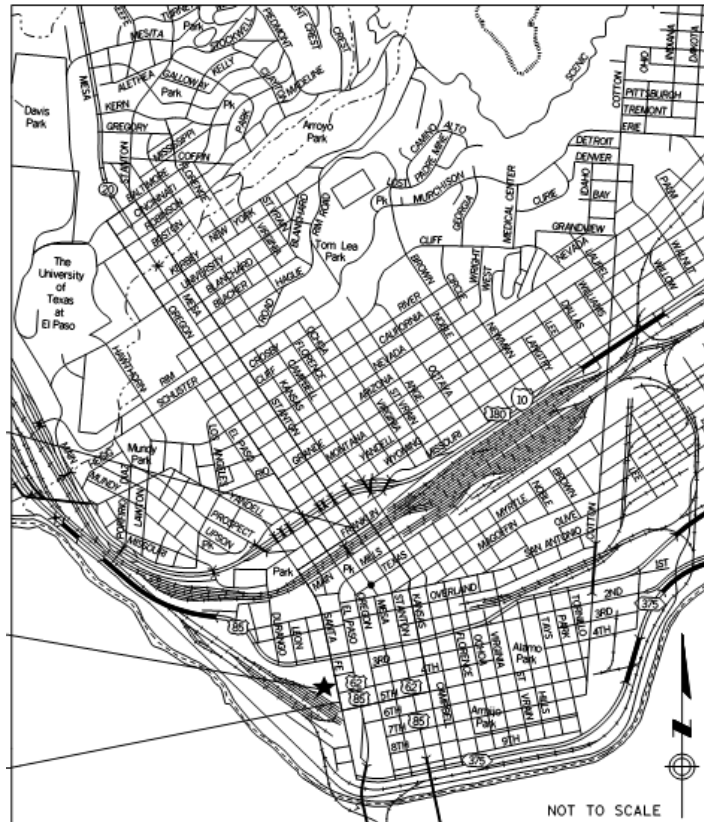




EL PASO STREETCAR SCADA PROJECT

El Paso, Texas



Camino Real Regional Mobility Authority
801 Texas Avenue
El Paso, Texas 79901



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I. INVITATION TO BID

EL PASO STREETCAR SCADA

All bids must be submitted in a sealed envelope

BEFORE June 29, 2020

2:00 P.M., MDT on the Bid Opening date June 29, 2020

to

CRRMA

801 Texas Avenue

El Paso, TX 79901

CAMINO REAL REGIONAL MOBILITY AUTHORITY

Procurement Schedule (subject to change):

<u>Event</u>	<u>Date (all times MDT)</u>	<u>Location (El Paso, TX)</u>
Plans and Proposal Bid Packet Available	June 8, 2020 10:00 AM	Nancy.Herrera@atkinsglobal.com Subject: "Proposal Request"
Questions & Clarifications Due	June 19, 2020 4:00 PM	Edgar.Fino@atkinsglobal.com Subject: El Paso Streetcar SCADA Questions
Answers Issued	June 22, 2020	Website CRRMA.org\Procurements
Bids Due & Bid Opening	June 29, 2020	CRRMA Offices 801 Texas Avenue Thorman Conference Room City 3 Building
Contract Awarded	July 2020	CRRMA Offices 801 Texas Avenue Thorman Conference Room City 3 Building

II. IMPORTANT NOTICE



EL PASO STREETCAR SCADA

You may address procurement questions to Edgar Fino in writing at

Edgar.Fino@atkinsglobal.com

Subject Line: “EL PASO STREETCAR SCADA Project Questions”

Any other communications, oral or in writing, are strictly prohibited.

Plans and Specifications for this project are available electronically by sending an email request to Nancy.Herrera@atkinsglobal.com.

BIDS OPEN: June 29, 2020 at 9:00 a.m.

An electronic copy of plans and bid packets are available by sending a request to:
Nancy.Herrera@atkinsglobal.com

Bidders must acknowledge the receipt of any and all amendments on the solicitation response
Failure to acknowledge may be cause for your bid to be considered non-responsive.

III. INFORMATION TO BIDDERS

EL PASO STREETCAR SCADA EL PASO TEXAS

Sealed bids will be received by the Camino Real Regional Mobility Authority (CRRMA), at El Paso City Hall, located at 801 Texas Avenue, El Paso, Texas 79901 before 2:00 p.m., Monday June 29 2020, publicly opened and read at El Paso City Hall, unless posted otherwise, for furnishing the CRRMA with the construction of El Paso Streetcar SCADA Project.

ONLY ONE BIDDER MAY BE AWARDED A CONTRACT PURSUANT THIS BID. Refer to “Instruction to Bidders”

Please note the CRRMA's qualification, for award of this project, in Section 5, Construction and Building Contracts of the CRRMA’s Policies and Procedures Governing the Procurement of Good and Services, item 5.2, Qualification of Bidders:

TxDOT Bidding Qualification: Waived

CRRMA Bidding Qualification: Must have experience with Siemens Proprietary SCADA Protocols. Provide a summary with the project’s name and description of the work. Bidder cannot be on the TxDOT or federal list of Debarred/Sanctioned Contractors.

Instructions to bidders: Bid packets (Specifications, Plans and all required forms) are available by submitting a request to: Nancy.Herrera@atkinsglobal.com.

Bid Guaranty: A Bid Guaranty is waived for this project.

Performance Bond: The successful bidder must furnish a Performance Bond as required by law, and the terms of this contract.

RAYMOND TELLES
EXECUTIVE DIRECTOR
CAMINO REAL REGIONAL MOBILITY AUTHORITY
801 Texas Avenue
El Paso, Texas 79901

Advertised in the El Paso Times on 7th day of June, 2020.

Advertised at www.CRRMA.org on 8th day of June, 2020.

IV. SCOPE OF WORK

EL PASO STREETCAR SCADA

SCOPE OF WORK

This El Paso Streetcar SCADA work consists of designing, installing, and testing a SCADA system to control the substations and add-alternate items. Work consists of setting up monitor and control points at the substations to remotely control the substations. Add-Alternate Work consists of installing monitor and control points at the rail switch cabinets. Add-Alternate Work can also consist of monitor points to be installed at the disconnect and bypass switches on the overhead catenary poles. The project extends 4.8 miles from the SunMetro Maintenance and Storage Facility to the University of Texas at El Paso.

Work is as listed below:

Base Bid 1:	Traction Power Substation SCADA
Add-Alternate 1:	Rail Switch Cabinet SCADA
Add-Alternate 2:	Monitoring of OCS Disconnect and Bypass Switches

The description of this scope of work, as shown above, is a general overview of this Project. Please refer to the drawings, specifications, and other information included in this package for further information. Prior to commencement of any work, bidder shall obtain a notice to proceed from CRRMA.

END SCOPE OF WORK

V. ADDENDUM ACKNOWLEDGEMENT

Project EL PASO STREETCAR SCADA
County EL PASO

ADDENDUM ACKNOWLEDGMENT

Each bidder is required to acknowledge receipt of an addendum issued for a specific project. This page is provided for the purpose of acknowledging an addendum.

FAILURE TO ACKNOWLEDGE RECEIPT OF AN ADDENDUM WILL RESULT IN THE BID NOT BEING READ.

In order to properly acknowledge an addendum, place a mark in the box next to the respective addendum.

ADDENDUM NO. 1	<input type="checkbox"/>
ADDENDUM NO. 2	<input type="checkbox"/>
ADDENDUM NO. 3	<input type="checkbox"/>

In addition, the bidder by affixing their signature to the signature page of the proposal is acknowledging that they have taken the addendum(s) into consideration when preparing their bid and that the information contained in the addendum will be included in the contract, if awarded by the Camino Real Regional Mobility Authority or other designees.

VI. PROPOSAL TO THE CAMINO REAL REGIONAL MOBILITY AUTHORITY

PROPOSAL TO THE CAMINO REAL REGIONAL MOBILITY AUTHORITY

**EL PASO STREETCAR SCADA
EL PASO COUNTY, TEXAS**

This project is to be completed in 180 calendar days and will be accepted when fully completed and finished to the satisfaction of the Executive Director or designee. This project will be a standard work week based on calendar days.

Any addenda issued amending this proposal and/or the plans that have been acknowledged by the bidder, become part of this proposal.

By signing the proposal, the bidder certifies:

1. the only persons or parties interested in this proposal are those named and the bidder has not directly or indirectly participated in collusion, entered into an agreement or otherwise taken any action in restraint of free competitive bidding in connection with the above captioned project.
2. In the event of the award of a contract, the organization represented will secure bonds for the full amount of the contract.
3. the signatory represents and warrants that they are an authorized signatory for the organization for which the bid is submitted, and they have full and complete authority to submit this bid on behalf of their firm.
4. that the certifications and representations contained in the proposal are true and accurate and the bidder intends the proposal to be taken as a genuine government record.

• **Signed:** **

(1) _____ (2) _____ (3) _____

Print Name:

(1) _____ (2) _____ (3) _____

Title:

(1) _____ (2) _____ (3) _____

Company:

(1) _____ (2) _____ (3) _____

- Signatures to comply with Item 2 of the specifications.
**Note: Complete (1) for single venture, through (2) for joint venture and through (3) for triple venture.
* When the working days field contains an asterisk (*) refer to the Special Provisions and General Notes.

VII. NOTICE TO BIDDERS

NOTICE TO BIDDERS

ANY BIDDER INTENDING TO BID ON ANY WORK TO BE AWARDED BY THE CAMINO REAL REGIONAL MOBILITY AUTHORITY MUST BE PRE-QUALIFIED BY CAMINO REAL REGIONAL MOBILITY AUTHORITY THROUGH CRRMA'S CONFIDENTIAL QUESTIONNAIRE.

VIII. BID PROPOSAL

BID PROPOSAL

In the space provided below, please enter your total bid amount for this project. Only this figure will be read publicly by the Camino Real Regional Mobility Authority at the public bid opening.

It is understood and agreed by the bidder in signing this proposal that the total bid amount entered below is binding on the bidder and the CRRMA. It is further agreed that the official total bid amount for this proposal will be determined by summing the totals of the base bid, and the bidder's selected add-alternate and additional work totals.

Base Bid	\$ _____
Add-Alternate 1	\$ _____
Add-Alternate 2	\$ _____
Total Bid Amount	\$ _____

EL PASO STREETCAR SCADA

BID SCHEDULE BASE BID: TPSS				
Item #	Estimated Qty	Unit	Description	Total Amount
1	1.0	LS	Mobilization	
2	1.0	LS	TPSS A1 SCADA Hardware & Installation	
3	1.0	LS	TPSS A2 SCADA Hardware & Installation	
4	1.0	LS	TPSS A3 SCADA Hardware & Installation	
5	1.0	LS	TPSS A4 SCADA Hardware & Installation	
6	1.0	LS	TPSS S1 SCADA Hardware & Installation	
7	1.0	LS	SIEMENS S7 License Software & Development	
8	1.0	LS	Testing & Startup	
9	1.0	YR	Extended Warranty (Parts Only) \$ per year beyond 1 st year	
10	1.0	HR	On-Call Maintenance Service (\$ per hour for a technician with a 24-hour response time)	
BASE BID 1 TOTAL				

For the following add-alternate and additional work items, CRRMA reserves the right to award work depending on CRRMA's funding availability. Bidders may elect to bid or not bid on any of the following add-alternate and additional work items.

ADD-ALTERNATE 1: RAIL SWITCH CABINETS				
Item #	Estimated Qty	Unit	Description	Total Amount
1	1.0	LS	Stanton & Franklin Rail Switch Cabinet SCADA Hardware & Installation	
2	1.0	LS	Santa Fe Switch Cabinet SCADA Hardware & Installation	
ADD-ALT 1 TOTAL				

ADD-ALTERNATE 2: MONITORING OCS DISCONNECT & BYPASS SWITCHES				
Item #	Estimated Qty	Unit	Description	Total Amount
1	1.0	LS	DCL-BP1 Monitoring Equipment & Installation	
2	1.0	LS	DCL-BP2 Monitoring Equipment & Installation	
3	1.0	LS	ESL-BP1 Monitoring Equipment & Installation	
4	1.0	LS	ESL-BP2 Monitoring Equipment & Installation	
5	1.0	LS	S1-BP1 Monitoring Equipment & Installation	
6	1.0	LS	S2-BP2 Monitoring Equipment & Installation	
ADD-ALT 2 TOTAL				

TOTAL BID AMOUNT \$:

SIGNED _____

TITLE _____

DATE _____

IX. FORM OF CONTRACT

FORM OF CONTRACT

THE STATE OF TEXAS }

COUNTY OF EL PASO }

THIS AGREEMENT, made this _____ day of _____, 2020 by and between Camino Real Regional Mobility Authority, hereinafter called "Owner", and _____ a corporation located in: CITY OF _____ COUNTY OF _____ and STATE OF _____ hereinafter called "Contractor".

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned, to be made and performed by the Owner, the Contractor hereby agrees with the Owner to commence and complete the construction described as follows:

El Paso Streetcar SCADA hereinafter called the "Project", for the sum of _____ Dollars and ____ Cents (\$), and all extra work in connection therewith, under the terms as stated in the contract documents; and at Contractor(s) own proper cost and expense to furnish all the materials, supplies, machinery, equipment, tools, superintendence, labor, insurance and other accessories and services necessary to complete the said Project, in accordance with the conditions and prices stated in the Proposal, the General Conditions, Supplemental General Conditions and Special Conditions of the Contract, the plans, which include all maps, plats, blueprints and other drawings and printed or written explanatory matter thereof, the specifications and contract documents thereof as furnished by CRRMA or designated representative, all of which are made a part hereof and collectively evidence and constitute the Contract.

The Contractor agrees to commence work on a date to be specified in a written "Notice to Proceed" issued by the Owner. The Contract Time shall begin on the date to commence work specified in the "Notice to Proceed". Contractor shall Substantially Complete the project within **ONE HUNDRED AND EIGHTY CALENDAR DAYS** after the date to commence work in the "Notice to Proceed." Contractor agrees to pay, as liquidated damages, the sum of **(\$600)** for each working day after the expiration of the Contract Time for Remaining Work, as provided in Item 8L of the General Conditions. The unit price quantities of this contract are estimated.

Base Bid \$ _____

CONTRACT

IN WITNESS, WHEREOF, the parties to these presents have executed this Contract on the _____ day of _____, 20__ in two (2) counterparts, each of which shall be deemed an original, in the year and day first mentioned.

OWNER - CRRMA

by _____
Raymond Telles, Executive Director

APPROVED AS TO FORM:

Contractor:

CRRMA General Engineering Council

By _____

Typed Name & Title

APPROVED AS TO CONTENT:

Address, City, State, Zip Code

CRRMA General Engineering Council

Telephone Number

Fax Number

If the Contractor be a corporation, the following certificate should be executed:

I, _____, certify that I am the

Secretary of the corporation named as Bidder, hereinabove; and that
_____, who signed the foregoing Contract on behalf of the Bidder was
then _____ of said corporation; that said proposal was duly signed for and
in behalf of said corporation by authority of its governing body, and is within the scope of its corporate powers.

CORPORATE SECRETARY SIGNATURE AND CORPORATE SEAL

X. E – VERIFY CERTIFICATION

E-VERIFY CERTIFICATION

Pursuant to Executive Order RP-80, all state contracts for services must include a provision requiring Contractors to use the U.S. Department of Homeland Security's E-Verify system to determine employment eligibility. By signing the Contract, the Contractor certifies and ensures that for all contracts for services, Contractor will, to the extent permitted by law, utilize the United States Department of Homeland Security's E-Verify system during the term of the agreement to determine the eligibility of:

- ▲ All persons employed by Contractor during the term of the agreement to perform duties within the State of Texas; and**
- ▲ All persons, including subcontractors, assigned by Contractor to perform work pursuant to the agreement.**

Violation of this requirement shall constitute a material breach of the agreement.

XI. CONFLICT OF INTEREST

CERTIFICATION OF INTEREST IN OTHER BID PROPOSAL FOR THIS WORK

By signing this proposal the bidding firm and the signer certify that the following information, as indicated by checking “Yes” or “No” below, is true, accurate, and complete.

- A. Quotation(s) have been issued in this firm’s name to other firm(s) interested in this work for consideration for performing a portion of the work.

_____ YES

_____ NO

- B. If this proposal is the low bid, the bidder agrees to provide the following information prior to award of the contract.

1. Identify firms which bid as a prime contractor and from which the bidder received quotations for work on this project.
2. Identify all the firms which bid as prime contractor to which the bidder gave quotations for work on this project.

XII. GOVERNING SPECIFICATIONS AND SPECIAL PROVISIONS

Camino Real Regional Mobility Authority (CRRMA) GOVERNING SPECIFICATIONS AND SPECIAL PROVISIONS

ALL SPECIFICATIONS AND SPECIAL PROVISIONS APPLICABLE TO THIS PROJECT ARE IDENTIFIED AS FOLLOWS:

TXDOT STANDARD SPECIFICATIONS: ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION NOVEMBER 1, 2014. STANDARD SPECIFICATIONS ARE INCORPORATED INTO THE CONTRACT BY REFERENCE.

ITEMS 1L TO 9L INCL., GENERAL REQUIREMENTS

1L ABBREVIATIONS AND DEFINITIONS

2L INSTRUCTIONS TO BIDDERS

3L AWARD AND EXECUTION OF CONTRACT

4L SCOPE OF WORK

5L CONTROL OF THE WORK

6L CONTROL OF MATERIALS

7L LEGAL RELATIONS AND RESPONSIBILITIES

8L PROSECUTION AND PROGRESS

9L MEASUREMENT AND PAYMENT

SECTION 40 66 42 GENERAL

SECTION 34 21 32 SCADA SYSTEM

SECTION 40 66 43 WIRELESS NETWORK

SECTION 40 66 44 ADD-ALTERNATE WORK

EL PASO STREETCAR INFRASTRUCTURE SPECIFICATIONS: SPECIFICATIONS ARE
INCORPORATED INTO THE
CONTRACT BY REFERENCE.

SECTION 34 21 25 TPSS DC CONTROL POWER

SECTION 34 21 31 SUBSTATION AUTOMATION SYSTEM (SAS)

SECTION 34 21 33 RAIL-VOLTAGE MONITORING AND GROUNDING SYSTEM

SPECIAL SPECIFICATION EP-TWC TRAIN TO WAYSIDE COMMUNICATIONS SYSTEMS

TXDOT SPECIAL PROVISIONS: TXDOT SPECIAL PROVISIONS WILL GOVERN AND TAKE
PRECEDENCE OVER THE SPECIFICATIONS ENUMERATED HEREIN
WHEREVER IN CONFLICT THEREWITH.

SP 000-001L SCHEDULE OF LIQUIDATED DAMAGES

SP 000-002L NONSDISCRIMINATION

SP 000-008L SPECIAL LABOR PROVISIONS FOR STATE PROJECTS

SP 000-009L SMALL BUSINESS ENTERPRISE IN STATE FUNDED CONSTRUCTION

GENERAL: THE ABOVE-LISTED SPECIFICATION ITEMS ARE THOSE UNDER WHICH PAYMENT IS
TO BE MADE. THESE, TOGETHER WITH SUCH OTHER PERTINENT ITEMS, IF ANY, AS
MAY BE REFERRED TO IN THE ABOVE LISTED SPECIFICATION ITEMS, AND
INCLUDING THE SPECIAL PROVISIONS LISTED ABOVE, CONSTITUTE THE COMPLETE
SPECIFICATIONS FOR THIS PROJECT.

XIII. LOCAL GOVERNMENT GENERAL REQUIREMENTS

Item 1L

Abbreviations and Definitions

APPLICABILITY

Wherever the following terms are used in these specifications or other Contract documents, the intent and meaning will be interpreted as shown below.

ABBREVIATIONS

AAR	Association of American Railroads
AASHTO	American Association of State Highway Transportation Officials
AC	Alternating Current
ADA	Americans with Disabilities Act
ANSI	American National Standards Institute
AREMA	American Railway Engineering and Maintenance-of-Way Association
AWG	American Wire Gage
BMP	Best Management Practices
CFR	Code of Federal Regulations
COEP	City of El Paso
CRRMA	Camino Real Regional Mobility Authority
DBE	Disadvantaged Business Enterprise
DC	Direct Current
EMI	Electromagnetic Interference
EPA	United States Environmental Protection Agency
EPEC	El Paso Electric Company
FHWA	Federal Highway Administration, U.S. Department of Transportation
FSS	Federal Specifications and Standards (General Services Administration)
GUI	Graphic User Interface

HMI	Human Machine Interface
HVAC	High-Voltage Air Conditioning
IEEE	Institute of Electrical and Electronics Engineers
kA	Kilo-Amps
KCmil	Thousand Circular Mil
kV	Kilo-Volts
LAN	Local Area Network
LCD	Liquid Crystal Display
LED	Light Emitting Diode
mA	milliamps
MSF	Maintenance and Storage Facility
NCR	Nonconformance Report (TxDOT form)
NEC	National Electrical Code (Published by NFPA)
NEMA	National Electrical Manufacturers Association
NEPA	National Environmental Policy Act
NESC	National Electrical Safety Code
NFPA	National Fire Protection Association
OCS	Overhead Catenary System
OSHA	Occupational Safety & Health Administration, U.S. Department of Labor
PLC	Programmable Logic Controller
PS&E	Plans, Specifications, and Estimates
PSL	Project-Specific Location
QA	Quality Assurance
QC	Quality Control
RF	Radio Frequency

RRC	Railroad Commission of Texas
RTU	Remote Terminal Unit
SAS	Substation Automation System
SBE	Small Business Enterprise
SCADA	Supervisory Control and Data Acquisition
SI	International System of Units
SSS	SCADA System Supplier
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TDLR	Texas Department of Licensing and Regulation
TGC	Texas Government Code
TMUTCD	Texas Manual on Uniform Traffic Control Devices
TPS	Traction Power Substation
TWC	Train to Wayside Communication
TxDOT	Texas Department of Transportation
UL	Underwriters Laboratory, Inc.
USC	United States Code

DEFINITIONS

Actual Cost. Contractor's actual cost to provide labor, material, equipment, and project overhead necessary for the work.

Addendum. Change in bid documents developed between advertising and bid submittal deadline.

Additive Alternate. A bid item contained in the bid documents that is not a regular item or a replacement alternate bid item. The additive alternate items include work that may be added to the base bid work.

Deductive Alternate. A bid item contained in the bid documents that is not a regular item or a replacement alternate bid item. The deductive alternate items include work that may be deducted from the base bid work.

Advertisement. The public announcement required by law inviting bids for work to be performed or materials to be furnished.

Affiliates. Two or more firms are affiliated if they share common officers, directors, or stockholders; a family member of an officer, director, or stockholder of one firm serves in a similar capacity in another of the firms; an individual who has an interest in, or controls a part of, one firm either directly or indirectly also has an interest in, or controls a part of, another of the firms; the firms are so closely connected or associated that one of the firms, either directly or indirectly, controls or has the power to control another firm; one firm controls or has the power to control another of the firms; or the firms are closely allied through an established course of dealings, including, but not limited to, the lending of financial assistance.

Air Temperature. The temperature measured in degrees Fahrenheit (°F) in the shade, not in the direct rays of the sun, and away from artificial heat.

Anticipated Profit. Profit for work not performed.

Apparent Low Bidder. The Bidder determined to have the numerically lowest total bid as a result of the tabulation of bids by the Owner.

Notice of Award. The Owner's acceptance of a Contractor's bid for a proposed Contract that authorizes the Owner to enter into a Contract.

Base Bid. The total bid amount without additive alternates.

Bid. The offer from the Bidder for performing the work described in the bid documents, submitted on the prescribed bid form, considering addenda issued and giving unit bid prices for performing the work described in the bid documents.

Bid Bond. The security executed by the Contractor and the Surety furnished to the Owner to guarantee payment of liquidated damages if the Contractor fails to enter into an awarded Contract.

Bid Documents. The complete set of documents necessary for a Bidder to submit a bid. The documents may include plans, specifications, special specifications, special provisions, addenda, and the prescribed form a Bidder is to submit as the Bid. Other terms used may include general conditions, proposal, instructions to bidders, and construction specifications.

Bid Error. A mathematical mistake made by a Bidder in the unit price entered into the bid documents.

Bid Form. The portion of the bid documents that a prospective Bidder must submit to the Owner for their bid to be considered.

Bidder. An individual, partnership, limited liability company, corporation, or joint venture submitting a bid for a proposed Contract.

Building Contract. A Contract entered under State law for the construction or maintenance of an Owner building or appurtenance facilities. Building Contracts are considered to be construction Contracts.

Certificate of Insurance. A form approved by the Owner covering insurance requirements stated in the Contract.

Change Order. Written order to the Contractor detailing changes to the specified work, item quantities or any other modification to the Contract.

Construction Contract. A Contract entered under State law for the construction, reconstruction, or maintenance of a segment of the Owner's transportation system.

Consultant. The licensed professional engineer or engineering firm, or the architect or architectural firm, registered in the State of Texas and under Contract to the Owner to perform professional services. The consultant may be the Engineer or architect of record or may provide services through and be subcontracted to the Engineer or architect of record.

Contract. The agreement between the Owner and the Contractor establishing the obligations of the parties for furnishing of materials and performance of the work prescribed in the Contract documents.

Contract Documents. Elements of the Contract, including, but not limited to, the plans, specifications incorporated by reference, special provisions, special specifications, Contract bonds, change orders, addendums, and supplemental agreements.

Contract Time. The number of days specified for completion of the work, including authorized additional working days.

Contractor. The individual, partnership, limited liability company, corporation, or joint venture and all principals and representatives with which the Contract is made by the Owner.

Date of Written Authorization. Date of the written Notice to Proceed authorizing the Contractor to begin work.

Debar (Debarment). Action taken by the Owner, State, or federal government pursuant to regulation that prohibits a person or company from entering into a Contract, or from participating as a subcontractor, or supplier of materials or equipment used in a highway improvement Contract as defined in local, state, or federal law.

Department. When used in the context of the party with whom the Contractor has a Construction Contract, Department refers to Owner. When used in other contexts such as technical specifications, refers to the Texas Department of Transportation.

Disadvantaged Business Enterprise. A small business certified through the Texas Unified Certification Program in accordance with 49 CFR Part 26, that is at least 51% owned by one or more socially and economically disadvantaged individuals, or in the case of a publicly owned business, in which is at least 51% of the stock is owned by one or more socially and economically disadvantaged individuals, and whose management and daily business operations are controlled by one or more of the individuals who own it.

Engineer. The Professional Engineer licensed in Texas who represents the interests of the Owner.

Entity. Political subdivision for which the project is designed and constructed. Either a Municipality (City) or a County or other entity organized under the authority of State of Texas statutes. May also be referred to as an **Owner**.

Family Member. A family member of an individual is the individual's parent, parent's spouse, step-parent, step-parent's spouse, sibling, sibling's spouse, spouse, child, child's spouse, spouse's child, spouse's child's spouse, grandchild, grandparent, uncle, uncle's spouse, aunt, aunt's spouse, first cousin, or first cousin's spouse.

Force Account. Payment for directed work based on the actual cost of labor, equipment, and materials furnished with markups for project overhead and profit.

Historically Underutilized Business. A corporation, sole proprietorship, partnership, or joint venture formed for the purpose of making a profit certified by the Texas Comptroller of Public Accounts, and 51% owned by one or more persons who are economically disadvantaged because of their identification as members of certain groups, including African Americans, Hispanic Americans, Asian-Pacific Americans, Native Americans, or women, and have a proportionate interest and demonstrate active participation in the control, operation, and management of the business' affairs. Individuals meeting the HUB definition are required to be residents of the State of Texas. Businesses that do not have their primary headquarters in the State of Texas are not eligible for HUB certification.

Incentive/Disincentive Provisions. An adjustment to the Contract price of a predetermined amount for each day the work is completed ahead of or behind the specified milestone, phase, or Contract completion dates. The amount of the incentive/disincentive is determined based on estimated costs for engineering, traffic control, delays to the motorists, and other items involved in the Contract.

Independent Assurance Tests. Tests used to evaluate the sampling and testing techniques and equipment used in the acceptance program. The tests are performed by the Owner or the Owner's representative and are not used for acceptance purposes.

Inspector. The person assigned by the Owner to inspect any or all parts of the work and the materials used for compliance with the Contract.

Intersection. The general area where 2 or more highways, streets, or roads join or cross, including the roadway and roadside facilities for traffic movements within it.

Joint Venture. Any combination of individuals, partnerships, limited liability companies, or corporations submitting a single bid form.

Letting. The receipt, opening, tabulation, and determination of the apparent low Bidder.

Letting Official. The Owner representative empowered by the Owner to officially receive bids and close the receipt of bids at a letting.

Licensed Professional Engineer. A person who has been duly licensed by the Texas Board of Professional Engineers to engage in the practice of engineering in the State of Texas; also referred to as a Professional Engineer.

Limits of Construction. An area with established boundaries, identified within the highway right of way and easements, where the Contractor is permitted to perform the work.

Local Street or Road. A street or road primarily for access to residence, business, or other abutting property.

Materially Unbalanced Bid. A bid that generates a reasonable doubt that award to the Bidder submitting a mathematically unbalanced bid will result in the lowest ultimate cost to the Owner.

Mathematically Unbalanced Bid. A bid containing bid prices that do not reflect reasonable actual costs plus a reasonable proportionate share of the Bidder's anticipated profit, overhead costs, and other indirect costs.

Milestone Date. The date that a specific portion of the work is to be completed, before the completion date for all work under the Contract.

National Holidays. January 1, the last Monday in May, July 4, the first Monday in September, the fourth Thursday in November, and December 24 or December 25.

Nonresident Bidder. A Bidder whose principal place of business is not in Texas. This includes a Bidder whose ultimate parent company or majority owner does not have its principal place of business in Texas.

Nonresponsive Bid. A bid that does not meet the criteria for acceptance contained in the bid documents.

Notice to Proceed, Written notification to the Contractor authorizing work to begin.

Notification. Either written or oral instruction to the Contractor concerning the work. Voice mail is oral notification.

Owner, Political subdivision for whom the project is designed and constructed. Either a Municipality (City), a County or other entity organized under the authority of State of Texas statutes. May also be referred to as an **Entity**.

Payment Bond. The security executed by the Contractor and the Surety, furnished to the Owner to guarantee payment of all legal debts of the Contractor pertaining to the Contract.

Performance Bond. The security executed by the Contractor and the Surety, furnished to the Owner to guarantee the completion of the work in accordance with the terms of the Contract.

Plans. The approved drawings, including true reproductions of the drawings that show the location, character, dimensions, and details of the work and are a part of the Contract.

Power of Attorney for Surety Bonds. An instrument under corporate seal appointing an attorney-in-fact to act on behalf of a Surety in signing bonds.

Qualification. The process for determining a Contractor's eligibility to be awarded a construction contract

Prequalification. The process for determining a Contractor's eligibility to bid work.

Prequalification Statement. The forms on which required information is furnished concerning the Contractor's ability to perform and finance the work.

Prequalified Contractor. A contractor that is approved to bid on TxDOT contracts by satisfying their Prequalification Process.

Post Qualification. The owner will determine if contractors are qualified to bid on the project after bids are open. The bid documents will identify the minimum requirements that contractor must meet to be qualified for the project. Unqualified contractors' bids will be considered non-responsive and not accepted.

Project-Specific Location. A material source, plant, waste site, parking area, storage area, field office, staging area, haul road, or other similar location either outside the project limits or within the project limits but not specifically addressed in the Contract.

Proposal Guaranty. The security furnished by the Bidder as a guarantee that the Bidder will enter into a Contract if awarded the work.

Quality Assurance. Sampling, testing, inspection, and other activities conducted by the Engineer to determine payment and make acceptance decisions.

Quality Control. Sampling, testing, and other process control activities conducted by the Contractor to monitor production and placement operations.

Referee Tests. Tests requested to resolve differences between Contractor and Owner test results. The referee laboratory is the Owners.

Regular Item. A bid item contained in the bid documents and not designated as an additive alternate or replacement alternate bid item.

Replacement Alternate. A bid item identified on the bid documents that a Bidder may substitute for a specific regular item of work.

Responsive Bid. A bid that meets all requirements of the advertisement and the bid documents for acceptance.

Right of Way. A general term denoting land or property devoted to transportation purposes.

Sidewalk. Portion of the right of way constructed exclusively for pedestrian use.

Special Provisions. Additions or revisions to these standard specifications or special specifications.

Special Specifications. Supplemental specifications applicable to the Contract not covered by these standard specifications.

Specifications. Directives or requirements issued or made pertaining to the method and manner of performing the work or to quantities and qualities of materials to be furnished under the Contract. References to DMSs, ASTM or AASHTO specifications, or TxDOT bulletins and manuals, imply the latest standard or tentative standard in effect on the date of the bid. The Owner will consider incorporation of subsequent changes to these documents in accordance with Item 4L, "Scope of Work."

Small Business Enterprise. A firm (including affiliates) whose annual gross receipts do not exceed the U.S. Small Business Administration's size standards for 4 consecutive years.

State. The State of Texas.

State Holiday. A holiday authorized by the State Legislature excluding optional state holidays and not listed in Section 1.3.85., "National Holidays." A list of state holidays can be found on the TxDOT's website.

Station. A unit of measurement consisting of 100 horizontal feet.

Subcontract. The agreement between the Contractor and subcontractor establishing the obligations of the parties for furnishing of materials and performance of the work prescribed in the Contract documents.

Subcontractor. An individual, partnership, limited liability company, corporation, or any combination thereof that the Contractor sublets, or proposes to sublet, any portion of a Contract, excluding a material supplier, a

hauling firm hauling only from a commercial source to the project, truck owner-operator, wholly-owned subsidiary, or specialty-type businesses such as security companies and rental companies.

Subsidiary. Materials, labor, or other elements that because of their nature or quantity have not been identified as a separate item and are included within the items on which they necessarily depend.

Superintendent. The representative of the Contractor who is available at all times and able to receive

Supplemental Agreement. Written agreement entered into between the Contractor and the Owner and approved by the Surety, covering alterations and changes in the Contract. A supplemental agreement is used by the Owner whenever the modifications include assignment of the Contract from one party to another or other cases as desired by the Owner.

Surety. The corporate body or bodies authorized to do business in Texas bound with and for the Contractor for the faithful performance of the work covered by the Contract and for the payment for all labor and material supplied in the prosecution of the work.

Surplus Materials. Any debris or material related to the Contract but not incorporated into the work.

Suspension. Action taken by the Owner, State, or federal government pursuant to regulation that prohibits a person or company from entering into a Contract, or from participating as a subcontractor, or supplier of materials or equipment used in a contract

Utility. Privately, publicly, or cooperatively owned lines, facilities, and systems for producing, transmitting, or distributing communications, power, heat, gas, oil, water, waste, or storm water that are not connected with the highway drainage, signal systems, or other products that directly or indirectly serve the public; the utility company.

Verification Tests. Tests used to verify accuracy of QC and QA and mixture design testing.

Wholly-Owned Subsidiary. A legal entity owned entirely by the Contractor or subcontractor.

Work. The furnishing of all labor, materials, equipment, and other incidentals necessary for the successful completion of the Contract.

Written Notice. Written notice is considered to have been duly given if delivered in person to the individual or member to whom it is intended or if sent by regular, registered, or certified mail and delivered to the last known business address; sent by facsimile to the last known phone number; or sent by e-mail to the last known address. The date of the letter will serve as the beginning day of notice. Unclaimed mail or failure to provide current mailing address will not be considered a failure to provide written notice.

Item 2L

Instructions to Bidders

INTRODUCTION

Instructions to the Contractor in these specifications are generally written in active voice, imperative mood. The subject of imperative sentences is understood to be “the Contractor.” The Owner’s responsibilities are generally written in passive voice, indicative mood. Phrases such as “as approved,” “unless otherwise approved,” “upon approval,” “as directed,” “as verified,” “as ordered,” and “as determined” refer to actions of the Engineer unless otherwise stated, and it is understood that the directions, orders, or instructions to which they relate are within the limitations of and authorized by the Contract.

ELIGIBILITY OF BIDDERS

Bidders on this project must be prequalified through TxDOT. Refer to TxDOT’s web site for prequalification requirements. Assure prequalification documents are submitted to TxDOT at least 14 days before bid opening. Comply with all technical prequalification requirements in the bid documents.

ISSUING BID DOCUMENTS

Bid Documents may be obtained at CRRMA’s Website, www.crrma.org

Copies will be available in CD format at no cost.

At the time Bid Documents are obtained, Bidder must provide a working e-mail address, so as to receive any addenda or clarification issued by the Owner.

The Owner will not issue bid documents if one or more of the following apply:

- the Bidder is prohibited from rebidding a specific project due to a bid error on the original bid documents,
- the Bidder failed to enter into a Contract on the original award,
- the Bidder was defaulted or terminated on the original Contract, unless the Owner terminated for convenience, or
- the Bidder or a subsidiary or affiliate of the Bidder has received compensation from the Owner to participate in the preparation of the plans or specifications on which the bid or Contract is based.

INTERPRETING ESTIMATED QUANTITIES

The quantities listed in the bid documents are approximate and will be used for the comparison of bids. Payments will be made for actual quantities of work performed in accordance with the Contract.

EXAMINING DOCUMENTS AND WORK LOCATIONS

Examine the bid documents and specified work locations before submitting a bid for the work. Submitting a bid will be considered evidence that the Bidder has performed this examination. Borings, soil profiles, water elevations, and underground utilities shown on the plans were obtained for the use of the Owner in the preparation of plans. This information is provided for the Bidder's information only and the Owner makes no representation as to the accuracy of the data. Be aware of the difficulty of accurately classifying all material encountered in making foundation investigations, the possible erosion of stream channels and banks after survey data have been obtained, and the unreliability of water elevations other than for the date recorded.

Oral explanations, instructions, or consideration for Contractor-proposed changes in the bid documents given during the bidding process are not binding. Only requirements included in the bid documents and Owner-issued addenda are binding. Request explanations of documents at least five (5) days prior to the bid opening.

Immediately notify the Owner of any error, omission, or ambiguity discovered in any part of the bid documents. The Owner will issue addenda when appropriate.

PREPARING THE BID

Prepare the bid form furnished by the Owner. Informational bid forms printed from the Owner's website will not be accepted.

Specify a unit price in dollars and cents for each regular item, additive alternate item, deductive alternate item or replacement alternate item for which an estimated quantity is given.

When "Working Days" is an item, submit the number of working days to be used to complete the Contract or phases of the Contract.

The Owner will not accept an incomplete bid. A bid that has one or more of the deficiencies listed below is considered incomplete:

- the bid form was not signed,
 - all certifications were not acknowledged,
 - a regular item, additive alternate item or deductive alternate item is left blank,
 - a regular item and the corresponding replacement alternate item are left blank,
 - the bid form submitted had the incorrect number of items, or
- all addenda were not acknowledged.

NONRESPONSIVE BID

The Owner will not accept a nonresponsive bid. A bid that has one or more of the deficiencies listed below is considered nonresponsive:

- The bid was not in the hands of the Letting Official at the time and location specified in the advertisement.
- A bid was submitted for the same project by a Bidder or Bidders and one or more of its partners or affiliates.

- The Bidder failed to acknowledge receipt of all addenda issued.
- The bid form was signed by a person who was not authorized to bind the Bidder or Bidders.
- The bid guaranty did not comply with the requirements contained in this Item.
- The bid was in a form other than the official bid form issued by the Owner.
- The Bidder modified the bid in a manner that altered the conditions or requirements for work as stated in the bid documents.
- The Bidder bid more than the maximum or less than the minimum number of allowable working days when working days was an item.
- The Bidder did not attend a specified mandatory pre-bid conference.
- The Bidder did not meet the requirements of the technical qualification.
- The Bidder did not include a signed State of Texas Child Support Business Ownership Form.
- The bidder is not prequalified by TxDOT
- The bidder does not meet the Owner's qualification requirements.

SUBMITTAL OF BIDS

Electronic Bids. When electronic bidding is available, the Bidder is responsible for taking the appropriate measures to submit a bid. These measures include, but are not limited to, acquiring hardware, software, and Internet connectivity needed for submitting a bid via the Owner's bidding system.

Bid Form. Use the electronic bid form in the Owner's bidding system. When regular bid items have corresponding replacement alternate items, select the bid item or group of items to be used for the bid tabulation. Acknowledge all addenda listed in the Owner's bidding system.

The electronic bid form may not contain the special provisions, special specifications, general notes, and other Contract documents. These documents are included by reference.

Bid Guaranty. Provide a bid guaranty in the amount indicated on the bid form. Use an electronic bid bond. Guaranty checks or printed bid bonds will not be accepted.

Use the most current version of the electronic bond accepted by the Owner. For a joint venture, the bond must be in the name of all joint venture participants. Enter the bond authorization code into the Owner's bidding system.

It is the Bidder's responsibility to ensure the electronic bid bond is issued in the name or names of the Bidder or Bidders.

Submittal of Bid. Submit the bid using the Owner's bidding system.

Revising the Bid Form. Make desired changes as allowed by the Owner's bidding system up until the time and date set for the opening of bids. The last bid submitted will be used for tabulation purposes.

Withdrawing a Bid. Submit an electronic or written request to withdraw a bid before the time and date set for the opening. The Owner will not accept oral requests. An electronic request must be made using the Owner's bidding system.

A written request must be signed and submitted to the Letting Official with proof of identification. The request must be made by a person authorized to bind the Bidder or Bidders. In the case of joint venture, the Owner will accept a request from any person authorized to bind a party to the joint venture. The Owner may require written delegation of authority to withdraw a bid when the individual sent to withdraw the bid is not authorized to bind the Bidder or Bidders.

Printed Bid.

Bid Form. Mark all entries in ink. As an alternative to hand writing the unit prices in the bid form, submit a typed bid form. A typed bid form must contain the information in the format shown on the “Example of Bid Prices Submitted by Computer Printout” in the bid form.

When regular bid items have corresponding replacement alternate items, select the bid item or group of items to be used for the bid tabulation. Acknowledge all addenda by checking the appropriate box on the addendum acknowledgement page. Provide the complete and correct name of the Bidder submitting the bid. A person authorized to bind the Bidder must sign the bid form. In the case of a joint venture, provide the complete and correct name of all Bidders submitting the bid. In the case of a joint venture, the person signing the bid form must be authorized to bind all joint venture participants.

If a bid form contains both regular items for domestic steel or iron materials and replacement alternate items for foreign steel or iron materials, the Bidder must either:

submit unit bid prices for domestic items only, or
submit unit bid prices for both the domestic and foreign items.

Bid Guaranty. Provide a bid guaranty in the amount indicated on the bid documents. Use either a guaranty check or a printed bid bond. An electronic bid bond may be used as the guaranty. Ensure the electronic bid bond meets the requirements of Section 2.8.1.2., “Bid Guaranty,” and submit the electronic bid bond with the printed bid.

Guaranty Check. Make the check payable to the Owner. The check must be a cashier’s check, money order, or teller’s check drawn by or on a state or national bank, or a state or federally chartered credit union (collectively referred to as “bank”). The check must be dated on or before the date of the bid opening. Postdated checks will not be accepted. The type of check or money order must be indicated on the face of the instrument, except in the case of a teller’s check, and the instrument must be no more than 90 days old. A check must be made payable at or through the institution issuing the instrument; be drawn by a bank and on a bank; or be payable at or through a bank. The Owner will not accept personal checks, certified checks, or other types of money orders.

Bid Bond. Use the bid bond form provided by the Owner. Submit the bid bond with the powers of attorney attached and, in the amount, specified. The bond must be dated on or before the date of the bid opening, bear the impressed seal of the Surety, and be signed by the Bidder or Bidders and an authorized individual of the Surety. As an alternative for joint venture Bidders, each of the Bidders may submit a separate bid bond completed as outlined in this section. Bid bonds will only be accepted from Sureties authorized to execute a bond under and in accordance with State law.

Submittal of Bid. Place the completed bid form and the bid guaranty in a sealed envelope marked to indicate the contents.

When submitting by mail or delivery service, place the envelope in another sealed envelope and address as indicated in the official advertisement or in the bid documents. It is the Bidder's responsibility to ensure that the sealed bid arrives at the location described on or before the time and date set for the bid opening. To be accepted, the bid must be in the hands of the Letting Official by that time of opening regardless of the method chosen for delivery.

Revising the Bid Form. Make desired changes to the bid form in ink and submit the bid to the Letting Official. The Owner will not make revisions to a bid on behalf of a Bidder.

Withdrawing a Bid. Submit a written request to withdraw a bid before the time and date set for the opening. The Owner will not accept oral requests. A written request must be signed and submitted to the Letting Official with proof of identification. The request must be made by a person authorized to bind the Bidder or Bidders. In the case of joint venture, the Owner will accept a request from any person authorized to bind a party to the joint venture. The Owner may require written delegation of authority to withdraw a bid when the individual sent to withdraw the bid is not authorized to bind the Bidder or Bidders.

OPENING AND READING OF BIDS

At the time, date, and location specified in the official advertisement, the Owner will publicly open and read bids.

TABULATING BIDS

Official Total Bid Amount. The Owner will sum the products of the quantities and the unit prices bid in the bid form to determine the official total bid amount, except as provided in Section 2.11., "Consideration of Unit Prices." The official total bid amount is the basis for determining the apparent low Bidder. The total bid amounts will be compared, and the results made public.

Rounding of Unit Prices. The Owner will round off all unit bids involving fractional parts of a cent to the nearest one-tenth cent (\$0.001) in determining the amount of the bid as well as computing the amount due for payment of each item under the Contract. For rounding purposes, entries of five-hundredths of a cent (\$0.0005) or more will be rounded up to the next highest tenth of a cent, while entries less than five-hundredths of a cent will be rounded down to the next lowest tenth of a cent.

Interpretation of Unit Prices. The Owner will make a documented determination of the unit bid price if a unit bid price is illegible or conflicting in the case of replacement alternate items. The Owner's determination will be final.

Consideration of Unit Prices.

A + B Bidding. The official total bid amount will be determined by the summation of the Contract amount and the time element. The Owner will use the following formula to make the calculation:

$$A + B1 + B2 + BX + \dots + BT$$

The Contract amount, equal to A in the formula, is determined by the summation of the products of the approximate quantities shown in the bid and the unit bid prices bid. The time element, equal to B1, B2, BX (when phases are included as bid components), and BT (substantial completion of the project when included as

a bid component), of the bid is determined by multiplying the number of working days bid to substantially complete the project, or phases, by the daily road-user cost (RUC) provided on the bid documents. When partial days are bid, they will be rounded up to the nearest whole day.

The formula above determines the low Bidder and establishes the Contract time.

Buy America. Unless otherwise stated in the contract and specifications, bidder must comply with FTA's Buy America requirements set by 49 U.S.C 5323(j)(1) and the applicable regulations in 49 CFR Part 661 and certify it complies by submitting a Buy America Certification with the bid response.

CONSIDERATION OF BID ERRORS.

The Owner will consider a claim of a bid error by the apparent low Bidder if the following requirements have been met:

Submit written notification to the Owner within 5 business days after the date the bid is opened.

Identify the items of work involved and include bidding documentation. The Owner may request clarification of submitted documentation.

The Owner will evaluate the claim of an error by the apparent low Bidder by considering the following:

The bid error relates to a material item of work.

The bid error amount is a significant portion of the total bid.

The bid error occurred despite the exercise of ordinary care.

The delay of the proposed work will not impact cost and safety to the public.

Acceptance of the bid error claim by the Owner will result in the rejection of the bid of the apparent low bidder and the Owner may consider the second responsive bid. The erring Contractor will not be allowed to bid the project if it is re-let. Rejection of bids due to the Contractor's bid error may result in the application of sanctions by the Owner.

TIE BIDS

If the official total bid amount for 2 or more Bidders is equal and those bids are the lowest submitted, each tie Bidder will be given an opportunity to withdraw their bid. If 2 or more tie Bidders do not withdraw their bids, the low Bidder will be determined by a coin toss. If all tie Bidders request to withdraw their bids, no withdrawals will be allowed, and the low Bidder will be determined by a coin toss. The Letting Official will preside over the proceedings for the coin toss.

Item 3L

Award and Execution of Contract

AWARD OF CONTRACT

The Owner will award, reject, or defer the Contract within 30 days after the opening of the bid. The Owner reserves the right to reject any or all bids and to waive technicalities in the best interest of the Owner.

Award. The Owner will award the Contract to the low Bidder as determined by Article 2.11., “Tabulating Bids.” The Owner may award a Contract to the second lowest Bidder when the following requirements have been met:

- The low Bidder withdraws its bid.
- The low Bidder fails to enter into a contract with the Owner after Award
- The second low Bidder’s unit bid prices are reasonable.

Rejection. The Owner will reject the Contract if:

- Collusion may have existed among the Bidders. Collusion participants will not be allowed to bid future bids for the same Contract.
- The low bid is mathematically and materially unbalanced. The Bidder will not be allowed to bid future bids for the same Contract.
- The lowest bid is higher than the Owner’s estimate and re-advertising for bids may result in a lower bid.
- Rejection of the Contract is in the best interest of the Owner.

Deferral. The Owner may defer the award or rejection of the Contract when deferral is in the best interest of the Owner.

RESCINDING OF AWARD

1. The Owner reserves the right to cancel the award of any Contract before Contract execution with no compensation due when the cancellation is in the best interest of the Owner. The Owner will return the bid guaranty to the Contractor.

DISADVANTAGED BUSINESS ENTERPRISE (DBE)/HISTORICALLY UNDERUTILIZED BUSINESS/SMALL BUSINESS ENTERPRISE (SBE)

2. Submit all DBE/HUB/SBE information in the time frame specified when required by the bid documents.

EXECUTION OF CONTRACT

Provide the following within 15 days after written notification of award of the Contract:

Contract. Executed by Contractor and Surety.

Bonds. Executed performance bond and payment bond in the full amount of the Contract price with powers of attorney. Provide bonds in accordance with Table 1. Furnish the payment and performance bonds as a guaranty for the protection of the claimants and the Owner for labor and materials and the faithful performance of the work.

Table 1

Bonding Requirements

Contract Amount	Required Bonds
Less than \$25,000	None
\$25,000 to \$100,000	Payment
More than \$100,000	Performance and Payment

Insurance. Submit a Certificate of Insurance showing coverages in accordance with Contract requirements.

Insurances must cover the contracted work for the duration of the Contract and must remain in effect until final acceptance. Failure to obtain and maintain insurance for the contracted work may result in suspension of work or default of the Contract. If the insurance expires and coverage lapses for any reason, stop all work until the Owner receives an acceptable Certificate of Insurance.

Provide the Owner with a Certificate of Insurance verifying the types and amounts of coverage shown in Table 2. The Certificate of Insurance must be in a form approved by the Owner. Any Certificate of Insurance provided must be available for public inspection.

Table 2
Insurance Requirements

Type of Insurance	Amount of Coverage
Commercial General Liability Insurance	Not Less Than: \$600,000 each occurrence
Business Automobile Policy	Not Less Than: \$600,000 combined single limit
Workers' Compensation	Not Less Than: Statutory
All Risk Builder's Risk Insurance (For building-facilities Contracts only)	100% of Contract Price

By signing the Contract, the Contractor certifies compliance with all applicable laws, rules, and regulations pertaining to workers' compensation insurance. This certification includes all subcontractors. Pay all deductibles stated in the policy. Subcontractors must meet the requirements of Table 2 either through their own coverage or through the Contractor's coverage.

The Workers' Compensation policy must include a waiver of subrogation endorsement in favor of the Owner.

For building-facilities Contracts, provide All Risk Builder's Risk Insurance to protect the Owner against loss by storm, fire or extended coverage perils on work and materials intended for use on the project including the adjacent structure. Name the Owner under the Lost Payable Clause.

For Contracts with railroad requirements, see project-specific details for additional insurance requirements.

Provide a substitute Surety on the Contract bonds in the original full Contract amount within 15 days of notification if the Surety is declared bankrupt or insolvent, the Surety's underwriting limitation drops below the Contract amount or the Surety's right to do business is terminated by the Owner. The substitute Surety must be authorized by the laws of the State and acceptable to the Owner. Work will be suspended until a substitute Surety is provided. Working day charges will be suspended for 15 days or until an acceptable Surety is provided, whichever is sooner.

The work performed under this section will not be measured or paid for directly but will be subsidiary to pertinent items.

Railroad Documents. Provide all required documents for satisfaction of railroad requirements for projects that have work which involves railroad right of way.

FAILURE TO ENTER CONTRACT

If the Contractor fails to comply with all of the requirements in Article 3.4., “Execution of Contract,” the bid guaranty will become the property of the Owner, not as a penalty, but as liquidated damages. The Contractor forfeiting the bid guaranty will not be considered in future bids for the same work unless there has been a substantial change in design of the work.

APPROVAL AND EXECUTION OF CONTRACT

The Contract will be approved and signed under authority of the Owner.

RETURN OF BID GUARANTY

The bid guaranty check of the low Bidder will be retained until after the Contract has been rejected or awarded and executed. Bid bonds will not be returned.

BEGINNING OF WORK

Do not begin work until authorized in writing by the Owner.

When callout work is required, provide a method of contact available from 8 A.M. until 5 P.M. every work day and 24 hr. a day, 7 days a week for projects with emergency mobilization, unless otherwise shown on the plans. The time of notice will be the transmission time of the notice sent, provided orally, or provided in person by the Owner’s representative.

Verify all quantities of materials shown on the plans before ordering.

For projects with alternate bid items, the work order will identify the base bid work and additive or deductive alternate work to be performed. The Owner makes no guarantee that the additive or deductive alternate work will be required.

ASSIGNMENT OF CONTRACT

Do not assign, sell, transfer, or otherwise dispose of the Contract or any portion rights, title, or interest (including claims) without the approval of the Owner or designated representative. The Owner must deem any proposed assignment justified and legally acceptable before the assignment can take place.

EXCLUDED PARTIES

The Contractor certifies by signing the Contract that the Contractor will not enter into any subcontract with a subcontractor that is debarred or suspended by the Owner or by any state or federal agency.

Item 4L**Scope of Work**

CONTRACT INTENT

The intent of the Contract is to describe the completed work to be performed. Furnish materials, supplies, tools, equipment, labor, and other incidentals necessary for the proper prosecution and completion of the work in accordance with Contract documents.

PRECONSTRUCTION CONFERENCE

Before starting work, schedule and attend a preconstruction conference with the Owner. Failure to schedule and attend a preconstruction conference is not grounds for delaying the beginning of working day charges.

Work with the Owner to resolve all issues during the course of the Contract. Refer to Article 4.7., "Dispute or Claims Procedure," for all unresolved issues.

PARTNERING (OPTIONAL)

The intent of this Article is to promote an environment of trust, mutual respect, integrity, and fair-dealing between the Owner and the Contractor.

Informal partnering does not make use of a facilitator, while formal partnering uses the services of a facilitator (internal or external).

Procedures for Partnering Meetings and Format. Informal partnering is required, unless formal partnering is mutually agreed to instead of the informal partnering.

Facilitators. The facilitator is to act as a neutral party seeking to initiate cooperative working relationships. This individual must have the technical knowledge and ability to lead and guide discussions. Choose either an internal or external facilitator. The facilitator must be acceptable to the Engineer.

Internal Facilitators. An Owner or Contractor internal (staff) facilitator may be selected as the facilitator at no additional cost to either party.

External Facilitators. A private firm or individual that is independent of the Contractor and the Owner may be selected as the facilitator. Submit the facilitator's name and estimated fees for approval before contracting with the facilitator.

Meetings and Arrangements. Coordinate with the Engineer for meeting dates and times, locations including third party facilities, and other needs and appurtenances, including, but not limited to, audio or visual equipment. Make all meeting arrangements for formal partnering. Use Owner facilities or facilities in the vicinity of the project if available. Submit the estimated meeting costs for approval before finalizing arrangements.

Coordinate facilitator discussions before the partnering meeting to allow the facilitator time to prepare an appropriate agenda. Prepare a list of attendees with job titles and include critical Contractor, subcontractor, and supplier staff in the list. Provide the facilitator the list of attendees and invite the attendees listed.

The Owner will invite and provide a list of attendees that includes, but is not limited to, Owner, TxDOT, other local governments, law enforcement, railroad, and utility representatives.

Participate in additional partnering meetings as mutually agreed.

Payment. Expenses for labor, Contractor equipment, or overhead will not be allowed. Markups as prescribed in Article 9.7., “Payment for Extra Work and Force Account Method,” will not be allowed.

Informal partnering will be conducted with each party responsible for their own costs.

For formal partnering using internal facilitators, the Contractor will be responsible for arrangements and for expenses incurred by its internal facilitator, including, but not limited to, meals, travel, and lodging. Owner facilitators, if available, may be used at no additional cost.

For formal partnering using external facilitators, submit an invoice to the Engineer for reimbursement. The Owner will reimburse the Contractor for half of the eligible expenses as approved. For external facilitators not approved by the Owner but used at the Contractor’s option, the Contractor will be responsible for all costs of the external facilitator.

For meeting facilities and appurtenances, submit an invoice to the Engineer for reimbursement. The Owner will reimburse the Contractor for half of the eligible expenses as approved.

CHANGES IN THE WORK

The Engineer reserves the right to make changes in the work including addition, reduction, or elimination of quantities and alterations needed to complete the Contract. Perform the work as altered. These changes will not invalidate the Contract nor release the Surety. The Contractor is responsible for notifying the sureties of any changes to the Contract.

If the changes in quantities or the alterations do not significantly change the character of the work under the Contract, the altered work will be paid for at the Contract unit price. If the changes in quantities or the alterations significantly change the character of the work, the Contract will be amended by a change order. If no unit prices exist, this will be considered extra work and the Contract will be amended by a change order. Provide cost justification as requested, in an acceptable format. Payment will not be made for anticipated profits on work that is eliminated.

Agree on the scope of work and the basis of payment for the change order before beginning the work. If there is no agreement, the Engineer may order the work to proceed under Article 9.7., “Payment for Extra Work and Force Account Method,” or by making an interim adjustment to the Contract. In the case of an adjustment, the Engineer will consider modifying the compensation after the work is performed.

A significant change in the character of the work occurs when:

- the character of the work for any item as altered differs materially in kind or nature from that in the Contract or
- a major item of work varies by more or less than 25% from the original Contract quantity.

When the quantity of work to be done under any major item of the Contract is more than 125% of the original quantity stated in the Contract, then either party to the Contract may request an adjustment to the unit price on the portion of the work that is above 125%.

When the quantity of work to be done under any major item of the Contract is less than 75% of the original quantity stated in the Contract, then either party to the Contract may request an adjustment to the unit price. When mutually agreed, the unit price may be adjusted by multiplying the Contract unit price by the factor in Table 1. If an adjusted unit price cannot be agreed upon, the Engineer may determine the unit price by multiplying the Contract unit price by the factor in Table 1.

Table 1

Quantity-Based Price Adjustment Factors

% of Original Quantity	Factor
≥ 50 and < 75	1.05
≥ 25 and < 50	1.15
< 25	1.25

If the changes require additional working days to complete the Contract, Contract working days will be adjusted in accordance with Item 8, "Prosecution and Progress."

DIFFERING SITE CONDITIONS

During the progress of the work, differing subsurface or latent physical conditions may be encountered at the site. The 2 types of differing site conditions are defined as:

- those that differ materially from those indicated in the Contract and
- unknown physical conditions of an unusual nature differing materially from those ordinarily encountered and generally recognized as inherent in the work provided for in the Contract.

Notify the Engineer in writing when differing site conditions are encountered. The Engineer will notify the Contractor when the Owner discovers differing site conditions. Unless directed otherwise, do not work on the affected items and leave the site undisturbed. The Engineer will investigate the conditions and determine whether differing site conditions exist. If the differing site conditions cause an increase or decrease in the cost or number of working days specified for

the performance of the Contract, the Engineer will make adjustments, excluding the loss of anticipated profits, in accordance with the Contract. Additional compensation will be made only if the required written notice has been provided.

REQUESTS FOR ADDITIONAL COMPENSATION

Notify the Engineer in writing of any intent to request additional compensation once there is knowledge of the basis for the request. An assessment of damages is not required to be part of this notice but is desirable. The intent of the written notice requirement is to provide the Owner an opportunity to evaluate the request and to keep an accurate account of the actual costs that may arise. Minimize impacts and costs.

If written notice is not given, the Contractor waives the right to additional compensation unless the circumstances could have reasonably prevented the Contractor from knowing the cost impact before performing the work. Notice of the request and the documentation of the costs will not be construed as proof or substantiation of the validity of the request. Submit the request in enough detail to enable the Owner to determine the basis for entitlement, adjustment in the number of working days specified in the Contract, and compensation.

The Owner will not consider fees and interest on requests for additional compensation. Fees include, but are not limited to: preparation, attorney, printing, shipping, and various other fees.

Damages occur when impacts that are the responsibility of the Owner result in additional costs to the Contractor that could not have been reasonably anticipated at the time of letting. Costs of performing additional work are not considered damages. For Contractor damages, the intent is to reimburse the Contractor for actual expenses arising out of a compensable impact. No profit or markups, other than labor burden, will be allowed. For damages, labor burden will be reimbursed at 35% unless the Contractor can justify higher actual cost. Justification for a higher percentage must be in accordance with the methodology provided by the Owner, submitted separately for project overhead labor and direct labor, and determined and submitted by a Certified Public Accountant (CPA). Submit CPA-prepared labor burden rates directly to the Owner.

If the Contractor requests compensation for delay damages and the delay is determined to be compensable, then standby equipment costs and project overhead compensation will be based on the duration of the compensable delay and will be limited as follows:

Standby Equipment Costs. Payment will be made in accordance with Section 9.7.1.4.3., “Standby Equipment Costs.”

Project Overhead. Project overhead is defined as the administrative and supervisory expenses incurred at the work locations. When delay to project completion occurs, reimbursement for project overhead for the Contractor will be made using the following options:
reimbursed at 6% (computed as daily cost by dividing 6% of the original Contract amount by the number of original Contract work days), or
actual documented costs for the impacted period.

Project overhead for delays impacting subcontractors will be determined from actual documented costs submitted by the Contractor.

Time extensions and suspensions alone will not be justification for reimbursement for project overhead.

Home Office Overhead. The Owner will not compensate the Contractor for home office overhead.

DISPUTE OR CLAIMS PROCEDURE

The dispute resolution policy promotes a cooperative attitude between the Engineer and Contractor. Emphasis is placed on resolving issues while they are still current, at the project office, and in an informal manner. Open sharing of information is encouraged by all parties involved so the information provided completely and accurately reflects the issues and facts. If information is not shared, decisions may be limited to relying on the documentation that is available for review.

The Owners' goal is to have a dispute settled by the Engineer before elevating it as a claim.

If a dispute cannot be resolved, initiate the Contract claim procedure by filing a Contract claim after the completion of the Contract or when required for orderly performance of the Contract. Submit the claim to the Owner in accordance with state law.

For a claim resulting from enforcement of a warranty period, file the claim no later than one year after expiration of the warranty period. For all other claims, file the claim no later than the date the Owner issues notice to the Contractor that they are in default, the date the Owner terminates the Contract, or one year after the date of final acceptance of the Contract. It is the Contractor's responsibility to submit requests in a timely manner.

Item 5L

Control of the Work

AUTHORITY OF ENGINEER

The Engineer has the authority to observe, test, inspect, approve, and accept the work on behalf of the Owner. The Engineer decides all questions about the quality and acceptability of materials, work performed, work progress, Contract interpretations, and acceptable Contract fulfillment. The Engineer has the authority to enforce and make effective these decisions.

The Engineer acts as a referee in all questions arising under the terms of the Contract. The Engineer's decisions will be final and binding.

PLANS AND WORKING DRAWINGS

When required, provide working drawings to supplement the plans with all necessary details not included on the Contract plans. Prepare and furnish working drawings in a timely manner and obtain approval, if required, before the beginning of the associated work. For all working drawing submittal requirements, the Engineer may allow electronic and other alternative submission procedures. Have a licensed professional engineer sign, seal, and date the working drawings as indicated in Table 1.

Prepare working drawings using United States standard measures in the English language. The routing of submittals for review and approval will be established at the preconstruction conference. The Contractor is responsible for the accuracy, coordination, and conformity of the various components and details of the working drawings. Owner approval of the Contractor's working drawings will not relieve the Contractor of any responsibility under the Contract. The work performed under this article will not be measured or paid for directly but will be subsidiary to pertinent items.

Table 1

Signature and Approval Requirements for Working Drawings

Working Drawings For		Requires Licensed Professional Engineer's Signature, Seal, and Date	Requires Owner Approval
1. Alternate or optional designs submitted by Contractor		Yes	Yes
2. Supplementary shop and fabrication drawings for structural Items		No unless required on the plans	See applicable Item
3. Contractor-proposed temporary facilities that affect the public safety, not included on the plans		Yes	Yes
4. Form and falsework details	Bridges, retaining walls, and other major structures	Yes unless otherwise shown on the plans	No ¹
	Minor structures	No unless otherwise shown on the plans	No
5. Erection drawings		Yes	No ^{1,2}
6. Contractor-proposed major modifications to traffic control plan		Yes	Yes

1. The Engineer may require that the Contractor have a licensed professional engineer certify that the temporary works are constructed according to the sealed drawings.
2. Approval is required for items spanning over live traffic or where safety of the traveling public is affected, in the opinion of the Engineer.

CONFORMITY WITH PLANS, SPECIFICATIONS, AND SPECIAL PROVISIONS

Furnish materials and perform work in reasonably close conformity with the lines, grades, cross-sections, dimensions, details, gradations, physical and chemical characteristics of materials, and other requirements shown in the Contract (including additional plans for non-site-specific work). Reasonably close conformity limits will be as defined in the respective items of the Contract or, if not defined, as determined by the Engineer. Obtain approval before deviating from the plans and approved working drawings. Do not perform work beyond the lines and grades shown on the plans or any extra work without the Engineer's approval. Work performed beyond the lines and grades shown on the plans or any extra work performed without approval is considered unauthorized and excluded from pay consideration. The Owner will not pay for material rejected due to improper fabrication, excess quantity, or any other reasons within the Contractor's control.

Acceptance of Defective or Unauthorized Work. When work fails to meet Contract requirements, but is adequate to serve the design purpose, the Engineer will decide the extent to which the work will be accepted and remain in place. The Engineer will document the basis of acceptance by a letter and may adjust the Contract price.

Correction of Defective or Unauthorized Work. When work fails to meet Contract requirements and is inadequate to serve the design purpose it will be considered defective. Correct, or remove and replace, the work at the Contractor's expense, as directed.

The Engineer has the authority to correct or to remove and replace defective or unauthorized work. The cost may be deducted from any money due or to become due to the Contractor.

COORDINATION OF PLANS, SPECIFICATIONS, AND SPECIAL PROVISIONS

The specifications, accompanying plans (including additional plans for non-site-specific work), special provisions, change orders, and supplemental agreements are intended to work together and be interpreted as a whole.

Numerical dimensions govern over scaled dimensions. Special provisions govern over plans (including general notes), which govern over standard specifications and special specifications. Job-specific plan sheets govern over standard plan sheets.

However, in the case of conflict between plans (including general notes) and specifications regarding responsibilities for hazardous materials and traffic control in Items 1L through 9L and Item 502, "Barricades, Signs, and Traffic Handling," special provisions govern over standard specifications and special specifications, which govern over the plans.

Notify the Engineer promptly of any omissions, errors, or discrepancies discovered so that necessary corrections and interpretations can be made. Failure to promptly notify the Engineer will constitute a waiver of all claims for misunderstandings or ambiguities that result from the errors, omissions, or discrepancies discovered.

COOPERATION OF CONTRACTOR

Cooperate with the Engineer. Respond promptly to instructions from the Engineer. Provide all information necessary to administer the Contract.

Designate in writing a competent, English-speaking Superintendent employed by the Contractor. The Superintendent must be experienced with the work being performed and capable of reading and understanding the Contract. Ensure the Superintendent is available at all times and able to receive instructions from the Engineer or authorized Owner representatives and to act for the Contractor. The Engineer may suspend work without suspending working day charges if a Superintendent is not available or does not meet the above criteria.

At the written request of the Engineer, immediately remove from the project any employee or representative of the Contractor or a subcontractor who, in the opinion of the Engineer, does not perform work in a proper and skillful manner or who is disrespectful, intemperate, disorderly, uncooperative, or otherwise objectionable. Do not reinstate these individuals without the written consent of the Engineer.

Furnish suitable machinery, equipment, and construction forces for the proper prosecution of the work. Provide adequate lighting to address quality requirements and inspection of nighttime work.

The Engineer may suspend the work without suspending working day charges until the Contractor complies with this requirement. All work associated with fulfilling this requirement is subsidiary to the various items of the Contract and no direct compensation will be made.

COOPERATING WITH UTILITIES

Use established safety practices when working near utilities. Consult with the appropriate utilities before beginning work. Notify the Engineer immediately of utility conflicts. The Engineer will decide whether to adjust utilities or adjust the work to eliminate or lessen the conflict. Unless otherwise shown on the plans, the Engineer will make necessary arrangements with the utility owner when utility adjustments are required.

Use work procedures that protect utilities or appurtenances that remain in place during construction. Cooperate with utilities to remove and rearrange utilities to avoid service interruption or duplicate work by the utilities. Allow utilities access to the right of way.

Immediately notify the appropriate utility of service interruptions resulting from damage due to construction activities. Cooperate with utilities until service is restored. Maintain access to active fire hydrants at all times unless approved by the Engineer.

COOPERATION BETWEEN CONTRACTORS

Cooperate and coordinate with other Contractors working within the limits or adjacent to the limits.

COOPERATION WITH RAILROADS

Plan and prosecute portions of the work involving a railway to avoid interference with or hindrance to the railroad company.

If the work is on railroad right of way, do not interfere with the operation of the railroad company's trains or other property.

Project-Specific Information. Refer to project-specific plan sheets in the Contract for specific information concerning the work to be completed by both the Contractor and the railroad within railroad right of way; railroad right of way locations impacted by construction; percentage of Contract work at each location; train movements at each location; and requirements for railroad insurance, flagging, and Right of Entry (ROE) Agreements.

Right of Entry Agreement (if required). The process for obtaining a fully executed ROE Agreement will be as follows:

The Owner will send the unexecuted ROE Agreement to the Contractor with the unexecuted construction Contract.

Partially execute the ROE Agreement and return it to the Department with the required insurance attached.

The Owner will coordinate with the railroad company regarding the further execution of the ROE Agreement and associated fees. The Owner will pay any ROE Agreement fees directly to the railroad company.

Once the Owner has received the fully-executed ROE Agreement from the railroad company, the Owner will forward the fully-executed ROE Agreement to the Contractor.

CONSTRUCTION SURVEYING

Use Method A unless otherwise specified in the Contract. Upon request, the Engineer will allow the Contractor to copy available earthwork cross-sections, computer printouts or data files, and other information necessary to establish and control work. Maintain the integrity of control points. Preserve all control points, stakes, marks, and right of way markers. Assume cost and responsibility of replacing disturbed control points, stakes, marks, and right of way markers damaged by the Contractor's or its subcontractor operations. If the Owner repairs disturbed control points, stakes, marks, or right of way markers, the cost of repair may be deducted from money due or to become due to the Contractor. Replace right of way markers under the direction of a RPLS. This work will be subsidiary to pertinent items.

The Engineer reserves the right to make measurements and surveys to determine the accuracy of the work and determine pay quantities. The Engineer's measurements and surveys do not relieve

the Contractor's responsibility for accuracy of work. Allow the Engineer adequate time to verify the surveying.

Method A. The Engineer will set control points for establishing lines, slopes, grades, and centerlines and for providing both vertical and horizontal control. At a minimum, provide a controlling pair of monument points at both the beginning and end of construction project for projects less than 2 miles in length. For projects greater than 2 miles in length, monuments will be set in pairs of 2 at a minimum of 2 miles based on the overall length of the project. Use these control points as reference to perform the work.

Furnish materials, equipment, and qualified workforce necessary for the construction survey work. Place construction points, stakes, and marks at intervals sufficient to control work to established tolerances. Place construction stakes at intervals of no more than 100 ft., or as directed. Place stakes and marks so as not to interfere with normal maintenance operations.

Method B. The Engineer will set adequate control points, stakes, and marks to establish lines, slopes, grades, and centerlines. Furnish additional work, stakes, materials, and templates necessary for marking and maintaining points and lines.

Method C. Set adequate control points, stakes, and marks to establish lines, slopes, grades, and centerlines.

INSPECTION

Inspectors are authorized representatives of the Engineer. Inspectors are authorized to examine all work performed and materials furnished, including preparation, fabrication, and material manufacture. Inspectors inform the Contractor of failures to meet Contract requirements. Inspectors may reject work or materials and may suspend work until any issues can be referred to and decided by the Engineer. Inspectors cannot alter, add, or waive Contract provisions, issue instructions contrary to the Contract, act as foremen for the Contractor, or interfere with the management of the work. Inspection, or lack of inspection, will not relieve the Contractor from obligation to provide materials or perform the work in accordance with the Contract.

Provide safe access to all parts of the work and provide information and assistance to the Engineer to allow a complete and detailed inspection. Give the Engineer sufficient notice to inspect the work. Work performed without suitable inspection, as determined by the Engineer, may be ordered removed and replaced at Contractor's expense. Remove or uncover portions of finished work as directed. Once inspected, restore work to Contract requirements. If the uncovered work is acceptable, the costs to uncover, remove, and replace or make good the parts removed will be paid for in accordance with Article 4.4., "Changes in the Work." If the work is unacceptable, assume all costs associated with repair or replacement, including the costs to uncover, remove, and replace or make good the parts removed.

When a government entity, utility, railroad company, or other entity accepts or pays a portion of the Contract, that organization's representatives may inspect the work but cannot direct the Contractor. The right of inspection does not make that entity a party to the Contract and does not interfere with the rights of the parties to the Contract.

FINAL CLEANUP

Upon completion of the work, remove litter, debris, objectionable material, temporary structures, excess materials, and equipment from the work locations. Clean and restore property damaged by the Contractor's operations during the prosecution of the work. Leave the work locations in a neat and presentable condition. This work will not be paid for directly but will be considered subsidiary to items of the Contract.

Remove from the right of way cofferdams, construction buildings, material and fabrication plants, temporary structures, excess materials, and debris resulting from construction. Where work is in a stream, remove debris to the ground line of the bed of the stream. Leave stream channels and rights of way in a neat and presentable condition. Clean structures to the flow line or the elevation of the outfall channel, whichever is higher. Dispose of all excess material in accordance with federal, state, and local regulations.

FINAL ACCEPTANCE

Final acceptance is made when all work is complete and the Engineer, in writing, accepts all work for the work locations in the Contract. Final acceptance relieves the Contractor from further Contract responsibilities.

Work Completed. Work completed must include work for vegetative establishment and maintenance, test, and performance periods and work to meet the requirements of Article 5.11., "Final Cleanup."

Final Inspection. After all work is complete, the Contractor will request a final inspection by the Engineer authorized to accept the work.

The final inspection will be made as soon as possible, and not later than 10 calendar days after the request. No working day charges will be made between the date of request and final inspection.

After the final inspection, if the work is satisfactory, the Engineer will notify the Contractor in writing of the final acceptance of the work. If the final inspection finds any work to be unsatisfactory, the Engineer will identify in writing all deficiencies in the work requiring correction. Correct the deficiencies identified. Working day charges will resume if these deficiencies are not corrected within 7 calendar days, unless otherwise approved. Upon correction, the Engineer will inspect to verify that all deficiencies were corrected satisfactorily. The Engineer will provide written notice of the final acceptance.

Final Measurement. Final measurements and pay quantity adjustments may be made after final acceptance.

Removal of Traffic Control Devices. Remove construction traffic control devices and advance warning signs upon final acceptance or as directed.

Item 6L

Control of Materials

SOURCE CONTROL

Use only materials that meet Contract requirements. Unless otherwise specified or approved, use new materials for the work. Secure the Engineer's approval of the proposed source of materials to be used before their delivery. Materials can be approved at a supply source or staging area but may be re-inspected in accordance with Article 6.4., "Sampling, Testing, and Inspection."

Buy America. Comply with the latest provision of Buy America requirements set by 49 U.S.C 5323(j)(1) and the applicable regulations in 49 CFR Part 661. Buy America requirements may be waived if the owner finds that:

- Application of Buy America is inconsistent with the public interest;
- The steel, iron, and goods produced in the U.S. are not produced in a sufficient and reasonably available amount or are not of a satisfactory quality; or
- including domestic material will increase the cost of the overall project by more than 25 percent for rolling stock

The process for seeking a waiver is set forth in 49 CFR 661.7 and 661.9 Grantees are encouraged to apply for a waiver as soon as possible and to provide detailed requests to expedite CRRMA's review.

When procuring rolling stock, which includes train control, communication, traction power equipment, and rolling stock prototypes, the cost of the components and subcomponents produced in the U.S. must be more than 70 percent. Final assembly for rolling stock also must occur in the U.S. Additionally, rolling stock procurements may be subject to the pre-award and post-delivery Buy America audit provisions set forth in 49 U.S.C. § 5323(m) and 49 CFR part 663.

Manufactured goods must be 100-percent produced in the U.S. as set forth in 49 CFR 661.5(d) A manufactured good is considered produced in the United States if: all of the manufacturing processes for the product take place in the United States; and all of the components of the product are of United States origin. A component is considered of United States origin if it is manufactured in the United States, regardless of the origin of its subcomponents.

Provide a notarized original of the TxDOT FORM D-9-USA-1 (or equivalent) with the proper attachments for verification of compliance.

Manufacturing is any process that modifies the chemical content, physical shape or size, or final finish of a product. Manufacturing begins with initial melting and mixing and continues through fabrication (cutting, drilling, welding, bending, etc.) and coating (paint, galvanizing, epoxy, etc.).

Convict Produced Materials. Materials produced by convict labor may only be incorporated in the work if such materials have been:

- produced by convicts who are on parole, supervised release, or probation from prison; or
- produced in a qualified prison facility.

A “qualified prison facility” means any prison facility in which convicts, during the 12-month period ending July 1, 1987, produced materials for use in federal-aid highway construction projects.

MATERIAL QUALITY

Correct or remove materials that fail to meet Contract requirements or that do not produce satisfactory results. Reimburse the Owner for cost incurred if additional sampling and testing is required by a change of source.

Materials not meeting Contract requirements will be rejected, unless the Engineer approves corrective actions. Upon rejection, immediately remove and replace rejected materials.

If the Contractor does not comply with this article, the Owner may have defective material removed and replaced. The cost of testing, removal, and replacement will be deducted from the estimate.

MANUFACTURER WARRANTIES

Transfer to the Owner warranties and guarantees required by the Contract or received as part of normal trade practice.

SAMPLING, TESTING, AND INSPECTION

Incorporate into the work only material that has been inspected, tested, and accepted by the Engineer. Remove, at the Contractor’s expense, materials from the work locations that are used without prior testing and approval or written permission.

Unless otherwise mutually agreed, the material requirements and standard test methods in effect at the time the proposed Contract is advertised govern. Unless otherwise noted, the Engineer will perform testing at Owner’s expense. In addition to facilities and equipment required by the Contract, furnish facilities and calibrated equipment required for tests to control the manufacture of construction items. If requested, provide a complete written statement of the origin, composition, and manufacture of materials.

All materials used are subject to inspection or testing at any time during preparation or use. Material which has been tested and approved at a supply source or staging area may be re-

inspected or tested before or during incorporation into the work and rejected if it does not meet Contract requirements. Copies of test results are to be made available upon request. Do not use material that, after approval, becomes unfit for use.

Unless otherwise noted in the Contract, all testing must be performed within the United States and witnessed by the Engineer. If materials or processes require testing outside the contiguous 48 United States, reimburse the Owner for inspection expenses.

PLANT INSPECTION AND TESTING

The Engineer may, but is not obligated to, inspect materials at the acquisition or manufacturing source. Material samples will be obtained and tested for compliance with quality requirements.

If inspection is at the plant, meet the following conditions unless otherwise specified:

Cooperate fully and assist the Engineer during the inspection.

Ensure the Engineer has full access to all parts of the plant used to manufacture or produce materials.

In accordance with pertinent items and the Contract, provide a facility at the plant for use by the Engineer as an office or laboratory.

Provide and maintain adequate safety measures and restroom facilities.

Furnish and calibrate scales, measuring devices, and other necessary equipment.

The Engineer may provide inspection for periods other than daylight hours if:

continuous production of materials for Owner use is necessary due to the production volume being handled at the plant, and
the lighting is adequate to allow satisfactory inspection.

STORAGE OF MATERIALS

Store and handle materials to preserve their quality and fitness for the work. Store materials so that they can be easily inspected and retested. Place materials under cover, on wooden platforms, or on other hard, clean surfaces as necessary or when directed.

Obtain approval to store materials on the right of way. Storage space off the right of way is at the Contractor's expense.

OWNER-FURNISHED MATERIAL

The Owner will supply materials as shown in the Contract documents. The cost of handling and placing materials supplied by the Owner will not be paid for directly but is subsidiary to the item in which they are used. Assume responsibility for materials upon receipt.

USE OF MATERIALS FOUND ON THE RIGHT OF WAY

Material found in the excavation areas and meeting the Owner's specifications may be used in the work. This material will be paid for at the Contract bid price for excavation and under the item for which the material is used.

Do not excavate or remove any material from within the right of way that is not within the limits of the excavation without written permission. If excavation is allowed within a right of way project-specific location (PSL), replace the removed material with suitable material at no cost to the Owner as directed.

RECYCLED MATERIALS

The Owner will not allow hazardous wastes, as defined in 30 TAC 335, proposed for recycling to be used on the project. Use nonhazardous recyclable materials (NRMs) only if the specification for the item does not disallow or restrict use. Determine if NRMs are regulated under 30 TAC 312, 330, 332, 334, or 335, and comply with all general prohibitions and requirements. Use NRMs in accordance with DMS-11000, "Evaluating and Using Nonhazardous Recyclable Materials Guidelines," and furnish all documentation required by that specification.

HAZARDOUS MATERIALS

Use materials that are free of hazardous materials as defined in Item 1L, "Abbreviations and Definitions."

Notify the Engineer immediately when a visual observation or odor indicates that materials in required material sources or on sites owned or controlled by the owner may contain hazardous materials. Except when the contract includes bid items for the contractor to remove hazardous materials, the Engineer is responsible for testing and removing or disposing of hazardous materials not introduced by the Contractor on sites owned or controlled by the Owner as indicated below.

The plans will indicate locations where paint on steel is suspected to contain hazardous materials and where regulated asbestos containing materials have been found. The Engineer may suspend work wholly or in part during the testing, removal, or disposition of hazardous materials on sites owned or controlled by the Owner, except in the case of when the contract includes removing and disposing of hazardous materials.

When a visual observation or odor indicates that materials delivered to the work locations by the Contractor may contain hazardous materials, have an approved commercial laboratory test the materials for contamination. Remove, remediate, and dispose of any of these materials found to be contaminated. Testing, removal, and disposition of hazardous materials introduced onto the work locations by the Contractor will be at the Contractor's expense. Working day charges will not be suspended and extensions of working days will not be granted for activities related to handling hazardous material delivered by the Contractor.

Painted Steel Requirements. Paint containing hazardous materials will be removed as shown on the plans.

Paint Removed by Third Party. The Owner may provide a third party to remove paint containing hazardous materials where paint must be removed to perform work or to allow dismantling of the steel.

Paint Removed by the Contractor. This work may only be performed by a firm or company with one of the following certifications:

- SSPC-QP2 certification for lead painting operations, or
- Certified Lead Firm by the Texas Department of State Health Services.

Maintain certification for the duration of the work. Provide copies of audits or certification if requested.

Comply with worker and public safety regulations, including, but not limited to, OSHA 29 CFR Parts 1910.1025, 1926.62, and 1926.63. Monitor permissible exposure limits in accordance with OSHA requirements.

Remove paint containing hazardous materials from designated areas shown on the plans or as directed. Comply with access limitations shown on the plans.

Provide power hand tools, equipped with high-efficiency particulate air filter vacuums to mechanically remove paint.

Contain, collect, store, transport, and dispose of all waste generated by cleaning operation in accordance with local, state, and federal requirements including 40 CFR 302. Properly characterize and dispose of all wastes. Manage any hazardous wastes in accordance with regulatory requirements and dispose in a facility authorized to accept such wastes. Provide copies of disposal manifests.

The work performed, materials furnished, equipment, labor, tools, and incidentals will be paid for in accordance with Item 446, "Field Cleaning and Painting Steel."

Removal and Disposal of Painted Steel. Painted steel will be disposed of at a steel recycling or smelting facility unless otherwise shown on the plans. If the paint contains hazardous materials, maintain and make available to the Engineer invoices and other records obtained from the facility showing the received weight of the steel and the facility name.

For steel that is dismantled by unbolting, no paint stripping will be required. Use care to not damage existing paint. When dismantling is performed using flame or saw-cutting methods to remove steel elements coated with paint containing hazardous materials, the plans will show stripping locations.

The work provided, materials furnished, equipment, labor, tools, and incidentals will be paid for in accordance with Item 496, "Removing Structures," and Item 497, "Sale of Salvageable Material."

Asbestos Requirements. The plans will indicate locations or elements where asbestos containing materials (ACM) have been found. At locations where previously unknown ACM has been found, the Owner will arrange for abatement by a third party. For work at these locations, notify the Engineer of proposed dates of demolition or removal of structural elements with ACM at least 60 days before work is to begin to allow the Owner enough time to abate the asbestos.

Work Performed by a Third Party. When the work for removal of paint or asbestos abatement is to be provided by a third party, coordinate and cooperate with the third party and the Owner. Continue other work detailed on the plans not directly involved in the paint removal or asbestos abatement work. Provide notice to the Owner regarding the progress of the work to allow the Owner enough time to schedule the third-party work.

SURPLUS MATERIALS

Take ownership of surplus materials unless otherwise shown on the plans or as directed by the Engineer. Remove and dispose of materials in accordance with federal, state, and local regulations. If requested, provide an appropriate level of documentation to verify proper disposal. When materials are disposed of on private property, provide written authorization from the property owner for the use of the property for this purpose upon request.

Item 7L

Legal Relations and Responsibilities

SAFETY

Point of Contact. Designate a Contractor Safety Point of Contact (CSPOC). The Owner will assign an Owner employee for their point of contact designated as Owner's Safety Point of Contact OSPOC. The CSPOC will ensure that the Contractor's and Subcontractor's employees' use the appropriate personal protection equipment (hard hats, safety vests, protective toe footwear, etc.).

The CSPOC will ensure that crew leaders and foremen (including subcontractors) have attended the required training.

Safety Preconstruction Meeting. In cooperation with the Engineer, schedule and attend a safety preconstruction meeting (may be a part of the preconstruction conference in Article 4.2., "Preconstruction Conference." Attendees for this safety preconstruction meeting will be:

- the Contractor,
- subcontractors,
- Owner,
- local law enforcement, and
- other personnel that play an active role on the project.

Public Safety and Convenience. Ensure the safety and convenience of the public and property as provided in the Contract and as directed by the Engineer. Keep existing roadways open to traffic or construct and maintain detours and temporary structures for safe public travel. Manage construction to minimize disruption to traffic. Maintain the roadway in a good and passable condition, including proper drainage and provide for ingress and egress to adjacent property.

Store all equipment not in use in a manner and at locations that will not interfere with the safe passage of traffic.

Provide qualified flaggers in accordance with Item 502.2.2., "Flaggers," for the safety and convenience of the traveling public and workers, as directed.

If the Engineer determines that any of the requirements of this article have not been met, the Engineer may take any necessary corrective action. This will not change the legal responsibilities set forth in the Contract. The cost to the Owner for this work will be deducted from any money due or to become due to the Contractor.

Use of Blue Warning Lights. Texas Transportation Code 547.105 authorizes the use of warning lights to promote safety and provides an effective means of gaining the travelling public's attention as they drive in areas where construction crews are present. In order to influence the public to move over when high risk construction activities are taking place, minimize the utilization of blue warning lights. These lights must be used only while performing work on or near the travel lanes or shoulder where the travelling public encounters construction crews that are not protected by a standard work zone set up such as a lane closure, shoulder closure, or one-way traffic control. Refrain from leaving the warning lights engaged while

travelling from one work location to another or while parked on the right of way away from the pavement or a work zone.

Barricades, Warning and Detour Signs, and Traffic Handling. Provide, install, move, replace, maintain, clean, and remove all traffic control devices in accordance with the traffic control devices specifications and as shown on the plans and as directed. If details are not shown on the plans, provide devices and work in accordance with the TMUTCD and as directed by the Engineer. When authorized or directed by the Engineer, provide additional signs or traffic control devices not required by the plans.

If an unexpected situation arises that causes the Contractor to believe that the traffic control should be changed, make all reasonable efforts to promptly contact the Engineer. Take prudent actions until the Engineer can be contacted.

The Engineer may authorize or direct in writing the removal or relocation of project limit advance warning signs. When project limit advance warning signs are removed before final acceptance, traffic control in accordance with the TMUTCD may be used for minor operations as approved. Removal or relocation of project limit advance warning signs does not imply final acceptance.

LAWS TO BE OBSERVED

Comply with all federal, state, and local laws, ordinances, and regulations that affect the performance of the work. Indemnify and save harmless the Owner and its representatives against any claim arising from violation by the Contractor of any law, ordinance, or regulation.

This Contract is between the Owner and the Contractor only. No person or entity may claim third-party beneficiary status under this Contract or any of its provisions, nor may any non-party sue for personal injuries or property damage under this Contract.

PERMITS, LICENSES, AND TAXES

Procure all permits and licenses; pay all charges, fees, and taxes; and give all notices necessary and incidental to the due and lawful prosecution of work, except for permits provided by the Owner and as specified in Article 7.6., “Preservation of Cultural and Natural Resources and the Environment.”

PATENTED DEVICES, MATERIAL, AND PROCESSES

Indemnify and save harmless the Owner from any claims for infringement from the Contractor’s use of any patented design, device, material, process, trademark, or copyright selected by the Contractor and used in connection with the work. Indemnify and save harmless the Owner against any costs, expenses, or damages that it may be obliged to pay, by reason of this infringement, at any time during the prosecution or after the completion of the work.

PERSONAL LIABILITY OF PUBLIC OFFICIALS

Owner employees are agents and representatives of the Owner and will incur no liability, personal or otherwise, in carrying out the provisions of the Contract or in exercising any power or authority granted under the Contract.

PRESERVATION OF CULTURAL AND NATURAL RESOURCES AND THE ENVIRONMENT

If the Contractor initiates changes to the Contract and the Owner approves the changes, the Contractor is responsible for obtaining clearances and coordinating with the appropriate regulatory agencies.

Cultural Resources. Cease all work immediately if a site, building, or location of historical, archeological, educational, or scientific interest is discovered within the right of way. The site, building, or location will be investigated and evaluated by the Owner.

Texas Pollutant Discharge Elimination System (TPDES) Permits and Storm Water Pollution Prevention Plans (SWP3). The Owner will file the Notice of Intent (NOI) and the Notice of Termination (NOT) for work shown on the plans in the right of way. Adhere to all requirements of the SWP3.

Work in Waters of the United States. For work in the right of way, the Owner will obtain any required Section 404 permits from the U.S. Army Corps of Engineers before work begins. Adhere to all agreements, mitigation plans, and standard best management practices required by the permit. When Contractor-initiated changes in the construction method changes the impacts to waters of the U.S., obtain new or revised Section 404 permits.

Work in Navigable Waters of the United States. For work in the right of way, the Owner will obtain any required Section 9 permits from the U.S. Coast Guard before work begins. Adhere to the stipulations of the permits and associated best management practices. When Contractor-initiated changes in the construction method changes the impacts to navigable waters of the U.S., obtain new or revised Section 9 permits.

Work Over the Recharge or Contributing Zone of Protected Aquifers. Make every reasonable effort to minimize the degradation of water quality resulting from impacts relating to work over the recharge or contributing zones of protected aquifers, as defined and delineated by the TCEQ. Use best management practices and perform work in accordance with Contract requirements.

Project-Specific Locations. For all project-specific locations (PSLs) on or off the right of way (material sources, waste sites, parking areas, storage areas, field offices, staging areas, haul roads, etc.), signing the Contract certifies compliance with all applicable laws, rules, and regulations pertaining to the preservation of cultural resources, natural resources, and the environment as issued by the following or other agencies:

- Occupational Safety and Health Administration,
- Texas Commission on Environmental Quality,
- Texas Department of Transportation,

- Texas Historical Commission,
- Texas Parks and Wildlife Department,
- Texas Railroad Commission,
- U.S. Army Corps of Engineers,
- U.S. Department of Energy,
- U.S. Department of Transportation,
- U.S. Environmental Protection Agency,
- U.S. Federal Emergency Management Agency, and
- U.S. Fish and Wildlife Service.

All subcontractors must also comply with applicable environmental laws, rules, regulations, and requirements in the Contract. Maintain documentation of certification activities including environmental consultant reports, Contractor documentation on certification decisions and contacts, and correspondence with the resource agencies. Provide documentation upon request.

Obtain written approval from the Engineer for all PSLs in the right of way not specifically addressed on the plans. Prepare an SWP3 for all Contractor facilities, such as asphalt or concrete plants located within public right of way. Comply with all TCEQ permit requirements for portable facilities, such as concrete batch plants, rock crushers, asphalt plants, etc. Address all environmental issues, such as Section 404 permits, wetland delineation, endangered species consultation requirements, or archeological and historic site impacts. Obtain all permits and clearances in advance.

AGRICULTURAL IRRIGATION

Regulate the sequence of work and make provisions as necessary to provide for agricultural irrigation or drainage during the work. Meet with the Irrigation District or land owner to determine the proper time and sequence when irrigation demands will permit shutting-off water flows to perform work.

Unless otherwise provided on the plans, the work performed under this article will not be measured or paid for directly but will be subsidiary to pertinent items.

SANITARY PROVISIONS

Provide and maintain adequate, neat, and sanitary toilet accommodations for employees, including Owner employees, in compliance with the requirements and regulations of the Texas Department of Health or other authorities with jurisdiction.

ABATEMENT AND MITIGATION OF EXCESSIVE OR UNNECESSARY NOISE

Minimize noise throughout all phases of the Contract. Exercise particular and special efforts to avoid the creation of unnecessary noise impact on adjacent noise sensitive receptors in the placement of non-mobile equipment such as air compressors, generators, pumps, etc. Place mobile and stationary equipment to cause the least disruption of normal adjacent activities.

All equipment associated with the work must be equipped with components to suppress excessive noise and these components must be maintained in their original operating condition considering normal depreciation. Noise-attenuation devices installed by the manufacturer such as mufflers, engine covers, insulation, etc. must not be removed nor rendered ineffectual nor be permitted to remain off the equipment while the equipment is in use.

USING EXPLOSIVES

Do not endanger life or property. The contractor is required to submit a written Blasting Plan if required by the plans or requested by the Engineer. The Owner retains the right to reject the blasting plan. Store all explosives securely and clearly mark all storage places with “DANGER – EXPLOSIVES.” Store, handle, and use explosives and highly flammable material in compliance with federal, state, and local laws, ordinances, and regulations. Assume liability for property damage, injury, or death resulting from the use of explosives.

Give at least a 48-hr. advance notice to the appropriate Road Master before doing any blasting work involving the use of electric blasting caps within 200 ft. of any railroad track.

RESPONSIBILITY FOR HAZARDOUS MATERIALS

Indemnify and save harmless the Owner and its agents and employees from all suits, actions, or claims and from all liability and damages for any injury or damage to any person or property arising from the generation or disposition of hazardous materials introduced by the Contractor on any work done by the Contractor on Owner-owned or controlled sites. Indemnify and save harmless the Owner and its representatives from any liability or responsibility arising out of the Contractor’s generation or disposition of any hazardous materials obtained, processed, stored, shipped, etc., on sites not owned or controlled by the Owner. Reimburse the Owner for all payments, fees, or restitution the Owner is required to make as a result of the Contractor’s actions.

ASBESTOS CONTAINING MATERIAL

In Texas, the Department of State Health Services (DSHS), Asbestos Programs Branch, is responsible for administering the requirements of the National Emissions Standards for Hazardous Air Pollutants, 40 CFR, Subpart M (NESHAP) and the Texas Asbestos Health Protection Rules (TAHPR). Based on EPA guidance and regulatory background information, bridges are considered to be a regulated “facility” under NESHAP. Therefore, federal standards for demolition and renovation apply.

Provide notice to the Owner of demolition or renovation to the structures listed on the plans at least 30 calendar days before initiating demolition or renovation of each structure or load bearing member. Provide the scheduled start and completion date of structure demolition, renovation, or removal.

When demolition, renovation, or removal of load-bearing members is planned for several phases, provide the start and completion dates identified by separate phases.

DSHS requires that notifications be postmarked at least 10 working days before initiating demolition or renovation. If the date of actual demolition, renovation, or removal is changed, the Owner will be required to notify DSHS at least 10 days in advance of the work. This notification is also required when a previously scheduled (notification sent to DSHS) demolition, renovation, or removal is delayed. Therefore, if the date of actual demolition, renovation, or removal is changed, provide the Engineer, in writing, the revised dates in enough time to allow for the Owner's notification to DSHS to be postmarked at least 10 days in advance of the actual work.

Failure to provide the above information may require the temporary suspension of work under Article 8.4., "Temporary Suspension of Work or Working Day Charges," due to reasons under the control of the Contractor. The Owner retains the right to determine the actual advance notice needed for the change in date to address post office business days and staff availability.

RESTORING SURFACES OPENED BY PERMISSION

Do not authorize anyone to make an opening in the highway for utilities, drainage, or any other reason without written permission by the Engineer. Repair all openings as directed by the Engineer. Payment for repair of surfaces opened by permission will be made in accordance with pertinent items or Article 4.4., "Changes in the Work." Costs associated with openings made with Contractor authorization but without Owner approval will not be paid.

PROTECTING ADJACENT PROPERTY

Protect adjacent property from damage. If any damage results from an act or omission on the part of or on behalf of the Contractor, take corrective action to restore the damaged property to a condition similar or equal to that existing before the damage was done.

RESPONSIBILITY FOR DAMAGE CLAIMS

Indemnify and save harmless the Owner and its agents and employees from all suits, actions, or claims and from all liability and damages for any injury or damage to any person or property due to the Contractor's negligence in the performance of the work and from any claims arising or amounts recovered under any laws, including workers' compensation and the Texas Tort Claims Act. Indemnify and save harmless the Owner and assume responsibility for all damages and injury to property of any character occurring during the prosecution of the work resulting from any act, omission, neglect, or misconduct on the Contractor's part in the manner or method of executing the work; from failure to properly execute the work; or from defective work or material.

Pipelines and other underground installations that may or may not be shown on the plans may be located within the right of way. Indemnify and save harmless the Owner from any suits or claims resulting from damage by the Contractor's operations to any pipeline or underground

installation. Make available the scheduled sequence of work to the respective utility owners so that they may coordinate and schedule adjustments of their utilities that conflict with the proposed work.

HAULING AND LOADS ON ROADWAYS AND STRUCTURES

Comply with federal and state laws concerning legal gross and axle weights. Except for the designated Interstate system, vehicles with a valid yearly overweight tolerance permit may haul materials to the work locations at the permitted load. Provide copies of the yearly overweight tolerance permits to the Engineer upon request. Construction equipment is not exempt from oversize or overweight permitting requirements on roadways open to the traveling public.

Protect existing bridges and other structures that will remain in use by the traveling public during and after the completion of the Contract. Construction traffic on roadways, bridges, and culverts within the limits of the work, including any structures under construction that will remain in service during and after completion of the Contract is subject to legal size and weight limitations.

Additional temporary fill may be required by the Engineer for hauling purposes for the protection of certain structures. This additional fill will not be paid directly but will be subsidiary.

Replace or restore to original condition any structure damaged by the Contractor's operations.

The Engineer may allow equipment with oversize or non-divisible overweight loads to operate without a permit within the work locations on pavement structures not open to the traveling public. Submit Contractor-proposed changes to traffic control plans for approval, in accordance with Item 502, "Barricades, Signs, and Traffic Handling." The following sections further address overweight allowances. The Owner will make available to the Contractor any available plans and material reports for existing structures.

Overweight Construction Traffic Crossing Structures. The Engineer may allow crossing of a structure not open to the public within the work locations, when divisible or non-divisible loads exceed legal weight limitations, including limits for load-posted bridges. Obtain written permission to make these crossings. Submit for approval a structural analysis by a licensed professional engineer indicating that the excessive loads should be allowed. Provide a manufacturer's certificate of equipment weight that includes the weight distribution on the various axles and any additional parts such as counterweights, the configuration of the axles, or other information necessary for the analysis. Submit the structural analysis and supporting documentation sufficiently in advance of the move to allow for review. Permission may be granted if the Engineer finds that no damage or overstresses in excess of those normally allowed for occasional overweight loads will result to structures that will remain in use after Contract completion. Provide temporary matting or other protective measures as directed.

Schedule loads so that only one vehicle is on any span or continuous unit at any time. Use barricades, fences, or other positive methods to prevent other vehicular access to structures at any time the overweight load is on any span or continuous unit.

Construction Equipment Operating on Structures. Cranes and other construction equipment used to perform construction operations that exceed legal weight limits may be allowed on structures. Before any operation that may require placement of equipment on a structure, submit for approval a detailed structural analysis prepared by a licensed professional engineer.

Submit the structural analysis and supporting documentation sufficiently in advance of the use to allow for review and approval. Include all axle loads and configurations, spacing of tracks or wheels, tire loads, outrigger placements, center of gravity, equipment weight, and predicted loads on tires and outriggers for all planned movements, swings, or boom reaches. The analysis must demonstrate that no overstresses will occur in excess of those normally allowed for occasional overweight loads.

Loads on Structures. Do not store or stockpile material on bridge structures without written permission. If required, submit a structural analysis and supporting documentation by a licensed professional engineer for review. Permission may be granted if the Engineer finds that no damage or overstresses in excess of those normally allowed for occasional overweight loads will result to structures that will remain in use after Contract completion. Provide temporary matting or other protective measures as directed.

Hauling Divisible Overweight Loads on Pavement Within the Work Locations. The Engineer may allow divisible overweight loads on pavement structures within the work locations not open to the traveling public. Obtain written approval before hauling the overweight loads. Include calculations to demonstrate that there will be no damage or overstress to the pavement structure.

CONTRACTOR'S RESPONSIBILITY FOR WORK

Until final acceptance of the Contract, take every precaution against injury or damage to any part of the work by the action of the elements or by any other cause, whether arising from the execution or from the nonexecution of the work. Protect all materials to be used in the work at all times, including periods of suspension.

Then any roadway or portion of the roadway is in suitable condition for travel, it may be opened to traffic as directed. Opening of the roadway to traffic does not constitute final acceptance.

Repair damage to all work until final acceptance. Repair damage to existing facilities in accordance with the Contract or as directed. Repair damage to existing facilities or work caused by Contractor operations at the Contractor's expense. Repair work for damage that was not due to the Contractor's operations will not be paid for except as provided below.

Reimbursable Repair. Except for damage to appurtenances listed in Section 7.17.2.1., "Unreimbursed Repair," the Contractor will be reimbursed for repair of damage caused by:

- motor vehicle, watercraft, aircraft, or railroad-train incident;
- vandalism; or
- Acts of God, such as earthquake, tidal wave, tornado, hurricane, or other cataclysmic phenomena of nature.

Appurtenances.

Unreimbursed Repair. Except for destruction (not reusable) due to hurricanes, reimbursement will not be made for repair of damage to the following temporary appurtenances, regardless of cause:

- signs,
- barricades,
- changeable message signs, and
- other work zone traffic control devices.

Crash cushion attenuators and guardrail end treatments are the exception to the above listing and are to be reimbursed in accordance with Section 7.17.2.2., “Reimbursed Repair.”

For the devices listed in this section, reimbursement may be made for damage due to hurricanes. Where the Contractor retains replaced appurtenances after completion of the project, the Owner will limit the reimbursement to the cost that is above the salvage value at the end of the project.

Reimbursed Repair. Reimbursement will be made for repair of damage due to the causes listed in Section 7.17.1., “Reimbursable Repair,” to appurtenances (including temporary and permanent crash cushion attenuators and guardrail end treatments).

Roadways and Structures. Until final acceptance, the Contractor is responsible for all work constructed under the Contract. The Owner will not reimburse the Contractor for repair work to new construction, unless the failure or damage is due to one of the causes listed in Section 7.17.1., “Reimbursable Repair.”

The Owner will be responsible for the cost for repair of damage to existing roadways and structures not caused by the Contractor’s operations.

Detours. The Contractor will be responsible for the cost of maintenance of detours constructed under the Contract, unless the failure or damage is due to one of the causes listed in Section 7.17.1., “Reimbursable Repair.” The Engineer may consider failures beyond the Contractor’s control when determining reimbursement for repairs to detours constructed. The Owner will be responsible for the cost of maintenance of existing streets and roadways used for detours or handling traffic.

Relief from Maintenance. The Engineer may relieve the Contractor from responsibility of maintenance as outlined in this section. This relief does not release the Contractor from responsibility for defective materials or work or constitute final acceptance.

Isolated Work Locations. For isolated work locations, when all work is completed, including work for Article 5.11., “Final Cleanup,” the Engineer may relieve the Contractor from responsibility for maintenance.

Work Except for Vegetative Establishment and Test Periods. When all work for all or isolated work locations has been completed, including work for Article 5.11., “Final Cleanup,” with the exception of vegetative establishment and maintenance periods and test and performance periods, the Engineer may relieve the Contractor from responsibility for maintenance of completed portions of work.

Work Suspension. When all work is suspended for an extended period of time, the Engineer may relieve the Contractor from responsibility for maintenance of completed portions of work during the period of suspension.

When Directed by the Engineer. The Engineer may relieve the Contractor from the responsibility for maintenance when directed.

Basis of Payment. When reimbursement for repair work is allowed and performed, payment will be made in accordance with pertinent items or Article 4.4., “Changes in the Work.”

ELECTRICAL REQUIREMENTS

Definitions.

Electrical Work. Electrical work is work performed for:

- Item 610, “Roadway Illumination Assemblies,”
 - Item 614, “High Mast Illumination Assemblies,”
 - Item 616, “Performance Testing of Lighting Systems,”
 - Item 617, “Temporary Roadway Illumination,”
 - Item 618, “Conduit,”
 - Item 620, “Electrical Conductors,”
 - Item 621, “Tray Cable,”
 - Item 622, “Duct Cable,”
 - Item 628, “Electrical Services,”
 - Item 680, “Highway Traffic Signals,”
 - Item 681, “Temporary Traffic Signals,”
 - Item 684, “Traffic Signal Cables,”
 - Item 685, “Roadside Flashing Beacon Assemblies,”
 - other items that involve either the distribution of electrical power greater than 50 volts or the installation of conduit and duct banks,
 - the installation of conduit and wiring associated with Item 624, “Ground Boxes,” and Item 656, “Foundations for Traffic Control Devices,” and
- the installation of the conduit system for communication and fiber optic cable.

Electrical work does not include the installation of communications or fiber optic cable, or the connections for low voltage and inherently power limited circuits such as electronic or communications equipment. Assembly and placement of poles, structures, cabinets, enclosures,

manholes, or other hardware will not be considered electrical work as long as no wiring, wiring connections, or conduit work is done at the time of assembly and placement.

Specialized Electrical Work. Specialized electrical work is work that includes the electrical service and feeders, sub-feeders, branch circuits, controls, raceways, and enclosures for the following:

- pump stations,
- moveable bridges,
- ferry slips,
- motor control centers,
- facilities required under Item 504, “Field Office and Laboratory,”
- rest area or other public buildings,
- weigh-in-motion stations,
- electrical services larger than 200 amps,
- electrical services with main or branch circuit breaker sizes not shown in the Contract, and
- any 3-phase electrical power.

Certified Person. A certified person is a person who has passed the test from the TxDOT course TRF450, “TxDOT Roadway Illumination and Electrical Installations,” or other courses as approved by the Owner. Submit a current and valid certification upon request.

Licensed Electrician. A licensed electrician is a person with a current and valid unrestricted master electrical license, or unrestricted journeyman electrical license that is supervised or directed by an unrestricted master electrician. An unrestricted master electrician need not be on the work locations at all times electrical work is being done, but the unrestricted master electrician must approve work performed by the unrestricted journeyman. Licensed electrician requirements by city ordinances do not apply to on state system work.

The unrestricted journeyman and unrestricted master electrical licenses must be issued by the Texas Department of Licensing and Regulation or by a city in Texas with a population of 50,000 or greater that issues licenses based on passing a written test and demonstrating experience.

The Engineer may accept other states’ electrical licenses. Submit documentation of the requirements for obtaining that license. Acceptance of the license will be based on sufficient evidence that the license was issued based on:

- passing a test based on the NEC similar to that used by Texas licensing officials, and sufficient electrical experience commensurate with general standards for an unrestricted master and unrestricted journeyman electrician in the State of Texas.

Work Requirements. The qualifications required to perform electrical work and specialized electrical work are listed in Table 2.

Table 2**Work Requirements**

Type of Work	Qualifications to Perform Work
Electrical work with plans	Licensed electrician, certified person, or workers directly supervised by a licensed electrician or certified person
Electrical work without plans	Licensed electrician or workers directly supervised by a licensed electrician
Specialized electrical work	Licensed electrician or workers directly supervised by a licensed electrician
Replace lamps, starting aids, and changing fixtures	Licensed electrician, certified person, or workers directly supervised by a licensed electrician or certified person
Conduit in precast section with approved working drawings	Inspection by licensed electrician or certified person
Conduit in cast-in-place section	Inspection by licensed electrician or certified person
All other electrical work (troubleshooting, repairs, component replacement, etc.)	Licensed electrician or workers directly supervised by a licensed electrician

A licensed electrician must be physically present during all electrical work when Table 2 states that workers are to be directly supervised by a licensed electrician or certified person.

A non-certified person may install conduit in cast-in-place concrete sections if the work is verified by a certified person before concrete placement.

When the plans specify IMSA certification, the requirements of Table 2 will still apply to the installation of the conduit, ground boxes, electrical services, pole grounding, and electrical conductors installed under Item 620, “Electrical Conductors.”

Item 8L

Prosecution and Progress

PROSECUTION OF WORK

Unless otherwise shown in the Contract, begin work within 90 calendar days after the authorization date to begin work as shown on the Notice to Proceed. Prosecute the work continuously to completion within the working days specified. Unless otherwise shown in the Contract documents, work may be prosecuted in concurrent phases if no changes are required in the traffic control plan or if a revised traffic control plan is approved. Notify the Engineer at least 24 hr. before beginning work or before beginning any new operation. Do not start new operations to the detriment of work already begun. Minimize interference to traffic.

SUBCONTRACTING

Do not sublet any portion of a construction Contract without the Engineer's written approval. A subcontract does not relieve any responsibility under the Contract and bonds. Ensure that all subcontracted work complies with all governing labor provisions.

The Contractor certifies by signing the Contract that the Contractor will not enter into any subcontract with a subcontractor that is debarred or suspended by the Owner, or any state or federal agency.

For federally funded Contracts, ensure the required federal documents are physically attached to each subcontract agreement including all tiered subcontract agreements.

For all DBE/HUB/SBE subcontracts including all tiered DBE/HUB/SBE subcontracts, submit a copy of the executed subcontract agreement.

Submit a copy of the executed non-DBE subcontracts including all tiered non-DBE subcontracts when requested.

Construction Contracts. Perform work with own organization on at least 30% of the total original Contract cost (25% if the Contractor is an SBE on a wholly State or local funded Contract) excluding any items determined to be specialty items. Specialty items are those that require highly specialized knowledge, abilities, or equipment not usually available in the contracting firm expected to bid on the proposed Contract as a whole.

Specialty items will be shown on the plans or as directed by the Engineer. Bid cost of specialty items performed by subcontractors will be deducted from the total original Contract cost before computing the required amount of work to be performed by the Contractor's own organization.

The term "perform work with own organization" includes only:

- workers employed and paid directly by the Contractor or wholly owned subsidiary;
- equipment owned by the Contractor or wholly owned subsidiary;

- rented or leased equipment operated by the Contractor's employees or wholly owned subsidiary's employees;
- materials incorporated into the work if the majority of the value of the work involved in incorporating the material is performed by the Contractor's own organization, including a wholly owned subsidiary's organization; and
- labor provided by staff leasing firms licensed under Chapter 91 of the Texas Labor Code for nonsupervisory personnel if the Contractor or wholly owned subsidiary maintains direct control over the activities of the leased employees and includes them in the weekly payrolls.

When staff leasing firms provide materials or equipment, they are considered subcontractors. In these instances, submit staff leasing firms for approval as a subcontractor.

Copies of cancelled checks and certified statements may be required to verify compliance with the requirements of this section.

Payments to Subcontractors. Report payments for DBE/HUB/SBE subcontracts including tiered DBE/HUB/SBE subcontracts in the manner as prescribed by the Owner.

Payment Records. Make payment records, including copies of cancelled checks, available for inspection by the Owner. Submit payment records upon request. Retain payment records for a period of 3 yr. following completion of the Contract work or as specified by the Owner.

Failure to submit this information to the Engineer by the 20th day of each month will result in the Owner taking actions, including, but not limited to, withholding estimates and suspending the work. This work will not be measured or paid for directly but will be subsidiary to pertinent items.

COMPUTATION OF CONTRACT TIME FOR COMPLETION

Upon request, the Engineer will provide the conceptual time determination schedule to the Contractor for informational purposes only. The schedules assume generic resources, production rates, sequences of construction and average weather conditions based on historic data. The Owner will not adjust the number of working days and milestones, if any, due to differences in opinion regarding any assumptions made in the preparation of the schedule or for errors, omissions, or discrepancies found in the Owner's conceptual time schedule.

The number of working days is established by the Contract. Working day charges will begin 30 calendar days after the date of the written authorization to begin work. Working day charges will continue in accordance with the Contract. The Engineer may consider increasing the number of working days under extraordinary circumstances.

Working Day Charges. Working days will be charged in accordance with Section 8.3.1.4., "Standard Workweek," unless otherwise shown in the Contract documents. Working days will be computed and charged in accordance with one of the following:

Five-Day Workweek. Working days will be charged Monday through Friday, excluding national holidays, regardless of weather conditions or material availability. The Contractor has the option of

working on Saturdays. Provide sufficient advance notice when scheduling work on Saturdays. Work on Sundays and national holidays will not be permitted without written permission. If work requiring an Inspector to be present is performed on a Saturday, Sunday, or national holiday, and weather and other conditions permit the performance of work for 7 hr. between 7 A.M. and 6 P.M., a working day will be charged.

Six-Day Workweek. Working days will be charged Monday through Saturday, excluding national holidays, regardless of weather conditions or material availability. Work on Sundays and national holidays will not be permitted without written permission. If work requiring an Inspector to be present is performed on a Sunday or a national holiday, and weather or other conditions permit the performance of work for 7 hr. between 7 A.M. and 6 P.M., a working day will be charged.

Seven-Day Workweek. Working days will be charged Monday through Sunday, excluding national holidays, regardless of weather conditions or material availability. Work on national holidays will not be permitted without written permission. If work is performed on any of these holidays requiring an Inspector to be present, and weather or other conditions permit the performance of work for 7 hr. between 7 A.M. and 6 P.M., a working day will be charged.

Standard Workweek. Working days will be charged Monday through Friday, excluding national or state holidays, if weather or other conditions permit the performance of the principal unit of work underway, as determined by the Engineer, for a continuous period of at least 7 hr. between 7 A.M. and 6 P.M., unless otherwise shown in the Contract. The Contractor has the option of working on Saturdays or state holidays. Provide sufficient advance notice to the Engineer when scheduling work on Saturdays. Work on Sundays and national holidays will not be permitted without written permission. If work requiring an Inspector to be present is performed on a Saturday, Sunday, or holiday, and weather or other conditions permit the performance of work for 7 hr. between 7 A.M. and 6 P.M., a working day will be charged.

Calendar Day. Working days will be charged Sunday through Saturday, including all holidays, regardless of weather conditions, material availability, or other conditions not under the control of the Contractor.

Other. Working days will be charged as shown in the Contract documents.

Restricted Work Hours. Restrictions on Contractor work hours and the related definition for working day charges are as prescribed in this article unless otherwise shown in the Contract documents.

Nighttime Work. Nighttime work is allowed only when shown in the Contract documents or as directed. Nighttime work is defined as work performed from 30 min. after sunset to 30 min. before sunrise.

Five-, Six-, and Seven-Day Workweeks. Nighttime work that extends past midnight will be assigned to the following day for the purposes of approval for allowing work on Sundays or national holidays.

Standard Workweek.

Nighttime Work Only. When nighttime work is allowed or required and daytime work is not allowed, working day charges will be made when weather and other conditions permit the performance of the principal unit of work underway, as determined by the Engineer, for a continuous period of at

least 7 hr. for the nighttime period, as defined in Section 8.3.3., “Nighttime Work,” unless otherwise shown in the Contract documents.

Nighttime Work and Daytime Work Requiring Inspector. When nighttime work is performed or required and daytime work is allowed, working day charges will be made when weather and other conditions permit the performance of the principal unit of work underway, as determined by the Engineer, for a continuous period of at least 7 hr. for the nighttime period, as defined in Section 8.3.3., “Nighttime Work,” or for a continuous period of at least 7 hr. for the alternative daytime period unless otherwise shown in the Contract documents. Only one day will be charged for each 24-hr. time period. When the Engineer agrees to restrict work hours to the nighttime period only, working day charges will be in accordance with Section 8.3.3.2.1., “Nighttime Work Only.”

Time Statements. The Engineer will furnish the Contractor a monthly time statement. Review the monthly time statement for correctness. Report protests in writing, no later than 30 calendar days after receipt of the time statement, providing a detailed explanation for each day protested. Not filing a protest within 30 calendar days will indicate acceptance of the working day charges and future consideration of that statement will not be permitted.

TEMPORARY SUSPENSION OF WORK OR WORKING DAY CHARGES

The Engineer may suspend the work, wholly or in part, and will provide notice and reasons for the suspension in writing. Suspend and resume work only as directed in writing.

When part of the work is suspended, the Engineer may suspend working day charges only when conditions not under the control of the Contractor prohibit the performance of critical activities. When all of the work is suspended for reasons not under the control of the Contractor, the Engineer will suspend working day charges.

PROJECT SCHEDULES

Prepare, maintain, and submit project schedules. Project schedules are used to convey the Contractor’s intended work plan to the Owner. Prepare project schedules with a level of effort sufficient for the work being performed. Project schedules will not be used as a basis to establish the amount of work performed or for the preparation of the progress payments.

Project Scheduler. Designate an individual who will develop and maintain the progress schedule. The Project Scheduler will be prepared to discuss, in detail, the proposed sequence of work and methods of operation, and how that information will be communicated through the Progress Schedule at the Preconstruction Meeting. This individual will also attend the project meetings and make site visits to prepare, develop, and maintain the progress schedules.

Construction Details. Before starting work, prepare and submit a progress schedule based on the sequence of work and traffic control plan shown in the Contract documents. At a minimum, prepare the progress schedule as a Bar Chart or Critical Path Method (CPM), as shown on the plans. Include all planned work activities and sequences and show Contract completion within the number of working days specified. Incorporate major material procurements, known utility relocations, and other activities that may affect the completion of the Contract in the progress schedule. Show a

beginning date, ending date, and duration in whole working days for each activity. Do not use activities exceeding 20 working days, except for agreed upon activities. Show an estimated production rate per working day for each work activity.

Schedule Format. Format all project schedules according to the following:

- Begin the project schedule on the date of the start of Contract time or start of activities affecting work on the project;
- Show the sequence and interdependence of activities required for complete performance of the work. If using a CPM schedule, show a predecessor and a successor for each activity; and
- Ensure all work sequences are logical and show a coordinated plan of the work.

PM schedules must also include:

- Clearly and accurately identify the critical path as the longest continuous path;
- Provide a legend for all abbreviations, run date, data date, project start date, and project completion date in the title block of each schedule submittal; and
- Through the use of calendars, incorporate seasonal weather conditions into the schedule for work (e.g., earthwork, concrete paving, structures, asphalt, drainage, etc.) that may be influenced by temperature or precipitation. Also, incorporate non-work periods such as holidays, weekends, or other non-work days as identified in the Contract.

Activity Format. For each activity on the project schedule provide:

- A concise description of the work represented by the activity;
- An activity duration in whole working days;
- Code activities so that organized plots of the schedule may be produced.

CPM schedules must also include the quantity of work and estimated production rate for major items of work. Provide enough information for review of the work being performed.

Schedule Types.

Bar Chart. Seven calendar days before the preconstruction meeting, prepare and submit a hard copy of the schedule using the bar chart method.

Progress Schedule Reviews. Update the project schedule and submit a hard copy when changes to the schedule occur or when requested.

Critical Path Method. Prepare and submit the schedule using the CPM.

Preliminary Schedule. Seven calendar days before the preconstruction meeting, submit both the plotted and electronic copies of the project schedule showing work to be performed within the first 90 calendar days of the project.

Baseline Schedule. The baseline schedule will be considered the Contractor's plan to successfully construct the project within the time frame and construction sequencing indicated in the Contract. Submit both plotted and electronic copies of the baseline schedule. Submit 2 plots of the schedule: one organized with the activities logically grouped using the activity coding; and the other plot showing only the critical path determined by the longest path, not based on critical float.

Develop and submit the baseline schedule for review within the first 45 calendar days of the project unless the time for submission is extended.

Review. Within 15 calendar days of receipt of the schedule, the Engineer will evaluate, and inform the Contractor if the schedule has been accepted. If the schedule is not accepted, the Engineer will provide comments to the Contractor for incorporation. Provide a revised schedule based on the Engineer's comments, or reasons for not doing so within 10 calendar days. The Engineer's review and acceptance of the project schedule is for conformance to the requirements of the Contract documents only and does not relieve the Contractor of any responsibility for meeting the interim milestone dates (if specified) or the Contract completion date. Review and acceptance does not expressly or by implication warrant, acknowledge, or admit the reasonableness of the logic or durations of the project schedule. If the Contractor fails to define any element of work, activity, or logic and the Engineer's review does not detect this omission or error, the Contractor is responsible for correcting the error or omission.

Submit an acceptable baseline schedule before the 90th calendar day of the project unless the time for submission is extended.

Progress Schedule. Maintain the project schedule for use by both the Contractor and the Engineer. Submit both the plotted and electronic copy as it will become an as-built record of the daily progress achieved on the project. If continuous progress of an activity is interrupted for any reason except non-work periods (such as holidays, weekend, or interference from temperature or precipitation), then the activity will show the actual finish date as that date of the start of the interruption and the activity will be broken into a subsequent activity (or activities, based on the number of interruptions) similarly numbered with successive alpha character as necessary. The original duration of the subsequent activity will be that of the remaining duration of the original activity. Relationships of the subsequent activity will match those of the original activity so that the integrity of the project schedule logic is maintained. Once established, the original durations and actual dates of all activities must remain unchanged. Revisions to the schedule may be made as necessary.

The project schedule must be revised when changes in construction phasing and sequencing occur or other changes that cause deviation from the original project schedule occur. Any revisions to the schedule must be listed in the monthly update narrative with the purpose of the revision and description of the impact on the project schedule's critical path and project completion date. Create the schedule revision using the latest update before the start of the revision.

Monthly updating of the project schedule will include updating of:

- The actual start dates for activities started;
- The actual finish dates for activities completed;
- The percentage of work completed and remaining duration for each activity started but not yet completed; and
- The calendars to show days actual work was performed on the various work activities.

The cut-off day for recording monthly progress will be the last day of each month. Submit the updated project schedule no later than the 20th calendar day of the following month. The Engineer will evaluate the updated schedule within 5 calendar days of receipt and inform the

Contractor if it has or has not been accepted. If the schedule is not accepted, the Engineer will provide comments to the Contractor for incorporation. Provide a revised schedule based on the Engineer's comments, or reasons for not doing so within 5 calendar days.

Provide a brief narrative in a bulleted statement format for major items that have impacted the schedule. Notify the Engineer if resource-leveling is being used.

Project Schedule Summary Report (PSSR). When shown on the plans, provide the PSSR instead of the narrative required in Section 8.5.5.2.3., "Progress Schedule." The PSSR includes a listing of major items that have impacted the schedule as well as a summary of progress in days ahead or behind schedule. Include an explanation of the project progress for the period represented on the form provided by the Owner.

Notice of Potential Time Impact. Submit a "Notice of Potential Time Impact" when a Contract time extension or adjustment of milestone dates may be justified or when directed.

Failure to provide this notice in the time frames outlined above will compromise the Owner's ability to mitigate the impacts and the Contractor forfeits the right to request a time extension or adjustment of milestone dates unless the circumstances are such that the Contractor could not reasonably have had knowledge of the impact at the time.

Time Impact Analysis. When directed, provide a time impact analysis. A time impact analysis is an evaluation of the effects of impacts on the project. A time impact analysis consists of the following steps:

- **Step 1.** Establish the status of the project immediately before the impact.
- **Step 2.** Predict the effect of the impact on the schedule update used in Step 1.
- **Step 3.** Track the effects of the impact on the schedule during its occurrence.
- **Step 4.** Establish the status of the project after the impact's effect has ended and provide details identifying any mitigating actions or circumstances used to keep the project ongoing during the impact period.

Determine the time impact by comparing the status of the work before the impact (Step 1) to the prediction of the effect of the impact (Step 2), if requested, and to actual effects of the impact once it is complete (Step 4). Unless otherwise approved, Steps 1, 3, and 4, must be completed before consideration of a Contract time extension or adjustment of a milestone date will be provided. Time extensions will only be considered when delays that affect milestone dates or the Contract completion date are beyond the Contractor's control. Submit Step 4 no later than 15 calendar days after the impact's effects have ended or when all the information on the effect has been realized.

Submit one electronic backup copy of the complete time impact analysis and a copy of the full project schedule incorporating the time impact analysis. If the project schedule is revised after the submittal of a time impact analysis, but before its approval, indicate in writing the need for any modification to the time impact analysis.

The Engineer will review the time impact analysis upon completion of step 4. If this review detects revisions or changes to the schedule that had not been performed and identified in a

narrative, the Engineer may reject the time impact analysis. If the Engineer is in agreement with the time impact analysis, a change order may be issued to grant additional working days, or to adjust interim milestones. Once a change order has been executed, incorporate the time impact analysis into the project schedule. The time impact analysis may also be used to support the settlement of disputes and claims. Compensation related to the time impact analysis may be provided at the completion of the analysis or the completion of the project to determine the true role the impact played on the final completion.

The work performed under this article will not be measured or paid for directly but will be subsidiary to pertinent items.

FAILURE TO COMPLETE WORK ON TIME

The time established for the completion of the work is an essential element of the Contract. If the Contractor fails to complete the work within the number of working days specified, working days will continue to be charged. Failure to complete the Contract, a separate work order, or callout work within the number of working days specified, including any approved additional working days, will result in liquidated damages for each working day charged over the number of working days specified in the Contract. The dollar amount specified in the Contract will be deducted from any money due or to become due the Contractor for each working day the Contract remains incomplete. This amount will be assessed not as a penalty but as liquidated damages.

DEFAULT OF THE CONTRACT

Declaration of Default. The Engineer may declare the Contractor to be in default of the Contract if the Contractor:

- fails to begin the work within the number of days specified,
- fails to prosecute the work to assure completion within the number of days specified,
- is uncooperative, disruptive or threatening,
- fails to perform the work in accordance with the Contract requirements,
- neglects or refuses to remove and replace rejected materials or unacceptable work,
- discontinues the prosecution of the work without the Engineer's approval,
- makes an unauthorized assignment,
- fails to resume work that has been discontinued within a reasonable number of days after notice to do so,
- fails to conduct the work in an acceptable manner, or
- commits fraud or other unfixable conduct as determined by the Owner.

If any of these conditions occur, the Engineer will give notice in writing to the Contractor and the Surety of the intent to declare the Contractor in default. If the Contractor does not proceed as directed within 10 days after the notice, the Owner will provide written notice to the Contractor and the Surety to declare the Contractor to be in default of the Contract. The Owner will also provide written notice of default to the Surety. If the Contractor provides the Owner written notice of voluntary default of the Contract, the Owner may waive the 10-day notice of intent to

declare the Contractor in default and immediately provide written notice of default to the Contractor and the Surety. Working day charges will continue until completion of the Contract. The Owner may suspend work in accordance with Section 8.4., “Temporary Suspension of Work or Working Day Charges,” to investigate apparent fraud or other unfixable conduct before defaulting the Contractor. The Contractor may be subject to sanctions under the state and/or federal laws and regulations.

The Owner will determine the method used for the completion of the remaining work as follows:

- **Contracts without Performance Bonds.** The Owner will determine the most expeditious and efficient way to complete the work, and recover damages from the Contractor.
- **Contracts with Performance Bonds.** The Owner will, without violating the Contract, demand that the Contractor’s Surety complete the remaining work in accordance with the terms of the original Contract. A completing Contractor will be considered a subcontractor of the Surety. The Owner reserves the right to approve or reject proposed subcontractors. Work may resume after the Owner receives and approves Certificates of Insurance as required in Section 3.4.3., “Insurance.” Certificates of Insurance may be issued in the name of the completing Contractor. The Surety is responsible for making every effort to expedite the resumption of work and completion of the Contract. The Owner may complete the work using any or all materials at the work locations that it deems suitable and acceptable. Any costs incurred by the Owner for the completion of the work under the Contract will be the responsibility of the Surety.

From the time of notification of the default until work resumes (either by the Surety or the Owner), the Owner will maintain traffic control devices and will do any other work it deems necessary, unless otherwise agreed upon by the Owner and the Surety. All costs associated with this work will be deducted from money due to the Surety.

The Owner will hold all money earned but not disbursed by the date of default. Upon resumption of the work after the default, all payments will be made to the Surety. All costs and charges incurred by the Owner as a result of the default, including the cost of completing the work under the Contract, costs of maintaining traffic control devices, costs for other work deemed necessary, and any applicable liquidated damages or disincentives will be deducted from money due the Contractor for completed work. If these costs exceed the sum that would have been payable under the Contract, the Surety will be liable and pay the Owner the balance of these costs in excess of the Contract price. In case the costs incurred by the Owner are less than the amount that would have been payable under the Contract if the work had been completed by the Contractor, the Owner will be entitled to retain the difference.

Comply with Article 8.2., “Subcontracting,” and abide by the DBE/HUB/SBE commitments previously approved by the Owner.

No markups as defined in Article 9.7., “Payment for Extra Work and Force Account Method,” will be allowed for the Surety.

Wrongful Default. Submit a written request to the Owner within 14 calendar days of receipt of the notice of default for consideration of wrongful default.

The Owner will determine if the Contractor has been wrongfully defaulted, and will proceed with the following:

- If the Owner determines the default is proper, the default will remain. If the Contractor is in disagreement, the Contractor may file a claim in accordance with Article 4.7., “Dispute or Claims Procedure.”
- If the Owner determines it was a wrongful default, the Owner will terminate the Contract for convenience, in accordance with Article 8.8., “Termination of the Contract.”

TERMINATION OF THE CONTRACT

The Owner may terminate the Contract in whole or in part whenever:

- the Contractor is prevented from proceeding with the work as a direct result of an executive order of the President of the United States or the Governor of the State;
- the Contractor is prevented from proceeding with the work due to a national emergency, or when the work to be performed under the Contract is stopped, directly or indirectly, because of the freezing or diversion of materials, equipment or labor as the result of an order or a proclamation of the President of the United States;
- the Contractor is prevented from proceeding with the work due to an order of any federal authority;
- the Contractor is prevented from proceeding with the work by reason of a preliminary, special, or permanent restraining court order where the issuance of the restraining order is primarily caused by acts or omissions of persons or agencies other than the Contractor; or
- the Owner determines that termination of the Contract is in the best interest of the Owner or the public. This includes, but is not limited to, the discovery of significant hazardous material problems, right of way acquisition problems, or utility conflicts that would cause substantial delays or expense to the Contract.

Procedures and Submittals. The Engineer will provide written notice to the Contractor of termination specifying the extent of the termination and the effective date. Upon notice, immediately proceed in accordance with the following:

- stop work as specified in the notice;
- place no further subcontracts or orders for materials, services, or facilities, except as necessary to complete a critical portion of the Contract, as approved;
- terminate all subcontracts to the extent they relate to the work terminated;
- complete performance of the work not terminated;
- settle all outstanding liabilities and termination settlement proposals resulting from the termination for public convenience of the Contract;
- create an inventory report, including all acceptable materials and products obtained for the Contract that have not been incorporated in the work that was terminated (include in the inventory report a description, quantity, location, source, cost, and payment status for each of the acceptable materials and products); and

- take any action necessary, or that the Engineer may direct, for the protection and preservation of the materials and products related to the Contract that are in the possession of the Contractor and in which the Owner has or may acquire an interest.

Settlement Provisions. Within 60 calendar days of the date of the notice of termination, submit a final termination settlement proposal, unless otherwise approved. The Engineer will prepare a change order that reduces the affected quantities of work and adds acceptable costs for termination. No claim for loss of anticipated profits will be considered. The Owner will pay reasonable and verifiable termination costs including:

- all work completed at the unit bid price and partial payment for incomplete work;
- the percentage of Item 500, "Mobilization," equivalent to the percentage of work complete or actual cost that can be supported by cost records, whichever is greater;
- expenses necessary for the preparation of termination settlement proposals and support data;
- the termination and settlement of subcontracts;
- storage, transportation, restocking, and other costs incurred necessary for the preservation, protection, or disposition of the termination inventory; and other expenses acceptable to the Owner.

Item 9L

Measurement and Payment

1. MEASUREMENT OF QUANTITIES

The Engineer will measure all completed work using United States standard measures, unless otherwise specified.

Linear Measurement. Unless otherwise specified, all longitudinal measurements for surface areas will be made along the actual surface of the roadway and not horizontally. No deduction will be made for structures in the roadway with an area of 9 sq. ft. or less. For all transverse measurements for areas of base courses, surface courses, and pavements, the dimensions to be used in calculating the pay areas will be the neat dimensions and will not exceed those shown on the plans, unless otherwise directed.

Volume Measurement. Transport materials measured for payment by volume in approved hauling vehicles. Display a unique identification mark on each vehicle. Furnish information necessary to calculate the volume capacity of each vehicle. The Engineer may require verification of volume through weight measurement. Use body shapes that allow the capacity to be verified. Load and level the load to the equipment's approved capacity. Loads not hauled in approved vehicles may be rejected.

Weight Measurement. Transport materials measured for payment by weight or truck measure in approved hauling vehicles. Furnish certified measurements, tare weights, and legal gross weight calculations for all haul units. Affix a permanent, legible number on the truck and on the trailer to correspond with the certified information. Furnish certified weights of loaded haul units transporting material if requested.

The material will be measured at the point of delivery. The cost of supplying these volume and weight capacities is subsidiary to the pertinent item. For measurement by the ton, in the field, provide measurements in accordance with Item 520, "Weighing and Measuring Equipment," except for items where ton measurements are measured by standard tables.

The Engineer may reject loads and suspend hauling operations for overloading.

Hauling on Routes Accessible to the Traveling Public. For payment purposes on haul routes accessible to the traveling public, the net weight of the load will be calculated as follows:

- If the gross vehicle weight is less than the maximum allowed by state law, including applicable yearly weight tolerance permit, the net weight of the load will be determined by deducting the tare weight of the vehicle from the gross weight.
- If the gross vehicle weight is more than the maximum allowed by state law, including applicable yearly weight tolerance permit, the net weight of the load will be determined by deducting the tare weight of the vehicle from the maximum gross weight allowed.

Hauling on Routes Not Accessible to the Traveling Public. For payment purposes on haul routes that are not accessible to the traveling public where advance permission is obtained in writing from the Engineer:

- If the gross vehicle weight is less than the maximum allowed, including applicable yearly weight tolerance permit, the net weight of the load will be determined by deducting the tare weight of the vehicle from the gross weight.

- If the gross vehicle weight is more than the maximum allowed, the net weight of the load will be determined by deducting the tare weight of the vehicle from the maximum gross weight allowed.

PLANS QUANTITY MEASUREMENT

Plans quantities may or may not represent the exact quantity of work performed or material moved, handled, or placed during the execution of the Contract. The estimated bid quantities are designated as final payment quantities, unless revised by the governing specifications or this article.

If the quantity measured as outlined under “Measurement” varies by more than 5% (or as stipulated under “Measurement” for specific Items) from the total estimated quantity for an individual item originally shown in the Contract, an adjustment may be made to the quantity of authorized work done for payment purposes.

When quantities are revised by a change in design approved by the Owner, by change order, or to correct an error on the plans, the plans quantity will be increased or decreased by the amount involved in the change, and the 5% variance will apply to the new plans’ quantity.

If the total Contract quantity multiplied by the unit bid price for an individual item is less than \$250 and the item is not originally a plans quantity item, then the item may be paid as a plans quantity item if the Engineer and Contractor agree in writing to fix the final quantity as a plans quantity.

For Contracts with callout work and work orders, plans quantity measurement requirements are not applicable.

ADJUSTMENT OF QUANTITIES

The party to the Contract requesting the adjustment will provide field measurements and calculations showing the revised quantity. When approved, this revised quantity will constitute the final quantity for which payment will be made. Payment for revised quantity will be made at the unit price bid for that item, except as provided for in Article 4.4., “Changes in the Work.”

SCOPE OF PAYMENT

Payment of the Contract unit price is full compensation for all materials, equipment, labor, tools, and supplies necessary to complete the item of work under the Contract. Until final acceptance in accordance with Article 5.12., “Final Acceptance,” assume liability for completing the work according to the Contract documents and any loss or damage arising from the performance of the work or from the action of the elements, infringement of patent, trademark, or copyright, except as provided elsewhere in the Contract.

The Owner will only pay for material incorporated into the work in accordance with the Contract. Payment of progress estimates will in no way affect the Contractor’s obligation under the Contract to repair or replace any defective parts in the construction or to replace any defective materials used in the construction and to be responsible for all damages due to defects if the defects and damages are discovered on or before final inspection and acceptance of the work.

PROGRESS PAYMENTS

The Engineer will prepare a monthly estimate of the amount of work performed, including materials in place. Incomplete items of work may be paid at an agreed upon percentage as approved. Payment of the monthly estimate is determined at the Contract item prices less any withholdings or deductions in accordance with the Contract. Progress payments may be withheld for failure to comply with the Contract.

PAYMENT FOR MATERIAL ON HAND (MOH)

If payment for MOH is desired, request compensation for the invoice cost of acceptable nonperishable materials that have not been used in the work before the request, and that have been delivered to the work location or are in acceptable storage places. Nonperishable materials are those that do not have a shelf life or whose characteristics do not materially change when exposed to the elements. Include only materials that have been sampled, tested, approved, or certified, and are ready for incorporation into the work. Only materials which are completely constructed or fabricated on the Contractor's order for a specific Contract and are so marked and on which an approved test report has been issued are eligible. Payment for MOH may include the following types of items: concrete traffic barrier, precast concrete box culverts, concrete piling, reinforced concrete pipe, and illumination poles. Any repairs required after fabricated materials have been approved for storage will require approval of the Engineer before being made and will be made at the Contractor's expense. Include only those materials that have an invoice cost of at least \$1,000 in the request for MOH payment.

If the request is acceptable, the Engineer will include payment for MOH in a progress payment. Payment for MOH does not constitute acceptance of the materials. Payment will not exceed the actual cost of the material as established by invoice, or the total cost for the associated item less reasonable placement costs, whichever is less. Materials for which the Contractor does not have a paid invoice within 60 days will not be eligible for payment and will be removed from the estimate. Payment may be limited to a portion of the invoice cost or unit price if shown elsewhere in the Contract. Payment for precast products fabricated or constructed by the Contractor for which invoices or freight bills are not available may be made based on statements of actual cost.

Submit the request on forms provided by the Owner. These forms may be electronically reproduced, provided they are in the same format and contain all the required information and certifications. Continue to submit monthly MOH forms until the total value of MOH is \$0.

By submitting a request for MOH payment, the Contractor expressly authorizes the Owner to audit MOH records, and to perform process reviews of the record-keeping system. If the Owner determines noncompliance with any of the requirements of this provision, the Owner may exclude payment for any or all MOH for the duration of the Contract.

Maintain all records relating to MOH payment until final acceptance. Provide these records to the Engineer upon request.

PAYMENT FOR EXTRA WORK AND FORCE ACCOUNT METHOD

Payment for extra work directed, performed, and accepted will be made in accordance with Article 4.4., "Changes in the Work." Payment for extra work may be established by agreed unit prices or by Force Account Method.

Agreed unit prices are unit prices that include markups and are comparable to recent bid prices for the same character of work. These unit prices may be established without additional breakdown justification.

When using Force Account Method, determine an estimated cost for the proposed work and establish labor and equipment rates and material costs. Maintain daily records of extra work and provide copies of these records daily, signed by the Contractor's representative, for verification by the Engineer. Request payment for the extra work no later than the 10th day of the month following the month in which the work was performed. Include copies of all applicable invoices. If the extra work to be performed has an estimated cost of less than \$10,000, submit for approval and payment an invoice of actual cost for materials, equipment, labor, tools, and incidentals necessary to complete the extra work.

Markups. Payment for extra work may include markups as compensation for the use of small tools, overhead expense, and profit.

Labor. Compensation will be made for payroll rates for each hour that the labor, foremen, or other approved workers are actually engaged in the work. In no case will the rate of wages be less than the minimum shown in the Contract for a particular category. An additional 25% of this sum will be paid as compensation for overhead, superintendence, profit, and small tools.

Insurance and Taxes. An additional 55% of the labor cost, excluding the 25% compensation provided in Section 9.7.1.1., "Labor," will be paid as compensation for labor insurance and labor taxes including the cost of premiums on non-project-specific liability (excluding vehicular) insurance, workers compensation insurance, Social Security, unemployment insurance taxes, and fringe benefits.

Materials. Compensation will be made for materials associated with the work based on actual delivered invoice costs, less any discount. An additional 25% of this sum will be paid as compensation for overhead and profit.

Equipment. Payment will be made for the established equipment hourly rates for each hour that the equipment is involved in the work. An additional 15% of this sum will be paid as compensation for overhead and profit not included in the rates.

Transportation cost for mobilizing equipment will be included if the equipment is mobilized from an off-site location.

Contractor-Owned Equipment. For Contractor-owned machinery, trucks, power tools, or other equipment, use the FHWA rental rates found in the *Rental Rate Blue Book* multiplied by the regional adjustment factor and the rate adjustment factor to establish hourly rates. Use the rates in effect for each section of the *Rental Rate Blue Book* at the time of use.

If a rate has not been established for a particular piece of equipment in the *Rental Rate Blue Book*, the Engineer will allow a reasonable hourly rate. This price will include operating costs.

Payment for equipment will be made for the actual hours used in the work. The Owner reserves the right to withhold payment for low production or lack of progress. Payment will not be made for time lost for equipment breakdowns, time spent to repair equipment, or time after equipment is no longer needed.

If equipment is used intermittently while dedicated solely to the work, payment will be made for the duration the equipment is assigned to the work but no more than 8 hours will be paid during a 24-hour day, nor more

than 40 hours per week, nor more than 176 hours per month, except when time is computed using a six-day or seven-day workweek. When using a six-day workweek, no more than 8 hours will be paid during a 24-hour day, nor more than 48 hours per week, nor more than 211 hours per month. When using a seven-day workweek, no more than 8 hours will be paid during a 24-hour day, nor more than 56 hours per week, nor more than 246 hours per month.

Equipment Not Owned by the Contractor. For equipment rented from a third party not owned by the Contractor, payment will be made at the invoice daily rental rate for each day the equipment is needed for the work. The Owner reserves the right to limit the daily rate to comparable *Rental Rate Blue Book* rates. When the invoice specifies that the rental rate does not include fuel, lubricants, repairs, and servicing, the *Rental Rate Blue Book* hourly operating cost for each hour the equipment is operated will be added.

When the invoice specifies equipment operators as a component of the equipment rental, payment will be made at the invoice rate for each operator for each day the equipment is needed for the work.

Standby Equipment Costs. Payment for standby equipment will be made in accordance with Section 9.7.1.4., “Equipment,” except that:

Contractor-Owned Equipment. For Contractor-owned machinery, trucks, power tools, or other equipment:

- Standby will be paid at 50% (to remove operating cost) of the FHWA rental rates found in the *Rental Rate Blue Book* multiplied by the regional adjustment factor and the rate adjustment factor.
- Standby costs will not be allowed during periods when the equipment would have otherwise been idle.

Equipment Not Owned by the Contractor. For equipment rented from a third party not owned by the Contractor:

- Standby will be paid at the invoice daily rental rate, excluding operating cost, which includes fuel, lubricants, repairs, and servicing. The Owner reserves the right to limit the daily standby rate to comparable FHWA rental rates found in the *Rental Rate Blue Book* multiplied by the regional adjustment factor and the rate adjustment factor.
- Standby will be paid for equipment operators when included on the invoice and equipment operators are actually on standby.
- Standby costs will not be allowed during periods when the equipment would have otherwise been idle.

Subcontracting. An additional 5% of the actual invoice cost will be paid to the Contractor as compensation for administrative cost, superintendence, and profit.

Law Enforcement. An additional 5% of the actual invoice cost will be paid as compensation for administrative costs, superintendence, and profit.

Railroad Flaggers. An additional 5% of the actual invoice cost will be paid as compensation for administrative cost, superintendence, and profit.

Bond Cost. An additional 1% of the total compensation provided in Article 9.7., “Payment for Extra Work and Force Account Method,” will be paid for the increase in bond.

RETAINAGE

The Owner will not withhold retainage on the Contractor. The Contractor may withhold retainage on subcontractors in accordance with state and federal regulations.

PAYMENT PROVISIONS FOR SUBCONTRACTORS

For the purposes of this article only, the term subcontractor includes suppliers and the term work includes materials provided by suppliers at a location approved by the Engineer.

These requirements apply to all tiers of subcontractors. Incorporate the provisions of this article into all subcontract or material purchase agreements.

Pay subcontractors for work performed within 10 days after receiving payment for the work performed by the subcontractor. Also, pay any retainage on a subcontractor's work within 10 days after satisfactory completion of all the subcontractor's work. Completed subcontractor work includes vegetative establishment, test, maintenance, performance, and other similar periods that are the responsibility of the subcontractor.

For the purpose of this section, satisfactory completion is accomplished when:

- the subcontractor has fulfilled the Contract requirements of both the Owner and the subcontract for the subcontracted work, including the submittal of all information required by the specifications and the Owner; and
- the work done by the subcontractor has been inspected, approved, and paid by the Owner.

Provide a certification of prompt payment in accordance with the Owner's prompt payment procedure to certify that all subcontractors and suppliers were paid from the previous months payments and retainage was released for those whose work is complete. Submit the completed form each month and the month following the month when final acceptance occurred at the end of the project.

The inspection and approval of a subcontractor's work does not eliminate the Contractor's responsibilities for all the work as defined in Article 7.17., "Contractor's Responsibility for Work."

The Owner may pursue actions against the Contractor, including withholding of estimates and suspending the work, for noncompliance with the subcontract requirements of this section upon receipt of written notice with sufficient details showing the subcontractor has complied with contractual obligations.

FINAL PAYMENT

When the Contract has been completed, all work has been approved, final acceptance has been made in accordance with Article 5.12., "Final Acceptance," and Contractor submittals have been received, the Engineer will prepare a final estimate for payment showing the total quantity of work completed and the money owed the Contractor. The final payment will reflect the entire sum due, less any sums previously paid.

XIV. SPECIAL PROVISIONS

Special Provision to Item 000
Schedule of Liquidated Damages

The dollar amount of daily contract administration Liquidated Damages per Calendar Day is \$600. This is the cost for the owner to keep a record keeper and an inspector/engineer available for an 8-hour working day.

Special Provision to Item 000
Nondiscrimination

DESCRIPTION

All recipients of federal financial assistance are required to comply with various nondiscrimination laws including Title VI of the Civil Rights Act of 1964, as amended, (Title VI). Title VI forbids discrimination against anyone in the United States on the grounds of race, color, or national origin by any agency receiving federal funds.

Owner, as a recipient of Federal financial assistance, and under Title VI and related statutes, ensures that no person shall on the grounds of race, religion (where the primary objective of the financial assistance is to provide employment per 42 U.S.C. § 2000d-3), color, national origin, sex, age or disability be excluded from participation in, be denied the benefits of, or otherwise be subjected to discrimination under any of Owner's programs or activities.

DEFINITION OF TERMS

Where the term "contractor" appears in the following six nondiscrimination clauses, the term "contractor" is understood to include all parties to contracts or agreements with the Owner.

NONDISCRIMINATION PROVISIONS

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

Compliance with Regulations. The Contractor shall comply with the Regulations relative to nondiscrimination in Federally-assisted programs of the Department of Transportation (hereinafter, "DOT") Title 49, Code of Federal Regulations, Part 21, as they may be amended from time to time, (hereinafter referred to as the Regulations), which are herein incorporated by reference and made a part of this contract.

Nondiscrimination. The contractor, with regard to the work performed by it during the contract, shall not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor shall not participate either directly or indirectly in the discrimination prohibited by section 21.5 of the Regulations, including employment practices when the contract covers a program set forth in Appendix B of the Regulations.

Solicitations for Subcontracts, Including Procurements of Materials and Equipment: In all solicitations either by competitive bidding or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the contractor of the contractor's obligations under this contract and the Regulations relative to nondiscrimination on the grounds of race, color, or national origin.

Information and Reports: The contractor shall provide all information and reports required by the Regulations or directives issued pursuant thereto, and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Owner or the Texas Department of Transportation to be pertinent to ascertain compliance with such Regulations, orders and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish this information the contractor shall so certify to the Owner or the Texas Department of Transportation as appropriate and shall set forth what efforts it has made to obtain the information.

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

- withholding of payments to the contractor under the contract until the contractor complies, and/or
- cancellation, termination or suspension of the contract, in whole or in part.

Incorporation of Provisions. The contractor shall include the provisions of paragraphs (3.1) through (3.6) in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Regulations, or directives issued pursuant thereto. The contractor shall take such action with respect to any subcontract or procurement as the Owner may direct as a means of enforcing such provisions including sanctions for non-compliance: provided, however that, in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the contractor may request the Owner to enter into such litigation to protect the interests of the Owner, and, in addition, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

Special Provision to Item 000

Special Labor Provisions for State Projects

GENERAL

This is a "Public Works" Project, as provided under Government Code Title 10, Chapter 2258, "Prevailing Wage Rates," and is subject to the provisions of the Statute. No provisions in the Contract are intended to be in conflict with the provisions of the Statute.

The Owner has ascertained and indicated in the special provisions the regular rate of per diem wages prevailing in each locality for each craft or type of worker. Apply the wage rates contained in the specifications as minimum wage rates for the Contract.

MINIMUM WAGES, HOURS AND CONDITIONS OF EMPLOYMENT

All workers necessary for the satisfactory completion of the work are within the purview of the Contract.

Whenever and wherever practical, give local citizens preference in the selection of labor.

Do not require any worker to lodge, board or trade at a particular place, or with a particular person as a condition of employment.

Do not charge or accept a fee of any from any person who obtains work on the project. Do not require any person who obtains work on the project to pay any fee to any other person or agency obtaining employment for the person on the project.

Do not charge for tools or equipment used in connection with the duties performed, except for loss or damage of property. Do not charge for necessary camp water.

Do not charge for any transportation furnished to any person employed on the project.

The provisions apply where work is performed by piece work, station work, etc. The minimum wage paid will be exclusive of equipment rental on any shipment which the worker or subcontractor may furnish in connection with his work.

Take responsibility for carrying out the requirements of this specification and ensure that each subcontractor working on the project complies with its provisions.

Any form of subterfuge, coercion or deduction designated to evade, reduce or discount the established minimum wage scales will be considered a violation of the Contract.

The Fair Labor Standards Acts (FLSA) established one and one-half (1-1/2) pay for overtime in excess of 40 hours worked in 1 week. Do not consider time consumed by the worker in going to and returning from the place of work as part of the hours of work. Do not require or permit any worker to work in excess of 40 hours in 1 week, unless the worker receives compensation at a rate not less than 1-1/2 times the basic rate of pay for all hours worked in excess of 40 hours in the workweek.

The general rates of per diem wages prevailing in this locality for each class and type of workers whose services are considered necessary to fulfill the Contract are indicated in the special provisions, and these rates govern as minimum wage rates on this Contract. A penalty of \$60.00 per calendar day or portion of a calendar day for each worker that is paid less than the stipulated general rates of per diem wages for any work done under the Contract will be deducted. The Owner, upon receipt of a complaint by a worker, will determine within 30 days whether good cause exists to believe that the Contractor or a subcontractor has violated wage rate requirements and notify the parties involved of the findings. Make every effort to resolve the alleged violation within 14 days after notification. The next alternative is submittal to binding arbitration in accordance with the provisions of the Texas General Arbitration Act (Art. 224 et seq., Revised Statutes).

Notwithstanding any other provision of the Contract, covenant and agree that the Contractor and its subcontractors will pay each of their employees and contract labor engaged in any way in work under the Contract, a wage not less than what is generally known as the “federal minimum wage” as set out in 29 U.S.C. 206 as that Statute may be amended from time to time.

Pay any worker employed whose position is not listed in the Contract, a wage not less than the per diem wage rate established in the Contract for a worker whose duties are most nearly comparable.

RECORD AND INSPECTIONS

Keep copies of weekly payrolls for review. Require subcontractors to keep copies of weekly payrolls for review. Show the name, occupation, number of hours worked each day and per diem wage paid each worker together with a complete record of all deductions made from such wages. Keep records for a period of 3 years from the date of completion of the Contract.

Where the piece-work method is used, indicate on the payroll for each person involved:

- Quantity of piece work performed.
- Price paid per piece-work unit.
- Total hours employed.

The Owner may require the Contractor to file an affidavit for each payroll certifying that payroll is a true and accurate report of the full wages due and paid to each person employed.

Post or make available to employees the prevailing wage rates from the Contract. Require subcontractors to post or make available to employees the prevailing wage rates from the Contract.

Special Provision to Item 000

Small Business Enterprise in State Funded Projects

DESCRIPTION

The purpose of this Special Provision is to carry out the Texas Department of Transportation's policy of ensuring that Small Business Enterprise (SBE) has an opportunity to participate in the performance of contracts. If the SBE goal is greater than zero, Article A of this Special Provision shall apply to this Contract; otherwise, Article B of this Special Provision applies. The percentage goal for SBE participation in the work to be performed under this contract will be shown in the proposal.

DEFINITIONS

Small Business Enterprise (SBE) is a firm (including affiliates) certified by the Texas Department of Transportation whose annual gross receipts do not exceed the U.S. Small Business Administration's size standards for 4 consecutive years. Firms certified as Historically Underutilized Businesses (HUBs) by the Texas Comptroller of Public Accounts and as Disadvantaged Business Enterprises (DBEs) by the Texas Uniform Certification Program automatically qualify as SBEs.

Article A - SBE Goal is Greater than Zero.

Policy. The Owner is committed to providing contracting opportunities for small businesses. In this regard, it is the Owner's policy to develop and maintain a program in order to facilitate contracting opportunities for small businesses. Consequently, the requirements of the Owner's Small Business Enterprise Program apply to this contract as follows:

The Contractor shall make a good faith effort to meet the SBE goal for this contract.

The Contractor and any Subcontractors shall not discriminate on the basis of race, color, national origin, age, disability or sex in the award and performance of this contract. These nondiscrimination requirements shall be incorporated into any subcontract and purchase order.

After a conditional award is made to the low bidder, the Owner will determine the adequacy of a Contractor's efforts to meet the contract goal, as is outlined under Section 2, "Contractor's Responsibilities." If the requirements of Section 2 are met, the contract will be forwarded to the Contractor for execution.

The Contractor's performance, during the construction period of the contract in meeting the SBE goal, will be monitored by the Owner.

Contractor's Responsibilities. These requirements must be satisfied by the Contractor. An SBE Contractor may satisfy the SBE requirements by performing at least 25% of the contract work with its own organization as defined elsewhere in the contract.

The Contractor shall submit a completed SBE Commitment Agreement Form for each SBE they intend to use to satisfy the SBE goal to the Owner so as to arrive not later than 5:00 p.m. on the 10th business day, excluding national holidays, after the conditional award of the contract. When requested, additional time, not to exceed 7 business days, excluding national holidays, may be granted based on documentation submitted by the Contractor.

A Contractor who cannot meet the contract goal, in whole or in part, shall document the good faith efforts taken to meet the SBE goal. The Owner will consider as good faith efforts all documented explanations that are submitted and that describe a Contractor's failure to meet an SBE goal or obtain SBE participation, including:

Advertising in general circulation, trade association, and/or minority/women focus media concerning subcontracting opportunities,

Dividing the contract work into reasonable portions in accordance with standard industry practices,

Documenting reasons for rejection or meeting with the rejected SBE to discuss the rejection,

Providing qualified SBEs with adequate information about bonding, insurance, plans, specifications, scope of work, and the requirements of the contract,

Negotiating in good faith with qualified SBEs, not rejecting qualified SBEs who are also the lowest responsive bidder, and;

Using the services of available minorities and women, community organizations, contractor groups, local, state and federal business assistance offices, and other organizations that provide support services to SBEs.

The good faith effort documentation is due to the Owner at the time specified in 2.1.2.1. of this Special Provision. The Owner will evaluate the Contractor's documentation. If it is determined that the Contractor has failed to meet the good faith effort requirements, the Contractor will be given an opportunity for reconsideration by the Owner.

Should the bidder to whom the contract is conditionally awarded refuse, neglect or fail to meet the SBE goal and/or demonstrate to the Owner's satisfaction sufficient efforts to obtain SBE participation, the proposal guaranty filed with the bid shall become the property of the Owner, not as a penalty, but as liquidated damages to the Owner.

The Contractor must not terminate an SBE subcontractor submitted on a commitment agreement for a contract with an assigned goal without the prior written consent of the Owner.

The Contractor shall designate an SBE contact person who will administer the Contractor's SBE program and who will be responsible for submitting reports, maintaining records, and documenting good faith efforts to use SBEs.

The Contractor must inform the Owner of the representative's name, title and telephone number within 10 days of beginning work.

Eligibility of SBEs.

The Texas Department of Transportation certifies the eligibility of SBEs.

The Owner will make available to interested parties a directory of certified SBEs.

Only firms certified at the time of letting or at the time the commitments are submitted are eligible to be used in the information furnished by the Contractor required under Section 2. (a) above.

Certified HUBs and DBEs are eligible as SBEs.

Small Business Size Regulations and Eligibility is referenced on e-CFR (Code of Federal Regulations), Title 13 – Business Credit and Assistance, Chapter 1 – Small Business Administration, Part 121 – Small Business Size Regulations, Subpart A – Size Eligibility Provisions and Standards.

Determination of SBE Participation. SBE participation shall be counted toward meeting the SBE goal in this contract in accordance with the following:

A Contractor will receive credit for all payments actually made to an SBE for work performed and costs incurred in accordance with the contract, including all subcontracted work.

An SBE Contractor or subcontractor may not subcontract more than 75% of a contract. The SBE shall perform not less than 25% of the value of the contract work with its own organization.

An SBE may lease equipment consistent with standard industry practice. An SBE may lease equipment from the prime contractor if a rental agreement, separate from the subcontract specifying the terms of the lease arrangement, is approved by the Owner prior to the SBE starting the work in accordance with the following:

If the equipment is of a specialized nature, the lease may include the operator. If the practice is generally acceptable with the industry, the operator may remain on the lessor's payroll. The operator of the equipment shall be subject to the full control of the SBE, for a short term, and involve a specialized piece of heavy equipment readily available at the job site.

For equipment that is not specialized, the SBE shall provide the operator and be responsible for all payroll and labor compliance requirements.

Records and Reports.

The Contractor shall submit monthly reports, after work begins, on SBE payments, (including payments to HUBs and DBEs). The monthly reports are to be sent to the Owner. These reports will be due within 15 days after the end of a calendar month.

These reports will be required until all SBE subcontracting or supply activity is completed. The “SBE Progress Report” is to be used for monthly reporting. Upon completion of the contract and prior to receiving the final payment, the Contractor shall submit the “SBE Final Report” to the Owner. These forms may be obtained from the Owner and reproduced as necessary. The Owner may verify the amounts being reported as paid to SBEs by requesting, on a random basis, copies of invoices and cancelled checks paid to SBEs. When the SBE goal requirement is not met, documentation supporting Good Faith Efforts, as outlined in Section 2. (b) of this Special Provision, must be submitted with the Final Report.

SBE subcontractors and/or suppliers should be identified on the monthly report by SBE certification number, name and the amount of actual payment made to each during the monthly period. **These reports are required regardless of whether or not SBE activity has occurred in the monthly reporting period.**

All such records must be retained for a period of 3 years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the Owner.

Compliance of Contractor. To ensure that SBE requirements of this contract are complied with, the Owner will monitor the Contractor’s efforts to involve SBEs during the performance of this contract. This will be accomplished by a review of monthly reports submitted by the Contractor indicating his progress in achieving the SBE contract goal and by compliance reviews conducted by the Owner.

A Contractor’s failure to comply with the requirements of this Special Provision shall constitute a material breach of this contract. In such a case, the Owner reserves the right to employ remedies as the Owner deems appropriate in the terms of the contract.

Article B - No SBE Goal.

Policy. It is the policy of the Owner that SBEs shall have an opportunity to participate in the performance of contracts. Consequently, the requirements of the Owner’s Small Business Enterprise Program apply to this contract as specified in Section 2-5 of this Article.

Contractor's Responsibilities. If there is no SBE goal, the Contractor will offer SBEs an opportunity to participate in the performance of contracts and subcontracts.

Prohibit Discrimination. The Contractor and any subcontractor shall not discriminate on the basis of race, color, national origin, religion, age, disability or sex in the award and performance of contracts. These nondiscrimination requirements shall be incorporated into any subcontract and purchase order.

Records and Reports.

The Contractor shall submit reports on SBE (including HUB and DBE) payments. The reports are to be sent to the Owner. These reports will be due annually by the 31st of August or at project completion, whichever comes first.

These reports will be required until all SBE subcontracting or supply activity is completed. The “SBE Progress Report” is to be used for reporting. Upon completion of the contract and prior to receiving the final payment, the Contractor shall submit the “SBE Final Report” to the Owner. These forms may be obtained from the Owner and reproduced as necessary. The Owner may verify the amounts being reported as paid to SBEs by requesting copies of invoices and cancelled checks paid to SBEs on a random basis.

SBE subcontractors and/or suppliers should be identified on the report by SBE Certification Number, name and the amount of actual payment made.

All such records must be retained for a period of 3 years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the Owner.

XV. TECHNICAL SPECIFICATIONS

SECTION 40 66 42

GENERAL

PART 1 GENERAL

1.00 SCOPE OF WORK

- A. The SCADA System Supplier (SSS) shall design, furnish, install, test and commission all new equipment to interface with existing infrastructure as a single network.
- B. The Contractor shall interface with existing substation monitoring and control equipment to provide the following functionality from Streetcar Dispatch:
 - 1. Provide indication and control of 480 Volt AC power to the rectifier transformer
 - 2. Provide indication and control of DC Circuit Breakers, including cathode breaker and OCS feeder circuit breakers
 - 3. Provide indication of alarm statuses including: transformer and rectifier high temperatures, Negative Ground Device status and lockout, HVAC status, intrusion alarms, loss of AC power, fire alarms. A list of indication and control points is given in these specifications. The indications will show on the LCD/HMI Panel
 - 4. Local power for new RTU and radio equipment shall be obtained from the substation 125 Volt DC panel.
- C. DC bypass switches shall be equipped with new status indication functionality,
 - 1. A set of normally open and closed contacts shall be installed on the disconnect switch operating mechanisms to provide the status to a local RTU/Radio device. The existing switches and cabinets shall be modified as required to accommodate the new equipment.
 - 2. RTU/Radio equipment may be installed in a new enclosure at ground level, or on the OCS pole. RTU/Radio equipment may be solar powered. If local utility power is required, the contractor shall coordinate with the utility to provide the service and shall install all required conduits and metering.
 - 3. New conduit installed on the outside of the existing poles shall be painted to match the poles.
 - 4. The contractor shall be responsible for cutting and patching existing sidewalks and/or pavement and curbs and gutters.
 - 5. Should the contractor elect to provide power from an adjacent substation of the MSF conduit shall be provided accordingly. Contractor shall submit conduit outing and details for approval. Contractor shall also designate where in existing facility power shall be obtained and submit design and working drawings for the installations.
 - 6. Existing disconnect switches are shown on sheet number 1180 of Volume 3 Systems plan set. Submittal 182.01 DC Disconnect Switches Shop Drawings shows the product information

pertaining to the disconnect switch. The disconnect switches were made by MAC products. They are the 2kA pole and wall mounted switch.

- D. Contractor shall interface with track switch control units to provide indication of switch status and remote control of the track switches.
 - a Existing control units are from Siemens and are located in cabinets on the sidewalk near by the track switches
 - b Status of track circuits shall also be displayed
 - c Status of traffic signals shall be displayed as available to the existing controller
 - d Central – Control of Transit Signal Interlocking synced with traffic signal

1.01 REGULATORY CODES, STANDARDS AND SPECIFICATIONS

- A. Except as otherwise indicated, the current editions of the following apply:
 - 1. ASTM International: American Society for Testing and Materials
 - 2. Institute of Electrical and Electronics Engineers IEEE
 - 3. National Electrical Safety Code NESC
 - 4. National Electrical Code NEC
 - 5. National Electrical Contractors Association NECA
 - 6. National Electrical Manufacturers Association NEMA
 - 7. National Fire Protection Association NFPA
 - 8. Underwriters Laboratories UL
 - 9. EN 14811 European Standard “Railway Applications – Track -Special Purpose rails- Grooved”
 - 10. AASHTO: American Association of State Highway Transportation Officials
- B. Except as otherwise indicated, these specifications within Contract Exhibit B Volume 1 El Paso Streetcar Road Track System Specifications contain additional information:
 - 1. Section 34 71 29 10 Train to wayside communications systems
 - 2. Special Specification EP-SYSTEMS Systems
 - 3. Section 26 05 19 Low-Voltage conductors and cable
 - 4. Section 26 05 26 Grounding and bonding
 - 5. Section 26 05 43 Underground ducts and raceways for electrical systems

6. Section 34 21 40 DC disconnect switches
7. Section 34 23 40 OCS wire and cable
8. Section 34 23 78 OCS Disconnect Switch Installation

1.02 SUBMITTALS

- A. Baseline Schedule
- B. Submit product data sheets for the equipment provided. Include complete manufacturer's part and model numbers.
- C. Submit manufacturer's standard installation, operation and maintenance manuals.
- D. Submit preliminary design report within 60 days of receiving Notice to Proceed. The design report must contain the contractor's basis of design, plans, calculations, or computer, and back-up data that verify the design is compatible with the existing equipment. Any typical drawings and related catalog cuts of the supplier's proposed materials must be included.
 1. The Preliminary design report submittal will be reviewed for approval by owner and the evaluation of the submittal will be considered for the final design submittal as approved by the owner.
- E. Submit Final Design Submittal within 60 days of receiving owner's comments on Preliminary Design Submittal.
- F. Submit training plan prior to completion of SCADA installation for review.

PART 2 EXISTING EQUIPMENT

2.00 TRACTION POWER SUBSTATIONS (TPS)

- A. General
 1. There are five TPS. Four along the mainline and one at the Maintenance and Storage Facility (MSF). The four TPS along the mainline are labeled as A1, A2, A3, and A4. The TPS at the MSF is labeled S1.
 2. Substations were supplied by Siemens and installed between 2017 and 2018.
 3. Substation equipment is installed in climate controlled prefabricated metal buildings.
 4. Rated for 600/750 VDC, 305 kw measured at the output terminals.
 5. Default output for TPSS is 600 VDC.
 6. Configured as a 12-pulse, double-way, in accordance with IEEE 1653.2. Except for TPSS S1 that is configured as a 6-pulse.

7. Converts 480 VAC, 60Hz, 3 Phase, three conductor primary power to 600/750 VDC at full load.
8. AC power source is El Paso Electric Company (EPEC).

B. Locations

1. TPS A1 is at Cincinnati Avenue and Oregon Street nearby University of Texas at El Paso.
2. TPS A2 is located near the intersection of Crosby Avenue and Stanton Street.
3. TPS A3 is located at the intersection of Campbell Street and Overland Avenue.
4. TPS A4 is located on the same property as the Sunmetro Downtown Transfer Facility (DTC) on Santa Fe Street
5. TPS S1 is located inside the MSF on Santa Fe Street in the 1st floor utility/electrical room.

C. Configuration

1. TPS are configured and sectionalized in accordance with plan J603, sheet number 1213, in the as-built drawings.

2.01 TRACK SWITCHES

A. General

1. There are two point-switch cabinets. They are embedded in concrete along with the track. There are 6" drains stub-ups in the concrete slab in accordance with Sheet number 123, Drawing K941.
2. Switches consist of double tongue flexible switch points. Switches are secured at the heel using a fastener design that withstands HS-20 traffic loads and resists corrosion. The design allows for removal and replacement of the switch points.
3. Turnouts are provided with switch mechanisms and steel housings for the switch mechanisms. The housing is insulated from the switch points to prevent rail to rail current paths. Housing also withstands HS-20 traffic loads.
4. All turnouts are manufactured from 51R1 and grade R290GHT in accordance with EN 14811.
5. There is elastomeric material on the special trackwork. The initial and secondary and encapsulation is polyurethane.
6. One track switch is located at the intersection of Stanton Street and Franklin Avenue. The other is located on Santa Fe Street north of the intersection of Santa Fe street and Fourth Avenue.

2.02 OCS BYPASS

A. Locations

1. There are six OCS bypass cabinets located on OCS poles.
2. Two are near the intersection of Franklin Avenue and Stanton Street. Two are near the intersection of Oregon Street and Franklin Avenue. Two are within MSF yard.
3. Locations are shown in Drawing J603 sheet number 1213 of the El Paso Streetcar Plans volume 3 Systems Version 2.

B. Cabinet

1. Sized according to requirements.
4. Capable of pole mounting.
5. For housing radio, sensors and PLC where required.
6. Six required for power bypass switches monitoring.
7. Two required for rail switches monitoring and control.
8. Surge arrestors protect each side of the switch.
9. A dead-front operating handle and linkage are inside the enclosure.
10. Operating handle is suitable for operation from ground level with a hot stick

B. Mounting

1. Cable supports will be installed where cable weight may affect switch operation.
2. Feeder cables shall only enter or exit bottom side of disconnect switch.

C. Cables

1. Four 250 KCMIL 2kV insulated feeder connect the bypass to the OCS
2. There are 2 on each side of the section insulator.

D. Bypass Position

1. Bypass are normally closed unless otherwise set.

E. Switch Contacts

1. Moving and stationary contact surfaces are silver plated copper
2. Contacts are self-aligning, wear-compensating, with wiping action on switch closing
3. Other current-carrying parts: High conductivity copper or copper alloy.

4. Switches are capable of breaking load currents under emergency conditions.
5. Auxiliary Contacts: Isolated from 600/750 Vdc to prevent inadvertent shorting of 600/750Vdc with low voltage control signals used for switch position and interlocking.

F. Insulation

1. Switches have double insulation, consisting of two independent insulators each rated for the system voltage. One is between the switch and the operating handle. The other is between the switch and the pole/wall upon which it is mounted.

G. Further Information

1. All other related information is contained within technical specification Section 34 21 40 DC Disconnect Switches of Contract Exhibit B Volume I EPSC Road Track System Specifications.

END OF SECTION

SECTION 34 21 32

SCADA SYSTEM

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:

1. The traction power SCADA system that will connect existing traction power substations to the MSF new workstation.
2. Requirements for monitoring of six (6) traction power Bypass switches and monitoring and control of two (2) train Interlocking switches.

1.02 ABBREVIATIONS

- A. SCADA: Supervisory Control and Data Acquisition
- B. TPS: Traction Power Substation
- C. MSF: Maintenance and Storage Facility
- D. HMI: Human Machine Interface
- E. GUI: Graphic User Interface
- F. PLC: Programmable Logic Controller

PART 2 - PRODUCTS

2.01 SCADA SYSTEM DESIGN

- A. The Contractor is responsible for designing the SCADA system and for furnishing SunMetro with a complete tested and working system including all necessary hardware and software.
- B. The SCADA system shall be fail-safe, such that a hardware or software failure condition does not result in an unsafe equipment state.
- C. The SCADA system shall provide monitoring and control for three existing subsystems:
 1. Four (4) Siemens Traction Power Substations,
 2. Two (2) Voestalpine running rail two-way Point Switches with Siemens Simatic ET200S PLC; and
 3. Six (6) 750 VDC manual Bypass Switches.

2.02 SCADA WORKSTATION/SERVER

- A. The Contractor shall work with SunMetro to configure the existing networking equipment to link to the new Workstation/Server at the Maintenance and Storage Facility (MSF).
- B. The workstation shall be equipped as a minimum according to the specifications below. Furnish additional requirements to SunMetro for the SCADA workstations, as required.
 - 1. Processor: XEON.
 - 2. Operating system: Windows 10 Professional 64.
 - 3. Memory: Minimum 64 GB.
 - 4. Internal Storage: 2 TB SATA.
 - 5. Slot for second internal storage drive. (Optional)
 - 6. One Blu-Ray writer optical disc drive.
 - 7. One SD card reader.
 - 8. Minimum three USB connectors. 2x USB 3.1, 1x USB 3.0
 - 9. Connections for microphone and speaker shall be in the back of the computer.
 - 10. Graphic Card, DVI, Display Port, and HDMI.
 - 11. Ensure that the computers are fitted with all required communication cards to properly interface with the Wireless and Wired Network.
- C. The Workstation shall be equipped with input and output devices as described below:
 - 1. QWERTY Keyboard:
 - a. Wired (USB)
 - b. Equipped with backlit keys
 - c. Washable
 - 2. Mouse:
 - a. Sealed
 - b. Three buttons
 - c. Scrolling wheel
 - d. Wired (USB)
 - e. Optical
 - f. Monitors:
 - g. Two monitors for each workstation, all of the same manufacturer and type
 - h. Size: Minimum 24 inch
 - i. Resolution: Minimum 2560 x1440 pixels
 - j. Ports: One DVI, and two HDMI, one DisplayPort

- A. The equipment in each of the 4 TPS is connected via an internal network as shown in the Appendix. The integrated modular substation is supplied by Siemens.
 1. Automatic operations are preprogrammed and report to the on-site HMI.
 2. The HMI features a touch-screen GUI.
 3. All indications and controls are shown on the HMI.
 4. The OMF display shall mimic the local GUI.
 5. All local indications and controls shall be matched on the MSF Workstation.
 6. Actions by the operator at MSF causing state changes at the TPS will result in the changed state showing on both the local and remote display.
 7. All “state” changes shall be captured in event logs at both “local” and at “remote LCD/HMI” locations.
- B. The two rail Point switch control cabinets house the Voestalpine Point switch and the Siemens PLC.
 1. The position of the Point switch is determined by the route called onboard the transit vehicle.
 2. All “state” changes shall be displayed at both “local” and “remote LCD/HMI” locations
- C. The six Bypass switches are located in cabinets on top of catenary poles.
 1. The SCADA Workstation software shall monitor the position of the switch which is normally closed.
 2. Each switch is equipped with form C limit switch contacts indicating both the closed and open positions.
 3. A simple I/O monitor device with either a serial or Ethernet port shall transmit the state of each limit switch over the Wireless Network to the Workstation at the MSF
 4. The top-level GUI on the Workstation shall indicate the state of the Bypass switch in a manner to be agreed upon with SunMetro.
 5. There are no control functions for the Bypass switch since it is for manual operation only.

2.04 SOFTWARE

- A. The following software is presently owned by SunMetro:

Application	Part Number	Description
HMI Development Software	6AV2102-0AA03-0AA5	SIMATIC WinCC Advanced V13 SP1
PLC Development Software	6ES7822-1AA03-0YA5	SIMATIC STEP 7 Professional V13 SP1

DC Relay Configuration		Sitras PRO SW
AC Relay Configuration	7XS5-4000-AA00	DIGSI V4.90
Modbus License	2XV94501MB00	SIMATIC MODBUS/TCP CP FOR NCM_CP, SINGLE LICENSE, ON CD

B. Password Protection:

1. Any commands sent from the Workstation shall require the operator to log in with username and password
2. Download of historical data shall be possible only after login with username and password.

PART 3 - EXECUTION

END OF SECTION

SECTION 40 66 43
WIRELESS NETWORK

PART 1 GENERAL

1.00 SCOPE OF WORK

- A. The SCADA System Supplier (SSS) shall furnish, install and place into operation wireless network as specified.
- B. The SSS shall furnish all necessary interconnecting cables, antenna connectors, couplers, mating adapters, feedlines and appurtenances as indicated herein or as required for proper operation of the system.
- C. The SSS shall configure all existing network devices to operate as a unified single network.

1.01 REGULATORY CODES, STANDARDS AND SPECIFICATIONS

- A. Except as otherwise indicated, the current editions of the following apply:
 - 11. Federal Communications Commission – Title 47
 - 12. Telecommunications Industry Association (TIA) – Standard 222

1.02 SUBMITTALS

- A. Submit performance data sheets for the equipment provided. Include complete manufacturer's part and model numbers.
- B. Submit manufacturer's standard installation, operation and maintenance manuals.

PART 2 PRODUCTS

2.00 RADIO TRANSCEIVER

A. GENERAL

- 1. Unlicensed Spread Spectrum radios shall be provided at the locations indicated on the contract drawings.
- 2. The radio transceiver shall be an unlicensed radio in the 900 MHz frequency range for creation of point to multipoint system (PMP).
- 3. Radio Transceiver shall be provided with the radio diagnostics options.
- 4. The radio transceivers shall include one master station and multiple remote radios.

B. 900 MHz UNLICENSED PMP RADIO TRANSCEIVER

1. RADIO

- a. The radio transceiver shall be a licensed microwave radios in the 900 - 928 MHz ISM band frequency.
- b. Operating mode:
 - 1) Master (Access Point)
 - 2) Remote
- ii Interface
 - 1) IP Ethernet
 - 2) RS-232
 - 3) RS-485
- c. Power 24 VDC
- h. The radio transceiver shall be MDS series Orbit MCR-900, or approved equivalent.

2.01 ANTENNAS

A. Remote Yagi

1. Yagi antennas shall be installed at all traction power locations.

- a. Frequency Range: 900 – 930 MHz (unlicensed)
- b. Gain: 9 dB
- c. VSWR: Less than 1.5:1.
- d. Front-to-Back Ratio: 15 dB, minimum.
- e. Input: Type N Female.

B. Omni-Directional Antenna.

1. The omni-directional antenna shall be mounted on all remote communications cabinet locations
 - a. Input: N Female Connection
 - b. Gain: Unity
 - c. Frequency Range: 900 – 930 MHz (unlicensed)
 - d. VSWR: Less than 1.5:1

C. 120 Degree Directional Sector Antenna.

1. The sector antenna shall be installed at the Maintenance Facility
 - a. Frequency Range: 900 – 930 MHz (unlicensed)
 - b. Gain: 11.5 dB
 - c. VSWR: Less than 1.5:1.
 - d. Front-to-Back Ratio: 17 dB, minimum.
 - e. Connector: Type N Female.

2.02 POWERED CABINETS

A. NEMA 3R Cabinet

1. Sized according to requirements.
2. Capable of pole mounting.
3. For housing radio, sensors and PLC where required.
4. Six required for power bypass switches monitoring.
5. Two required for rail switches monitoring and control.

B. Solar Power Supply

1. Sized according to requirements.
2. 24 VDC power supply.
3. Capable of pole mounting.
4. Solar cell power source.
5. Non-gassing battery.

2.03 1500 VDC Propulsion Power Sensors

- A. Failsafe voltage sensors.
- B. Monitors power on both sides of power disconnect, supply and load.
- C. Provides logic input to PLC.

2.04 Programmable Logic Controllers (PLC)

- A. Monitor only required for power disconnect switches.
- B. Monitor and control required for rail point switches.

C. Existing Siemens controller may be used in rail point switches if desired.

2.05 Spare Parts

A. One spare of each item supplied.

PART 3 EXECUTION

3.00 GENERAL

A. Coordinate and schedule work with Owner to minimize disruption and impact.

3.01 INSTALLATION AND START-UP

A. Perform Site Work and install Communications equipment as shown on Drawings. Install associated equipment including antenna mounts, cable, cable jumpers, connectors and grounding systems.

B. Install antennas, associated transmission lines, power cabinets, conduit work and any ancillary antenna accessories per this and applicable specifications and as shown on the contract drawings.

1. Directional antennas shall be installed on a 2" pipe mast as indicated on the contract drawings.

2. Provide weather wrapping for all exposed cabling and connectors. Weather wrapping shall be Scotch 3M, cold shrink.

3. Antenna shall be firmly secured utilizing all necessary mounting brackets, clamps, bolts, screws and adapters. Mounting hardware shall be heavy duty rigid stainless steel.

4. Provide cable ground within 24" of antenna to pipe mast.

5. Antennas shall be aligned at each location.

C. RF connectors shall be installed in accordance with the manufacturer's installation requirements.

D. System Start-up and Site Acceptance:

1. Schedule start-up efforts with Owner.

3.02 SCADA SYSTEM SUPPLIER FIELD SERVICES

A. Provide on-site supervision for installation efforts by a direct full-time employee of the SSS.

B. Path Verification

1. The preferred method of communications is 900 MHz unlicensed frequency for all remote sites. The SSS shall provide signal path and strength testing from the remote to the 900 MHz Master station located at the Maintenance Facility. If communications signal and path are not viable, the SSS shall use alternate sites as a relay point.

3.03 RADIO PROGRAMMING, CONFIGURATION AND ADJUSTMENT

A. Radio Adjustment:

1. Perform radio manufacturer's maintenance and calibration tests as published in the O&M manuals.
2. Adjust radio parameters to meet the operational limits established by the Owner's FCC license.

B. Programming and Configuration

1. Program and configure the radio as required to interface with the existing communications network.
2. Program and configure the routing tables and repeater paths as required to establish communications with the defined SCADA master, repeater and hubs indicated on the drawings.

3.04 WIRELESS NETWORK TESTING

3.05 PREPARATION

- A. Ensure spare parts and consumables are available to complete the Site Acceptance Test.
- B. Provide Radio Commissioning Binder.

END OF SECTION

XVI. APPENDICES

- a. Forms and Certifications
 - i. Buy America Certification
- b. Existing El Paso Streetcar Documents
 - A. El Paso Streetcar Infrastructure Specifications
 - B. SCADA Product Data
 - C. SCADA Related Drawings
 - D. EPSC Plans Volume 3 System V2
 - E. Contract Exhibit B - Vol1 EPSC Specs Road Track System

a. Forms and Certifications

BUY AMERICA CERTIFICATION

Instructions:

Bidder to complete the Buy America Certification listed below. Bidder shall certify EITHER COMPLIANCE OR NON-COMPLIANCE (not both). This Certification MUST BE submitted with the Bidder's bid response.

Certification requirement for procurement of steel, iron, or manufactured products.

Certificate of Compliance with 49 U.S.C. 5323(j)(1)

The bidder or offeror hereby certifies that it **will meet** the requirements of 49 U.S.C. 5323(j)(1) and the applicable regulations in 49 CFR Part 661 and any amendments thereto.

Signature _____

Company Name _____

Title _____

Date _____

Certificate of Non-Compliance with 49 U.S.C. 5323(j)(1)

The bidder or offeror hereby certifies that it **cannot comply** with the requirements of 49 U.S.C. 5323(j)(1) and 49 C.F.R. 661.5, but it may qualify for an exception pursuant to 49 U.S.C. 5323(j)(2)(A), 5323(j)(2)(B), or 5323(j)(2)(D), and 49 C.F.R. 661.7.

Signature _____

Company Name _____

Title _____

Date _____

Special Note: Make sure you have signed only one of the above statements -- either Compliance OR Non-Compliance (not both).

b. Existing El Paso Streetcar Documents

Note: These are 5 separate documents:

- A. El Paso Streetcar Infrastructure Specifications
- B. SCADA Product Data
- C. SCADA Related Drawings
- D. EPSC Plans Volume 3 System V2
- E. Contract Exhibit B - Vol1 EPSC Specs Road Track System