shall do all bracing, sheathing, or shoring necessary to perform and protect the excavation and the structure as required for safety or conformance to governing laws. The cost of bracing, sheathing, or shoring shall be included in the unit price bid for excavation.

**d.** All bracing, sheathing, or shoring shall be removed by the Contractor after the completion of the structure. Removal shall be not disturb or damage the finished concrete. The cost of removal shall be included in the unit price bid for excavation.

**e.** After each excavation is completed, the Contractor shall notify the Engineer. No concrete or reinforcing steel shall be placed until the Engineer has approved the depth of the excavation and the character of the foundation material.

#### 752-3.2 Backfilling.

**a.** After a structure has been completed, backfilling with approved material shall be accomplished by applying the fill in horizontal layers not to exceed 8 inches (200 mm) in loose depth, and compacted. The field density of the compacted material shall be at least 90% of the maximum density for cohesive soils and 95% of the maximum density for noncohesive soils. The maximum density shall

be determined in accordance with ASTM D698. The field density shall be determined in accordance with ASTM D1556.

**b.** No backfilling shall be placed against any structure until approved by the Engineer. For concrete, approval shall not be given until the concrete has been in place seven (7) days, or until tests establish that the concrete has attained sufficient strength to withstand any pressure created by the backfill or the placement methods.

**c.** Fill placed around concrete culverts shall be deposited on each side at the same time and to approximately the same elevation. All slopes bounding or within the areas to be backfilled shall be stepped or serrated to prevent wedge action against the structure.

**d.** Backfill will not be measured for direct payment. Performance of this work shall be considered as a subsidiary obligation of the Contractor, covered under the contract unit price for "unclassified excavation for structures."

**752-3.3 Weep holes.** Weep holes shall be constructed as shown on the plans.

**752-3.4 Cleaning and restoration of site.** After the backfill is completed, the Contractor shall dispose of all surplus material, dirt, and rubbish from the site. Surplus dirt may be deposited in embankment, shoulders, or as approved by the Engineer. The Contractor shall restore all disturbed areas to their original condition. The Contractor shall remove all tools and equipment, leaving the entire site free, clear, and in good condition.

## METHOD OF MEASUREMENT

**752-4.1** The quantity of dry wells measure for payment shall be measured per each in place, completed, and accepted.

# **BASIS OF PAYMENT**

**752-5.1** Payment will be made at the contract unit price per each dry well installed and approved by the Engineer. These prices shall be full compensation for furnishing all materials and for all preparation, excavation, and placing the materials, and for all labor, equipment, tools, and incidentals necessary to complete the structure.

Payment will be made under:

Item D-752-5.1 Dry Well - per each

## **TESTING REQUIREMENTS**

ASTM D698Standard Test Methods for Laboratory Compaction Characteristics of Soil<br/>Using Standard Effort (12,400 ft-lb/ft³ (600 kN-m/m³))ASTM D1556Standard Test Method for Density and Unit Weight of Soil in Place by the<br/>Sand-Cone Method

## END OF ITEM D-752
#### **ITEM T-910 HYDRO-MULCH**

#### **GENERAL**

The Contractor shall furnish all equipment, labor and materials required to apply a hydro-mulch mixture, as specified herein, on all unpaved areas between edges of pavement and limits of grading as shown on the plans, and other unpaved areas inadvertently disturbed by the Contractor's operations beyond said limits of grading.

#### **MATERIALS HYDRO-MULCH**

- Α. Seed shall be clearly tagged or labeled showing type of seed, test date, name of supplier and percentage of the following: pure seed, crip seed, inert matter, weed seed, noxious seed and total germination content.
- Β. Fiber shall be derived from cellulose such as wood pulp or similar organic materials. When used in the applied mixture, an absorptive pr porous mat will result on the surface of the ground.
- С. Water shall be clean, fresh, suitable for domestic consumption, and free from such amounts of material and organic substances as would inhibit germination or growth.
- D. Soil Stabilizer shall be "Ecology Control M-Binder," or approved equal.
- Ε. Fertilizer shall have a guaranteed analysis of (16-6-8).

### HYDRO-MULCH MIXTURE AND APPLICATION RATES

The hydro-mulch mixture shall consist of the following materials applied at the rates as indicated:

1. Seed mix with application rates per acre:

	a.	Briza maxima:	2 lbs. per acre
	b.	Elymus glaucus:	8 lbs. per acre
	c.	Eschscholzia california:	3 lbs. per acre
	d.	Hordeum californicum:	12 lbs. per acre
	e.	Lupinus nanus:	2 lbs. per acre
	f.	Nassella pulchra:	10 lbs. per acre
	g.	Vulpia microstachys:	8 lbs. per acre
2.		Fertilizer (16-6-8):	250 lbs. per acre
3.		Soil stabilizer:	100 lbs. per acre
4.		Fiber:	1,5000 lbs. per acre
-		117 /	A 1 1 C 1.

5. Water: As needed for application

Before applying the above mixture, a Certificate of Compliance shall be furnished to the Engineer for the various materials in the mixture.

### HYDRO-MULCH MIXING AND APPLICATION

Hydro-mulching shall not begin prior to acceptance of the finished grading.

Seed, fiber, water, soil stabilizer, and fertilizer shall be thoroughly mixed into a homogeneous slurry of the proper proportions specified. It shall have the proper consistency to adhere to the ground surfaces without lumping or running. The mixing shall be performed in a tank, with a buiot-in continuous agitation and recirculation system, of sufficient operating capacity to produce a homogeneous mixture and a discharge system which will apply the mixture at a continuous and uniform rate. All slurry mixture which has not been applied within four (4) hours after mixing will be rejected and removed from the project at the Contractor's expense.

Caution shall be used to not allow hydro-mulch mixture to be sprayed on adjacent paved surfaces, signs and light fixtures. Application shall not be done if winds exceed 10 MPH. Any mixture sprayed on adjacent paved surfaces, signs and/or light fixtures shall be thoroughly washed and cleaned to the satisfaction of the Engineer, at the Contractor's expense.

#### MEASUREMENT

Measurement for hydro-mulch, shall be by the acres, as measured in the field after all hydro-mulch applications have been successfully completed. There will be no measurement for areas of inadvertent double-application, nor will there be any measurement for repeat applications due to improper or inadequate initial applications.

### PAYMENT

Payment for hydro-mulch shall be at the bid unit price per acre for hydro-mulch. Any areas beyond the grading limits as shown which are inadvertently disturbed by the Contractor's operations shall receive an application of hydro-mulch mixture as specified herein.

Payment made shall be full compensation for furnishing all materials, and for all preparation, mixing and placing of these materials, and for all labor, equipment, tools and incidentals necessary to complete the item, including water application.

Payment will be made under:

Item 910-6.1 Hydro-Mulch – per acre.

### END OF SECTION T-910

#### END OF CIVIL TECHNICAL SPECIFICATIONS

# **DIVISION 7**

# ELECTRICAL TECHNICAL SPECIFICATIONS

<u>Section</u>	<u>Title</u>
Item L-107	Airport Wind Cones
Item L-108	Underground Power Cable for Airports
Item L-109	Airport Transformer Vault and Vault Equipment
Item L-110	Airport Underground Electrical Duct Banks and Conduits
Item L-115	Electrical Manholes and Junction Structures
Item L-125	Installation of Airport Lighting Systems
Item L-130	Transient Voltage Surge Suppression Equipment



#### **ITEM L-107 AIRPORT WIND CONES**

#### DESCRIPTION

**107-1.1** This item shall consist of furnishing and installing an airport wind cone per these specifications and per the dimensions, design, and details shown in the plans.

The work shall include the furnishing and installation of a support for mounting the wind cone, the specified interconnecting wire, and a concrete foundation. The item shall also include all cable connections, conduit and conduit fittings, the furnishing and installation of all lamps, ground rod and ground connection, the testing of the installation, and all incidentals necessary to place the wind cone in operation (as a completed unit) to the satisfaction of the Engineer.

#### EQUIPMENT AND MATERIALS

#### 107-2.1 General.

**a.** Airport lighting equipment and materials covered by advisory circulars (ACs) shall be certified and listed in AC 150/5345-53, Airport Lighting Equipment Certification Program.

**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 responsibility to provide materials per these specifications. Materials supplied and/or installed that do not comply with these specifications shall be removed (when directed by the Engineer) and replaced with materials that comply with these specifications, at the Contractor's cost.

**d.** All materials and equipment used to construct this item shall be submitted to the 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 products or models applicable to this project. Indicate all optional equipment and delete any non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment to which they apply on each submittal sheet. Markings shall be made bold and clear with arrows or circles (highlighting is not acceptable). Contractor is solely responsible for delays in the project that may accrue directly or indirectly from late submissions or resubmissions of submittals.

**e.** The data submitted shall be sufficient, in the opinion of the Engineer, to determine compliance with the plans and specifications. The Engineer reserves the right to reject any and all equipment, materials or procedures, that do not meet the system design and the standards and codes, specified in this document.

**f.** All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for at least twelve (12) months from the date of final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner.

**107-2.2 Wind cones.** The primary wind cone assembly shall be Type L-807, Style 1-A, Size 2 meeting the requirements of AC 150/5345-27, Specification for Wind Cone Assemblies.

**107-2.3 Electrical wire and cable.** Cable rated up to 5,000 volts in conduit shall conform to AC 150/5345-7, Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits. For ratings up to 600 volts, moisture and heat resistant thermoplastic wire conforming to Commercial Item Description A-A-59544A Type THWN-2 shall be used. The wires shall be of the type, size, number of conductors, and voltage shown in the plans or in the proposal.

**107-2.4 Conduit.** Rigid steel conduit and fittings shall conform to the requirements of Underwriters Laboratories Standards 6, 514B, and 1242.

**107-2.5 Plastic conduit (for use below grade only).** Plastic conduit and fittings shall be per the following:

- UL 514B covers W-C-1094 Conduit fittings all types, Classes 1 thru 3 and 6 thru 10
- UL 514C covers W-C-1094 all types, Class 5 junction box and cover in plastic (polyvinyl chloride (PVC))
- UL 651 covers W-C-1094 Rigid PVC Conduit, types I and II, Class 4
- UL 651A covers W-C-1094 Rigid PVC Conduit and high density polyethylene (HDPE) Conduit type III and Class 4

Underwriters Laboratories Standard UL-651 shall be one of the following, as shown in the plans:

 ${\bf a.}$  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.

Plastic conduit adhesive shall be a solvent cement manufactured specifically for the purpose of gluing the type of plastic conduit and fitting.

**107-2.6 Concrete.** The concrete for foundations shall be proportioned, placed, and cured per Item P-610, Structural Portland Cement Concrete.

### 107-2.7 Paint.

**a.** Priming paint for non-galvanized metal surfaces shall be a high solids alkyd primer per Society for Protective Coatings (SSPC) Specification - Paint 25, Primer, Raw Linseed Oil and Alkyd Primer (Without Lead and Chromate Pigments).

**b.** Priming paint for galvanized metal surfaces shall be zinc dust-zinc oxide primer paint conforming to MIL-DTL-24441C/19B. Use MIL-24441 thinner per paint manufacturer's recommendations.

**c.** Orange paint for the body and the finish coats on metal and wood surfaces shall consist of a readymixed non-fading paint per Master Painter's Institute (MPI) Reference #9 (gloss). The color shall be per Federal Standards 595, International Orange, Number 12197.

**d.** White paint for body and finish coats on metal and wood surfaces shall be ready-mixed paint conforming to the MPI, Reference #9, Exterior Alkyd, Gloss.

e. Priming paint for wood surfaces shall be mixed on the job by thinning the above specified aviationorange or white paint by adding 1/2 pint of raw linseed oil to each gallon (liter).

### **CONSTRUCTION METHODS**

**107-3.1 Installation.** The hinged support or hinged pole shall be installed on a concrete foundation per the plans.

**107-3.2 Support pole erection.** The Contractor shall erect the pole on the foundation following the manufacturer's requirements and erection details. The pole shall be level and secure.

**107-3.3 Electrical connection.** The Contractor shall furnish all labor and materials and shall make complete electrical connections per the wiring diagram furnished with the project plans. The electrical installation shall conform to the requirements of the latest edition of National Fire Protection Association, NFPA-70, National Electric Code (NEC).

If underground cable from the transformer vault to the wind cone site and duct for this cable installation is required, the cable and duct shall be installed in accordance with and paid for as described in Item L-108, Underground Power Cables for Airports, and Item L-110, Airport Underground Electrical Duct Banks and Conduits.

### 107-3.4 Booster transformer. Not Used.

**107-3.5 Ground connection and ground rod.** The Contractor shall furnish and install a ground rod, grounding cable, and ground clamps for grounding the "A" frame of the 12-foot (3.7-m) assembly or pipe support of the 8-foot (2.4-m) support near the base. The ground rod shall be of the type, diameter and length specified in Item L-108, Underground Power Cable for Airports. The ground rod shall be driven into the ground adjacent to the concrete foundation minimum distance from foundation of 2 feet so that the top is at least 6 inches below grade. The grounding cable shall consist of No. 4 American wire gauge (AWG) minimum stranded copper wire or larger and shall be firmly attached to the ground rod by exothermic welding. If an exothermic weld is not possible, connections to the grounding bus shall be made by using connectors approved for direct burial in soil or concrete per UL 467. The other end of the grounding cable shall be securely attached to a leg of the frame or to the base of the pipe support with non-corrosive metal and shall be of substantial construction. The resistance to ground shall not exceed 25 ohms. If a single rod grounding electrode has a resistance to earth of over 25 ohms, then install one supplemental rod not less than 10 feet from the first rod.

**107-3.6 Painting.** Three coats of paint shall be applied (one prime, one body, and one finish) to all exposed material installed under this item except the fabric cone, obstruction light globe, and lamp reflectors. The wind cone assembly, if already painted upon receipt, shall be given one finish coat of paint in lieu of the three coats specified above. The paint shall be per MPI Reference #9 (gloss). The color shall be per Federal Standard 595, International Orange, Number 12197.

**107-3.7 Light sources.** The Contractor shall furnish and install lamps per the manufacturer's instruction book. L-810 obstruction light with 116 watt, 120 volt incandescent lamp. External wind cone light source 75 watt, 120 volt halogen lamp which swivels with wind cone.

**107-3.8 Chain and padlock.** The Contractor shall furnish and install a suitable operating chain for lowering and raising the hinged top section. The chain shall be attached to the pole support in a manner to prevent the light fixture assembly from striking the ground in the lowered position.

A padlock shall also be furnished by the Contractor on the 8-foot wind cone for securing the hinged top section to the fixed lower section. Keys for the padlock shall be delivered to the Engineer.

**107-3.9 Segmented circle.** The segmented circle shall be constructed in accordance with AC 150/5340-5, Segmented Circle Airport Marker System, and the details in the Plans.

#### METHOD OF MEASUREMENT

**107-4.1** The quantity to be paid shall be the number of wind cones installed as completed units in place, accepted, and ready for operation.

**107-4.2** The quantity of segmented circle airport marker systems to be paid for shall be the number of systems installed as completed units in place, accepted, and ready for operation.

#### **BASIS OF PAYMENT**

**107-5.1** Payment will be made at the contract unit price for each completed and accepted job. 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.

Payment will be made under:

Item L-107-5.1	L-807, Style 1-A, Size 2 Wind Cone and Foundation, in Place per Each
Item L-107-5.2	Segmented Circle Marker System, in Place per Each

#### MATERIAL REQUIREMENTS

AC 150/5340-5	Segmented Circle Airport Marker System		
AC 150/5340-30	Design and Installation Details for airport Visual Aids		
AC 150/5345-7	Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits		
AC 150/5345-27	Specification for Wind Cone Assem	blies	
AC 150/5345-53	Airport Lighting Equipment Certifi	cation Program	
Commercial	Item Cable and Wire, Electrical (Power,	Description A- Fixed Installation)	·A-59544
FED STD 595	Colors Used in Government Procus	rement	
MIL-DTL-24441C/19B Paint, Epoxy-Polyamide, Zinc Primer, Formula 159, Type III			
Underwriters	Laboratories Electrical Rigid Metal Conduit – St	Standard eel	6
Underwriters	Laboratories Conduit, Tubing, and Cable Fitting	Standard s	514B

Underwriters	Laboratories	Standard	514C
	Nonmetallic Outlet Boxes, Flush-I	Device Boxes, and Covers	
Underwriters	Laboratories	Standard	651
	Schedule 40, 80, Type EB and A R	igid PVC Conduit and Fittings	
Underwriters	Laboratories	Standard	651A
	Type EB and A Rigid PVC Condui	t and HDPE Conduit	
Underwriters	Laboratories	Standard	1242
	Electrical Intermediate Metal Con	duit - Steel	
NFPA-70	National Electric Code (NEC)		

### END OF ITEM L-107

### **ITEM L-108 UNDERGROUND POWER CABLE FOR AIRPORTS**

#### **108-1 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 is covered under Item L-110 "Airport Underground Electrical Duct Banks and Conduits."

#### **108-2 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 D, 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 Contractor's submittals shall be neatly bound in a properly sized 3-ring binder, tabbed by specification section.] The Engineer reserves the right to reject 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 minimum, (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 150/5345-7F, 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 bare copper wire conforming to the requirements of ASTM D 33.

Ground rods shall be **copper**. 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 and Heat-Shrinked 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-24391or 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 3M, 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.** Flowable material used to backfill trenches for power cable trenches shall conform to the requirements of Item P-153 "Controlled Low Strength Material".

**108-2.8 CABLE IDENTIFICATION TAGS.** Cable identification tags shall be made from a noncorrosive 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.

### **108-3 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 ensure 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 re-cleaned 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 hand winch 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. NOT USED.

All cable to be installed in Ducts per 108-3.2

### 108-3.4 CABLE MARKERS FOR DIRECT-BURIED CABLE. Not Used.

**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. Not Allowed.

**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 (37 mm) 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 (37 mm) on each side of the joint.

### d. Heat-Shrink Tubing.

Heat shrinkable tubing shall be installed over the entire Plug Connector type splices. Heat shrink tubing shall extend 2" beyond the connector and over the conductor. Install following manufacturer's instructions. Direct flame heating shall not be permitted unless recommended by the manufacturer. Cable surfaces within the limits of the heat-shrink application shall be clean and free of contaminates prior to application.

**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 attached 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 (150 m) 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.

### **108-4 METHOD OF MEASUREMENT**

**108-4.1** Cable installed in trench, duct bank or conduit shall be measured by the number of linear feet of cable installed in trenches, duct bank or conduit ready for operation, and accepted as satisfactory. Separate measurement shall be made for each cable installed in trench, duct bank or conduit. The measurement for this item **shall not** include additional quantities required for slack or connection to transformers. The measurement will be made from center to center of Light Bases or pull boxes.

**108-4.2** Counterpoise wire installed in trench shall be measured by the number of linear feet of counterpoise wire installed ground rods and grounding connectors, and trench marking tape ready for operation, and accepted as satisfactory.

**108-4.3** Bare equipment ground wire with ground rods shall be measured by the number of linear feet of conductor to ground the light base, j-box, or sign base. This bare equipment cable **shall not** be connected to the counterpoise system.

#### **108-5 BASIS OF PAYMENT**

**108-5.1** Payment will be made at the contract unit price for cable and bare counterpoise wire installed in trench (direct-buried), or cable and equipment ground installed in duct bank or conduit, in place by the Contractor and accepted by the 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.

Payment will be made under:

Item L-108-5.1	<b>No. 8 AWG</b> L-824C Cable, installed in duct bank or conduit— per linear foot.
Item L-108-5.2	Bare Counterpoise Wire, installed in trench, duct bank or conduit, including ground rods and ground connectors—per linear foot.
Item L-108-5.3	Bare equipment ground wire, equipment ground rod and connection per light base or sign base. per linear foot.
Л	MATERIAL REQUIREMENTS
AC 150/5345-7 F	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

# ITEM L-109 AIRPORT TRANSFORMER VAULT AND VAULT EQUIPMENT

### DESCRIPTION

**109-1.1** This item shall consist of furnishing a precast concrete airport transformer vault on a concrete pad, in accordance with these specifications and with the design and dimensions shown in the plans. This work shall also include the installation of conduits and foundation, painting and lighting of the vault and the furnishing of all fixtures, HVAC equipment, hardware and incidentals necessary to produce a completed unit.

#### EQUIPMENT AND MATERIALS

#### 109-2.1 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) 150/5345-53D.

**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.

### PRECAST CONCRETE VAULT

**109-2.2** The equipment vault shall be constructed of precast concrete to the dimensions shown on the drawings.

**a.** The vault shall be designed to meet requirements of loading of the National Standards (ANS) "Building Code Requirements for Minimum Design Loads in Buildings and Other Structures", and the requirements of the American Concrete Institute (ACI-318R-83), "Building Code Requirements for Reinforced Concrete".

**b.** The Precast Concrete vault design shall be such that the walls and roof are monolithic at manufacture. The floor is connected to the walls by a secondary concrete placement.

**c.** The building shall be designed to meet the following minimum loadings:

Roof Live Load	60 PSF
Floor Live Load	100 PSF
Floor Dead Load	75 PSF
Wall Wind Load	140 PSF
Earthquake	Zone 4

**d.** The vault interior finished height shall be 8 ft. minimum, 10 ft. maximum.

**e.** The exterior Precast Concrete exterior walls shall be a smooth finish with a sandstone color, with cant strip type extension at base and roof line.

**f.** The vault exterior shall be rated at a 2 hour fireproof rating without damage to its interior contents.

**g.** The vault shall be "earthquake proof" designed for any zone in the continental U.S.A.

**h.** The vault shall be waterproof.

**i.** The vault shall be designed for maintenance free use.

**j.** Walls and ceilings shall be finished with FRP mounted on  $\frac{1}{2}$ " fiber core and 1.5" rigid installation with minimum insulation value of R11.

**k.** The exterior door shall be flush steel construction insulated core 3'-0" wide x 7'-0" high x 1 3/4" thick, 18 gauge. A key operated security lock shall be installed with a corrosion resistant handle on exterior. Three non-removable pin hinges shall be provided. Retaining hooks shall be provided to hold door in the open position. The door shall have a retaining chain and spring to keep the door restrained. Frame shall be constructed of steel, with welded joints. Weather stop shall be attached to bottom of door.

1. Vault shall be entirely assembled by manufacturer at his plant, sealed, waterproofed and tested for water tightness. All joints shall be finished, caulked and concrete on interior smoothed to remove any projecting pieces of concrete. The vault manufacturer shall prepare interior walls and ceiling for painting by removal of all foreign matter, dirt, grease, and other surface

contaminates. The surface temperature shall be maintained at 70 to 90 degrees for the application and curing period.

**m.** Prior to shipment, the vault will receive a finish coating on the exterior, and an inspection shall be conducted. The unit shall be wrapped with shrink-wrap plastic and/or tarp prior to shipment.

**n.** The vault shall be as manufactured by Oldcastle Precast, Thermo Bond Buildings or approved equal.???

**109-2.3 RIGID STEEL CONDUIT**. Rigid steel conduit and fittings shall be in accordance with Underwriters Laboratories Standard 6 and 514.

**109-2.4 LIGHTING.** Vault light fixtures shall be of a vapor-proof type fluorescent as indicated on the drawings.

**109-2.5 OUTLETS**. Convenience outlets shall be heavy-duty duplex units, specification grade, back and side wired, 20 amp 125v. with impact resistant thermoplastic cover plates.

**109-2.6 SWITCHES.** Vault light switches shall be single-pole switches, specification grade, back and side wired, 20 amp 120v. with impact resistant thermoplastic cover plates.

**109-2.7 PAINT**. Paint for the floor shall be in accordance with Fed. Spec. TT-E-487. Walls and ceiling shall be light gray and the floor shall be medium gray.

**109-2.8 GROUND BUS AND GROUND RING.** Ground bus shall be  $1/8 \ge 1/8 \ge 1$ -inch copper bus bar. The exterior ground ring shall be # 4/0 AWG bare copper stranded wire.

**109-2.9 SQUARE DUCT**. Duct shall be square similar to that manufactured by the Square D Company (or equal), or the Trumbull Electric Manufacturing Company (or equal). The entire front of the duct on each section shall consist of hinged or removable cover for ready access to the interior. The cross section of the duct shall be not less than 4 x 4 inches except where otherwise shown in the plans.

**109-2.10 GROUND RODS**. Ground rods shall be copper or copper-clad of the length and diameter specified on the plans.

**109-2.11 METER SOCKET**. Meter socket shall be rated as indicated on the drawings and of the type approved by the local power company. Provide integral 225 ampere 120/240 volt circuit breaker in meter enclosure.

**109-2.13 TRANSIENT VOLTAGE SURGE SUPPRESSION.** The TVSS is paid for under Item L-130.

**109-2.15 FAA-APPROVED EQUIPMENT**. Certain items of airport lighting equipment installed in vaults are covered by individual FAA equipment specifications. The specifications are listed below:

AC 150/5345-7F	Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits
AC 150/5345-10G	Specification for Constant Current Regulators and Regulator Monitors
AC 150/5345-49C	Radio Control Equipment

Provide a new constant current regulator; 3 step, 240V. input, 6.6 amp output, Ferro resonant type, 7.5 KW. Furnish and install a new S1 cutout in the vault.

**a.** Provide L-854 radio control equipment including antenna and antenna cable as indicated on the drawings.

**b.** Provide new L-821 relay control panel as indicated on the drawings.

**c.** Provide connections as shown on the schematic wiring diagram on the drawings for the L-854 and L-821 control equipment.

**109-2.16 OTHER ELECTRICAL EQUIPMENT.** Contactors, disconnect switches, relays, terminal blocks, circuit breakers, and all other regularly used commercial items of electrical equipment not covered by FAA equipment specifications shall conform to the applicable rulings and standards of the Institute of Electrical and Electronic Engineers or the National Electrical Manufacturers Association. When specified, test reports from a testing laboratory indicating that the equipment meets the specifications shall be supplied. In all cases, equipment shall be new and a first-grade product. This equipment shall be supplied in the quantities required for the specific project and shall incorporate the electrical and mechanical characteristics specified in the proposal and plans.

**109-2.17 WIRE.** Wire in conduit rated up to 5,000 volts shall conform to AC 150/5345-7E, Specification for L-824 Underground Electrical Cables for Airport Lighting Circuits, for thermosetting cross linked polyethylene insulated wire. For ratings up to 600 volts, thermoplastic wire conforming to Fed. Spec. J-C-30, Type THWN, shall be used. The wires shall be of the type, size, number of conductors, and voltage shown in the plans or in the proposal.

**109-2.18 HVAC UNITS.** Install completely self-contained cooling/heating units as shown on the drawings to maintain the temperature inside the vault between +32 and +80 degrees F.

Accessories: Provide indoor supply/return grilles ass indicated on drawings. The supply grille shall be an aluminum louvered, double-deflection type grille allowing user adjustment of direction of air distribution. The return grille shall be an aluminum louvered, fixed, single-deflection style grille. Provide two additional sets of filters, MERV 7 per ASHRAE Standard 52.2 (20% efficient per ASHRAE 52.1).

**109-2.19 Short circuit / coordination / device evaluation / arc flash analysis.** The Contractor shall, based upon the equipment provided, include as a part of the submittal process an electrical system "Short Circuit / Coordination / Device evaluation / Arc Flash Analysis". The analysis shall be performed by the equipment manufacturer and submitted in a written report. The analysis shall be signed and sealed by a registered professional Engineer from the state in which the project is located. The analysis shall comply with NFPA-70E and IEEE 1584.

The analysis will include: one line diagrams, short circuit analysis, coordination analysis, equipment evaluation, arc flash analysis and arc flash labels containing at a minimum, equipment name, voltage/current rating, available incident energy and flash protection boundary.

The selected firms' field service Engineer shall perform data gathering for analysis completion and device settings, perform device setting as recommended by the analysis and will furnish and install the arc flash labels. The components worst case incident energy will be considered the available arc flash energy at that specific point in the system. Submit three written copies and one electronic copy of the report.

### **CONSTRUCTION METHODS - VAULT**

**109-3.1 GENERAL**. The Contractor shall install the transformer vault at the location indicated in the plans. Foundation and floor details, installation methods, and equipment placement are shown in the plans.

The Contractor shall clear, grade, and seed the area around the vault for a minimum distance of 10 feet on all sides or as necessary to restore the entire extent of the disturbed area. The slope shall be not less than 1/2-inch per foot away from the vault in all directions.

**109-3.2 PAINTING**. Paint for floor shall be a light gray color approved by the Engineer. Before painting, the surfaces shall be dry and clean. The first coat shall be thinned by adding 2/3-quart of spar varnish and 1/3-quart of turpentine to each gallon of paint. The second coat shall be applied without thinning.

**109-3.3 LIGHTS AND SWITCHES**. The Contractor shall furnish and install lights, specification grade 20 ampere switches, and specification grade 20 ampere, duplex convenience outlets at the locations indicated.

### INSTALLATION OF EQUIPMENT IN VAULT

**109-3.4 GENERAL.** The Contractor shall furnish, install, and connect all equipment accessories, conduit, cables, wires, buses, grounds, and support necessary to insure a complete and operable electrical distribution center for the airport lighting system as specified herein and shown on the plans.

The equipment installation and mounting shall comply with the requirements of the State of California Electrical Code and local code agency having jurisdiction.

**109-3.5 CONTACTORS, RELAYS, TRANSFORMERS, AND PANELS.** Contactors, relays transformers, panels, panel boards, wire-ways, and other similar items shall be furnished and installed at the locations shown on the plans or as directed by the Engineer. Wall or ceiling-mounted items shall be attached to the wall or ceiling with galvanized bolts of not less than 3/8-inch diameter engaging metal expansion shields or anchors in concrete vault. A plywood backboard of dimensions indicated shall be furnished and installed for wall mounted equipment. Provide a  $\frac{3}{4}$ " – 3'x 3' communication backboard, painted black both sides for communication equipment. Mount above 2" telephone stub up shown on the vault plan.

**109-3.6 DUCT AND CONDUIT.** The Contractor shall furnish and install square-type exposed metallic ducts with hinged covers for the control circuits in the vault. These shall be mounted along the walls behind all floor-mounted equipment and immediately below all wall-mounted equipment. The hinged covers shall be placed to open from the front side with the hinges at the front bottom.

Wall brackets for square ducts shall be installed at all joints 2 feet or more apart with intermediate brackets as specified. Conduit shall be used between square ducts and equipment or between different items of equipment when the equipment is designed for conduit connection. When the equipment is not designed for conduit connection, conductors shall enter the square-type control duct through insulating bushings in the duct or on the conduit risers.

**109-3.7 ELECTRIC AND COMMUNICATIONS SERVICE ENTRANCE.** The Contractor installing the vault equipment shall be responsible for furnishing and installing empty underground

conduit for power and communications as indicated on the plans from the existing power utility primary vault (sectionalizing switch) to a new pad mounted transformer and the existing communications pull box to the vault equipment backboard.

The Contractor shall coordinate work with the Airport and Utility Company as well as obtain all permits, pay all fees, and provide materials and labor necessary for interfacing with the utility companies, including providing a transformer pad meeting the utility requirements.

**109-3.8 VAULT CABLE ENTRANCE**. The Contractor installing the vault equipment shall bring the secondary cables from the pad mounted transformer through the service entrance conduits into the service disconnect and meter and then make the necessary electrical connections to the Panel Board A inside the vault as shown on the drawings. All electrical duct/conduit entrance openings into the vault shall be carefully sealed to ensure that they are permanently watertight, using UL rated fire sealing compound.

### 109-3.9 HVAC UNITS. Install per manufacturers' recommendations

**109-3.10 WIRING AND CONNECTIONS.** The Contractor shall make all necessary electrical connections in the vault in accordance with the wiring diagrams furnished and as directed by the Engineer. In wiring to the terminal blocks, the Contractor shall leave sufficient extra length on each control lead to make future changes in connections at the terminal block. This shall be accomplished by running each control lead the longest way around the box to the proper terminal. Leads shall be neatly laced in place.

**109-3.11 MARKING AND LABELING.** All equipment, control wires, terminal blocks, etc., shall be tagged, marked, or labeled as specified below:

a. Wire Identification. The Contractor shall furnish and install self-sticking wire labels or identifying tags on all control wires at the point where they connect to the control equipment or to the terminal blocks. Wire labels, if used, shall be of the self-sticking preprinted type and of the manufacturer's recommended size for the wire involved. Identification markings designated in the plans shall be followed. Tags, if used, shall be of fiber not less than 3/4-inch in diameter and not less than 1/32-inch thick. Identification markings designated in the plans shall be stamped on tags by means of small tool dies. Each tag shall be securely tied to the proper wire by a nonmetallic cord.

b. Labels. The Contractor shall stencil identifying labels on the cases of regulators and distribution and control relay cases with white oil paint as designated by the Engineer. The letters and numerals shall be not less than 1 inch in height and shall be of proportionate width. The Contractor shall also mark the correct circuit designations in accordance with the wiring diagram on the terminal marking strips which are a part of each terminal block.

**109-3.12 GROUND TESTING**. Test grounding connections per NEC using a ground megger and provide reports on ground rings at vault and generator loop to engineer.

**109-3.14 RECORD DRAWINGS**. At the completion of work described by this Item and following final testing of all electrical equipment, switch gear, and circuits and prior to final payment, record drawings shall be prepared by the contractor and submitted (with documented general contractor approval) to the Engineer for final approval.

### METHOD OF MEASUREMENT

**109-4.1 VAULT.** The quantity of vaults to be paid for under this item shall consist of the number of vaults constructed in place and accepted as a complete unit, including equipment installed and connected as indicated on the drawings, as a complete unit ready for operation – lump sum

**109-4.2 ELECTRICAL SERVICE CONNECTION AND UTILITY COORDINATION.** A single measurement will be made for payment purposes at the time that all necessary coordination with the local electric and communication utilities has been completed and all power and communication service connections have been furnished and all materials have been installed. Preparation, assembly, and installation of these materials related to the service connection, and all labor, equipment, tools, and incidentals necessary to complete this item as required to produce a functional system ready for operation as intended and accepted by the Engineer and Owner – lump sum

**109-4.3 UTILITY FEES.** All services and materials provided by the utility that are required to complete the utility service entrance installations as indicated on drawings or required – Fee per power and communication utility.

### **BASIS OF PAYMENT**

**109-5.1** Payment shall be made at the contract lump sum price for each completed and accepted Airport Transformer Vault installation and by the contract lump sum price for the completed and accepted installation of the vault and electrical equipment in the transformer vault. 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.

**109-5.2** Payment shall be made by lump sum price for all work related to installation of the utility service entrance and shall be full compensation for furnishing all materials for all preparation, installation of these materials and for all labor, equipment, tools, and incidentals necessary to complete the item.

**109-5.3** Payment for the work done by the local utility company shall be paid at the exact cost the power company and communication company invoices the Contractor. The Contractor shall include a lump sum in the Contractor's bid price to cover the invoiced amount the power and communication company charges for coordination and work performed by the power company to provide electric and communication service to the Airport Transformer Vault.

Payment will be made under:

Item L-109-5.1	Airport Transformer Vault and Foundation in Place – per Lump Sum
Item L-109-5.2	Electrical Service Connection and Utility Coordination Fee – per Lump Sum
Item L-109-5.3	Electrical Utility Fees – per Lump Sum

# MATERIAL REQUIREMENTS

Fed. Spec. J-C-30	Cable and Wire, Electrical (Power, Fixed Installation)
AC 150/5345-3G	Specification for L-821 Panels for Remote Control of Airport Lighting
AC 150/5345-7E	Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits
AC 150/5345-10G	Specification for Constant Current Regulators and Regulator Monitors
AC 150/5345-49C	Specification for L-854, Radio Control Equipment
ACI-318R-83	Building Code Requirements for Reinforced Concrete

### END OF ITEM L-109

# ITEM L-110 AIRPORT UNDERGROUND ELECTRICAL DUCT BANKS AND CONDUITS

#### **110-1 DESCRIPTION**

**110-1.1** This item shall consist of underground electrical conduits and duct banks (single or multiple conduits encased in concrete or buried in sand) installed per this specification at the locations and per the dimensions, designs, and details shown on the plans. This item shall include furnishing and installing of all underground electrical duct banks and individual and multiple underground conduits. It shall also include all turfing trenching, backfilling, removal, and restoration of any paved or turfed areas; concrete encasement, mandrelling, pulling lines, duct markers, plugging of conduits, and the testing of the installation as a completed system ready for installation of cables per the plans and specifications. This item shall also include furnishing and installing conduits and all incidentals for providing positive drainage of the system. Verification of existing ducts is incidental to the pay items provided in this specification.

#### **110-2 EQUIPMENT AND MATERIALS**

#### 110-2.1 General.

**a.** All equipment and materials covered by referenced specifications shall be subject to acceptance through manufacturer's certification of compliance with the applicable specification when requested by the Engineer.

**b.** Manufacturer's certifications shall not relieve the Contractor of the responsibility to provide materials per these specifications and acceptable to the Engineer. Materials supplied and/or installed that do not comply with these specifications shall be removed, when directed by the Engineer and replaced with materials, that comply with these specifications, at the Contractor's cost.

c. All materials and equipment used to construct this item shall be submitted to the 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 products or models applicable to this project. Indicate all optional equipment and delete non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment for which they apply on each submittal sheet. Markings shall be made bold and clear with arrows or circles (highlighting is not acceptable). The Contractor is solely responsible for delays in project that accrue directly or indirectly from late submissions or resubmissions of submittals.

**d.** The data submitted shall be sufficient, in the opinion of the Engineer, to determine compliance with the plans and specifications. The Contractor's submittals shall be neatly bound in a properly sized 3-ring binder, tabbed by specification section. The Engineer reserves the right to reject any and all equipment, materials or procedures that do not meet the system design and the standards and codes specified in this document.

**e.** All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for a period of at least twelve (12) months from final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner.

**110-2.2 Steel conduit**. Rigid galvanized steel (RGS) conduit and fittings shall be hot dipped galvanized inside and out and conform to the requirements of Underwriters Laboratories Standards 6, 514B, and 1242. All RGS conduits or RGS elbows installed below grade, in concrete, permanently wet locations or other similar environments shall be painted with a 10 mil thick coat of asphaltum sealer or shall have a factory bonded polyvinyl chloride (PVC) cover. Any exposed galvanizing or steel shall be coated with 10 mil of asphaltum sealer. When using PVC coated RGS conduit, care shall be exercised not to damage the factory PVC coating. Damaged PVC coating shall be repaired per the manufacturer's written instructions.

110-2.3 Plastic conduit. Plastic conduit and fittings-shall conform to the following requirements:

- UL 514B covers W-C-1094-Conduit fittings all types, classes 1 thru 3 and 6 thru 10.
- UL 514C covers W-C-1094- all types, Class 5 junction box and cover in plastic (PVC).
- UL 651 covers W-C-1094-Rigid PVC Conduit, types I and II, Class 4.
- UL 651A covers W-C-1094-Rigid PVC Conduit and high density polyethylene (HDPE) Conduit type III and Class 4.

Underwriters Laboratories Standards UL-651 and Article 352 of the current National Electrical Code shall be one of the following, as shown on the plans:

 ${\bf a.}$  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.

**c.** Type III – Schedule 80 PVC suitable for either above ground or underground use either directburied or encased in concrete.

**d.** Type III –HDPE pipe, minimum standard dimensional ratio (SDR) 11, suitable for placement with directional boring under pavement.

The type of solvent cement shall be as recommended by the conduit/fitting manufacturer.

**110-2.4 Split conduit**. Split conduit shall be pre-manufactured for the intended purpose and shall be made of steel or plastic.

**110-2.5 Conduit spacers**. Conduit spacers shall be prefabricated interlocking units manufactured for the intended purpose. They shall be of double wall construction made of high grade, high density polyethylene complete with interlocking cap and base pads, They shall be designed to accept No. 4 reinforcing bars installed vertically.

**110-2.6 Concrete.** Concrete shall conform to Item P-610, Structural Portland Cement Concrete, using 3/4 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 A615 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.** Flowable material used to back fill conduit and duct bank trenches shall conform to the requirements of Item P-153, Controlled Low Strength Material. Fill shall be designed to achieve a 28-day compressive strength of 200 psi (1.4 MPa) under pavement.

**110-2.8 Detectable warning tape**. Plastic, detectable, American Wood Preservers Association (AWPA) Red (electrical power lines, cables, conduit and lighting cable) with continuous legend magnetic tape shall be polyethylene film with a metallized foil core and shall be 3-6 inches (75-150 mm) wide. Detectable tape is incidental to the respective bid item.

### **110-3 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 (50 mm) inside diameter or comply with the National Electrical Code based on cable to be installed, whichever is larger. All duct bank and conduit lines shall be laid to grade toward access points and duct or conduit ends for drainage. Unless shown otherwise on the plans, grades shall be at least 3 inches (75 mm) per 100 feet (30 m). On runs where it is not practicable to maintain the grade all one way, the duct bank and conduit lines shall be graded from the center in both directions toward access points or conduit ends, with a drain into the storm drainage system. Pockets or traps where moisture may accumulate shall be avoided. No duct bank or underground conduit shall be less than 18 inches (0.5 m) 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 (6 mm) smaller than the bore of the conduit shall be pulled or pushed through each conduit. The mandrel shall have a leather or rubber gasket slightly larger than the conduit hole.

The Contractor shall swab out all conduits/ducts and clean base can, manhole, pull boxes, etc., interiors IMMEDIATELY prior to pulling cable. Once cleaned and swabbed the light bases, manholes, pull boxes, etc., and all accessible points of entry to the duct/conduit system shall be kept closed except when installing cables. Cleaning of ducts, base cans, manholes, etc., is incidental to the pay item of the item being cleaned. All raceway systems left open, after initial cleaning, for any reason shall be re-cleaned 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 (90 kg) test polypropylene pull rope. The ends shall be secured and sufficient length shall be left in access points to prevent it from slipping back into the conduit. Where spare conduits are installed, as indicated on the plans, the open ends shall be plugged with removable tapered plugs, designed for this purpose. All conduits shall be securely fastened in place during construction and shall be plugged to prevent contaminants from entering the conduits. Any conduit section having a defective joint shall not be installed. Ducts shall be supported and spaced apart using approved spacers at intervals not to exceed 5 feet (1.5 m).

Unless otherwise shown on the plans, concrete encased duct banks shall be used when crossing under pavements expected to carry aircraft loads, such as runways, taxiways, taxilanes, ramps and aprons. When under paved shoulders and other paved areas, conduit and duct banks shall be encased using flowable fill for protection.

All conduits within concrete encasement of the duct banks shall terminate with female ends for ease in current and future use. Install factory plugs in all unused ends. Do not cover the ends or plugs with concrete.

Where turf is well established and the sod can be removed, it shall be carefully stripped and properly stored.

Trenches for conduits and duct banks may be excavated manually or with mechanical trenching equipment unless in pavement, in which case they shall be excavated with mechanical trenching equipment. Walls of trenches shall be essentially vertical so that a minimum of shoulder surface is disturbed. Blades of graders shall not be used to excavate the trench.

When rock is encountered, the rock shall be removed to a depth of at least 3 inches (75 mm) below the required conduit or duct bank depth and it shall be replaced with bedding material of earth or sand containing no mineral aggregate particles that would be retained on a 1/4 inch (6 mm) 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 6 inches above the duct/conduit or the counterpoise wire if present.

Joints in plastic conduit shall be prepared per the manufacturer's recommendations for the particular type of conduit. Plastic conduit shall be prepared by application of a plastic cleaner and brushing a plastic solvent on the outside of the conduit ends and on the inside of the couplings. The conduit fitting shall then be slipped together with a quick one-quarter turn twist to set the joint tightly. Where more than one conduit is placed in a single trench, or in duct banks, joints in the conduit shall be staggered a minimum of 2 feet (60 cm).

Changes in direction of runs exceeding 10 degrees, either vertical or horizontal, shall be accomplished using manufactured sweep bends.

Whether or not specifically indicated on the drawings, where the soil encountered at established duct bank grade is an unsuitable material, as determined by the Engineer, the unsuitable material shall be removed per 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, per 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 offsite.

Any excess excavation shall be filled with suitable material approved by the Engineer and compacted per Item P-152.

It is the Contractor's responsibility to locate existing utilities within the work area prior to excavation. Where existing active cables) cross proposed installations, the Contractor shall ensure that these cables are adequately protected. Where crossings are unavoidable, no splices will be allowed in the existing cables, except as specified on the plans. Installation of new cable where such crossings must occur shall proceed as follows:

**a.** Existing cables shall be located manually. Unearthed cables shall be inspected to assure absolutely no damage has occurred

**b.** Trenching, etc., in cable areas shall then proceed with approval of the 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 at no expense to the owner.

**110-3.2 Duct banks**. Unless otherwise shown in the plans, duct banks shall be installed so that the top of the concrete envelope is not less than 18 inches (0.5 m) below the bottom of the base or stabilized base course layers where installed under runways, taxiways, aprons, or other paved areas, and not less than 18 inches (0.5 m) below finished grade where installed in unpaved areas.

Unless otherwise shown on the plans, duct banks under paved areas shall extend at least 3 feet (1 m) beyond the edges of the pavement or 3 feet (1 m) beyond any under drains that may be installed alongside the paved area. Trenches for duct banks shall be opened the complete length before concrete is placed so that if any obstructions are encountered, provisions can be made to avoid them. Unless otherwise shown on the plans, all duct banks shall be placed on a layer of concrete not less than 3 inches (75 mm) thick prior to its initial set. The Contractor shall space the conduits not less than 3 inch (75 mm) apart (measured from outside wall to outside wall). All such multiple conduits shall be placed using conduit spacers applicable to the type of conduit. As the conduit laying progresses, concrete shall be placed around and on top of the conduits not less than 3 inches (75 mm) thick unless otherwise shown on the plans. All conduits shall terminate with female ends for ease of access in current and future use. Install factory plugs in all unused ends. Do not cover the ends or plugs with concrete.

Conduits forming the duct bank shall be installed using conduit spacers. No. 4 reinforcing bars shall be driven vertically into the soil a minimum of 6 inches (150 mm) to anchor the assembly into the earth prior to placing the concrete encasement. For this purpose, the spacers shall be fastened down with locking collars attached to the vertical bars. Spacers shall be installed at 5-foot (1.5-m) intervals. Spacers shall be in the proper sizes and configurations to fit the conduits. Locking collars and spacers shall be submitted to the 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 (1.5-m) intervals.

All pavement surfaces that are to have ducts installed therein shall be neatly saw cut to form a vertical face. All excavation shall be included in the contract with price for the duct.

Install a plastic, detectable, color as noted, 3 to 6 inches (75 to 150 mm) wide tape, 8 inches (200 mm) minimum below grade above all underground conduit or duct lines not installed under pavement. Utilize the 3-inch (75-mm) wide tape only for single conduit runs. Utilize the 6-inch (150-mm) wide tape for multiple conduits and duct banks. For duct banks equal to or greater than 24 inches (600 mm) in width, utilize more than one tape for sufficient coverage and identification of the duct bank as required.

When existing cables are to be placed in split duct, encased in concrete, the cable shall be carefully located and exposed by hand tools. Prior to being placed in duct, the 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 (150 mm) nor more than 12 inches (300 mm) wide. The trench for 2 or more conduits installed at the same level shall be proportionately wider. Trench bottoms for conduits without concrete encasement shall be made to conform accurately to grade to provide uniform support for the conduit along its entire length.

Unless otherwise shown on the plans, a layer of fine earth material, at least 4 inches (100 mm) thick (loose measurement) shall be placed in the bottom of the trench as bedding for the conduit. The bedding material shall consist of soft dirt, sand or other fine fill, and it shall contain no particles that would be retained on a 1/4 inch (6 mm) sieve. The bedding material shall be tamped until firm. Flowable backfill may alternatively be used.

Unless otherwise shown on plans, conduits shall be installed so that the tops of all conduits within the Airport's secured area where trespassing is prohibited are at least 18 inches (0.5 m) below the finished grade. Conduits outside the Airport's secured area shall be installed so that the tops of the conduits are at least 24 inches (60 cm) below the finished grade per National Electric Code (NEC), Table 300.5.

When two or more individual conduits intended to carry conductors of equivalent voltage insulation rating are installed in the same trench without concrete encasement, they shall be spaced not less than 3 inches (75 mm) apart (measured from outside wall to outside wall) in a horizontal direction and not less than 6 inches (150 mm) apart in a vertical direction. Where two or more individual conduits intended to carry conductors of differing voltage insulation rating are installed in the same trench without concrete encasement, they shall be placed not less than 3 inches (75 mm) apart (measured from outside wall to outside wall to outside wall to outside wall to outside wall in the same trench without concrete encasement, they shall be placed not less than 3 inches (75 mm) apart (measured from outside wall to outside wall) in a horizontal direction and lot less than 6 inches (150 mm) apart in a vertical direction and lot less than 6 inches (150 mm) apart in a vertical direction.

Trenches shall be opened the complete length between normal termination points before conduit is installed so that if any unforeseen obstructions are encountered, proper provisions can be made to avoid them.

Conduits shall be installed using conduit spacers. No. 4 reinforcing bars shall be driven vertically into the soil a minimum of 6 inches (150 mm) to anchor the assembly into the earth while backfilling. For

this purpose, the spacers shall be fastened down with locking collars attached to the vertical bars. Spacers shall be installed at 5-foot (1.5-m) intervals. Spacers shall be in the proper sizes and configurations to fit the conduits. Locking collars and spacers shall be submitted to the 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 (60 cm) square and 4 - 6 inches (100 - 150 mm) thick extending approximately one inch (25 mm) above the surface. The markers shall also be located directly above the ends of all conduits or duct banks, except where they terminate in a junction/access structure or building. Each cable or duct run from a line of lights and signs to the equipment vault must be marked at approximately every 200 feet (61 m) along the cable or duct run, with an additional marker at each change of direction of cable or duct run.

The Contractor shall impress the word "DUCT" or "CONDUIT" on each marker slab. Impression of letters shall be done in a manner, approved by the Engineer, for a neat, professional appearance. All letters and words must be neatly stenciled. After placement, all markers shall be given one coat of high-visibility international orange paint, as approved by the Engineer. 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 (100 mm) high and 3 inches (75 mm) wide with width of stroke 1/2 inch (12 mm) and 1/4 inch (6 mm) deep or as large as the available space permits. Furnishing and installation of duct markers is incidental to the respective duct pay item.

**110-3.5 Backfilling for conduits.** For conduits, 8 inches (200 mm) of sand, soft earth, or other fine fill (loose measurement) shall be placed around the conduits ducts and carefully tamped around and over them with hand tampers. The remaining trench shall then be backfilled and compacted per Item P-152 "Excavation and Embankment" except that material used for back fill shall be select material not larger than 4 inches (100 mm) in diameter.

Flowable backfill may alternatively be used.

Trenches shall not contain pools of water during back filling operations.

The trench shall be completely backfilled and tamped level with the adjacent surface; except that, where sod is to be placed over the trench, the backfilling shall be stopped at a depth equal to the thickness of the sod to be used, with proper allowance for settlement.

Any excess excavated material shall be removed and disposed of per instructions issued by the Engineer.

**110-3.6 Backfilling for duct banks**. After the concrete has cured, the remaining trench shall be backfilled and compacted per Item P-152 "Excavation and Embankment" except that the material used for backfill shall be select material not larger than 4 inches (100 mm) in diameter. In addition to the requirements of P-152, where duct banks are installed under pavement, one moisture/density test per lift shall be made for each 250 linear feet (76 m) of duct bank or one work period's construction, whichever is less.

Flowable backfill may alternatively be used.

Trenches shall not contain pools of water during backfilling operations.

The trench shall be completely backfilled and tamped level with the adjacent surface; except that, where sod is to be placed over the trench, the backfilling shall be stopped at a depth equal to the thickness of the sod to be used, with proper allowance for settlement.

Any excess excavated material shall be removed and disposed of per instructions issued by the 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 soil stabilization as shown on the plans. The Contractor shall be held responsible for maintaining all disturbed surfaces and replacements until final acceptance. All restoration shall be considered incidental to the L-110 pay item. Following restoration of all trenching near airport movement surfaces, the Contractor shall thoroughly visually inspect the area for foreign object debris (FOD), and remove any such FOD that is found. This FOD inspection and removal shall be considered incidental to the pay item of which it is a component part.

### **110-4 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.

### **110-5 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.

Payment will be made under: confirm

Item L-110-5.1	4-4 Inch Schedule 40 PVC Duct, Trenched, Concrete Encased - per linear foot
Item L-110-5.2	4-4 Inch Schedule 40 PVC Duct, Trenched, Un-encased - per linear foot
Item L-110-5.3	1-2 Inch Schedule 40 PVC Duct, Trenched, Un-encased - per linear foot
Item L-110-5.4	21-2 Inch Schedule 40 PVC Duct, Trenched, UnConcrete-e Encased - per linear foot
Item L-110-5.5	2-2 Inch Schedule 40 PVC Duct, Trenched, Concrete-encased - per linear foot
Item L-110-5.6	4-2 Inch Schedule 40 PVC Duct, Trenched, Un-encased - per linear foot
Item L-110-5.7	1-3 Inch and 2-4 Inch Schedule 40 PVC Ducts for Utility Service, Trenched, $$ - per linear foot
Item L-110-5.8	2-2 Inch and 2-4 Inch Schedule 40 PVC Ducts for Utility Service Trenched, - per linear foot

# MATERIAL REQUIREMENTS

Advisory Circular (A	C) 150/5340-30 H		
	Design and Installation Details for Ai	rport Visual Aids	
AC 150/5345-53 D	Airport Lighting Equipment Certification Program		
ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement		
ASTM D1556	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand- Cone Method		
ASTM D1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft <sup>3</sup> (2,700 kN-m/m <sup>3</sup> ))		
ASTM D2167	Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method		
ASTM D2922	Standard Test Methods for Density of Methods (Shallow Depth)	'Soil and Soil-Aggregate in Place	e by Nuclear
NFPA-70	National Electrical Code (NEC)		
Underwriters	Laboratories Electrical Rigid Metal Conduit - Stee	Standard d	6
Underwriters	Laboratories Conduit, Tubing, and Cable Fittings	Standard	514B
Underwriters	Laboratories Nonmetallic Outlet Boxes, Flush-De	Standard vice Boxes, and Covers	514C
Underwriters	Laboratories Electrical Intermediate Metal Condu	Standard it Steel	1242
Underwriters	Laboratories Schedule 40, 80, Type EB and A Rig	Standard id PVC Conduit and Fittings	651
Underwriters	Laboratories Type EB and A Rigid PVC Conduit a	Standard nd HDPE Conduit	651A

### END OF ITEM L-110
# ITEM L-115 ELECTRICAL MANHOLES AND JUNCTION STRUCTURES

#### **115-1 DESCRIPTION**

115-1.1 This item shall consist of electrical manholes and junction structures (handholes, pullboxes, junction cans, etc.) installed in accordance with this specification, at the indicated locations and conforming to the lines, grades and dimensions shown on the plans or as required by the Engineer. This item shall include the installation of each electrical manhole and/or junction structures with all associated excavation, backfilling, sheeting and bracing, concrete, reinforcing steel, ladders, appurtenances, testing, dewatering and restoration of surfaces to the satisfaction of the Engineer.

#### **115-2 EQUIPMENT AND MATERIALS**

#### 115-2.1 GENERAL.

- **a.** All equipment and materials covered by referenced specifications shall be subject to acceptance through manufacturer's certification of compliance with the applicable specification when so requested by the 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 Contractor's submittals shall be neatly bound in a properly sized 3-ring binder, tabbed by specification section. 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.

**115-2.2 CONCRETE STRUCTURES.** Cast-in-place concrete structures shall conform to the details and dimensions shown on the plans.

Provide precast concrete structures where shown on the plans. Precast concrete structures shall be an approved standard design of the manufacturer. Precast units shall have mortar or bitumastic sealer placed between all joints to make them watertight. The structure shall be designed to withstand [100,000lb aircraft] loads, unless otherwise shown on the plans. Openings or knockouts shall be provided in the structure as detailed on the plans.

Threaded inserts and pulling eyes shall be cast in as shown.

If the Contractor chooses to propose a different structural design, signed, and sealed shop drawings, design calculations, and other information requested by the Engineer shall be submitted by the Contractor to allow for a full evaluation by the Engineer. The Engineer shall review in accordance with the process defined in the General Provisions.

**115-2.3 JUNCTION CANS.** Junction Cans shall be L-867 Class 1 (non-load bearing) or L-868 Class 1 (load bearing) cans encased in concrete. The cans shall have a galvanized steel blank cover, gasket, and stainless steel hardware. Covers shall be 3/8" thickness for L-867 and 3/4" thickness for L-868.

**115-2.4 MORTAR.** The mortar shall be composed of one part of Portland cement and two parts of mortar sand, by volume. The Portland cement shall conform to the requirements of ASTM C 150, Type I. The sand shall conform to the requirements of ASTM C 144. Hydrated lime may be added to the mixture of sand and cement in an amount not to exceed 15 percent of the weight of cement used. The hydrated lime shall meet the requirements of ASTM C 6. The water shall be clean and free of deleterious amounts of acid, alkalies or organic material. If the water is of questionable quality, it shall be tested in accordance with AASHTO T-26.

**115-2.5 CONCRETE.** All concrete used in structures shall conform to the requirements of Item P-610, Structural Portland Cement Concrete.

**115-2.6 FRAMES AND COVERS.** The frames shall conform to one of the following requirements:

- **a.** Gray iron castings shall meet the requirements of ASTM A 48.
- **b.** Malleable iron castings shall meet the requirements of ASTM A 47.
- **c.** Steel castings shall meet the requirements of ASTM A 27.

- **d.** Structural steel for frames shall conform to the requirements of ASTM A-283, Grade D.
- e. Ductile iron castings shall conform to the requirements of ASTM A 536.
- **f.** Austempered ductile iron castings shall conform to the requirements of ASTM A 897.

All castings specified shall withstand a maximum tire pressure of 160 psi and maximum load of 80,000 pounds.

All castings or structural steel units shall conform to the dimensions shown on the plans and shall be designed to support the loadings specified.

Each frame and cover unit shall be provided with fastening members to prevent it from being dislodged by traffic, but which will allow easy removal for access to the structure.

All castings shall be thoroughly cleaned. After fabrication, structural steel units shall be galvanized to meet the requirements of ASTM A 123.

Each cover shall have the word "ELECTRIC" or other approved designation cast on it. Each frame and cover shall be as shown on the plans or approved equivalent. No cable notches are required.

115-2.7 LADDERS. Ladders, if specified, shall be galvanized steel or as shown on the plans.

**115-2.8 REINFORCING STEEL.** All reinforcing steel shall be deformed bars of new billet steel meeting the requirements of ASTM A 615, Grade 60.

**115-2.9 BEDDING/SPECIAL BACKFILL.** Bedding or special backfill shall be as shown on the plans.

**115-2.10 FLOWABLE BACKFILL.** Flowable material used to backfill shall conform to the requirements of Item P-153 "Controlled Low Strength Material".

**115-2.11 CABLE TRAYS.** Cable trays shall be of galvanized steel, plastic, or aluminum. Cable trays shall be located as shown on the plans.

**115-2.12 PLASTIC CONDUIT.** Plastic conduit shall comply with Item L-110 - Airport Underground Electrical Duct Banks and Conduits.

**115-2.13 CONDUIT TERMINATORS.** Conduit terminators shall be pre-manufactured for the specific purpose and sized as required or as shown on the plans.

**115-2.14 PULLING-IN IRONS.** Pulling-in irons shall be manufactured with 7/8-inch (22mm) diameter hot-dipped galvanized steel or stress-relieved carbon steel roping designed for concrete applications (7 strand, 1/2-inch diameter with an ultimate strength of 270,000 psi). Where stress-relieved carbon steel roping is used, a rustproof sleeve shall be installed at the hooking point and all exposed surfaces shall be encapsulated with a polyester coating to prevent corrosion.

**115-2.15 GROUND RODS.** Ground rods shall be one piece, **copper.** 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 (240 cm) long nor less than 5/8 inch (15 mm) in diameter.

## **115-3 CONSTRUCTION METHODS**

1. 115-3.1 UNCLASSIFIED EXCAVATION. It is the Contractor's responsibility to locate existing utilities within the work area prior to excavation. Damage to utility lines, through lack of care in excavating, shall be repaired or replaced to the satisfaction of the Engineer without additional expense to the Owner.

The Contractor shall perform excavation for structures and structure footings to the lines and grades or elevations shown on the plans or as staked by the Engineer. The excavation shall be of sufficient size to permit the placing of the full width and length of the structure or structure footings shown.

All excavation shall be unclassified and shall be considered incidental to the respective L-115 pay item of which it is a component part. Dewatering necessary for L-115 structure 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-115. The cost of all excavation regardless of type of material encountered, shall be included in the unit price bid for the L-115 Item.

Boulders, logs and all other objectionable material encountered in excavation shall be removed. All rock and other hard foundation material shall be cleaned of all loose material and cut to a firm surface either level, stepped or serrated, as directed by the Engineer. All seams, crevices, disintegrated rock and thin strata shall be removed. When concrete is to rest on a surface other than rock, special care shall be taken not to disturb the bottom of the excavation. Excavation to final grade shall not be made until just before the concrete or reinforcing is to be placed.

The Contractor shall provide all bracing, sheeting and shoring necessary to implement and protect the excavation and the structure as required for safety or conformance to governing laws. The cost of bracing, sheeting and shoring shall be included in the unit price bid for the structure.

Unless otherwise provided, bracing, sheeting and shoring involved in the construction of this item shall be removed by the Contractor after the completion of the structure. Removal shall be effected in a manner that will not disturb or mar finished masonry. The cost of removal shall be included in the unit price bid for the structure.

After each excavation is completed, the Contractor shall notify the Engineer. Structures shall be placed after the Engineer has approved the depth of the excavation and the suitability of the foundation material.

Prior to installation the Contractor shall provide a minimum of 6 inches of sand or a material approved by the Engineer as a suitable base to receive the structure. The base material shall be compacted and graded level and at proper elevation to receive the structure in proper relation to the conduit grade or ground cover requirements, as indicated on the plans. **2. 115-3.2 CONCRETE STRUCTURES.** Concrete structures shall be built on prepared foundations conforming to the dimensions and form indicated on the plans. The concrete and construction methods shall conform to the requirements specified in Item P-610. Any reinforcement required shall be placed as indicated on the plans and shall be approved by the Engineer before the concrete is placed.

**3. 115-3.3 PRECAST UNIT INSTALLATIONS.** Precast units shall be installed plumb and true. Joints shall be made watertight by use of sealant at each tongue-and-groove joint and at roof of manhole. Excess sealant shall be removed and severe surface projections on exterior of neck shall be removed.

4. 115-3.4 PLACEMENT AND TREATMENT OF CASTINGS, FRAMES AND FITTINGS. All castings, frames and fittings shall be placed in the positions indicated on the Plans or as directed by the Engineer and shall be set true to line and to correct elevation. If frames or fittings are to be set in concrete or cement mortar, all anchors or bolts shall be in place and position before the concrete or mortar is placed. The unit shall not be disturbed until the mortar or concrete has set.

Field connections shall be made with bolts, unless indicated otherwise. Welding will not be permitted unless shown otherwise on the approved shop drawings and written permission is granted by the casting manufacturer. Erection equipment shall be suitable and safe for the workman. Errors in shop fabrication or deformation resulting from handling and transportation that prevent the proper assembly and fitting of parts shall be reported immediately to the Engineer and approval of the method of correction shall be obtained. Approved corrections shall be made at Contractor's expense.

**5.** Anchor bolts and anchors shall be properly located and built into connection work. Bolts and anchors shall be preset by the use of templates or such other methods as may be required to locate the anchors and anchor bolts accurately.

**6.** Pulling-in irons shall be located opposite all conduit entrances into structures to provide a strong, convenient attachment for pulling-in blocks when installing cables. Pulling-in irons shall be set directly into the concrete walls of the structure.

**7. 115–3.5 INSTALLATION OF LADDERS.** Ladders shall be installed such that they may be removed if necessary. Mounting brackets shall be supplied top and bottom and shall be cast in place during fabrication of the structure or drilled and grouted in place after erection of the structure.

8. 115-3.6 REMOVAL OF SHEETING AND BRACING. In general, all sheeting and bracing used to support the sides of trenches or other open excavations shall be withdrawn as the trenches or other open excavations are being refilled. That portion of the sheeting extending below the top of a structure shall be withdrawn, unless otherwise directed, before more than six (6) inches of material is placed above the top of the structure and before any bracing is removed. Voids left by the sheeting shall be carefully refilled with selected material and rammed tight with tools especially adapted for the purpose or otherwise as may be approved.

**9.** The Engineer may order the Contractor to delay the removal of sheeting and bracing if, in his judgment, the installed work has not attained the necessary strength to permit placing of backfill.

**115-3.7 BACKFILLING.** After a structure has been completed, the area around it shall be backfilled in horizontal layers not to exceed 6 inches in thickness measured after compaction to the density

requirements in Item P-152. Each layer shall be deposited all around the structure to approximately the same elevation. The top of the fill shall meet the elevation shown on the plans or as directed by the Engineer.

**10.** Backfill shall not be placed against any structure until permission is given by the Engineer. In the case of concrete, such permission shall not be given until tests made by the laboratory under supervision of the Engineer establish that the concrete has attained sufficient strength to provide a factor of safety against damage or strain in withstanding any pressure created by the backfill or the methods used in placing it.

Where required, the Engineer may direct the Contractor to add, at his own expense, sufficient water during compaction to assure a complete consolidation of the backfill. The Contractor shall be responsible for all damage or injury done to conduits, duct banks, structures, property or persons due to improper placing or compacting of backfill.

11. 115-3.8 CONNECTION OF DUCT BANKS. To relieve stress of joint between concrete-encased duct banks and structure walls, reinforcement rods shall be placed in the structure wall and shall be formed and tied into duct bank reinforcement at the time the duct bank is installed.

**12.115-3.9 GROUNDING.** A ground rod shall be installed in the floor of all concrete structures so that the top of rod extends 6 inches above the floor. The ground rod shall be installed within 1 foot of a corner of the concrete structure. Ground rods shall be installed prior to casting the bottom slab. Where the soil condition does not permit driving the ground rod into the earth without damage to the ground rod, the Contractor shall drill a 4-inch diameter hole into the earth to receive the ground rod. The hole around the ground rod shall be filled throughout its length, below slab, with Portland cement grout. Ground rods shall be installed in precast bottom slab of structures by drilling a hole through bottom slab and installing the ground rod. Bottom slab penetration shall be sealed watertight with Portland cement grout around the ground rod.

A grounding bus of 4/0 bare stranded copper shall be exothermically bonded to the ground rod and loop the concrete structure walls. The ground bus shall be a minimum of 1 foot above the floor of the structure and separate from other cables. No. 2 AWG bare copper pigtails shall bond the grounding bus to all cable trays and other metal hardware within the concrete structure. Connections to the grounding bus shall be exothermic. Hardware connections may be mechanical, using a lug designed for that purpose.

**13. 115-3.10 CLEANUP AND REPAIR.** After erection of all galvanized items, damaged areas shall be repaired by applying a liquid cold-galvanizing compound conforming MIL-P-21035. Surfaces shall be prepared and compound applied in accordance with manufacturer's recommendations.

Prior to acceptance, the entire structure shall be cleaned of all dirt and debris.

14.115-3.11 RESTORATION. After the backfill is completed, the Contractor shall dispose of all surplus material, dirt and rubbish from the site. The Contractor shall restore all disturbed areas equivalent to or better than their original condition. All sodding, grading and restoration shall be considered incidental to the respective L-115 pay item.

The Contractor shall grade around structures as required to provide positive drainage away from the structure.

**15.** Areas with special surface treatment, such as roads, sidewalks, or other paved areas shall have backfill compacted to match surrounding areas, and surfaces shall be repaired using materials comparable to original materials.

**16.** After all work is completed, the Contractor shall remove all tools and other equipment, leaving the entire site free, clear and in good condition.

**17.115-3.12 INSPECTION.** Prior to final approval, the electrical structures shall be thoroughly inspected for conformance with the plans and this specification. Any indication of defects in materials or workmanship shall be further investigated and corrected. The earth resistance to ground of each ground rod shall not exceed 25 ohms. Each ground rod shall be tested utilizing the fall-of-potential ground impedance test as described by ANSI IEEE Standard 81. This test shall be performed prior to establishing connections to other ground electrodes.

**115-3.13 Duct Extension to Existing Ducts.** Where existing concrete encased ducts are to be extended, the duct extension shall be concrete encased plastic conduit. The fittings to connect the ducts together shall be standard manufactured connectors designed and approved for the purpose. The duct extensions shall be installed according to the concrete encased duct detail and as shown on the plans.

# 115-4 METHOD OF MEASUREMENT

**115-4.1** Electrical manholes and junction structures shall be measured by each unit completed in place and accepted. The following additional items are specifically included in each unit.

- All Required Excavation, Dewatering
- All Required Backfilling with On-Site Materials
- Restoration of All Surfaces and Finished Grading, Sodding
- All Required Connections
- Dewatering If Required
- Temporary Cables and Connections

# 115-5 BASIS OF PAYMENT

**115-5.1** The accepted quantity of electrical manholes and junction structures will be paid for at the Contract unit price per each, complete and in place. This price shall be full compensation for furnishing all materials and for all preparation, excavation, backfilling and placing of the materials, furnishing and installation of appurtenances and connections to duct banks and other structures as may be required to

complete the item as shown on the plans and for all labor, equipment, tools and incidentals necessary to complete the structure.

Payment will be made under:

Item L-115-5.1	Electrical J-box-Handhole – Precast ID 3'x3'x3' – Used as a pullbox – Per Each
Item L-115-5.2	L-867 Electrical Junction Base – Used as a splice can – Per Each
Item L-115-5.3	TID Vault per Detail 1/E8.2 – Per Each
Item L-115-5.4	TID Transformer Pad and Bollards per Details 1, 2 and 3, $E8.1 - Per Each$
Item L-115-5.5	AT&T Pullbox – Per Each

# MATERIAL REQUIREMENTS

ANSI/IEEE Std 81	IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System
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 AA-59544 Cable and Wire, Electrical (Power, Fixed Installation))
ASTM B.3	Soft or Annealed Copper Wire
ASTM B.8	Concentric-Lay-Stranded Copper Conductor, Hard, Medium-Hard, or Soft

## END OF ITEM L-115

# **ITEM L-125 INSTALLATION OF AIRPORT LIGHTING SYSTEMS**

### **125-1 DESCRIPTION**

**125-1.1** This item shall consist of airport lighting systems furnished and installed in accordance with this specification, the referenced specifications, and the applicable advisory circulars. The systems are installed at the locations and in accordance with the dimensions, design, and details shown in the plans. This item shall include the furnishing of all equipment, materials, services, and incidentals necessary to place the systems in operation as completed units to the satisfaction of the Engineer.

## **125-2 EQUIPMENT AND MATERIALS**

## 125-2.1 GENERAL.

a. Airport lighting equipment and materials covered by Federal Aviation Administration (FAA) specifications shall be as approved under the Airport Lighting Equipment Certification Program described in the current version of Appendix 3 to Advisory Circular (AC) 150/5345-53D.

b. Manufacturer's certifications shall not relieve the Contractor of the Contractor's responsibility to provide materials in accordance with these specifications, Appendix 3 to AC 150/5345-53D and as deemed 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 submitted data shall be sufficient, in the opinion of the Engineer, to determine compliance with the plans and specifications and AC 150/5345-53D. The Contractor's submittals shall be neatly bound in a properly sized 3-ring binder, tabbed by specification section. 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.

**125-2.2 CONCRETE.** Concrete shall conform to Specification Item P610 Structural Portland Cement Concrete.

**125-2.3 CONDUIT**. Conduit shall conform to Specification Item L-110 Installation of Airport Underground Electrical Duct.

**125-2.4 CABLE AND COUNTERPOISE.** Cable and Counterpoise shall conform to Item L-108 Installation of Underground Cable for Airports.

**125-2.5 TAPE.** Rubber electrical tape shall be a self-fusing Ethylene Propylene Rubber (EPR) based high-insulating voltage tape such Scotch Electrical Tape Number 23 as manufactured by 3M Company or an approved equal.

Plastic vinyl tape shall be 8.5 mil heavy duty, premium grade all-weather vinyl electrical insulating tape such as Scotch Premium Vinyl Electrical Tape 88 as manufactured by 3M Company or an approved equal.

**125-2.6 CABLE CONNECTIONS.** Cable Connections shall conform to Item L-108 Installation of Underground Cable for Airports.

**125-2.7 RETROREFLECTIVE MARKERS.** Retroflective markers shall be type L-853 and shall conform to the requirements of 150/5345-39D and be listed in appendix 3 to AC 150/5345-53D.

**125-2.8 LIGHT BASE AND TRANSFORMER HOUSINGS.** Light Base and Transformer Housings shall conform to the requirements of 150/5345-42 H and be listed in appendix 3 to AC 150/5345-53D. Light bases shall be Type L-867, Size B shall be provided as indicated or as required to accommodate the fixture or device installed thereon. Base plates, cover plates, and adapter plates shall be provided to accommodate various sizes of fixtures.

**125-2.9 ISOLATION TRANSFORMERS.** Isolation transformers shall be Type L-830, size as required for each installation. Transformer shall conform to AC 150/5345-47 C and be listed in appendix 3 to AC 150/5345-53 D.

**125-2.10 RUNWAY AND TAXIWAY LIGHTS.** Runway and Taxiway Edge Lights shall conform to the requirements of 150/5345-46 E and be listed in appendix 3 to AC 150/5345-53 D.

a. Runway and Taxiway Elevated Lights.

L-861T(L) Taxiway edge light (MIRLS), LED Blue – 12 watts maximum L-861(L) Runway edge light (MIRLS), LED Clear/Yellow, Clear/Clear as indicated – 12 watts maximum **125-2.11 RUNWAY AND TAXIWAY SIGNS.** Runway and Taxiway Signs shall conform to the requirements of 150/5345-44 K and be listed in the current version of Appendix 3 to AC 150/5345-53 D.

- a. L-858 Airfield Guidance Signs -as Scheduled
- b. Signs shall be Size 1, class 2, LED; input 6.6 A constant current 3 step.

#### **125-3 CONSTRUCTION**

#### 125-3.1 SHIPPING AND STORAGE

- a. Equipment should be shipped in suitable packing material to prevent damage during shipping. Equipment and materials should be maintained in new condition and stored in areas protected from weather and physical damage.
- b. Any equipment and materials, in the opinion of the Engineer, damaged during construction or storage shall be replaced by the contractor at no additional cost to the owner. Painted or galvanized surfaces that are damaged shall be repaired according to manufacturer's recommendations.

#### **125-3.2 ELEVATED LIGHTS**

Installation details for installing runway and taxiway light fixtures are shown on the drawings and are suggested sequence of installation.

- a. Water, debris, and other foreign substances shall be removed prior to installing light base and light.
- b. A jig or holding device shall be used when installing each light fixture to ensure positioning to the proper elevation, alignment, level control, and azimuth control. Light fixture shall be oriented with the light beams parallel to the runway or taxiway centerline and facing in the required direction. Outermost edge of fixture shall be level with the surrounding pavement. Surplus sealant or flexible embedding material shall be removed. The holding device shall remain in place until sealant has reached its initial set.

#### **125-3.3 GUIDANCE SIGNS**

Guidance signs shall be installed in accordance with the details shown on the drawings. Sign foundation dimensions shall be coordinated with the sign manufacturer.

#### **125-4 METHOD OF MEASUREMENT**

**125-4.1** Taxiway Edge Lights with new L-867B base will be measured by the number of each type installed as completed units in place, ready for operation, and accepted by the Engineer.

**125-4.2** Taxiway Edge Lights mounted on existing L-867B base will be measured by the number of each type installed as completed units in place, ready for operation, and accepted by the Engineer.

**125-4.3** Runway Edge Lights with new L-867B base will be measured by the number of each type installed as completed units ready for operation, and accepted by the Engineer.

**125-4.4** Guidance signs will be measured by the number of each type and size installed as shown on contract drawings, ready for operation, and as accepted by the Engineer.

#### 125-5 BASIS OF PAYMENT

**125-5.1** Payment will be made at the Contract unit price for each complete runway light, taxiway light or guidance sign, installed by the Contractor and accepted by the Engineer. These payments will be full compensation for furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools and incidentals necessary to complete these items.

Itemize types

Payment will be made under:

Item L-125-5.1	L-861T Taxiway Edge Light – LED, On New Base – Per each
Item L-125-5.2	L-861 Runway Edge Light – LED, On New Base - (color per plan) – Per each
Item L-125-5.3	L-861SE Runway Threshold Light, Incandescent, Red/Green, On new Base. – Per each
Item L-125-5.4	New L-858 Size 1, 2 Module Sign, LED, New Sign Pad Installed – Per each

#### MATERIAL REQUIREMENTS

AC 150/5345-26 D	L-823 Plug and Receptacle, Cable Connectors
AC 150/5345-42 H	Airport Light Bases, Transformer Houses, Junction Boxes and Accessories
AC 150/5345-44 K	Taxiway and Runway Signs
AC 150/5345-46 E	Runway and Taxiway Light Fixtures

AC 150/5345-47 C Isolation Transformers for Airport Lighting Systems

# END OF ITEM L-125

# **ITEM L-130 TRANSIENT VOLTAGE SURGE SUPPRESSION EQUIPMENT**

### DESCRIPTION

#### 130-1.1

**a.** These specifications describe the electrical and mechanical requirements for a hybrid, high energy, suppression filter system that integrates transient voltage surge suppression (TVSS/SPD) with high frequency electrical line noise filtering for high exposure applications and lightning protection where specified.

**b.** The specified unit shall provide effective high energy transient voltage suppression, surge current diversion, and noise attenuation for all electrical modes of equipment connected downstream from the facilities meter or main over current device in high exposure.

**C.** The unit shall be designed and manufactured in the USA by a qualified manufacturer of surge suppression equipment. The qualified manufacturer shall have been engaged in the commercial design and manufacture of such products for a minimum of ten (10) years.

## d. <u>STANDARDS.</u>

The specified unit shall be designed, manufactured, tested and installed in compliance with the following standards:

CODE (year)	TITLE
ANSI/IEEE C62.41 (1991)	Category C environments.
ANSI/IEEE C62.33	Standard Test Specifications for Varistor Protection Devices
ANSI/IEEE C62.34,	Secondary Surge Arrestor and Articles 280 and 285 of the 2014 NEC
ANSI/IEEE C62.35	Standard Test Specifications for Avalanche Semiconductor Protection Devices
ANSI/IEEE C62.41 (1991)	Recommended practice on Surge Voltages in Low Voltage AC Power Circuits
ANSI/IEEE C62.45 (1987)	Guide on Surge Testing for Equipment Connected to Low Voltage AC Power Circuits
UL – 96	Standard for Lightning Protection Components
UL -1449,	2nd Edition Standard for Safety - Transient Voltage Surge Suppressors
NFPA 70	National Electrical Code

CODE (year)	TITLE
NFPA 780	Standard for the Installation of Lightning Protection Systems

## **e.** <u>ENVIRONMENTAL REQUIREMENTS</u>

C F)		
C		
F)		
, 0		
m ) ft)		
Audible Noise – The unit shall not generate any audible noise		
Magnetic Fields – No appreciable Magnetic fields shall be generated. Unit shall be capable of use directly in computer rooms in any location without danger to data storage systems or devices		

# EQUIPMENT AND MATERIALS

#### 130-2.1

**a**. Transient voltage surge suppressor (TVSS) or Surge protection devices are the equipment required for the protection, within specified limits, of AC electrical circuits and electronic equipment from the effects of lightning induced voltages, external switching transients and internally generated switching transients. Individual suppressors shall be installed where shown on the drawings.

The nominal unit operating voltage and configuration shall be as indicated on the drawings and electrical connections to equipment being protected.

Surge suppression, grounding and bonding shall effectively protect within tested limits, the systems to which applied against lightning transients, internal and external switching transients, and other surge transients throughout the useful life of the system.

Any Surge Protection Device (SPD) which shows evidence of failure or incorrect operation during the ten year warranty shall be replaced or repaired at no expense to the owner with the exception of fair labor costs. Since Acts of nature or similar statements include the lightning threat to which this SPD shall be exposed, any such general limiting warranty responsibility in the general conditions of this specification shall not apply to this section.

### b. <u>COMPONENTS</u>

Main service and distribution equipment suppressors: Combination Surge and Lighting Arrestor. The AC voltage SPD's shall be a high speed, high current device designed to protect electrical systems and electronic equipment from transient over-voltage. The SPD shall provide continuous bi-polar, bi-directional, non-interrupting protection and be capable of instant reset with no degradation in protection. Gas tubes are not acceptable. The SPD shall utilize SAD or Selenium Based MOV technology. It shall start to suppress at a minimum of 115% of the peak voltage of the sine wave. At maximum surge current dissipation, the device shall not exceed the maximum voltage protection level. The SPD shall be installed in parallel with the service main disconnect, distribution or branch panel main lugs as shown. Connect SPD to over current protection sized as shown with an AIC rating equal to panel rating. The suppressor shall have status indicator lights, dry contacts with remote alarm capabilities and an audible alarm. Suppressors shall be assembled as modular units to permit quick, easy replacement of failed components. The product shall comply with UL 96, UL 1449 and ANSI/IEEE 62.34

(1). Electrical Service

i.Voltage shall be as indicated on drawings

ii.Frequency 60 Hz

iii.Phases -- 1 phase

iv. Wiring configuration -- as indicated on drawings.

(2). IEEE 62.41 Categories unless otherwise indicated on drawings:

i.Service entrance sizes

ii.Up to 600A B3/C1

iii.> 600A to 1.2 KA C2

iv.> 1.2 KA C3

v.Distribution or sub-panels B2

(3). Electrical Performance

i.Response time < 5 nanoseconds

ii.MCOV 115% minimum

iii.Shortwave test- surge current

iv.(6kv, 1.2/50usec; 3ka 8/20µsec) 5000 surges

(4). Minimum surge current:

i.Service Entrance 410,000 Amps/Phase

ii. Distribution and Sub-panels 210,000 Amps/Phase

**(5).** Suppression system protected modes shall be L-N, L-G, L-L for Single Phase, 3 Wire Systems.

(6). <u>Power on indicators and failure detection</u>: A lighted panel on the cover shall provide indication that the suppressor is properly activated and shall also indicate mode

failure. If the suppressor fails, an isolated contact shall close. In addition, an audible alarm shall be provided with manual reset.

(7). <u>Failure mode:</u> SPD's shall be designed to fail shorted. Any fuses in series with the SPD's shall not open during a surge event.

c. <u>DISCONNECT</u>: Main service suppressors shall be provided with an integral fused disconnect switch or dedicated circuit breaker as shown or required by UL. Breakers and suppressors shall have an AIC fault withstand rating equal or greater than the AIC rating of the equipment to which it is connected. The length of wiring from the tap at the service conductors to the suppressor being protected, however, shall not exceed the maximum length permitted by manufacturer, to maintain the maximum voltage protection level. Suppressors may be installed within switchgear or panel boards where UL label or listing is not affected, suppressors are completely and easily accessible, indicator lights are visible and audible alarm can be easily heard.

### d. <u>OPERATION STATUS INDICATOR</u>: Audible Remote Signaling and Visual Systems.

(1). <u>Visual System:</u>

i.Protection: Suppressor Working - Green LED's

ii.Warning/Fault: Suppressor Failure - Red LED's

iii.LED's shall be field replaceable

iv. Other visual indicators where approved.

(2). <u>Remote Signaling:</u> Relay with Auxiliary for C contacts: Two sets @ 2 ampere, 120 volts each. 1 Set N.O. and 1 set N.C. to operate upon failure of suppression module, blown fuse or tripped circuit breaker in suppressor module or in disconnect switch for alarm connection to remote location.

(3). <u>Audible</u>: The audible alarm shall activate upon a fault condition within the suppressor. An alarm silence / reset switch and push-to-test switch shall be provided.

e. <u>BONDING AND GROUNDING CONDUCTORS AND MATERIALS FOR MAIN</u> <u>SERVICE SUPPRESSORS</u>:

(1). <u>Size:</u> Conductors utilized for surge suppressor connections to service conductors shall be a minimum of #6 AWG stranded insulated copper unless otherwise specified

(2). <u>Bus:</u> Ground bus or strip material where used shall be copper, a minimum of <sup>1</sup>/<sub>4</sub> inch thickness and two inches wide unless otherwise specified. Bus materials shall be secured to surfaces with appropriate insulators and mechanical fasteners. Bus connections shall be bolted and reinforced as necessary to provide a permanent and secure connection.

(3). <u>Connections Compliance:</u> Connectors, splices, and other fitting used to interconnect grounding conductors, bonding to equipment or ground bars, shall comply with requirements of the National Electric Code and be accepted by Underwriters' Laboratories for the purpose.

(4). <u>Connectors:</u> Connectors and fitting for grounding and bonding conductors shall be of the compression type in above grade locations. Connections below grade shall be exothermically welded.

(5). <u>Connectors</u>: Connectors and fitting for grounding and bonding conductors shall be of the compression type in above grade locations. Connections below grade shall be exothermically welded.

iii.<u>Dissimilar Materials</u>: Bonding connections between electrically dissimilar metals shall be made using exothermic welds or using bi-metal connectors designed to prevent galvanic corrosion.

## **CONSTRUCTION METHODS**

130-3.1 INSTALLATION. Install per manufacturers' recommendations

**130-3.2 OPERATIONS AND MAINTENANCE SUBMITTAL.** At the completion of work described by this item, operation and maintenance manuals shall be prepared by the contractor and submitted (with documented general contractor approval) to the Engineer for final approval.

## METHOD OF MEASUREMENT

**130-4.1 TVSS** shall be measured as a lump sum measurement including all connections and overcurrent devices.

## **BASIS OF PAYMENT**

**130-5.1** Payment made shall be made for TVSS as installed, as shown on contract drawings, as a lump sum price. This price shall be full compensation for furnishing all materials and for all preparation, assembly and labor, equipment, tools and incidentals necessary to complete this item.

Payment will be made under:

Item L-130-5.1 TVSS Installed - Per Lump Sum'

# END OF ITEM L-130

# END OF ELECTRICAL TECHNICAL PROVISIONS

# **DIVISION 8**

# APPENDICES

# APPENDIX A GENERAL DECISION NUMBER CA170029 (05/05/2017)

General Decision Number: CA170029 05/05/2017 CA29

Superseded General Decision Number: CA20160029

State: California

Construction Types: Building, Heavy (Heavy and Dredging) and Highway

Counties: Alameda, Calaveras, Contra Costa, Fresno, Kings, Madera, Mariposa, Merced, Monterey, San Benito, San Francisco, San Joaquin, San Mateo, Santa Clara, Santa Cruz, Stanislaus and Tuolumne Counties in California.

BUILDING CONSTRUCTION PROJECTS; DREDGING PROJECTS (does not include hopper dredge work); HEAVY CONSTRUCTION PROJECTS (does not include water well drilling); HIGHWAY CONSTRUCTION PROJECTS

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		01/20/2017
2		01/27/2017
3		02/17/2017
4		02/24/2017
5		03/03/2017
б		03/10/2017
7		03/31/2017
8		04/14/2017
9		04/21/2017
10		05/05/2017

ASBE0016-004 01/01/2017

AREA 1: CALAVERAS, FRESNO, KINGS, MADERA, MARIPOSA, MERCED, MONTEREY, SAN BENITO, SAN JOAQUIN, SANTA CRUZ, STANISLAUS & TOULMNE COUNTIES

AREA 2: ALAMEDA, CONTRA COSTA, SAN FRANSICO, SAN MATEO & SANTA CLARA COUNTIES

Rates Fringes

Asbestos Removal worker/hazardous material handler (Includes preparation, wetting, stripping, removal, scrapping, vacuuming, bagging and disposing of all insulation materials from mechanical systems, whether they contain asbestos or not) Area 1......\$ 28.20 Area 2.....\$ 32.98 ASBE0016-008 01/01/2017

AREA 1: ALAMEDA, CONTRA COSTA, MONTEREY, SAN BENITO, SAN FRANSICO, SAN MATEO, SANTA CLARA, & SANTA CRUZ AREA 2: CALAVERAS, COLUSA, FRESNO, KINGS, MADERA, MARIPOSA, MERCED, SAN JOAQUIN, STANISLAU, & TUOLUMNE Rates Fringes Asbestos Workers/Insulator (Includes the application of all insulating materials, Protective Coverings, Coatings, and Finishes to all types of mechanical systems) Area 1.....\$ 62.36 Area 2.....\$ 46.96 22.98 23.10 BOIL0549-001 10/01/2016 AREA 1: ALAMEDA, CONTRA COSTA, SAN FRANCISCO, SAN MATEO & SANTA CLARA COUNTIES AREA 2: REMAINING COUNTIES Rates Fringes BOILERMAKER Area 1.....\$ 43.28 37.91 Area 2.....\$ 39.68 35.71 BRCA0003-001 02/01/2017 Rates Fringes 14.99 MARBLE FINISHER.....\$ 31.17 \_\_\_\_\_ BRCA0003-003 02/01/2017 Rates Fringes MARBLE MASON.....\$ 41.77 26.76 BRCA0003-005 05/01/2016 Rates Fringes BRICKLAYER (1) Fresno, Kings, Madera, Mariposa, Merced....\$ 37.04 21.13 ( 7) San Francisco, San Mateo.....\$ 40.89 25.78 (8) Alameda, Contra Costa, San Benito, Santa Clara.....\$ 42.70 ( 9) Calaveras, San 21.67 Joaquin, Stanislaus, Toulumne.....\$ 38.21 (16) Monterey, Santa Cruz...\$ 39.51 20.71 23.49 \_\_\_\_\_ \_ \_ \_ \_ \_ \_ \_ \_ \_ BRCA0003-008 07/01/2016 Rates Fringes TERRAZZOFINISHER......\$34.43TERRAZZOWORKER/SETTER......\$42.41 16.58 26.31 \_\_\_\_\_ \* BRCA0003-011 04/21/2017 AREA 1: Alameda, Contra Costa, Monterey, San Benito, San Francisco, San Mateo, Santa Clara, Santa Cruz

AREA 2: Calaveras, San Joaquin, Stanislaus, Tuolumne

	Rates	Fringes
TILE FINISHER Area 1	27.48 25.60 24.42	15.45 14.90
Area 3         Tile Layer         Area 1         Area 2         Area 3         \$         Area 3	45.80 42.67 35.31	14.53 17.54 17.46 16.83
CARP0022-001 07/01/2016		
San Francisco County		
	Rates	Fringes
Carpenters Bridge Builder/Highway Carpenter\$ Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector Saw	44.40	28.20
Filer\$ Journeyman Carpenter\$ Millwright\$	44.55 44.40 44.50	28.20 28.20 29.79
CARP0034-001 07/01/2016		
	Rates	Fringes
Diver		
Assistant fender, Rov Tender/Technician\$ Diver standby\$ Diver Tender\$ Diver wet\$ Manifold Operator (mixed	43.65 48.61 47.82 93.17	31.40 31.40 31.40 31.40
Manifold Operator (Standby).\$	47.82	31.40
DEPTH PAY (Surface Diving): 050 to 100 ft \$2.00 per foot 101 to 150 ft \$3.00 per foot 151 to 220 ft \$4.00 per foot		
SATURATION DIVING: The standby rate shall apply unt saturation diving rate applies w pressure continuously until work complete. The diver rate shall b hours.	il saturation s hen divers are task and decom e paid for all	starts. The under pression are saturation
DIVING IN ENCLOSURES: Where it is necessary for Divers or other enclosures where there following premium shall be paid: entrance 26 feet to 300 feet: \$ necessary for a diver to enter a enclosure less than 48" in heigh \$1.00 per foot.	to enter pipes is no vertical Distance trav 1.00 per foot. ny pipe, tunnel t, the premium	or tunnels, ascent, the eled from When it is or other will be
WORK IN COMBINATION OF CLASSIFICAT Employees working in any combina within the diving crew (except d are paid in the classification w that shift.	IONS: tion of classif ive supervisor) ith the highest	ications in a shift rate for
CARP0034-003 07/01/2016		

rates
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31.40 Piledriver.....\$ 44.65 \_\_\_\_\_ CARP0035-007 07/01/2016 AREA 1: Alameda, Contra Costa, San Francisco, San Mateo, Santa Clara counties AREA 2: Monterey, San Benito, Santa Cruz Counties AREA 3: Calaveras, Fresno, Kings, Madera, Mariposa, Merced, San Joaquin, Stanislaus, Tuolumne Counties Rates Fringes Modular Furniture Installer Area 1 

 Installer I......\$ 24.91

 Installer II.....\$ 21.48

 Lead Installer.....\$ 28.36

 Master Installer....\$ 32.58

 19.63 19.63 20.13 20.13 Area 2 Installer I.....\$ 22.26 Installer II.....\$ 19.31 Lead Installer....\$ 25.23 19.63 19.63 20.13 Master Installer.....\$ 28.86 20.13 Area 3 Installer I.....\$ 21.31 19.63 Installer II...... \$ 18.54 Lead Installer...... \$ 24.11 Master Installer..... \$ 31.13 19.63 20.13 20.13 \_\_\_\_\_ CARP0035-008 08/01/2016 AREA 1: Alameda, Contra Costa, San Francisco, San Mateo, Santa Clara counties AREA 2: Monterey, San Benito, Santa Cruz Counties AREA 3: San Joaquin AREA 4: Calaveras, Fresno, Kings, Madera, Mariposa, Merced, Stanislaus, Tuolumne Counties Rates Fringes Drywall Installers/Lathers: Area 1.....\$ 44.40 28.64 

 Area 2.....\$ 38.52

 Area 3.....\$ 39.02

 Area 4.....\$ 37.67

 28.64 28.64 28.64 Drywall Stocker/Scrapper 

 Area 1......\$ 22.20

 Area 2.....\$ 19.26

 Area 3.....\$ 19.51

 16.57 16.57 16.57 Area 4.....\$ 18.84 16.57 \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_\_\_\_\_ CARP0152-001 07/01/2016 Contra Costa County Rates Fringes

Carpenters Bridge Builder/Highway		
Carpenter\$	44.40	28.20
Hardwood Floorlayer,		
Shingler, Power Saw		
Operator, Steel Scattold &		
Steel Shoring Erector, Saw		
Filer\$	44.55	28.20
Journeyman Carpenter\$	44.40	28.20

Millwright.....\$ 44.50 29.79 \_\_\_\_\_ CARP0152-002 07/01/2016 San Joaquin County Rates Fringes Carpenters Bridge Builder/Highway Carpenter....\$ 44.40 28.20 Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw ------CARP0152-004 07/01/2016 Calaveras, Mariposa, Merced, Stanislaus and Tuolumne Counties Rates Fringes Carpenters Bridge Builder/Highway Carpenter.....\$ 44.40 28.20 Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw Filer.....\$ 37.32 Journeyman Carpenter.....\$ 37.17 Millwright....\$ 39.67 28.20 28.20 29.79 CARP0217-001 07/01/2016 San Mateo County Rates Fringes Carpenters Bridge Builder/Highway Carpenter.....\$ 44.40 28.20 Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw 29.79 \_\_\_\_\_ \_\_\_\_\_ CARP0405-001 07/01/2016 Santa Clara County Rates Fringes Carpenters Bridge Builder/Highway Carpenter.....\$ 44.40 28.20 Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw Steel Shoring Erector, Saw Filer.....\$ 44.55 Journeyman Carpenter.....\$ 44.40 \$ 44.50 28.20 28.20 Millwright.....\$ 44.50 29.79 \_\_\_\_\_ \_\_\_\_\_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ \_ CARP0405-002 07/01/2016 San Benito County Rates Fringes

Carpenters		
Bridge Builder/Highway Carpenter	44 40	28 20
Hardwood Floorlayer,	11.10	20.20
Shingler, Power Saw		
Steel Shoring Erector, Saw		
Filer\$	38.58	28.20
Millwright\$	38.52 41.02	28.20 29.79
CARP0505-001 07/01/2016		
Santa Cruz County		
	Rates	Fringes
Carpenters		
Bridge Builder/Highway	44 40	20.20
Hardwood Floorlayer,	44.40	20.20
Shingler, Power Saw		
Steel Shoring Erector, Saw		
Filer\$	38.67	28.20
Millwright\$	38.52 41.02	28.20 29.79
CARP0605-001 07/01/2016		
Monterey County		
	Rates	Fringes
- · ·		1 1 1 1 9 0 0
Carpenters Bridge Builder/Highway		
Carpenter\$	44.40	28.20
Hardwood Floorlayer, Shingler, Power Saw		
Operator, Steel Scaffold &		
Steel Shoring Erector, Saw Filer	38.67	28.20
Journeyman Carpenter\$	38.52	28.20
CAPDO701_001_07/01/2016	41.02	29.79
Fresno and Madera Countles		
	Rates	Fringes
Carpenters		
Carpenter\$	44.40	28.20
Hardwood Floorlayer,		
Operator, Steel Scaffold &		
Steel Shoring Erector, Saw	27 20	20.20
Journeyman Carpenter\$	37.17	28.20
Millwright\$	39.67	29.79
CARP0713-001 07/01/2016		
Alameda County		
	Rates	Fringes
Carpenters		
Bridge Builder/Highway	44 40	28 20
Hardwood Floorlayer,	JI.IV	20.20
Shingler, Power Saw		
operator, becer bearrord d		

Steel Shoring Erector, Saw		20.00	
Journeyman Carpenter\$ Millwright\$	44.55 44.40 44.50	28.20 28.20 29.79	
CARP1109-001 07/01/2016			
Kings County			
	Rates	Fringes	
Carpenters Bridge Builder/Highway Carpenter\$ Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold &	44.40	28.20	
Filer\$ Journeyman Carpenter\$ Millwright\$	37.32 37.17 39.67	28.20 28.20 29.79	
ELEC0006-004 12/01/2016			
SAN FRANCISCO COUNTY			
	Rates	Fringes	
Sound & Communications Installer\$ Technician\$	35.57 40.50	3%+18.05 3%+18.05	
is to transmit or receive infor data systems or multiple system function or power supply; inclu terminations and testings of co their function; excluding fire a in raceways (including wire and performed on new or major remode jobs for which the conductors for installed in conduit; excluding systems, line voltage work, indu systems (all buildings having fl above the lowest floor level hav excluding energy management syst	mation; excludi: s which include sion or exclusi nductors determ larm work when cable pulling) l building pro or the fire alar installation of strial work, li oors located mo: ring building ac ems.	ng all other control on of ined by installed and when jects or m system are raceway fe-safety re than 75' cess);	
FOOTNOTE: Fire alarm work when installed in raceways (including wire and cable pulling), on projects which involve new or major remodel building construction, for which the conductors for the fire alarm system are installed in the conduit, shall be performed by the inside electrician.			
ELEC0006-007 06/01/2016			
SAN FRANCISCO COUNTY			
	Rates	Fringes	
ELECTRICIAN\$ ELEC0100-002 03/01/2017	64.00	30.38	
FRESNO, KINGS, AND MADERA COUNTIES			
	Rates	Fringes	
ELECTRICIAN\$	36.50	21.65	
ELEC0100-005 12/01/2016			
FRESNO, KINGS, MADERA			

	Naces	FIIIges
Communications System		
Installer\$	30.64	3%+17.86
Technician\$	34.89	3%+17.86

Pator

Fringes

SCOPE OF WORK

Includes the installation testing, service and maintenance, of the following systems which utilize the transmission and/or transference of voice, sound, vision and digital for commercial, education, security and entertainment purposes for the following: TV monitoring and surveillance, background-foreground music, intercom and telephone interconnect, inventory control systems, microwave transmission, multi-media, multiplex, nurse call system, radio page, school intercom and sound, burglar alarms, and low voltage master clock systems.

A. SOUND AND VOICE TRANSMISSION/TRANSFERENCE SYSTEMS Background foreground music, Intercom and telephone interconnect systems, Telephone systems Nurse call systems, Radio page systems, School intercom and sound systems, Burglar alarm systems, Low voltage, master clock systems, Multi-media/multiplex systems, Sound and musical entertainment systems, RF systems, Antennas and Wave Guide,

#### B. FIRE ALARM SYSTEMS Installation, wire pulling and testing

C. TELEVISION AND VIDEO SYSTEMS Television monitoring and surveillance systems Video security systems, Video entertainment systems, Video educational systems, Microwave transmission systems, CATV and CCTV

D. SECURITY SYSTEMS Perimeter security systems Vibration sensor systems Card access systems Access control systems, Sonar/infrared monitoring equipment

E. COMMUNICATIONS SYSTEMS THAT TRANSMIT OR RECEIVE INFORMATION AND/OR CONTROL SYSTEMS THAT ARE INTRINSIC TO THE ABOVE LISTED SYSTEMS SCADA (Supervisory Control and Data Acquisition) PCM (Pulse Code Modulation) Inventory Control Systems, Digital Data Systems Broadband and Baseband and Carriers Point of Sale Systems, VSAT Data Systems Data Communication Systems RF and Remote Control Systems, Fiber Optic Data Systems

WORK EXCLUDED Raceway systems are not covered (excluding Ladder-Rack for the purpose of the above listed systems). Chases and/or nipples (not to exceed 10 feet) may be installed on open wiring systems. Energy management systems. SCADA (Supervisory Control and Data Acquisition) when not intrinsic to the above listed systems (in the scope). Fire alarm systems when installed in raceways (including wire and cable pulling) shall be performed at the electrician wage rate, when either of the following two (2) conditions apply: 1. The project involves new or major remodel building trades construction. 2. The conductors for the fire alarm system are installed in conduit.

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#### ELEC0234-001 12/25/2016

MONTEREY, SAN BENITO AND SANTA CRUZ COUNTIES

	Rates	Fringes
ELECTRICIAN		
Zone A\$	44.65	24.44
Zone B\$	49.12	24.57

Zone A: All of Santa Cruz, Monterey, and San Benito Counties within 25 air miles of Highway 1 and Dolan Road in Moss Landing, and an area extending 5 miles east and west of

Highway 101 South to the San Luis Obispo County Line

Zone B: Any area outside of Zone A

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ELEC0234-003 12/01/2016

MONTEREY, SAN BENITO, AND SANTA CRUZ COUNTIES

	Rates	Fringes
Sound & Communications		
Installer\$	35.07	18.60
Technician\$	37.94	16.30

SCOPE OF WORK: Including any data system whose only function is to transmit or receive information; excluding all other data systems or multiple systems which include control function or power supply; inclusion or exclusion of terminations and testings of conductors determined by their function; excluding fire alarm work when installed in raceways (including wire and cable pulling) and when performed on new or major remodel building projects or jobs for which the conductors for the fire alarm system are installed in conduit; excluding installation of raceway systems, line voltage work, industrial work, life-safety systems (all buildings having floors located more than 75' above the lowest floor level having building access); excluding energy management systems.

FOOTNOTE: Fire alarm work when installed in raceways (including wire and cable pulling), on projects which involve new or major remodel building construction, for which the conductors for the fire alarm system are installed in the conduit, shall be performed by the inside electrician.

ELEC0302-001 02/27/2017

CONTRA COSTA COUNTY

	Rates	Fringes
CABLE SPLICER\$ ELECTRICIAN\$	5 54.92 5 48.51	26.75 26.56
ELEC0302-003 12/01/2016		

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CONTRA COSTA COUNTY

	Rates	Fringes
Sound & Communications		
Installer\$	35.07	18.05
TechnicianŚ	39.93	18.20

SCOPE OF WORK: Including any data system whose only function is to transmit or receive information; excluding all other data systems or multiple systems which include control function or power supply; inclusion or exclusion of terminations and testings of conductors determined by their function; excluding fire alarm work when installed in raceways (including wire and cable pulling) and when performed on new or major remodel building projects or jobs for which the conductors for the fire alarm system are installed in conduit; excluding installation of raceway systems, line voltage work, industrial work, life-safety systems (all buildings having floors located more than 75' above the lowest floor level having building access); excluding energy management systems.

FOOTNOTE: Fire alarm work when installed in raceways (including wire and cable pulling), on projects which involve new or major remodel building construction, for

which the conductors for the fire alarm system are installed in the conduit, shall be performed by the inside electrician.

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#### ELEC0332-001 05/30/2016

#### SANTA CLARA COUNTY

	Rates	Fringes
CABLE SPLICER\$	67.87 59.02	33.28

FOOTNOTES: Work under compressed air or where gas masks are required, orwork on ladders, scaffolds, stacks, "Bosun's chairs," or other structures and where the workers are not protected by permanent guard rails at a distance of 40 to 60 ft. from the ground or supporting structures: to be paid one and one-half times the straight-time rate of pay. Work on structures of 60 ft. or over (as described above): to be paid twice the straight-time rate of pay.

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#### ELEC0332-003 12/01/2016

SANTA CLARA COUNTY

	Rates	Fringes
Sound & Communications		
Installer\$	35.07	18.602
Technician\$	39.93	18.748

SCOPE OF WORK: Including any data system whose only function is to transmit or receive information; excluding all other data systems or multiple systems which include control function or power supply; inclusion or exclusion of terminations and testings of conductors determined by their function; excluding fire alarm work when installed in raceways (including wire and cable pulling) and when performed on new or major remodel building projects or jobs for which the conductors for the fire alarm system are installed in conduit; excluding installation of raceway systems, line voltage work, industrial work, life-safety systems (all buildings having floors located more than 75' above the lowest floor level having building access); excluding energy management systems.

FOOTNOTE: Fire alarm work when installed in raceways (including wire and cable pulling), on projects which involve new or major remodel building construction, for which the conductors for the fire alarm system are installed in the conduit, shall be performed by the inside electrician.

# ELEC0595-001 06/01/2016

#### ALAMEDA COUNTY

	Rates	Fringes
CABLE SPLICER\$ ELECTRICIAN\$	58.95 52.40	34.14 33.95
ELEC0595-002 12/01/2016		
CALAVERAS AND SAN JOAQUIN COUNTIES		
	Rates	Fringes
CABLE SPLICER\$	40.54 7.	5%+23.49
(1) Tunnel work\$	37.01 7.	.5%+23.49

(2) All other work.....\$ 35.25 7.5%+23.49

ELEC0595-006 12/01/2016

ALAMEDA COUNTY

	Rates	Fringes
Sound & Communications		
Installer\$	35.07	3%+17.55
Technician\$	39.93	3%+17.55

SCOPE OF WORK: Including any data system whose only function is to transmit or receive information; excluding all other data systems or multiple systems which include control function or power supply; inclusion or exclusion of terminations and testings of conductors determined by their function; excluding fire alarm work when installed in raceways (including wire and cable pulling) and when performed on new or major remodel building projects or jobs for which the conductors for the fire alarm system are installed in conduit; excluding installation of raceway systems, line voltage work, industrial work, life-safety systems (all buildings having floors located more than 75' above the lowest floor level having building access); excluding energy management systems.

FOOTNOTE: Fire alarm work when installed in raceways (including wire and cable pulling), on projects which involve new or major remodel building construction, for which the conductors for the fire alarm system are installed in the conduit, shall be performed by the inside electrician.

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ELEC0595-008 12/01/2016

CALAVERAS AND SAN JOAQUIN COUNTIES

	Rates	Fringes
Communications System		
Installer\$	30.64	3%+17.55
TechnicianŚ	34.89	3%+17.55

SCOPE OF WORK: Including any data system whose only function is to transmit or receive information; excluding all other data systems or multiple systems which include control function or power supply; inclusion or exclusion of terminations and testings of conductors determined by their function; excluding fire alarm work when installed in raceways (including wire and cable pulling) and when performed on new or major remodel building projects or jobs for which the conductors for the fire alarm system are installed in conduit; excluding installation of raceway systems, line voltage work, industrial work, life-safety systems (all buildings having floors located more than 75' above the lowest floor level having building access); excluding energy management systems.

FOOTNOTE: Fire alarm work when installed in raceways (including wire and cable pulling), on projects which involve new or major remodel building construction, for which the conductors for the fire alarm system are installed in the conduit, shall be performed by the inside electrician.

ELEC0617-001 06/01/2016

SAN MATEO COUNTY

	Rates	Fringes
ELECTRICIAN\$	55.30	32.19

ELEC0617-003 12/01/2016

SAN MATEO COUNTY

	Rates	Fringes
Sound & Communications		
Installer\$	35.07	18.86
Technician\$	39.93	18.86

SCOPE OF WORK: Including any data system whose only function is to transmit or receive information; excluding all other data systems or multiple systems which include control function or power supply; inclusion or exclusion of terminations and testings of conductors determined by their function; excluding fire alarm work when installed in raceways (including wire and cable pulling) and when performed on new or major remodel building projects or jobs for which the conductors for the fire alarm system are installed in conduit; excluding installation of raceway systems, line voltage work, industrial work, life-safety systems (all buildings having floors located more than 75' above the lowest floor level having building access); excluding energy management systems.

FOOTNOTE: Fire alarm work when installed in raceways (including wire and cable pulling), on projects which involve new or major remodel building construction, for which the conductors for the fire alarm system are installed in the conduit, shall be performed by the inside electrician.

ELEC0684-001 12/01/2016

MARIPOSA, MERCED, STANISLAUS AND TUOLUMNE COUNTIES

	Rates	Fringes
ELECTRICIANŚ	36.40	3%+20.73

CABLE SPLICER = 110% of Journeyman Electrician

ELEC0684-004 12/01/2016

MARIPOSA, MERCED, STANISLAUS AND TUOLUMNE COUNTIES

	Rates	Fringes
Communications System		
Installer\$	30.64	3%+17.86
Technician\$	34.89	3%+17.86

SCOPE OF WORK: Including any data system whose only function is to transmit or receive information; excluding all other data systems or multiple systems which include control function or power supply; inclusion or exclusion of terminations and testings of conductors determined by their function; excluding fire alarm work when installed in raceways (including wire and cable pulling) and when performed on new or major remodel building projects or jobs for which the conductors for the fire alarm system are installed in conduit; excluding installation of raceway systems, line voltage work, industrial work, life-safety systems (all buildings having floors located more than 75' above the lowest floor level having building access); excluding energy management systems.

FOOTNOTE: Fire alarm work when installed in raceways (including wire and cable pulling), on projects which involve new or major remodel building construction, for which the conductors for the fire alarm system are installed in the conduit, shall be performed by the inside electrician.

ELEC1245-001 06/01/2015 Rates Fringes LINE CONSTRUCTION (1) Lineman; Cable splicer..\$ 52.85(2) Equipment specialist (operates crawler tractors, commercial motor vehicles, backhoes, trenchers, cranes (50 tons and below), overhead & underground distribution lineequipment)......\$ 42.2114.32(3)Groundman.....\$ 32.2814.03(4)Powderman.....\$ 47.1914.60 HOLIDAYS: New Year's Day, M.L. King Day, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving Day and day after Thanksgiving, Christmas Day \_\_\_\_\_ ELEV0008-001 01/01/2017 Rates Fringes ELEVATOR MECHANIC.....\$ 63.44 31.585 FOOTNOTE: PAID VACATION: Employer contributes 8% of regular hourly rate as vacation pay credit for employees with more than 5 years of service, and 6% for 6 months to 5 years of service. PAID HOLIDAYS: New Years Day, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving Day, Friday after Thanksgiving, and Christmas Day. \_\_\_\_\_ ENGI0003-008 07/01/2013 Rates Fringes Dredging: (DREDGING: CLAMSHELL & DIPPER DREDGING; HYDRAULIC SUCTION DREDGING:) AREA 1: (1) Leverman.....\$ 40.53 27.81 (2) Dredge Dozer; Heavy duty repairman.....\$ 35.57 27.81 (3) Booster Pump Operator; Deck Engineer; Deck mate; Dredge Tender; Winch Operator.....\$ 34.45 (4) Bargeman; Deckhand; 27.81 Fireman; Leveehand; Oiler..\$ 31.15 27.81 AREA 2: (1) Leverman.....\$ 42.53
(2) Dredge Dozer; Heavy 27.81 duty repairman.....\$ 37.57 27.81 (3) Booster Pump Operator; Deck Engineer; Deck mate; Dredge Tender; Winch Operator.....\$ 36.45 (4) Bargeman; Deckhand; 27.81 Fireman; Leveehand; Oiler..\$ 33.15 27.81 AREA DESCRIPTIONS

AREA 1: ALAMEDA, BUTTE, CONTRA COSTA, KINGS, MARIN, MERCED, NAPA, SACRAMENTO, SAN BENITO, SAN FRANCISCO, SAN JOAQUIN, SAN MATEO, SANTA CLARA, SANTA CRUZ, SOLANO, STANISLAUS, SUTTER, YOLO, AND YUBA COUNTIES

AREA 2: MODOC COUNTY THE REMAINGING COUNTIES ARE SPLIT BETWEEN AREA 1 AND AREA 2 AS NOTED BELOW: ALPINE COUNTY: Area 1: Northernmost part Area 2: Remainder CALAVERAS COUNTY: Area 1: Remainder Area 2: Eastern part COLUSA COUNTY: Area 1: Eastern part Area 2: Remainder ELDORADO COUNTY: Area 1: North Central part Area 2: Remainder FRESNO COUNTY: Area 1: Remainder Area 2: Eastern part GLENN COUNTY: Area 1: Eastern part Area 2: Remainder LASSEN COUNTY: Area 1: Western part along the Southern portion of border with Shasta County Area 2: Remainder MADERA COUNTY: Area 1: Except Eastern part Area 2: Eastern part MARIPOSA COUNTY Area 1: Except Eastern part Area 2: Eastern part MONTERREY COUNTY Area 1: Except Southwestern part Area 2: Southwestern part NEVADA COUNTY: Area 1: All but the Northern portion along the border of Sierra County Area 2: Remainder PLACER COUNTY: Area 1: Al but the Central portion Area 2: Remainder PLUMAS COUNTY: Area 1: Western portion Area 2: Remainder SHASTA COUNTY: Area 1: All but the Northeastern corner Area 2: Remainder SIERRA COUNTY: Area 1: Western part Area 2: Remainder SISKIYOU COUNTY: Area 1: Central part Area 2: Remainder SONOMA COUNTY: Area 1: All but the Northwestern corner Area 2: Remainder

TEHAMA COUNTY: Area 1: All but the Western border with Mendocino & Trinity Counties Area 2: Remainder TRINITY COUNTY: Area 1: East Central part and the Northeastern border with Shasta County Area 2: Remainder TUOLUMNE COUNTY: Area 1: Except Eastern part Area 2: Eastern part

ENGI0003-018 06/30/2014

"AREA 1" WAGE RATES ARE LISTED BELOW

"AREA 2" RECEIVES AN ADDITIONAL  $2.00\ {\rm PER}$  hour above area 1 rates.

SEE AREA DEFINITIONS BELOW

			Rates	Fringes
OPERATOR:	Power Equipment			
GROUP GROUP GROUP GROUP GROUP GROUP GROUP GROUP GROUP OPERATOR: (Cranes and	1	\$7.\$7.\$7.\$7.\$7.\$7.\$7.\$7. 	39.85 38.32 36.84 35.46 34.19 32.87 31.73 30.59 28.38	27.44 27.44 27.44 27.44 27.44 27.44 27.44 27.44 27.44 27.44
GROUP	1			
Crane Oiler Truck	crane oiler	\$ \$	40.73 33.76 37.33	27.44 27.44 27.44
Crane Oiler Truck	crane oiler	\$ \$	38.97 33.50 37.04	27.44 27.44 27.44
Crane Hydra Oiler Truck	s ulic Crane Oiler	\$ \$ \$	37.23 32.87 33.26 36.77	27.44 27.44 27.44 27.44
Crane OPERATOR: (Piledrivin	4 s Power Equipment g - AREA 1:)	\$	34.19	27.44
GROUP Lifti Oiler Truck	ng devices	\$ \$ \$	41.07 31.81 34.09	27.44 27.44 27.44
Lifti Oiler Truck	ng devices	\$ \$	39.25 31.54 33.84	27.44 27.44 27.44
Lifti Oiler Truck	ng devices Crane Oiler	\$ \$	37.57 31.32 33.55	27.44 27.44 27.44
Lifti	ng devices	\$	35.80	27.44
GROUP Lifti	b ng devices	\$	34.50	27.44

GROUP 6		
Lifting devices\$	33.16	27.44
OPERATOR: Power Equipment		
(Steel Erection - AREA 1:)		
GROUP 1		
Cranes\$	41.70	27.44
Oiler\$	32.15	27.44
Truck Crane Oiler\$	34.38	27.44
GROUP 2		
Cranes\$	39.93	27.44
Oiler\$	31.88	27.44
Truck Crane Oiler\$	34.16	27.44
GROUP 3		
Cranes\$	38.45	27.44
Hydraulic\$	32.67	27.44
Oiler\$	31.66	27.44
Truck Crane Oiler\$	33.89	27.44
GROUP 4		
Cranes\$	36.43	27.44
GROUP 5		
Cranes\$	35.13	27.44
OPERATOR: Power Equipment		
(Tunnel and Underground Work		
- AREA 1:)		
SHAFTS, STOPES, RAISES:		
GROUP 1\$	35.95	27.44
GROUP 1-A\$	38.32	27.44
GROUP 2\$	34.59	27.44
GROUP 3\$	33.36	27.44
GROUP 4\$	32.22	27.44
GROUP 5\$	31.08	27.44
UNDERGROUND:		
GROUP 1\$	35.85	27.44
GROUP 1-A\$	38.32	27.44
GROUP 2\$	34.59	27.44
GROUP 3\$	33.26	27.44
GROUP 4\$	32.12	27.44
GROUP 5	30.98	27.44

FOOTNOTE: Work suspended by ropes or cables, or work on a Yo-Yo Cat: \$.60 per hour additional.

#### POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1: Operator of helicopter (when used in erection work); Hydraulic excavator, 7 cu. yds. and over; Power shovels, over 7 cu. yds.

GROUP 2: Highline cableway; Hydraulic excavator, 3-1/2 cu. yds. up to 7 cu. yds.; Licensed construction work boat operator, on site; Power blade operator (finish); Power shovels, over 1 cu. yd. up to and including 7 cu. yds. m.r.c.

GROUP 3: Asphalt milling machine; Cable backhoe; Combination backhoe and loader over 3/4 cu. yds.; Continuous flight tie back machine assistant to engineer or mechanic; Crane mounted continuous flight tie back machine, tonnage to apply; Crane mounted drill attachment, tonnage to apply; Dozer, slope brd; Gradall; Hydraulic excavator, up to 3 1/2 cu. yds.; Loader 4 cu. yds. and over; Long reach excavator; Multiple engine scraper (when used as push pull); Power shovels, up to and including 1 cu. yd.; Pre-stress wire wrapping machine; Side boom cat, 572 or larger; Track loader 4 cu. yds. and over; Wheel excavator (up to and including 750 cu. yds. per hour)

GROUP 4: Asphalt plant engineer/box person; Chicago boom; Combination backhoe and loader up to and including 3/4 cu. yd.; Concrete batch plant (wet or dry); Dozer and/or push cat; Pull- type elevating loader; Gradesetter, grade checker (GPS, mechanical or otherwise); Grooving and grinding machine; Heading shield operator; Heavy-duty drilling equipment, Hughes, LDH, Watson 3000 or similar;
Heavy-duty repairperson and/or welder; Lime spreader; Loader under 4 cu. yds.; Lubrication and service engineer (mobile and grease rack); Mechanical finishers or spreader machine (asphalt, Barber-Greene and similar); Miller Formless M-9000 slope paver or similar; Portable crushing and screening plants; Power blade support; Roller operator, asphalt; Rubber-tired scraper, self-loading (paddle-wheels, etc.); Rubber- tired earthmoving equipment (scrapers); Slip form paver (concrete); Small tractor with drag; Soil stabilizer (P & H or equal); Spider plow and spider puller; Tubex pile rig; Unlicensed constuction work boat operator, on site; Timber skidder; Track loader up to 4 yds.; Tractor-drawn scraper; Tractor, compressor drill combination; Welder; Woods-Mixer (and other similar Pugmill equipment)

GROUP 5: Cast-in-place pipe laying machine; Combination slusher and motor operator; Concrete conveyor or concrete pump, truck or equipment mounted; Concrete conveyor, building site; Concrete pump or pumpcrete gun; Drilling equipment, Watson 2000, Texoma 700 or similar; Drilling and boring machinery, horizontal (not to apply to waterliners, wagon drills or jackhammers); Concrete mixer/all; Person and/or material hoist; Mechanical finishers (concrete) (Clary, Johnson, Bidwell Bridge Deck or similar types); Mechanical burm, curb and/or curb and gutter machine, concrete or asphalt); Mine or shaft hoist; Portable crusher; Power jumbo operator (setting slip-forms, etc., in tunnels); Screed (automatic or manual); Self-propelled compactor with dozer; Tractor with boom D6 or smaller; Trenching machine, maximum digging capacity over 5 ft. depth; Vermeer T-600B rock cutter or similar

GROUP 6: Armor-Coater (or similar); Ballast jack tamper; Boom- type backfilling machine; Assistant plant engineer; Bridge and/or gantry crane; Chemical grouting machine, truck-mounted; Chip spreading machine operator; Concrete saw (self-propelled unit on streets, highways, airports and canals); Deck engineer; Drilling equipment Texoma 600, Hughes 200 Series or similar up to and including 30 ft. m.r.c.; Drill doctor; Helicopter radio operator; Hydro-hammer or similar; Line master; Skidsteer loader, Bobcat larger than 743 series or similar (with attachments); Locomotive; Lull hi-lift or similar; Oiler, truck mounted equipment; Pavement breaker, truck-mounted, with compressor combination; Paving fabric installation and/or laying machine; Pipe bending machine (pipelines only); Pipe wrapping machine (tractor propelled and supported); Screed (except asphaltic concrete paving); Self- propelled pipeline wrapping machine; Tractor; Self-loading chipper; Concrete barrier moving machine

GROUP 7: Ballast regulator; Boom truck or dual-purpose A-frame truck, non-rotating - under 15 tons; Cary lift or similar; Combination slurry mixer and/or cleaner; Drilling equipment, 20 ft. and under m.r.c.; Firetender (hot plant); Grouting machine operator; Highline cableway signalperson; Stationary belt loader (Kolman or similar); Lift slab machine (Vagtborg and similar types); Maginnes internal full slab vibrator; Material hoist (1 drum); Mechanical trench shield; Pavement breaker with or without compressor combination); Pipe cleaning machine (tractor propelled and supported); Post driver; Roller (except asphalt); Chip Seal; Self-propelled automatically applied concrete curing mahcine (on streets, highways, airports and canals); Self-propelled compactor (without dozer); Signalperson; Slip-form pumps (lifting device for concrete forms); Tie spacer; Tower mobile; Trenching machine, maximum digging capacity up to and including 5 ft. depth; Truck- type loader

GROUP 8: Bit sharpener; Boiler tender; Box operator; Brakeperson; Combination mixer and compressor (shotcrete/gunite); Compressor operator; Deckhand; Fire tender; Forklift (under 20 ft.); Generator; Gunite/shotcrete equipment operator; Hydraulic monitor; Ken seal machine (or similar); Mixermobile; Oiler; Pump operator; Refrigeration plant; Reservoir-debris tug (selfpropelled floating); Ross Carrier (construction site); Rotomist operator; Self-propelled tape machine; Shuttlecar; Self-propelled power sweeper operator (includes vacuum sweeper); Slusher operator; Surface heater; Switchperson; Tar pot firetender; Tugger hoist, single drum; Vacuum cooling plant; Welding machine (powered other than by electricity)

GROUP 8-A: Elevator operator; Skidsteer loader-Bobcat 743 series or smaller, and similar (without attachments); Mini excavator under 25 H.P. (backhoe-trencher); Tub grinder wood chipper

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#### ALL CRANES AND ATTACHMENTS

GROUP 1: Clamshell and dragline over 7 cu. yds.; Crane, over 100 tons; Derrick, over 100 tons; Derrick barge pedestal-mounted, over 100 tons; Self-propelled boom-type lifting device, over 100 tons

GROUP 2: Clamshell and dragline over 1 cu. yd. up to and including 7 cu. yds.; Crane, over 45 tons up to and including 100 tons; Derrick barge, 100 tons and under; Self-propelled boom-type lifting device, over 45 tons; Tower crane

GROUP 3: Clamshell and dragline up to and including 1 cu. yd.; Cranes 45 tons and under; Self-propelled boom-type lifting device 45 tons and under;

GROUP 4: Boom Truck or dual purpose A-frame truck, non-rotating over 15 tons; Truck-mounted rotating telescopic boom type lifting device, Manitex or similar (boom truck) over 15 tons; Truck-mounted rotating telescopic boom type lifting device, Manitex or similar (boom truck) - under 15 tons;

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#### PILEDRIVERS

GROUP 1: Derrick barge pedestal mounted over 100 tons; Clamshell over 7 cu. yds.; Self-propelled boom-type lifting device over 100 tons; Truck crane or crawler, land or barge mounted over 100 tons

GROUP 2: Derrick barge pedestal mounted 45 tons to and including 100 tons; Clamshell up to and including 7 cu. yds.; Self-propelled boom-type lifting device over 45 tons; Truck crane or crawler, land or barge mounted, over 45 tons up to and including 100 tons; Fundex F-12 hydraulic pile rig

GROUP 3: Derrick barge pedestal mounted under 45 tons; Selfpropelled boom-type lifting device 45 tons and under; Skid/scow piledriver, any tonnage; Truck crane or crawler, land or barge mounted 45 tons and under

GROUP 4: Assistant operator in lieu of assistant to engineer; Forklift, 10 tons and over; Heavy-duty repairperson/welder

GROUP 5: Deck engineer

GROUP 6: Deckhand; Fire tender

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#### STEEL ERECTORS

GROUP 1: Crane over 100 tons; Derrick over 100 tons; Selfpropelled boom-type lifting device over 100 tons

GROUP 2: Crane over 45 tons to 100 tons; Derrick under 100 tons; Self-propelled boom-type lifting device over 45 tons to 100 tons; Tower crane GROUP 3: Crane, 45 tons and under; Self-propelled boom-type lifting device, 45 tons and under GROUP 4: Chicago boom; Forklift, 10 tons and over; Heavy-duty repair person/welder GROUP 5: Boom cat \_\_\_\_\_ TUNNEL AND UNDERGROUND WORK GROUP 1-A: Tunnel bore machine operator, 20' diameter or more GROUP 1: Heading shield operator; Heavy-duty repairperson; Mucking machine (rubber tired, rail or track type); Raised bore operator (tunnels); Tunnel mole bore operator GROUP 2: Combination slusher and motor operator; Concrete pump or pumpcrete gun; Power jumbo operator GROUP 3: Drill doctor; Mine or shaft hoist GROUP 4: Combination slurry mixer cleaner; Grouting Machine operator; Motorman GROUP 5: Bit Sharpener; Brakeman; Combination mixer and compressor (gunite); Compressor operator; Oiler; Pump operator; Slusher operator AREA DESCRIPTIONS: POWER EQUIPMENT OPERATORS, CRANES AND ATTACHMENTS, TUNNEL AND UNDERGROUND [These areas do not apply to Piledrivers and Steel Erectors] AREA 1: ALAMEDA, BUTTE, CONTRA COSTA, KINGS, MARIN, MERCED, NAPA, SACRAMENTO, SAN BENITO, SAN FRANCISCO, SAN JOAQUIN, SAN MATEO, SANTA CLARA, SANTA CRUZ, SOLANO, STANISLAUS, SUTTER, YOLO, AND YUBA COUNTIES AREA 2 - MODOC COUNTY THE REMAINING COUNTIES ARE SPLIT BETWEEN AREA 1 AND AREA 2 AS NOTED BELOW: ALPINE COUNTY: Area 1: Northernmost part Area 2: Remainder CALAVERAS COUNTY: Area 1: Except Eastern part Area 2: Eastern part COLUSA COUNTY: Area 1: Eastern part Area 2: Remainder DEL NORTE COUNTY: Area 1: Extreme Southwestern corner Area 2: Remainder ELDORADO COUNTY: Area 1: North Central part Area 2: Remainder FRESNO COUNTY Area 1: Except Eastern part

Area 2: Eastern part GLENN COUNTY: Area 1: Eastern part Area 2: Remainder HUMBOLDT COUNTY: Area 1: Except Eastern and Southwestern parts Area 2: Remainder LAKE COUNTY: Area 1: Southern part Area 2: Remainder LASSEN COUNTY: Area 1: Western part along the Southern portion of border with Shasta County Area 2: Remainder MADERA COUNTY Area 1: Remainder Area 2: Eastern part MARIPOSA COUNTY Area 1: Remainder Area 2: Eastern part MENDOCINO COUNTY: Area 1: Central and Southeastern parts Area 2: Remainder MONTEREY COUNTY Area 1: Remainder Area 2: Southwestern part NEVADA COUNTY: Area 1: All but the Northern portion along the border of Sierra County Area 2: Remainder PLACER COUNTY: Area 1: All but the Central portion Area 2: Remainder PLUMAS COUNTY: Area 1: Western portion Area 2: Remainder SHASTA COUNTY: Area 1: All but the Northeastern corner Area 2: Remainder SIERRA COUNTY: Area 1: Western part Area 2: Remainder SISKIYOU COUNTY: Area 1: Central part Area 2: Remainder SONOMA COUNTY: Area 1: All but the Northwestern corner Area 2: Reaminder TEHAMA COUNTY: Area 1: All but the Western border with mendocino & Trinity Counties Area 2: Remainder TRINITY COUNTY: Area 1: East Central part and the Northeaster border with Shasta County Area 2: Remainder TULARE COUNTY;

Area 1: Remainder Area 2: Eastern part

TUOLUMNE COUNTY: Area 1: Remainder Area 2: Eastern Part

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ENGI0003-019 07/01/2013

SEE AREA DESCRIPTIONS BELOW

		Rates	Fringes
OPERATOR:	Power Equipment		
GROUP	1		
AREA	1ś	29.64	25.71
AREA	2\$	31.64	25.71
GROUP	2		
AREA	1\$	26.04	25.71
AREA	2\$	28.04	25.71
GROUP	3		
AREA	1\$	21.43	25.71
AREA	2\$	23.43	25.71

GROUP DESCRIPTIONS:

GROUP 1: Landscape Finish Grade Operator: All finish grade work regardless of equipment used, and all equipment with a rating more than 65 HP.

GROUP 2: Landscape Operator up to 65 HP: All equipment with a manufacturer's rating of 65 HP or less except equipment covered by Group 1 or Group 3. The following equipment shall be included except when used for finish work as long as manufacturer's rating is 65 HP or less: A-Frame and Winch Truck, Backhoe, Forklift, Hydragraphic Seeder Machine, Roller, Rubber-Tired and Track Earthmoving Equipment, Skiploader, Straw Blowers, and Trencher 31 HP up to 65 HP.

GROUP 3: Landscae Utility Operator: Small Rubber-Tired Tractor, Trencher Under 31 HP.

AREA DESCRIPTIONS:

AREA 1: ALAMEDA, BUTTE, CONTRA COSTA, KINGS, MARIN, MERCED, NAPA, SACRAMENTO, SAN BENITO, SAN FRANCISCO, SAN JOAQUIN, SAN MATEO, SANTA CLARA, SANTA CRUZ, SOLANO, STANISLAUS, SUTTER, YOLO, AND YUBA COUNTIES

AREA 2 - MODOC COUNTY

THE REMAINING COUNTIES ARE SPLIT BETWEEN AREA 1 AND AREA 2 AS NOTED BELOW:

ALPINE COUNTY: Area 1: Northernmost part Area 2: Remainder

CALAVERAS COUNTY: Area 1: Except Eastern part Area 2: Eastern part

COLUSA COUNTY: Area 1: Eastern part Area 2: Remainder

DEL NORTE COUNTY: Area 1: Extreme Southwestern corner Area 2: Remainder

ELDORADO COUNTY: Area 1: North Central part

Area 2: Remainder FRESNO COUNTY Area 1: Except Eastern part Area 2: Eastern part GLENN COUNTY: Area 1: Eastern part Area 2: Remainder HUMBOLDT COUNTY: Area 1: Except Eastern and Southwestern parts Area 2: Remainder LAKE COUNTY: Area 1: Southern part Area 2: Remainder LASSEN COUNTY: Area 1: Western part along the Southern portion of border with Shasta County Area 2: Remainder MADERA COUNTY Area 1: Remainder Area 2: Eastern part MARIPOSA COUNTY Area 1: Remainder Area 2: Eastern part MENDOCINO COUNTY: Area 1: Central and Southeastern parts Area 2: Remainder MONTEREY COUNTY Area 1: Remainder Area 2: Southwestern part NEVADA COUNTY: Area 1: All but the Northern portion along the border of Sierra County Area 2: Remainder PLACER COUNTY: Area 1: All but the Central portion Area 2: Remainder PLUMAS COUNTY: Area 1: Western portion Area 2: Remainder SHASTA COUNTY: Area 1: All but the Northeastern corner Area 2: Remainder SIERRA COUNTY: Area 1: Western part Area 2: Remainder SISKIYOU COUNTY: Area 1: Central part Area 2: Remainder SONOMA COUNTY: Area 1: All but the Northwestern corner Area 2: Reaminder TEHAMA COUNTY: Area 1: All but the Western border with mendocino & Trinity Counties Area 2: Remainder TRINITY COUNTY: Area 1: East Central part and the Northeaster border with

Shasta County Area 2: Remainder TULARE COUNTY; Area 1: Remainder Area 2: Eastern part TUOLUMNE COUNTY: Area 1: Remainder Area 2: Eastern Part \_\_\_\_\_ IRON0377-002 07/01/2016 Rates Fringes Ironworkers: Fence Erector.....\$ 28.33 20.64 Ornamental, Reinforcing and Structural.....\$ 34.75 29.20

PREMIUM PAY:

\$6.00 additional per hour at the following locations:

China Lake Naval Test Station, Chocolate Mountains Naval Reserve-Niland, Edwards AFB, Fort Irwin Military Station, Fort Irwin Training Center-Goldstone, San Clemente Island, San Nicholas Island, Susanville Federal Prison, 29 Palms - Marine Corps, U.S. Marine Base - Barstow, U.S. Naval Air Facility - Sealey, Vandenberg AFB

\$4.00 additional per hour at the following locations:

Army Defense Language Institute - Monterey, Fallon Air Base, Naval Post Graduate School - Monterey, Yermo Marine Corps Logistics Center

\$2.00 additional per hour at the following locations:

Port Hueneme, Port Mugu, U.S. Coast Guard Station - Two Rock

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LABO0067-002 06/27/2016

AREA "A" - ALAMEDA, CONTRA COSTA, MARIN, SAN FRANCISCO, SAN MATEO AND SANTA CLARA COUNTIES

AREA "B" - ALPINE, AMADOR, BUTTE, CALAVERAS, COLUSA, DEL NORTE, EL DORADO, FRESNO, GLENN, HUMBOLDT, KINGS, LAKE, LASSEN, MADERA, MARIPOSA, MENDOCINO, MERCED, MODOC, MONTEREY, NAPA, NEVADA, PLACER, PLUMAS, SACRAMENTO, SAN BENITO, SAN JOAQUIN, SANTA CRUZ, SHASTA, SIERRA, SISKIYOU, SOLANO, SONOMA, STANISLAUS, SUTTER, TEHAMA, TRINITY, TULARE, TUOLUMNE, YOLO AND YUBA COUNTIES

	Rates	Fringes
Asbestos Removal Laborer		
Areas A & B\$	20.66	10.02
LABORER (Lead Removal)		
Area A\$	30.00	21.34
Area BŚ	29.00	21.34

ASBESTOS REMOVAL-SCOPE OF WORK: Site mobilization; initial site clean-up; site preparation; removal of asbestos-containing materials from walls and ceilings; or from pipes, boilers and mechanical systems only if they are being scrapped; encapsulation, enclosure and disposal of asbestos-containing materials by hand or with equipment or machinery; scaffolding; fabrication of temporary wooden barriers; and assembly of decontamination stations.

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LABO0067-006 06/30/2014

AREA "A" - ALAMEDA, CONTRA COSTA, MARIN, SAN FRANCISCO, SAN MATEO AND SANTA CLARA COUNTIES

AREA "B" - ALPINE, AMADOR, BUTTE, CALAVERAS, COLUSA, EL DORADO, FRESNO, GLENN, KINGS, LASSEN, MADERA, MARIPOSA, MERCED, MODOC, MONTEREY, NAPA, NEVADA, PLACER, PLUMAS, SACRAMENTO, SAN BENITO, SAN JOAQUIN, SANTA CRUZ, SHASTA, SIERRA, SISKIYOU, SOLANO, SONOMA, STANISLAUS, SUTTER, TEHAMA, TRINITY, TULARE, TUOLUMNE, YOLO AND YUBA COUNTIES

	Rates	Fringes
Laborers: (CONSTRUCTION CRAFT LABORERS - AREA A:) Construction Specialist		
Group\$ GROUP 1\$ GROUP 1-a\$ GROUP 1-c\$ GROUP 1-c\$ GROUP 1-c\$ GROUP 1-f\$ GROUP 1-f\$	29.09 28.39 28.61 28.44 28.94 28.97	18.66 18.66 18.66 18.66 18.66 18.66
County)\$ GROUP 2\$ GROUP 3\$ GROUP 4\$ See groups 1-b and 1-d under lab Laborers: (CONSTRUCTION CRAFT LABORERS - AREA B:)	28.59 28.24 28.14 21.83 orer classifica	18.66 18.66 18.66 18.66 tions.
GROUP 1	28.09 27.39 27.61 27.44 27.94 27.97 27.24 27.14 20.83 orer classifica	18.66 18.66 18.66 18.66 18.66 18.66 18.66 18.66 18.66 18.66
Laborers: (GUNITE - AREA A:) GROUP 1	29.35 28.85 28.26 28.14	18.66 18.66 18.66 18.66
GROUP 1	28.35 27.85 27.26 27.14	18.66 18.66 18.66 18.66
GROUP 1\$ GROUP 2\$	28.39 28.24	18.66 18.66
Laborers: (WRECKING - AREA B:) GROUP 1	27.39 27.24	18.66 18.66
LABORERS - AREA A:) (1) New Construction\$ (2) Establishment Warranty	28.14	18.66
Period\$ Landscape Laborer (GARDENERS, HORTICULURAL & LANDSCAPE	21.83	18.66
LABORERS - AREA B:) (1) New Construction\$	27.14	18.66
(2) Establishment warranty Period\$	20.83	18.66

FOOTNOTES:

Laborers working off or with or from bos'n chairs, swinging

scaffolds, belts shall receive \$0.25 per hour above the applicable wage rate. This shall not apply to workers entitled to receive the wage rate set forth in Group 1-a below.

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#### LABORER CLASSIFICATIONS

CONSTRUCTION SPECIALIST GROUP: Asphalt ironer and raker; Chainsaw; Laser beam in connection with laborers' work; Cast-in- place manhole form setter; Pressure pipelayer; Davis trencher - 300 or similar type (and all small trenchers); Blaster; Diamond driller; Multiple unit drill; Hydraulic drill

GROUP 1: Asphalt spreader boxes (all types); Barko, Wacker and similar type tampers; Buggymobile; Caulker, bander, pipewrapper, conduit layer, plastic pipelayer; Certified hazardous waste worker including Leade Abatement; Compactors of all types; Concrete and magnesite mixer, 1/2 yd. and under; Concrete pan work; Concrete sander; Concrete saw; Cribber and/or shoring; Cut granite curb setter; Dri-pak-it machine; Faller, logloader and bucker; Form raiser, slip forms; Green cutter; Headerboard, Hubsetter, aligner, by any method; High pressure blow pipe (1-1/2" or over, 100 lbs. pressure/over); Hydro seeder and similar type; Jackhammer operator; Jacking of pipe over 12 inches; Jackson and similar type compactor; Kettle tender, pot and worker applying asphalt, lay-kold, creosote, lime, caustic and similar type materials (applying means applying, dipping or handling of such materials); Lagging, sheeting, whaling, bracing, trenchjacking, lagging hammer; Magnesite, epoxyresin, fiberglass, mastic worker (wet or dry); No joint pipe and stripping of same, including repair of voids; Pavement breaker and spader, including tool grinder; Perma curb; Pipelayer (including grade checking in connection with pipelaying); Precast-manhole setter; Pressure pipe tester; Post hole digger, air, gas and electric; Power broom sweeper; Power tampers of all types (except as shown in Group 2); Ram set gun and stud gun; Riprap stonepaver and rock-slinger, including placing of sacked concrete and/or sand (wet or dry) and gabions and similar type; Rotary scarifier or multiple head concrete chipping scarifier; Roto and Ditch Witch; Rototiller; Sandblaster, pot, gun, nozzle operators; Signalling and rigging; Tank cleaner; Tree climber; Turbo blaster; Vibrascreed, bull float in connection with laborers' work; Vibrator; Hazardous waste worker (lead removal); Asbestos and mold removal worker

GROUP 1-a: Joy drill model TWM-2A; Gardner-Denver model DH143 and similar type drills; Track driller; Jack leg driller; Wagon driller; Mechanical drillers, all types regardless of type or method of power; Mechanical pipe layers, all types regardless of type or method of power; Blaster and powder; All work of loading, placing and blasting of all powder and explosives of whatever type regardless of method used for such loading and placing; High scalers (including drilling of same); Tree topper; Bit grinder

GROUP 1-b: Sewer cleaners shall receive \$4.00 per day above Group 1 wage rates. "Sewer cleaner" means any worker who handles or comes in contact with raw sewage in small diameter sewers. Those who work inside recently active, large diameter sewers, and all recently active sewer manholes shal receive \$5.00 per day above Group 1 wage rates.

GROUP 1-c: Burning and welding in connection with laborers' work; Synthetic thermoplastics and similar type welding

GROUP 1-d: Maintenance and repair track and road beds. All employees performing work covered herein shall receive \$

.25 per hour above their regular rate for all work performed on underground structures not specifically covered herein. This paragraph shall not be construed to apply to work below ground level in open cut. It shall apply to cut and cover work of subway construction after the temporary cover has been placed.

GROUP 1-e: Work on and/or in bell hole footings and shafts thereof, and work on and in deep footings. (A deep footing is a hole 15 feet or more in depth.) In the event the depth of the footing is unknown at the commencement of excavation, and the final depth exceeds 15 feet, the deep footing wage rate would apply to all employees for each and every day worked on or in the excavation of the footing from the date of inception.

 $\ensuremath{\mathsf{GROUP}}$  1-f: Wire winding machine in connection with guniting or shot crete

GROUP 1-g, CONTRA COSTA COUNTY: Pipelayer (including grade checking in connection with pipelaying); Caulker; Bander; Pipewrapper; Conduit layer; Plastic pipe layer; Pressure pipe tester; No joint pipe and stripping of same, including repair of voids; Precast manhole setters, cast in place manhole form setters

GROUP 2: Asphalt shoveler; Cement dumper and handling dry cement or gypsum; Choke-setter and rigger (clearing work); Concrete bucket dumper and chute; Concrete chipping and grinding; Concrete laborer (wet or dry); Driller tender, chuck tender, nipper; Guinea chaser (stake), grout crew; High pressure nozzle, adductor; Hydraulic monitor (over 100 lbs. pressure); Loading and unloading, carrying and hauling of all rods and materials for use in reinforcing concrete construction; Pittsburgh chipper and similar type brush shredders; Sloper; Single foot, hand-held, pneumatic tamper; All pneumatic, air, gas and electric tools not listed in Groups 1 through 1-f; Jacking of pipe - under 12 inches

GROUP 3: Construction laborers, including bridge and general laborer; Dump, load spotter; Flag person; Fire watcher; Fence erector; Guardrail erector; Gardener, horticultural and landscape laborer; Jetting; Limber, brush loader and piler; Pavement marker (button setter); Maintenance, repair track and road beds; Streetcar and railroad construction track laborer; Temporary air and water lines, Victaulic or similar; Tool room attendant (jobsite only)

GROUP 4: Final clean-up work of debris, grounds and building including but not limited to: street cleaner; cleaning and washing windows; brick cleaner (jobsite only); material cleaner (jobsite only). The classification "material cleaner" is to be utilized under the following conditions:

A: at demolition site for the salvage of the material.B: at the conclusion of a job where the material is to be salvaged and stocked to be reused on another job.C: for the cleaning of salvage material at the jobsite or temporary jobsite yard.

The material cleaner classification should not be used in the performance of "form stripping, cleaning and oiling and moving to the next point of erection".

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GUNITE LABORER CLASSIFICATIONS

- GROUP 1: Structural Nozzleman
- GROUP 2: Nozzleman, Gunman, Potman, Groundman
- GROUP 3: Reboundman
- GROUP 4: Gunite laborer

WRECKING WORK LABORER CLASSIFICAT	IONS	
GROUP 1: Skilled wrecker (remov windows and materials)	ing and salvagin	ng of sash,
GROUP 2: Semi-skilled wrecker ( materials)	salvaging of oth	ner building
LAB00073-002 06/30/2014		
CALAVERAS AND SAN JOAQUIN COUNTIE	S	
	Rates	Fringes
LABORER (TRAFFIC CONTROL/LANE		
CLOSURE) Escort Driver, Flag Person Traffic Control Person I Traffic Control Person II	\$ 27.14 \$ 27.44 \$ 24.94	19.03 19.03 19.03
TRAFFIC CONTROL PERSON I: Layou cushions, construction area and	t of traffic con roadside signag	trol, crash ge.
TRAFFIC CONTROL PERSON II: Inst temporary/permanent signs, mark cushions.	allation and rem ers, delineators	noval of and crash
LABO0073-003 06/30/2014		
SAN JOAQUIN COUNTY		
	Rates	Fringes
LABORER Mason Tender-Brick	\$ 31.11	17.34
LABO0073-005 06/30/2014		
	Rates	Fringes
Tunnel and Shaft Laborers: GROUP 1 GROUP 2 GROUP 3 GROUP 4 GROUP 5 Shotcrete Specialist	\$ 34.60 \$ 34.37 \$ 34.12 \$ 33.67 \$ 33.13 \$ 35.12	19.49 19.49 19.49 19.49 19.49 19.49 19.49
TUNNEL AND SHAFT CLASSIFICATIONS		
GROUP 1: Diamond driller; Groun nozzlemen	dmen; Gunite and	l shotcrete
GROUP 2: Rodmen; Shaft work & r excavated ground level)	aise (below actu	ual or
<pre>GROUP 3: Bit grinder; Blaster, Cherry pickermen - where car is in tunnel; Concrete screedman; Gunite &amp; shotcrete gunman &amp; potr pressure nozzleman; Miner - tun bottom man on shaft and raise w slick line; Sandblaster - potma Segment Erector, Tunnel Muck Ha setter; Timberman, retimberman materials therefore); Tugger (fe Cable tender; Chuck tender; Pow GROUP 4: Vibrator operator, pav</pre>	driller, powderm lifted; Concret Grout pumpman ar man; Headermen; nel, including t ork; Nipper; Noz n, Robotic Shoto uler, Steel Form (wood or steel c or tunnel labore derman - primer ement breaker; E	men, heading; ce finisher id potman; High cop and zzleman on crete Placer, n raiser and or substitute or work); house Bull gang -
muckers, trackmen; Concrete cre	w - includes rod	lding and

spreading, Dumpmen (any method) GROUP 5: Grout crew; Reboundman; Swamper/ Brakeman \_\_\_\_\_ LABO0166-001 07/01/2006 ALAMEDA AND CONTRA COSTA COUNTIES: Rates Fringes Brick Tender.....\$ 25.91 14.65 FOOTNOTES: Work on jobs where heat-protective clothing is required: \$2.00 per hour additional. Work at grinders: \$.25 per hour additional. Manhole work: \$2.00 per day additional. \_\_\_\_\_ LABO0166-002 07/01/2007 SAN FRANCISCO AND SAN MATEO COUNTIES: Rates Fringes MASON TENDER, BRICK.....\$ 26.93 16.50 FOOTNOTES: Underground work such as sewers, manholes, catch basins, sewer pipes, telephone conduits, tunnels and cut trenches: \$5.00 per day additional. Work in live sewage: \$2.50 per day additional. \_\_\_\_\_ LABO0261-003 06/30/2014 SAN FRANCISCO AND SAN MATEO COUNTIES Rates Fringes LABORER (TRAFFIC CONTROL/LANE CLOSURE) Escort Driver, Flag Person..\$ 28.14 Traffic Control Person I....\$ 28.44 Traffic Control Person II...\$ 25.94 19.03 19.03 19.03 TRAFFIC CONTROL PERSON I: Layout of traffic control, crash cushions, construction area and roadside signage. TRAFFIC CONTROL PERSON II: Installation and removal of temporary/permanent signs, markers, delineators and crash cushions. \_\_\_\_\_ LAB00261-005 06/30/2014 SAN FRANCISCO AND SAN MATEO COUNTIES Rates Fringes Tunnel and Shaft Laborers: GROUP 1.....\$ 34.60 GROUP 2.....\$ 34.37 19.49 19.49 GROUP 3......\$ 34.37 GROUP 3.....\$ 34.12 GROUP 4.....\$ 33.67 GROUP 5.....\$ 33.13 Shotcrete Specialist.....\$ 35.12 19.49 19.49 19.49 19.49 TUNNEL AND SHAFT CLASSIFICATIONS GROUP 1: Diamond driller; Groundmen; Gunite and shotcrete nozzlemen GROUP 2: Rodmen; Shaft work & raise (below actual or excavated ground level) GROUP 3: Bit grinder; Blaster, driller, powdermen, heading;

Cherry pickermen - where car is lifted; Concrete finisher in tunnel; Concrete screedman; Grout pumpman and potman; Gunite & shotcrete gunman & potman; Headermen; High pressure nozzleman; Miner - tunnel, including top and bottom man on shaft and raise work; Nipper; Nozzleman on slick line; Sandblaster - potman, Robotic Shotcrete Placer, Segment Erector, Tunnel Muck Hauler, Steel Form raiser and setter; Timberman, retimberman (wood or steel or substitute materials therefore); Tugger (for tunnel laborer work); Cable tender; Chuck tender; Powderman - primer house GROUP 4: Vibrator operator, pavement breaker; Bull gang - muckers, trackmen; Concrete crew - includes rodding and spreading, Dumpmen (any method) GROUP 5: Grout crew; Reboundman; Swamper/ Brakeman \_\_\_\_\_ LABO0270-003 06/30/2014 AREA A: SANTA CLARA AREA B: MONTEREY, SAN BENITO AND SANTA CRUZ COUNTIES Rates Fringes LABORER (TRAFFIC CONTROL/LANE CLOSURE) Escort Driver, Flag Person Area A.....\$ 28.14 19.03 Area B.....\$ 27.14 19.03 Traffic Control Person I Area A.....\$ 28.44 19.03 19.03 Area B.....\$ 27.44 Traffic Control Person II Area A.....\$ 25.94 19.03 Area B.....\$ 24.94 19.03 TRAFFIC CONTROL PERSON I: Layout of traffic control, crash cushions, construction area and roadside signage. TRAFFIC CONTROL PERSON II: Installation and removal of temporary/permanent signs, markers, delineators and crash cushions. \_\_\_\_\_ LABO0270-004 06/30/2014 MONTEREY, SAN BENITO, SANTA CLARA, AND SANTA CRUZ COUNTIES Rates Fringes Tunnel and Shaft Laborers: 

 GROUP 1
 \$ 34.60

 GROUP 2
 \$ 34.37

 GROUP 3
 \$ 34.12

 GROUP 4
 \$ 33.67

 GROUP 5
 \$ 33.13

 Shotcrete Specialist
 \$ 35.12

 19.49 19.49 19.49 19.49 19.49 19.49 TUNNEL AND SHAFT CLASSIFICATIONS GROUP 1: Diamond driller; Groundmen; Gunite and shotcrete nozzlemen GROUP 2: Rodmen; Shaft work & raise (below actual or excavated ground level) GROUP 3: Bit grinder; Blaster, driller, powdermen, heading; Cherry pickermen - where car is lifted; Concrete finisher in tunnel; Concrete screedman; Grout pumpman and potman; Gunite & shotcrete gunman & potman; Headermen; High pressure nozzleman; Miner - tunnel, including top and bottom man on shaft and raise work; Nipper; Nozzleman on

slick line; Sandblaster - potman Segment Erector, Tunnel Muck Hau setter; Timberman, retimberman ( materials therefore); Tugger (fo: Cable tender; Chuck tender; Powd	, Robotic Shotc ler, Steel Form wood or steel o r tunnel laborer erman - primer l	rete Placer, raiser and r substitute r work); house
GROUP 4: Vibrator operator, pave muckers, trackmen; Concrete crew spreading, Dumpmen (any method)	ment breaker; Bu - includes rodo	ull gang - ding and
GROUP 5: Grout crew; Reboundman;	Swamper/ Braker	man
LABO0270-005 07/01/2013		
MONTEREY AND SAN BENITO COUNTIES		
	Rates	Fringes
LABORER Mason Tender-Brick\$	31.70	16.53
LABO0294-001 06/30/2014		
FRESNO, KINGS AND MADERA COUNTIES		
	Rates	Fringes
LABORER (Brick) Mason Tender-Brick\$	31.11	17.34
LABO0294-002 06/30/2014		
FRESNO, KINGS, AND MADERA COUNTIES		
	Rates	Fringes
LABORER (TRAFFIC CONTROL/LANE CLOSURE) Escort Driver, Flag Person\$ Traffic Control Person I\$ Traffic Control Person II\$	27.14 27.44 24.94	19.03 19.03 19.03
TRAFFIC CONTROL PERSON I: Layout cushions, construction area and	of traffic cont roadside signage	crol, crash e.
TRAFFIC CONTROL PERSON II: Insta temporary/permanent signs, marke: cushions.	llation and remo rs, delineators	oval of and crash
LABO0294-005 06/30/2014		
FRESNO, KINGS, AND MADERA COUNTIES		
	Rates	Fringes
Tunnel and Shaft Laborers:         GROUP 1	34.60 34.37 34.12 33.67 33.13 35.12	19.49 19.49 19.49 19.49 19.49 19.49 19.49
TUNNEL AND SHAFT CLASSIFICATIONS		
GROUP 1: Diamond driller; Ground nozzlemen	men; Gunite and	shotcrete
GROUP 2: Rodmen; Shaft work & ra excavated ground level)	ise (below actu	al or
GROUP 3: Bit grinder; Blaster, d Cherry pickermen - where car is	riller, powderme lifted; Concrete	en, heading; e finisher

in tunnel; Concrete screedman; Grout pumpman and potman; Gunite & shotcrete gunman & potman; Headermen; High pressure nozzleman; Miner - tunnel, including top and bottom man on shaft and raise work; Nipper; Nozzleman on slick line; Sandblaster - potman, Robotic Shotcrete Placer, Segment Erector, Tunnel Muck Hauler, Steel Form raiser and setter; Timberman, retimberman (wood or steel or substitute materials therefore); Tugger (for tunnel laborer work); Cable tender; Chuck tender; Powderman - primer house GROUP 4: Vibrator operator, pavement breaker; Bull gang muckers, trackmen; Concrete crew - includes rodding and spreading, Dumpmen (any method) GROUP 5: Grout crew; Reboundman; Swamper/ Brakeman

### LAB00304-002 06/30/2014

ALAMEDA COUNTY

Rates

\_\_\_\_\_

Fringes

LABORER (TRAFFIC CONTROL/LANE		
CLOSURE)		
Escort Driver, Flag Person\$	28.14	19.03
Traffic Control Person I\$	28.44	19.03
Traffic Control Person II\$	25.94	19.03

TRAFFIC CONTROL PERSON I: Layout of traffic control, crash cushions, construction area and roadside signage.

TRAFFIC CONTROL PERSON II: Installation and removal of temporary/permanent signs, markers, delineators and crash cushions.

#### LABO0304-003 06/30/2014

#### ALAMEDA COUNTY

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6019.493719.491219.496719.491319.491219.49
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TUNNEL AND SHAFT CLASSIFICATIONS

GROUP 1: Diamond driller; Groundmen; Gunite and shotcrete nozzlemen

GROUP 2: Rodmen; Shaft work & raise (below actual or excavated ground level)

GROUP 3: Bit grinder; Blaster, driller, powdermen, heading; Cherry pickermen - where car is lifted; Concrete finisher in tunnel; Concrete screedman; Grout pumpman and potman; Gunite & shotcrete gunman & potman; Headermen; High pressure nozzleman; Miner - tunnel, including top and bottom man on shaft and raise work; Nipper; Nozzleman on slick line; Sandblaster - potman, Robotic Shotcrete Placer, Segment Erector, Tunnel Muck Hauler, Steel Form raiser and setter; Timberman, retimberman (wood or steel or substitute materials therefore); Tugger (for tunnel laborer work); Cable tender; Chuck tender; Powderman - primer house

GROUP 4: Vibrator operator, pavement breaker; Bull gang - muckers, trackmen; Concrete crew - includes rodding and spreading, Dumpmen (any method)

GROUP 5: Grout crew; Reboundman; Swamper/ Brakeman

LAB00324-002 06/30/2014

CONTRA COSTA COUNTY

#### Rates

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Fringes

LABORER (TRAFFIC CONTROL/LANE CLOSURE)

KL)		
Escort Driver, Flag Person\$	28.14	19.03
Traffic Control Person I\$	28.44	19.03
Traffic Control Person II\$	25.94	19.03
	20191	22.00

TRAFFIC CONTROL PERSON I: Layout of traffic control, crash cushions, construction area and roadside signage.

TRAFFIC CONTROL PERSON II: Installation and removal of temporary/permanent signs, markers, delineators and crash cushions.

LABO0324-006 06/30/2014

CONTRA	COSTA	COUNTY	

	Rates	Fringes
Tunnel and Shaft Laborers:         GROUP 1	34.60 34.37 34.12 33.67 33.13	19.49 19.49 19.49 19.49 19.49 19.49
Shotcrete Specialist\$	35.12	19.49

TUNNEL AND SHAFT CLASSIFICATIONS

GROUP 1: Diamond driller; Groundmen; Gunite and shotcrete nozzlemen

GROUP 2: Rodmen; Shaft work & raise (below actual or excavated ground level)

GROUP 3: Bit grinder; Blaster, driller, powdermen, heading; Cherry pickermen - where car is lifted; Concrete finisher in tunnel; Concrete screedman; Grout pumpman and potman; Gunite & shotcrete gunman & potman; Headermen; High pressure nozzleman; Miner - tunnel, including top and bottom man on shaft and raise work; Nipper; Nozzleman on slick line; Sandblaster - potman, Robotic Shotcrete Placer, Segment Erector, Tunnel Muck Hauler, Steel Form raiser and setter; Timberman, retimberman (wood or steel or substitute materials therefore); Tugger (for tunnel laborer work); Cable tender; Chuck tender; Powderman - primer house

GROUP 4: Vibrator operator, pavement breaker; Bull gang muckers, trackmen; Concrete crew - includes rodding and spreading, Dumpmen (any method)

GROUP 5: Grout crew; Reboundman; Swamper/ Brakeman

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LAB01130-002 06/30/2014

MARIPOSA, MERCED, STANISLAUS, AND TUOLUMNE COUNTIES

Rates

Fringes

LABORER (TRAFFIC CONTROL/LANE		
CLOSURE)		
Escort Driver, Flag Person\$	27.14	19.03
Traffic Control Person I\$	27.44	19.03
Traffic Control Person II\$	24.94	19.03

TRAFFIC CONTROL PERSON I: Layout of traffic control, crash cushions, construction area and roadside signage.

TRAFFIC CONTROL PERSON II: Installation and removal of temporary/permanent signs, markers, delineators and crash cushions.

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LAB01130-003 06/30/2014

MARIPOSA, MERCED, STANISLAUS, AND TUOLUMNE COUNTIES

Funnel and Shaft Laborers:       GROUP 1			Rates	Fringes
Shotcrete Specialist\$ 35.12 19.49	Tunnel and GROUP GROUP GROUP GROUP GROUP Shotc:	Shaft Laborers: 1\$ 2\$ 3\$ 4\$ 5\$ rete Specialist\$	34.60 34.37 34.12 33.67 33.13 35.12	19.49 19.49 19.49 19.49 19.49 19.49 19.49

TUNNEL AND SHAFT CLASSIFICATIONS

GROUP 1: Diamond driller; Groundmen; Gunite and shotcrete nozzlemen

GROUP 2: Rodmen; Shaft work & raise (below actual or excavated ground level)

GROUP 3: Bit grinder; Blaster, driller, powdermen, heading; Cherry pickermen - where car is lifted; Concrete finisher in tunnel; Concrete screedman; Grout pumpman and potman; Gunite & shotcrete gunman & potman; Headermen; High pressure nozzleman; Miner - tunnel, including top and bottom man on shaft and raise work; Nipper; Nozzleman on slick line; Sandblaster - potman, Robotic Shotcrete Placer, Segment Erector, Tunnel Muck Hauler, Steel Form raiser and setter; Timberman, retimberman (wood or steel or substitute materials therefore); Tugger (for tunnel laborer work); Cable tender; Chuck tender; Powderman - primer house

GROUP 4: Vibrator operator, pavement breaker; Bull gang - muckers, trackmen; Concrete crew - includes rodding and spreading, Dumpmen (any method)

GROUP 5: Grout crew; Reboundman; Swamper/ Brakeman

LABO1130-005 06/30/2014

MARIPOSA, MERCED, STANISLAUS AND TUOLUMNE COUNTIES

	Rates	Fringes	
LABORER Mason Tender-Brick	\$ 31.11	17.34	
LABO1414-004 08/03/2016			
SAN FRANCISCO AND SAN MATEO COU	NTIES:		
	Rates	Fringes	
PLASTER TENDER	\$ 34.15	19.28	
Work on a swing stage scaffold:	\$1.00 per hou	ar additional.	
LAB01414-007 08/03/2016			
CALAVERAS, FRESNO, KINGS, MADERA	A, MARIPOSA, M	ERCED, SAN	

JOAQUIN, STANISLAUS & TUOLUMNE

	Rates	Fringes
Plasterer tender\$	34.15	19.28
Work on a swing stage scaffold: \$3	1.00 per hour ac	ditional.
LABO1414-008 08/03/2016		
ALAMEDA AND CONTRA COSTA COUNTIES:		
	Rates	Fringes
Plasterer tender\$	34.15	19.28
Work on a swing stage scaffold: \$2	1.00 per hour ac	ditional.
LAB01414-010 08/03/2016		
SANTA CLARA AND SANTA CRUZ COUNTIN	ES	
	Rates	Fringes
PLASTER TENDER 4 Stories and under\$ 5 Stories and above\$	32.15 34.15	19.28 19.28
Work on a swing stage scaffold: \$3	1.00 per hour ac	ditional.
LABO1414-011 08/03/2016		
MONTEREY AND SAN BENITO COUNTIES		
	Rates	Fringes
Plasterer tender\$	34.15	19.28
Work on a swing stage scaffold: \$3	1.00 per hour ac	ditional.
PAIN0016-001 01/01/2017		
ALAMEDA, CONTRA COSTA, MONTEREY, S CLARA, AND SANTA CRUZ COUNTIES	SAN BENITO, SAN	MATEO, SANTA
	Rates	Fringes
Painters:\$	38.87	22.83
PREMIUMS:		
EXOTIC MATERIALS - \$0.75 additional SPRAY WORK: - \$0.50 additional per INDUSTRIAL PAINTING - \$0.25 additi [Work on industrial buildings us processing of goods for sale or (bridges), stacks, towers, tanks	al per hour. r hour. Lonal per hour sed for the manu service; steel s, and similar s	facture and construction tructures]
HIGH WORK: over 50 feet - \$2.00 per hour add 100 to 180 feet - \$4.00 per hour a Over 180 feet - \$6.00 per houir ad	itional additional dditional	
PAIN0016-003 01/01/2017		
AREA 1: ALAMEDA, CONTRA COSTA, SAN CLARA COUNTIES	N FRANCISCO, SAN	MATEO & SANTA
AREA 2: CALAVERAS, MARIPOA, MERCEI JOAQUIN, SANTA CRUZ, STANISLAUS &	), MONTEREY, SAN TUOLUMNE COUNTI	BENITO, SAN ES
	Rates	Fringes
Drywall Finisher/Taper		

AREA 1\$ AREA 2\$	44.16 40.03	25.64 24.29		
PAIN0016-012 01/01/2017				
ALAMEDA, CONTRA COSTA, MARIPOSA, MERCED, MONTEREY, SAN BENITO, SAN FRANCISCO, SAN MATEO, SANTA CLARA AND SANTA CRUZ COUNTIES				
	Rates	Fringes		
SOFT FLOOR LAYER\$	47.39	24.64		
PAIN0016-015 01/01/2017				
CALAVERAS, MARIPOSA, MERCED, SAN J COUNTIES	OAQUIN, STANISLA	US & TUOLUMNE		
	Rates	Fringes		
PAINTER Brush\$	32.16	18.26		
FOOTNOTES: SPRAY/SANDBLAST: \$0.50 additional EXOTIC MATERIALS: \$1.00 additional HIGH TIME: Over 50 ft above gro additional per hour. 100 to 180 level \$4.00 additional per hour. or water level \$6.00 additional	per hour. per hour. pund or water lev ft above ground Over 180 ft al per hour.	vel \$2.00 d or water bove ground		
PAIN0016-022 01/01/2017				
SAN FRANCISCO COUNTY				
	Rates	Fringes		
PAINTER\$	42.49	22.83		
PAIN0169-001 01/01/2017				
FRESNO, KINGS, MADERA, MARIPOSA AN	D MERCED COUNTIE	S:		
	Rates	Fringes		
GLAZIER\$	34.93	24.03		
PAIN0169-005 01/01/2017				
ALAMEDA CONTRA COSTA, MONTEREY, SA MATEO, SANTA CLARA & SANTA CRUZ CO	N BENITO, SAN FR DUNTIES	ANCISCO, SAN		
	Rates	Fringes		
GLAZIER\$	45.13	26.79		
PAIN0294-004 01/01/2017				
FRESNO, KINGS AND MADERA COUNTIES				
	Rates	Fringes		
PAINTER Brush, Roller\$ Drywall Finisher/Taper\$	27.94 33.99	16.95 21.56		
FOOTNOTE: Spray Painters & Paperhangers re hour. Painters doing Drywall Pat additional per hour. Lead Abate \$1.50 additional per hour. High not include work from a lift) \$0	cive \$1.00 addit ching receive \$1 ers & Sandblaster Time - over 30 0.75 per hour add	ional per 25 cs receive feet (does ditional.		

PAIN0294-005 01/01/2017

FRESNO, KINGS & MADERA

	Rates	Fringes
SOFT FLOOR LAYER\$	31.49	19.23
PAIN0767-001 01/01/2017		
CALAVERAS, SAN JOAQUIN, STANISLAUS	AND TUOLUMNE C	OUNTIES:
	Rates	Fringes
GLAZIER\$	34.57	25.96
PAID HOLIDAYS: New Year's Day, M President's Day, Memorial Day, I Veteran's Day, Thanksgiving Day,	Martin Luther Ki ndependence Day and Christmas	ng, Jr. Day, , Labor Day, Day.
Employee rquired to wear a body per hour above the basic hourly	harness shall r rate at any ele	eceive \$1.50 vation.
PAIN1176-001 07/01/2014		
HIGHWAY IMPROVEMENT		
	Rates	Fringes
Parking Lot Striping/Highway Marking: GROUP 1\$ GROUP 2\$ GROUP 3\$	34.26 29.12 29.46	11.65 11.65 11.65
CLASSIFICATIONS		
GROUP 1: Striper: Layout and app stripes and marking; hot thermo stripes and markings	plication of paim plastic; tape,	nted traffic traffic
GROUP 2: Gamecourt & Playground	Installer	
GROUP 3: Protective Coating, Pav	rement Sealing	
PAIN1237-003 01/01/2017		
CALAVERAS; SAN JOAQUIN COUNTIES; S COUNTIES:	TANISLAUS AND T	UOLUMNE
	Rates	Fringes
SOFT FLOOR LAYER\$	33.93	20.39
PLAS0066-002 07/01/2016		
ALAMEDA, CONTRA COSTA, SAN MATEO A	ND SAN FRANCISC	O COUNTIES:
	Rates	Fringes
PLASTERER\$	39.52	35.37
PLAS0300-001 07/01/2014		
	Rates	Fringes
PLASTERER AREA 188: Fresno\$	29.44	22.26
AREA 224. San Benito, Santa Clara, Santa Cruz\$	31.59	22.26

https://www.wdol.gov/wdol/scafiles/davisbacon/CA29.dvb?v=10[5/9/2017 12:15:50 PM]

AREA 295: Calaveras & San Joaquin Couonties\$ AREA 337: Monterey County\$ AREA 429: Mariposa, Merced, Stanislaus, Tuolumne Counties	31.41 30.52	22.26 22.26
	J1.41	
PLAS0300-005 07/01/2016		
	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER\$	37.74	19.37
PLUM0038-001 07/01/2016		
SAN FRANCISCO COUNTY		
	Rates	Fringes
PLUMBER (Plumber, Steamfitter, Refrigeration Fitter)\$	68.00	45.09
PLUM0038-005 07/01/2016		
SAN FRANCISCO COUNTY		
	Rates	Fringes
Landscape/Irrigation Fitter (Underground/Utility Fitter)\$	57.80	33.46
PLUM0062-001 01/01/2017		
MONTEREY AND SANTA CRUZ COUNTIES		
	Rates	Fringes
PLUMBER & STEAMFITTER\$	41.90	29.59
PLUM0159-001 07/01/2016		
CONTRA COSTA COUNTY		
	Rates	Fringes
Plumber and steamfitter (1) Refrigeration\$ (2) All other work\$	55.03 55.92	34.46 34.44
PLUM0246-001 01/01/2017		
FRESNO, KINGS & MADERA COUNTIES		
	Rates	Fringes
PLUMBER & STEAMFITTER\$	38.40	29.39
PLUM0246-004 01/01/2017		
FRESNO, MERCED & SAN JOAQUIN COUNI	ES	
	Rates	Fringes
PLUMBER (PIPE TRADESMAN)\$	13.00	10.74
PIPE TRADESMAN SCOPE OF WORK: Installation of corrugated metal as installation of corrugated me connection with storm sewers and packing and diapering of joints, paving over joints, in piping; T work for building site preparati pavement breakers, chipping guns to cut holes, chases and channel	piping for dra tal piping for drains; Grouti: holes or chase emporary piping on; Operating j; , concrete saws s for piping sys	inage, as well culverts in ng, dry s including for dirt ack hammers, and spades stems;

Digging, grading, backfilling and ground preparation for all types of pipe to all points of the jobsite; Ground preparation including ground leveling, layout and planting of shrubbery, trees and ground cover, including watering, mowing, edging, pruning and fertilizing, the breaking of concrete, digging, backfilling and tamping for the preparation and completion of all work in connection with lawn sprinkler and landscaping; Loading, unloading and distributing materials at jobsite; Putting away materials in storage bins in jobsite secure storage area; Demolition of piping and fixtures for remodeling and additions; Setting up and tearing down work benches, ladders and job shacks; Clean-up and sweeping of jobsite; Pipe wrapping and waterproofing where tar or similar material is applied for protection of buried piping; Flagman

# PLUM0342-001 07/01/2016

#### ALAMEDA & CONTRA COSTA COUNTIES

	Rates	Fringes
PIPEFITTER CONTRA COSTA COUNTY	.\$ 56.56	40.74
PLUMBER, PIPEFITTER,		
STEAMFITTER		
ALAMEDA COUNTY	.\$ 56.56	40.74

PLUM0355-004 07/01/2015

ALAMEDA, CALAVERAS, CONTRA COSTA, FRESNO, KINGS, MADERA, MARIPOSA, MERCED, MONTEREY, SAN BENITO, SAN JOAQUIN, SAN MATEO, SANTA CLARA, SANTA CRUZ, STANISLAUS, AND TUOLUMNE COUNTIES:

	Rates	Fringes	
Underground Utility Worker /Landscape Fitter	\$ 28.60	10.05	
PLUM0393-001 07/01/2016			
SAN BENITO AND SANTA CLARA COU	JNTIES		

	Rates	Fringes	
PLUMBER/PIPEFITTER	\$ 58.91	38.58	
PLUM0442-001 01/01/2017			

CALAVERAS, MARIPOSA, MERCED, SAN JOAQUIN, STANISLAUS & TUOLUMNE COUNTIES

	Rates	Fringes
PLUMBER & STEAMFITTER\$	40.00	28.39
PLUM0467-001 07/01/2016		
SAN MATEO COUNTY		
	Rates	Fringes
<pre>Plumber/Pipefitter/Steamfitter\$</pre>	60.70	33.46
ROOF0027-002 01/01/2017		
FRESNO, KINGS, AND MADERA COUNTIES		
	Rates	Fringes
ROOFER\$	26.01	14.21

FOOTNOTE: Work with pitch, pitch base of pitch impregnated products or any material containing coal tar pitch, on any building old or new, where both asphalt and pitchers are used in the application of a built-up roof or tear off: \$2.00 per hour additional. \_\_\_\_\_ ROOF0040-002 08/01/2015 SAN FRANCISCO & SAN MATEO COUNTIES: Rates Fringes ROOFER.....\$ 35.50 15.82 ROOF0081-001 08/01/2015 ALAMEDA AND CONTRA COSTA COUNTIES: Rates Fringes Roofer.....\$ 36.08 14.90 ROOF0081-004 08/01/2015 CALAVERAS, MARIPOSA, MERCED, SAN JOAQUIN, STANISLAUS AND TUOLUMNE COUNTIES: Rates Fringes ROOFER.....\$ 32.71 14.65 \_\_\_\_\_ ROOF0095-002 08/01/2015 MONTEREY, SAN BENITO, SANTA CLARA, AND SANTA CRUZ COUNTIES: Rates Fringes ROOFER Journeyman.....\$ 37.55 15.52 Kettle person (2 kettles); Bitumastic, Enameler, Coal Tar, Pitch and Mastic worker.....\$ 39.55 15.52 \_\_\_\_\_ SFCA0483-001 01/01/2017 ALAMEDA, CONTRA COSTA, SAN FRANCISCO, SAN MATEO AND SANTA CLARA COUNTIES: Rates Fringes SPRINKLER FITTER (FIRE).....\$ 58.72 28.07 \_\_\_\_\_ \_\_\_\_\_ SFCA0669-011 04/01/2016 CALAVERAS, FRESNO, KINGS, MADERA, MARIPOSA, MERCED, MONTEREY, SAN BENITO, SAN JOAQUIN, SANTA CRUZ, STANISLAUS AND TUOLUMNE COUNTIES: Rates Fringes SPRINKLER FITTER.....\$ 35.71 20.25 \_\_\_\_\_ SHEE0104-001 01/01/2017 AREA 1: ALAMEDA, CONTRA COSTA, SAN FRANCISCO, SAN MATEO, SANTA CLARA AREA 2: MONTEREY & SAN BENITO AREA 3: SANTA CRUZ

	Rates	Fringes
SHEET METAL WORKER AREA 1: Moghanigal Contracts		
Mechanical contractsunder \$200,000All Other WorkAREA 2AREA 3	48.23 54.58 34.96 38.28	36.45 37.08 34.21 33.01
SHEE0104-003 07/01/2016		
CALAVERAS AND SAN JOAQUIN COUNTIES	:	
	Rates	Fringes
SHEET METAL WORKER\$	38.12	30.50
SHEE0104-005 07/01/2016		
MARIPOSA, MERCED, STANISLAUS AND T	UOLUMNE COUNTIE	s:
	Rates	Fringes
SHEET METAL WORKER (Excluding metal deck and siding)\$	36.88	33.30
SHEE0104-007 07/01/2016		
FRESNO, KINGS, AND MADERA COUNTIES	:	
	Rates	Fringes
SHEET METAL WORKER\$	36.15	33.70
SHEE0104-015 07/01/2016		
ALAMEDA, CONTRA COSTA, MONTEREY, S MATEO, SANTA CLARA AND SANTA CRUZ	AN BENITO, SAN : COUNTIES:	FRANCISCO, SAN
	Rates	Fringes
SHEET METAL WORKER (Metal Decking and Siding only)\$	35.64	31.49
SHEE0104-018 07/01/2016		
CALAVERAS, FRESNO, KINGS, MADERA, JOAQUIN, STANISLAUS AND TUOLUMNE C	MARIPOSA, MERCE COUNTIES:	D, SAN
	Rates	Fringes
Sheet metal worker (Metal decking and siding only)\$	35.64	31.49
TEAM0094-001 07/01/2016		
	Rates	Fringes
Truck drivers: GROUP 1	29.63 29.93 30.23 30.58 30.93	26.66 26.66 26.66 26.66 26.66
auger); Dumpcrete truck; Skid tr pre-batch concrete mix trucks; I Slurry truck: Use dump truck yar	cuck (debris box Dumpster or simi cdage rate.	); Dry lar type;

Heater planer; Asphalt burner; Scarifier burner; Industrial lift truck (mechanical tailgate); Utility and clean-up truck: Use appropriate rate for the power unit or the equipment utilized.

#### TRUCK DRIVER CLASSIFICATIONS

GROUP 1: Dump trucks, under 6 yds.; Single unit flat rack (2axle unit); Nipper truck (when flat rack truck is used appropriate flat rack shall apply); Concrete pump truck (when flat rack truck is used appropriate flat rack shall apply); Concrete pump machine; Fork lift and lift jitneys; Fuel and/or grease truck driver or fuel person; Snow buggy; Steam cleaning; Bus or personhaul driver; Escort or pilot car driver; Pickup truck; Teamster oiler/greaser and/or serviceperson; Hook tender (including loading and unloading); Team driver; Tool room attendant (refineries)

GROUP 2: Dump trucks, 6 yds. and under 8 yds.; Transit mixers, through 10 yds.; Water trucks, under 7,000 gals.; Jetting trucks, under 7,000 gals.; Single-unit flat rack (3-axle unit); Highbed heavy duty transport; Scissor truck; Rubber-tired muck car (not self-loaded); Rubber-tired truck jumbo; Winch truck and "A" frame drivers; Combination winch truck with hoist; Road oil truck or bootperson; Buggymobile; Ross, Hyster and similar straddle carriers; Small rubber-tired tractor

GROUP 3: Dump trucks, 8 yds. and including 24 yds.; Transit mixers, over 10 yds.; Water trucks, 7,000 gals. and over; Jetting trucks, 7,000 gals. and over; Vacuum trucks under 7500 gals. Trucks towing tilt bed or flat bed pull trailers; Lowbed heavy duty transport; Heavy duty transport tiller person; Self- propelled street sweeper with self-contained refuse bin; Boom truck - hydro-lift or Swedish type extension or retracting crane; P.B. or similar type self-loading truck; Tire repairperson; Combination bootperson and road oiler; Dry distribution truck (A bootperson when employed on such equipment, shall receive the rate specified for the classification of road oil trucks or bootperson); Ammonia nitrate distributor, driver and mixer; Snow Go and/or plow

GROUP 4: Dump trucks, over 25 yds. and under 65 yds.; Water pulls - DW 10's, 20's, 21's and other similar equipment when pulling Aqua/pak or water tank trailers; Helicopter pilots (when transporting men and materials); Lowbedk Heavy Duty Transport up to including 7 axles; DW10's, 20's, 21's and other similar Cat type, Terra Cobra, LeTourneau Pulls, Tournorocker, Euclid and similar type equipment when pulling fuel and/or grease tank trailers or other miscellaneous trailers; Vacuum Trucks 7500 gals and over and truck repairman

GROUP 5: Dump trucks, 65 yds. and over; Holland hauler; Low bed Heavy Duty Transport over 7 axles

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

\_\_\_\_\_

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

#### \_\_\_\_\_

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

#### Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than "SU" or "UAVG" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

#### Survey Rate Identifiers

Classifications listed under the "SU" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

#### Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

#### WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- \* an existing published wage determination
- \* a survey underlying a wage determination
- \* a Wage and Hour Division letter setting forth a position on a wage determination matter
- \* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations Wage and Hour Division U.S. Department of Labor 200 Constitution Avenue, N.W. Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator U.S. Department of Labor 200 Constitution Avenue, N.W. Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board U.S. Department of Labor 200 Constitution Avenue, N.W. Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

\_\_\_\_\_

END OF GENERAL DECISION

# APPENDIX B AC 150/5370-2F OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION



U.S. Department of Transportation

Federal Aviation Administration

**Subject:** Operational Safety on Airports During Construction

Advisory Circular

 Date:
 9/29/11
 AC No:
 150/5370-2F

 Initiated by:
 AAS-100
 AAS-100
 AAS-100

1. Purpose. This AC sets forth guidelines for operational safety on airports during construction.

**2.** What this AC Cancels. This AC cancels AC 150/5370-2E, Operational Safety on Airports During Construction, dated January 17, 2003.

**3.** Whom This AC Affects. This AC assists airport operators in complying with Title 14 Code of Federal Regulations (CFR) Part 139, Certification of Airports (Part 139). For those certificated airports, this AC provides one way, but not the only way, of meeting those requirements. The use of this AC is mandatory for those airport construction projects receiving funds under the Airport Improvement Program (AIP) or the Passenger Facility Charge (PFC) Program. See Grant Assurance No. 34, "Policies, Standards, and Specifications," and PFC Assurance No. 9, "Standard and Specifications." While we do not require non-certificated airports without grant agreements to adhere to these guidelines, we recommend that they do so to help these airports maintain operational safety during construction.

### 4. Principal Changes.

**a.** Construction activities are prohibited in safety areas while the associated runway or taxiway is open to aircraft.

b. Guidance is provided in incorporating Safety Risk Management.

**c.** Recommended checklists are provided for writing Construction Safety and Phasing Plans and for daily inspections.

**5. Reading Material Related to this AC.** Numerous ACs are referenced in the text of this AC. These references do not include a revision letter, as they are to be read as referring to the latest version. Appendix 1 contains a list of reading material on airport construction, design, and potential safety hazards during construction, as well as instructions for obtaining these documents.

Michael J. O'Donnell Director of Airport Safety and Standards

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## **Chapter 1. Planning an Airfield Construction Project**

**101. Overview.** Airports are complex environments, and procedures and conditions associated with construction activities often affect aircraft operations and can jeopardize operational safety. Safety considerations are paramount and may make operational impacts unavoidable. However, careful planning, scheduling, and coordination of construction activities can minimize disruption of normal aircraft operations and avoid situations that compromise the airport's operational safety. The airport operator must understand how construction activities and aircraft operations affect one another to be able to develop an effective plan to complete the project. While the guidance in this AC is primarily used for construction operations, some of the concepts, methods and procedures described may also enhance the day-to-day airport maintenance operations, such as lighting maintenance and snow removal operations.

**102. Plan for Safety.** Safety, maintaining aircraft operations, and construction costs are all interrelated. Since safety must not be compromised, the airport operator must strike a balance between maintaining aircraft operations and construction costs. This balance will vary widely depending on the operational needs and resources of the airport and will require early coordination with airport users and the FAA. As the project design progresses, the necessary construction locations, activities, and associated costs will be identified. As they are identified, their impact to airport operations must be assessed. Adjustments are made to the proposed construction activities, often by phasing the project, and/or to airport operations in order to maintain operational safety. This planning effort will ultimately result in a project Construction Safety and Phasing Plan (CSPP). The development of the CSPP takes place through the following five steps:

**a.** Identify Affected Areas. The airport operator must determine the geographic areas on the airport affected by the construction project. Some, such as a runway extension, will be defined by the project. Others may be variable, such as the location of haul routes and material stockpiles.

**b.** Describe Current Operations. Identify the normal airport operations in each affected area for each phase of the project. This becomes the baseline from which the impact on operations by construction activities can be measured. This should include a narrative of the typical users and aircraft operating within the affected areas. It should also include information related to airport operations: the Aircraft Reference Code (ACRC) for each runway; Airplane Design Group (ADG) and Taxiway Design Group (TDG)<sup>1</sup> for each affected taxiway; designated approach visibility minimums; available approach and departure procedures; most demanding aircraft; declared distances; available air traffic control services; airport Surface Movement Guidance and Control System plan; and others. The applicable seasons, days and times for certain operations should also be identified as applicable.

c. Allow for Temporary Changes to Operations. To the extent practical, current airport operations should be maintained during the construction. In consultation with airport users, Aircraft Rescue and Fire Fighting (ARFF) personnel, and FAA Air Traffic Organization (ATO) personnel, the airport operator should identify and prioritize the airport's most important operations. The construction activities should be planned, through project phasing if necessary, to safely accommodate these operations. When the construction activities cannot be adjusted to safely maintain current operations, regardless of their importance, then the operations must be revised accordingly. Allowable changes include temporary revisions to approach procedures, restricting certain aircraft to specific runways and taxiways, suspension of certain operations, decreased weights for some aircraft due to shortened runways,

<sup>&</sup>lt;sup>1</sup> Taxiway Design Group will be introduced in AC 150/5300-13A.

and other changes. An example of a table showing temporary operations versus current operations is shown in Table 3-1 Sample Operations Effects.

**d.** Take Required Measures to Revised Operations. Once the level and type of aircraft operations to be maintained are identified, the airport operator must determine the measures required to safely conduct the planned operations during the construction. These measures will result in associated costs, which can be broadly interpreted to include not only direct construction costs, but also loss of revenue from impacted operations. Analysis of costs may indicate a need to reevaluate allowable changes to operations. As aircraft operations and allowable changes will vary so widely among airports, this AC presents general guidance on those subjects.

e. Manage Safety Risk. Certain airport projects may require the airport operator to provide a Project Proposal Summary to help the FAA to determine the appropriate level of Safety Risk Management (SRM) documentation. The airport operator must coordinate with the appropriate FAA Airports Regional or District Office early in the development of the CSPP to determine the need for SRM documentation. See FAA Order 5200.11, FAA Airports (ARP) Safety Management System (SMS), for more information. If the FAA requires SRM documentation, the airport operator must at a minimum:

(1) Notify the appropriate FAA Airports Regional or District Office during the project "scope development" phase of any project requiring a CSPP.

- (2) **Provide documents** identified by the FAA as necessary to conduct SRM.
- (3) **Participate in the SRM process** for airport projects.
- (4) **Provide a representative** to participate on the SRM panel.

(5) Ensure that all applicable SRM identified risks elements are recorded and mitigated within the CSPP.

**103.** Develop a Construction Safety and Phasing Plan (CSPP). Development of an effective CSPP will require familiarity with many other documents referenced throughout this AC. See Appendix 1, Related Reading Material for a list of related reading material.

**a.** List Requirements. A CSPP must be developed for each on-airfield construction project funded by the Airport Improvement Program (AIP) or the Passenger Facility Charge (PFC) program or located on an airport certificated under Part 139. As per Order 5200.11, such projects do not include construction, rehabilitation, or change of any facility that is entirely outside the air operations area, does not involve any expansion of the facility envelope and does not involve construction equipment, haul routes or placement of material in locations that require access to the air operations area, increase the facility envelope, or impact line-of-sight. Such facilities may include passenger terminals and parking or other structures. However, extraordinary circumstances may trigger the need for a Safety Assessment and a CSPP. The CSPP is subject to subsequent review and approval under the FAA's Safety Risk Management procedures (see paragraph 102.e above). Additional information may be found in Order 5200.11.

**b. Prepare a Safety Plan Compliance Document.** The Safety Plan Compliance Document (SPCD) details how the contractor will comply with the CSPP. Also, it will not be possible to determine all safety plan details (for example specific hazard equipment and lighting, contractor's points of contact, construction equipment heights) during the development of the CSPP. The successful contractor must define such details by preparing an SPCD that the airport operator reviews for approval prior to issuance of a notice-to-proceed. The SPCD is a subset of the CSPP, similar to how a shop drawing review is a subset to the technical specifications.

c. Assume Responsibility for the CSPP. The airport operator is responsible for establishing and enforcing the CSPP. The airport operator may use the services of an engineering consultant to help develop the CSPP. However, writing the CSPP cannot be delegated to the construction contractor. Only those details the airport operator determines cannot be addressed before contract award are developed by the contractor and submitted for approval as the SPCD. The SPCD does not restate nor propose differences to provisions already addressed in the CSPP.

## 104. Who Is Responsible for Safety During Construction?

a. Establish a Safety Culture. Everyone has a role in operational safety on airports during construction: the airport operator, the airport's consultants, the construction contractor and subcontractors, airport users, airport tenants, ARFF personnel, Air Traffic personnel, including Technical Operations personnel, FAA Airports Division personnel, and others. Close communication and coordination between all affected parties is the key to maintaining safe operations. Such communication and coordination should start at the project scoping meeting and continue through the completion of the project. The airport operator and contractor should conduct onsite safety inspections throughout the project and immediately remedy any deficiencies, whether caused by negligence, oversight, or project scope change.

**b.** Assess Airport Operator's Responsibilities. An airport operator has overall responsibility for all activities on an airport, including construction. This includes the predesign, design, preconstruction, construction, and inspection phases. Additional information on the responsibilities listed below can be found throughout this AC. The airport operator must:

(1) **Develop a CSPP** that complies with the safety guidelines of Chapter 2, Construction Safety and Phasing Plans, and Chapter 3, Guidelines for Writing a CSPP. The airport operator may develop the CSPP internally or have a consultant develop the CSPP for approval by the airport operator. For tenant sponsored projects, approve a CSPP developed by the tenant or its consultant.

(2) **Require, review and approve the SPCD** by the contractor that indicates how it will comply with the CSPP and provides details that cannot be determined before contract award.

(3) Convene a preconstruction meeting with the construction contractor, consultant, airport employees and, if appropriate, tenant sponsor and other tenants to review and discuss project safety before beginning construction activity. The appropriate FAA representatives should be invited to attend the meeting. See AC 150/5300-9, *Predesign, Prebid, and Preconstruction Conferences for Airport Grant Projects*. (Note "FAA" refers to the Airports Regional or District Office, the Air Traffic Organization, Flight Standards Service, and other offices that support airport operations, flight regulations, and construction/environmental policies.)

(4) **Ensure contact information** is accurate for each representative/point of contact identified in the CSPP and SPCD.

(5) Hold weekly or, if necessary, daily safety meetings with all affected parties to coordinate activities.

(6) Notify users, ARFF personnel, and FAA ATO personnel of construction and conditions that may adversely affect the operational safety of the airport via Notices to Airmen (NOTAM) and other methods, as appropriate. Convene a meeting for review and discussion if necessary.

(7) Ensure construction personnel know of any applicable airport procedures and of changes to those procedures that may affect their work.

(8) Ensure construction contractors and subcontractors undergo training required by the CSPP and SPCD.

(9) Ensure vehicle and pedestrian operations addressed in the CSPP and SPCD are coordinated with airport tenants, the airport traffic control tower (ATCT), and construction contractors.

(10) At certificated airports, ensure each CSPP and SPCD is consistent with Part 139.

(11) **Conduct inspections** sufficiently frequently to ensure construction contractors and tenants comply with the CSPP and SPCD and that there are no altered construction activities that could create potential safety hazards.

(12) **Resolve safety deficiencies immediately.** At airports subject to 49 CFR Part 1542, Airport Security, ensure construction access complies with the security requirements of that regulation.

(13) Notify appropriate parties when conditions exist that invoke provisions of the CSPP and SPCD (for example, implementation of low-visibility operations).

(14) Ensure prompt submittal of a Notice of Proposed Construction or Alteration (Form 7460-1) for conducting an aeronautical study of potential obstructions such as tall equipment (cranes, concrete pumps, other.), stock piles, and haul routes. A separate form may be filed for each potential obstruction, or one form may be filed describing the entire construction area and maximum equipment height. In the latter case, a separate form must be filed for any object beyond or higher than the originally evaluated area/height. The FAA encourages online submittal of forms for expediency. The appropriate FAA Airports Regional or District Office can provide assistance in determining which objects require an aeronautical study.

(15) **Promptly notify the FAA Airports Regional or District Office** of any proposed changes to the CSPP prior to implementation of the change. Changes to the CSPP require review and approval by the airport operator and the FAA. Coordinate with appropriate local and other federal government agencies, such as EPA, OSHA, TSA, and the state environmental agency.

c. Define Construction Contractor's Responsibilities. The contractor is responsible for complying with the CSPP and SPCD. The contractor must:

(1) Submit a Safety Plan Compliance Document (SPCD) to the airport operator describing how it will comply with the requirements of the CSPP and supplying any details that could not be determined before contract award. The SPCD must include a certification statement by the contractor that indicates it understands the operational safety requirements of the CSPP and it asserts it will not deviate from the approved CSPP and SPCD unless written approval is granted by the airport operator. Any construction practice proposed by the contractor that does not conform to the CSPP and SPCD may impact the airport's operational safety and will require a revision to the CSPP and SPCD and recoordination with the airport operator and the FAA in advance.

(2) Have available at all times copies of the CSPP and SPCD for reference by the airport operator and its representatives, and by subcontractors and contractor employees.

(3) Ensure that construction personnel are familiar with safety procedures and regulations on the airport. Provide a point of contact who will coordinate an immediate response to correct any construction-related activity that may adversely affect the operational safety of the airport. Many projects will require 24-hour coverage.

(4) Identify in the SPCD the contractor's on-site employees responsible for monitoring compliance with the CSPP and SPCD during construction. At least one of these employees must be on-site whenever active construction is taking place.

(5) **Conduct inspections** sufficiently frequently to ensure construction personnel comply with the CSPP and SPCD and that there are no altered construction activities that could create potential safety hazards.
(6) **Restrict movement of construction vehicles and personnel** to permitted construction areas by flagging, barricading, erecting temporary fencing, or providing escorts, as appropriate and as specified in the CSPP and SPCD.

(7) Ensure that no contractor employees, employees of subcontractors or suppliers, or other persons enter any part of the air operations area (AOA) from the construction site unless authorized.

(8) Ensure prompt submittal through the airport operator of Form 7460-1 for the purpose of conducting an aeronautical study of contractor equipment such as tall equipment (cranes, concrete pumps, other equipment), stock piles, and haul routes when different from cases previously filed by the airport operator. The FAA encourages online submittal of forms for expediency.

**d.** Define Tenant's Responsibilities if planning construction activities on leased property. Airport tenants, such as airline operators, fixed base operators, and FAA ATO/Technical Operations sponsoring construction must:

(1) **Develop, or have a consultant develop, a project specific CSPP** and submit it to the airport operator for certification and subsequent approval by the FAA. The approved CSPP must be made part of any contract awarded by the tenant for construction work.

(2) In coordination with its contractor, develop an SPCD and submit it to the airport operator for approval to be issued prior to issuance of a Notice to Proceed.

(3) Ensure that construction personnel are familiar with safety procedures and regulations on the airport.

(4) **Provide a point of contact** of who will coordinate an immediate response to correct any construction-related activity that may adversely affect the operational safety of the airport.

(5) Identify in the SPCD the contractor's on-site employees responsible for monitoring compliance with the CSPP and SPCD during construction. At least one of these employees must be on-site whenever active construction is taking place.

(6) **Ensure that no tenant or contractor employees,** employees of subcontractors or suppliers, or any other persons enter any part of the AOA from the construction site unless authorized.

(7) **Restrict movement of construction vehicles** to construction areas by flagging and barricading, erecting temporary fencing, or providing escorts, as appropriate, and as specified in the CSPP and SPCD.

(8) Ensure prompt submittal through the airport operator of Form 7460-1 for the purpose of conducting an aeronautical study of contractor equipment such as tall equipment (cranes, concrete pumps, other.), stock piles, and haul routes. The FAA encourages online submittal of forms for expediency.

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# **Chapter 2. Construction Safety and Phasing Plans**

# Section 1. Basic Considerations

**201. Overview.** Aviation safety is the primary consideration at airports, especially during construction. The airport operator's Construction Safety and Phasing Plan (CSPP) and the contractor's Safety Plan Compliance Document (SPCD) are the primary tools to ensure safety compliance when coordinating construction activities with airport operations. These documents identify all aspects of the construction project that pose a potential safety hazard to airport operations and outline respective mitigation procedures for each hazard. They must provide all information necessary for the Airport Operations during construction. All aviation safety provisions included within the project drawings, contract specifications, and other related documents must also be reflected in the CSPP and SPCD.

**202. Assume Responsibility.** Operational safety on the airport remains the airport operator's responsibility at all times. The airport operator must develop, certify, and submit for FAA approval each CSPP. It is the airport operator's responsibility to apply the requirements of the FAA approved CSPP. The airport operator must revise the CSPP when conditions warrant changes and must submit the revised CSPP to the FAA for approval. The airport operator must also require and approve a SPCD from the project contractor.

**203.** Submit the CSPP. Construction Safety and Phasing Plans should be developed concurrently with the project design. Milestone versions of the CSPP should be submitted for review and approval as follows. While these milestones are not mandatory, early submission will help to avoid delays. Submittals are preferred in 8.5 x 11 in or 11 x 17 in format for compatibility with the FAA's Obstruction Evaluation / Airport Airspace Analysis (OE / AAA) process.

**a.** Submit an Outline/Draft. By the time approximately 25% to 30% of the project design is completed, the principal elements of the CSPP should be established. Airport operators are encouraged to submit an outline or draft, detailing all CSPP provisions developed to date, to the FAA for review at this stage of the project design.

**b.** Submit a Construction Safety and Phasing Plan (CSPP). The CSPP should be formally submitted for FAA approval when the project design is 80% to 90% complete. Since provisions in the CSPP will influence contract costs, it is important to obtain FAA approval in time to include all such provisions in the procurement contract.

c. Submit a Safety Plan Compliance Document (SPCD). The contractor should submit the SPCD to the airport operator for approval to be issued prior to the Notice to Proceed.

**d.** Submit CSPP Revisions. All revisions to the CSPP or SPCD should be submitted to the FAA for approval as soon as required changes are identified.

# 204. Meet CSPP Requirements.

**a.** To the extent possible, the CSPP should address the following as outlined in Section 2, Plan Requirements and Chapter 3, Guidelines for Writing a CSPP, as appropriate. Details that cannot be determined at this stage are to be included in the SPCD.

# (1) Coordination.

- (a) Contractor progress meetings.
- (b) Scope or schedule changes.
- (c) FAA ATO coordination.

## (2) Phasing.

- (a) Phase elements.
- (b) Construction safety drawings

### (3) Areas and operations affected by the construction activity.

- (a) Identification of affected areas.
- (b) Mitigation of effects.

## (4) **Protection of navigation aids (NAVAIDs).**

### (5) Contractor access.

- (a) Location of stockpiled construction materials.
- (b) Vehicle and pedestrian operations.

## (6) Wildlife management.

- (a) Trash.
- (b) Standing water.
- (c) Tall grass and seeds.
- (d) Poorly maintained fencing and gates.
- (e) Disruption of existing wildlife habitat.
- (7) Foreign Object Debris (FOD) management.
- (8) Hazardous materials (HAZMAT) management
- (9) Notification of construction activities.
  - (a) Maintenance of a list of responsible representatives/ points of contact.
  - (b) Notices to Airmen (NOTAM).
  - (c) Emergency notification procedures.
  - (d) Coordination with ARFF Personnel.
  - (e) Notification to the FAA.

# (10) Inspection requirements.

- (a) Daily (or more frequent) inspections.
- (b) Final inspections.
- (11) Underground utilities.
- (12) Penalties.
- (13) Special conditions.
- (14) Runway and taxiway visual aids. Marking, lighting, signs, and visual NAVAIDs.

- (a) General.
- (b) Markings.
- (c) Lighting and visual NAVAIDs.
- (d) Signs.
- (15) Marking and signs for access routes.

#### (16) Hazard marking and lighting.

- (a) Purpose.
- (b) Equipment.

(17) **Protection.** Of runway and taxiway safety areas, object free areas, obstacle free zones, and approach/departure surfaces

- (a) Runway Safety Area (RSA).
- (b) Runway Object Free Area (ROFA).
- (c) Taxiway Safety Area (TSA).
- (d) Taxiway Object Free Area (TOFA).
- (e) Obstacle Free Zone (OFZ).
- (f) Runway approach/departure surfaces.

#### (18) Other limitations on construction.

- (a) Prohibitions.
- (b) Restrictions.

**b.** The Safety Plan Compliance Document (SPCD) should include a general statement by the construction contractor that he/she has read and will abide by the CSPP. In addition, the SPCD must include all supplemental information that could not be included in the CSPP prior to the contract award. The contractor statement should include the name of the contractor, the title of the project CSPP, the approval date of the CSPP, and a reference to any supplemental information (that is, "I, Name of Contractor, have read the Title of Project CSPP, approved on Date, and will abide by it as written and with the following additions as noted:"). The supplemental information in the SPCD should be written to match the format of the CSPP indicating each subject by corresponding CSPP subject number and title. If no supplemental information is necessary for any specific subject, the statement, "No supplemental information," should be written after the corresponding subject title. The SPCD should not duplicate information in the CSPP:

(1) **Coordination.** Discuss details of proposed safety meetings with the airport operator and with contractor employees and subcontractors.

- (2) **Phasing.** Discuss proposed construction schedule elements, including:
  - (a) Duration of each phase.
  - (b) Daily start and finish of construction, including "night only" construction.
  - (c) Duration of construction activities during:
    - (i) Normal runway operations.
    - (ii) Closed runway operations.

(iii) Modified runway "Aircraft Reference Code" usage.

(3) Areas and operations affected by the construction activity. These areas and operations should be identified in the CSPP and should not require an entry in the SPCD.

(4) **Protection of NAVAIDs.** Discuss specific methods proposed to protect operating NAVAIDs.

(5) **Contractor access.** Provide the following:

(a) Details on how the contractor will maintain the integrity of the airport security fence (gate guards, daily log of construction personnel, and other).

(b) Listing of individuals requiring driver training (for certificated airports and as

requested).

- (c) Radio communications.
  - (i) Types of radios and backup capabilities.
  - (ii) Who will be monitoring radios.
  - (iii) Whom to contact if the ATCT cannot reach the contractor's designated person by

radio.

(d) Details on how the contractor will escort material delivery vehicles.

(6) Wildlife management. Discuss the following:

- (a) Methods and procedures to prevent wildlife attraction.
- (b) Wildlife reporting procedures.

(7) Foreign Object Debris (FOD) management. Discuss equipment and methods for control of FOD, including construction debris and dust.

(8) Hazardous material (HAZMAT) management. Discuss equipment and methods for responding to hazardous spills.

(9) Notification of construction activities. Provide the following:

- (a) Contractor points of contact.
- (b) Contractor emergency contact.

(c) Listing of tall or other requested equipment proposed for use on the airport and the timeframe for submitting 7460-1 forms not previously submitted by the airport operator.

(d) Batch plant details, including 7460-1 submittal.

(10) Inspection requirements. Discuss daily (or more frequent) inspections and special inspection procedures.

(11) Underground utilities. Discuss proposed methods of identifying and protecting underground utilities.

(12) **Penalties.** Penalties should be identified in the CSPP and should not require an entry in the SPCD.

(13) **Special conditions.** Discuss proposed actions for each special condition identified in the CSPP.

(14) Runway and taxiway visual aids. Including marking, lighting, signs, and visual NAVAIDs. Discuss proposed visual aids including the following:

- (a) Equipment and methods for covering signage and airfield lights.
- (b) Equipment and methods for temporary closure markings (paint, fabric, other).
- (c) Types of temporary Visual Guidance Slope Indicators (VGSI).

(15) Marking and signs for access routes. Discuss proposed methods of demarcating access routes for vehicle drivers.

(16) Hazard marking and lighting. Discuss proposed equipment and methods for identifying excavation areas.

(17) **Protection of runway and taxiway safety areas.** including object free areas, obstacle free zones, and approach/departure surfaces. Discuss proposed methods of identifying, demarcating, and protecting airport surfaces including:

(a) Equipment and methods for maintaining Taxiway Safety Area standards.

(b) Equipment and methods for separation of construction operations from aircraft operations, including details of barricades.

(18) Other limitations on construction should be identified in the CSPP and should not require an entry in the SPCD.

#### Section 2. Plan Requirements

**205.** Coordination. Airport operators, or tenants conducting construction on their leased properties, should use predesign, prebid, and preconstruction conferences to introduce the subject of airport operational safety during construction (see AC 150/5300-9). In addition, the following should be coordinated as required:

**a.** Contractor Progress Meetings. Operational safety should be a standing agenda item for discussion during progress meetings throughout the project.

**b.** Scope or Schedule Changes. Changes in the scope or duration of the project may necessitate revisions to the CSPP and review and approval by the airport operator and the FAA.

c. FAA ATO Coordination. Early coordination with FAA ATO is required to schedule airway facility shutdowns and restarts. Relocation or adjustments to NAVAIDs, or changes to final grades in critical areas, may require an FAA flight inspection prior to restarting the facility. Flight inspections must be coordinated and scheduled well in advance of the intended facility restart. Flight inspections may require a reimbursable agreement between the airport operator and FAA ATO. Reimbursable agreements should be coordinated a minimum of 12 months prior to the start of construction. (See 213.e(3)(b) for required FAA notification regarding FAA owned NAVAIDs.)

**206. Phasing.** Once it has been determined what types and levels of airport operations will be maintained, the most efficient sequence of construction may not be feasible. In such a case, the sequence of construction may be phased to gain maximum efficiency while allowing for the required operations. The development of the resulting construction phases should be coordinated with local Air Traffic personnel and airport users. The sequenced construction phases established in the CSPP must be incorporated into the project design and must be reflected in the contract drawings and specifications.

- a. Phase Elements. For each phase the CSPP should detail:
  - Areas closed to aircraft operations

- Duration of closures
- Taxi routes
- ARFF access routes
- Construction staging areas
- Construction access and haul routes
- Impacts to NAVAIDs
- Lighting and marking changes
- Available runway length
- Declared distances (if applicable)
- Required hazard marking and lighting
- Lead times for required notifications

**b.** Construction Safety Drawings. Drawings specifically indicating operational safety procedures and methods in affected areas (that is, construction safety drawings) should be developed for each construction phase. Such drawings should be included in the CSPP as referenced attachments and should likewise be included in the contract drawing package.

**207.** Areas and Operations Affected by Construction Activity. Runways and taxiways should remain in use by aircraft to the maximum extent possible without compromising safety. Pre-meetings with the FAA Air Traffic Organization (ATO) will support operational simulations. See Chapter 3 for an example of a table showing temporary operations versus current operations.

**a.** Identification of Affected Areas. Identifying areas and operations affected by the construction will help to determine possible safety problems. The affected areas should be indentified in the construction safety drawings for each construction phase. (See 206.b above.) Of particular concern are:

(1) Closing, or partial closing, of runways, taxiways and aprons. When a runway is partially closed, a portion of the pavement is unavailable for any aircraft operation, meaning taxiing, landing, or taking off in either direction on that pavement is prohibited. A displaced threshold, by contrast, is established to ensure obstacle clearance and adequate safety area for landing aircraft. The pavement prior to the displaced threshold is available for take-off in the direction of the displacement and for landing and taking off in the opposite direction. Misunderstanding this difference, and issuance of a subsequently inaccurate NOTAM, can lead to a hazardous condition.

- (2) Closing of Aircraft Rescue and Fire Fighting access routes.
- (3) Closing of access routes used by airport and airline support vehicles.
- (4) Interruption of utilities, including water supplies for fire fighting.
- (5) Approach/departure surfaces affected by heights of objects.

(6) **Construction areas,** storage areas, and access routes near runways, taxiways, aprons, or helipads.

**b.** Mitigation of Effects. Establishment of specific procedures is necessary to maintain the safety and efficiency of airport operations. The CSPP must address:

- (1) Temporary changes to runway and/or taxi operations.
- (2) Detours for ARFF and other airport vehicles.

- (3) Maintenance of essential utilities.
- (4) Temporary changes to air traffic control procedures. Such changes must be coordinated with the ATO.

208. Navigation Aid (NAVAID) Protection. Before commencing construction activity, parking vehicles, or storing construction equipment and materials near a NAVAID, coordinate with the appropriate FAA ATO/Technical Operations office to evaluate the effect of construction activity and the required distance and direction from the NAVAID. (See paragraph 213.e(3) below.) Construction activities, materials/equipment storage, and vehicle parking near electronic NAVAIDs require special consideration since they may interfere with signals essential to air navigation. If any NAVAID may be affected, the CSPP and SPCD must show an understanding of the "critical area" associated with each NAVAID and describe how it will be protected. Where applicable, the operational critical areas of NAVAIDs should be graphically delineated on the project drawings. Pay particular attention to stockpiling material, as well as to movement and parking of equipment that may interfere with line of sight from the ATCT or with electronic emissions. Interference from construction equipment and activities may require NAVAID shutdown or adjustment of instrument approach minimums for low visibility operations. This condition requires that a NOTAM be filed (see paragraph 213.b below). Construction activities and materials/equipment storage near a NAVAID must not obstruct access to the equipment and instruments for maintenance. Submittal of a 7460-1 form is required for construction vehicles operating near FAA NAVAIDs. (See paragraph 213.e(1) below.)

**209.** Contractor Access. The CSPP must detail the areas to which the contractor must have access, and explain how contractor personnel will access those areas. Specifically address:

**a.** Location of Stockpiled Construction Materials. Stockpiled materials and equipment storage are not permitted within the RSA and OFZ, and if possible should not be permitted within the Object Free Area (OFA) of an operational runway. Stockpiling material in the OFA requires submittal of a 7460-1 form and justification provided to the appropriate FAA Airports Regional or District Office for approval. The airport operator must ensure that stockpiled materials and equipment adjacent to these areas are prominently marked and lighted during hours of restricted visibility or darkness. (See paragraph 218.b below.) This includes determining and verifying that materials are stabilized and stored at an approved location so as not to be a hazard to aircraft operations and to prevent attraction of wildlife and foreign object damage. See paragraphs 210 and 211 below.

**b.** Vehicle and Pedestrian Operations. The CSPP should include specific vehicle and pedestrian requirements. Vehicle and pedestrian access routes for airport construction projects must be controlled to prevent inadvertent or unauthorized entry of persons, vehicles, or animals onto the AOA. The airport operator should coordinate requirements for vehicle operations with airport tenants, contractors, and the FAA air traffic manager. In regard to vehicle and pedestrian operations, the CSPP should include the following, and detail associated training requirements:

(1) **Construction site parking.** Designate in advance vehicle parking areas for contractor employees to prevent any unauthorized entry of persons or vehicles onto the AOA. These areas should provide reasonable contractor employee access to the job site.

(2) Construction equipment parking. Contractor employees must park and service all construction vehicles in an area designated by the airport operator outside the OFZ and never in the safety area of an active runway or taxiway. Unless a complex setup procedure makes movement of specialized equipment infeasible, inactive equipment must not be parked on a closed taxiway or runway. If it is necessary to leave specialized equipment on a closed taxiway or runway at night, the equipment must be well lighted. Employees should also park construction vehicles outside the OFA when not in use by

construction personnel (for example, overnight, on weekends, or during other periods when construction is not active). Parking areas must not obstruct the clear line of sight by the ATCT to any taxiways or runways under air traffic control nor obstruct any runway visual aids, signs, or navigation aids. The FAA must also study those areas to determine effects on airport design criteria, surfaces established by 14 CFR Part 77, Safe, Efficient Use, and Preservation of the Navigable Airspace (Part 77), and on NAVAIDs and Instrument Approach Procedures (IAP). See paragraph 213.e(1) below for further information.

(3) Access and haul roads. Determine the construction contractor's access to the construction sites and haul roads. Do not permit the construction contractor to use any access or haul roads other than those approved. Access routes used by contractor vehicles must be clearly marked to prevent inadvertent entry to areas open to airport operations. Pay special attention to ensure that if construction traffic is to share or cross any ARFF routes that ARFF right of way is not impeded at any time, and that construction traffic on haul roads does not interfere with NAVAIDs or approach surfaces of operational runways.

(4) Marking and lighting of vehicles in accordance with AC 150/5210-5, Painting, Marking, and Lighting of Vehicles Used on an Airport.

(5) **Description of proper vehicle operations** on various areas under normal, lost communications, and emergency conditions.

### (6) Required escorts.

(7) **Training requirements for vehicle drivers** to ensure compliance with the airport operator's vehicle rules and regulations. Specific training should be provided to those vehicle operators providing escorts. See AC 150/5210-20, Ground Vehicle Operations on Airports, for information on training and records maintenance requirements.

(8) Situational awareness. Vehicle drivers must confirm by personal observation that no aircraft is approaching their position (either in the air or on the ground) when given clearance to cross a runway, taxiway, or any other area open to airport operations. In addition, it is the responsibility of the escort vehicle driver to verify the movement/position of all escorted vehicles at any given time.

### (9) Two-way radio communication procedures.

(a) General. The airport operator must ensure that tenant and construction contractor personnel engaged in activities involving unescorted operation on aircraft movement areas observe the proper procedures for communications, including using appropriate radio frequencies at airports with and without ATCT. When operating vehicles on or near open runways or taxiways, construction personnel must understand the critical importance of maintaining radio contact, as directed by the airport operator, with:

- (i) Airport operations
- (ii) ATCT
- (iii) Common Traffic Advisory Frequency (CTAF), which may include UNICOM,

#### MULTICOM.

(iv) Automatic Terminal Information Service (ATIS). This frequency is useful for monitoring conditions on the airport. Local air traffic will broadcast information regarding construction related runway closures and "shortened" runways on the ATIS frequency.

(b) Areas requiring two-way radio communication with the ATCT. Vehicular traffic crossing active movement areas must be controlled either by two-way radio with the ATCT, escort, flagman, signal light, or other means appropriate for the particular airport.

(c) Frequencies to be used. The airport operator will specify the frequencies to be used by the contractor, which may include the CTAF for monitoring of aircraft operations. Frequencies may also be assigned by the airport operator for other communications, including any radio frequency in compliance with Federal Communications Commission requirements. At airports with an ATCT, the airport operator will specify the frequency assigned by the ATCT to be used between contractor vehicles and the ATCT.

- (d) Proper radio usage, including read back requirements.
- (e) Proper phraseology, including the International Phonetic Alphabet.

(f) Light gun signals. Even though radio communication is maintained, escort vehicle drivers must also familiarize themselves with ATCT light gun signals in the event of radio failure. See the FAA safety placard "Ground Vehicle Guide to Airport Signs and Markings." This safety placard may be downloaded through the Runway Safety Program Web site at <u>http://www.faa.gov/airports/</u> <u>runway\_safety/publications/</u> (See "Signs & Markings Vehicle Dashboard Sticker".) or obtained from the FAA Airports Regional Office.

### (10) Maintenance of the secured area of the airport, including:

(a) Fencing and gates. Airport operators and contractors must take care to maintain security during construction when access points are created in the security fencing to permit the passage of construction vehicles or personnel. Temporary gates should be equipped so they can be securely closed and locked to prevent access by animals and unauthorized people. Procedures should be in place to ensure that only authorized persons and vehicles have access to the AOA and to prohibit "piggybacking" behind another person or vehicle. The Department of Transportation (DOT) document DOT/FAA/AR-00/52, Recommended Security Guidelines for Airport Planning and Construction, provides more specific information on fencing. A copy of this document can be obtained from the Airport Consultants Council, Airports Council International, or American Association of Airport Executives.

(b) Badging requirements.

(c) Airports subject to 49 CFR Part 1542, Airport Security, must meet standards for access control, movement of ground vehicles, and identification of construction contractor and tenant personnel.

**210. Wildlife Management.** The CSPP and SPCD must be in accordance with the airport operator's wildlife hazard management plan, if applicable. See also AC 150/5200-33, Hazardous Wildlife Attractants On or Near Airports, and Certalert 98-05, Grasses Attractive to Hazardous Wildlife. Construction contractors must carefully control and continuously remove waste or loose materials that might attract wildlife. Contractor personnel must be aware of and avoid construction activities that can create wildlife hazards on airports, such as:

a. Trash. Food scraps must be collected from construction personnel activity.

### b. Standing Water.

c. Tall Grass and Seeds. Requirements for turf establishment can be at odds with requirements for wildlife control. Grass seed is attractive to birds. Lower quality seed mixtures can contain seeds of plants (such as clover) that attract larger wildlife. Seeding should comply with the guidance in AC 150/5370-10, Standards for Specifying Construction of Airports, Item T-901, Seeding. Contact the local office of the United Sates Department of Agriculture Soil Conservation Service or the State University Agricultural Extension Service (County Agent or equivalent) for assistance and recommendations. These agencies can also provide liming and fertilizer recommendations.

d. Poorly Maintained Fencing and Gates. See 209.b(10)(a) above.

e. Disruption of Existing Wildlife Habitat. While this will frequently be unavoidable due to the nature of the project, the CSPP should specify under what circumstances (location, wildlife type) contractor personnel should immediately notify the airport operator of wildlife sightings.

**211.** Foreign Object Debris (FOD) Management. Waste and loose materials, commonly referred to as FOD, are capable of causing damage to aircraft landing gears, propellers, and jet engines. Construction contractors must not leave or place FOD on or near active aircraft movement areas. Materials capable of creating FOD must be continuously removed during the construction project. Fencing (other than security fencing) may be necessary to contain material that can be carried by wind into areas where aircraft operate. See AC 150/5210-24, Foreign Object Debris (FOD) Management.

**212. Hazardous Materials (HAZMAT) Management.** Contractors operating construction vehicles and equipment on the airport must be prepared to expeditiously contain and clean-up spills resulting from fuel or hydraulic fluid leaks. Transport and handling of other hazardous materials on an airport also requires special procedures. See AC 150/5320-15, Management of Airport Industrial Waste.

**213.** Notification of Construction Activities. The CSPP and SPCD must detail procedures for the immediate notification of airport users and the FAA of any conditions adversely affecting the operational safety of the airport. It must address the notification actions described below, as applicable.

**a.** List of Responsible Representatives/ points of contact for all involved parties, and procedures for contacting each of them, including after hours.

**b. NOTAMS.** Only the airport operator may initiate or cancel NOTAMs on airport conditions, and is the only entity that can close or open a runway. The airport operator must coordinate the issuance, maintenance, and cancellation of NOTAMs about airport conditions resulting from construction activities with tenants and the local air traffic facility (control tower, approach control, or air traffic control center), and must provide information on closed or hazardous conditions on airport movement areas to the FAA Flight Service Station (FSS) so it can issue a NOTAM. The airport operator must file and maintain a list of authorized representatives with the FSS. Refer to AC 150/5200-28, Notices to Airmen (NOTAMs) for Airport Operators, for a sample NOTAM form. Only the FAA may issue or cancel NOTAMs on shutdown or irregular operation of FAA owned facilities. Any person having reason to believe that a NOTAM is missing, incomplete, or inaccurate must notify the airport operator. See paragraph 207.a(1) above regarding issuing NOTAMs for partially closed runways versus runways with displaced thresholds.

c. Emergency notification procedures for medical, fire fighting, and police response.

**d.** Coordination with ARFF. The CSPP must detail procedures for coordinating through the airport sponsor with ARFF personnel, mutual aid providers, and other emergency services if construction requires:

- The deactivation and subsequent reactivation of water lines or fire hydrants, or
- The rerouting, blocking and restoration of emergency access routes, or
- The use of hazardous materials on the airfield.

### e. Notification to the FAA.

(1) **Part 77.** Any person proposing construction or alteration of objects that affect navigable airspace, as defined in Part 77, must notify the FAA. This includes construction equipment and proposed

parking areas for this equipment (i.e. cranes, graders, other equipment) on airports. FAA Form 7460-1, Notice of Proposed Construction or Alteration, can be used for this purpose and submitted to the appropriate FAA Airports Regional or District Office. See Appendix 1, Related Reading Material, to download the form. Further guidance is available on the FAA web site at <u>oeaaa.faa.gov</u>.

(2) Part 157. With some exceptions, Title 14 CFR Part 157, Notice of Construction, Alteration, Activation, and Deactivation of Airports, requires that the airport operator notify the FAA in writing whenever a non-Federally funded project involves the construction of a new airport; the construction, realigning, altering, activating, or abandoning of a runway, landing strip, or associated taxiway; or the deactivation or abandoning of an entire airport. Notification involves submitting FAA Form 7480-1, Notice of Landing Area Proposal, to the nearest FAA Airports Regional or District Office. See Appendix 1, Related Reading Material to download the form.

(3) NAVAIDS. For emergency (short-notice) notification about impacts to both airport owned and FAA owned NAVAIDs, contact: 866-432-2622.

(a) Airport owned/FAA maintained. If construction operations require a shutdown of more than 24 hours, or more than 4 hours daily on consecutive days, of a NAVAID owned by the airport but maintained by the FAA, provide a 45-day minimum notice to FAA ATO/Technical Operations prior to facility shutdown.

(b) FAA owned.

(i) General. The airport operator must notify the appropriate FAA ATO Service Area Planning and Requirements (P&R) Group a minimum of 45 days prior to implementing an event that causes impacts to NAVAIDs. (Impacts to FAA equipment covered by a Reimbursable Agreement (RA) do not have to be reported by the airport operator.)

(ii) Coordinate work for an FAA owned NAVAID shutdown with the local FAA ATO/Technical Operations office, including any necessary reimbursable agreements and flight checks. Detail procedures that address unanticipated utility outages and cable cuts that could impact FAA NAVAIDs. In addition, provide seven days notice to schedule the actual shutdown.

### 214. Inspection Requirements.

**a. Daily Inspections.** Inspections should be conducted at least daily, but more frequently if necessary to ensure conformance with the CSPP. A sample checklist is provided in Appendix 3, Safety and Phasing Plan Checklist. See also AC 150/5200-18, Airport Safety Self-Inspection.

**b.** Final Inspections. New runways and extended runway closures may require safety inspections at certificated airports prior to allowing air carrier service. Coordinate with the FAA Airport Certification Safety Inspector (ACSI) to determine if a final inspection will be necessary.

**215. Underground Utilities.** The CSPP and/or SPCD must include procedures for locating and protecting existing underground utilities, cables, wires, pipelines, and other underground facilities in excavation areas. This may involve coordinating with public utilities and FAA ATO/Technical Operations. Note that "One Call" or "Miss Utility" services do not include FAA ATO/Technical Operations

**216. Penalties.** The CSPP should detail penalty provisions for noncompliance with airport rules and regulations and the safety plans (for example, if a vehicle is involved in a runway incursion). Such penalties typically include rescission of driving privileges or access to the AOA.

217. Special Conditions. The CSPP must detail any special conditions that affect the operation of the

airport and will require the activation of any special procedures (for example, low-visibility operations, snow removal, aircraft in distress, aircraft accident, security breach, Vehicle / Pedestrian Deviation (VPD) and other activities requiring construction suspension/resumption).

**218. Runway and Taxiway Visual Aids.** Includes marking, lighting, signs, and visual NAVAIDS. The CSPP must ensure that areas where aircraft will be operating are clearly and visibly separated from construction areas, including closed runways. Throughout the duration of the construction project, verify that these areas remain clearly marked and visible at all times and that marking, lighting, signs, and visual NAVAIDs remain in place and operational. The CSPP must address the following, as appropriate:

**a.** General. Airport markings, lighting, signs, and visual NAVAIDs must be clearly visible to pilots, not misleading, confusing, or deceptive. All must be secured in place to prevent movement by prop wash, jet blast, wing vortices, or other wind currents and constructed of materials that would minimize damage to an aircraft in the event of inadvertent contact.

**b.** Markings. Markings must be in compliance with the standards of AC 150/5340-1, Standards for Airport Markings. Runways and runway exit taxiways closed to aircraft operations are marked with a yellow X. The preferred visual aid to depict temporary runway closure is the lighted X signal placed on or near the runway designation numbers. (See paragraph 218.b(1)(b) below.)

## (1) Closed Runways and Taxiways.

(a) Permanently Closed Runways. For runways, obliterate the threshold marking, runway designation marking, and touchdown zone markings, and place Xs at each end and at 1,000-foot (300 m) intervals.

(b) Temporarily Closed Runways. For runways that have been temporarily closed, place an X at the each end of the runway directly on or as near as practicable to the runway designation numbers. Figure 2-1 illustrates.



Figure 2-1 Markings for a Temporarily Closed Runway

(c) Partially Closed Runways and Displaced Thresholds. When threshold markings are needed to identify the temporary beginning of the runway that is available for landing, the markings must comply with AC 150/5340-1. An X is not used on a partially closed runway or a runway with a displaced threshold. See paragraph 207.a(1) above for the difference between partially closed runways and runways with displaced thresholds.

(i) Partially Closed Runways. Pavement markings for temporary closed portions of the runway consist of a runway threshold bar and yellow chevrons to identify pavement areas that are unsuitable for takeoff or landing (see AC 150/5340-1).

(ii) Displaced Thresholds. Pavement markings for a displaced threshold consist of a runway threshold bar and white arrowheads with and without arrow shafts. These markings are required to identify the portion of the runway before the displaced threshold to provide centerline guidance for pilots during approaches, takeoffs, and landing rollouts from the opposite direction. See AC 150/5340-1.

(d) Taxiways.

(i) Permanently Closed Taxiways. AC 150/5300-13 notes that it is preferable to remove the pavement, but for pavement that is to remain, place an X at the entrance to both ends of the closed section. Obliterate taxiway centerline markings, including runway leadoff lines, leading to the closed taxiway. Figure 2-2 illustrates.



Figure 2-2 Taxiway Closure

(ii) Temporarily Closed Taxiways. Place barricades outside the safety area of intersecting taxiways. For runway/taxiway intersections, place an X at the entrance to the closed taxiway from the runway. If the taxiway will be closed for an extended period, obliterate taxiway centerline markings, including runway leadoff lines, leading to the closed section. If the centerline markings will be reused upon reopening the taxiway, it is preferable to paint over the marking. This will result in less damage to the pavement when the upper layer of paint is ultimately removed.

(e) Temporarily Closed Airport. When the airport is closed temporarily, mark all the runways as closed.

(2) If unable to paint temporary markings on the pavement, construct them from any of the following materials: fabric, colored plastic, painted sheets of plywood, or similar materials. They must be properly configured and appropriately secured to prevent movement by prop wash, jet blast, or other wind currents.

(3) It may be necessary to remove or cover runway markings, including but not limited to, runway designation markings, threshold markings, centerline markings, edge stripes, touchdown zone markings and aiming point markings, depending on the length of construction and type of activity at the airport. When removing runway markings, apply the same treatment to areas between stripes or numbers, as the cleaned area will appear to pilots as a marking in the shape of the treated area.

(4) If it is not possible to install threshold bars, chevrons, and arrows on the pavement, temporary outboard markings may be used. Locate them outside of the runway pavement surface on both sides of the runway. The dimension along the runway direction must be the same as if installed on the pavement. The lateral dimension must be at least one-half that of on-pavement markings. If the markings are not discernible on grass or snow, apply a black background with appropriate material over the ground to ensure they are clearly visible.

(5) The application rate of paint to mark a short-term temporary runway and taxiway markings may deviate from the standard (see Item P-620, "Runway and Taxiway Painting," in AC 150/5370-10), but the dimensions must meet the existing standards.

c. Lighting and Visual NAVAIDs. This paragraph refers to standard runway and taxiway lighting systems. See below for hazard lighting. Lighting must be in conformance with AC 150/5340-30, Design and Installation Details for Airport Visual Aids, and AC 150/5345-50, Specification for Portable Runway and Taxiway Lights. When disconnecting runway and taxiway lighting fixtures, disconnect the associated isolation transformers. Alternately, cover the light fixture in such a way as to prevent light leakage. Avoid removing the lamp from energized fixtures because an excessive number of isolation transformers with open secondaries may damage the regulators and/or increase the current above its normal value. Secure, identify, and place any above ground temporary wiring in conduit to prevent electrocution and fire ignition sources.

(1) **Permanently Closed Runways and Taxiways.** For runways and taxiways that have been permanently closed, disconnect the lighting circuits.

(2) Temporarily Closed Runways. If available, use a lighted X, both at night and during the day, placed at each end of the runway facing the approach. The use of a lighted X is required if night work requires runway lighting to be on. See AC 150/5345-55, Specification for L-893, Lighted Visual Aid to Indicate Temporary Runway Closure. For runways that have been temporarily closed, but for an extended period, and for those with pilot controlled lighting, disconnect the lighting circuits or secure switches to prevent inadvertent activation. For runways that will be opened periodically, coordinate procedures with the FAA air traffic manager or, at airports without an ATCT, the airport operator. Activate stop bars if available. Figure 2-3 shows a lighted X by day. Figure 2-4 shows a lighted X at night.



Figure 2-3 Lighted X in Daytime



Figure 2-4 Lighted X at Night

(3) **Partially Closed Runways and Displaced Thresholds.** When a runway is partially closed, a portion of the pavement is unavailable for any aircraft operation, meaning taxiing and landing or

taking off in either direction. A displaced threshold, by contrast, is put in place to ensure obstacle clearance by landing aircraft. The pavement prior to the displaced threshold is available for takeoff in the direction of the displacement, and for landing and takeoff in the opposite direction. Misunderstanding this difference and issuance of a subsequently inaccurate NOTAM can result in a hazardous situation. For both partially closed runways and displaced thresholds, approach lighting systems at the affected end must be placed out of service

(a) Partially Closed Runways. Disconnect edge and threshold lights on that part of the runway at and behind the threshold (that is, the portion of the runway that is closed). Alternately, cover the light fixture in such a way as to prevent light leakage.

(b) Displaced Thresholds. Edge lighting in the area of the displacement emits red light in the direction of approach and yellow light in the opposite direction. Centerline lights are blanked out in the direction of approach if the displacement is 700 ft or less. If the displacement is over 700 ft, place the centerline lights out of service. See AC 150/5340-30 for details on lighting displaced thresholds.

(c) Temporary runway thresholds and runway ends must be lighted if the runway is lighted and it is the intended threshold for night landings or instrument meteorological conditions.

(d) A temporary threshold on an unlighted runway may be marked by retroreflective, elevated markers in addition to markings noted in paragraph 218.b(1)(c) above. Markers seen by aircraft on approach are green. Markers at the rollout end of the runway are red. At certificated airports, temporary elevated threshold markers must be mounted with a frangible fitting (see 14 CFR Part 139.309). At non-certificated airports, the temporary elevated threshold markings may either be mounted with a frangible fitting or be flexible. See AC 150/5345-39, Specification for L-853, Runway and Taxiway Retroreflective Markers.

(e) Temporary threshold lights and end lights and related visual NAVAIDs are installed outboard of the edges of the full-strength pavement only when they cannot be installed on the pavement. They are installed with bases at grade level or as low as possible, but not more than 3 in (7.6 cm) above ground. When any portion of a base is above grade, place properly compacted fill around the base to minimize the rate of gradient change so aircraft can, in an emergency, cross at normal landing or takeoff speeds without incurring significant damage. See AC 150/5370-10.

(f) Maintain threshold and edge lighting color and spacing standards as described in AC 150/5340-30. Battery powered, solar, or portable lights that meet the criteria in AC 150/5345-50 may be used. These systems are intended primarily for visual flight rules (VFR) aircraft operations but may be used for instrument flight rules (IFR) aircraft operations, upon individual approval from the Flight Standards Division of the applicable FAA Regional Office.

(g) Reconfigure yellow lenses (caution zone), as necessary. If the runway has centerline lights, reconfigure the red lenses, as necessary, or place the centerline lights out of service.

(h) Relocate the visual glide slope indicator (VGSI), such as VASI and PAPI; other airport lights, such as Runway End Identifier Lights (REIL); and approach lights to identify the temporary threshold. Another option is to disable the VGSI or any equipment that would give misleading indications to pilots as to the new threshold location. Installation of temporary visual aids may be necessary to provide adequate guidance to pilots on approach to the affected runway. If the FAA owns and operates the VGSI, coordinate its installation or disabling with the local ATO/Technical Operations Office. Relocation of such visual aids will depend on the duration of the project and the benefits gained from the relocation, as this can result in great expense.

(i) Issue a NOTAM to inform pilots of temporary lighting conditions.

(4) **Temporarily Closed Taxiways.** If possible, deactivate the taxiway lighting circuits. When deactivation is not possible (for example other taxiways on the same circuit are to remain open),

cover the light fixture in such a way as to prevent light leakage.

**d.** Signs. To the extent possible, signs must be in conformance with AC 150/5345-44, Specification for Runway and Taxiway Signs and AC 150/5340-18, Standard for Airport Sign Systems. Any time a sign does not serve its normal function; it must be covered or removed to prevent misdirecting pilots. Note that information signs identifying a crossing taxiway continue to perform their normal function even if the crossing taxiway is closed. For long term construction projects, consider relocating signs, especially runway distance remaining signs.

**219.** Marking and Signs for Access Routes. The CSPP should indicate that pavement markings and signs for construction personnel will conform to AC 150/5340-18 and, to the extent practicable, with the Federal Highway Administration Manual on Uniform Traffic Control Devices (MUTCD) and/or State highway specifications. Signs adjacent to areas used by aircraft must comply with the frangibility requirements of AC 150/5220-23, Frangible Connections, which may require modification to size and height guidance in the MUTCD.

# 220. Hazard Marking, Lighting and Signing.

a. Hazard Marking and Lighting Prevents Pilots from entering areas closed to aircraft, and prevents construction personnel from entering areas open to aircraft. The CSPP must specify prominent, comprehensible warning indicators for any area affected by construction that is normally accessible to aircraft, personnel, or vehicles. Hazard marking and lighting must also be specified to identify open manholes, small areas under repair, stockpiled material, waste areas, and areas subject to jet blast. Also consider less obvious construction-related hazards and include markings to identify FAA, airport, and National Weather Service facilities cables and power lines; instrument landing system (ILS) critical areas; airport surfaces, such as RSA, OFA, and OFZ; and other sensitive areas to make it easier for contractor personnel to avoid these areas.

### b. Equipment.

(1) **Barricades**, including traffic cones, (weighted or sturdily attached to the surface) are acceptable methods used to identify and define the limits of construction and hazardous areas on airports. Careful consideration must be given to selecting equipment that poses the least danger to aircraft but is sturdy enough to remain in place when subjected to typical winds, prop wash and jet blast. The spacing of barricades must be such that a breach is physically prevented barring a deliberate act. For example, if barricades are intended to exclude vehicles, gaps between barricades must be smaller than the width of the excluded vehicles, generally 4 ft. Provision must be made for ARFF access if necessary. If barricades are intended to exclude pedestrians, they must be continuously linked. Continuous linking may be accomplished through the use of ropes, securely attached to prevent FOD.

(2) Lights must be red, either steady burning or flashing, and must meet the luminance requirements of the State Highway Department. Batteries powering lights will last longer if lights flash. Lights must be mounted on barricades and spaced at no more than 10 ft. Lights must be operated between sunset and sunrise and during periods of low visibility whenever the airport is open for operations. They may be operated by photocell, but this may require that the contractor turn them on manually during periods of low visibility during daytime hours.

(3) Supplement barricades with signs (for example "No Entry," "No Vehicles") as necessary.

(4) Air Operations Area – General. Barricades are not permitted in any active safety area. Within a runway or taxiway object free area, and on aprons, use orange traffic cones, flashing or steady burning red lights as noted above, collapsible barricades marked with diagonal, alternating orange and

white stripes; and/or signs to separate all construction/maintenance areas from the movement area. Barricades may be supplemented with alternating orange and white flags at least 20 by 20 in (50 by 50 cm) square and securely fastened to eliminate FOD. All barricades adjacent to any open runway or taxiway / taxilane safety area, or apron must be as low as possible to the ground, and no more than 18 in high, exclusive of supplementary lights and flags. Barricades must be of low mass; easily collapsible upon contact with an aircraft or any of its components; and weighted or sturdily attached to the surface to prevent displacement from prop wash, jet blast, wing vortex, or other surface wind currents. If affixed to the surface, they must be frangible at grade level or as low as possible, but not to exceed 3 in (7.6 cm) above the ground. Figure 2-5 and Figure 2-6 show sample barricades with proper coloring and flags.



**Figure 2-5 Interlocking Barricades** 



# **Figure 2-6 Low Profile Barricades**

(5) Air Operations Area – Runway/Taxiway Intersections. Use highly reflective barricades with lights to close taxiways leading to closed runways. Evaluate all operating factors when determining how to mark temporary closures that can last from 10 to 15 minutes to a much longer period of time. However, even for closures of relatively short duration, close all taxiway/runway intersections with barricades. The use of traffic cones is appropriate for short duration closures.

(6) Air Operations Area – Other. Beyond runway and taxiway object free areas and

aprons, barricades intended for construction vehicles and personnel may be many different shapes and made from various materials, including railroad ties, sawhorses, jersey barriers, or barrels.

(7) **Maintenance.** The construction specifications must include a provision requiring the contractor to have a person on call 24 hours a day for emergency maintenance of airport hazard lighting and barricades. The contractor must file the contact person's information with the airport operator. Lighting should be checked for proper operation at least once per day, preferably at dusk.

**221. Protection of Runway and Taxiway Safety Areas.** Runway and taxiway safety areas, Obstacle Free zones (OFZ), object free areas (OFA), and approach surfaces are described in AC 150/5300-13. Protection of these areas includes limitations on the location and height of equipment and stockpiled material. An FAA airspace study may be required. Coordinate with the appropriate FAA Airports Regional or District Office if there is any doubt as to requirements or dimensions (See paragraph 213.e above.) as soon as the location and height of materials or equipment are known. The CSPP should include drawings showing all safety areas, object free areas, obstacle free zones and approach departure surfaces affected by construction.

**a. Runway Safety Area (RSA).** A runway safety area is the defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway (see AC 150/5300-13). Construction activities within the existing RSA are subject to the following conditions:

(1) No construction may occur within the existing RSA while the runway is open for aircraft operations. The RSA dimensions may be temporarily adjusted if the runway is restricted to aircraft operations requiring an RSA that is equal to the RSA width and length beyond the runway ends available during construction. (see AC 150/5300-13). The temporary use of declared distances and/or partial runway closures may provide the necessary RSA under certain circumstances. Coordinate with the appropriate FAA Airports Regional or District Office to have declared distances information published. See AC 150/5300-13 for guidance on the use of declared distances.

(2) The airport operator must coordinate the adjustment of RSA dimensions as permitted above with the appropriate FAA Airports Regional or District Office and the local FAA air traffic manager and issue a NOTAM.

(3) The CSPP and SPCD must provide procedures for ensuring adequate distance for protection from blasting operations, if required by operational considerations.

### (4) Excavations.

(a) Open trenches or excavations are not permitted within the RSA while the runway is open. If possible, backfill trenches before the runway is opened. If the runway must be opened before excavations are backfilled, cover the excavations appropriately. Covering for open trenches must be designed to allow the safe operation of the heaviest aircraft operating on the runway across the trench without damage to the aircraft.

(b) Construction contractors must prominently mark open trenches and excavations at the construction site with red or orange flags, as approved by the airport operator, and light them with red lights during hours of restricted visibility or darkness.

(5) Erosion Control. Soil erosion must be controlled to maintain RSA standards, that is, the RSA must be cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations, and capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and fire fighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft.

**b.** Runway Object Free Area (ROFA). Construction, including excavations, may be permitted in the ROFA. However, equipment must be removed from the ROFA when not in use, and material should not be stockpiled in the ROFA if not necessary. Stockpiling material in the OFA requires submittal of a 7460-1 form and justification provided to the appropriate FAA Airports Regional or District Office for approval.

c. Taxiway Safety Area (TSA). A taxiway safety area is a defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway. (See AC 150/5300-13.) Construction activities within the TSA are subject to the following conditions:

(1) No construction may occur within the TSA while the taxiway is open for aircraft operations. The TSA dimensions may be temporarily adjusted if the taxiway is restricted to aircraft operations requiring a TSA that is equal to the TSA width available during construction (see AC 150/5300-13, Table 4-1).

(2) The airport operator must coordinate the adjustment of the TSA width as permitted above with the appropriate FAA Airports Regional or District Office and the FAA air traffic manager and issue a NOTAM.

(3) The CSPP and SPCD must provide procedures for ensuring adequate distance for protection from blasting operations.

### (4) Excavations.

(a) Open trenches or excavations are not permitted within the TSA while the taxiway is open. If possible, backfill trenches before the taxiway is opened. If the taxiway must be opened before excavations are backfilled, cover the excavations appropriately. Covering for open trenches must be designed to allow the safe operation of the heaviest aircraft operating on the taxiway across the trench without damage to the aircraft.

(b) Construction contractors must prominently mark open trenches and excavations at the construction site with red or orange flags, as approved by the airport operator, and light them with red lights during hours of restricted visibility or darkness.

(5) Erosion Control. Soil erosion must be controlled to maintain TSA standards, that is, the TSA must be cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations, and capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and fire fighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft.

**d.** Taxiway Object Free Area (TOFA). Unlike the Runway Object Free Area, aircraft wings regularly penetrate the taxiway object free area during normal operations. Thus the restrictions are more stringent. Except as provided below, no construction may occur within the taxiway object free area while the taxiway is open for aircraft operations.

(1) The taxiway object free area dimensions may be temporarily adjusted if the taxiway is restricted to aircraft operations requiring a taxiway object free area that is equal to the taxiway object free area width available.

(2) Offset taxiway pavement markings may be used as a temporary measure to provide the required taxiway object free area. Where offset taxiway pavement markings are provided, centerline lighting or reflectors are required.

(3) **Construction activity may be accomplished** without adjusting the width of the taxiway object free area, subject to the following restrictions:

(a) Appropriate NOTAMs are issued.

(b) Marking and lighting meeting the provisions of paragraphs 218 and 220 above

are implemented.

(c) Five-foot clearance is maintained between equipment and materials and any part of an aircraft (includes wingtip overhang). In these situations, flaggers must be used to direct construction equipment, and wing walkers will be necessary to guide aircraft. Wing walkers should be airline/aviation personnel rather than construction workers. If such clearance can only be maintained if an aircraft does not have full use of the entire taxiway width (with its main landing gear at the edge of the pavement), then it will be necessary to move personnel and equipment for the passage of that aircraft.

e. Obstacle Free Zone (OFZ). In general, personnel, material, and/or equipment may not penetrate the OFZ while the runway is open for aircraft operations. If a penetration to the OFZ is necessary, it may be possible to continue aircraft operations through operational restrictions. Coordinate with the FAA through the appropriate FAA Airports Regional or District Office.

**f. Runway Approach/Departure Areas and Clearways.** All personnel, materials, and/or equipment must remain clear of the applicable threshold siting surfaces, as defined in Appendix 2, "Threshold Siting Requirements," of AC 150/5300-13. Objects that do not penetrate these surfaces may still be obstructions to air navigation and may affect standard instrument approach procedures. Coordinate with the FAA through the appropriate FAA Airports Regional or District Office.

(1) Construction activity in a runway approach/departure area may result in the need to partially close a runway or displace the existing runway threshold. Partial runway closure, displacement of the runway threshold, as well as closure of the complete runway and other portions of the movement area also require coordination through the airport operator with the appropriate FAA air traffic manager (FSS if non-towered) and ATO/Technical Operations (for affected NAVAIDS) and airport users.

(2) Caution regarding partial runway closures. When filing a NOTAM for a partial runway closure, clearly state to OCC personnel that the portion of pavement located prior to the threshold is not available for landing and departing traffic. In this case, the threshold has been moved for both landing and takeoff purposes (this is different than a displaced threshold). There may be situations where the portion of closed runway is available for taxiing only. If so, the NOTAM must reflect this condition).

(3) Caution regarding displaced thresholds. : Implementation of a displaced threshold affects runway length available for aircraft landing over the displacement. Depending on the reason for the displacement (to provide obstruction clearance or RSA), such a displacement may also require an adjustment in the landing distance available and accelerate-stop distance available in the opposite direction. If project scope includes personnel, equipment, excavation, other work. within the existing RSA of any usable runway end, do not implement a displaced threshold unless arrivals and departures toward the construction activity are prohibited. Instead, implement a partial closure.

**222. Other Limitations on Construction.** The CSPP must specify any other limitations on construction, including but not limited to:

# a. Prohibitions.

(1) No use of tall equipment (cranes, concrete pumps, and so on) unless a 7460-1 determination letter is issued for such equipment.

(2) No use of open flame welding or torches unless fire safety precautions are provided and the airport operator has approved their use.

(3) No use of electrical blasting caps on or within 1,000 ft (300 m) of the airport property.

See AC 150/5370-10.

(4) No use of flare pots within the AOA.

#### b. Restrictions.

- (1) Construction suspension required during specific airport operations.
- (2) Areas that cannot be worked on simultaneously.
- (3) Day or night construction restrictions.
- (4) Seasonal construction restrictions.

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## Chapter 3. Guidelines for Writing a CSPP

**301. General Requirements.** The CSPP is a standalone document written to correspond with the subjects outlined in Chapter 2, Section 1, paragraph 204. The CSPP is organized by numbered sections corresponding to each subject listed in Chapter 2, Section 1, paragraph 204, and described in detail in Chapter 2, Section 2. Each section number and title in the CSPP matches the corresponding subject outlined in Chapter 2, paragraph 204 (for example, 1. Coordination, 2. Phasing, 3. Areas and Operations Affected by the Construction Activity, and so on.). With the exception of the project scope of work outlined in Section 2. Phasing, only subjects specific to operational safety during construction should be addressed.

302. Applicability of Subjects. Each section should, to the extent practical, focus on the specific subject. Where an overlapping requirement spans several sections, the requirement should be explained in detail in the most applicable section. A reference to that section should be included in all other sections where the requirement may apply. For example, the requirement to protect existing underground FAA Instrument Landing System (ILS) cables during trenching operations could be considered FAA ATO coordination (Section 1. Coordination, paragraph 205.c), an area and operation affected by the construction activity (Section 3. Areas and Operations Affected by the Construction Activity, paragraph 207.a(4)), a protection of a NAVAID (Section 4. Protection of Navigational Aids (NAVAIDs), paragraph 208), or a notification to the FAA of construction activities (Section 9, Notification of Construction Activities, paragraph 210.e(3)(b)). However, it is more specifically an underground utility requirement (Section 11. Underground Utilities, paragraph 215). The procedure for protecting underground ILS cables during trenching operations should therefore be described in Section 11: "The contractor must coordinate with the local FAA System Support Center (SSC) to mark existing ILS cable routes along Runway 17-35. The ILS cables will be located by hand digging whenever the trenching operation moves within 10 feet of the cable markings." All other applicable sections should include a reference to Section 11: "ILS cables shall be identified and protected as described in Section 11" or "See Section 11 for ILS cable identification and protection requirements." Thus, the CSPP should be considered as a whole, with no need to duplicate responses to related issues.

**303. Graphical Representations.** Construction safety drawings should be included in the CSPP as attachments. When other graphical representations will aid in supporting written statements, the drawings, diagrams, and/or photographs should also be attached to the CSPP. References should be made in the CSPP to each graphical attachment and may be made in multiple sections.

**304. Reference Documents.** The CSPP must not incorporate a document by reference unless reproduction of the material in that document is prohibited. In that case, either copies of or a source for the referenced document must be provided to the contractor.

**305. Restrictions.** The CSPP should not be considered as a project design review document. The CSPP should also avoid mention of permanent ("as-built") features such as pavements, markings, signs, and lighting, except when such features are intended to aid in maintaining operational safety during the construction.

**306.** Coordination. Include in this section a detailed description of conferences and meetings both before and during the project. Include appropriate information from AC 150/5300-9. Discuss coordination procedures and schedules for each required FAA ATO airway facility shutdown and restart and all required flight inspections.

**307. Phasing.** Include in this section a detailed scope of work description for the project as a whole and each phase of work covered by the CSPP. This includes all locations and durations of the work proposed. Attach drawings to graphically support the written scope of work. Detail in this section the sequenced phases of the proposed construction. Include a reference to paragraph 308 below, as appropriate.

**308.** Areas and Operations Affected By Construction. Focus in this section on identifying the areas and operations affected by the construction. Describe corresponding mitigation that is not covered in detail elsewhere in the CSPP. Include references to paragraphs below as appropriate. Attach drawings as necessary to graphically describe affected areas and mechanisms proposed. Tables and charts such as the following may be helpful in highlighting issues to be addressed.

Project	Runway 15-33 Reconstruction	
Phase	Phase II: Reconstruct Runway 15 End	
Scope of Work	Reconstruct 1,000 ft of north end of Runway 15-33 with Portland Cement Concrete (PCC).	
<b>Operational Requirements</b>	Normal (Existing)	Phase II (Anticipated)
Runway 15 Average Aircraft Operations	Carrier: 52 /day GA: 26 /day Military: 11 /day	Carrier: 52 / day GA: 20 / day Military: 0 /day
Runway 33 Average Aircraft Operations	Carrier: 40 /day GA: 18 /day Military: 10 /day	Carrier: 20 /day GA: 5 /day Military: 0 /day
Runway 15-33 ARC	C-IV	C-IV
Runway 15 Approach Visibility Minimums	<sup>3</sup> ⁄4 mile	1 mile
Runway 33 Approach Visibility Minimums	<sup>3</sup> ⁄4 mile	1 mile
	TORA: 7,820	TORA: 6,420
Punway 15 Declared Distances	TODA: 7,820	TODA: 6,420
Kuliway 15 Declared Distances	ASDA: 7,820	ASDA: 6,420
	LDA: 7,820	LDA: 6,420
	TORA: 8,320	TORA: 6,920
Runway 33 Declared Distances	TODA: 8,320	TODA: 6,920
Kullway oo Declared Distances	ASDA: 8,320	ASDA: 6,920
	LDA: 7,820	LDA: 6,420
	ILS	LOC only
<b>Runway 15 Approach Procedures</b>	RNAV	N/A
	VOR	N/A
	ILS	Visual only
<b>Runway 33 Approach Procedures</b>	RNAV	N/A
	VOR	N/A
Runway 15 NAVAIDs	ILS/DME, MALSR, RVR	LOC/DME, PAPI (temp), RVR

#### **Table 3-1 Sample Operations Effects**

Runway 33 NAVAIDs	ILS/DME, MALSF, PAPI, RVR	MALSF, PAPI, RVR
Taxiway G ADG	IV	IV (N/A between T/W H and R/W 15 end)
Taxiway E ADG	IV	IV
ATCT (hours open)	06:00 – 24:00 local	06:00 – 24:00 local
ARFF Index	D	D
Special Conditions	Air National Guard (ANG) military operations	Military operations relocated to alternate ANG Base
	Airline XYZ requires VGSI	Airline XYZ requires VGSI

Complete the following chart for each phase to determine the area that must be protected along the runway edges:

Runway	Aircraft Approach Category* A, B, C, or D	Airplane Design Group* I, II, III, or IV	RSA Width in Feet Divided by 2*
*See AC 150/5300-13 to complete the chart for a specific runway.			

Complete the following chart for each phase to determine the area that must be protected before the runway threshold:

Runway End Number	Airplane Design Group* I, II, III, or IV	Aircraft Approach Category* A, B, C, or D	Minimum Safety Area Prior to the Threshold*	Minimum Distar Based on Requ Slo	nce to Threshold ired Approach pe*
			ft	ft	: 1
			ft	ft	: 1
			ft	ft	: 1
			ft	ft	: 1
*See AC 150/5300-13 to complete the chart for a specific runway.					

**309.** Navigation Aid (NAVAID) Protection. List in this section all NAVAID facilities that will be affected by the construction. Identify NAVAID facilities that will be placed out of service at any time prior to or during construction activities. Identify individuals responsible for coordinating each shutdown and when each facility will be out of service. Include a reference to paragraph 306 above for FAA ATO NAVAID shutdown, restart, and flight inspection coordination. Outline in detail procedures to protect each NAVAID facility remaining in service from interference by construction activities. Include a reference to paragraph 314 for the issuance of NOTAMs as required. Include a reference to paragraph 316 for the protection of underground cables and piping serving NAVAIDs. If temporary visual aids are proposed to replace or supplement existing facilities, include a reference to paragraph 319. Attach drawings to graphically indicate the affected NAVAIDS and the corresponding critical areas.

310. Contractor Access. This will necessarily be the most extensive section of the CSPP. Provide

sufficient detail so that a contractor not experienced in working on airports will understand the unique restrictions such work will require. Due to this extent, it should be broken down into subsections as described below:

**a.** Location of Stockpiled Construction Materials. Describe in this section specific locations for stockpiling material. Note any height restrictions on stockpiles. Include a reference to paragraph 321 for hazard marking and lighting devices used to identify stockpiles. Include a reference to paragraph 311 for provisions to prevent stockpile material from becoming wildlife attractants. Include a reference to paragraph 312 for provisions to prevent stockpile material from becoming FOD. Attach drawings to graphically indicate the stockpile locations.

**b.** Vehicle and Pedestrian Operations. While there are many items to be addressed in this major subsection of the CSPP, all are concerned with one main issue: keeping people and vehicles from areas of the airport where they don't belong. This includes preventing unauthorized entry to the AOA and preventing the improper movement of pedestrians or vehicles on the airport. In this section, focus on mechanisms to prevent construction vehicles and workers traveling to and from the worksite from unauthorized entry into movement areas. Specify locations of parking for both employee vehicles and construction equipment, and routes for access and haul roads. In most cases, this will best be accomplished by attaching a drawing. Quote from AC 150/5210-5 specific requirements for contractor vehicles rather than referring to the AC as a whole, and include special requirements for identifying Hazardous Material (HAZMAT) vehicles. Quote from, rather than incorporate by reference, AC 150/5210-20 as appropriate to address the airport's rules for ground vehicle operations, including its training program. Discuss the airport's recordkeeping system listing authorized vehicle operators.

c. Two-Way Radio Communications. Include a special section to identify all individuals who are required to maintain communications with Air Traffic (AT) at airports with active towers, or monitor Common Traffic Advisory Frequencies (CTAF) at airports without or with closed ATCT. Include training requirements for all individuals required to communicate with AT. Individuals required to monitor AT frequencies should also be identified. If construction employees are also required to communicate by radio with Airport Operations, this procedure should be described in detail. Usage of vehicle mounted radios and/or portable radios should be addressed. Communication procedures for the event of disabled radio communication (that is, light signals, telephone numbers, others) must be included. All radio frequencies should by identified (Tower, Ground Control, CTAF, UNICOM, ATIS, and so on).

**d. Airport Security.** Address security as it applies to vehicle and pedestrian operations. Discuss TSA requirements, security badging requirements, perimeter fence integrity, gate security, and other needs. Attach drawings to graphically indicate secured and/or Security Identification Display Areas (SIDA), perimeter fencing, and available access points.

**311. Wildlife Management.** Discuss in this section wildlife management procedures. Describe the maintenance of existing wildlife mitigation devices, such as perimeter fences, and procedures to limit wildlife attractants. Include procedures to notify Airport Operations of wildlife encounters. Include a reference to paragraph 310 for security (wildlife) fence integrity maintenance as required.

**312.** Foreign Object Debris (FOD) Management. In this section, discuss methods to control and monitor FOD: worksite housekeeping, ground vehicle tire inspections, runway sweeps, and so on. Include a reference to paragraph 315 for inspection requirements as required.

**313. Hazardous Materials (HAZMAT) Management.** Describe in this section HAZMAT management procedures: fuel deliveries, spill recovery procedures, Material Safety Data Sheet (MSDS) availability, and other considerations. Any specific airport HAZMAT restrictions should also be

identified. Include a reference to paragraph 310 for HAZMAT vehicle identification requirements. Quote from, rather than incorporate by reference, AC 150/5320-15.

Notification of Construction Activities. List in this section the names and telephone numbers of 314. points of contact for all parties affected by the construction project. We recommend a single list that includes all telephone numbers required under this section. Include emergency notification procedures for all representatives of all parties potentially impacted by the construction. Identify individual representatives – and at least one alternate – for each party. List both on-duty and off-duty contact information for each individual, including individuals responsible for emergency maintenance of airport construction hazard lighting and barricades. Describe procedures to coordinate immediate response to events that might adversely affect the operational safety of the airport (such as interrupted NAVAID service). Explain requirements for and the procedures for the issuance of Notices to Airmen (NOTAMs), notification to FAA required by 14 CFR Part 77 and Part 157 and in the event of affected NAVAIDs. For NOTAMs, identify an individual, and at least one alternate, responsible for issuing and cancelling each specific type of Notice to Airmen (NOTAM) required. Detail notification methods for police, fire fighting, and medical emergencies. This may include 911, but should also include direct phone numbers of local police departments and nearby hospitals. The local Poison Control number should be listed. Procedures regarding notification of Airport Operations and/or the ARFF Department of such emergencies should be identified, as applicable. If airport radio communications are identified as a means of emergency notification, include a reference to paragraph 310. Differentiate between emergency and nonemergency notification of ARFF personnel, the latter including activities that affect ARFF water supplies and access roads. Identify the primary ARFF contact person and at least one alternate. If notification is to be made through Airport Operations, then detail this procedure. Include a method of confirmation from the ARFF department.

**315. Inspection Requirements.** Describe in this section inspection requirements to ensure airfield safety compliance. Include a requirement for routine inspections by the resident engineer (RE) and the construction contractors. If the engineering consultants and/or contractors have a Safety Officer who will conduct such inspections, identify this individual. Describe procedures for special inspections, such as those required to reopen areas for aircraft operations. Part 139 requires daily airfield inspections at certificated airports, but these may need to be more frequent when construction is in progress. Discuss the role of such inspections on areas under construction. Include a requirement to immediately remedy any deficiencies, whether caused by negligence, oversight, or project scope change.

**316.** Underground Utilities. Explain how existing underground utilities will be located and protected. Identify each utility owner and include contact information for each company/agency in the master list. Address emergency response procedures for damaged or disrupted utilities. Include a reference to paragraph 314 above for notification of utility owners of accidental utility disruption as required.

**317. Penalties.** Describe in this section specific penalties imposed for noncompliance with airport rules and regulations, including the CSPP: SIDA violations, Vehicle/Pedestrian Deviations (VPD), and others.

**318. Special Conditions.** Identify any special conditions that may trigger specific safety mitigation actions outlined in this CSPP: low visibility operations, snow removal, aircraft in distress, aircraft accident, security breach, VPD, and other activities requiring construction suspension/resumption. Include a reference to paragraph 310 above for compliance with airport safety and security measures and for radio communications as required. Include a reference to paragraph 319 below for emergency notification of all involved parties, including police/security, ARFF, and medical services.

319. Runway and Taxiway Visual Aids. Include marking, lighting, signs, and visual NAVAIDS.

Detail temporary runway and taxiway marking, lighting, signs, and visual NAVAIDs required for the construction. Discuss existing marking, lighting, signs, and visual NAVAIDs that are temporarily, altered, obliterated, or shut down. Consider non-federal facilities and address requirements for reimbursable agreements necessary for alteration of FAA facilities and for necessary flight checks. Identify temporary TORA signs or runway distance remaining signs if appropriate. Identify required temporary visual NAVAIDs such as REIL or PAPI. Quote from, rather than incorporate by reference, AC 150/5340-1, Standards for Airport Markings, AC 150/5340-18, Standards for Airport Sign Systems, and AC 150/5340-30, as required. Attach drawings to graphically indicate proposed marking, lighting, signs, and visual NAVAIDs.

**320.** Marking and Signs for Access Routes. Detail plans for marking and signs for vehicle access routes. To the extent possible, signs should be in conformance with the Federal Highway Administration Manual on Uniform Traffic Control Devices (MUTCD) and/or State highway specifications, not hand lettered. Detail any modifications to the guidance in the MUTCD necessary to meet frangibility/height requirements.

**321. Hazard Marking and Lighting.** Specify all marking and lighting equipment, including when and where each type of device is to be used. Specify maximum gaps between barricades and the maximum spacing of hazard lighting. Identify one individual and at least one alternate responsible for maintenance of hazard marking and lighting equipment in the master telephone list. Include a reference to paragraph 314 above. Attach drawings to graphically indicate the placement of hazard marking and lighting equipment.

322. Protection of Runway and Taxiway Safety Areas. This section should focus exclusively on procedures for protecting all safety areas, including those altered by the construction: methods of demarcation, limit of access, movement within safety areas, stockpiling and trenching restrictions, and so on. Reference AC 150/5300-13: Airport Design as required. Include a reference to paragraph 310 above for procedures regarding vehicle and personnel movement within safety areas. Include a reference to paragraph 310 above for material stockpile restrictions as required. Detail requirements for trenching, excavations, and backfill. Include a reference to paragraph 321 for hazard marking and lighting devices used to identify open excavations as required. If runway and taxiway closures are proposed to protect safety areas, or if temporary displaced thresholds and/or revised declared distances are used to provide adequate Runway Safety Area, include a reference to paragraphs 314 and 319 above. Detail procedures for protecting the runway OFZ, runway OFA, taxiway OFA and runway approach surfaces including those altered by the construction: methods of demarcation, limit of cranes, storage of equipment, and so on. Quote from, rather than incorporate by reference, AC 150/5300-13: Airport Design as required. Include a reference to paragraph 323 for height (i.e. crane) restrictions as required. One way to address the height of equipment that will move during the project is to establish a three-dimensional "box" within which equipment will be confined that can be studied as a single object. Attach drawings to graphically indicate the safety area, OFZ, and OFA boundaries.

**323.** Other Limitations on Construction. This section should describe what limitations must be applied to each area of work and when each limitation will be applied: limitations due to airport operations, height (i.e. crane) restrictions, areas which cannot be worked at simultaneously, day/night work restrictions, winter construction, and other limitations. Include a reference to paragraph 307 above for project phasing requirements based on construction limitations as required.

# **Appendix 1. Related Reading Material**

Obtain the latest version of the following free publications from the FAA on its Web site at <u>http://www.faa.gov/airports/</u>.

AC	Title and Description
AC 150/5200 28	Notices to Airmen (NOTAMs) for Airport Operators
AC 150/5200-28	Guidance for using the NOTAM System in airport reporting.
	Airport Winter Safety and Operations
AC 150/5200-30	Guidance for airport owners/operators on the development of an acceptable airport snow and ice control program and on appropriate field condition reporting procedures.
	Hazardous Wildlife Attractants On or Near Airports
AC 150/5200-33	Guidance on locating certain land uses that might attract hazardous wildlife to public- use airports.
	Painting, Marking, and Lighting of Vehicles Used on an Airport.
AC 150/5210-5	Guidance, specifications, and standards for painting, marking, and lighting vehicles operating in the airport air operations areas.
	Ground Vehicle Operations on Airports
AC 150/5210-20	Guidance to airport operators on developing ground vehicle operation training programs.
	Airport Design
AC 150/5300-13	FAA standards and recommendations for airport design, establishes approach visibility minimums as an airport design parameter, and contains the Object Free area and the obstacle free-zone criteria.
AC 150/5310-24	Airport Foreign Object Debris Management
	Guidance for developing and managing an airport foreign object debris (FOD) program
AC 150/5220-4	Water Supply Systems for Aircraft Fire and Rescue Protection.
	Guidance on selecting a water source and meeting standards for a distribution system to support aircraft rescue and fire fighting service operations on airports.
AC 150/5320-15	Management of Airport Industrial Waste
	Basic information on the characteristics, management, and regulations of industrial wastes generated at airports. Guidance for developing a Storm Water Pollution Prevention Plan (SWPPP) that applies best management practices to eliminate, prevent, or reduce pollutants in storm water runoff with particular airport industrial activities.
AC 150/5340-1	Standards for Airport Markings
	FAA standards for markings used on airport runways, taxiways, and aprons.
AC 150/5340-18	Standards for Airport Sign Systems
	FAA standards for the siting and installation of signs on airport runways and taxiways.
	Precision Approach Path Indicator (PAPI) Systems
AC 150/5345-28	FAA standards for PAPI systems, which provide pilots with visual glide slope guidance during approach for landing.

AC	Title and Description
AC 150/5340-30	Design and Installation Details for Airport Visual Aids
	Guidance and recommendations on the installation of airport visual aids.
AC 150/5345-39	Specification for L-853, Runway and Taxiway Retroreflective Markers
AC 150/5245 44	Specification for Runway and Taxiway Signs
AC 150/5545-44	FAA specifications for unlighted and lighted signs for taxiways and runways.
AC 150/5245 52	Airport Lighting Certification Program
AC 150/5545-55	Details on the Airport Lighting Equipment Certification Program (ALECP).
	Specification for Portable Runway and Taxiway Lights
AC 150/5345-50	FAA standards for portable runway and taxiway lights and runway end identifier lights for temporary use to permit continued aircraft operations while all or part of a runway lighting system is inoperative.
AC 150/5345-55	Specification for L-893, Lighted Visual Aid to Indicate Temporary Runway Closure
AC 150/5370-10	Standards for Specifying Construction of Airports
	Standards for construction of airports, including earthwork, drainage, paving, turfing, lighting, and incidental construction.
FAA Order 5200.11	FAA Airports (ARP) Safety Management System (SMS)
	Basics for implementing SMS within ARP. Includes roles and responsibilities of ARP management and staff as well as other FAA lines of business that contribute to the ARP SMS.
FAA Certalert 98-05	Grasses Attractive to Hazardous Wildlife
	Guidance on grass management and seed selection.
FAA Form 7460-1	Notice of Proposed Construction or Alteration
FAA Form 7480-1	Notice of Landing Area Proposal

Obtain the latest version of the following free publications from the Electronic Code of Federal Regulations at <u>http://ecfr.gpoaccess.gov/</u>.

Title 14 CFR Part 139	Certification of Airports
Title 49 CFR Part 1542	Airport Security

Obtain the latest version of the Manual on Uniform Traffic Control Devices from the Federal Highway Administration at <u>http://mutcd.fhwa.dot.gov/</u>.

appendia 2. Deminion of rerms
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Term	Definition
7460-1	Notice Of Proposed Construction Or Alteration. For on-airport projects, the form submitted to the FAA regional or airports division office as formal written notification of any kind of construction or alteration of objects that affect navigable airspace, as defined in 14 CFR Part 77, safe, efficient use, and preservation of the navigable airspace. (See guidance available on the FAA web site at oeaaa.faa.gov.) The form may be downloaded at <a href="http://www.faa.gov/airports/resources/forms/">http://www.faa.gov/airports/resources/forms/</a> , or filed electronically at: <a href="https://www.faa.gov.">https://www.faa.gov/airports/resources/forms/</a> , or
7480-1	Notice Of Landing Area Proposal. Form submitted to the FAA Airports Regional Division Office or Airports District Office as formal written notification whenever a project without an airport layout plan on file with the FAA involves the construction of a new airport; the construction, realigning, altering, activating, or abandoning of a runway, landing strip, or associated taxiway; or the deactivation or abandoning of an entire airport The form may be downloaded at <a href="http://www.faa.gov/airports/resources/forms/">http://www.faa.gov/airports/resources/forms/</a> .
AC	Advisory Circular
ACRC	Aircraft Reference Code
ACSI	Airport Certification Safety Inspector
ADG	Airplane Design Group
AIP	Airport Improvement Program
ALECP	Airport Lighting Equipment Certification Program
ANG	Air National Guard
AOA	Air Operations Area. Any area of the airport used or intended to be used for the landing, takeoff, or surface maneuvering of aircraft. An air operations area includes such paved or unpaved areas that are used or intended to be used for the unobstructed movement of aircraft in addition to its associated runways, taxiways, or aprons.
ARFF	Aircraft Rescue and Fire Fighting
ARP	FAA Office of Airports
ASDA	Accelerate-Stop Distance Available
ATCT	Airport Traffic Control Tower
ATIS	Automatic Terminal Information Service
АТО	Air Traffic Organization
Certificated Airport	An airport that has been issued an Airport Operating Certificate by the FAA under the authority of 14 CFR Part 139, Certification of Airports.
CFR	Code of Federal Regulations
Construction	The presence and movement of construction-related personnel, equipment, and materials in any location that could infringe upon the movement of aircraft.
CSPP	Construction Safety And Phasing Plan. The overall plan for safety and phasing of a construction project developed by the airport operator, or developed by the airport operator's consultant and approved by the airport operator. It is included in the invitation for bids and becomes part of the project specifications.

Term	Definition
CTAF	Common Traffic Advisory Frequency
Displaced Threshold	A threshold that is located at a point on the runway other than the designated beginning of the runway. The portion of pavement behind a displaced threshold is available for takeoffs in either direction or landing from the opposite direction.
DOT	Department of Transportation
EPA	Environmental Protection Agency
FOD	Foreign Object Debris
HAZMAT	Hazardous Materials
IFR	Instrument Flight Rules
ILS	Instrument Landing System
LDA	Landing Distance Available
LOC	Localizer antenna array
Movement Area	The runways, taxiways, and other areas of an airport that are used for taxiing or hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading aprons and aircraft parking areas (reference 14 CFR Part 139).
MSDS	Material Safety Data Sheet
MUTCD	Manual on Uniform Traffic Control Devices
NAVAID	Navigation Aid
NAVAID Critical Area	An area of defined shape and size associated with a NAVAID that must remain clear and graded to avoid interference with the electronic signal.
Non-Movement Area	The area inside the airport security fence exclusive of the Movement Area. It is important to note that the non-movement area includes pavement traversed by aircraft.
NOTAM	Notices to Airmen
Obstruction	Any object/obstacle exceeding the obstruction standards specified by 14 CFR Part 77, subpart C.
OE / AAA	Obstruction Evaluation / Airport Airspace Analysis
OFA	Object Free Area. An area on the ground centered on the runway, taxiway, or taxi lane centerline provided to enhance safety of aircraft operations by having the area free of objects except for those objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes. (See AC 150/5300-13, for additional guidance on OFA standards and wingtip clearance criteria.)
OFZ	Obstacle Free Zone. The airspace below 150 ft (45 m) above the established airport elevation and along the runway and extended runway centerline that is required to be clear of all objects, except for frangible visual NAVAIDs that need to be located in the OFZ because of their function, in order to provide clearance protection for aircraft landing or taking off from the runway and for missed approaches. The OFZ is subdivided as follows: Runway OFZ, Inner Approach OFZ, Inner Transitional OFZ, and Precision OFZ. Refer to AC 150/5300-13 for guidance on OFZ.
OSHA	Occupational Safety and Health Administration
P&R	Planning and Requirements Group
Term	Definition
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PAPI	Precision Approach Path Indicators
PFC	Passenger Facility Charge
PLASI	Pulse Light Approach Slope Indicators
Project Proposal Summary	A clear and concise description of the proposed project or change that is the object of Safety Risk Management.
RE	Resident Engineer
REIL	Runway End Identifier Lights
RNAV	Area Navigation
ROFA	Runway Object Free Area
RSA	Runway Safety Area. A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway, in accordance with AC 150/5300-13.
SIDA	Security Identification Display Area
SMS	Safety Management System
SPCD	Safety Plan Compliance Document. Details developed and submitted by a contractor to the airport operator for approval providing details on how the performance of a construction project will comply with the CSPP.
SRM	Safety Risk Management
Taxiway Safety Area	A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway, in accordance with AC 150/5300-13.
TDG	Taxiway Design Group
Temporary	Any condition that is not intended to be permanent.
Temporary Runway End	The beginning of that portion of the runway available for landing and taking off in one direction, and for landing in the other direction. Note the difference from a displaced threshold.
Threshold	The beginning of that portion of the runway available for landing. In some instances, the landing threshold may be displaced.
TODA	Takeoff Distance Available
TOFA	Taxiway Object Free Area
TORA	Takeoff Run Available. The length of the runway less any length of runway unavailable and/or unsuitable for takeoff run computations. See AC 150/5300-13 for guidance on declared distances.
TSA	Taxiway Safety Area Transportation Security Administration
UNICOM	A radio communications system of a type used at small airports.
VASI	Visual Approach Slope Indicators

Term	Definition
VGSI	Visual Glide Slope Indicator. A device that provides a visual glide slope indicator to landing pilots. These systems include precision approach path indicators (PAPI), visual approach slope indicators (VASI), and pulse light approach slope indicators (PLASI).
VFR	Visual Flight Rules
VOR	VHF Omnidirectional Radio Range
VPD	Vehicle / Pedestrian Deviation

#### Appendix 3. Safety and Phasing Plan Checklist

This appendix is keyed to Section 2. Plan Requirements. In the electronic version of this AC, clicking on the paragraph designation in the Reference column will access the applicable paragraph. There may be instances where the CSPP requires provisions that are not covered by the list in this appendix.

This checklist is intended as an aid, not as a required submittal.

Coordination	Reference	Addressed		ed	Remarks
Gen	eral Consideration	S			
Requirements for predesign, prebid, and preconstruction conferences to introduce the subject of airport operational safety during construction are specified.	205	□ Yes	D No	□ NA	
Operational safety is a standing agenda item for construction progress meetings.	205	□ Yes	D No	D NA	
Scheduling of the construction phases is properly addressed.	206	□ Yes	D No	□ NA	
Areas and Operation	s Affected by Con	structio	n Activ	vity	
Drawings showing affected areas are included.	207.a	Tes	D No	D NA	
Closed or partially closed runways, taxiways, and aprons are depicted on drawings.	207.a(1)	□ Yes	D No	D NA	
Access routes used by ARFF vehicles affected by the project are addressed.	207.a(2)	□ Yes	D No	□ NA	
Access routes used by airport and airline support vehicles affected by the project are addressed.	207.a(3)	□ Yes	D No	□ NA	
Underground utilities, including water supplies for fire fighting and drainage.	207.a(4)	□ Yes	D No	□ NA	
Approach/departure surfaces affected by heights of temporary objects are addressed.	207.a(5)	□ Yes	D No	□ NA	
Construction areas, storage areas, and access routes near runways, taxiways, aprons, or helipads are properly depicted on drawings.	207.a	□ Yes	D No	D NA	
Temporary changes to taxi operations are addressed.	207.b(1)	The Yes	D No	D NA	

## AC 150/5370-2F

Coordination	Reference	A	ddress	ed	Remarks
Detours for ARFF and other airport vehicles are identified.	207.b(2)	□ Yes	□ No	□ NA	
Maintenance of essential utilities and underground infrastructure is addressed.	207.b(3)	The set of	D No	D NA	
Temporary changes to air traffic control procedures are addressed.	207.b(4)	The set of	D No	D NA	
	NAVAIDS	I			
Critical areas for NAVAIDs are depicted on drawings.	208	□ Yes	D No	□ NA	
Effects of construction activity on the performance of NAVAIDS, including unanticipated power outages, are addressed.	208	The second secon	D No	D NA	
Protection of NAVAID facilities is addressed.	208	The second secon	D No	D NA	
The required distance and direction from each NAVAID to any construction activity is depicted on drawings.	208	The set of	D No	D NA	
Procedures for coordination with FAA ATO/Technical Operations, including identification of points of contact, are included.	208, 213.a, 213.e(3)(a), 218.a	The set of	D No	D NA	
С	ontractor Access				
The CSPP addresses areas to which contractor will have access and how the areas will be accessed.	209	□ Yes	D No	□ NA	
The application of 49 CFR Part 1542 Airport Security, where appropriate, is addressed.	209	□ Yes	D No	D NA	
The location of stockpiled construction materials is depicted on drawings.	209.a	The set of	D No	D NA	
The requirement for stockpiles in the ROFA to be approved by FAA is included.	209.a	□ Yes	D No	□ NA	
Requirements for proper stockpiling of materials are included.	209.a	The set of	D No		

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Coordination	Reference	A	ddress	ed	Remarks
Construction site parking is addressed.	209.b(1)	Tes	D No	□ NA	
Construction equipment parking is addressed.	209.b(2)	□ Yes	D No	□ NA	
Access and haul roads are addressed.	209.b(3)	Tes	D No		
A requirement for marking and lighting of vehicles to comply with AC 150/5210-5, Painting, Marking and Lighting of Vehicles Used on an Airport, is included.	209.b(4)	□ Yes	D No	D NA	
Proper vehicle operations, including requirements for escorts, are described.	209.b(5), 209.b(6)	The Yes	D No	D NA	
Training requirements for vehicle drivers are addressed.	209.b(7)	Tes	D No	D NA	
Two-way radio communications procedures are described.	209.b(9)	□ Yes	D No	□ NA	
Maintenance of the secured area of the airport is addressed.	209.b(10)	Tes	D No		
Wi	ldlife Management	;			
The airport operator's wildlife management procedures are addressed.	210	□ Yes	□ No	D NA	
Foreign O	bject Debris Mana	gement			
The airport operator's FOD management procedures are addressed.	211	Tes	D No		
Hazardou	s Materials Manag	gement	<b>I</b>	<b>I</b>	
The airport operator's hazardous materials management procedures are addressed.	212	The Yes	D No	D NA	
Notification	of Construction A	Activitie	es		·
Procedures for the immediate notification of airport user and local FAA of any conditions adversely affecting the operational safety of the airport are detailed.	213	□ Yes	□ No		

Coordination	Reference	A	ddress	ed	Remarks
Maintenance of a list by the airport operator of the responsible representatives/points of contact for all involved parties and procedures for contacting them 24 hours a day, seven days a week is specified.	213.a	□ Yes	D No	□ NA	
A list of local ATO/Technical Operations personnel is included.	213.a	□ Yes	□ No	□ NA	
A list of ATCT managers on duty is included.	213.a	□ Yes	D No	D NA	
A list of authorized representatives to the OCC is included.	213.b	□ Yes	D No	D NA	
Procedures for coordinating, issuing, maintaining and cancelling by the airport operator of NOTAMS about airport conditions resulting from construction are included.	208, 213.b, 218.b(4)(i)	The set of	D No	D NA	
Provision of information on closed or hazardous conditions on airport movement areas by the airport operator to the OCC is specified.	213.b	□ Yes	D No	□ NA	
Emergency notification procedures for medical, fire fighting, and police response are addressed.	213.c	□ Yes	□ No	□ NA	
Coordination with ARFF personnel for non- emergency issues is addressed.	213.d	□ Yes	□ No	□ NA	
Notification to the FAA under 14 CFR parts 77 and 157 is addressed.	213.e	□ Yes	D No	D NA	
Reimbursable agreements for flight checks and/or design and construction for FAA owned NAVAIDs are addressed.	213.e(3)(b)	The Yes	D No	D NA	
Inspe	ection Requiremen	ts	L.	L	
Daily inspections by both the airport operator and contractor are specified.	214.a	□ Yes	D No	□ NA	
Final inspections at certificated airports are specified when required.	214.b	The Yes	D No	D NA	
Und	derground Utilities	; ;	•	•	L
Procedures for protecting existing underground facilities in excavation areas are described.	215	Yes	D No		

Coordination	Reference	A	Addressed Remark		Remarks
	Penalties				
Penalty provisions for noncompliance with airport rules and regulations and the safety plans are detailed.	216	□ Yes	D No	□ NA	
SI	pecial Conditions				
Any special conditions that affect the operation of the airport or require the activation of any special procedures are addressed.	217	□ Yes	D No		
Runway and Taxiway Visual Aids	- Marking, Lightin	ıg, Sign	s, and `	Visual I	NAVAIDs
The proper securing of temporary airport markings, lighting, signs, and visual NAVAIDs is addressed.	218.a	The second secon	D No	□ NA	
Frangibility of airport markings, lighting, signs, and visual NAVAIDs is specified.	218.a, 218.c, 219, 220.b(4)	The Yes	D No	D NA	
The requirement for markings to be in compliance with AC 150/5340-1, Standards for Airport Markings is specified.	218.b	□ Yes	D No	□ NA	
The requirement for lighting to conform to AC 150/5340-30, Design and Installation Details for Airport Visual Aids, AC 150/5345-50, Specification for Portable Runway and Taxiway Lights , and AC 150/5345-53 Airport Lighting Certification Program, is specified.	218.b(1)(f)	□ Yes	D No	D NA	
The use of a lighted X is specified where appropriate.	218.b(1)(b), 218.b(3)	□ Yes	D No		
The requirement for signs to conform to AC 150/5345-44, Specification for Runway and Taxiway Signs, AC 50/5340-18, Standards for Airport Sign Systems, and AC 150/5345-53, Airport Lighting Certification Program, is specified.	218.c	□ Yes	D No	D NA	
Marking ar	nd Signs For Acces	s Route	s	T	1
The CSPP specifies that pavement markings and signs intended for construction personnel should conform to AC 150/5340-18 and, to the extent practicable, with the MUTCD and/or State highway specifications.	219	□ Yes	D No	□ NA	
Hazard	Marking and Ligh	nting	1	1	
Prominent, comprehensible warning indicators for any area affected by construction that is normally accessible to aircraft, personnel, or vehicles are specified.	220.a	□ Yes	D No	D NA	

Coordination	Reference	A	ddress	ed	Remarks
Hazard marking and lighting are specified to identify open manholes, small areas under repair, stockpiled material, and waste areas.	220.a	The Yes	D No	□ NA	
The CSPP considers less obvious construction- related hazards.	220.a	The Yes	D No	D NA	
Equipment that poses the least danger to aircraft but is sturdy enough to remain in place when subjected to typical winds, prop wash and jet blast is specified.	220.b(1)	□ Yes	D No	□ NA	
The spacing of barricades is specified such that a breach is physically prevented barring a deliberate act.	220.b(1)	□ Yes	D No	D NA	
Red lights meeting the luminance requirements of the State Highway Department are specified.	220.b(2)	□ Yes	D No	□ NA	
Barricades, temporary markers, and other objects placed and left in areas adjacent to any open runway, taxiway, taxi lane, or apron are specified to be as low as possible to the ground, and no more than 18 in high.	220.b(4)	□ Yes	D No	□ NA	
Barricades marked with diagonal, alternating orange and white stripes are specified to indicate construction locations in which no part of an aircraft may enter.	220.b(4)	□ Yes	□ No	□ NA	
Highly reflective barriers with lights are specified to barricade taxiways leading to closed runways.	220.b(5)	□ Yes	D No	□ NA	
Markings for temporary closures are specified.	220.b(5)	Tes	D No	D NA	
The provision of a contractor's representative on call 24 hours a day for emergency maintenance of airport hazard lighting and barricades is specified.	220.b(7)	□ Yes	□ No	□ NA	
Protection of Ru	nway and Taxiway	Safety	Areas		
The CSPP clearly states that no construction may occur within a safety area while the associated runway or taxiway is open for aircraft operations.	221.a(1), 221.c(1)	□ Yes	D No	□ NA	
The CSPP specifies that the airport operator coordinates the adjustment of RSA or TSA dimensions with the ATCT and the appropriate FAA Airports Regional or District Office and issues a local NOTAM.	221.a(2), 221.c(2)	□ Yes	D No	□ NA	

Coordination	Reference	A	ddress	ed	Remarks
Procedures for ensuring adequate distance for protection from blasting operations, if required by operational considerations, are detailed.	221.c(3)	The set of	D No	D NA	
The CSPP specifies that open trenches or excavations are not permitted within a safety area while the associated runway or taxiway is open.	221.a(4)	The set of	D No	D NA	
Appropriate covering of excavations in the RSA or TSA that cannot be backfilled before the associated runway or taxiway is open is detailed.	221.a(4)	□ Yes	D No	D NA	
The CSPP includes provisions for prominent marking of open trenches and excavations at the construction site.	221.a(4)	□ Yes	D No	D NA	
Grading and soil erosion control to maintain RSA/TSA standards are addressed.	221.c(5)	□ Yes	D No	□ NA	
The CSPP specifies that equipment is to be removed from the ROFA when not in use.	221.b	□ Yes	D No	D NA	
The CSPP clearly states that no construction may occur within a taxiway safety area while the taxiway is open for aircraft operations.	221.c	□ Yes	D No	D NA	
Appropriate details are specified for any construction work to be accomplished in a taxiway object free area.	221.d	The Yes	D No	D NA	
Measures to ensure that personnel, material, and/or equipment do not penetrate the OFZ or threshold siting surfaces while the runway is open for aircraft operations are included.	221.e	The second secon	D No	D NA	
Provisions for protection of runway approach/departure areas and clearways are included.	221.f	□ Yes	D No	D NA	
Other Lin	nitations on Constr	ruction			
The CSPP prohibits the use of open flame welding or torches unless adequate fire safety precautions are provided and the airport operator has approved their use.	222.a(2)	□ Yes	D No		
The CSPP prohibits the use of flare pots within the AOA at any time.	222.a(4)	The second secon	D No	D NA	
The CSPP prohibits the use of electrical blasting caps on or within 1,000 ft (300 m) of the airport property.	222.a(3)	Tes Tes	D No	D NA	

### Appendix 4. Construction Project Daily Safety Inspection Checklist

The situations identified below are potentially hazardous conditions that may occur during airport construction projects. Safety area encroachments, unauthorized and improper ground vehicle operations, and unmarked or uncovered holes and trenches near aircraft operating surfaces pose the most prevalent threats to airport operational safety during airport construction projects. The list below is one tool that the airport operator or contractor may use to aid in identifying and correcting potentially hazardous conditions. It should be customized as appropriate for each project.

#### **Potentially Hazardous Conditions**

Item	Action Required	or	None
Excavation adjacent to runways, taxiways, and aprons improperly backfilled.			
Mounds of earth, construction materials, temporary structures, and other obstacles near any open runway, taxiway, or taxi lane; in the related Object Free area and aircraft approach or departure areas/zones; or obstructing any sign or marking.			
Runway resurfacing projects resulting in lips exceeding 3 in (7.6 cm) from pavement edges and ends.			
Heavy equipment (stationary or mobile) operating or idle near AOA, in runway approaches and departures areas, or in OFZ.			
Equipment or material near NAVAIDs that may degrade or impair radiated signals and/or the monitoring of navigation and visual aids. Unauthorized or improper vehicle operations in localizer or glide slope critical areas, resulting in electronic interference and/or facility shutdown.			
Tall and especially relatively low visibility units (that is, equipment with slim profiles) — cranes, drills, and similar objects — located in critical areas, such as OFZ and approach zones.			
Improperly positioned or malfunctioning lights or unlighted airport hazards, such as holes or excavations, on any apron, open taxiway, or open taxi lane or in a related safety, approach, or departure area.			
Obstacles, loose pavement, trash, and other debris on or near AOA. Construction debris (gravel, sand, mud, paving materials) on airport pavements may result in aircraft propeller, turbine engine, or tire damage. Also, loose materials may blow about, potentially causing personal injury or equipment damage.			

Item	Action Required	or	None
Inappropriate or poorly maintained fencing during construction intended to deter human and animal intrusions into the AOA. Fencing and other markings that are inadequate to separate construction areas from open AOA create aviation hazards.			
Improper or inadequate marking or lighting of runways (especially thresholds that have been displaced or runways that have been closed) and taxiways that could cause pilot confusion and provide a potential for a runway incursion. Inadequate or improper methods of marking, barricading, and lighting of temporarily closed portions of AOA create aviation hazards.			
Wildlife attractants — such as trash (food scraps not collected from construction personnel activity), grass seeds, tall grass, or standing water — on or near airports.			
Obliterated or faded temporary markings on active operational areas.			
Misleading or malfunctioning obstruction lights. Unlighted or unmarked obstructions in the approach to any open runway pose aviation hazards.			
Failure to issue, update, or cancel NOTAMs about airport or runway closures or other construction related airport conditions.			
Failure to mark and identify utilities or power cables. Damage to utilities and power cables during construction activity can result in the loss of runway / taxiway lighting; loss of navigation, visual, or approach aids; disruption of weather reporting services; and/or loss of communications.			
Restrictions on ARFF access from fire stations to the runway / taxiway system or airport buildings.			
Lack of radio communications with construction vehicles in airport movement areas.			
Objects, regardless of whether they are marked or flagged, or activities anywhere on or near an airport that could be distracting, confusing, or alarming to pilots during aircraft operations.			
Water, snow, dirt, debris, or other contaminants that temporarily obscure or derogate the visibility of runway/taxiway marking, lighting, and pavement edges. Any condition or factor that obscures or diminishes the visibility of areas under construction.			
Spillage from vehicles (gasoline, diesel fuel, oil) on active pavement areas, such as runways, taxiways, aprons, and airport roadways.			

Item	Action Required	or	None
Failure to maintain drainage system integrity during construction (for example, no temporary drainage provided when working on a drainage system).			
Failure to provide for proper electrical lockout and tagging procedures. At larger airports with multiple maintenance shifts/workers, construction contractors should make provisions for coordinating work on circuits.			
Failure to control dust. Consider limiting the amount of area from which the contractor is allowed to strip turf.			
Exposed wiring that creates an electrocution or fire ignition hazard. Identify and secure wiring, and place it in conduit or bury it.			
Site burning, which can cause possible obscuration.			
Construction work taking place outside of designated work areas and out of phase.			

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# APPENDIX C AC 150/5340-5D AIRPORT WIND CONES



U.S. Department of Transportation Federal Aviation Administration

# Advisory Circular

Subject:SEGMENTED CIRCLE AIRPORTDMARKER SYSTEMIn

Date: 09/25/13 Initiated by: AAS-100 AC No: 150/5340-5D

**1. PURPOSE.** This advisory circular (AC) sets forth standards for a system of airport marking consisting of certain pilot aids and traffic control devices.

**2.** CANCELLATION. Advisory Circular 150/5340-5C, Segmented Circle Airport Marker System, dated September 14, 2007, is cancelled.

- 3. PRINCIPAL CHANGES. The principal changes in this AC are:
  - a. The APPLICATION paragraph has been revised to reflect the system qualification requirements under Federal grant assistance programs.
  - b. A Note has been added to paragraph 6.a(5) to clarify the siting requirement for landing strip and traffic pattern indicators.
  - c. Editorial changes have been made.

## 4. RELATED READING MATERIAL.

- **a.** Advisory Circular 150/5340-30, Design and Installation Details for Airport Visual Aids.
- **b.** Advisory Circular 150/5345-27, Specification for Wind Cone Assemblies.

**5. APPLICATION.** The FAA recommends the guidelines and standards in this AC for a Segmented Circle Airport Marker System. This AC does not constitute a regulation and in general is not mandatory. However, use of these guidelines is mandatory for associated equipment that is funded under the Airport Improvement Program (AIP) or the Passenger Facility Charge (PFC) Program. It also provides one, but not the only, acceptable means of meeting the requirements of Title 14 Code of Federal Regulations (CFR) part 139, *Certification of Airports*, when a Segmented Circle is required.

## 6. GENERAL REQUIREMENTS.

**a.** Segmented Circle Airport Marker System. This provides for a minimum installation consisting of a segmented circle located OFF the traffic area with a conventional wind cone located at its center. To this minimum installation, other pilot aids and traffic control devices are added as required to meet the conditions existing at a particular airport. The types of devices to

be used, the purpose they must serve, and their construction and installation must be as described below and shown on Figure 1.

(1) Segmented Circle. The segmented circle is the basic element of the system. Segmentation of the circle is necessary so that from a reasonable distance it can be readily distinguished from a solid circle, which is sometimes used to mark the center of a landing area. The segmented circle performs two functions; it aids the pilot in locating airports and it provides a centralized location for such indicators and signal devices as may be required on a particular airport. Install the circle in a position affording maximum visibility to pilots in the air and on the ground. Consideration should also be given to accessibility for ground operations.

(2) Wind Direction Indicator. Install a conventional wind direction indicator as shown in Figure 1, to be used as the wind direction indicator.

(3) Landing Direction Indicator. When conditions at an airport warrant its use, install a landing direction indicator, as shown in Figure 1, for the purpose of showing pilots in the air and on the ground the direction in which landings and takeoffs are to be made. This indicator may be so designed that it can be made free-swinging when left unattended.

(4) Landing Strip Indicators. Landing strip indicators are used to show the orientation of landing strips and/or to give a positive indication of the strip specified for use. When used, they must be arranged in pairs as shown in Figure 1.

(5) **Traffic Pattern Indicators.** Install these indicators for the purpose of controlling the direction of the traffic pattern when there is any variation from the normal left-hand pattern. When the traffic pattern indicators are included in an installation, they must be arranged in pairs in conjunction with landing strip indicators. Note: If the traffic pattern or landing strip indicator is constructed of material, i.e., not painted on the surface, such material is not permitted inside the Runway Safety Area or Runway Object Free Area.

(6) **Right-Turn Indicators.** The use of the segmented circle airport marker system is encouraged. Only the "L" shaped indicators, formed by using the landing strip and traffic pattern indicators referred to above, are required for compliance with Title 14 CFR part 91, *General Operating And Flight Rules*, AND ARE USED ONLY ON RUNWAYS USING RIGHT-HAND TRAFFIC PATTERNS. Where only these indicators are used, the airport operator is encouraged to locate them so that the segmented circle and other visual aids can be added later. However, if this is undesirable or impracticable, they may be constructed in any practicable manner near the end of the runway. Locate any raised type of indicator so as not to become a hazard to the operation of aircraft.

(7) **Closed Field Signal**. Place panels in the center of the circle in the form of a cross to signify that a field is permanently closed to all traffic. When this signal is used, the wind cone and the landing direction indicator are removed from the circle. Other indicators may remain in place.

**b. Pilot Familiarization.** Post the information contained in the foregoing paragraphs of these "General Requirements", together with a copy of the "Segmented Circle Airport Marker

System", Figure 1, and in a diagram showing the application of the system to the particular airport on all airport bulletin boards.

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Michael J. O'Donnell Director of Airport Safety and Standards



Figure 1. Segmented Circle Marker System

# APPENDIX D AC 150/5210-5D PAINTING, MARKING AND LIGHTING OF VEHICLES USED ON AIRPORTS



U.S. Department of Transportation

Federal Aviation Administration

# Advisory Circular

Subject: Painting, Marking, and Lighting of	Date: April 1, 2010	AC No: AC 150/5210-5D	
Vehicles Used on an Airport	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. 4<sup>th</sup> 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 75<sup>th</sup> 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 onsite 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.

**I.** 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  $0^{\circ}$  (horizontal) up to  $10^{\circ}$  above the horizontal and for  $360^{\circ}$  horizontally. The upper limit of 400 candelas (effective) is necessary to avoid damage to night vision.

(3) From  $10^{\circ}$  to  $15^{\circ}$  above the horizontal plane, the light output must be  $1/10^{\text{th}}$  of peak intensity or between 4 and 40 candelas (effective).

(4) Lights must flash at  $75 \pm 15$  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.* 

Standard	Chrome Yellow		Yellowish-Green		International Orange				
Illuminant D65 Usage	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 <b>A</b> E		11.1			11.7			10.7	

Table A-1.	Specification	for vehicle and	flag colors
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**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 ( $\Delta E$ ) 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  $\Delta L^*$ ,  $\Delta a^*$ , and  $\Delta b^*$  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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# APPENDIX E AIRPORT CONSTRUCTION SAFETY PHASING PLAN (CSPP)

Turlock Municipal Airport Turlock, California Widen Runway 12/30 and Airfield Electrical Upgrades AIP 03-06-0265-12-2017

**Construction Safety Phasing Plan** 





Prepared for: City of Turlock, California 156 South Broadway, Suite 150 Turlock, CA 95380

Prepared by: Stantec Consulting Services Inc. 8200 South 48th Street Phoenix, AZ 85044 (602) 438-2200

May 19, 2017
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# 1.0 CONSTRUCTION SAFETY AND PHASING PLAN (CSPP) OVERVIEW

The City of Turlock, CA (hereinafter "Owner" or "Sponsor") is required to adhere to the standards contained in the various Federal Aviation Administration Advisory Circular (AC) 150 series as part of the airport's grant assurance obligations in return for accepting federal funds under the Airport Improvement Program for the design and construction of airport projects. The goal of this Airport Construction Safety and Phasing Plan (CSPP) is to achieve and maintain a desirable level of operational safety during construction. This plan provides information, responsibilities, and procedures to implement the requirements of the contract safety provisions and FAA Advisory Circular AC 150/5370-2F.

Hazardous practices and marginal conditions created by construction activities can decrease or jeopardize operational safety on the airport. To minimize disruption of normal aircraft operations and to avoid situations that compromise the airport's operational safety, ALL construction activity that occurs within the boundaries of Turlock Municipal Airport must be carefully planned, scheduled, and coordinated with the Sponsor.

This CSPP is intended to provide general information to all Contractors, Sub-Contractors and suppliers (hereinafter "Contractor") on the requirements and procedures for accident prevention, safety, and security at Turlock Municipal Airport (hereinafter "Airport") during the '**Widening Runway 12/30**, **AND AIRFIELD ELECTRICAL UPGRADES'** project. Contractors shall conduct their operations in a manner that will provide safe working conditions for all personnel and the protection of the airport tenants and users who may be affected by the project's construction activities. Nothing contained in this CSPP is intended to relieve the Contractor of the obligations assumed by the Contractor under contract with the Sponsor or as required by law. Safety must be an integral part of each job. Full participation, cooperation, and support are necessary to ensure the safety and health of all persons and property involved in the project.

Requirements and procedures in this CSPP may be altered, on a case by case basis, if determined by the Sponsor that safety is not compromised and the proposed alternative better meets operational or project needs. Any such alterations or deviations shall be at the sole discretion of the Airport.

The critical operational areas at Turlock Municipal Airport are defined as follows:

# 1.1 THE AIR OPERATIONS AREA (AOA)

For the purpose of this document, the AOA is defined as any part of the Airport utilized for aircraft operations and includes any area inside the perimeter security fence.

# 1.2 RUNWAY AND TAXIWAY SAFETY AREAS

As described in FAA Advisory Circular AC 150/5370-2F these are restricted areas. The safety area dimensions are described in AC 150/5300-13A, Change1. When working in these areas, construction will be limited in accordance with the project specifications and this CSPP. Graphical depictions of these areas are contained in in Attachment 2.

# 2.0 AIRPORT CONTACT NUMBERS

The following numbers will be the Sponsor contact numbers for this project.

TITLE	NAME	PHONE
City of Turlock , CA	TBD	209-668-6035
Stantec Consulting Services Inc. (Engineer)	Mark Koester P.E.	602-707-2200
Engineer's Field Representative	(TBD)	(TBD)
Construction Foreman	(TBD)	(TBD)

Injuries are to be reported to the Sponsor and Engineer immediately. Medical, Fire and Police assistance may be reached by calling 911. All phone numbers should be placed on the project phone list that shall be kept in all the Contractor's supervisor's vehicles.

# 3.0 PROJECT SCOPE OF WORK

The project will include reconstruction of 25' and addition of 10' to the north side of Runway 12/30, milling the surface of the southern 25' of the runway and overlaying the entire runway surface, grading and drainage and electrical upgrades at Turlock Municipal Airport.

Project construction elements include:

- Widen Runway 12/30 to 60'
- Grading/Drainage Improvements to the RSA/OFA/RPZ
- Install Drainage Structures
- Upgrade of Runway Lighting to MIRL (LED)
- Install Airfield Signage (LED) and Markings
- Construct new Airfield Lighting Vault

- Install Regulator, Service Panel and Controls
- Upgrade Airfield Electrical Infrastructure including new Electrical Service, and Cable in Conduit

These improvements are depicted in the construction drawings and in this CSPP in Attachment 2.

# 4.0 CONSTRUCTION SAFETY AND PHASING PLAN (CSPP) REQUIREMENTS

The requirements outlined below correspond with the subjects contained in AC 150/5370-2F, Chapter 2, Section 1, paragraph 204 and described in detail in Chapter 2, Section 2. The checklist corresponding to these requirements is contained in Attachment 1 and shall be acknowledged by the Contractor in the Safety Plan Compliance Documents (SPCD) in Section 5.

# 4.1 COORDINATION

Sponsor's staff will coordinate with the tenants and operators affected by this project in advance of the start of construction. Additional information regarding notification of construction activities is contained in Section 4.12 of this CSPP. The locations of these facilities are depicted in CSPP Drawing contained in Attachment 2.

Prior to the start of construction, the Engineer will host a mandatory preconstruction meeting with the General Contractor and at least one representative from each of its subcontracting companies. Agenda items will include:

- Submission of Contractor's preliminary construction schedule, barricade plan, list of equipment, list of subcontractors and the Contractor's emergency phone number list and items required by the project SPCD.
- Identification of the Contractor's superintendent and a discussion of his authority and responsibilities.
- Designation of Sponsor representative responsible for notifying the Flight Service Station serving the airport of the proposed start and completion dates and times of construction or any circumstances requiring the issuance of a Notice to Airmen (NOTAM).
- Scheduling of work and the need to perform certain items at various stages of the project, including operational safety issues which might arise because of the proposed work.

- The General Contractor must provide hand held radios or cell phones to establish day to day communications between the airport operations staff and subcontractors.
- Establish a desired date for issuance of a Notice to Proceed.

### 4.2 CONTRACTOR PROGRESS MEETINGS

Progress meetings to discuss construction scheduling and safety issues will be held on a regular basis at the airport for the duration of the project. The agenda will include a standing item to discuss safety issues at these progress meetings.

# 4.3 SCOPE OR SCHEDULE CHANGES

After the initial approval of the Contractor's schedule, the construction schedule will be a standing agenda item for discussion at the construction progress meetings.

Any changes to the project schedule will require approval by the City of Turlock. Changes to project scope will require approvals of the City, FAA and Caltrans.

### 4.4 PHASING

This project has been phased to minimize operational impact to those facilities located inside the secure area of airport. The scope of work for this project is described in Section 3 of this CSPP and is depicted as a single phase in the construction documents.

#### 4.4.1 PHASE 1 INFRASTRUCTURE

Location -	Runway 12/30 Safety Area and new electrical service line extensions
Duration -	66 Calendar Days
Runway Closures -	Maximum 45 nighttime runway closure from 8:00 PM to 6:00 AM
Taxiway Closures -	Taxiway closures will coincide with runway closures.
Taxilane Closures -	No Taxilane closures are required.
Parking Aprons -	No aircraft parking aprons (ramps) or hangars access restrictions are required
Impact to NAVAIDS -	Edge Lights and Tetrahedron out of service
Operational Impact -	Airport access intermittently restricted, runway closed at night.

#### 4.4.2 PHASE 2 RUNWAY WIDENING AND LIGHTING

Location -	Runway 12/30 paving and new electrical improvements
Duration -	60 Calendar Days
Runway Closures -	Runway Closed for Duration of Phase 2 work
Taxilane Closures -	No Taxilane closures are required.
Parking Aprons -	No aircraft parking aprons (ramps) or hangars access restrictions are required
Impact to NAVAIDS -	N/A
Operational Impact -	Runway 12/30 Closed

#### 4.4.3 PHASE 3 COMMISIONING AND REMAINING WORK

Location -	Runway 12/30 Safety Area and new electrical service line extensions
Duration -	45 Calendar Days
Runway Closures -	Maximum 2 days for final striping to be coordinated with Airport
Taxiway Closures -	Taxiway closures will coincide with runway closures.
Taxilane Closures -	No Taxilane closures are required.
Parking Aprons -	No aircraft parking aprons (ramps) or hangars access restrictions are required
Impact to NAVAIDS -	Edge Lights available
Operational Impact -	Airport intermittently restricted for cleanup and commissioning

All work is to be completed within 171 consecutive calendar days.

# 4.5 AREAS AND OPERATIONS AFFECTED BY CONSTRUCTION

This CSPP presents possible safety problems that could occur during a typical airport construction project. Any of these safety problems could occur if this plan is not followed in any of the project areas. The work associated with the WIDENING OF RUNWAY 12/30, AND AIRFIELD ELECTRICAL UPGRADES will not impact aircraft operations and facilities outside of the immediate work areas as construction is specified during runway closures

The work will not impede emergency services access or helicopter operations during construction of the work since the construction will occur north of the parking aprons and hangars. A flagman will be required to monitor crossings at airfield access roads and airport entry gates.

A construction setback limit corresponding to the existing Runway Safety Area (RSA) of 60 feet from the Runway 12-30 centerline extending 240 feet beyond each end of the runway has been established and no work will be permitted within this setback limit unless the runway is closed. Runway closures

will require placement of Lighted Runway Closure markers in accordance with AC 150/5340-1. Details depicting construction limits, general barricade placement, access routes and other information are contained in Attachment 2.

# 4.6 PROTECTION OF NAVIGATIONAL AIDS (NAVAIDS)

Existing NAVAIDS at the airport will not be impacted by this project with the exception of the existing Tetrahedron.

# 4.7 CONTRACTOR ACCESS

Maintaining control of construction personnel within the AOA is crucial for the safety of workers and aircraft. The Contractor's forces will only be permitted access to the airport at designated locations and will be restricted from entering all active Runway Safety Areas (RSA), Runway Object Free Areas (ROFA), Obstacle Free Zones (OFZ), Taxiway Safety Areas (TSA) and Object Free Areas (TOFA) and the runway approach and departure surfaces, except during runway closures. Contractor access and haul routes are depicted on the project plans and contained in Attachment 2, CSPP Plans.

Cones and barricades will be used to keep the Contractor's personnel from inadvertently entering hangar and aircraft parking areas. The Contractor will acknowledge and comply with the following requirements.

#### 4.7.1 Location of Stockpiled Construction Materials

Milled pavements will be removed from the existing runway and hauled to the stockpile area depicted on the project plans and contained in Attachment 2, CSPP Plans.

Excavated soils materials not incorporated into the work area shall be stockpiled on airport property within the existing perimeter fence, as shown on the plans. Stockpiled material shall be watered and compacted as necessary to prevent airborne particulates. No stockpiles will exceed 10 feet in height.

#### 4.7.2 Vehicle and Pedestrian Operations

Restricted areas for the airports are generally all areas within the Air Operations Area (AOA) of the airports which is protected by the airport security fencing, but also includes certain utility rooms, operations areas, electrical rooms and terminal building areas not open to the general public. Entrance to these areas will be arranged on a case-by-case basis depending on need.

No unauthorized entry to the AOA will be permitted. Workers and equipment will be restricted to the approved entry points and access routes to work areas. All vehicles will be marked and lighted as described herein and work areas barricaded and marked to delineate restricted areas of the airport. Contractor employee parking shall be as designated on the project plans and the drawings contained in Attachment 2.

The Contractor will be required to furnish flaggers at crossings of active movement areas should his forces be permitted access. The Contractor will be required to be available by cell phone contact with Engineer continuously when any of his personnel or material suppliers are working at the airport.

The Contractor shall ensure that all dirt and gravel in the work area is kept well-watered at all times. They shall also recognize that it can also create a personal safety hazard for his employees because of the flying debris that could be blown toward them. The Contractor shall train his personnel to be aware of all aircraft that are operating in the area.

#### 4.7.3 Construction Equipment/Personnel Parking

Contractor employee parking shall only be allowed only in designated areas which are outside of the AOA. No personal vehicles will be allowed in the AOA. Construction equipment will be parked at the designated staging areas when not in use. No construction equipment will be left unattended at the work locations.

#### 4.7.4 Access and Haul Roads

The locations of construction traffic routing are depicted in Attachment 2 and the project plans. Access to the work areas will be delineated with traffic cones or other approved traffic control devices and controlled by flagmen to assure safety is observed on the airport.

#### 4.7.5 Marking and Lighting of Vehicles

All Contractor vehicles involved with this project will comply with FAA Advisory Circular 150/5210-5D (Painting and Marking of Vehicles Used on an Airport) by mounting a 3' x 3' orange and white checked flag or an amber beacon on the highest part of the vehicle while on the AOA. Vehicles operating at night shall use the amber beacon. All vehicles operating within the airfield boundary which are approved for unescorted access shall be identified with a painted or magnetic sign on each side of the vehicle bearing the Contractor's name and logo.

#### 4.8.6 Description of Proper Vehicle Operations

When contractor personnel must have access to the restricted areas, they must be under an authorized escort at all times. All requests for escorts shall be made a MINIMUM of 24 hours in advance of entry. All personnel responsible for escorting or guarding gates shall be personnel who have been approved by the Sponsor based on compliance with FAA requirements. In the event that a Contractor leaves the closed project area and gets disoriented, he/she shall remain in place and then call the Engineer.

All vehicles operating within the AOA shall be escorted by the Contractor. If any delivery vehicles need to get from the access gate to the work area, the Contractor shall provide an escort.

#### 4.8.8 Requirements for Vehicle Drivers

All personnel operating a motor vehicle within the AOA of Turlock Municipal Airport shall have a valid state issued driver's license.

All vehicle drivers must be aware of their environment at the Airport and confirm by personal observation that no aircraft are approaching their position. Drivers shall always give way to aircraft operations and emergency vehicles.

#### 4.8.9 Situational Awareness

Portions of the work associated with this project will be completed while the runway and areas of the parallel taxiway and associated exits are open. Construction setback limits from the runway centerline for work permitted during operations and the required barricading during each phase of the work for the taxiway and exits is shown on Attachment 2. The Contractor's forces will be restricted to the closed areas in which work is to be performed. The Contractor shall train his personnel to recognize and avoid the hazards of prop/jet blast when in proximity to active areas. The Contractor shall train his personnel to be aware of all aircraft that are operating in the area.

#### 4.8.10 Two Way Communication Procedure - N/A

Radio communications are not required and Contractor's supervisory personnel will provide mobile phone access to the Sponsor and Engineer at all times.

#### 4.8.11 Airport Security Requirements

The Contractor shall maintain control at all Contractor entrance gates to prevent unauthorized access onto airport property. Temporary fencing, gates, etc., shall be installed as necessary. All security measures shall be coordinated with the Engineer.

Contractor shall be responsible for protection of the construction site, and all work, materials, equipment, and existing facilities thereon, against vandals, wildlife, and other unauthorized persons. Security measures shall include such additional security fencing, barricades, lighting, flagmen and other measures as the Contractor may deem necessary to protect the site. The Job supervisor shall be responsible for assuring that the construction site is secured at all times from unlawful intrusions by unauthorized individuals at the end of each day by exercising security awareness and oversight, and locking gates used.

# 4.9 WILDLIFE MANAGEMENT

The Contractor shall be required to remove any/all food related trash from the Airport each shift. The Contractor shall also ensure that their water supply tankers and lines are not leaking so as to prevent the attraction of birds or other animals to the site.

Access gates to the secure areas of the airport shall be monitored full time while material deliveries or other construction activity is in process. Gates shall be closed and locked if not attended. In the event any wildlife is observed within the airport security fence during construction activities, Airport Operations shall be notified immediately.

# 4.10 FOREIGN OBJECT DEBRIS (FOD) MANAGEMENT

The Contractor's personnel shall access the work areas only on approved routes. Travel via the runway and taxiway system will not be allowed. The Contractor shall be responsible for keeping all paved access routes clean and free of debris using a dedicated vacuum sweeper. Engineer will conduct post-construction special inspections each morning and/or after daily construction. Contract documents require the Contractor to vacuum sweep all areas that may have FOD.

# 4.11 HAZARDOUS MATERIALS (HAZMAT) MANAGEMENT

With the exception of fuel and other fluids for vehicles, there are no hazardous materials associated with this project. If the Contractor does spill a small amount of fuel or other fluid (5 gallons or less), they shall immediately contain and remove it from the Airport and legally dispose of it.

If the Contractor spills any fuel or other fluid in excess of 5 gallons, the Airport Operations personnel shall be immediately notified so that the Airport's spill procedures can be followed.

Service areas for construction equipment shall not be located within buildings or in the vicinity of hazardous operations or materials or aircraft parking or fueling areas. No disposal of waste oils, grease, fuel, etc., shall be permitted on Sponsor's properties. All spills shall be IMMEDIATELY removed by the contractor and properly disposed of off airport property and disposal records provided to the Sponsor.

# **4.12 NOTIFICATION OF CONSTRUCTION ACTIVITIES**

In order to maintain the desired levels of operational safety on airports during construction activities, Sponsor and Engineer will follow the procedures listed below for the immediate notification of Airport users and the Federal Aviation Administration (FAA) of any condition adversely affecting operational safety during this project.

#### 4.12.1 List of Responsible Representatives (Project Directory)

Prior to the start of construction activities and after receipt of the Contractor's list of personnel, the Engineer will compile a list of all stakeholders for the project to include applicable points of contacts for the Airport, the Engineer, the Contractor and his subcontractors and materials suppliers, who will be permitted access to the work areas. This project directory will include office contact phone numbers, email addresses and 24 - hour emergency point of contact cell phone numbers.

This list of critical phone numbers must be kept in all Contractor supervisor's vehicles at all times. Airport personnel and the Engineer shall also keep this list in their vehicles during the project.

#### 4.12.2 Notice to Airmen (NOTAM) Issuance

The Sponsor will issue all NOTAMS associated with this project in accordance with FAA Advisory Circular 150/5200-28D. Sponsor will designate who will be responsible for physically closing the Runway should closure become necessary.

#### 4.12.3 Emergency Notification Procedures

The Sponsor provides fire and police response for the Airport. Contacting these services for an emergency shall be done by calling 911.

#### 4.12.4 Coordination with Sponsor Representative

Engineer must be advised of daily construction activity.

#### 4.12.5 Notifications to the FAA (Filing of Form 7460-1)

FAA Form 7460-1, Notice of Proposed Construction or Alteration, will be prepared by the Engineer and submitted to the FAA by the Airport with the support of the General Contractor. Should the Contractor elect to install equipment or production facilities that exceed 25 feet in height, a separate Form 7460-1 may be required.

# 4.13 INSPECTION REQUIREMENTS

The Contractor's personnel and Engineer will be responsible for conducting inspections of any work accomplished in the AOA.

#### 4.13.1 Daily Inspections

Engineer and Contractor shall conduct a special daily, post-construction inspection upon completion of any work within the AOA.

A temporarily closed AOA will only open upon approval of the Engineer.

#### 4.13.2 Final Inspections

A final inspection will be conducted upon completion of all work.

# 4.14 UNDERGROUND UTILITIES

Utilities of record are shown on the construction plans. The Contractor must comply with California Blue Stake requirements. If in the unlikely event a utility is disrupted, the Contractor is responsible for contacting that utility company and requesting the repair. The Contractor shall have an airfield electrician on duty while excavation is taking place near any existing airfield lighting circuits. Repair of any existing circuits must be expedited.

# 4.15 PENALTIES

The Airport is operated in strict compliance with Federal Aviation Regulations. If the Contractor's personnel fail to comply with any Airport rule or the provisions of this safety plan, the project work will cease until the violation is corrected. Violation of the rules and regulations are subject to the Sponsor's enforcement policies and a Notice of Violation incurred by the Contractor could incur penalties ranging from \$1,000 for a first offense and increasing for multiple offensives. The penalties also include assessment for liquidated damages in accordance with the contract. Also see Section 4.8.11 of this CSPP.

# 4.16 SPECIAL CONDITIONS

No special conditions will be required for normal operation of the Airport.

# 4.17 RUNWAY AND TAXIWAY VISUAL AIDS

Runway edge lights and primary wind cone and segmented circle will be replace during the project.

# 4.18 MARKINGS AND SIGNS FOR ACCESS ROUTES

The Contractor will be required to submit a traffic control plan for Sponsor's representative's approval prior to the start of work. The Contractors approved traffic control plan will be distributed to all vehicle drivers working in the AOA.

Routes will be marked by traffic cones or other devices as approved by the Airport. See Attachment 2, CSPP plans for additional information.

# 4.19 HAZARD MARKING AND LIGHTING

The Construction Phasing and Barricade plans contained in Attachment 2 depict general locations of anticipated construction barricade locations to identify work limits during each phase of the project and provide pilots with recognizable limits of potential hazards. The barricade devices to be used are described in Attachment 2, CSPP plans.

Placement of all barricades and hazard markings are shown on the plans and maintenance of barricades is included in the project specifications. Equipment over 15 feet in height will be restricted from work within the ROFA while the runway is open to aircraft operations.

# 4.20 PROTECTION OF SAFETY AREAS, OBJECT FREE AREAS, APPROACH AND DEPARTURE SURFACES

Runway and Taxiway Safety and Object Free Areas are described in AC 150/5300-13A and discussed below for Runway 12-30 and Taxiway 'A'.

#### 4.20.1 Runway Safety Area (RSA)

The RSA for Runway 12-30 extends to a lateral offset of 60 feet each side of the runway centerline and extends 240 feet beyond each runway end. No construction is allowed within the RSA while the runway is open for aircraft operations

#### 4.20.2 Runway Object Free Area (ROFA)

The ROFA for Runway 12-30 extends to the same longitudinal dimension as the RSA, but extends laterally from the runway centerline on each side to a distance of 125 feet.

Construction beyond the established 125' setback limit will require the Contractor remove all equipment from the ROFA when not in use, as well as any stockpiled material. When working in these areas, construction will be limited in accordance with the project specifications.

### 4.20.3 Taxiway Safety Area (TSA)

There will be no TSAs impacted by this project. All work will remain clear of all TSAs with the exception of localized drainage and electrical crossing at the locations shown in the plans,

#### 4.20.4 Taxiway Object Free Area (TOFA)

There will be no TOFAs impacted by this project. All work will remain clear of all TSAs with the exception of localized drainage and electrical crossing at the locations shown in the plans.

#### 4.20.5 Blasting Operations

This project does not require blasting operations therefore this section does not apply.

#### 4.20.6 Open Trenches or Excavation

No open trenches, excavations or stockpiled materials will be permitted within the runway setback limit or taxiway safety areas while the associated runway or taxiways are open to aircraft operations, in accordance with project specifications.

#### 4.20.7 Removal of Equipment

The Contractor will be required to remove all equipment from the ROFA or TOFA when not in use.

#### 4.20.8 Obstacle Free Zones (OFZ)

There will be no OFZs impacted during this project. All work will remain clear of all OFZs.

#### 4.20.9 Construction Activity in a Runway Approach/Departure Area

During this project there is no requirement to partially close the runway or displace the existing runway threshold; therefore, this section does not apply. All construction equipment will be staged outside of the ROFA when not in use.

### 4.21 OTHER LIMITATIONS ON CONSTRUCTION

**4.21.1** The Contractor must, at all times, conduct the work in conformance with requirements of the City of Turlock and the FAA.

**4.21.2** A FAA Form 7460-1 must be submitted for any material production plant proposed to be operated on the airport during construction of the work 45 days in advance.

**4.21.3** The use of open flame welding or torches is prohibited unless approved by the Airport.

4.21.4 The use of blasting caps is not applicable to this project.

4.21.5 The use of flare pots is not applicable to this project.

**4.21.6** The Contractor shall at all times conduct their work in a manner that does not create any hindrance, hazard, or obstacle to aircraft using the Airport.

**4.21.7** The Airport environment requires a high degree of care to control debris and dust. Spilled material on active roadways and aircraft parking aprons shall be swept up immediately.

**4.21.8** Sanitary facilities must be provided by the Contractor for use by the Contractor's employees. Public facilities at the Airport are not to be used. Sanitary facilities must be located at the Contractor's staging area unless otherwise approved by the Airport.

**4.21.9** Contractor vehicles will obey all posted speed limits on airport roadways. The maximum speed when operating inside the airport perimeter fence is 15 mph maximum consistent with safety.

**4.21.10** All personnel operating a motor vehicle on Airport property shall have a valid airfield and state- issued driver's license.

**4.21.11** Use of audio earphones and headsets are prohibited on the Airport unless directly related to job requirements.

**4.21.12** Beacons and flags must be maintained in good working condition and flags shall be replaced if they become faded, discolored, or ragged.

**4.21.13** Lighted barricades shall be maintained and kept in good working order and replaced if they are not operating properly.

# 5.0 SAFETY PLAN COMPLIANCE DOCUMENT (SPCD) OVERVIEW

The Construction Contractor is required to read, acknowledge and abide by this CSPP. Additionally, all required information for compliance will not be available until a construction award for the project has been made by the Sponsor. The following section provides for supplemental information and acknowledgement of the requirements of Section 4 of this CSPP. The Contractor should not duplicate information in the subject requirements as contained in Section 4, and if no supplemental information is required should enter, "No Supplemental Information". The Contractor shall provide the information and execute the acknowledgement statement as part of his project submittals. Additional guidance is contained in AC 150/5370-2F, Chapter 1.

# 6.0 CONTRACTOR CONTACT NUMBERS AND SUPPLEMENTAL INFORMATION

Ger	neral Contractor:		
Adc	Iress:		
Offi	ce Phone:		
Fax:			
	Contractor Personnel		
	TITLE	NAME	MOBILE PHONE
	Project Manager:		
	Project Superintendent:		
	Safety Officer:		
	Construction Schedule		
	The Notice to Proceed (NTP) date	is: <u>TBD</u>	
	The Official Start Date for this proje	ect is: <u>TBD</u>	
	The Project Duration is for: <u>171</u>	Calendar Days	
	The Project Completion Date is:	TBD	

Acknowledgement: I, \_\_\_\_\_\_ (Contractor) have read the 'Rehabilitate/Reconstruct GA Apron' Construction Safety and Phasing Plan, approved on <u>Date to</u> <u>Be Determined</u>, and will abide by it as written and with the following additions as noted.

**Supplemental Information:** (Insert "No Supplemental Information" if none is needed)

1. Coordination:

2. Phasing: 3. Areas and Operations Affected By Construction: 4. Protection of Navigational Aids (NAVAIDS): 5. Contractor Access: 6. Wildlife Management: 7. Foreign Object Debris (FOD) Management: 7. Foreign Object Debris (FOD) Management: 8. Hazardous Material (HAZMAT) Management: 9. Notification of Construction Activities: 10. Inspection Requirements: 11. Underground Utilities: 12. Penalties: 13. Special Conditions:		
	2.	Phasing:
<ol> <li>Protection of Navigational Aids (NAVAIDS):</li> <li>Contractor Access:</li> <li>Contractor Access:</li> <li>Wildlife Management:</li> <li>Wildlife Management:</li> <li>Foreign Object Debris (FOD) Management:</li> <li>Foreign Object Debris (FOD) Management:</li> <li>Razardous Material (HAZMAT) Management:</li> <li>Notification of Construction Activities:</li> <li>Notification of Construction Activities:</li> <li>10. Inspection Requirements:</li> <li>11. Underground Utilities:</li> <li>12. Penalties:</li> <li>13. Special Conditions:</li> </ol>	3.	Areas and Operations Affected By Construction:
	4.	Protection of Navigational Aids (NAVAIDS):
	5.	Contractor Access:
7. Foreign Object Debris (FOD) Management:         8. Hazardous Material (HAZMAT) Management:         9. Notification of Construction Activities:         10. Inspection Requirements:         11. Underground Utilities:         12. Penalties:         13. Special Conditions:	6.	Wildlife Management:
	7.	Foreign Object Debris (FOD) Management:
9. Notification of Construction Activities:         10. Inspection Requirements:         11. Underground Utilities:         12. Penalties:         13. Special Conditions:	8.	Hazardous Material (HAZMAT) Management:
10. Inspection Requirements:         11. Underground Utilities:         12. Penalties:         13. Special Conditions:	9.	Notification of Construction Activities:
10. Inspection Requirements:         11. Underground Utilities:         12. Penalties:         13. Special Conditions:		
11. Underground Utilities:         12. Penalties:         13. Special Conditions:	10.	Inspection Requirements:
11. Underground Utilities:         12. Penalties:         13. Special Conditions:		
12. Penalties: 13. Special Conditions:	11.	Underground Utilities:
12. Penalties: 13. Special Conditions:		
13. Special Conditions:	12.	Penalties:
13. Special Conditions:		
	13.	Special Conditions:

14. Runway and Taxiway Visual Aids:

15. Marking and Signs for Access Routes:

16. Hazard Marking and Lighting:

17. Protection of Safety Areas, Object Free Areas, Approach & Departure Surfaces:

18. Other Limitations on Construction:

# Attachment 1 Construction Safety Phasing Plan Checklist

#### FAA CSPP Checklist

Airport Name:	Turlock Municipal Airport	LOCID:	015
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Associate City: Turlock, California

Project No. AIP 3-06-0265-12-2017

Reference AC 150/5370-2F, Appendix F

CSPP Element	l Ad	Elemer dresse	nt ∋d?	Remarks	
	Yes	No	N/A		
Coordination (Section 205)					
<ul> <li>Contractor Progress Meetings</li> </ul>	×			See Section 4.2	
<ul> <li>Addresses necessary actions when changes are proposed to CSPP</li> </ul>	×			See Section 4.3	
<ul> <li>Provisions for FAA ATO Coordination</li> </ul>	×			See Section 4.4	
Phasing (Section 206)					
<ul> <li>Phase Elements</li> </ul>	×			See Section 4.5	
<ul> <li>Construction Safety Drawings</li> </ul>	×			See Attachment 2, CSPP Plans	
Area and Operations Affected by Construction Activity	(Section	on 207	)		
<ul> <li>Identification of Affected Areas</li> </ul>	×			See Section 4.6	
<ul> <li>Mitigation Affects</li> </ul>	×			See Section 4.6	
Navigation Aid Protection (Section 208)					
<ul> <li>Operational NAVAID Critical areas</li> </ul>	×			See Section 4.7	
Contractor Access (Section 209)					
<ul> <li>Location of Stockpiles Construction Material</li> </ul>	×			See Section 4.8.1	
<ul> <li>Vehicle and Pedestrian Operations</li> </ul>	×			See Section 4.8.2	
Wildlife Management (Section 210)					
- Trash	×			See Section 4.9	
<ul> <li>Standing Water</li> </ul>	×			See Section 4.9	
- Tall Grass			×		
<ul> <li>Fencing and Gates</li> </ul>	×			See Section 4.8.11 & CSPP Plans	
<ul> <li>Disruption of Wildlife Habitat</li> </ul>	X			See Section 4.9	
Foreign Object Debris (Section 211)					
<ul> <li>FOD Control Measures</li> </ul>	×			See Section 4.10	
Hazardous Material Management (Section 212)					
Hazardous Materials Controls	×			See Section 4.11	

Element CSPP Element Addressed? Remarks						
	Yes	No	N/A			
Notification of Construction Activities (Section 213)						
<ul> <li>List of Responsible Representatives</li> </ul>	×			See Section 4.12.1		
- NOTAMs	×			See Section 4.12.2		
<ul> <li>Emergency Notification Procedures</li> </ul>	×			See Section 4.12.3		
<ul> <li>Coordination with ARFF</li> </ul>	×			See Section 4.12.4		
- Notification to the FAA (Part 77, NAVAIDs)	×			See Section 4.12.5		
Inspection Requirements (Section 214)						
<ul> <li>Daily Inspections</li> </ul>	×			See Section 4.13.1		
- Final Inspections	×			See Section 4.13.2		
Underground Utilities (Section 215)		-				
<ul> <li>Procedures for protecting existing underground utilities</li> </ul>	×			See Section 4.14		
Penalties (Section 216)						
<ul> <li>Penalty provisions for noncompliance with safety plan provisions</li> </ul>	×			See Section 4.15		
Special Conditions (Section 217)						
<ul> <li>Unique conditions that may affect the operation of the airport</li> </ul>	×			See Section 4.16		
Runway and Taxiway Visual Aids (Section 218)						
<ul> <li>General – Convey Clear Meaning; Secured from movement; Frangible</li> </ul>	×			See Section 4.17		
- Markings			Х	Pavement markings are not impacted		
<ul> <li>Lighting and Visual NAVAIDs</li> </ul>	×			See Section 4.17		
- Signage	×			See Section 4.18		
Access Routes - Marking and Signage (Section 219)						
<ul> <li>Haul Road Demarcation</li> </ul>	×			See Attachment 2 & Section 4.18		
Hazard Marking, Lighting and Signage (Section 220)						
<ul> <li>Areas Impacted by Construction Operations</li> </ul>	×			See Section 4.19		
<ul> <li>Equipment</li> </ul>	×			See Section 4.19		
Protection Runway and Taxiway Areas, Zones and Su	rfaces	(Secti	on 221			
<ul> <li>Runway Safety Area (RSA)</li> </ul>	×			See Section 4.20.1		
<ul> <li>Runway Object Free Area (ROFA)</li> </ul>	×			See Section 4.20.2		
<ul> <li>Taxiway Safety Area (TSA)</li> </ul>	×			See Section 4.20.3		
<ul> <li>Taxiway Object Free Area (TOFA)</li> </ul>	×			See Section 4.20.4		
- Obstacle Free Zone (OFZ)	×			See Section 4.20.8		
<ul> <li>Approach and Departure Surfaces</li> </ul>	×			See Section 4.20.9		
Other Limitations on Construction (Section 222)						
- Prohibitions	×			See Section 4.21		
- Restrictions	×			See Section 4.21		

# Attachment 2 Construction Safety Phasing Plans



-X		
	ROFA	
	RSA	
	$\times$	
->		

LEGEND

AIRPORT PROPERTY LINE

PROJECT LIMITS (PHASES I AND II)

EXISTING FENCE LINE

RUNWAY OBJECT FREE AREA (ROFA)

RUNWAY SAFETY AREA (RSA)

RUNWAY CLOSURE MARKER

HAUL ROUTE

LOW PROFILE BARRICADE (LIGHTED)

FLAGMAN

Stantec Consulting Inc. 82 11 S. 48th Street Phoenix, AZ 85044-5355 Tel. 602.438.2200 www.stantec.com

> VERIFY SCALE BAR IS 1" ON ORIGINAL DRAWING 1/4" 3/4" IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY



DRAWN BY: WEH/RSC REV. BY: DCS CH. BY: MTK DATE: MAY 19, 2017 SCALE: AS NOTED CSSP 10204.dwg

SHEET of 48

#### TURLOCK MUNICIPAL AIRPORT WIDENING RUNWAY 12/30, AND AIRFIELD ELECTRICAL UPGRADES

