

SPECIFICATIONS AND CONTRACT DOCUMENTS

DIESEL PACKAGE GENERATOR SYSTEM
INSTALLATION AND
LABOR & MATERIAL
FOR
FIRE STATIONS #3, #4, #6, and #7
CITY OF TUPELO, MISSISSIPPI



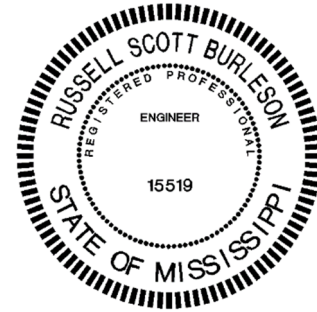
Allen&Hoshall
engineers-architects-surveyors

1661 International Drive, Suite 100
Memphis, TN 38120

BID NO: 2023-068PW
JOB NO.: 8542
DATE: December 2023

DOCUMENT 00002 CERTIFICATIONS

The Plans and Specifications covered by these Contract Documents were prepared under the supervision and direction of the undersigned Registered Engineers and/or Architects, whose seals are affixed below.



Signed copy on file
Russell Scott Burleson, P.E.
Electrical Engineer

END OF DOCUMENT

**DOCUMENT 00003
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END OF DOCUMENT

**DOCUMENT 00021
INVITATION TO BIDDERS**

Separate sealed bids *for the supply and installation of Diesel Generator Package Systems for Tupelo Fire Stations #3, #4, #6, and #7, Bid 2023-068PW*, will be received by the **CITY OF TUPELO** until **10:00 A.M., LOCAL TIME ON THURSDAY, THE 25TH DAY OF JANUARY, 2024** and then at said office publicly opened and read aloud. Sealed bids will be received until the designated date and time at **TUPELO CITY HALL, PURCHASING OFFICE, ATTENTION: TRACI DILLARD, 71 EAST TROY STREET, TUPELO, MS 38804**.

The Project generally consists of the following:

Furnishing and installation of Diesel Gas Generator Package Systems. Furnishing of concrete foundations, cutting and patching of existing concrete for new electrical. Furnishing and installation of Automatic Transfer Switch and all electrical connections back to the service transformer and generator. Furnishing and installation of connections to generator. Necessary Labor and Materials for turn-key installation.

Bid, Contract Documents, and Specifications can be viewed and obtained online at www.tupelomsbids.com. Any questions regarding electronic bidding or access to bid documents should be directed to PH Bidding Group at 662-407-0193.

Bids will be accepted only under the name of the Bidder to whom contract documents have been issued, and whose name appears on the official list of Planholders maintained by the City of Tupelo.

No Bidder may withdraw his bid within 45 days after the actual date of the opening thereof.

All applicable laws, ordinances and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout.

Each Bidder is responsible for reading and being thoroughly familiar with the Contract Documents. The failure or omission of any Bidder to do any of the foregoing shall in no way relieve any Bidder from any obligation in respect to this Bid.

A conditional or qualified Bid will not be accepted. Award will be made to the lowest responsible, responsive Bidder.

The Owner reserves the right to waive any informality or to reject any or all Bids.

This is the 27th day of December 2023.

**TODD JORDAN, MAYOR
CITY OF TUPELO**

Advertisement: December 27th, 2023, and January 3rd, 2024

DOCUMENT 00100 INSTRUCTIONS TO BIDDERS

1. DEFINED TERMS.

1.1 Terms used in these Instructions to Bidders, which are defined in the General Conditions of the Construction Contract, have the meanings assigned to them in the General Conditions. The term "Bidder" means one who submits a Bid directly to Owner, as distinct from a sub-bidder, who submits a bid to a Bidder. The term "Successful Bidder" means the lowest, qualified, responsible and responsive Bidder to whom Owner (on the basis of Owner's evaluation as hereinafter provided) makes an award. The term "Bidding Documents" includes the Advertisement or Invitation to Bid, Instructions to Bidders, the Bid Form, and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids).

2. COPIES OF BIDDING DOCUMENTS.

2.1 Complete sets of Bidding Documents for the sum stated in the Advertisement or Invitation to Bid may be obtained from Engineer. This sum is non-refundable.

2.2 Complete sets of Bidding Documents must be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

2.3 Owner and Engineer in making copies of Bidding Documents available on the above terms do so only for the purpose of obtaining Bids on the Work and do not confer a license or grant for any other use.

3. QUALIFICATIONS OF BIDDERS.

3.1 Each Bid must contain evidence of Bidder's qualification to do business in the state where the Project is located or covenant to obtain such qualification prior to award of the contract.

3.2 Each Bidder **not** listed in PRE-QUALIFIED CONTRACTORS as a pre-qualified contractor, shall submit Document 00420 - BIDDERS QUALIFICATION STATEMENT in a clearly marked separate envelope (separate from the BID). This document will not be made public.

4. EXAMINATION OF CONTRACT DOCUMENTS AND SITE.

4.1 It is the responsibility of each Bidder before submitting a Bid, to (a) examine the Contract Documents thoroughly, (b) visit the site to become familiar with the local conditions that may affect cost, progress, performance or furnishing of the Work, (c) consider federal, state and local Laws and Regulations that may affect cost, progress, performance or furnishing of the Work, (d) study and carefully correlate Bidder's observations with the Contract Documents, and (e) notify Engineer of all conflicts, errors or discrepancies in the Contract Documents.

4.2 Reference is made to the Supplementary Conditions for identification of:

a. Those drawings of physical conditions in or relating to existing surface and subsurface conditions (except Underground Facilities) which are at or contiguous to the site which have been utilized by Engineer in preparation of the Contract Documents. Bidder may rely upon the accuracy of the technical data contained in such drawings but not upon the completeness thereof for the purposes of bidding or construction.

b. Copies of such reports and drawings will be made available by Owner to any Bidder on request. Those reports and drawings are not part of the Contract Documents but the technical data contained therein upon which Bidder is entitled to rely as provided in Paragraphs 4.2(a) and 4.2(b) are incorporated therein by reference. Such technical data has been identified and established in the

Supplementary Conditions.

4.3 Information and data reflected in the Contract Documents with respect to Underground Facilities at or contiguous to the site is based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities or others, and Owner and Engineer do not assume responsibility for the accuracy or completeness thereof unless it is expressly provided otherwise in the Supplementary Conditions.

4.4 Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders on subsurface conditions, Underground Facilities and other physical conditions, and possible changes in the Contract Documents due to differing conditions appear in Paragraphs 4.2 and 4.3 of the General Conditions.

4.5 Before submitting a Bid, each Bidder will, at Bidder's own expense, make or obtain any additional examinations, investigations, explorations, tests and studies and obtain any additional information and data which pertain to the physical conditions (surface, subsurface and Underground Facilities) at or contiguous to the site or otherwise which may affect cost, progress, performance or furnishing of the Work and which Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price and other terms and conditions of the Contract Documents.

4.6 On request, in advance, Owner will provide each Bidder access to the site to conduct such explorations and tests as each Bidder deems necessary for submission of a Bid. Bidder shall fill all holes, clean up and restore the site to its former condition upon completion of such explorations.

4.7 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4, that without exception the Bid is premised upon performing and furnishing the Work required by the Contract Documents and such means, methods, techniques, sequences or procedures of construction as may be indicated in or required by the Contract Documents, and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

5. AVAILABILITY OF LANDS FOR WORK

5.1 The lands upon which the Work is to be performed, rights-of-way and easements for access thereto and other lands designated for use by Contractor in performing the Work are identified in the Contract Documents. All additional lands and access thereto required for temporary construction facilities or storage of materials and equipment are to be provided by Contractor. Easements for permanent structures or permanent changes in existing structures are to be obtained and paid for by Owner unless otherwise provided in the Contract Documents

6. INTERPRETATIONS AND ADDENDA.

6.1 All questions about the meaning or intent of the Contract Documents are to be directed to Engineer. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by Engineer as having received the Bidding Documents. Questions received less than seven days prior to the date for opening of Bids may not be answered. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

6.2 Addenda may also be issued to modify the Bidding Documents as deemed advisable by Owner or Engineer.

7. BID SECURITY.

7.1 Each Bid must be accompanied by Bid security made payable to Owner in an amount of five percent of the Bidder's maximum Bid price and in the form of a bank check or a Bid Bond issued by a surety meeting the requirements of Paragraph 5.1 of the General Conditions.

7.2 The Bid security of the Successful Bidder will be retained until such Bidder has executed the Agreement and furnished the required contract security, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Agreement and furnish the required contract security within fifteen days after the Notice of Award, Owner may annul the Notice of Award and the Bid security of that Bidder will be forfeited. The Bid security of other Bidders whom Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of the seventh day after the Effective Date of the Agreement or the forty-sixth day after the Bid opening, whereupon Bid security furnished by such Bidders will be returned. Bid security with Bids which are not competitive will be returned within ten days after the Bid opening.

8. CONTRACT TIME.

8.1 The number of days within which, or the dates by which, the Work is to be substantially completed and also completed and ready for final payment (the Contract Time) are set forth in the Bid Form and the Agreement.

9. LIQUIDATED DAMAGES.

9.1 Provisions for liquidated damages are set forth in the Agreement.

10. SUBSTITUTE OR "OR EQUAL" ITEMS.

10.1 The Contract, if awarded, will be on the basis of materials and equipment described in the Drawings or specified in the Specifications without consideration of possible substitute or "or-equal" items. Whenever it is indicated in the Drawings or specified in the Specifications that a substitute or "or-equal" item of material or equipment may be furnished or used by Contractor if acceptable to Engineer, application for such acceptance will not be considered by Engineer until after the Effective Date of the Agreement. The procedure for submission of any such application by Contractor and consideration by Engineer is set forth in the General Conditions and may be supplemented in the General Requirements.

11. SUBCONTRACTORS, SUPPLIERS, AND OTHERS

11.1 If the Bid Form or Supplementary Conditions require the identity of certain Subcontractors, Suppliers and other persons and organizations (including those who are to furnish the principal items of material and equipment) the Bidder shall list the requested data. If requested by the Owner, the apparent Successful Bidder, and any other Bidder so requested, shall within five days after Bid opening submit to Owner an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, person or organization listed. An Owner or Engineer who after due investigation has reasonable objection to any proposed Subcontractor, Supplier, other person or organization, may before the Notice of Award is given request apparent Successful Bidder to submit an acceptable substitute, without an increase in Bid price.

11.2 If apparent Successful Bidder declines to make any such substitution, Owner may award the contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers and other persons and organizations. The declining to make requested substitutions will not constitute grounds for sacrificing the Bid security of any Bidder. Any Subcontractor, Supplier, other person or organization listed and to whom Owner or Engineer does not make written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to revocation of such acceptance after the Effective Date of the Agreement as provided in Paragraph 6.5 of the General Conditions.

12. BID FORM.

12.1 The Bid Form is included with the Bidding Documents.

12.2 All blanks on the Bid Form must be completed in ink or by typewriter.

12.3 Bids by corporations must be executed in the corporate name by the president or a vice-president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal must be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation must be shown below the signature.

12.4 Bids by partnerships must be executed in the partnership name and signed by a partner, whose title must appear under the signature and the official address of the partnership must be shown below the signature.

12.5 All names must be typed or printed below the signature.

12.6 The Bid shall contain an acknowledgment of receipt of all Addenda (the numbers of which must be filled in on the Bid Form).

12.7 The address and telephone number for communications regarding the Bid must be shown.

12.8 Bids must be priced on a **Lump Sum** basis for the base contract. The **Total Lump Sum Bid** shall include all amounts stipulated on the **BID FORM** for Authorized Contract Amendments.

The value of OWNER FURNISHED MATERIALS is not to be included in the LUMP SUM BASE BID. Provide a separate price for each Alternate described in the Specifications and as provided for in the Bid Form. The price of the Bid for each Alternate will be the amount to be added to or deducted from the price of the base Bid if Owner selects the Alternate. Unit Price data is to be provided for all units listed on the Bid Form to allow contract price adjustment based on Change Order.

12.9 The Bid price shall include such amounts as the Bidder deems proper for overhead and profit on account of cash allowances named in the Contract Documents as provided in paragraph 11.6 of the General Conditions.

13. SUBMISSION OF BIDS.

13.1 Bids, Bid security, and other required documents shall be submitted at the time and place indicated in the Advertisement or Invitation to Bid.

13.2 **BID ENVELOPE.** The Bid shall be enclosed in an opaque sealed **Bid Envelope** separate from the postal/mailling/delivery service envelope when such delivery envelope is required. **The Project Title, Owner's name and address, Bidder's (and All submitted Subcontractor's) name and address, Contractor License Classification, License Number, and Expiration Date shall be marked on the outside of the Bid envelope in accordance with State Law (TCA § 62-6-119).** Document 00100-F is provided for the Bidder's convenience. Failure to show these items on the outside of the envelope will result in the Bid being listed as "**NON-RESPONSIVE**" and returned to the Bidder unopened.

13.3 **DELIVERY ENVELOPE** shall be used for the postal/mailling/delivery service envelope when such delivery envelope is required. **Delivery Envelope shall be marked "Bid Enclosed" with Project Name, Bid time and date.** Delivery Envelope shall be separate from the Bid Envelope.

13.4 Prospective Bidders are furnished one copy of Bidding Documents with one separate unbound copy of the Bid Form. The Bidding Documents are to be retained by the Bidder. **Two copies of the BID FORM are to be completed and submitted with the Bid security and other required**

documents.

13.5 A copy of the State Contractor's License certificate for the General Contractor and all submitted Subcontractors shall be submitted with the Bid.

13.6 Document 00482 – DRUG-FREE WORKPLACE AFFIDAVIT, is to be submitted with the BID FORM.

13.7 Document 00820, EQUAL OPPORTUNITY PROVISIONS, is to be submitted with the BID FORM.

14. MODIFICATION AND WITHDRAWAL OF BIDS.

14.1 Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that a Bid must be executed) and delivered to the place where Bids are to be submitted at any time prior to the opening of Bids.

14.2 If, within twenty-four hours after Bids are opened, any Bidder files a duly signed, written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid and the Bid security will be returned. Thereafter, that Bidder will be disqualified from further bidding on the Work to be provided under the Contract Documents.

15. OPENING OF BIDS.

15.1 Bids without evidence of proper qualifications as described in Paragraph 3 or not submitted as described in Paragraph 13 will be listed as **NON-RESPONSIVE** and will be returned to the Bidder unopened.

15.2 Bids will be opened and (unless obviously non-responsive) read aloud publicly. An abstract of the amounts of the base Bids and major alternates (if any) will be made available to Bidders after the opening of Bids.

16. BIDS TO REMAIN SUBJECT TO ACCEPTANCE.

16.1 All bids will remain subject to acceptance for forty-five days after the day of the Bid opening, but Owner may, in its sole discretion, release any Bid and return the Bid security prior to that date.

17. AWARD OF CONTRACT.

17.1 Owner reserves the right to reject any and all Bids, to waive any and all informalities not involving price, time or changes in the Work and to negotiate contract terms with the Successful Bidder, and the right to disregard all nonconforming, non-responsive, unbalanced or conditional Bids. Also, Owner reserves the right to reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder, whether because the Bid is not responsive or the Bidder is unqualified or of doubtful financial ability or fails to meet any other pertinent standard or criteria established by Owner. Discrepancies in the multiplication of units of Work and unit prices will be resolved in favor of the correct multiplication of the listed units and Unit Prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between words and figures will be resolved in favor of the words.

17.2 In evaluating Bids, Owner will consider the qualifications of the Bidders, whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award.

17.3 Owner may consider the qualifications and experience of Subcontractors, Suppliers, and other persons and organizations proposed for those portions of the Work as to which the identity of Subcontractors, Suppliers, and other persons and organizations must be submitted as provided in the Supplementary Conditions. Owner also may consider the operating costs, maintenance requirements, performance data and guarantees of major items of materials and equipment proposed for incorporation in the Work when such data is required to be submitted prior to the Notice of Award.

17.4 Owner may conduct such investigations as Owner deems necessary to assist in the evaluation of any Bid and to establish the responsibility, qualifications and financial ability of Bidders, proposed Subcontractors, Suppliers and other persons and organizations to perform and furnish the Work in accordance with the Contract Documents to Owner's satisfaction within the prescribed time.

17.5 If the contract is to be awarded, it will be awarded to the lowest Bidder whose evaluation by Owner indicates to Owner that the award will be in the best interests of the Project.

17.6 If the contract is to be awarded, Owner will give the Successful Bidder a Notice of Award within forty-five days after the day of the Bid opening.

18. CONTRACT SECURITY.

18.1 Paragraph 5.1 of the General Conditions and the Supplementary Conditions describe the Owner's requirements as to performance and payment Bonds. When the Successful Bidder delivers the executed Agreement to Owner, it must be accompanied by the required performance and payment Bonds.

19. SIGNING OF AGREEMENT.

19.1 When Owner gives a Notice of Award to the Successful Bidder, it will be accompanied by the required number of unsigned counterparts of the Agreement with all other written Contract Documents attached. Within (15) fifteen days thereafter Contractor shall sign and deliver the required number of counterparts of the Agreement and attached documents to Owner with the required Bonds and Insurance Certificates. Within (10) ten days thereafter Owner shall deliver one fully signed counterpart to Contractor. Each counterpart is to be accompanied by a complete set of the Drawings with appropriate identification.

20. PREBID CONFERENCE.

20.1 A pre-bid conference will not be held.

21. SALES AND USE TAXES.

21.1 The Owner is exempt from State Sales and Use Taxes on materials and equipment to be incorporated into the Work. Said taxes shall not be included in the Contract Price. Refer to Supplementary Conditions for additional information.

22. RETAINAGE.

22.1 Provisions concerning retainage and Contractors' rights to deposit securities in lieu of retainage are set forth in the Agreement.


END OF DOCUMENT

**DOCUMENT 00100F
BID ENVELOPE INFORMATION FORM**

BIDDER:

This form is for the Bidder's convenience as noted in Section 00100 - INSTRUCTIONS TO BIDDERS. This form is not required; however, **the information is required on the front of the Bid Envelope.**

Add the required information of all subcontractors proposed. Extend form as required.

	
Project:	Diesel Generator Package Systems for Tupelo Fire Stations #3, #4, #6, and #7
Owner:	City of Tupelo
Address:	71 East Troy Street Tupelo, MS 38804
Bidder:	_____
Address:	_____
Bidder License/Certificate No.	_____
Subcontractor:	_____
Address:	_____
Subcontractor License/Certificate No.	_____

END OF DOCUMENT

**DOCUMENT 00301
BID FORM**

Date: _____

To: City of Tupelo
71 East Troy Street
Tupelo, MS 38804

Gentlemen:

The undersigned, hereinafter called the "Materialman", hereby proposes to sell and deliver to The City of Tupelo, MS, hereinafter called the "Owner", upon the terms and conditions herein stated, the material specified in the attached Specifications dated December, 2023 for the following sum:

BASE BID:

<u>ITEM</u>	<u>QUANTITY</u>	<u>DESCRIPTION</u>	<u>TOTAL BID PRICE</u>
1	1	Fire Station #3 Diesel Package Generator System And Associated Equipment, Material, and Labor for Installation	\$ _____
2	1	Authorized Contract Amendments	\$ 5,000 _____

ADDER 1:

<u>ITEM</u>	<u>QUANTITY</u>	<u>DESCRIPTION</u>	<u>TOTAL BID PRICE</u>
1	1	Fire Station #4 Diesel Package Generator System And Associated Equipment, Material, and Labor for Installation	\$ _____
2	1	Authorized Contract Amendments	\$ 5,000 _____

ADDER 2:

<u>ITEM</u>	<u>QUANTITY</u>	<u>DESCRIPTION</u>	<u>TOTAL BID PRICE</u>
1	1	Fire Station #6 Diesel Package Generator System And Associated Equipment, Material, and Labor for Installation	\$ _____
2	1	Authorized Contract Amendments	\$ 5,000 _____

ADDER 3:

<u>ITEM</u>	<u>QUANTITY</u>	<u>DESCRIPTION</u>	<u>TOTAL BID PRICE</u>
1	1	Fire Station #7 Diesel Package Generator System And Associated Equipment, Material, and Labor for Installation	\$ _____
2	1	Authorized Contract Amendments	\$ 5,000 _____

TOTAL BID PRICE \$ _____

DELIVERY:

Delivery Site: Tupelo Fire Stations #3, #4, #6, and #7

Delivery Date: _____

An alternate Delivery Date of _____ is proposed by the Materialman. If this alternate Delivery Date is accepted by the Owner, a price reduction of \$_____ is offered.

GENERAL:

In submitting this Proposal, the Materialman agrees as follows:

The prices set forth herein do not include any sums which are or may be payable by the Materialman on account of taxes imposed by any taxing authority upon the sale, purchase, or use of the equipment. If any such tax is applicable to the sale, purchase, or use of the equipment, the amount thereof shall be added to the purchase price and paid by the Owner.

The Materialman agrees to the terms and conditions of the Document 00531 - MATERIALS CONTRACT.

The prices set forth herein are firm if accepted by the Owner within thirty (30) days and shall include the cost of delivery to the job site. The material shall be delivered to the Delivery Site on or before the Delivery Date.

The Materialman shall be responsible for securing all permits required for shipping to the Delivery Site and shall be responsible for any damages to road and utilities or other damages caused by the Materialman or his Delivery Agent during shipment to Delivery Site.

Notice of Shipment - The Materialman shall notify the Owner at the following times:

1. 10 days prior to shipment.
2. 24 hours prior to shipment.
3. 24 hours prior to delivery.

Shipments arriving after 2:00 p.m. on weekdays or arriving on weekends or holidays shall not be unloaded until the next working day and the Materialman shall be responsible for any demurrage.

Failure to provide notice shall result in Materialman being responsible for any demurrage charges resulting from the unavailability of equipment to unload equipment.

The Materialman agrees that all requests for time extensions shall be in writing, and that only such time extensions as are granted by the Owner in writing shall be considered.

Time is of the essence in order for the Owner to comply with established construction schedules. Should the Materialman fail to complete the terms of this Proposal by the Delivery Date, after all time extensions granted by the Owner have been added, then in that event the Owner shall have and is hereby given the right to deduct and retain out of such monies which may then be due, or which may become due and payable to the Materialman, the DAMAGE AMOUNT per calendar day as liquidated damages for each and every day that Certification is delayed beyond the Delivery Date. The Materialman and Owner agree that liquidated damages are for costs associated with project delay and not as a penalty and that proof of such losses or damages shall not be required. The DAMAGE AMOUNT shall be \$300 per day.

The GENERAL CONDITIONS and SUPPLEMENTARY CONDITIONS describe the Owner's requirements as to Performance and Payment Bonds. When the successful Bidder delivers the executed Materials contract to the Owner, it must be accompanied by the required Performance and Payment Bonds.

Proposal requirements, as outlined in the technical sections, shall be submitted with this proposal. Failure to submit requested data can result in Bid rejection.

The qualifications of the Materialman’s Field Services Representative for field inspection, testing and certification shall be attached to this proposal. Include the name of the proposed field service firm, if these services are not supplied by employees of the manufacturer. A schedule of field tests, applicable ANSI standards and test limits shall be submitted by the Materialman. The qualifications of the Field Service Representatives or Field Service Firm will be included in the overall evaluation of this proposal.

In estimating the lowest cost to the Owner as one of the factors in deciding the award of an order, the Owner will consider, in addition to the price quoted in the proposal, the following:

1. Stated exceptions to the specifications.
2. Method of delivery.
3. Warranty.
4. Installation, erection and operating costs.
5. Delivery time.
6. Work history on previous projects.

Failure to submit bid evaluation data as specified can lead to bid rejection.

Title of each equipment item shall pass to the Owner upon:

1. Delivery at location specified.
2. Satisfactory inspection for in transit damage.
3. Satisfactory installation and field test.
4. Acceptance by the Owner following completion of Item 3.

5. Payment: See Document 00531 - MATERIALS CONTRACT, Article II Payment. The Materialman shall submit bids on this PROPOSAL. Submit complete PROPOSAL in (2) two unaltered copies with all blank spaces completed. There shall be no exceptions for basic bid submitted by the Materialman; however, an alternate, with exceptions, may be bid as an attachment to a basic bid.

The Materialman acknowledges that he has received the following Addenda (insert Addenda number(s) and date(s) or NONE):

<u>ADDENDUM NUMBER</u>	<u>DATE</u>
_____	_____
_____	_____

It is understood by the undersigned that the Owner retains the privilege of accepting or rejecting all or any part of this Proposal and to waive any informalities or technicalities therein.

MATERIALMAN: _____

BY: _____

TITLE: _____

MAILING ADDRESS: _____

DATE: _____

TELEPHONE: _____

STREET ADDRESS: _____

FAX: _____

EMAIL: _____

PRINCIPAL CONTACT: _____

TELEPHONE: _____

EMAIL: _____

ALTERNATE CONTACT: _____

TELEPHONE: _____

EMAIL: _____

END OF DOCUMENT

**DOCUMENT 00420
BIDDERS QUALIFICATION STATEMENT**

The contents of this statement are CONFIDENTIAL. This Document is to be submitted separately from the Bidding Documents. See Document 00100, INSTRUCTIONS TO BIDDERS.

Submitted by:

Name of Organization _____

Name of Individual _____

Title _____

Address _____

Telephone _____

Email Address _____

BUSINESS ORGANIZATION INFORMATION:

Check one: Corporation Partnership Joint Venture Sole Proprietorship

If Corporation:

a. Date and State of Incorporation

b. List of Executive Officers

Name	Title
------	-------

_____	_____
_____	_____
_____	_____

If Partnership:

a. Date and State of Organization

b. Name of Current General Partners

c. Type of Partnership:

General Publicly Traded Limited Other (describe):

If Joint Venture:

a. Date and State of Organization

b. Name, Address, and Form of Organization of Joint Venture Partners: (indicate managing partner with an asterisk*)

If Sole Proprietorship:

a. Date and State of Organization

b. Name and Address of Owner or Owners

GENERAL BUSINESS INFORMATION:

1. Name of Surety Company and name, address, and phone number of agent.

2. What is your approximate total bonding capacity?

- \$500,000 to \$2,000,000 \$2,000,000 to \$5,000,000
- \$5,000,000 to \$10,000,000 \$10,000,000 or more

3. Is your organization a member of a controlled group of corporations as defined in

I.R.C. Sec 1563? Yes No

If yes, show names and addresses of affiliated companies

4. Describe the permanent safety program you maintain within your organization. Use attachment if necessary.

5. Furnish the following information with respect to an accredited banking institution familiar with your organization.

Name of Bank _____
 Address _____

 Account Manager _____
 Telephone _____

GENERAL PROJECT INFORMATION:

6. Value of Electric Work completed during the last calendar year \$ _____

7. Value of all Work completed for the last calendar year \$ _____

8. Attach a Schedule A listing major Electric projects, similar to the proposed Project, completed by this organization in the past three (3) years, with contact names and phone numbers. (If joint venture, list each participant's projects separately). List dollar value of Electric Work.

9. Attach a Schedule B listing current Electric projects under construction by this organization, with contact names and phone numbers. (If joint venture, list each participant's projects separately).

10. Has your organization ever failed to complete any construction contract awarded to it?

Yes No

If yes, describe circumstances on attachment.

11. In the last five years, has your organization ever failed to substantially complete a project in a timely manner?

Yes No

12. Has any Corporate officer, partner, joint venture participant or proprietor ever failed to complete a project in a timely manner while an employee/officer of another firm?

Yes No

If yes, describe circumstances on attachment.

13. Contractor's License Number for the state(s) in which this organization is licensed to do business:

I hereby certify that the information submitted herewith, including any attachment is true to the best of my knowledge and belief.

By: _____

Title: _____

Dated: _____

END of DOCUMENT

DOCUMENT 00482 MS
DRUG-FREE WORKPLACE AFFIDAVIT
(must be attached to bid form upon submission)

STATE OF MISSISSIPPI
COUNTY OF _____

DRUG-FREE WORKPLACE AFFIDAVIT
OF PRIME BIDDER

NOW COMES AFFIANT, who being duly sworn, deposes and says:

1. He/She is the principal officer for _____;
(insert name and address of bidding entity)
2. That the bidding entity has submitted a bid to _____
(insert name of city, dept, project No.)
for the construction of _____;
(insert name of project)
3. That the bidding entity employs no less than five (5) employees;
4. That Affiant certifies that the bidding entity has in effect, at the time of submission of its bid to perform the construction referred to above, a drug-free workplace program that complies with Miss. Code Ann. §71-7-1 through 71-7-33 (Rev. 1995);
5. That this affidavit is made on personal knowledge.

Further Affiant saith not.

AFFIANT

SUBSCRIBED AND SWORN TO before me this _____ day of _____, 20____.

NOTARY PUBLIC

My commission expires: _____

**DOCUMENT 00500
AGREEMENT**

THIS AGREEMENT is entered into as of the _____ day of _____, 2024 between the **City of Tupelo** (hereinafter called Owner) and _____ (hereinafter called Contractor).

Owner and Contractor, in consideration of the mutual covenants hereinafter set forth, agree as follows:

SECTION 1. WORK

The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows: **Diesel Generator Package Systems for Tupelo Fire Stations #3, #4, #6, and #7.**

SECTION 2. ENGINEER/ARCHITECT

Allen & Hoshall (hereinafter called Engineer/Architect) is to act as Owner's representative, and shall have the duties and responsibilities and the rights and authority assigned to Engineer/Architect in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

SECTION 3. CONTRACT TIME

3.1 Completion. The Work will be substantially completed on or before _____ for **Diesel Generator Package Systems for Tupelo Fire Stations #3, #4, #6, and #7**, and completed and ready for final payment in accordance with paragraph 14.8 of the General Conditions on or before _____.

3.2 Liquidated Damages. Owner and Contractor recognize that time is of the essence of this Agreement and that Owner will suffer financial loss if the Work is not completed within the times specified in paragraph 3.1 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. They also recognize the delays, expense and difficulties involved in proving in a legal proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty) Contractor shall pay Owner five hundred dollars (\$500) for each day that expires after the time specified in paragraph 3.1 for Substantial Completion until the Work is substantially complete. After Substantial Completion if Contractor shall neglect, refuse or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by Owner, Contractor shall pay Owner Five Hundred Dollars (\$500) for each day that expires after the time specified in paragraph 3.1 for completion and readiness for final payment.

SECTION 4. CONTRACT PRICE

Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents in current funds as follows:

ITEM 1	Diesel Generator Package System Fire Station #3	\$ _____
	Authorized Contract Amendments	\$ <u>5,000.00</u>
ADDER 1	Diesel Generator Package System Fire Station #4	\$ _____
	Authorized Contract Amendments	\$ <u>5,000.00</u>

ADDER 2	Diesel Generator Package System Fire Station #6	\$ _____
	Authorized Contract Amendments	\$ <u>5,000.00</u>
ADDER 3	Diesel Generator Package System Fire Station #7	\$ _____
	Authorized Contract Amendments	\$ <u>5,000.00</u>
TOTAL CONTRACT PRICE -		\$ _____

All specified allowances are included in the above price and have been computed in accordance with the General Conditions.

SECTION 5. PAYMENT PROCEDURES

5.1 Applications for Payment. Contractor shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by Engineer/Architect as provided in the General Conditions.

5.2 Progress Payments. Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment as recommended by Engineer/Architect on or about the 15th day of each month during construction as provided below. All progress payments will be on the basis of the progress of the Work measured by the Schedule of Values established in accordance with paragraph 2.8 of the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no Schedule of Values, as provided in the General Requirements. Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below, but, in each case, less the aggregate of payments previously made and less such amounts as Engineer/Architect shall determine, or Owner may withhold, in accordance with paragraph 14.3(d) of the General Conditions.

90% of materials and equipment not incorporated in the Work (but delivered, suitably stored and accompanied by documentation satisfactory to Owner as provided in paragraph 14.2 of the General Conditions).

90% of Work completed

5.3 Final Payment. Upon final completion and acceptance of the Work in accordance with paragraph 14.8 of the General Conditions, Owner shall pay the remainder of the Contract Price as recommended by Engineer/Architect as provided in paragraph 14.8 of the General Conditions.

SECTION 6. INTEREST

All moneys not paid when due as provided in Article 14 of the General Conditions shall bear interest at the maximum rate allowed by law at the place of the Project.

SECTION 7. CONTRACTOR'S REPRESENTATIONS

In order to induce Owner to enter into this Agreement Contractor makes the following representations:

7.1 Contractor has familiarized itself with the nature and extent of the Contact Documents, Work, site, locality, and all local conditions and all Laws and Regulations that in any manner may affect cost, progress, performance or furnishing of the Work.

7.2 Contractor has studied carefully all reports of explorations and tests of subsurface conditions and drawings of physical conditions which are identified in the Supplementary Conditions as provided in

paragraph 4.2 of the General Conditions, and accepts the determination set forth in paragraph 4.2 of the General Conditions of the extent of the technical data contained in such reports and drawings upon which Contractor is entitled to rely.

7.3 Contractor has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examinations, investigations, explorations, tests, reports and studies (in addition to or to supplement those referred to in paragraph 7.2 above) which pertain to the subsurface or physical conditions at or contiguous to the site or otherwise may affect the cost, progress, performance or furnishing of the Work as Contractor considers necessary for the performance or furnishing of the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of paragraph 4.2 of the General Conditions; and no additional examinations, investigations, explorations, tests, reports, studies or similar information or data are or will be required by Contractor for such purposes.

7.4 Contractor has reviewed and checked all information and data shown or indicated on the Contract Documents with respect to existing Underground Facilities at or contiguous to the site and assumes responsibility for the accurate location of said Underground Facilities. No additional examinations, investigations, explorations, tests, reports, studies or similar information or data in respect of said Underground Facilities are or will be required by Contractor in order to perform and furnish the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of paragraph 4.3 of the General Conditions.

7.5 Contractor has correlated the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.

7.6 Contractor has given Engineer/Architect written notice of all conflicts, errors or discrepancies that he has discovered in the Contract Documents and the written resolution thereof by Engineer/Architect is acceptable to Contractor.

SECTION 8. CONTRACT DOCUMENTS

The Contract Documents, which comprise the entire agreement between Owner and Contractor concerning the Work, consist of the following:

- (a) This Agreement.
- (b) Performance Bond, Payment Bond and other Bonds.
- (c) Notice of Award.
- (d) General Conditions.
- (e) Supplementary Conditions.
- (f) These Specifications - See Document 00003 - TABLE OF CONTENTS.
- (g) Drawings, consisting of a cover sheet and sheets numbered as listed in Document 00004 - LIST OF DRAWINGS, TABLES AND SCHEDULES of specification.
- (h) Addenda numbers _____ to _____, inclusive.
- (i) Contractor's Bid.
- (j) The following which may be delivered or issued after the Effective Date of the Agreement and are not attached hereto: All Written Amendments and other documents amending, modifying, or supplementing the Contract Documents pursuant to paragraph 3.4 of the General

Conditions.

The documents listed in paragraphs (a) through (j) above are attached to this Agreement (except as expressly noted otherwise above). There are no Contract Documents other than those listed above in this Section 8. The Contract Documents may only be amended, modified or supplemented as provided in paragraph 3.4 of the General Conditions.

SECTION 9. MISCELLANEOUS

9.1 Terms used in this Agreement which are defined in Article 1 of the General Conditions will have the meanings indicated in the General Conditions.

9.2 No assignments by a party hereto of any rights under or interest in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from duty or responsibility under the Contract Documents.

9.3 Owner and Contractor each binds itself, its partners, successors, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representatives in respect of all covenants, agreement sand obligations contained in the Contract Documents.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement in quadruplicate. One counterpart each has been delivered to Contractor and Engineer/Architect, and two to Owner.

This Agreement will be effective on _____.

Owner: **City of Tupelo**

Contractor: _____

By: _____

By: _____

[Corporate Seal]

[Corporate Seal]

Attest: _____

Attest: _____

Address for giving notice:

Address for giving notice:

71 East Troy Street _____

Tupelo, MS 38804 _____

License/Certificate No.: _____

Agent for service of process:

(If Owner is a public body attach)
(evidence of authority to sign)
(and resolution or other document)
(authorizing execution.)

(If Contractor is a corporation)
(attach evidence of authority)
(to sign.)

END OF DOCUMENT

**DOCUMENT 00570
WAIVER AND RELEASE OF LIEN**

WHEREAS, the undersigned _____ has furnished to _____ material for use in the Diesel Generator Package Systems For Tupelo Fire Stations #3, #4, #6, and #7 project belonging to the City of Tupelo.

NOW THEREFORE, the undersigned _____ for and in consideration of \$1.00 and other good and valuable consideration, the receipt of which is hereby acknowledged, does hereby waive and release any and all liens, or right to claim or lien, on the above described Project and premises, under any law, common or statutory, on account of labor or material, or both, heretofore or hereafter furnished by the undersigned to or for the account of said _____ for said project.

Given under my (our) hand(s) and seal this _____ day of _____, 20 _____

By _____

State of _____

County of _____

I, _____, a notary public, in and for said State and County, hereby certify that _____ whose name as _____ of _____ is signed to the foregoing and who is (Name of Manufacturer, Materialman, or Subcontractor)

known to me, acknowledged before me on this day that he, with full authority, executed the foregoing instrument voluntarily for and as the act of said

(Name of Manufacturer, Materialman, or Subcontractor)

Given under my hand and seal this _____ day of _____, 20 _____

Notary Public

My commission expires _____

END OF DOCUMENT

**DOCUMENT 00571
AFFIDAVIT OF CONTRACTOR**

STATE OF)
) SS:
COUNTY OF)

_____, being duly sworn according to Law, deposes and says
(Name of Affiant)
that he is the _____ of _____, the
(Title) (Name of Contractor)

Contractor, in a Construction Contract entered into between the Contractor and City of Tupelo the Owner, for the Diesel Generator Package Systems for Tupelo Fire Stations #3, #4, #6, and #7, Bid-2023-068PW, and that he is authorized to and does make this affidavit on behalf of said Contractor in order to induce the Owner to make payment to the Contractor, in accordance with the provisions of the said Construction Contract.

Affiant further says that all persons who have furnished labor in connection with the construction of the facilities have been paid in full; that the names of all Manufacturers, Materialmen, and Subcontractors that furnished any material and/or services in connection with such construction and the kind or kinds of material and/or services so furnished are as listed hereinafter; and that the Contractor has delivered to the Owner duplicate waivers and releases of liens executed by all such Manufacturers, Materialmen, and Subcontractors.

(Signature of Affiant)

Sworn to and subscribed before me this _____ day of _____, 20 _____.

(Notary Public)

My commission expires _____

DOCUMENT 00610
PERFORMANCE BONDS

Contractor to provide a Performance Bond, executed on standard forms. Insert immediately following this page.

**DOCUMENT 00620
PAYMENT BONDS**

Contractor to provide a Payment Bond, executed on standard forms. Insert immediately following this page.

DOCUMENT 00650
CERTIFICATES OF INSURANCE

Insurance Certificates shall be provided and inserted immediately following this page.

DOCUMENT 00700
GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT
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**DOCUMENT 00700
GENERAL CONDITIONS**

ARTICLE 1. DEFINITIONS

Wherever used in these General Conditions or in the other Contract Documents the following terms have the meanings indicated which are applicable to both the singular and the plural thereof.

"Addenda" - written or graphic instruments issued prior to the opening of Bids which clarify, correct or change the bidding documents or the Contract Documents.

"Agreement" - the written agreement between the Owner and the Contractor covering the Work to be performed; other Contract Documents are attached to the Agreement and made a part thereof as provided therein.

"Application for Payment" - the form to be used by the Contractor in requesting progress or final payments and including such supporting documentation as is required by the Contract Documents.

"Bid" - the offer or proposal of the bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

"Bonds" – bid, performance and payment bonds and other instruments of security.

"Change Order" - a document signed by the Contractor and the Owner which authorizes an addition, deletion or revision in the Work, or an adjustment in the Contract Price or the Contract Time, issued on or after the Effective Date of the Agreement.

"Contract Documents" - the Agreement, Addenda (which pertain to the Contract Documents), Contractor's Bid (including documentation accompanying the Bid and any post-Bid documentation submitted prior to the Notice of Award) when attached as an exhibit to the Agreement, the Bonds, these General Conditions, the Supplementary Conditions and the Specifications and Drawings as the same are more specifically identified in the Agreement, together with all amendments, modifications and supplements issued pursuant to paragraph 3.4 on or after the Effective Date of the Agreement.

"Contract Price" - the moneys payable by the Owner to the Contractor under the Contract Documents as stated in the Agreement (subject to the provisions of paragraph 11.7 in the case of Unit Price Work).

"Contract Time" - the number of days (computed as provided in paragraph 16.2) or the date stated in the Agreement for the completion of the Work.

"Contractor" - the person, firm or corporation with whom the Owner has entered into the Agreement.

"Defective" - an adjective which when modifying the word Work refers to Work that is unsatisfactory, faulty or deficient, or does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents, or has been damaged prior to the Architect/Engineer's

recommendation of final payment (unless responsibility for the protection thereof has been assumed by the Owner at Substantial Completion in accordance with paragraph 14.4 or 14.5).

"Drawings" - the drawings which show the character and scope of the Work to be performed and which have been prepared or approved by the Architect/Engineer and are referred to in the Contract Documents.

"Effective Date of the Agreement" - the date indicated in the Agreement on which it becomes effective, but if no such date is indicated it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

"Architect/Engineer" - the person, firm or corporation named as such in the Agreement.

"Field Order" - a written order issued by the Architect/Engineer which orders minor changes in the Work in accordance with paragraph 9.5 but which does not involve a change in the Contract Price or the Contract Time.

"General Requirements" - sections of Division 1 of the Specifications.

"Laws and Regulations; Laws or Regulations" - laws, rules, regulations, ordinances, codes and/or orders of any governmental authority.

"Notice of Award" - the written notice by the Owner to the apparent successful bidder stating that upon compliance by the apparent successful bidder with the conditions precedent enumerated therein, within the time specified, the Owner will sign and deliver the Agreement.

"Notice to Proceed" - a written notice given by the Owner to the Contractor (with a copy to the Architect/Engineer) fixing the date on which the Contract Time will commence to run and on which the Contractor shall start to perform the Contractor's obligations under the Contract Documents.

"Owner" - the public body or authority, corporation, association, firm or person with whom the Contractor has entered into the Agreement and for whom the Work is to be provided.

"Partial Utilization" - placing a portion of the Work in service for the purpose for which it is intended (or a related purpose) before reaching Substantial Completion for all the Work.

"Project" - the total construction of which the Work to be provided under the Contract Documents may be the whole or a part, as indicated elsewhere in the Contract Documents.

"Resident Project Representative" - the authorized representative of the Architect/Engineer who is assigned to the site or any part thereof.

"Shop Drawings" - all drawings, diagrams, illustrations, schedules and other data which are specifically prepared by or for the Contractor to illustrate some portion of the Work and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams and other information prepared by a Supplier and submitted by the Contractor to illustrate material or equipment for some portion of the Work.

"Specifications" - those portions of the Contract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the Work and certain administrative details applicable thereto.

"Subcontractor" - an individual, firm or corporation having a direct contract with the Contractor or with any other Subcontractor for the performance of a part of the Work at the site.

"Substantial Completion" - the Work (or a specified part thereof) has progressed to a point where, in the opinion of the Architect/Engineer as evidenced by the Architect/Engineer's definitive certificate of Substantial Completion, it is sufficiently complete, in accordance with the Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it is intended; or if there is no such certificate issued, when final payment is due in accordance with paragraph 14.8. The terms "substantially complete" and "substantially completed" as applied to any Work refer to Substantial Completion thereof.

"Supplementary Conditions" - the part of the Contract Documents which amends or supplements these General Conditions.

"Supplier" - a manufacturer, fabricator, supplier, distributor, materialman or vendor.

"Underground Facilities" - all pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments, and any encasements containing such facilities, which have been installed underground to furnish any of the following services or materials: electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, sewage and drainage removal, traffic or other control systems or water.

"Unit Price Work" - work to be paid for on the basis of unit prices.

"Work" - the entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work is the result of performing services, furnishing labor and furnishing and incorporating materials and equipment into the construction, all as required by the Contract Documents.

"Work Directive Change" - a written directive to the Contractor, issued on or after the Effective Date of the Agreement and signed by the Owner and recommended by the Architect/Engineer, ordering an addition, deletion or revision in the Work, or responding to differing or unforeseen physical conditions under which the Work is to be performed as provided in paragraph 4.2 or 4.3 or to emergencies under paragraph 6.13. A Work Directive Change may not change the Contract Price or the Contract Time, but is evidence that the parties expect that the change directed or documented by a Work Directive Change will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Time as provided in paragraph 10.1.

"Written Amendment" - a written amendment to the Contract Documents, signed by the Owner and the Contractor on or after the Effective Date of the Agreement and normally dealing with the nonengineering or nontechnical rather than strictly Work-related aspects of the Contract Documents.

ARTICLE 2. PRELIMINARY MATTERS

2.1 Copies of Documents. The Owner shall furnish to the Contractor up to ten copies (unless otherwise specified in the Supplementary Conditions) of the Contract Documents as are reasonably necessary for the execution of the Work. Additional copies will be furnished, upon request, at the cost of reproduction.

2.2 Bonds and Insurance. When the Contractor delivers the executed Agreements to the Owner, the Contractor shall also deliver to the Owner such Bonds as the Contractor may be required to furnish in accordance with paragraph 5.1. Before any Work at the site is started, the Contractor shall deliver to the Owner, with a copy to the Architect/Engineer, certificates (and other evidence of insurance requested by the Owner) evidencing the insurance which the Contractor is required to purchase and maintain in accordance with paragraphs 5.2, 5.3, and 5.5, and the Owner shall deliver to the Contractor certificates (and other evidence of insurance requested by the Contractor) evidencing any insurance which the Owner is required to purchase and maintain in accordance with the Supplementary Conditions.

2.3 Commencement of Contract Time; Notice to Proceed. The Contract Time will commence to run on the thirtieth day after the Effective Date of the Agreement, or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within thirty days after the Effective Date of the Agreement. In no event will the Contract Time commence to run later than the seventy-fifth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.4 Starting the Project. The Contractor shall start to perform the Work on the date when the Contract Time commences to run, but no Work shall be done at the site prior to the date on which the Contract Time commences to run.

2.5 Preconstruction Verifications. Before undertaking each part of the Work, the Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures shown thereon and all applicable field measurements. The Contractor shall promptly report in writing to the Architect/Engineer any conflict, error or discrepancy which the Contractor may discover and shall obtain a written interpretation or clarification from the Architect/Engineer before proceeding with any Work affected thereby; however, the Contractor shall not be liable to the Owner or the Architect/Engineer for failure to report any conflict, error or discrepancy in the Contract Documents, unless the Contractor had actual knowledge thereof or should reasonably have known thereof.

2.6 Preliminary Schedules. Within ten days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), the Contractor shall submit to the Architect/Engineer for review: (a) an estimated progress schedule indicating the starting and completion dates of the various stages of the Work; (b) a preliminary schedule of Shop Drawing submissions; and (c) a preliminary schedule of values for all of the Work which will include quantities and prices of items aggregating the Contract Price and will subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during construction. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work which will be confirmed in writing by the Contractor at the time of submission.

2.7 Preconstruction Conference. Within twenty days after the Effective Date of the Agreement, but before the Contractor starts the Work at the site, a conference attended by the Contractor, the Architect/Engineer and others as appropriate will be held to discuss the schedules referred to in paragraph 2.6, to discuss procedures for handling Shop Drawings and other submittals and for processing Applications for Payment, and to establish a working understanding among the parties as to the Work.

2.8 Finalizing Schedules. If requested by the Architect/Engineer at least ten days before submission of the first Application for Payment, a conference attended by the Contractor, the Architect/Engineer and others as appropriate will be held to finalize the schedules submitted in

accordance with paragraph 2.6. The finalized progress schedule must be acceptable to the Architect/Engineer as providing an orderly progression of the Work to completion within the Contract Time, but such acceptance will neither impose on the Architect/Engineer responsibility for the progress or the scheduling of the Work nor relieve the Contractor from full responsibility for such progress and scheduling and for the completion of the Work within the Contract Time. The finalized schedule of Shop Drawing submissions must be acceptable to the Architect/Engineer as providing a workable arrangement for processing the submissions. The finalized schedule of values must be acceptable to the Architect/Engineer as to form and substance.

ARTICLE 3. CONTRACT DOCUMENTS

3.1 Intent. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any Work, materials or equipment that may reasonably be inferred from the Contract Documents as being required to produce the intended results will be supplied whether or not specifically called for. When words which have a well-known technical or trade meaning are used to describe Work, materials or equipment, such words shall be interpreted in accordance with that meaning. Reference to standard specifications, manuals or codes of any technical society, organization or association, or to the Laws or Regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification manual, code or Laws or Regulations in effect at the time of opening of bids, except as may be otherwise specifically stated. However, no provision of any referenced standard specification, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties and responsibilities of the Owner, Contractor or Architect/Engineer, or any of their consultants, agents or employees, from those set forth in the Contract Documents, nor shall it be effective to assign to the Architect/Engineer, or any of the Architect/Engineer's consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.9. Clarifications and interpretations of the Contract Documents shall be issued by the Architect/Engineer as provided in paragraph 9.4.

3.2 Entire Agreement; Governing Law. The Contract Documents comprise the entire agreement between the Owner and the Contractor concerning the Work. The Contract Documents are complementary; what is called for by one is as binding as if called for by all. The Contract Documents will be construed in accordance with the law of the place of the Project.

3.3 Conflicts or Errors. If, during the performance of the Work, the Contractor finds a conflict, error or discrepancy in the Contract Documents, the Contractor shall so report to the Architect/Engineer in writing at once and, before proceeding with the Work affected thereby, shall obtain a written interpretation or clarification from the Architect/Engineer. However, the Contractor shall not be liable to the Owner or the Architect/Engineer for failure to report any conflict, error or discrepancy in the Contract Documents unless the Contractor had actual knowledge thereof or should reasonably have known thereof.

3.4 Amending and Supplementing.

(a) The Documents may be amended to provide for additions, deletions and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways: (i) a formal Written Amendment; (ii) a Change Order (pursuant to paragraph 10.1); or (iii) a Work Directive Change (pursuant to paragraph 10.1). As provided in paragraphs 11.2 and 12.1,

Contract Price and Contract Time may be changed only by a Change Order or a Written Amendment.

(b) In addition, the requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, in one or more of the following ways: (i) a Field Order (pursuant to paragraph 9.5); (ii) the Architect/Engineer's approval of a Shop Drawing or sample (pursuant to paragraph 6.14); or (iii) the Architect/Engineer's written interpretation or clarification (pursuant to paragraph 9.4).

3.5 Re-use of Documents. Neither the Contractor nor any Subcontractor or Supplier or other person or organization performing or furnishing any of the Work under a direct or indirect contract with the Owner shall have or acquire any title to or ownership rights in any of the Drawings, Specifications or other documents (or copies of any thereof) prepared by or bearing the seal of the

Architect/Engineer; and they shall not reuse any of them on extensions of the Project or any other project without written consent of the Owner and the Architect/Engineer and specific written verification or adaptation by the Architect/Engineer.

ARTICLE 4. LANDS; PHYSICAL CONDITIONS; REFERENCE POINTS

4.1 Availability of Lands. The Owner shall furnish, as indicated in the Contract Documents, the lands upon which the Work is to be performed, rights-of-way and easements for access thereto, and such other lands as are designated for the use of the Contractor. Easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by the Owner, unless otherwise provided in the Contract Documents. If the Contractor believes that any delay in the Owner's furnishing these lands, rights-of-way or easements entitles the Contractor to any extension of the Contract Time, the Contractor may make a claim therefor as provided in Article 12. The Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.2 Physical Conditions.

(a) Reference is made to the Supplementary Conditions for identification of those reports of explorations and tests of subsurface conditions at the site that have been utilized by the Architect/Engineer in preparation of the Contract Documents. The Contractor may rely upon the accuracy of the technical data contained in such reports, but not upon non-technical data, interpretations or opinions contained therein or for the completeness thereof for the Contractor's purposes. Except as indicated in the immediately preceding sentence and in subparagraph (f) of this paragraph, the Contractor shall have full responsibility with respect to subsurface conditions at the site.

(b) Reference is made to the Supplementary Conditions for identification of those drawings of physical conditions in or relating to existing surface and subsurface structures (except Underground Facilities referred to in paragraph 4.3) which are at or contiguous to the site that have been utilized by the Architect/Engineer in preparation of the Contract Documents. The Contractor may rely upon the accuracy of the technical data contained in such drawings, but not for the completeness thereof for the Contractor's purposes. Except as indicated in the immediately preceding sentence and in subparagraph (f) of this paragraph, the Contractor shall have full responsibility with respect to physical conditions in or relating to such structures.

(c) If the Contractor believes that (i) any technical data on which the Contractor is entitled to rely as provided in subparagraphs (a) and (b) of this paragraph is inaccurate, or (ii) any

physical condition uncovered or revealed at the site differs materially from that indicated, reflected or referred to in the Contract Documents, the Contractor shall, promptly after becoming aware thereof and before performing any Work in connection therewith (except in an emergency as permitted by paragraph 6.13), notify the Owner and the Architect/Engineer in writing about the inaccuracy or difference.

(d) The Architect/Engineer will promptly review the pertinent conditions, determine the necessity of obtaining additional explorations or tests with respect thereto and advise the Owner in writing (with a copy to the Contractor) of the Architect/Engineer's findings and conclusions.

(e) If the Architect/Engineer concludes that there is a material error in the Contract Documents or that because of newly discovered conditions a change in the Contract Documents is required, a Work Directive Change or Change Order will be issued as provided in Article 10 to reflect and document the consequences of the inaccuracy or difference.

(f) In each such case, an increase or decrease in the Contract Price or an extension or shortening of the Contract Time, or any combination thereof, will be allowable to the extent that they are attributable to any such inaccuracy or difference. If the Owner and the Contractor are unable to agree as to the amount or length thereof a claim may be made therefor as provided in Articles 11 and 12.

4.3 Physical Conditions - Underground Facilities.

(a) The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the site is based on information and data furnished to the Owner or the Architect/Engineer by the owners of such Underground Facilities or by others. Unless it is otherwise expressly provided in the Supplementary Conditions: (i) the Owner and the Architect/Engineer shall not be responsible for the accuracy or completeness of any such information or data; and, (ii) the Contractor shall have full responsibility for reviewing and checking all such information and data, for locating all Underground Facilities shown or indicated in the Contract Documents, for coordination of the Work with the owners of such Underground Facilities during construction, for the safety and protection thereof as provided in paragraph 6.12 and repairing any damage thereto resulting from the Work, the cost of all of which will be considered as having been included in the Contract Price.

(b) If an Underground Facility is uncovered or revealed at or contiguous to the site which was not shown or indicated in the Contract Documents and which the Contractor could not reasonably have been expected to be aware of, the Contractor shall, promptly after becoming aware thereof and before performing any Work affected thereby (except in an emergency as permitted by paragraph 6.13), identify the owner of such Underground Facility and give written notice thereof to that owner and to the Owner and the Architect/Engineer. The Architect/Engineer will promptly review the Underground Facility to determine the extent to which the Contract Documents should be modified to reflect and document the consequences of the existence of the Underground Facility, and the Contract Documents will be amended or supplemented to the extent necessary. During such time, the Contractor shall be responsible for the safety and protection of such Underground Facility as provided in paragraph 6.12. The Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, to the extent that they are attributable to the existence of any Underground Facility that was not shown or indicated in the Contract Documents and which the Contractor could not reasonably have been expected to be aware of. If the parties are unable to agree as to the amount or length thereof, the Contractor may make a claim therefor as provided in Articles 11 and 12.

4.4 Reference Points. The Owner shall provide engineering surveys to establish reference points for construction which in the Architect/Engineer's judgment are necessary to enable the Contractor to proceed with the Work. The Contractor shall be responsible for laying out the Work (unless otherwise specified in the General Requirements), shall protect and preserve the established reference points and shall make no changes or relocations without the prior written consent of the Owner. The Contractor shall report to the Architect/Engineer whenever any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points by professionally qualified personnel.

ARTICLE 5. BONDS AND INSURANCE

5.1 Bonds. The Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of all of the Contractor's obligations under the Contract Documents. These Bonds shall remain in effect at least until one year after the date when final payment becomes due, except as otherwise provided by Law or Regulation, or by the Contract Documents. The Contractor shall also furnish such other Bonds as are required by the Supplementary Conditions. All Bonds shall be in the forms prescribed by Law or Regulation or by the Contract Documents and be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts, U.S. Treasury Department. All Bonds signed by an agent must be accompanied by a certified copy of the authority to act. If the surety on any Bond furnished by the Contractor is declared a bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of this paragraph 5.1, the Contractor shall within five days thereafter substitute another Bond and surety, both of which must be acceptable to the Owner.

5.2 Contractor's Liability Insurance. The Contractor shall purchase and maintain such comprehensive general liability and other insurance as is appropriate for the Work being performed and furnished and as will provide protection from claims set forth below which may arise out of or result from the Contractor's performance and furnishing of the Work and the Contractor's other obligations under the Contract Documents, whether it is to be performed or furnished by the Contractor, by any Subcontractor, by anyone directly or indirectly employed by any of them to perform or furnish any of the Work, or by anyone for whose acts any of them may be liable:

- (a) Claims under worker's compensation and other similar employee benefit acts;
- (b) Claims for damages for bodily injury, occupational sickness or disease, or death of employees of Contractor;
- (c) Claims for damages because of bodily injury, sickness or disease or death of any person other than employees of the Contractor;
- (d) Claims for damages insured by personal injury liability coverage which are sustained (i) by any person as a result of an offense directly or indirectly related to the employment of such person by the Contractor or (ii) by any other person for any other reason;
- (e) Claims for damages, other than to the Work itself, because of injury to or destruction of

tangible property wherever located, including loss of use resulting therefrom;

(f) Claims arising out of operation of Laws or Regulations for damages because of bodily injury or death of any person or for damage to property; and

(g) Claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

The insurance required by this paragraph 5.2 shall include the specific coverages and be written for not less than the limits of liability and coverages provided in the Supplementary Conditions, or required by law, whichever is greater. The comprehensive general liability insurance shall include completed operations insurance. All of the policies of insurance so required to be purchased and maintained (or the certificates or other evidence thereof) shall contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least thirty days' prior written notice has been given to the Owner and the Architect/Engineer by certified mail. All such insurance shall remain in effect until final payment and at all times thereafter when the Contractor may be correcting, removing or replacing defective Work in accordance with paragraph 13.6. In addition, the Contractor shall maintain such completed operations insurance for at least two years after final payment and furnish the Owner with evidence of continuation of such insurance at final payment and one year thereafter.

5.3 Contractual Liability Insurance. The comprehensive general liability insurance required by paragraph 5.2 will include contractual liability insurance applicable to the Contractor's obligations under paragraph 6.16.

5.4 Owner's Liability Insurance. The Owner shall be responsible for purchasing and maintaining the Owner's own liability insurance and, at the Owner's option, may purchase and maintain such insurance as will protect the Owner against claims which may arise from operations under the Contract Documents.

5.5 Property Insurance on the Work.

(a) Unless otherwise provided in the Supplementary Conditions, Owner shall purchase and maintain property insurance upon the Work at the site to the full insurable value thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall include the interests of the Owner, the Contractor, the Subcontractors, the Architect/Engineer and the Architect/Engineer's consultants in the Work, all of whom shall be listed as insureds or additional insured parties, shall insure against the perils of fire and extended coverage and shall include "all risk" insurance for physical loss and damage including theft, vandalism and malicious mischief, collapse and water damage, and such other perils as may be provided in the Supplementary Conditions, and shall include damages, losses and expenses arising out of or resulting from any insured loss or incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers, architects, attorneys and other professionals). If not covered under the "all risk" insurance or otherwise provided in the Supplementary Conditions the Contractor shall purchase and maintain similar property insurance on portions of the Work stored on and off the site or in transit when such portions of the Work are to be included in an Application for Payment.

(b) The Owner shall purchase and maintain such boiler and machinery insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of the Owner, the Contractor, the Subcontractors, the Engineer/ Architect and the Architect/Engineer's consultants in the Work, all of whom shall

be listed as insured or additional insured parties.

(c) All the policies of insurance (or the certificates or other evidence thereof) required to be purchased and maintained by Owner in accordance with subparagraphs (a) and (b) of this section 5.5 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least thirty days' prior written notice has been given to the Contractor and the Architect/Engineer by certified mail and will contain waiver provisions in accordance with paragraph 5.6.

(d) The Owner shall not be responsible for purchasing and maintaining any property insurance to protect the interests of the Contractor, the Architect/Engineer, the Subcontractors, or others in the Work to the extent of any deductible amounts that are provided in the Supplementary Conditions. The risk of loss within the deductible amount, will be borne by the Contractor, the Subcontractor or others suffering any such loss and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

(e) If the Contractor requests in writing that other special insurance be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the costs thereof will be charged to the Contractor by appropriate Change Order or Written Amendment. Prior to commencement of the work at the site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.6 Waiver of Rights.

(a) The Owner and the Contractor waive all rights against each other for all losses and damages caused by any of the perils covered by the policies of insurance provided in response to subparagraphs (a) and (b) of paragraph 5.5 and any other property insurance applicable to the Work, and also waive all such rights against the Subcontractors, the Architect/Engineer, the Architect/Engineer's consultants and all other parties named as insureds in such policies for losses and damages so caused. As required by paragraph 6.5(c), each subcontract between the Contractor and a Subcontractor will contain similar waiver provisions by the Subcontractor in favor of the Owner, the Contractor, the Architect/Engineer, the Architect/Engineer's consultants and all other parties named as insured. None of the above waivers shall extend to rights that any of the insured parties may have to the proceeds of insurance held by the Owner as trustee or otherwise payable under any policy so issued.

(b) The Owner and the Contractor intend that any policies provided in response to subparagraphs (a) and (b) of paragraph 5.5 shall protect all of the parties insured and provide primary coverage for all losses and damages caused by the perils covered thereby. Accordingly, all such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any of the parties named as insureds or additional insureds, and if the insurers require separate waiver forms to be signed by the Architect/Engineer or the Architect/Engineer's consultants, the Owner will obtain the same, and if such waiver forms are required of any Subcontractor, the Contractor will obtain the same.

5.7 Receipt and Application of Proceeds.

(a) Any insured loss under the policies of insurance required by subparagraphs (a) and (b) of paragraph 5.5 will be adjusted with the Owner and made payable to the Owner as trustee for the insureds, as their interest may appear, subject to the requirements of any applicable mortgage clause and of subparagraph (b) of this paragraph 5.7. The Owner shall deposit in a separate account any money so received, and shall distribute it in accordance with such

agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the money so received applied on account thereof and the Work and the cost thereof covered by an appropriate Change Order or Written Amendment.

(b) The Owner as trustee shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within fifteen days after the occurrence of loss to the Owner's exercise of this power. If such objection be made, the Owner as trustee shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If required in writing by any party in interest, the Owner as trustee shall, upon the occurrence of an insured loss, give bond for the proper performance of such duties.

5.8 Acceptance of Insurance. If the Owner has any objection to the coverage afforded by or other provisions of the insurance required to be purchased and maintained by the Contractor in accordance with paragraphs 5.2, 5.3, and 5.5, on the basis of its not complying with the Contract Documents, the Owner shall notify the Contractor of such objection, in writing, within ten days of the date of delivery of the certificates of insurance to the Owner in accordance with paragraph 2.2. If the Contractor has any objection to the coverage afforded by or other provisions of the policies of insurance required to be purchased and maintained by the Owner in accordance with the Supplementary Conditions on the basis of their not complying with the Contract Documents, the Contractor shall notify the Owner of such objection, in writing, within ten days of the date of delivery of the insurance certificates to the Contractor in accordance with paragraph 2.2. The Owner and the Contractor shall each provide to the other such additional information in respect of insurance provided by each as the other may reasonably request. Failure by the Owner or the Contractor to give any such notice of objection within the time provided shall constitute acceptance of such insurance purchased by the other as complying with the Contract Documents.

5.9 Partial Utilization-Property Insurance. If the Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, such use or occupancy may be accomplished in accordance with paragraph 14.5; provided that no such use or occupancy shall commence before the insurers providing the property insurance have acknowledged notice thereof and in writing effected the changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or lapse on account of any such partial use or occupancy.

ARTICLE 6. CONTRACTOR'S RESPONSIBILITY

6.1 Supervision and Responsibility.

(a) The Contractor shall supervise and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. The Contractor shall be solely responsible for the means, methods, techniques, sequences and procedures of construction but the Contractor shall not be responsible for the negligence of others in the design or selection of a specific means, method, sequence or procedure of construction which is indicated in and required by the Contract Documents. The Contractor shall be responsible to see that the finished Work complies accurately with the Contract Documents. All Work shall be performed in a finished and workmanlike manner and in accordance with the best recognized trade practices. From commencement until completion and final acceptance by the Owner, all Work shall be in the charge and control of the Contractor. The Contractor shall be responsible for the

proper care and protection of the Work and all materials and equipment therefor, and all risks in connection with the construction and preservation of the Work and the materials and equipment to be used therein shall be borne by the Contractor.

(b) The Contractor shall keep on the Work at all times during its progress a competent resident superintendent meeting the approval of the Owner and the Architect/Engineer, and who shall not be replaced without written notice to the Owner and the Architect/Engineer, except under extraordinary circumstances. The superintendent will be the Contractor's representative at the site and shall have authority to act on behalf of the Contractor. All communications given to the superintendent shall be as binding as if given to the Contractor. The Owner reserves the right to require the removal from the Project of the superintendent or any other employee of the Contractor if, in the Architect/Engineer's or the Owner's judgment, such removal is necessary to protect the Owner's interest.

6.2 Labor, Materials and Equipment.

(a) The Contractor shall provide adequate numbers of competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. The Contractor shall at all times maintain good discipline and order at the site. Except in connection with the safety and protection of persons or the Work or property at the site or adjacent thereto, and except as otherwise indicated in the Contract Documents, all work at the site shall be performed during regular working hours and the Contractor will not permit overtime work or the performance of Work on Saturday, Sunday or any legal holiday without the Owner's written consent given after prior written notice to the Architect/Engineer. The Contractor shall pay at least the minimum wage rates established by law; but the Owner will have no responsibility for any additional compensation to the Contractor by reason of payment by the Contractor of any wage rates in excess of minimum rates or by reason of any wage increases established by law during the performance of the Work.

(b) Except as otherwise specified in the Contract Documents, the Contractor shall furnish and assume full responsibility for all materials, equipment, superintendence, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary construction and facilities and all other facilities and incidentals necessary for the furnishing, performance, testing, start-up and completion of the Work. Where specifically provided for in the Specifications, the inspection and testing of materials and finished articles to be incorporated in the Work at the site shall be made by bureaus, laboratories, or agencies approved by the Architect/Engineer. Unless otherwise expressly stated, the cost of such inspection and testing shall be paid by the Contractor. The Contractor shall furnish evidence satisfactory to the Architect/Engineer that the materials and finished articles have passed the required tests prior to the incorporation of such materials and finished articles in the Work. The Contractor shall promptly segregate and remove rejected materials and rejected finished articles from the site of the Work.

(c) All materials and equipment shall be of good quality and new, except as otherwise provided in the Contract Documents. If required by the Architect/Engineer, the Contractor shall furnish satisfactory evidence (including the reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instructions of the applicable Supplier except as otherwise provided in the Contract Documents; but no provision of any such instructions will be effective to assign to the Architect/Engineer, or any of the Architect/Engineer's consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.9. When equipment is to be installed in

equipment rooms or other areas with restricting dimensions, all such equipment shall be installed substantially as indicated, with adequate unobstructed access space around each piece of equipment to facilitate the proper installation, operation and maintenance of the equipment. Minor revisions in the layout may be made subject to the Architect/Engineer's approval, but the Contractor shall not be entitled to changes in the layout to accommodate proposed equipment which differs substantially from the specified equipment in size and arrangement. Before submitting equipment for approval, the Contractor shall determine that it conforms with the requirements of this subparagraph (c). The Architect/Engineer's general approval of proposed equipment shall not relieve the Contractor from the responsibility of complying with the requirements of this subparagraph (c).

(d) Cutting of new construction shall be avoided wherever possible by the proper coordination between the various trades, and by the placing of proper sleeves, inserts, bolts and other items in the construction as the Work progresses. Whenever cutting of new construction or cutting of existing construction is required, it shall be done in a neat, careful and approved manner, without unnecessary or extensive damage to the construction involved, and only to such extent that is reasonably necessary for the installation of the Work. All patching, repairing and altering shall be done only by mechanics skilled in the various trades involved, using materials and workmanship to match those of the original construction in type and quality. All existing construction which is disturbed or damaged in any way by the Contractor's operations shall be restored at least to the conditions which existed before the Work was begun, unless otherwise indicated.

6.3 Adjusting Schedule. The Contractor shall submit to the Architect/Engineer for approval any adjustments in the progress schedule to reflect the impact thereon of new developments; these will conform generally to the progress schedule then in effect and additionally will comply with any provisions of the General Requirements applicable thereto. No variation in the progress schedule submitted to or approved by the Architect/Engineer pursuant to this paragraph shall operate as an extension of the Contract Time.

6.4 Substitutes or "Or-Equal" Items.

(a) Whenever materials or equipment are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the naming of the item is intended to establish the type, function and quality required. Unless the name is followed by words indicating that no substitution is permitted, materials or equipment of other Suppliers may be accepted by the Architect/Engineer if sufficient information is submitted by the Contractor to allow the Architect/Engineer to determine that the material or equipment proposed is equivalent or equal to that named.

(b) If a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents, the Contractor may furnish or utilize a substitute means, method, sequence, technique or procedure of construction acceptable to the Architect/Engineer, if the Contractor submits sufficient information to allow the Architect/Engineer to determine that the substitute proposed is equivalent to that indicated or required by the Contract Documents.

(c) Requests for substitutions pursuant to this paragraph 6.4 will not be accepted by the Architect/Engineer from anyone other than the Contractor. All such requests for substitutions shall be made by written application of the Contractor to the Architect/Engineer, certifying that: (i) the proposed substitution will perform adequately the functions and achieve the results called for by the general design, be similar and of equal substance to that specified and be suited to the same use as that specified; (ii) that the evaluation and acceptance of the proposed

substitute will not prejudice the Contractor's achievement of Substantial Completion on time; (iii) whether or not acceptance of the substitute in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with the Owner for work on the Project) to adapt the design to the proposed substitute; and (iv) whether or not incorporation or use of the substitute in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute from that specified will be identified in the application and available maintenance and repair and replacement service will be indicated. The application will also contain an itemized estimate of all costs that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors affected by the resulting change, all of which shall be considered by the Architect/Engineer in evaluating the proposed substitute. The Architect/Engineer may require the Contractor to furnish additional data about the proposed substitute, at the Contractor's expense.

(d) The Architect/Engineer will be allowed a reasonable time within which to evaluate each proposed substitute. The Architect/Engineer will be the sole judge of acceptability, and no substitute will be ordered, installed or utilized without the Architect/Engineer's prior written acceptance which will be evidenced by either a Change Order or an approved Shop Drawing. The Owner may require the Contractor to furnish at the Contractor's expense a special performance guarantee or other surety with respect to any substitute. If a proposed substitute is rejected in the initial submittal, the Contractor shall provide only the specified items in each case, unless otherwise directed by the Architect/Engineer. If a second submittal is permitted by the Architect/Engineer and if the second submittal is rejected, the Contractor shall provide only the specified items.

6.5 Subcontractors, Suppliers and Others.

(a) The Contractor shall not employ any Subcontractor, Supplier or other person or organization, whether initially or as a substitute, against whom the Owner or the Architect/Engineer may have reasonable objection. The Contractor shall not be required to employ any Subcontractor, Supplier or other person or organization to furnish or perform any of the Work against whom the Contractor has reasonable objection. Any approval (whether express or by failing to make objection thereto) of any such Subcontractor, Supplier or other person or organization, by the Owner or the Architect/Engineer, may be revoked on the basis of reasonable objection after due investigation. In any such case of revocation of approval, the Contractor shall submit an acceptable substitute, the Contract Price will be increased by the difference in cost, if any, occasioned by such substitution and an appropriate Change Order will be issued or Written Amendment signed. No acceptance or approval (whether express or by failure to object) by the Owner or the Architect/Engineer of any such Subcontractor, Supplier or other person or organization shall constitute a waiver of any right of Owner or Architect/Engineer to reject, or otherwise exercise remedies with respect to, defective Work.

(b) The Contractor shall be fully responsible to the Owner and the Architect/Engineer for all acts and omissions of the Subcontractors, Suppliers and other persons and organizations performing or furnishings any of the Work under a direct or indirect contract with the Contractor, as fully as the Contractor is responsible for the Contractor's own acts and omissions. Nothing in the Contract Documents shall create any contractual relationship between the Owner or the Architect/Engineer and any such Subcontractor, Supplier or the person or organization, nor shall it create any obligation on the part of the Owner or the Architect/Engineer to pay or to see to the payment of any monies due any such Subcontractor, Supplier or other person or organization, except as and to the extent otherwise required by Laws and Regulations.

(c) All Work performed for the Contractor by a Subcontractor will be pursuant to an appropriate agreement between the Contractor and the Subcontractor which specifically binds the Subcontractor to the applicable terms and conditions of the Contract Documents for the benefit of the Owner and the Architect/Engineer and contains waiver provisions as required by paragraph 5.6. The Contractor shall pay each Subcontractor a just share of any insurance monies received by the Contractor on account of losses under policies issued pursuant to paragraph 5.5. The failure of the Contractor to enter into a proper agreement with any Subcontractor or Supplier, or any other person or organization, shall in no way relieve the Contractor of his responsibilities and obligations to the Owner and the Architect/Engineer under the Contract Documents.

(d) The Contractor and all Subcontractors shall cooperate fully with each other to facilitate the progress of the Work and to avoid all interferences between the various parts of the Work. Whenever his work is in progress, each Subcontractor shall have present at the job site a job superintendent, foreman or other duly authorized agent, meeting the approval of the Architect/Engineer and the Owner, with authority to control the Subcontractor's part of the Work. The Owner reserves the authority to remove this superintendent or foreman or any other employees of Subcontractors, if in the Architect/Engineer's or the Owner's judgement, such removal is necessary to protect the Owner's interest.

(e) The divisions and sections of the Specifications and the identifications of any Drawings shall not control the Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade. The Contractor and each Subcontractor shall carefully examine all Contract Drawings and read all specifications. They will be bound by all things therein affecting their special work, no matter under what heading they may appear.

6.6 Patent Fees and Royalties. The Contractor shall pay all license fees and royalties and assume all costs incident to the use and the performance of the Work or the incorporation in the Work of any invention, design, process, product or device which is the subject of patent rights or copyrights held by others. The Contractor shall indemnify and hold harmless the Owner and the Architect/Engineer and anyone directly or indirectly employed by either of them from and against all claims, damages, losses and expenses (including attorneys' fees and court costs) arising out of any infringement of patent rights or copyrights incident to the use and the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product or device not specified in the Contract Documents, and shall defend all such claims in connection with any alleged infringement of such rights.

6.7 Permits. Unless otherwise provided in the Supplementary Conditions, the Contractor shall obtain and pay for all construction permits and licenses. The Owner shall assist the Contractor, when necessary, in obtaining such permits and licenses. The Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work, which are applicable at the time of opening of the Bids, or if there are no Bids, on the Effective Date of the Agreement. The Contractor shall pay all charges of utility owners for connections to the Work, and the Owner shall pay all charges of such utility owners for capital costs related thereto such as plant investment fees.

6.8 Laws and Regulations. The Contractor shall give all notices and comply with all Laws and Regulations applicable to furnishing and performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither the Owner nor the Architect/Engineer shall be responsible for monitoring the Contractor's compliance with any Laws or Regulations. Compliance with such Laws and Regulations shall be deemed minimum requirements and everything shown or specified in the Contract Documents in excess of those

minimum requirements shall be furnished or provided in accordance with the requirements of the Contract Documents. No provisions in the Contract Documents shall be construed as a direction or authorization to violate any Law or Regulation. If the Contractor observes that the Specifications or Drawings are at variance with any Laws or Regulations, the Contractor shall give the Architect/Engineer prompt written notice thereof, and any necessary changes will be authorized by one of the methods indicated in paragraph 3.4. If the Contractor performs any Work knowing or having reason to know that it is contrary to such Laws or Regulations, and without such to the Architect/Engineer, the Contractor shall bear all costs arising therefrom; however, it shall not be the Contractor's primary responsibility to make certain that the Specifications and Drawings are in accordance with such Laws and Regulations.

6.9 Taxes. The Contractor shall pay all applicable federal, state and local taxes in connection with the providing and performing of the Work.

6.10 Use of Premises.

(a) The Contractor shall confine construction equipment, the storage of materials and equipment and the operations of workers to the Project site and lands and areas identified in and permitted by the Contract Documents and other land and areas permitted by Laws and Regulations, rights of way, permits and easements, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment. The Contractor shall assume full responsibility for any damage to any such land or area, or to the Owner or occupant thereof or of any land or areas contiguous thereto, resulting from the performance of the Work. The Contractor shall, to the fullest extent permitted by Laws and Regulations, indemnify and hold the Owner and Architect/Engineer harmless from and against all claims, damages, losses and expenses (including but not limited to fees of engineers, architects, attorneys and other professionals and court costs) arising directly, indirectly or consequently out of any claim or action, legal or equitable, brought by any such other party against the Owner or the Architect/Engineer to the extent based on a claim arising out of the Contractor's performance of the Work.

(b) During the progress of the Work, the Contractor shall keep the premises free from accumulations of waste materials, unnecessary or discarded tools and equipment, rubbish and other debris resulting from the Work. At the completion of the Work, the Contractor shall remove all waste materials, rubbish and debris from and about the premises as well as all tools, appliances, construction equipment and machinery and surplus materials, and shall leave the site clean and ready for occupancy by the Owner. The Contractor shall restore to original condition all property not designated for alteration by the Contract Documents.

(c) The Contractor shall not load or permit any part of any structure to be loaded in any manner that will endanger the structure; and the Contractor shall not subject any part of the Work or adjacent property to stresses that will endanger it.

6.11 Record Documents. The Contractor shall maintain in a safe place at the site one record copy of all Drawings, Specifications, Addenda, Written Amendments, Change Orders, Work Directive Changes, Field Orders and written interpretations and clarifications (issued pursuant to paragraph 9.4) in good order and annotated to show all changes made during construction. These record documents together with all approved samples and a counterpart of all approved Shop Drawings will be available to the Architect/Engineer for reference. Upon completion of the Work, these record documents, samples and Shop Drawings will be delivered to the Architect/Engineer for the Owner.

6.12 Safety and Protection.

(a) The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. The Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to: (i) all employees on the Work and other persons and organizations who may be affected thereby; (ii) all the Work and materials and equipment to be incorporated therein, whether in storage on or off the site; and (iii) other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities and Underground Facilities not designated for removal, relocation or replacement in the course of construction. The Contractor shall comply with all applicable Laws and Regulations for the safety of persons or property or to protect them from damage, injury or loss, and shall erect and maintain all necessary safeguards for such safety and protection. The Contractor shall notify owners of adjacent property and of Underground Facilities and utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation and replacement of their property. All damage, injury or loss to any property referred to in clause (ii) or (iii), above, in this paragraph 6.12(a), caused, directly or indirectly, in whole or in part, by the Contractor, any Subcontractor, Supplier or any other person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, shall be remedied by the Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of the Owner or the Architect/Engineer or anyone employed by either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of the Contractor). The Contractor's duties and responsibilities for the safety and protection of the Work shall continue until such time as all the Work is completed and the Architect/Engineer has issued a notice to the Owner and the Contractor in accordance with paragraph 14.8 that the Work is acceptable (except as otherwise as expressly provided in connection with Substantial Completion).

(b) The Contractor shall designate a responsible representative at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated in writing by the Contractor to the Owner.

6.13 Emergencies. In emergencies affecting the safety or protection of persons or the Work or property at the site or adjacent thereto, the Contractor, without special instruction or authorization from the Architect/Engineer or Owner, is obligated to act to prevent threatened damage, injury or loss. The Contractor shall give the Architect/Engineer prompt written notice if the Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby. If the Architect/Engineer determines that a change in the Contract Documents is required because of the action taken in response to an emergency, a Work Directive Change or Change Order will be issued to document the consequences of the changes or variations.

6.14 Shop Drawings and Samples.

(a) After checking and verifying all field measurements and after complying with applicable procedures specified in the General Requirements, the Contractor shall submit to the Architect/Engineer for review and approval in accordance with the accepted schedule of Shop Drawing submissions (see paragraph 2.8), or for other appropriate action if so indicated in the Supplementary Conditions, five (5) copies (unless otherwise specified in the General Requirements) of all Shop Drawings, which will bear a stamp or specific written indication that the Contractor has satisfied his responsibilities under the Contract Documents with respect to the review of the submission. All submissions will be identified as the Architect/Engineer may

require. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to enable the Architect/Engineer to review the information as required.

(b) The Contractor shall also submit to the Architect/Engineer for review and approval, with such promptness as to cause no delay in the Work, all samples required by the Contract Documents. Unless otherwise specified in the General Requirements, all samples shall be submitted in duplicate and shall be of adequate size to show quality, type, color range, finish, texture or other specified features. All samples shall have been checked by the Contractor and shall be accompanied by a specific written indication that the Contractor has satisfied his responsibilities under the Contract Documents with respect to the review of this submission and will be identified clearly as to material, Supplier, pertinent data, such as catalog numbers, and the use for which intended.

(c) Before submission of each Shop Drawing or sample, the Contractor shall have determined and verified all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar data with respect thereto and reviewed or coordinated each Shop Drawing or sample with other Shop Drawings and samples and with the requirements of the Work and the Contract Documents. At the time of each submission, the Contractor shall give the Architect/Engineer specific written notice of each variation that the Shop Drawings or samples may have from the requirements of the Contract Documents and, in addition, shall cause a specific notation of each such variation to be made on each Shop Drawing submitted to the Architect/Engineer for review and approval.

(d) The Architect/Engineer will review and approve with reasonable promptness all Shop Drawings and samples submitted, but the Architect/Engineer's review and approval will be only for conformance with the design concept of the Project and for compliance with information given in the Contract Documents and shall not extend to means, methods, techniques, sequences or procedures of construction (except where a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions. The Contractor shall make corrections required by the Architect/Engineer and shall return the required number of corrected copies of Shop Drawings and submit as required new samples for review and approval. The Contractor shall direct specific attention in writing to revisions other than the corrections called for by the Architect/Engineer on previous submittals.

(e) The Architect/Engineer's review and approval of Shop Drawings or samples shall not relieve the Contractor from responsibility for any variation from the requirements of the Contract Documents unless the Contractor has in writing called the Architect/Engineer's attention to each such variation at the time of submission, as required by the foregoing provisions of this paragraph, and the Architect/Engineer has given written approval of each such variation by a specific written notation thereof incorporated in or accompanying the Shop Drawing or sample approval. No approval by the Architect/Engineer shall relieve the Contractor from responsibility for errors or omissions in the Shop Drawings or from responsibility for having complied with the provisions of subparagraph (c) of this paragraph. Where a Shop Drawing or sample is required by the Specifications, any related Work performed prior to the Architect/Engineer's review and approval of the pertinent submission will be at the sole expense and responsibility of the Contractor.

6.15 Continuing Work During Disputes. The Contractor shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with the Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as

permitted by paragraph 15.4, or as the Contractor and Owner may otherwise agree in writing.

6.16 Indemnification.

(a) To the fullest extent permitted by Laws and Regulations, the Contractor shall indemnify and hold harmless the Owner and the Architect/Engineer and their consultants, agents and employees, from and against all claims, damages, losses and expenses, direct, indirect or consequential (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court costs) arising out of or resulting from the performance of the Work, provided that any such claim, damage, loss or expense (i) is attributable to bodily injury, sickness, disease or death, or to injury or destruction of tangible property (other than the Work itself) including the loss of use resulting therefrom and (ii) is caused in whole or in part by any negligent act or omission of the Contractor, any Subcontractor, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder or arises by or is imposed by Law and Regulations regardless of the negligence of any such party.

(b) In any and all claims against the Owner or the Architect/Engineer or any of their consultants, agents or employees by any employee of the Contractor, any Subcontractor, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, the indemnification obligation under this paragraph 6.16 shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any such Subcontractor or other person or organization under worker's or workmen's compensation acts, disability benefit acts or other employee benefit acts.

ARTICLE 7. OTHER WORK

7.1 Related Work at Site.

(a) The Owner may perform other work related to the Project at the site by the Owner's own forces, have other work performed by utility owners or let other direct contracts for such other work. If the fact that such other work is to be performed was not noted in the Contract Documents, written notice thereof will be given to the Contractor prior to starting any such other work; and, if the Contractor believes that such performance will involve additional expense to the Contractor or requires additional time and the parties are unable to agree to the extent thereof, the Contractor may make a claim therefor as provided in Articles 11 and 12.

(b) The Contractor shall afford each utility owner and other contractor who is a party to such a direct contract (or the Owner, if the Owner is performing the additional work with the Owner's employees) proper and safe access to the site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such work, and shall promptly connect and coordinate the Work with theirs. The Contractor shall do all cutting, fitting and patching of the Work that may be required to make its several parts come together properly and integrate with such other work. The Contractor shall not endanger any work of others by cutting, excavating or otherwise altering their work and will only cut or alter their work with the written consent of the Architect/Engineer and the others whose work will be affected. The duties and responsibilities of the Contractor under this paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of the Contractor in said direct contracts between the Owner and such utility owners and other contractors.

(c) If any part of the Contractor's Work depends for proper execution or results upon the work of any such other contractor or utility owner (or the Owner), the Contractor shall inspect and promptly report to the Architect/Engineer in writing any delays, defects or deficiencies in such work that render it unavailable or unsuitable for such proper execution and results. The Contractor's failure so to report will constitute an acceptance of the other work as fit and proper for integration with the Contractor's Work except for latent or non-apparent defects and deficiencies in the other work.

7.2 Coordination. If the Owner contracts with others for the performance of other work on the Project at the site, the person or organization who will have authority and responsibility for coordination of the activities among the various prime contractors will be identified in the Supplementary Conditions, and the specific matters to be covered by such authority and responsibility will be itemized, and the extent of such authority and responsibilities will be provided, in the Supplementary Conditions. Unless otherwise provided in the Supplementary Conditions, neither the Owner nor the Architect/Engineer shall have any authority or responsibility in respect to such coordination.

ARTICLE 8. OWNER'S RESPONSIBILITIES

8.1 Communications. The Owner shall issue all communications to the Contractor through the Architect/Engineer.

8.2 Replacement of Architect/Engineer. In case of termination of the employment of the Architect/Engineer, the Owner shall appoint an engineer or architect against whom the Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Architect/Engineer.

8.3 Duties and Responsibilities of Owner.

(a) The Owner shall furnish the data required of the Owner under the Contract Documents promptly and shall make payments to the Contractor promptly after they are due as provided in paragraphs 14.3 and 14.8.

(b) The Owner's duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in paragraphs 4.1 and 4.4. Paragraph 4.2 refers to the Owner's identifying and making available to the Contractor copies of reports of explorations and tests of subsurface conditions at the site and in existing structures which have been utilized by the Architect/Engineer in preparing the Drawings and Specifications.

(c) The Owner's responsibilities, if any, in respect of purchasing and maintaining insurance are referred to in Article 5 and may be set forth in the Supplementary Conditions.

(d) The Owner is obligated to execute Change Orders as indicated in paragraph 10.2.

(e) The Owner's responsibility in respect of certain inspections, tests and approvals is set forth in paragraph 13.3(b).

ARTICLE 9. THE ARCHITECT/ENGINEER

9.1 Owner's Representative. The Architect/Engineer will be the Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of the Architect/Engineer as the Owner's representative are set forth in the Contract Documents

and shall not be extended without the written consent of the Owner and the Architect/Engineer.

9.2 Visits to Site. The Architect/Engineer will make visits to the site at intervals appropriate to the various stages of construction to observe the progress and quality of the executed Work and to determine, in general, if the work is proceeding in accordance with the Contract Documents. The Architect/Engineer will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect/Engineer's efforts will be directed toward providing for the Owner a greater degree of confidence that the completed Work will conform to the Contract Documents.

9.3 Project Representation. If the Owner and the Architect/Engineer agree, the Architect/Engineer will furnish a Resident Project Representative to assist the Architect/Engineer in observing the performance of the Work. The duties, responsibilities and limitations of authority of any such Resident Project Representative will be as provided in the Supplementary Conditions. If the Owner designates another agent to represent the Owner at the site who is not the Architect/Engineer's agent or employee, the duties, responsibilities and limitations of authority of such other person will be as provided in the Supplementary Conditions.

9.4 Clarifications and Interpretations. The Architect/Engineer will issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents (in the form of Drawings or otherwise) as the Architect/Engineer may determine necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents. If the Contractor believes that a written clarification or interpretation justifies an increase in the Contract Price or an extension of the Contract Time and the parties are unable to agree as to the amount or extent thereof, the Contractor may make a claim therefor as provided in Article 11 or 12.

9.5 Minor Variations. The Architect/Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Time and are consistent with the overall intent of the Contract Documents. These may be accomplished by a Field Order and will be binding on the Owner, and also on the Contractor, who shall perform the Work involved promptly. If the Contractor believes that a Field Order justifies an increase in the Contract Price or an extension of the Contract Time and the parties are unable to agree as to the amount or extent thereof, the Contractor may make a claim therefor as provided in Article 11 or 12.

9.6 Rejecting Defective Work. The Architect/Engineer will have authority to disapprove or reject Work which the Architect/Engineer believes to be defective, and will also have authority to require special inspection or testing of the Work as provided in paragraph 13.4(b), whether or not the Work is fabricated, installed or completed.

9.7 Unit Price Determinations. The Architect/Engineer will determine the actual quantities and classifications of Unit Price Work performed by the Contractor. The Architect/Engineer will review with the Contractor the Architect/Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). The Architect/Engineer's written decisions thereon will be final and binding upon the Owner and the Contractor.

9.8 Decisions on Disputes.

(a) The Architect/Engineer will be the interpreter of the requirements of the Contract Documents and the judge of the acceptability of the Work thereunder. Claims, disputes and

other matters relating to the acceptability of the Work or the interpretation of the requirements of the Contract Documents pertaining to the performance and furnishing of the Work and claims under Articles 11 and 12 in respect of changes in the Contract Price or Contract Time will be referred initially to the Architect/Engineer in writing with a request for a formal decision in accordance with this paragraph, which the Architect/Engineer will render in writing within a reasonable time. Written notice of each such claim, dispute and other matter will be delivered by the claimant to the Architect/Engineer and the other party to the Agreement promptly (but in no event later than thirty days) after the occurrence of the event giving rise thereto, and written supporting data will be submitted to the Architect/Engineer and the other party within sixty days after such occurrence unless the Architect/Engineer allows an additional period of time to ascertain more accurate data in support of the claim. The written decision of the Architect/Engineer, with respect to any such dispute, claim, interpretation or other matter, shall be final and binding upon the Owner and the Contractor.

(b) When functioning as interpreter and judge under paragraphs 9.7 and 9.8, the Architect/Engineer will not show partiality to the Owner or the Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity. The rendering of a decision by the Architect/Engineer pursuant to paragraph 9.7 or 9.8(a) with respect to any such claim, dispute or other matter will be a condition precedent to any right of the Contractor to receive payment with respect to any matter in dispute.

9.9 Limitations on Architect/Engineer's Responsibilities.

(a) Neither the Architect/Engineer's authority to act under this Article 9 or elsewhere in the Contract Documents nor any decision made by the Architect/Engineer in good faith either to exercise or not exercise such authority shall give rise to any duty or responsibility of the Architect/Engineer to the Contractor, any Subcontractor, any Supplier, or any other person or organization providing or performing any of the Work, or to any surety for any of them.

(b) Whenever in the Contract Documents the terms "as ordered", "as directed", "as required", "as allowed", "as approved" or terms of like effect or import are used, or the adjectives "reasonable", "suitable", "acceptable", "proper" or "satisfactory" or adjectives of like effect or import are used to describe a requirement, direction, review or judgment of the Architect/Engineer as to the Work, it is intended that such requirement, direction, review or judgment will be solely to evaluate the Work for compliance with the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective shall not be effective to assign to Architect/Engineer any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of subsection (c) or (d) of this section 9.9.

(c) The Architect/Engineer will not be responsible for the Contractor's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, and the Architect/Engineer will not be responsible for the Contractor's failure to perform or furnish the Work in accordance with the Contract Documents.

(d) The Architect/Engineer will not be responsible for the acts or omissions of the Contractor or of any Subcontractor, any Supplier or of any other person or organization performing or furnishing any of the Work.

ARTICLE 10. CHANGES IN THE WORK

10.1 General. Without invalidating the Agreement and without notice to any surety the Owner may, at any time or from time to time, order additions, deletions or revisions in the

Work. These will be authorized by a Written Amendment, a Change Order or a Work Directive Change. Upon receipt of any such document, the Contractor shall promptly proceed with the work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided). If the Owner and Contractor are unable to agree as to the extent, if any, of an increase or decrease in the Contract Price or an extension or shortening of the Contract Time that should be allowed as a result of a Work Directive Change, a claim may be made therefor as provided in Article 11 or 12. The Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Time with respect to any Work performed that is not required by the Contract Documents (including any authorized amendments, modifications or supplements thereto), except in the case of an emergency as provided in paragraph 6.13 and except in the case of uncovering Work as provided in paragraph 13.4(b).

10.2 Documentation. The Owner and the Contractor shall execute appropriate Change Orders (or Written Amendments) covering (a) changes in the Work which are ordered by the Owner pursuant to paragraph 10.1, are required because of the acceptance of defective Work under paragraph 13.8 or correcting defective Work under paragraph 13.9, or are agreed to by the parties; (b) changes in the Contract Price or Contract Time which are agreed to by the parties; and (c) changes in the Contract Price or Contract Time which embody the substance of any written decision rendered by the Architect/Engineer pursuant to paragraph 9.8(a). If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including but not limited to Contract Price or Contract Time) is required by the provisions of any Bond to be given to a surety, the giving of any such notice will be the Contractor's responsibility, and the amount of each applicable Bond will be adjusted accordingly.

ARTICLE 11. CHANGES OF CONTRACT PRICE

11.1 General. The Contract Price constitutes the total compensation (subject to authorized adjustments) payable to the Contractor for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by the Contractor shall be at his expense without change in the Contract Price.

11.2 Claims for Change in Contract Price. The Contract Price may only be changed by a Change Order or by a Written Amendment. Any claim for an increase or decrease in the Contract Price shall be based on written notice delivered by the party making the claim to the other party and to the Architect/Engineer promptly (but in no event later than thirty days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the amount of the claim with supporting data shall be delivered within sixty days after such occurrence (unless the Architect/Engineer allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by claimant's written statement that the amount claimed covers all known amounts (direct, indirect and consequential) to which the claimant is entitled as a result of the occurrence of said event. All claims for adjustment in the Contract Price shall be determined by the Architect/Engineer in accordance with paragraph 9.8, unless the Owner and the Contractor otherwise agree on the amount involved. No claim for an adjustment in the Contract Price will be valid if not submitted in accordance with this paragraph 11.2.

11.3 Method of Determining Value. The value of any Work covered by a Change Order or of any claim for an increase or decrease in the Contract Price shall be determined in one of the following ways:

- (a) Where the Work involved is covered by unit prices contained in the Contract Documents,

by application of unit prices to the quantities of the items involved (subject to the provisions of paragraph 11.7).

(b) By mutual acceptance of a lump sum (which may include an allowance for overhead and profit not necessarily in accordance with paragraph 11.5).

(c) On the basis of the Cost of the Work (determined as provided in paragraph 11.4) plus a Contractor's Fee for overhead and profit (determined as provided in paragraph 11.5).

11.4 Cost of the Work.

(a) The term Cost of the Work means the sum of all costs necessarily incurred and paid by the Contractor in the proper performance of the Work. Except as otherwise may be agreed to in writing by the Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items (and shall not include any of the costs itemized in subparagraph (b) of this paragraph 11.4):

(i) Payroll costs for employees in the direct employ of the Contractor in the performance of the Work under schedules of job classifications agreed upon by the Owner and the Contractor. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits and employment taxes. Such employees shall include superintendents and foremen at the site. The expense of performing Work after regular working hours, on Saturday, Sunday or legal holidays, shall be included in the above to the extent authorized by the Owner.

(ii) Cost of all materials and equipment furnished and incorporated in the Work, including transportation and storage costs and Suppliers' field services required in connection therewith.

(iii) Payments made by the Contractor to the Subcontractors for Work performed by Subcontractors. If required by the Owner, the Contractor shall obtain competitive bids from Subcontractors acceptable to the Contractor and shall deliver such bids to the Owner who will then determine, with the advice of the Architect/Engineer, which bids will be accepted. If a subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work Plus a Fee, the Subcontractor's Cost of the Work shall be determined in the same manner as the Contractor's Cost of the Work. All subcontracts shall be subject to the other provisions of the Contract Documents insofar as applicable.

(iv) Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys and accountants) employed for services specifically related to the Work.

(v) Supplemental costs including the proportion of necessary transportation, travel and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work; cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office and temporary facilities at the site and hand tools not owned by the workers, which are consumed in the performance of the Work, and costs less market value of such items used but not consumed which remain the property of the Contractor; rental costs for construction equipment and machinery in accordance with rental agreements approved by the Owner with the advice of the Architect/Engineer, during the period necessary for the Work, and transportation, installation and removal costs; sales, consumer, use or similar taxes related to the Work, and for which the Contractor is liable, imposed by Laws and Regulations; deposits lost for causes other than negligence of the Contractor, any Subcontractor or anyone directly or

indirectly employed by any of them or for whose acts any of the them may be liable and royalty payments and fees for permits and licenses; losses and damages (and related expenses), not compensated by insurance or otherwise, to the Work or otherwise sustained by the Contractor in connection with the performance and furnishing of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with paragraph 5.5) provided they have resulted from causes other than the negligence of the Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable (provided, no such losses, damages and expenses shall be included in the Cost of the Work for the purpose of determining the Contractor's Fee); the cost of utilities, fuel and sanitary facilities at the site; minor expenses such as telegrams, long distance telephone calls, telephone service at the site, expressage and similar petty cash items in connection with the Work; and the cost of premiums for additional Bonds and insurance required because of changes in the Work.

(b) The term Cost of the Work shall not include any of the following:

(i) Payroll costs and other compensation of the Contractor's officers, executives, principals, general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, time keepers, clerks and other personnel employed by the Contractor whether at the site or in the Contractor's principal or a branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in subparagraph (a)(I) or (v), all of which are to be considered administrative costs covered by the Contractor's Fee.

(ii) Expenses of Contractor's principal and branch offices other than the Contractor's office at the site.

(iii) Any part of the Contractor's capital expenses, including interest on the Contractor's capital employed for the Work and charges against the Contractor for delinquent payments.

(iv) Cost of premiums for all Bonds and for all insurance whether or not Contractor is required by the Contract Documents to purchase and maintain the same (except for the cost of premiums covered by subparagraph (a)(v) above).

(v) Costs due to the negligence of the Contractor, any Subcontractor or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to the correction of defective Work, disposal of materials or equipment wrongly supplied and making good any damage to property.

(vi) Other overhead or general expense costs of any kind and the cost of any item not specifically and expressly included in subparagraph (a) of this paragraph 11.4.

(c) Whenever the cost of any Work is to be determined pursuant to this paragraph 11.4, the Contractor will submit in form acceptable to the Architect/Engineer an itemized cost breakdown together with supporting data.

11.5 Contractor's Fee. The Contractor's Fee allowed to the Contractor shall be either a mutually acceptable fixed fee, or if none can be agreed upon, a fee based on the following percentages of the various portions of the Cost of the Work:

(a) For costs incurred under subparagraphs (a)(I) and (a)(ii) of section 11.4, the Contractor's Fee shall be 15%;

(b) For costs incurred under subparagraph (a)(iii) of paragraph 11.4, the Contractor's Fee shall be 5%; and if a subcontract is on the basis of Cost of the Work Plus a Fee, the maximum allowable to the Contractor on account of overhead and profit of all Subcontractors shall be 15%;

(c) No fee shall be payable on the basis of any costs itemized in subparagraphs (a)(iv), (a)(v) or (b) of paragraph 11.4;

(d) The amount of credit to be allowed by the Contractor to the Owner for any such change which results in a net decrease in cost will be the amount of the actual net decrease plus a deduction in the Contractor's Fee by an amount equal to 10% of the net decrease; and

(e) When both additions and credits are involved in any one change, the adjustment in the Contractor's Fee shall be computed on the basis of the net change in accordance with clauses (a) through (d), inclusive, of this paragraph 11.5.

11.6 Cash Allowances. It is understood that the Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be done by such Subcontractors or Suppliers and for such sums within the limit of the allowances as may be acceptable to the Architect/Engineer. The Contractor agrees that (a) the allowances include the cost to the Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the site, and all applicable taxes, and (b) the Contractor's costs for unloading and handling on the site, labor, installation, overhead, profit and other expenses contemplated for the allowances have been included in the Contract Price and not in the allowances. No demand for additional payment on account of any thereof will be valid. Prior to final payment, an appropriate Change Order will be issued as recommended by the Architect/Engineer to reflect actual amounts due the Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.7 Unit Price Work.

(a) Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the established unit prices for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by the Contractor will be made by the Architect/Engineer in accordance with paragraph 9.7.

(b) Each unit price will be deemed to include an amount considered by the Contractor to be adequate to cover the Contractor's overhead and profit for each separately identified item.

(c) Where the quantity of any item of Unit Price Work performed by the Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement and there is no corresponding adjustment with respect to any other item of Work and if the Contractor believes that the Contractor has incurred additional expense as a result thereof, the Contractor may make a claim for an increase in the Contract Price in accordance with this Article 11 if the parties are unable to agree as to the amount of any such increase.

ARTICLE 12. CHANGE OF CONTRACT TIME

12.1 General. The Contract Time may be changed only by a Change Order or a Written Amendment. Any claim for an extension or shortening of the Contract Time shall be based on written notice delivered by the party making the claim to the other party and to the Architect/Engineer promptly (but in no event later than thirty days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the extent of the claim with supporting data shall be delivered within sixty days after such occurrence (unless the Architect/Engineer allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by the claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant has reason to believe that it is entitled as a result of the occurrence of said event. All claims for adjustment in the Contract Time shall be determined by the Architect/Engineer in accordance with paragraph 9.8, unless the Owner and the Contractor otherwise agree. No claim for an adjustment in the Contract Time will be valid if not submitted in accordance with the requirements of this paragraph 12.1.

12.2 Delays Beyond Contractor's Control. The Contract Time will be extended in an amount equal to time lost due to delays beyond the control of the Contractor, if a claim is made therefor as provided in paragraph 12.1, by reason of acts or neglect by the Owner or others performing additional work as contemplated by Article 7, or to fires, floods, labor disputes, epidemics, abnormal weather condition or acts of God.

12.3 Time is of the Essence. All time limits stated in the Contract Documents are of the essence of the Agreement. The provisions of this Article 12 shall not exclude recovery for damages (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court costs) for delay by either party.

ARTICLE 13. WARRANTY; TESTS AND INSPECTIONS; DEFECTIVE WORK

13.1 Warranty. The Contractor warrants and guarantees to the Owner and the Architect/Engineer that all Work will be in accordance with the Contract Documents and will not be defective. Notice of all defects shall be given to the Contractor promptly upon discovery thereof. All defective Work whether or not in place, may be rejected, corrected or accepted as provided in this Article 13.

13.2 Access to Work. The Architect/Engineer and Architect/Engineer's representatives, other representatives of the Owner, testing agencies and governmental agencies with jurisdictional interests will have access to the Work at reasonable times for their observation, inspecting and testing. The Contractor shall provide proper and safe conditions for such access.

13.3 Tests and Inspections.

(a) The Contractor shall give the Architect/Engineer timely notice of readiness of the Work for all required inspections, tests or approvals.

(b) If Laws or Regulations require any Work (or part thereof) to specifically be inspected, tested or approved, the Contractor shall assume full responsibility therefor, pay all costs in connection therewith and furnish the Architect/Engineer the required certificates of inspection, testing or approval. The Contractor shall also be responsible for and shall pay all costs in connection with any inspection or testing required in connection with the Owner's or the Architect/Engineer's acceptance of a Supplier of materials or equipment proposed to be incorporated in the Work, or of

materials or equipment submitted for approval prior to the Contractor's purchase thereof for incorporation in the Work. The costs of all inspections, tests and approvals in addition to the above which are required by the Contract Documents shall be paid by the Owner (unless otherwise specified).

(c) All inspections, tests or approvals other than those required by Laws or Regulations shall be performed by organizations acceptable to the Owner and the Contractor (or by the Architect/Engineer if so specified).

(d) If any Work (including the work of others) that is to be inspected, tested or approved is covered without written concurrence of the Architect/Engineer, it must, if requested by the Architect/Engineer, be uncovered for observation. Such uncovering shall be at the Contractor's expense unless the Contractor has given the Architect/Engineer timely notice of the Contractor's intention to cover the same and the Architect/Engineer has not acted with reasonable promptness in response to such notice.

(e) Neither observations by the Architect/Engineer nor inspections, tests or approvals by others shall relieve the Contractor from the Contractor's obligation to perform the Work in accordance with the Contract Documents.

13.4 Uncovering Work.

(a) If any Work is covered contrary to the written request of the Architect/Engineer, it must, if requested by the Architect/Engineer, be uncovered for the Architect/Engineer's observation and replaced at the Contractor's expense.

(b) If the Architect/Engineer considers it necessary or advisable that covered Work be observed by the Architect/Engineer or inspected or tested by others, the Contractor, at the Architect/Engineer's request shall uncover, expose or otherwise make available for observation, inspection or testing as the Architect/Engineer may require, that portion of the Work in question, furnishing all necessary labor material and equipment. If it is found that such Work is defective, the Contractor shall bear all direct, indirect and consequential costs of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction (including but not limited to fees and charges of engineers, architects, attorneys and other professionals), and the Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of any such decrease, the Owner may make a claim therefor as provided in Article 11. If, however, such Work is not found to be defective, the Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction; and if the parties are unable to agree as to the amount or extent thereof, the Contractor may make a claim therefor as provided in Articles 11 and 12.

13.5 Owner May Stop Work. If the Work is defective, or the Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to furnish or perform the Work in such a way that the completed Work will conform to the Contract Documents, the Owner may order the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated. This right of the Owner to stop the Work shall not give rise to any duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other party. Neither the existence of this right nor the exercise or the failure of exercise of this right to stop the Work shall preclude the exercise of any other rights or remedies of the Owner or the Architect/Engineer or constitute the waiver of any rights or remedies of the Owner or the Architect/Engineer.

13.6 Correction or Removal of Defective Work. If required by the Architect/Engineer, the Contractor shall promptly, as directed, either correct all defective Work, whether fabricated, installed or completed, or, if the Work has been rejected by the Architect/Engineer, remove it from the site and replace it with non-defective Work. The Contractor shall bear all direct, indirect and consequential costs of such correction or removal (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) made necessary thereby.

13.7 One Year Correction Period. If within one year after the date of Substantial Completion or such longer period of time as may be prescribed by Laws or Regulations or by the terms of any applicable special guarantee or warranty required by the Contract Documents or by any specific provision of the Contract Documents, any Work is found to be defective, the Contractor shall promptly, without cost to the Owner and in accordance with the Owner's instructions, either correct such defective Work, or, if it has been rejected by the Owner, remove it from the site and replace it with non-defective Work. If the Contractor does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, the Owner may have the defective Work corrected or the rejected Work removed and replaced, and all direct, indirect and consequential costs of such removal and replacement (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) will be paid by the Contractor. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications or by Written Amendment.

13.8 Acceptance of Defective Work. If, instead of requiring correction or removal and replacement of defective Work, the Owner prefers to accept it, he may do so with the concurrence of the Architect/Engineer. The Contractor shall bear all direct, indirect and consequential costs attributable to the Owner's evaluation of and determination to accept such defective Work (such costs to be approved by the Architect/Engineer as to reasonableness and to include and but not be limited to fees and charges of engineers, architects, attorneys and other professionals). If any such acceptance occurs prior to the Architect/Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and the Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of any such decrease, the Owner may make a claim therefor as provided in Article 11. If the acceptance occurs after such recommendation, an appropriate amount will be paid by the Contractor to the Owner.

13.9 Owner May Correct Defective Work. If the Contractor fails within a reasonable time after written notice of the Architect/Engineer to proceed to correct and to complete correction of any defective Work or to remove and replace rejected Work as required by the Architect/Engineer in accordance with paragraph 13.6, or if the Contractor fails to perform the Work in accordance with the Contract Documents, or if the Contractor fails to comply with any other provisions of the Contract Documents, the Owner may, after seven days' written notice to the Contractor, correct and remedy any such deficiency. To the extent necessary to complete corrective and remedial action, the Owner may exclude the Contractor from all or part of the site, take possession of all or part of the Work, and suspend Contractor's services related thereto, take possession of the Contractor's tools, appliances, construction equipment and machinery at the site and incorporate in the Work all materials and equipment stored at the site or for which the Owner has paid the Contractor but which are stored elsewhere. The Contractor shall allow the Owner and the Owner's representatives, agents and employees such access to the site as may be necessary to enable the Owner to exercise the rights and remedies under this paragraph. All direct, indirect and consequential costs of the Owner in exercising such

rights and remedies will be charged against the Contractor in an amount approved as to reasonableness by the Architect/Engineer, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and the Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of any such decrease, the Owner may make a claim therefor as provided in Article 11. Such direct, indirect and consequential costs will include but not be limited to fees and charges of engineers, architects, attorneys and other professionals, all court costs and all costs of repair and replacement of work of others destroyed or damaged by correction, removal or replacement of the Contractor's defective Work. The Contractor shall not be allowed an extension of the Contract Time because of any delay in performance of the Work attributable to the exercise by the Owner of the Owner's rights and remedies under this paragraph.

ARTICLE 14. PAYMENTS TO CONTRACTOR AND COMPLETION

14.1 Schedule of Values. The Schedule of values established as provided in paragraph 2.8 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to the Architect/Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.2 Application for Progress Payment.

(a) At least twenty days before each progress payment is scheduled (but not more often than once a month) the Contractor shall submit to the Architect/Engineer for review an Application for Payment filled out and signed by the Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice or other documentation warranting that the Owner has received the materials and equipment free and clear of all liens, charges, security interests and encumbrances (which are hereinafter in the General Conditions referred to as "Liens") and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect the Owner's interest therein, all of which must be satisfactory to the Owner. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

(b) The Contractor warrants and guarantees that title to all Work, materials and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to the Owner no later than the time of payment, free and clear of all Liens.

14.3 Review of Applications.

(a) The Architect/Engineer will, within ten days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to the Owner, or return the Application to the Contractor indicating in writing the Architect/Engineer's reasons for refusing to recommend payment. In the latter case, the Contractor may make the necessary corrections and resubmit the Application. Ten days after presentation of the Application for Payment with the Architect/Engineer's recommendation, the amount recommended will (subject to the provisions of the last sentence of paragraph 14.3(d)) become due and when due will be paid by the Owner to the Contractor.

(b) The Architect/Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by the Architect/Engineer to the Owner, based on the

Architect/Engineer's on-site observations of the Work in progress as an experienced and qualified design professional and on the Architect/Engineer's review of the Application for Payment and the accompanying data and schedules that the Work has progressed to the point indicated; that to the best of the Architect/Engineer's knowledge, information and belief, the quality of the Work is in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under paragraph 9.7, and to any other qualifications stated in the recommendation); and that the Contractor is entitled to payment of the amount recommended. However, by recommending any such payment, the Architect/Engineer will not thereby be deemed to have represented that exhaustive or continuous on-site inspections have been made to check the quality or the quantity of the Work beyond the responsibilities specifically assigned to the Architect/Engineer in the Contract Documents or that there may not be other matters or issues between the parties that might entitle the Contractor to be paid additionally by the Owner or the Owner to withhold payment to the Contractor.

(c) The Architect/Engineer's recommendation of final payment will constitute an additional representation by the Architect/Engineer to the Owner that the conditions precedent to the Contractor's being entitled to final payment as set forth in paragraph 14.8 have been fulfilled.

(d) The Architect/Engineer may refuse to recommend the whole or any part of any payment if, in the Architect/Engineer's opinion, it would be incorrect to make such representations to the Owner. The Architect/Engineer may also refuse to recommend any such payment, or, because of subsequently discovered evidence or the result of subsequent inspections or tests, nullify any such payment previously recommended, to such extent as may be necessary in the Architect/Engineer's opinion to protect the Owner from loss because: (i) the Work is defective, or completed Work has been damaged requiring correction or replacement; (ii) the Contract Price has been reduced by Written Amendment or Change Order; (iii) the Owner has been required to correct defective Work or complete Work in accordance with paragraph 13.9; or (iv) of the Architect/Engineer's actual knowledge of the occurrence of any of the events enumerated in paragraph 15.2. The Owner may refuse to make payment of the full amount recommended by the Architect/Engineer because claims have been made against the Owner on account of the Contractor's performance or furnishing of the Work or Liens have been filed in connection with the Work or there are other items entitling the Owner to a set-off against the amount recommended, but the Owner must give the Contractor immediate written notice (with a copy to the Architect/Engineer) stating the reasons for such action.

14.4 Substantial Completion.

(a) When the Contractor considers the entire Work ready for its intended use, the Contractor shall notify the Owner and the Architect/Engineer in writing that the entire Work is substantially complete (except for items specifically listed by the Contractor as incomplete) and request that the Architect/Engineer issue a certificate of Substantial Completion. Within a reasonable time thereafter, the Owner, the Contractor and the Architect/Engineer shall make an inspection of the Work to determine the status of completion. If the Architect/Engineer does not consider the Work substantially complete, the Architect/Engineer will notify the Contractor in writing giving the reasons therefore. If the Architect/Engineer considers the Work substantially complete, the Architect/Engineer will prepare and deliver to the Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. The Owner shall have seven days after receipt of the tentative certificate during which to make written objection to the Architect/Engineer as to any provisions of the certificate or attached list. If, after considering such objections, the Architect/Engineer concludes that the Work is not

substantially complete, the Architect/Engineer will within fourteen days after submission of the tentative certificate to the Owner, notify the Contractor in writing, stating the reasons therefor. If, after consideration of the Owner's objections, the Architect/Engineer considers the Work substantially complete, the Architect/Engineer will within said fourteen days execute and deliver to the Owner and the Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as the Architect/Engineer believes justified after consideration of any objections from the Owner.

(b) Except to the extent otherwise provided in subparagraphs (c) and (d) of this paragraph 14.4, pending final payment to the Contractor he shall not be relieved of any responsibility with respect to security, operation, safety, maintenance, heat, utilities, insurance or warranties, except to the extent specifically agreed to in writing signed by the Owner and the Contractor.

(c) At the time of delivery of the tentative certificate of Substantial Completion, the Architect/Engineer may deliver to the Owner and the Contractor a written recommendation as to division of responsibilities pending final payment between the Owner and the Contractor with respect to security, operation, safety, maintenance, heat, utilities, insurance and warranties. Unless the Owner and the Contractor agree otherwise in writing and so inform the Architect/Engineer prior to issuance of the definitive certificate of Substantial Completion, the Architect/Engineer's aforesaid recommendation will be binding upon the Owner and the Contractor until final payment.

(d) The Owner shall have the right to exclude the Contractor from the Work after the date of Substantial Completion, but the Owner shall allow the Contractor reasonable access to complete or correct items on the tentative list. If the Owner exercises its right to exclude the Contractor from the Work in accordance with this subparagraph, the Contractor shall be relieved of any responsibilities with respect to security, operation, safety, maintenance, heat and utilities, except to the extent otherwise agreed in writing and signed by the Owner and the Contractor, but the Contractor shall not be relieved of its responsibilities with respect to insurance and warranties, except to the extent specifically agreed to in writing by the Owner.

14.5 Partial Utilization. Use by the Owner of any finished part of the Work, which has been specifically identified in the Contract Documents, or which the Owner, the Architect/Engineer and the Contractor agree constitutes a separately functioning and usable part of the Work that can be used by the Owner without significant interference with the Contractor's performance of the remainder of the Work, may be accomplished prior to Substantial Completion of all the Work subject to the following:

(a) The Owner at any time may request the Contractor in writing to permit the Owner to use any such part of the Work which the Owner believes to be ready for its intended use and substantially complete. If the Contractor agrees, the Contractor will certify to the Owner and the Architect/Engineer that said part of the Work is substantially complete and request the Architect/Engineer to issue a certificate of Substantial Completion for that part of the Work. The Contractor at any time may notify the Owner and the Architect/Engineer in writing that the Contractor considers any such part of the Work ready for its intended use and substantially complete and requests the Architect/Engineer to issue a certificate of Substantial Completion for that part of the Work. Within a reasonable time after either such request, the Owner, the Contractor and the Architect/Engineer shall make an inspection of that part of the Work to determine its status of completion. If the Architect/Engineer does not consider that part of the Work to be substantially complete, the Architect/Engineer will notify the Owner and the Contractor in writing giving the reasons therefore. If the Architect/Engineer considers that part of the Work to be substantially complete, the provisions of paragraph 14.4 shall apply with

respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

(b) The Owner may at any time request the Contractor in writing to permit the Owner to take over operation of any such part of the Work although it is not substantially complete. A copy of such request will be sent to the Architect/Engineer and within a reasonable time thereafter the Owner, the Contractor and the Architect/Engineer shall make an inspection of that part of the Work to determine its status of completion and will prepare a list of the items remaining to be completed or corrected thereon before final payment. If the Contractor does not object in writing to the Owner and the Architect/Engineer that such part of the Work is not ready for separate operation by the Owner, the Architect/Engineer will finalize the list of items to be completed or corrected and will deliver such list to the Owner and the Contractor together with a written recommendation as to the division of responsibilities pending final payment between the Owner and the Contractor with respect to security, operation, safety, maintenance, utilities, insurance, warranties and guarantees for that part of the Work which will become binding upon the Owner and the Contractor at the time when the Owner takes over such operation (unless they shall have otherwise agreed in writing and so informed the Architect/Engineer). During such operation and prior to Substantial Completion of such part of the Work, the Owner shall allow the Contractor reasonable access to complete or correct items on said list and to complete other related Work.

(c) No occupancy or separate operation of part of the Work will be accomplished prior to compliance with the requirements of paragraph 5.9 in respect of property insurance.

14.6 Final Inspection. Upon written notice from the Contractor that the entire Work or an agreed portion thereof is complete, the Architect/Engineer will make a final inspection with the Owner and the Contractor and will notify the Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. The Contractor shall immediately take such measures as are necessary to remedy such deficiencies.

14.7 Final Application for Payment. After the Contractor has completed all such corrections to the satisfaction of the Architect/Engineer and delivered all maintenance and operating instructions, schedules, guarantees, Bonds, certificates of inspection, marked-up record documents (as provided in paragraph 6.11) and other documents, all as required by the Contract Documents, and after the Architect/Engineer has indicated that the Work is acceptable (subject to the provisions of paragraph 14.10), the Contractor may make application for final payment following the procedure for progress payments. The final Application for Payment shall be accompanied by all documentation called for in the Contract Documents, together with complete and legally effective releases or waivers (satisfactory to the Owner) of all Liens arising out of or filed in connection with the Work. In lieu thereof and as approved by the Owner, the Contractor may furnish receipts or releases in full; an affidavit of the Contractor that the releases and receipts include all labor, services, material and equipment for which a Lien could be filed, and that all payrolls, material and equipment bills, and other indebtedness connected with the Work for which the Owner or the Owner's property might in any way be responsible, have been paid or otherwise satisfied; and consent of the surety, if any, to final payment. If any Subcontractor or Supplier fails to furnish a release or receipt in full, the Contractor may furnish a Bond or other collateral satisfactory to the Owner to indemnify the Owner against any Lien.

14.8 Final Payment and Acceptance.

(a) If, on the basis of the Architect/Engineer's observation of the Work during construction and final inspection, and the Architect/Engineer's review of the final Application for Payment

and accompanying documentation all as required by the Contract Documents, the Architect/Engineer is satisfied that the Work has been completed and that Contractor's other obligations under the Contract Documents have been fulfilled, the Architect/Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing the Architect/Engineer's recommendation of payment and present the Application to the Owner for payment. Thereupon the Architect/Engineer will give written notice to the Owner and the Contractor that the Work is acceptable subject to the provisions of paragraph 14.10. Otherwise, the Architect/Engineer will return the Application to the Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case the Contractor shall make the necessary corrections and resubmit the Application. Thirty days after presentation to the Owner of the Application and accompanying documentation, in appropriate form and substance, and with the Architect/Engineer's recommendation and notice of acceptability, the amount recommended by the Architect/Engineer will become due and will be paid by the Owner to the Contractor.

(b) If, through no fault of the Contractor, final completion of the Work is significantly delayed and if the Architect/Engineer so confirms, the Owner shall, upon receipt of the Contractor's final Application for Payment and recommendation of the Architect/Engineer, and without terminating the Agreement, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by the Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if Bonds have been furnished as required in paragraph 5.1, the written consent of each surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect/Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

14.9 Contractor's Continuing Obligation. The Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. Neither recommendation of any progress or final payment by the Architect/Engineer, nor the issuance of a certificate of Substantial Completion, nor any payment by the Owner to the Contractor under the Contract Documents, nor any use or occupancy of the Work or any part thereof by the Owner, nor any act of acceptance by the Owner nor any failure to do so, nor any review and approval of a Shop Drawing or sample submission, nor the issuance of a notice of acceptability by the Architect/Engineer pursuant to paragraph 14.8, nor any correction of defective Work by the Owner will constitute an acceptance of Work not in accordance with the Contract Documents or a release of the Contractor's obligation to perform the Work in accordance with the Contract Documents (except as provided in paragraph 14.10).

14.10 Waiver of Claims. The making and acceptance of final payment will constitute:

(a) A waiver of all claims by the Owner against the Contractor, except claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to paragraph 14.6 or from failure to comply with the Contract Documents or the terms of any special guarantees specified therein; however it will not constitute a waiver by the Owner of any rights in respect of the Contractor's continuing obligations under the Contract Documents; and

(b) A waiver of all claims by the Contractor against the Owner other than those previously made in writing and still unsettled.

ARTICLE 15. SUSPENSION OF WORK AND TERMINATION

15.1 Suspension. The Owner may, at any time and without cause, suspend the Work, or any portion thereof for a period of not more than ninety days by notice in writing to the Contractor and the Architect/Engineer which will fix the date on which Work will be resumed. The Contractor shall resume the work on the date so fixed. The Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension if the Contractor makes an approved claim therefor as provided in Articles 11 and 12.

15.2 Termination by Owner. Upon the occurrence of any one or more of the following events:

(a) if the Contractor commences a voluntary case under any Chapter of the Bankruptcy Code (Title 11, United States Code), as now or hereafter in effect, or if the Contractor takes any equivalent or similar action by filing a petition or otherwise under any other federal or state law in effect at such time relating to bankruptcy or insolvency;

(b) if a petition is filed against the Contractor under any chapter of the Bankruptcy Code as now or hereafter in effect at the time of filing or if a petition is filed seeking any such equivalent or similar relief against the Contractor under any other federal or state law in effect at the time relating to bankruptcy or insolvency;

(c) if the Contractor makes a general assignment for the benefit of creditors;

(d) if a trustee, receiver, custodian or agent of the Contractor is appointed under applicable law or under contract, whose appointment or authority to take charge of the property of the Contractor is for the purpose of enforcing a Lien against such property or for the purpose of general administration of such property for the benefit of the Contractor's creditors;

(e) if the Contractor admits in writing an inability to pay his debts generally as they become due;

(f) if the Contractor persistently fails to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the progress schedule established under paragraph 2.8 as revised from time to time);

(g) if the Contractor disregards applicable Laws or Regulations;

(h) if the Contractor disregards the authority of the Architect/Engineer; or

(i) if the Contractor otherwise violates in any material way any provisions of the Contract Documents; the Owner may, after giving the Contractor (and the surety, if there be one) seven days' written notice and to the extent permitted by Laws and Regulations, terminate the services of the Contractor, exclude the Contractor from the site and take possession of the Work and of all the Contractor's tools, appliances, construction equipment and machinery at the site and use the same to the full extent they could be used by the Contractor (without liability to the Contractor for trespass or conversion), incorporate in the Work all materials and equipment stored at the site or for which the Owner has paid the Contractor but which are stored elsewhere, and finish the Work as the Owner may deem expedient. In such case the Contractor shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds the direct, indirect and consequential costs of

completing the Work (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court costs) such excess will be paid to the Contractor. If such costs exceed such unpaid balance, the Contractor shall pay the difference to the Owner. Such costs incurred by the Owner will be approved as to reasonableness by the Architect/Engineer and incorporated in a Change Order, but when exercising any rights and remedies under this paragraph, the Owner shall not be required to obtain the lowest price for the Work performed. Where the Contractor's services have been so terminated by the Owner, the termination will not affect any rights or remedies of the Owner against the Contractor then existing or which may thereafter accrue. Any retention or payment of monies due the Contractor by the Owner will not release the Contractor from liability.

15.3 Abandonment by Owner. Upon seven days' written notice to the Contractor and the Architect/Engineer, the Owner may, without cause and without prejudice to any other right or remedy, elect to abandon the Work and terminate the Agreement. In such case, the Contractor shall be paid for all Work executed and any expense sustained plus reasonable termination expenses which will include, but not be limited to, direct, indirect and consequential costs (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court costs).

15.4 Contractor Remedies. If, through no act or fault of the Contractor, the Work is suspended for a period of more than ninety days by the Owner or under an order of court or other public authority, or the Architect/Engineer fails to act on any Application for Payment within thirty days after it is submitted, or the Owner fails for thirty days to pay the Contractor any sum finally determined to be due, then the Contractor may, upon seven days' written notice to the Owner and the Architect/Engineer, terminate the Agreement and recover from the Owner payment for all Work executed and any expense sustained plus reasonable termination expenses. In addition and in lieu of terminating the Agreement, if the Architect/Engineer has failed to act on an Application for Payment or the Owner has failed to make any payment as aforesaid, the Contractor may upon seven days' written notice to the Owner and the Architect/Engineer, stop the Work until payment of all amounts then due. The provisions of this paragraph shall not relieve the Contractor of the obligation under paragraph 6.15 to carry on the Work in accordance with the progress schedule and without delay during disputes and disagreements with the Owner.

ARTICLE 16. MISCELLANEOUS

16.1 Notices. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice. In lieu of the foregoing, the Supplementary Conditions may specify other requirements with respect to the giving of notices pursuant to the Contract Documents.

16.2 Computation of Time. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

16.3 Duties, Rights and Remedies Not Exclusive. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto, and, in particular but without limitation, the warranties, guarantees and obligations imposed

upon the Contractor by paragraphs 6.16, 13.1, 13.7, 13.9, 14.2 and 15.2 and all of the rights and remedies available to the Owner and the Architect/Engineer thereunder, are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee or by other provisions of the Contract Documents, and the provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right and remedy to which they apply. All representations, warranties and guarantees made in the Contract Documents will survive final payment and termination or completion of the Agreement.

END OF DOCUMENT

DOCUMENT 00800
SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the General Conditions of the Construction Contract (the "General Conditions") and other provisions of the Contract Documents as indicated below. All provisions, which are not so amended or supplemented, remain in full force and effect.

1. DEFINED TERMS

- A. The terms used in these Supplementary Conditions which are defined in the General Conditions have the meanings assigned to them in the General Conditions.

2. PRELIMINARY MATTERS

- A. Paragraph 2.1, first line delete "ten" and substitute "four" therefore.

3. CONTRACT DOCUMENTS - No Amendments

4. LANDS; PHYSICAL CONDITIONS; REFERENCE POINTS

4.2 Physical Conditions

- (a) The following are identified as those reports of explorations and tests of subsurface conditions at the site that have been utilized by the Architect/Engineer in preparation of the Contract Documents:

NONE

- (b) The following are identified as those drawings of physical conditions in or relating to existing surface and subsurface structures (except Underground Facilities) which are at or contiguous to the site that have been utilized by the Architect/Engineer in preparation of the Contract Documents:

NONE

5. BONDS AND INSURANCE

- A. Delete Paragraph 5.4 and insert in its place:

5.4 Owner's Contractor Protective (OCP) Insurance. The contractor shall be responsible for purchasing and maintaining the Owner's Contractor Protective (OCP) Insurance to protect the Owner against claims which may arise from operations under the Contract Documents.

- B. Paragraph 5.5 (a.), first line, delete "Owner" and substitute "Contractor" therefore.

- C. Paragraph 5.5 (b.), first line, delete "Owner" and substitute "Contractor" therefore.

- D. Paragraph 5.5 (c.), second line, delete "Owner" and substitute "Contractor" therefore.

- E. Delete entirely Paragraph 5.5 (e).

- F. Paragraph 5.8, fifth line, delete the sentence that starts "If the Contractor has...." and the remainder of Paragraph 5.8".

- G. Add a new paragraph immediately after paragraph 5.9 of the GENERAL CONDITIONS which is to be read as follows:

5.10 Insurance Coverage Information. The liability insurance to be provided pursuant to paragraphs 5.2, 5.3 and 5.4 of the General Conditions shall comply with the following as to limits of coverage and certain other special provisions (if any):

- (a.) Worker's Compensation - In accordance with the laws of the State.
- (b.) Contractor shall provide Comprehensive General Liability insurance as follows on an Occurrence Form:

General Liability -	General Aggregate:	\$1,000,000
	Completed Operations:	\$1,000,000
	Property Damage:	\$1,000,000 each occurrence
	Personal Injury:	\$1,000,000 annual aggregate
	Each Occurrence:	\$1,000,000
Auto Liability -	Combined Single Limit:	\$1,000,000
	Bodily Injury and	\$ 500,000 each person
	Property Damage:	\$ 500,000 each accident
		\$1,000,000 annual aggregate

- (c.) Owner's Contractor Protective (OCP) Insurance: THIS INSURANCE SHALL BE IN THE FORM OF SEPARATE POLICY WRITTEN IN THE NAME OF THE OWNER, AND ALLEN & HOSHALL, ARCHITECTS ENGINEERS, SHALL BE NAMED THEREIN AS ADDITIONALLY INSURED.

General Liability -	General Aggregate:	\$1,000,000
	Each Occurrence:	\$1,000,000

- (d.) Pursuant to paragraph 5.5 of the General Conditions at his own expense, the Contractor shall provide and maintain during the life of this contract "All Risk Installation Floater" insurance in the full amount of the sum of (a) contract price and (b) value of the Owner Furnished Materials, to cover all work in place and/or materials stored on the project site. This insurance shall include Vandalism and Malicious Mischief coverage.
- (e.) Prior to commencement of any work under this contract the Contractor shall furnish to the Owner's authorized representative two copies of Certificates showing the effectiveness of the above specified insurance.
- (f.) Contractor's Insurance:
- (i) The Contractor shall obtain and maintain during the life of this contract insurance of the various types and amounts specified above. The "life of this contract" means the time period from date of issuance by the Architect/Engineer of Authorization To Proceed, through date of issuance by the Owner of Certificate of Final Completion.
 - (ii) Before any work is begun by the Contractor or any of his Subcontractors, the Contractor shall furnish to the Owner's authorized representative two (2) copies of Certificates of Insurance showing the effectiveness of all required insurance for the Contractor, for each of his Subcontractors, for the Owner, and for the Architect/Engineer. No work shall begin under this contract until the Owner's authorized representative has given written approval of the insurance certificates.

6. CONTRACTOR'S RESPONSIBILITY

- A. Paragraph 6.2(b), third line delete "power".
- B. Add a new paragraph immediately after paragraph 6.2(b) of the GENERAL CONDITIONS which is to read as follows:

6.2(b)

- 1.) The Owner will furnish 120/240 volt electric service to the Contractor's temporary service facilities for construction power. The Contractor is responsible for temporary service pole, meter base, breaker panel, and other temporary electrical service facilities to meet construction power requirements and all codes and regulatory requirements.

- C. Add a new paragraph immediately after paragraph 6.2(d) of the GENERAL CONDITIONS which is to read as follows:

6.2(e) Project Office and Telephone Service

- 1.) Provide on the premises in an approved location a temporary project office. A suitable trailer or other suitable type portable office may be used, subject to approval.
- 2.) Keep on file in this office, copies of contract drawings, shop drawings, specifications, and other records pertaining to the project, in good condition, and readily accessible to the Contractor, Engineer, and all parties concerned. After project acceptance and after approval, remove the temporary project office.
- 3.) Provide, maintain, and pay for telephone service in the temporary project office for the use of all persons associated with the project, until project acceptance.

6.2(f) Owner Furnished Materials

- 1.) Contractor will assume full responsibility for all Owner Furnished Materials upon receipt from Owner's warehouse, material vendors/suppliers, or on site. All possible methods shall be taken to ensure the care and protection of all materials from damage during handling, storage, or from weather. Materials damaged due to negligence and/or improper handling will be charged to the Contractor at the Owner's present stock value.

- D. Add a new paragraph immediately after paragraph 6.5 (e) of the GENERAL CONDITIONS which is to be read as follows:

6.5(f) The Contractor is responsible for all subcontractors with respect to working on energized facilities.

- E. Add to the end of paragraph 6.7(e) of the GENERAL CONDITIONS the following:

The [Contractor] [Owner] shall obtain the necessary permissions or permits for over or on utilities, highways, railroads, and other obstructions, or from other authorities. The Contractor shall include in the Bid Price all costs that are, or may result from, performing this work.

- F. Add a new paragraph immediately after paragraph 6.9 of the GENERAL CONDITIONS which is to read as follows:

- (a) The Owner is exempt from State, Sales and Use Taxes on materials, equipment, and labor to be incorporated into the Work. Said taxes shall not be included in the Contract Price.
- (b) The Contractor is responsible for all Business taxes/permits as may be required by the Jurisdiction of the Project location.

- G. Delete paragraph 6.10 (b) in its entirety and insert in its place the following:
- (b) During the progress of the Work, the Contractor shall keep the premises free from accumulations of waste materials, unnecessary or discarded tools and equipment, rubbish and other debris resulting from the activities of the Contractor, Contractor's subcontractors, and/or Contractor's or Owner's material vendors and suppliers associated with the Work. At the completion of the Work, the Contractor shall remove all waste materials, rubbish and debris from and about the premises as well as all tools, appliances, construction equipment and machinery and surplus materials, and shall leave the site clean and ready for occupancy by the Owner. The Contractor shall restore to original condition all property not designated for alteration by the Contract Documents
7. OTHER WORK - No Amendments
- 7.3 The Contractor is responsible for coordination of "Work" involving TVA. Contractor shall notify Owner and Engineer of coordination needs. Owner and/or the Engineer will contact TVA.
8. OWNER'S RESPONSIBILITIES - No Amendments
9. THE ARCHITECT/ENGINEER - No Amendments
10. CHANGES IN THE WORK - No Amendments
11. CHANGE OF CONTRACT PRICE
- A. Add a new paragraph immediately after paragraph 11.3 (c) of the GENERAL CONDITIONS which is to read as follows:
- (d) Where the Work involved is covered by a Lump Sum Base Bid and unit prices for adjustment are contained in the Contract Documents, by application of adjustment unit prices to the quantities of the items involved. Provisions of paragraph 11.7 do not apply.
- B. Delete paragraph 11.6 of the GENERAL CONDITIONS in its entirety and insert in its place:
- 11.6 Allowances.
- (a) Authorized Contract Amendments. Authorized Contract Amendments allowance amount shall cover unforeseen contingencies, which may arise during construction, and to cover other extra work, which may be authorized by the Engineer. All work chargeable to this allowance shall be done ONLY upon Engineer's written authorization. The Contractor agrees that (a) this allowance includes the cost to the Contractor (less any applicable trade discounts) of materials and equipment required by the allowance to be delivered at the site, and all applicable taxes, and (b) the Contractor's costs for unloading and handling on the site, labor, installation, overhead, profit and other expenses contemplated for the allowance. No demand for additional payment on account of any thereof will be valid. If this allowance is not expended, the unexpended balance shall be credited to the contract. Likewise, if the authorized expenditures exceed this allowance, the Contractor will be reimbursed accordingly. Prior to final payment, an appropriate Change Order will be issued as recommended by the Architect/Engineer to reflect actual amounts due the Contractor on account of Work covered by Authorized Contract Amendments, and the Contract Price shall be correspondingly adjusted. The Unit Prices listed in the Bid Form will be used, as appropriate, in the calculation of the Change Order Amount for the Authorized Contract Amendments.
12. CHANGE OF CONTRACT TIME - No Amendments

13. WARRANTY; TESTS AND INSPECTIONS; DEFECTIVE WORK

- A. Paragraph 13.3,(b), last sentence, delete "Owner" and substitute "Contractor" therefore.
- B. Add a new paragraph immediately after Paragraph 13.3, (e) to read as follows:

(f) The Owner will pay for all testing and inspecting specifically requested by the Engineer/Architect over and above those described in the Contract Documents. When tests requested by the Engineer/Architect indicate noncompliance with the Contract Documents, all testing and subsequent retesting occasioned by the noncompliance shall be performed by the same testing laboratory and the costs thereof shall be paid by the Contractor.

14. PAYMENTS TO CONTRACTOR AND COMPLETION

- A. Delete the first sentence of paragraph 14.4 (a) and substitute the following:

(a) When the substation has been energized for a period of 72 hours without load and the Contractor considers the entire Work ready for its intended use, the Contractor shall notify the Owner and the Architect/Engineer in writing that the entire Work is substantially complete (except for items specifically listed by the Contractor as incomplete) and request that the Architect/Engineer issue a certificate of Substantial Completion.

15. SUSPENSION OF WORK AND TERMINATION - No Amendments

16. MISCELLANEOUS - No Amendments

The following paragraphs provide Amendments or Supplements to Document 00700 - GENERAL CONDITIONS.

17. SALVAGED MATERIALS AND EQUIPMENT

The Owner may select certain removed existing materials and equipment and retain them for his future use. BEFORE removing any existing materials and equipment, determine from the Owner which of these materials and equipment (if any) he desires to retain. Remove all Owner-selected materials and equipment without unnecessary damage thereto, and safely store them at locations designated by the Owner.

18. CONTINUITY OF SERVICES AND EXISTING OPERATIONS

- (a) Arrange all work to interfere as little as possible with the normal existing operations. Do not interrupt any existing utility or other service or existing operation at any time without Owner's prior approval. After each interruption has been made, make all necessary connections and alterations, and restore services and avoid interferences with normal existing operations as quickly as possible.
- (b) At no additional cost to Owner, provide all necessary temporary connections and temporary facilities to accomplish the required continuity of services and existing operations.
- (c) Owner reserves the right to operate and maintain facilities involved in the Project during emergency operation periods.

19. CAPACITIES, RATINGS, SIZES, AND OTHER REQUIREMENTS NOT SPECIFIED

- A. For all items of material and/or equipment, the capacities, ratings, sizes, and other requirements thereof not specified shall be as indicated on the Contract drawings.

- B. Where capacities, ratings, sizes, and other requirements for materials and/or equipment may be neither specified nor indicated on the Contract drawings, refer each such case to the Engineer before ordering the materials and/or equipment involved or proceeding with the work involved, and the Engineer's decision shall govern.
- C. All minor and necessary appurtenances items, not specified herein, that are necessary to make a complete assembly installation shall be included as though specified.

20. EQUIPMENT AND MATERIALS STORAGE AND PROTECTION

- A. Equipment Which Will Be Installed Indoors: At all times prior to its installation, store this equipment in dry warehouses or other shelters which will protect this equipment from damage by weather and other causes. Obtain Engineer's prior approval of proposed storage facilities; plastic wrapping or covering alone will not be considered adequate protection.
 - 1.) This includes but shall not be limited to: relay panels; control equipment; panelboards; lighting fixtures; batteries; and battery chargers.
- B. Equipment and Materials Which Will Be Installed Outdoors: At all times prior to its installation, store this equipment and these materials on pallets, skids, runners, platforms, or other suitable supports which will hold all parts of this equipment and these materials at least six inches above ground; provide watertight coverings for those stored items which may be damaged by rain or snow; all as approved.
- C. Payment for Stored Materials and Equipment: No payment will be made for on-site or off-site stored materials and equipment that is not stored as specified above.

END OF DOCUMENT

SECTION 00820 EQUAL OPPORTUNITY PROVISIONS

The Bidder represents that:

It has [], does not have [], 100 or more employees, and if it has, that

It has [], has not [], furnished the Equal Employment Opportunity - Employers Information Report EEO-1, Standard Form 100, required of employers with 100 or more employees pursuant to Executive Order 11246 and Title VII of the Civil Rights Act of 1964.

The Bidder agrees that it will obtain, prior to the award of any subcontract for more than \$10,000 hereunder to a subcontractor with 100 or more employees, a statement, signed by the proposed subcontractor, that the proposed subcontractor has filed a current report on Standard Form 100.

The Bidder agrees that if it has 100 or more employees and has not submitted a report on Standard Form 100 for the current reporting year and that if this contract will amount to more than \$10,000, the Contractor will file such report, as required by law, and notify the Owner in writing of such filing prior to the Owner's acceptance of this Proposal.

CERTIFICATION OF NONSEGREGATED FACILITIES. The Bidder certifies that it does not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The Bidder certifies further that it will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it will not permit its employees to perform their services at any location, under its control where segregated facilities are maintained. The Bidder agrees that a breach of this certification is a violation of the Equal Opportunity Clause in this contract. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, or national origin, because of habit, local custom, or otherwise. The Bidder agrees that (except where it has obtained identical certifications from proposed subcontractors for specific time periods) it will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity Clause, and that it will retain such certifications in its files.

The penalty for making false statements is prescribed in 18. U.S.C. 1001.

EQUAL OPPORTUNITY CLAUSE. During the performance of this contract, the Bidder agrees as follows:

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

employees and applicants for employment, notices to be provided setting forth the provision of this Equal Opportunity Clause.

- (2) The Bidder will, in all solicitations or advertisements for employees placed by or on behalf of the Bidder, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.
- (3) The Bidder will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representative of the Bidder's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- (4) The Bidder will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- (5) The Bidder will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to its books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- (6) In the event of the Bidder's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the Bidder may be declared ineligible for further contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in the said Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in the said Executive Order or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
- (7) The Bidder will include this Equal Opportunity Clause in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Bidder will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance; provided, however, that in the event a Bidder becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency, the Bidder may request the United States to enter into such litigation to protect the interests of the United States.

END OF SECTION

**DOCUMENT 00900
ADDENDA**

1. INTERPRETATIONS - ADDENDA

- A. Interpretations and Addenda for questions concerning the meaning or intent of the Contract Documents and response of these will be made through the issuing of Addenda.
- B. All Addenda are incorporated, by reference, into the Contract. Failure of any Bidder or sub-bidder to receive any addenda shall not relieve the Bidder of any obligation with respect to their Bid.
- C. All Addenda and modifications to the Contract Documents shall be inserted and indexed numerically in this location behind this page and coordinated as instructed in each Addendum.

END OF DOCUMENT

SECTION 01012 SUMMARY OF WORK

PART 1. GENERAL

1.01 SUMMARY

- A. The "Project," of which the "Work" of this Contract is a part, is titled "Diesel Generator Package Systems for Tupelo Fire Stations #3, #4, #6, and #7".
- B. The "Work" of this Contract is defined in the Contract Documents to include furnishing and paying for all necessary materials, labor, tools, equipment, and other items, and constructing complete in every detail and ready for Owner's beneficial use, as specified herein, and/or indicated on the Contract Drawings listed elsewhere in these specifications. This project shall consist generally of but not be limited to the following items:
 - 1. Local Permits (if required).
 - 2. 100 kW Diesel Generator (Fire Stations #3 and #4)
 - 3. 25 kW Diesel Generator (Fire Stations #6 and #7)
 - 4. Automatic Transfer Switches.
 - 5. Concrete Foundations.
 - 6. Grounding and conduit.
 - 7. Electrical work.
 - 8. Control and low voltage power cable.
 - 9. Control Panel Modification and Wiring
 - 10. Electrical Testing Services.
 - 11. Project clean-up.
 - 12. Other items as indicated or specified.
- C. Contractor shall coordinate all work with Owner and Engineer.
- D. Contractor shall assume responsibility for erosion controls (if required) established by the Site Contractor or Site Work Subcontractor, provide all required inspections of erosion controls, provide all required finish grading of disturbed site areas due to construction, weather, or other activity.
- E. Electrical testing for this project will be provided by the Contractor. The Contractor is responsible for the coordination of the testing with respect to the project schedule. The Contractor shall notify the Engineer and Owner of the testing schedule. Failure of the Contractor to coordinate testing will not relieve the Contractor from maintaining the project schedule and completion dates.
- F. Contractor shall correct all deficiencies in "Work" by the Contractor as may be indicated by testing and as directed by the Engineer.

1.02 RELATED SECTIONS

- A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and other Sections in DIVISION 1 of these Specifications.

1.03 PROJECT CONDITIONS

- A. This project is located in the City of Tupelo at Fire Stations #3, #4, #6, and #7.

- B. The Contractor shall take all necessary precautions and use the appropriate safety work methods and Personal Protective Equipment as may be specified by Federal, State, Local, or other appropriate regulatory authority.
- C. The Contractor is responsible for all subcontractors.

1.04 SEQUENCING AND SCHEDULING SERVICE OUTAGES

- A. All outages shall be coordinated with Owner. A representative of the Contractor shall be on-site during all outages. Exact details of the outages, including date, time, duration and facilities involved, will be developed at the appropriate time of the Project Schedule and construction milestone.

1.5 ENERGIZING GENERATOR FACILITIES

- A. The Engineer will review the Preliminary Test Report and the Work. After review and approval of the Preliminary Test Report and Work, the Engineer and Owner will determine the suitability of the generator to be energized.
- B. The project will not be approved for energizing without complete installation of the grounding system and appropriate safe guards in place as required by Federal, State, Local, or other appropriate regulatory authority.
- C. The Contractor shall be on site during the energizing and loading of the generator.

1.6 QUALITY ASSURANCE

- A. Perform all work in accordance with applicable codes and standards.
- B. Maintain at least one copy of Contract Documents and Manufacturers' recommended installation methods on site at all times.

END OF SECTION

SECTION 01021 ALLOWANCES

PART 1. GENERAL

1.01 SUMMARY

- A. To provide adequate budget and bonding to cover items not precisely determined by the Owner prior to bidding, allow within the proposed Total Contract Sum the amounts described in this Section.
- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Divisions 1 through 16 of these Specifications.
 - 2. Other provisions concerning Cash Allowances also may be stated in other Sections of these Specifications.

1.02 AUTHORIZED CONTRACT AMENDMENTS

- A. The Allowance amount shown in Document 00301 - BID FORM for Authorized Contract Amendments is to cover unforeseen contingencies which may arise during construction, and to cover other extra work which may be authorized by the Engineer. All work chargeable to this allowance shall be done ONLY upon Engineer's written authorization. If this allowance is not expended, the unexpended balance shall be credited to the contact. Likewise, if the authorized expenditures exceed this allowance, the Contractor will be reimbursed accordingly. Payment for work chargeable to this allowance will be computed in accordance with appropriate section of the GENERAL CONDITIONS.
- B. No part of the above specified allowance shall be used to cover any work which is specified or indicated.

END OF SECTION

SECTION 01025 MEASUREMENT AND PAYMENT

PART 1. GENERAL

1.01 SECTION INCLUDES

- A. Provide a detailed breakdown of the agreed Contract Price showing values allocated to each of the various parts of the Work, as specified herein and in other provisions of the Contract Documents. Provide the Method of Measurement for the various Unit Prices as may be requested in the Contract Documents.

1.02 RELATED SECTIONS

- A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in DIVISION 1 of these Specifications.

1.03 SUBMITTALS

- A. Preparation and submittal of a Schedule of Values is required by the General Conditions.
- B. Schedule of Values is required to be compatible with the Application for Payment, as described in General Conditions.
- C. Within 10 days after Effective Date of Agreement submit a preliminary schedule of values to the Engineer/Architect. Meet with the Engineer/Architect and determine additional data, if any, required to be submitted. Secure the Engineer/Architect's approval of the final schedule of values at least 10 days prior to submitting first application for payment.
- D. The Schedule of Values shall include, but not limited to the following:
 - 1. 100 kW Diesel Generator EPA certified (Fire Stations #3, #4)
 - 2. 25 kW Diesel Generator EPA certified (Fire Stations #6, #7)
 - 3. Foundations
 - 4. Cutting and patching of existing concrete for new electrical
 - 5. If Necessary, crane for setting equipment
 - 6. Automatic Transfer Switch
 - 7. Conduit System
 - 8. Control and low voltage power cable system
 - 9. Control Panel Modification, Wiring, and Control Settings
 - 10. All necessary labor and materials for installation and wiring of the generator system
 - 11. Electrical Testing
 - 12. Authorized Contract Amendments

1.04 UNIT PRICE METHOD OF MEASUREMENT AND PAYMENT

- A. The Unit Prices as stated in the Contract Documents shall be measured as described below:
 - 1. Earthwork:
 - a. Unclassified Excavation
Basis of Measurement: Unclassified Excavation shall be measured by the cubic yard in its final position, compacted in place. Measurement shall not include the quantity of material excavated without authorization beyond normal lines, or the quantity of material used for purposes other than those directed. The quantity of unclassified

excavation shall be measured in its final position based upon elevation difference taken on ten (10) foot grid, and by means of Average End areas from elevations to the nearest 0.01 foot. Unclassified excavation material shall not include in any other excavation quantities.

Basis of Payment: The unit price per cubic yard shall be full compensation for furnishing all materials; placing, and compaction of the materials; and for all labor, equipment, tools and incidentals to complete the item.

b. Borrow Excavation

Basis of Measurement: Borrow Excavation shall be measured by the cubic yard and paid for on the basis of the number of cubic yards of approved material obtained from Contractor-furnished Borrow areas required to construct the project to the lines and grades indicated; all measured in its final position compacted in place. Suitable materials obtained from unclassified excavation and used as embankment material shall be not be measured as borrow. The quantity of borrow excavation shall be measured in its final position based upon elevation difference taken on ten (10) foot grid, and by means of Average End areas from elevations to the nearest 0.01 foot. Borrow excavation material shall not include in any other excavation quantities.

Basis of Payment: The unit price per cubic yard shall be full compensation for furnishing all materials; placing, and compaction of the materials; and for all labor, equipment, tools and incidentals to complete the item.

c. Undercut Excavation

Basis of Measurement: Undercut Excavation shall be measured by the cubic yard and paid for on the basis of the number of cubic yards of unsuitable material, authorized by the Engineer to be removed, measured in its original position. The quantity of undercut excavation shall be measured in its final position based upon elevation difference taken on ten (10) foot grid, and by means of Average End areas from elevations to the nearest 0.01 foot. Undercut excavation material shall not include in any other excavation quantities. The unit price per cubic yard of undercut shall be full compensation for all materials, equipment, labor, tools and incidentals necessary to complete the item regardless of the depth encountered. Only the undercut authorized by the Engineer shall be paid for.

Basis of Payment: The price includes disposal of unsuitable material off of the job site. Material used to replace "undercut" areas is a separate pay item and shall be obtained from grading operations or borrow areas or granular backfill material as directed by the Engineer. The unit price per cubic yard shall be full compensation for excavation and removal of unsuitable material, and for all labor, equipment, tools and incidentals to complete the item.

d. Rock Excavation

Basis of Measurement: Rock Excavation shall be measured by the cubic yard and paid for on the basis of the number of cubic yards of material excavated and removed from the project site. The quantity of rock excavation shall be measured in its original position based upon elevation difference taken on ten (10) foot grid, and by means of Average End areas from elevations to the nearest 0.01 foot. Where it is impractical to measure material by the cross section method due to the erratic location of isolated deposits, acceptable methods involving three-dimensional measurements may be used. Rock excavation material shall not include in any other excavation quantities.

Basis of Payment: The unit price per cubic yard shall be full compensation for furnishing all materials; excavation and removal of rock material, and for all labor, equipment, tools and incidentals to complete the item.

- e. **Rock Undercut Excavation**
Basis of Measurement: Rock Undercut Excavation shall be measured by the cubic yard and paid for on the basis of the number of cubic yards of material, authorized by the Engineer, to be excavated and removed from the project site. The quantity of rock excavation shall be measured in its original position based upon elevation difference taken on ten (10) foot grid, and by means of Average End areas from elevations to the nearest 0.01 foot. Where it is impractical to measure material by the cross section method due to the erratic location of isolated deposits, acceptable methods involving three-dimensional measurements may be used. Rock undercut excavation material shall not include in any other excavation quantities.

Basis of Payment: The price includes disposal of rock material off of the job site. Material used to replace "undercut" areas is a separate pay item and shall be obtained from grading operations or borrow areas or granular backfill material as directed by the Engineer. The unit price per cubic yard shall be full compensation for excavation and removal of rock material, and for all labor, equipment, tools and incidentals to complete the item.

- f. **Granular Backfill**
Basis of Measurement: Granular Backfill shall be measured by the cubic yard in its final position, compacted in place. Measurement shall not include the quantity of material backfilled without authorization beyond normal lines, or the quantity of material used for purposes other than those directed. The quantity of Granular Backfill shall be measured in its final position based upon elevation difference taken on ten (10) foot grid, and by means of Average End areas from elevations to the nearest 0.01 foot.

Basis of Payment: The unit price per cubic yard shall be full compensation for furnishing all materials; placing, and compaction of the materials; and for all labor, equipment, tools and incidentals to complete the item.

- g. **Flowable Fill**
Basis of Measurement: Flowable Fill shall be measured by the cubic yard in its final position.

Basis of Payment: Payment is at the contract unit price per cubic yard which shall be full compensation for all materials, mixing, transporting, placing and finishing of the flowable fill as well as all labor, tools, equipment and other incidentals necessary for the satisfactory completion of the work.

2. Sitework

- a. **Asphaltic Concrete Paving** shall be measured by the square yard of the complete pavement section as shown in the Contract Documents. This includes base stone, asphaltic base course, and asphaltic surface course materials of the thickness specified in the Contract Documents, in its final position, placed, shaped, compacted and accepted in the completed course. The unit price per square yard shall be full compensation for furnishing all materials; placing, and compaction of the materials; and for all labor, equipment, tools and incidentals to complete the item.
- b. **Asphaltic Concrete Surface Course Paving** shall be measured by the square yard of the complete surface course pavement section as shown in the Contract Documents. This asphaltic surface course materials of the thickness specified in the Contract Documents, in its final position, placed, shaped, compacted and accepted in the completed course. The unit price per square yard shall be full compensation for furnishing all materials; placing, and compaction of the materials; and for all labor,

equipment, tools and incidentals to complete the item.

- c. Rubble Stone Rip-Rap shall be measured by the square yard of material of the thickness specified in the Contract Documents, in its final position, placed, shaped, and accepted in the completed course. The unit price per square yard shall be full compensation for furnishing all materials; placing of the materials; and for all labor, equipment, tools and incidentals to complete the item.
 - d. Trenching shall be measured by the linear foot, including the excavation, aggregate/earth backfill and reconditioning of the surface area, completed, measured as excavated and accepted as satisfactory as described in the Contract Documents. Trenching that serves a dual use (e.g. duct bank and ground grid) or multiple conduits will be measured as one unit. When specified in the Bid Form, separate measurement shall be made for trenches of various specified widths.
 - e. The quantity of Seeding and Mulching to be paid for shall be the number of square yards measured on the ground surface, completed and accepted, including all labor, material, equipment, tools and incidentals necessary to complete the work.
3. Concrete
- a. Concrete Pads and Spread Footer Foundations shall be measured by the cubic yard of concrete volume installed including all formwork, anchor bolts, materials, and supplies, necessary to provide a complete concrete pad as described in the Contract Documents.
4. Electrical
- a. Control Cable shall be measured by the linear foot of cable installed including materials, and supplies, completed, tested, and accepted as satisfactory as described in the Contract Documents. When specified in the Bid Form, separate measurement shall be made for cables of various specified types.
 - b. Control Cable Termination shall be measured by the cable installed including the termination of both ends, materials, and supplies, completed, tested, and accepted as satisfactory as described in the Contract Documents. When specified in the Bid Form, separate measurement shall be made for cable terminations of various specified types.
 - c. Instrumentation Cable shall be measured by the linear foot of cable installed including materials, and supplies, completed, tested, and accepted as satisfactory as described in the Contract Documents. When specified in the Bid Form, separate measurement shall be made for cables of various specified types.
 - d. Instrumentation Cable Termination shall be measured by the cable installed including the termination of both ends, shields and/or drain wires as required, materials, and supplies, completed, tested, and accepted as satisfactory as described in the Contract Documents. When specified in the Bid Form, separate measurement shall be made for cable terminations of various specified types.
 - e. Low Voltage (LV) Power Cable (600v) shall be measured by the linear foot of cable (e.g. single phase = 1-1/C as a separate unit) or group of cables (e.g. three phase = 3-1/C as a separate unit), installed including materials, and supplies, completed, tested, and accepted as satisfactory as described in the Contract Documents. When specified in the Bid Form, separate measurement shall be made for cables of various specified types or cable groups.
 - f. Low Voltage (LV) Power Cable (600v) Terminations shall be measured by the cable

(e.g. single phase = 1-1/C as a separate unit) or group of cables (e.g. three phase = 3-1/C as a separate unit), installed including the termination of both ends, materials, and supplies, completed, tested, and accepted as satisfactory as described in the Contract Documents. When specified in the Bid Form, separate measurement shall be made for cables of various specified types and cable groups.

- g. Cable removal shall be measured by the linear foot removed including the removal of the required cable terminations. Pay item includes all cable types.
- h. Conduit shall be measured by the linear foot, for each type and size of conduit, including all labor, materials and supplies to furnish the components of a complete conduit system ready for use as described in the Contract Documents. When specified in the Bid Form, separate measurement shall be made for conduits of various specified sizes and types.
- i. Conduit elbows shall be measured per elbow, for each type and size of elbow, including all labor, materials and supplies to meet the requirements of the specified conduit system for use as described in the Contract Documents. When specified in the Bid Form, separate measurement shall be made for elbows of various specified sizes and types.
- j. Grounding grid system conductor shall be measured by the linear foot of conductor installed including materials, supplies, and connections/connectors, completed and accepted as satisfactory as described in the Contract Documents. When specified in the Bid Form, separate measurement shall be made for grounding grid conductor of various specified types.
- k. Ground Rods shall be measured per each unit installed including materials, supplies and connections/connectors completed and accepted as satisfactory as described in the Contract Documents.

1.05 QUALITY ASSURANCE

- A. Use required means to assure arithmetical accuracy of the sums described.
- B. When so required by the Engineer/Architect, provide copies of the subcontracts or other data acceptable to the Engineer/Architect, substantiating the sums described.

PART 2. PRODUCTS

(NOT USED)

PART 3. EXECUTION

(NOT USED)

END OF SECTION

**DOCUMENT 01025F
APPLICATION FOR PAYMENT NO. _____**

To: **City of Tupelo**

Contract for: **Diesel Generator Package Systems for Tupelo Fire Stations #3, #4, #6, and #7**

Owner's Project No. **2023-068PW**

Engineer/Architect's Project No. **8542**

For Work accomplished through the date of: _____

The status of this contract is as follows:

Original Contract Price \$ _____

Change Orders Approved in Previous Months:

No. 1 Approved _____ 20__ (Adds ___ days) \$ _____

No. 2 Approved _____ 20__ (Adds ___ days) \$ _____

No. 3 Approved _____ 20__ (Adds ___ days) \$ _____

No. 4 Approved _____ 20__ (Adds ___ days) \$ _____

No. 5 Approved _____ 20__ (Adds ___ days) \$ _____

No. 6 Approved _____ 20__ (Adds ___ days) \$ _____

Total of Change Orders (Adds ___ days)

Work Order Date _____

Contract Sum to Date \$ _____

Original Completion Date _____

Total Completed and

Authorized Time Extension _____

Stored to Date \$ _____

Amended Completion Date _____

Less Retainage \$ _____

Remarks _____

Total Earned Less

Retainage \$ _____

Less Previous Applications

for Payment \$ _____

Amount due this Application \$ _____

Contractor's Certification:

The undersigned Contractor certifies that (1) all previous progress payments received from Owner on account of Work done under the Contract referred to above have been applied to discharge in full all obligations of Contractor incurred in connection with Work covered by prior Applications for Payment numbered 1 through _____ inclusive; and (2) title to all materials and equipment incorporated in said Work or otherwise listed in or covered by this Application for Payment will pass to Owner at time of payment free and clear of all liens, claims, security interests and encumbrances (except such as covered by Bond acceptable to Owner). Progress status is as described in schedule under monthly construction payment request.

Dated: _____, 20____ Contractor _____

By: _____

State of: _____ County of: _____

Subscribed and sworn to before me this _____ day of _____, 20____.

Notary Public: _____

My Commission expires: _____

Payment of the above AMOUNT DUE THIS APPLICATION is recommended.

Dated: _____, 20____

Allen & Hoshall, Inc.

By: _____

APPLICATION FOR PAYMENT NO. MONTHLY CONSTRUCTION PAYMENT REQUEST									
A	B	C	D	E	F	G	H	I	J
ITEM NO.	DESCRIPTION OF WORK	SCHEDULED VALUE	WORK COMPLETED			TOTAL COMPLETE & STORED TO DATE (D+E+F)	% (G/C)	BALANCE TO COMPLETION	RETAINAGE
			Previous Requests	THIS REQUEST					
				Work in Place	Stored Materials (not in D or E)				

END OF DOCUMENT

DOCUMENT 01036
CHANGE ORDER PROCEDURE

PART 1. GENERAL

1.01 SUMMARY

- A. Make such changes in the Work, in the Contract Price, in the Contract Time, or any combination thereof, as are described in written Change Orders signed by the Owner and the Engineer/Architect and issued after execution of the Agreement, in accordance with the provisions of this Section.

- B. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in DIVISION 1 of these Specifications.
 - 2. Changes in the Work are described further in General Conditions.
 - 3. Engineer/Architect's supplemental instructions:
 - a. From time to time during progress of the Work the Engineer/Architect may issue supplemental instructions which interpret the Contract Documents or order minor changes in the Work without change in Contract Sum or Contract Time.
 - b. Should the Contractor consider that a change in Contract Sum or Contract Time is required, he shall submit an itemized proposal to the Engineer/Architect immediately and before proceeding with the Work. If the proposal is found to be satisfactory and in proper order, the supplemental instructions in that event will be superseded by a Change Order.
 - 4. Proposal requests:
 - a. From time to time during progress of the Work the Engineer/Architect may issue a proposal request for an itemized quotation for changes in the Contract Price and/or Contract Time incidental to proposed modifications to the Contract Documents.
 - b. This will not be a Change Order, and will not be a direction to proceed with the changes described therein.

1.02 QUALITY ASSURANCE

- A. Include within the Contractor's quality assurance program such measures as are needed to assure familiarity of the Contractor's staff and employees with these procedures for processing Change Order data.

1.03 PROCESSING PROPOSAL REQUESTS

- A. Make written reply to the Engineer/Architect in response to each proposal request.
 - 1. State proposed change in the Contract Sum, if any.
 - 2. State proposed change in the Contract Time of Completion, if any.
 - 3. Clearly describe other changes in the Work, if any, required by the proposed change or desirable therewith.

4. Include full backup data such as subcontractor's letter of proposal or similar information.
 5. Submit this response in single copy.
- B. When cost or credit for the change has been agreed upon by the Owner and the Contractor, or the Owner has directed that cost or credit be determined in accordance with provisions of the General Conditions, the Engineer/Architect will issue a Change Order to the Contractor.

1.04 PROCESSING CHANGE ORDERS

- A. Change Orders will be numbered in sequence, and dated.
- B. The Change Order will describe the change or changes, will refer to the proposal requests or supplemental instructions involved, and will be signed by the Owner and the Engineer/Architect.
- C. The Engineer/Architect will issue four copies of each Change Order to the Contractor.
 1. The Contractor promptly shall sign all four copies and return three copies to the Engineer/Architect.
 2. The Engineer/Architect will retain one signed copy in his file, and forward two signed copies to the Owner.

PART 2. PRODUCTS

(NOT USED)

PART 3. EXECUTION

(NOT USED)

END OF SECTION

CHANGE ORDER No. _____

Project: **Diesel Generator Package System for Tupelo Fire Stations #3, #4, #6, #7**

Date of Issuance: _____

Owner: **City of Tupelo**

Address: 71 East Troy Street, Tupelo, MS 38804

Contractor: _____
Engineer/Architect: **Allen & Hoshall, Inc.**

Owner's Project No. **2023-068PW**
Engineer/Architect's Project No. **8542**

You are directed to make the following changes in the Contract Documents.

Description:

Purpose of Change Order:

Attachments:

CHANGE IN CONTRACT PRICE:	CHANGE IN CONTRACT TIME:
Base Contract Price \$ _____ Authorized Amendments \$ _____ Original Contract Price \$ _____	Original Contract Time _____ days or date
Net Change from previous Change Orders No. _____ thru No. _____ \$ _____	Net Change from previous Change Orders No. _____ thru No. _____ _____ days
Original Contract Price prior to this Change Order \$ _____	Contract Time Prior to this Change Order _____ days or date
Net Increase (Decrease) of this Change Order \$ _____	Net Increase (Decrease) of this Change Order _____ days
Contract Price with all approved Change Orders Original Contract Price \$ _____ Total Change Orders \$ _____ Current Contract Price \$ _____	Contract Time with all approved Change Orders _____ days or date

RECOMMENDED:
By: _____

Allen & Hoshall, Inc.
Engineer/Architect

Date: _____

APPROVED:
By: _____

City of Tupelo
Owner

Date: _____

End of Document

APPROVED:
By: _____

Contractor

Date: _____

DOCUMENT 01037
AUTHORIZED CONTRACT AMENDMENT
ORDER PROCEDURE

PART 1. GENERAL

1.01 SUMMARY

- A. Authorizes Work within the Authorized Contract Amendment (ACA) amount, as are described in written ACA Orders signed by the Owner and the Engineer/Architect and issued after execution of the Agreement, in accordance with the provisions of this Section.
- B. Related work:
 - 1. Documents affecting additional work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in DIVISION 1 of these Specifications.
 - 2. Additions in the Work are described further in Supplementary Conditions.
 - 3. Proposal requests:
 - a. From time to time during progress of the Work the Engineer/Architect may issue a proposal request for an itemized quotation for additional Work.
 - b. This will not be a ACA Order, and will not be a direction to proceed with the changes described therein.
 - c. If the Contractor is authorized to provide the Work, an executed ACA Order will be issued.
 - d. The associated cost with an ACA shall be detailed on the pay request as a separate line item corresponding to the appropriate ACA number.

1.02 QUALITY ASSURANCE

- A. Include within the Contractor's quality assurance program such measures as are needed to assure familiarity of the Contractor's staff and employees with these procedures for processing ACA Order data.

1.03 PROCESSING PROPOSAL REQUESTS

- A. Make written reply to the Engineer/Architect in response to each proposal request.
 - 1. State proposed cost and appropriate ACA number.
 - 2. State proposed change in the Contract Time of Completion, if any. If time is required a separate Change Order will also be required.
 - 3. Clearly describe other changes in the Work, if any, required by the proposed change or desirable therewith.
 - 4. Include full backup data such as subcontractor's letter of proposal or similar information.
 - 5. Submit this response in single copy.
- B. When cost for the change has been agreed upon by the Owner and the Contractor, or the Owner has directed that cost or credit be determined in accordance with provisions of the General

Conditions, the Engineer/Architect will issue a ACA Order to the Contractor.

1.04 PROCESSING ACA ORDERS

- A. ACA Orders will be numbered in sequence, and dated.
- B. The ACA Order will describe the change or changes, will refer to the proposal requests or supplemental instructions involved, and will be signed by the Owner and the Engineer/Architect.
- C. The Engineer/Architect will issue a copy of each ACA Order to the Contractor.
 - 1. The Contractor promptly shall sign all copies and return copies to the Engineer/Architect.
 - 2. The Engineer/Architect will retain a signed copy in his file, and forward signed copies to the Owner.

PART 2. PRODUCTS

(NOT USED)

PART 3. EXECUTION

(NOT USED)

END OF SECTION

ACA ORDER No. _____

Project: **Diesel Generator Package Systems for Tupelo Fire Stations #3, #4, #6, #7**

Date of Issuance: _____

Owner: **City of Tupelo**

Address: 71 East Troy Street, Tupelo, MS 38804

Contractor: _____ Owner's Project No. **2023-068PW**

Engineer/Architect: Allen & Hoshall, Inc. Engineer/Architect's Project No. **8542**

You are directed to make the following changes in the Contract Documents.

Description:

Attachments: (list documents supporting change)

<p style="text-align: center;">AUTHORIZED CONTRACT AMENDMENTS:</p> <p>Authorized Amendments \$ _____ As stated in Contract</p>	<p style="text-align: center;">CHANGE IN CONTRACT TIME:</p> <p>Original Contract Time _____ days or date</p>
<p>Net Change from previous ACA Orders No. _____ thru No. _____ \$ _____</p>	<p>Net Change from previous ACA Orders No. _____ thru No. _____ _____ days</p>
<p>ACA Balance prior to this ACA Order \$ _____</p>	<p>Contract Time Prior to this ACA Order _____ days or date</p>
<p>Net Amount of ACA used in this Order \$ _____</p>	<p>Net Increase (Decrease) of this ACA Order _____ days</p>
<p>ACA with all approved Field Directives</p> <p>Base ACA \$ _____ ACA Used to Date \$ _____ ACA Remaining \$ _____</p>	<p>Contract Time with all approved ACA Orders _____ days or date</p>

RECOMMENDED:

APPROVED:

APPROVED:

By: _____

By: _____

By: _____

Allen & Hoshall, Inc.
Engineer/Architect

City of Tupelo
Owner

Contractor

Date: _____

Date: _____

Date: _____

End of Document

SECTION 01038 WEATHER DELAYS

PART 1. GENERAL

1.01 EXTENSIONS OF CONTRACT TIME

- A. If the basis exists for an extension of time in accordance with ARTICLE 12 of the GENERAL CONDITIONS, an extension of time on the basis of weather may be granted only for the number of Weather Delay Days in excess of the number of days listed as the Standard Baseline for that month.

1.02 STANDARD BASELINE FOR AVERAGE CLIMATIC RANGE

- A. The Owner/Engineer has reviewed weather data available from the National Oceanic and Atmospheric Administration and determined a Standard Baseline of average climatic range for the Project location.
- B. Standard Baseline shall be regarded as the normal and anticipatable number of calendar days for each month during which construction activity shall be expected to be prevented and suspended by cause of adverse weather. Suspension of construction activity for the number of days each month as listed in the Standard Baseline is included in the Work and is not eligible for extension of Contract Time.
- C. Standard Baseline is as follows:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
12	11	8	7	7	6	7	5	4	5	6	11

1.03 ADVERSE WEATHER AND WEATHER DELAY DAYS

- A. Adverse Weather is defined as the occurrence of one or more of the following conditions which prevents exterior construction activity or access to the site within twenty-four (24) hours:
1. Precipitation (rain, snow or ice) in excess of one-tenth inch (0.10") liquid measure.
 2. Temperatures which do not rise above 32 degrees F by 10:00 a.m.
 3. Temperatures which do not rise above that specified for the day's construction activity by 10:00 a.m., if any is specified.
 4. Sustained wind in excess of twenty-five (25) m.p.h.
 5. Standing snow in excess of one inch (1.00").
- B. Adverse Weather may include, if appropriate, "dry-out" or "mud" days when all the following conditions are met:
1. For rain days above the standard baseline.
 2. Only if there is a hindrance to site access or site work, such as excavation, backfill and footings.
 3. At a rate no greater than One (1) make-up day for each day or consecutive days of rain beyond the standard baseline that total 1.0 inch or more, liquid measure, unless specifically recommended otherwise by the Owner/Engineer.
- C. A Weather Delay Day may be counted if adverse weather prevents work on the project for fifty percent (50%) or more of the Contractor's scheduled work day, including a weekend day or holiday if Contractor has scheduled construction activity that day.

- D. Contractor shall take into account that certain construction activities are more affected by adverse weather and seasonal conditions than other activities, and that “dry-out” days are not eligible to be counted as a Weather Delay Day until the Standard Baseline is exceeded.

1.04 DOCUMENTATION AND SUBMITTALS

- A. Submit daily jobsite work logs showing which and to what extent construction activities have been affected by weather on a monthly basis.
- B. Submit actual weather data to support claim for time extension obtained from nearest NOAA weather station or other independently verified source approved by Owner/Engineer at beginning of project.
- C. Use Standard Baseline data provided in this section when documenting actual delays due to weather in excess of the average climatic range.
- D. Organize claim and documentation to facilitate evaluation on a basis of calendar month periods, and submit in accordance with the procedures for claims established in ARTICLE 12 of the GENERAL CONDITIONS.
- E. If an extension of the Contract Time is appropriate, it shall be effected in accordance with the provision of ARTICLE 10 of the GENERAL CONDITIONS and the applicable SUPPLEMENTARY CONDITIONS.

PART 2. PRODUCTS

(NOT USED)

PART 3. EXECUTION

(NOT USED)

END OF SECTION

**SECTION 01040
PROJECT COORDINATION**

PART 1. GENERAL

1.01 SECTION INCLUDES

- A. Coordination
- B. Project Representatives and Addresses

1.02 COORDINATION

- A. All work, submittals, and testing shall be coordinated with the Work listed in the Contract Documents to assure efficient progress of the Project Construction.

1.03 PROJECT REPRESENTATIVES AND ADDRESS

- A. Owner: City of Tupelo

Address: 71 East Troy Street
Tupelo, MS 38804
Telephone: (662) 841-6460
Fax: (662) 841-6401

Contact: Mark Timmons
City of Tupelo
email: mark.timmons@tupeloms.gov

Alternate: Chuck Williams
City of Tupelo
email: chuck.williams@tupeloms.gov
- B. Engineer: Allen & Hoshall
Engineers Architects Surveyors

Address: 1661 International Drive, Suite 100
Memphis, TN 38120
Telephone: (901) 820-0820
Fax: (901) 683-1001

Contact: Scott Burleson (901.261.4639) email: sburleson@allenhoshall.com
Alternate: Adam Yeiser (270.993.9139) email: ayeiser@allenhoshall.com
- C. All correspondence to the Owner shall be addressed as in Article 1.03, A.
- D. All correspondence, submittals, shop drawings, test reports, instruction manuals, operation manuals and any other pertinent Project materials shall be addressed to the Engineer as in Article 1.03, B.
- E. Forward a copy of all correspondence addressed to the Owner to the Engineer.
- F. Notify Owner and Engineer of the Primary Project Representative, Alternate Project Representative, mailing address, package delivery address, phone number (normal working hours), phone number (after working hours) and fax number.

- G. All correspondence, submittals or other items associated with the Contract shall be identified by the Project Owner and Project name as listed in the Contract Documents.

END OF SECTION

**DOCUMENT 01060
REGULATORY REQUIREMENTS**

PART 1. GENERAL

1.01 SECTION INCLUDES

- A. All material, equipment and services furnished shall conform to accepted standards and practices of the electric utility industry, and the standards and codes listed in Section 01090 - REFERENCE STANDARDS.
- B. Perform and construct work in accordance with all federal, state and local laws, codes, and regulations, including those regulating the environment.
- C. Obtain and pay for all construction permits and licenses/certificates of responsibility.
- D. Contractors shall furnish registration and license/certificate of responsibility.

PART 2. PRODUCTS

(NOT USED)

PART 3. EXECUTION

3.01 CONTRACTOR'S RESPONSIBILITY

- A. Contractor shall, as a minimum requirement, construct work in accordance with all federal, state and local laws, codes, and regulations, including but not limited to environmental regulations.
- B. Contractor shall determine all requirements, obtain and pay for all construction permits, including but not limited to, fire protection, environmental control permits, local construction permits and any licenses and permits not obtained by Owner.
- C. Contractor shall pay all inspection fees, governmental charges and/or taxes necessary for execution of work.
- D. Contractor shall give all notices and comply with all laws, ordinances, building and construction codes, rules and regulations applicable to work.
 - 1. If the drawings and specifications are at variance with any federal, state or local laws, ordinances, rules or regulations, the contractor shall notify the Owner and Engineer and shall not proceed with work affected thereby until authorized.
 - 2. If any of the work is done contrary to such laws, ordinances, rules or regulations, the contractor shall bear all expense arising therefrom.

3.02 CONTRACTOR'S REGISTRATION AND LICENSE/CERTIFICATE OF RESPONSIBILITY

- A. Contractor shall possess state registration and license/certificate of responsibility in accordance with the laws of the state where project is located in effect throughout the entire period of construction and provide a copy to the Engineer.

END OF DOCUMENT

SECTION 01090 REFERENCE STANDARDS

PART 1. GENERAL

1.01 SECTION INCLUDES

- A. Quality Assurance
- B. Schedule of References

1.02 QUALITY ASSURANCE

- A. Comply with latest revision of the standard for all equipment, materials and labor, except when more rigid requirements are specified or are required by applicable codes.
- B. Request clarification from Engineer before proceeding, should specified reference standards conflict with Contract Documents.

1.03 SCHEDULE OF REFERENCE

- A. Documents and/or Standards from the following agencies may be referenced in the Contract Documents:

AA	Aluminum Association
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWS	American Welding Society
CRSI	Concrete Reinforcing Steel Institute
CSI	Construction Specifications Institute
EEl	Edison Electric Institute
EPA	Environmental Protection Agency
ICEA	Insulated Cable Engineers' Association

IEEE	Institute of Electrical and Electronics Engineers
NEC	National Electrical Code
NEMA	National Electrical Manufacturers' Association
NESC	National Electrical Safety Code
NFPA	National Fire Protection Association
OSHA	Occupational Safety and Health Administration
SSPC	Steel Structures Painting Council
RUS	Rural Utility Service
UL	Underwriters' Laboratories, Inc.

END OF DOCUMENT

SECTION 01300 SUBMITTALS

PART 1. GENERAL

1.01 SECTION INCLUDES

- A. Submittal Procedures
- B. Submittal Schedule
- C. Construction and Progress Schedules

1.02 RELATED SECTIONS

- A. DIVISIONS 0 and 1 - CONTRACT DOCUMENTS, and GENERAL REQUIREMENTS: These shall apply to all work included in this section.
- B. Section 01025 - MEASUREMENT AND PAYMENT
- C. Section 01036 - CHANGE ORDER PROCEDURES
- D. Section 01040 - PROJECT COORDINATION
- E. Section 01340 - SHOP DRAWINGS
- F. Section 01400 - QUALITY CONTROL
- G. Section 01720 - PROJECT RECORD DOCUMENTS

1.03 SUBMITTAL PROCEDURES

- A. Transmit each submittal with transmittal letter or Engineer accepted form. Sequentially number the transmittal forms. Resubmittals to have original number with an alphabetic suffix.
- B. Submit shop drawings as specified in Section 01340 - SHOP DRAWINGS.
- C. Identify Owner's name, project title, Contractor, subcontractor or supplier; pertinent drawing sheet and detail number(s), and specification section number, as appropriate.
- D. Schedule submittals to expedite the project, and deliver to Engineer with copy of transmittal letter to Owner's representative as identified in Section 01040 - PROJECT COORDINATION.
- E. Subcontractor submittals shall be reviewed and approved by the Contractor **before** submission to the Engineer.
- F. Identify variations from Contract Documents and product or system limitations which may be detrimental to successful performance of the completed Work.
- G. Provide space for Contractor and Engineer review stamps.
- H. Revise and resubmit submittals as required, identify all changes made since previous submittal.
- I. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.

1.04 SUBMITTAL SCHEDULE

- A. Provide schedule for project submittals in accordance with the specifications and as agreed to by Engineer and Contractor.

1.05 CONSTRUCTION AND PROGRESS SCHEDULE

- A. Submit initial progress schedule in duplicate within 15 days after date Owner-Contractor Agreement for Architect/Engineer review.
- B. Revise and resubmit as required.
- C. Submit revised schedules with Application for Payment, identifying changes since previous version.
- D. Submit a horizontal bar chart with separate line for each major section of Work or operation, identifying first work day of each week.
- E. Indicate estimated percentage of completion for each item of Work at each submission.
- F. Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates, including those furnished by Owner and under Allowances.

PART 2. PRODUCTS

(NOT USED)

PART 3. EXECUTION

(NOT USED)

END OF SECTION

SECTION 01340 SHOP DRAWINGS

PART 1. GENERAL

1.01 SECTION INCLUDES

- A. Submit Shop Drawings and product data required by contract documents.

1.02 RELATED SECTIONS

- A. DIVISIONS 0 and 1 - CONTRACT DOCUMENTS, and GENERAL REQUIREMENTS: These shall apply to all work included in this section.
- B. Section 01300 - SUBMITTALS
- C. Section 01720 - PROJECT RECORD DOCUMENTS

1.03 SHOP DRAWINGS

- A. Shop drawings shall include: fabrication, erection, layout, and setting drawings; material lists; manufacturer's catalog sheets and/or descriptive data for materials and equipment showing dimensions, performance characteristics, and capacities; wiring and control diagrams; electrical characteristics, and capacities; and other pertinent information as required to obtain approval of the items involved.
- B. Drawings shall be presented in a clear and thorough manner.
 - 1. Details shall be identified by reference to sheet and detail numbers shown on Contract Drawings and Specification Sections.
- C. Minimum sheet size: 8½" x 11".
- D. Maximum sheet size: 22" x 34"

1.04 PRODUCT DATA

- A. Preparation:
 - 1. Clearly mark each copy to identify pertinent products or models.
 - 2. Show performance characteristics and capacities.
 - 3. Show dimensions and clearances required.
- B. Manufacturer's standard schematic drawings and diagrams:
 - 1. Modify drawings and diagrams to delete information which is not applicable to the Work.
 - 2. Supplement standard information to provide information specifically applicable to the Work.

1.05 CONTRACTOR RESPONSIBILITIES

- A. Designate in the construction schedule, or in a separate coordinated schedule, the dates for submission and the dates that reviewed Shop Drawings and product data will be required to maintain construction schedule.

- B. Review Shop Drawings and Product Data prior to submission.
- C. Contractor is responsible for review of all Subcontractor and supplier submittals.
- D. Determine and verify:
 - 1. Field measurements
 - 2. Field construction criteria
 - 3. Catalog numbers and similar data
 - 4. Conformance with specifications
- E. Coordinate each submittal with requirements of the Work and of Contract Documents.
- F. Notify the Engineer in writing, at time of submission, of any deviations in the submittals from requirements of the Contract Documents.
- G. Begin no fabrication or work which required submittals until return of submittals with satisfactory review.

1.06 SUBMISSION REQUIREMENTS

- A. Make submittals promptly in accordance with approved schedule, and in such sequence as to cause no delay in the work or in the work of any other contractor.
- B. Number of submittals required:
 - 1. Shop Drawings: Submit one (1) copy of electronic data files of all drawings prepared for the project. Electronic data files shall be either a Design Web Format (.DWF) or a PDF format. Raster based scans (.TIF, .PCX, or .GIF) files of manual drawings are not acceptable.
 - 2. Product Data: Submit one electronic (1) copy of product data of all items for which product data is specified in other sections. Electronic data files shall be in a PDF format.
 - 3. Shop Drawings and Product Data can be provided on a CD-ROM or via e-mail. When submittal data is delivered via e-mail, it is the Contractor's responsibility to verify receipt by the Engineer.
- C. Submittals shall contain:
 - 1. Submittal identification number. Submittals shall be numbered consecutively. Re-submittals shall use the same submittal number with an alphabetic suffix added.
 - 2. The date of submission and the dates of any previous submissions.
 - 3. The Owner's name, project title and number.
 - 4. Contract identification.
 - 5. The names of:
 - a. Contractor
 - b. Subcontractor
 - c. Supplier
 - d. Manufacturer

6. Identification of the project, with the specification section number.
7. Field dimensions, clearly identified as such.
8. Relation to adjacent or critical features of the work or materials.
9. Applicable standards, such as ASTM or Federal Specification numbers.
10. Identification of deviations from Contract Documents.
11. Identification of revisions on resubmittals.
12. An 8"x3" blank space for Contractor and Engineer stamps.
13. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of products, field measurements and field construction criteria, and coordination of the information within the submittal with requirements of the Work of Contract Documents.

1.07 RETURN FOR RESUBMISSION

- A. The Engineer will return for resubmission all shop drawings submitted without the above specified approval and certification which in the Engineers opinion contain numerous discrepancies, have not been checked, or do not meet the requirements for submission.

1.08 REVIEW OF SUBMITTALS

- A. The Engineer will review, mark and date all submitted shop drawings. One (1) electronic set will be returned to the Materialman. Contractor shall make corrections and changes as indicated.
- B. Resubmit shop drawings as specified above, until satisfactory review has been obtained. Corrections and/or changes indicated on shop drawings by Engineer/Owner shall not be considered as an extra work order.
- C. After satisfactory "Review" or "Furnish as Corrected" has been obtained for all shop drawings, a set of shop drawings marked "FOR CONSTRUCTION" shall be furnished to the Engineer in the format specified in Article 1.06 above. The "FOR CONSTRUCTION" drawings shall be provided within 21 days of receipt of approval drawings by Materialman.
- D. Review of shop drawings by the Engineer will be general only, and such review will not relieve the Contractor of responsibility for accuracy of such shop drawings, proper fitting, coordination, construction of work, and furnishing materials required by the Specifications but not indicated on shop drawings. Review of shop drawings shall not be construed as approving departures from the Specifications.

1.09 DISTRIBUTION

- A. Distribute reproductions of Shop Drawings and copies of Product Data which carry the Engineer stamp of approval to:
 1. Job site file
 2. Record Documents File
 3. Other affected contractors
 4. Subcontractors

5. Supplier or fabricator

1.10 ENGINEER DUTIES

- A. Review submittals with reasonable promptness and in accordance with schedule.
- B. Affix stamp and initials or signature, and indicate requirements for resubmittal, or satisfactory review of submittal.
- C. Return submittals to Contractor for distribution, or for resubmission.

PART 2. PRODUCTS

(NOT USED)

PART 3. EXECUTION

(NOT USED)

END OF DOCUMENT

SECTION 01400 QUALITY CONTROL

PART 1. GENERAL

1.01 SECTION INCLUDES

- A. Required inspection and testing services are intended to assist in the determination of compliance of the work with the quality standards specified or indicated.

1.02 RELATED SECTIONS

- A. DIVISIONS 0 and 1 - CONTRACT DOCUMENTS, and GENERAL REQUIREMENTS: These shall apply to all work included in this section.

1.03 QUALITY OF WORK

- A. Perform all work in the most workmanlike manner and according to the best standard practices. All work shall be free from faults and defects in workmanship.
- B. Contractor shall be solely responsible for quality control of the work and shall maintain quality control over suppliers, manufacturers, products, services, site conditions and workmanship, to produce work of specified quality.
- C. Required testing and inspection are intended to assist in determination of probable compliance of the Work with the Contract Documents, but do not relieve Contractor of responsibility for this compliance. Specified testing and inspection are not intended to limit Contractor's quality control program.
- D. Contractor shall submit a Project Quality Control Plan.

PART 2. PRODUCTS

(NOT USED)

PART 3. EXECUTION

(NOT USED)

END OF DOCUMENT

SECTION 01500 CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Summary of construction facilities and temporary controls required for the Work, such as:
 - 1. Overhead line construction guard structures
 - 2. Environmental Controls
 - 3. Erosion Controls
 - 4. Construction Cleaning
 - 5. Traffic regulation

1.02 RELATED SECTIONS

- A. DIVISIONS 0 and 1 - PROPOSAL DOCUMENTS, MATERIALS CONTRACT AND GENERAL REQUIREMENTS: These shall apply to all work included in this section.

1.03 REFERENCES

- A. Published Specifications, standards, tests, or recommended methods of trade, industry, or governmental organizations apply to work in this section where cited in Section 01090 - REFERENCE STANDARDS.

PART 2 PRODUCTS

(NOT USED)

PART 3 EXECUTION

3.01 TEMPORARY GUARD STRUCTURES

- A. Utility and Road Crossings.
 - 1. The contractor shall furnish and install all guard structures required for all crossings over electric supply lines, communication lines, railroads, roads, highways, and other obstructions, and for the protection of the conductors. The Contractor shall obtain the necessary permissions or permits for stringing conductors over utilities, highways, railroads, and other obstructions. The Contractor shall make adequate preparations to safely cross all facilities with a minimum of inconvenience and delay to the public.
 - 2. The Contractor shall furnish and install steel traffic plates to cover open trenches to allow vehicle traffic flow. Contractor is responsible for pinning of the plates and temporary asphalt ramp edges for plates. Plate installation shall be coordinated with local roadway authorities.

3. When guard structures are no longer needed, the Contractor shall safely remove all temporary structures and appurtenances.
- B. Environmental Protection
1. Perform Work in such a manner as to maximize preservation of beauty, conservation of natural resources and minimize marring and scarring of the landscape and silting of drainage areas and streams. Do not deposit trash, herbicides, or other chemicals or their containers in or near streams, waterways, drainage areas, streets, alleys, lawns, pastures, or on the landscape.
 2. Contractor shall utilize and if warranted, implement the procedures of A Guide for Environmental Protection and Best Management Practices for Tennessee Valley Authority Transmission Construction and Maintenance Activities for the duration of construction.
- C. Project Clean Up
1. The site and the structures to be constructed thereon shall be maintained and kept clean and free from rubbish, unused materials, and equipment during the construction period. From time to time, remove all dirt, rubbish and surplus materials of all descriptions, including equipment not in use, and maintain the site in a neat and orderly condition. Materials or equipment known to belong to others shall not be removed from the site without duly notifying the Owner thereof.
 2. Upon completion of the work the Contractor shall remove all construction equipment and unused materials provided for the Work.
- D. Erosion Control
1. Prior to construction activities that will cause disturbance to storm water discharges, drainage paths, or which may cause erosion of soil and the discharge of other pollutants, the Contractor shall file a Notice of Intent (NOI) with the Department of Environment and Conservation.
 2. An Erosion and Control Plan for the Project shall be developed and implemented in accordance with State regulations concerning the general permit.
 3. The Contractor shall file and be the signatory principal for the NOI, and shall be solely responsible for: compliance to applicable state and federal laws, liabilities, or penalties pursuant to non-compliance.
- 3.02 TRAFFIC CONTROL AND WARNINGS**
- A. Schedule and perform all work to interfere as little as possible with vehicular traffic flow. Poor planning and gross inconsiderateness of traffic flow will be just cause for the Owner to stop the Contractor's work until the unsatisfactory conditions have been remedied.
 - B. Mark clearly all open ditches, soft backfill, parked equipment, etc., with signs and barricades during day hours, and in addition, with flares at night. Maintain all flares, signs, and barricades during weekends, holidays, and at other times when work is not in progress.
 - C. Provide adequate signs and watchmen to comply with the requirements of all authorities having jurisdiction, and as necessary for the safety and convenience of the general public.

END OF SECTION

SECTION 01610 DELIVERY, STORAGE AND HANDLING

PART 1. GENERAL

1.01 SUMMARY

- A. Protect products scheduled for use in the Work by means including, but not necessarily limited to, those described in this Section.
- B. Related Work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
 - 2. Additional procedures also may be prescribed in other Sections of these Specifications.

1.02 QUALITY ASSURANCE

- A. Include within the Contractor's quality assurance program such procedures as are required to assure full protection of work and materials.

1.03 MANUFACTURERS' RECOMMENDATIONS

- A. Except as otherwise approved by the Architect/Engineer, determine and comply with manufacturers' recommendations on product handling, storage, and protection.

1.04 PACKAGING

- A. Deliver products to the job site in their manufacturer's original container, with labels intact and legible.
 - 1. Maintain packaged materials with seals unbroken and labels intact until time of use.
 - 2. Promptly remove damaged material and unsuitable items from the job site, and promptly replace with material meeting the specified requirements, at no additional cost to the Owner.
- B. The Architect/Engineer may reject as non-complying such material and products that do not bear identification satisfactory to the Architect/Engineer as to manufacturer, grade, quality, and other pertinent information.

1.05 PROTECTION AND HANDLING

- A. Protect finished surfaces, including jambs and soffits of openings used as passageways, through which equipment and materials are handled.
- B. Provide protection for finished floor surfaces in traffic areas prior to allowing equipment or materials to be moved over such surfaces.
- C. Maintain finished surfaces clean, unmarred, and suitably protected until accepted by the Owner.

1.06 REPAIRS AND REPLACEMENTS

- A. In event of damage, promptly make replacements and repairs to the approval of the Architect/Engineer and at no additional cost to the Owner.
- B. Additional time required to secure replacements and to make repairs will not be considered by the Architect/Engineer to justify an extension in the Contract Time of Completion.

END OF SECTION

**SECTION 01720
PROJECT RECORD DOCUMENTS**

PART 1. GENERAL

1.01 SECTION INCLUDES

- A. Record of changes
- B. Final "As-Built" drawings
- C. Operation and maintenance manuals

1.02 RELATED SECTIONS

- A. DIVISIONS 0 and 1 - CONTRACT DOCUMENTS, and GENERAL REQUIREMENTS: These shall apply to all work included in this section.
- B. Other requirements affecting Project Record Documents may appear in pertinent other Sections of these Specifications.

1.03 SUBMITTALS

- A. Comply with pertinent provisions of Document 00700 - GENERAL CONDITIONS and Section 01300 - SUBMITTALS.
- B. The Engineer/Architect's approval of the current status of Project Record Documents may be a prerequisite to the Engineer/Architect's approval of requests for progress payment and request for final payment under the Contract.
- C. Prior to submitting each request for progress payment, secure the Engineer/Architect's approval of the current status of the Project Record Documents.
- D. Prior to submitting request for final payment, submit the final Project Record Documents to the Engineer/Architect for approval.

1.04 QUALITY ASSURANCE

- A. Delegate the responsibility for maintenance of Record Documents to one person on the Contractor's staff as approved by the Engineer/Architect.
- B. Accuracy of records:
 - 1. Thoroughly coordinate changes within the Record Documents, making adequate and proper entries on each page of Specifications and each sheet of Drawings and other Documents where such entry is required to show the change properly.
 - 2. Accuracy of records shall be such that future searches for items shown in the Contract Documents may rely reasonably on information obtained from the approved Project Record Documents.
- C. Make entries within 24 hours after receipt of information that the change has occurred.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Maintain the job set of Record Documents completely protected from deterioration and from loss and damage until completion of the Work and transfer of all recorded data to the final Project Record Documents.
- B. In the event of loss of recorded data, use means necessary to again secure the data to the Engineer/Architect's approval.
 - 1. Such means shall include, if necessary in the opinion of the Engineer/Architect, removal and replacement of concealing materials by Contractor at his cost.
 - 2. In such case, provide replacements to the standards originally required by the Contract Documents by Contractor at his cost.

PART 2. PRODUCTS**2.01 RECORD DOCUMENTS**

- A. Job set: Promptly following the Effective Date of Agreement secure from the Engineer/Architect at no charge to the Contractor one complete set of all Documents comprising the Contract.

PART 3. EXECUTION**3.01 MAINTENANCE OF JOB SET**

- A. Immediately upon receipt of the job set described in Paragraph 2.01-A above, identify each of the Documents with the title, "RECORD DOCUMENTS - JOB SET."
- B. Preservation:
 - 1. Considering the Contract completion time, the probable number of occasions upon which the job set must be taken out for new entries and for examination, and the conditions under which these activities will be performed, devise a suitable method for protecting the job set to the approval of the Engineer/Architect.
 - 2. Do not use the job set for any purpose except entry of new data and for review by the Engineer/Architect, until start of transfer of data to final Project Record Documents.
 - 3. Maintain the job set at the site of Work as that site is designated by the Engineer/Architect.
- C. Making entries on Drawings:
 - 1. Using an erasable colored pencil (not ink or indelible pencil), clearly describe the change by graphic line and note as required.
 - 2. Date all entries.
 - 3. Call attention to the entry by a "cloud" drawn around the area or areas affected.
 - 4. In the event of overlapping changes, use different colors for the overlapping changes.
- D. Make entries in the pertinent other Documents as approved by the Engineer/Architect.

- E. Drawings shall clearly show actual installed locations, depth, and sizes of:
1. Pipework of all descriptions below ground outside of building and structures, including locations of cleanouts, manholes, inlets, hydrants, and underground valves.
 2. Electrical conduits, electrical ducts, ground grid conductors, and directly buried conductors underground outside of buildings and structures, including locations of pull and junction boxes, electric manholes and handholes, pad mounted electrical equipment, utility poles, electrical outlets, and lighting fixtures.
- F. Conversion of schematic layouts:
1. In some cases on the Drawings, arrangements of conduits, circuits, piping, ducts, and similar items, is shown schematically and is not intended to portray precise physical layout.
 - a. Final physical arrangement is determined by the Contractor, subject to the Engineer/Architect's approval.
 - b. However, design of future modifications of the facility may require accurate information as to the final physical layout of items which are shown only schematically on the Drawings.
 2. Show on the job set of Record Drawings, by dimension accurate to within one inch, the centerline of each run of items such as are described in Article 3.01-E above.
 - a. Clearly identify the item by accurate note such as "cast iron drain," "galv. water," and the like.
 - b. Show, by symbol or note, the vertical location of the item ("under slab," "in ceiling plenum," "exposed," and the like).
 - c. Make all identification so descriptive that it may be related reliably to the Specifications.
 3. The Engineer/Architect may waive the requirements for conversion of schematic layouts where, in the Engineer/Architect's judgment, conversion serves no useful purpose. However, do not rely upon waivers being issued except as specifically issued in writing by the Engineer/Architect.
- G. Review and submittal:
1. Submit the completed set of Project Record Documents to the Engineer/Architect as described in Paragraph 1.03-D above.
 2. Participate in review meetings as required.
 3. Make required changes and promptly deliver the Project Record Documents to the Engineer/Architect.

3.02 FINAL DRAWINGS

- A. At completion of project, the Contractor shall incorporate all revisions into the shop drawings to provide a complete set of final drawings. The drawings shall be marked as "Final-As Constructed".
- B. One (1) copy of electronic data files of all drawings prepared for the project. Format shall be AutoCAD 2000 or later, vector based (.DWG or .DXF) files. Raster based scans (e.g., TIF, .PCX, or .GIF) files of manual drawings are not acceptable. Media shall be CD-ROM or via email.

3.03 OPERATION AND MAINTENANCE MANUALS

- A. The Contractor shall provide four (4) complete sets of Operations and Maintenance Manuals covering all equipment furnished for the project.
- B. Contents of Operations and Maintenance Manuals
 - 1. Manufacturer's technical literature; descriptive bulletins; installation, operation and maintenance instructions; and parts list.
 - 2. As-Constructed shop drawings.
 - 3. Certified factory test results.
- C. Format
 - 1. All Operations and Maintenance Manuals shall be bound in a three ring binder of suitable size (maximum 2") for the material to be inserted.
 - 2. Binders shall be white in color with clear jacket for the insertion of printed cover and edge identification sheets.
 - 3. All information bound shall be 8½" x 11" or accordion folded to this size.
 - 4. Page dividers with plastic reinforced holes and tabs shall be used to organize Operations and Maintenance Manuals.
 - 5. Binder cover and edge inserts shall contain Owner's name, project title, date and subject matter of the manual.
- D. Organization
 - 1. Table of Contents shall list all information contained.
 - 2. Contact information for all major equipment suppliers, Contractor, and subcontractors.
 - 3. Organize manual by equipment item. Contents as specified above.

3.04 FINAL SUBMITTAL

- A. All Record Documents including, job set, final drawings and Operation and Maintenance Manuals shall be submitted to Engineer prior to submitting final payment request.

3.05 CHANGES SUBSEQUENT TO ACCEPTANCE

- A. The Contractor has no responsibility for recording changes in the Work subsequent to Final Completion, except for changes resulting from work performed under Warranty.

END OF DOCUMENT

SECTION 02200 EARTHWORK

PART 1. GENERAL

1.01 SECTION INCLUDES

- A. Remove and store surfacing.
- B. Excavation, Embankment, and Backfill.

1.02 RELATED SECTIONS

- A. DIVISIONS 0 and 1 - PROPOSAL DOCUMENTS, MATERIALS CONTRACT AND GENERAL REQUIREMENTS: These shall apply to all work included in this section.
- B. DIVISION 2 - SITEWORK.
- C. DIVISION 3 - CONCRETE.

1.03 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. See Section 01025 - MEASUREMENT AND PAYMENT

1.04 REFERENCES

- A. Published Specifications, standards, tests, or recommended methods of trade, industry, or governmental organizations apply to work in this section where cited in Section 01090 - REFERENCE STANDARDS and in the listing below:
 - 1. ASTM C136 - Method of Sieve Analysis for Fine and Coarse Aggregates.
 - 2. ASTM D2487 - Classifications of Soils for Engineering Purposes.
 - 3. OSHA – “Occupational Safety and Health Act”, Latest Revision, State and Federal Governments.

1.05 SUBMITTALS

- A. Shop drawings shall be submitted for approval in accordance with Section 01300 - SUBMITTALS and Section 01340 - SHOP DRAWINGS.
- B. Submit test reports certifying that fill materials comply with specifications.

1.06 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies:
 - 1. Work shall comply with rules and regulations of local and state agencies having jurisdiction.
 - 2. State and local code requirements shall control disposal of debris and excess materials.

1.07 JOB CONDITIONS

- A. Existing Conditions:

1. Carefully maintain bench marks, monuments, and survey control references.
2. Verify or determine locations of underground utilities and avoid damage. Should damage occur, notify the Owner and repair at no additional cost to the Contract.
3. Restore grades disturbed by this contract activity or other causes to elevations indicated or noted on drawings or as required to provide proper drainage.
4. In areas of excavations in public dedicated right-of-way or construction easements through private property adjacent to or adjoining existing buildings or structures including manholes, junction boxes, or storm drain catch basins or in paved streets or alleys, Contractor shall provide sheeting, shoring and bracing of the sides of the excavation to prevent undermining, settlement, cave-ins or sliding to protect persons and property from injury or damage. No separate pay item shall be established for this Work
5. Protect all existing pipes, poles, overhead wires, cables, fences and other facilities located in public dedicated right-of-way, construction easements, adjoining private property. In case of damage, Contractor shall immediately notify the City or County Engineer, the Engineer, and the respective utility company to repair or replace the damaged structure so that service can be restored to affected property owners. Repair work costs are the responsibility of the Contractor.
6. The Contractor shall obtain pre-blast surveys of adjoining properties to verify conditions prior to blasting operations.

1.08 ENVIRONMENTAL REQUIREMENTS

- A. When rainy weather conditions necessitate interrupting filling and grading operations, grade and compact the surface to avoid collection of water. Provide adequate temporary drainage to prevent erosion. After interruption, re-establish compaction specified in last layer before resuming work.
- B. Conduct earthwork operations so as to prevent windblown dust and dirt and waterborne silt from interfering with the Owner's and adjacent property owners' normal operations. Assume liability for all claims related to windblown dust, and dirt caused by this Contractor's work.

1.09 ARCHEOLOGICAL REQUIREMENTS

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

1.10 SEQUENCING

- A. Sequence operations so as to maintain safe working conditions and preserve existing work which is to remain.

PART 2. PRODUCTS

2.01 MATERIALS

- A. Contractor-Furnished Borrow Material.
1. Comply with ASTM D2487 Soil Classification groups SP, SM, SC, ML, and CL.
 2. Plasticity Index 20 or less and liquid limit 50 or less.
- B. Contractor-Furnished Topsoil Material -Topsoil shall be the surface layer of soil with no admixture of refuse or any material toxic to plant growth, and it shall be free from subsoil and stumps, roots, brush, stones (2 inches or more in diameter), clay lumps or similar objects. Brush and other vegetation which will not be incorporated with the soil during handling operations shall be cut and removed. Ordinary sods and herbaceous growth such as grass and weeds are not to be removed but shall be thoroughly broken up and intermixed with the soil during handling operations. The topsoil or soil mixture, unless otherwise specified or approved, shall have a pH range of approximately 5.5 Ph to 7.6 Ph, when tested in accordance with the methods of testing of the Association of Official Agricultural Chemists in effect on the date of invitation of bids. The organic content shall be not less than 3% nor more than 20% as determined by the wet-combustion method (chromic acid reduction). There shall be not less than 20% nor more than 80% of the material passing the 200 mesh sieve as determined by the wash test in accordance with ASTM C 117. Natural topsoil may be amended by the Contractor with approved materials and methods to meet the above specifications.
- C. Fill Materials: Fill materials shall be selected earth excavated from the project site (SP, SM, SC, ML, and CL), borrow material, or as directed by the Engineer.
- D. Granular Backfill Material (where specified on drawings or as directed by the Engineer)
1. Crushed Rock:
 - a. Clean mineral aggregate (broken stone, crushed or uncrushed gravel, or combination thereof).
 - b. Absorption of water in saturated surface dry condition shall not exceed 3 percent of oven dry weight of sample.
 - c. Graded (Laboratory sieves, US Series) to following:

<u>Sieve Size</u>	<u>Percentage Passing Sieve</u>
3/4 inch	100
No. 200	8-15
 2. Sand: Clean dry concrete sand of no special grading.
 3. Drainage Rock (Gravel): Clean river wash rock; graded minimum 3/8 inch to maximum 3/4 inch, no fines.
- E. All fine materials shall be free of wood, rubbish, vegetable materials, topsoil, and other unsuitable materials.
- F. Geotextile Fabric: This shall be a woven or nonwoven synthetic, permeable barrier sheet, as manufactured by Mirafi, Inc., 140N unless otherwise indicated, or equal, which is resistant to soil, chemicals, and mildew, stable under freeze-thaw cycles, will not shrink or expand under wet conditions and will not unravel or become clogged during use. The filter cloth shall have a minimum grab tensile strength of 120 pounds in air accordance with ASTM D-1682. Fabric

furnished shall be specifically selected to prevent existing soil from inter-mixing with the granular backfill material but will allow ground water to enter the granular backfill material.

2.02 CLASSIFICATION

- A. Unclassified Excavation. Unclassified excavation shall consist of the excavation and disposal of all material, regardless of its nature, shall be used in fill areas only when approved as suitable by the Engineer and shaped and compacted as specified herein. Excess material shall be disposed of off the job site at Contractor's expense.
- B. Undercut Excavation. This item shall include the excavation of unsuitable subgrade material as determined by the Engineer. It shall be the Contractor's responsibility to perform compaction efforts on the top 24 inches of existing subgrade prior to authorization for undercutting. Material used to replace "undercut" areas shall be obtained from the grading operations or borrow areas or replaced with granular backfill material as directed by the Engineer.
- C. Borrow Excavation. Borrow excavation shall consist of approved material required for the construction of subgrade when insufficient quantity or quality of onsite excavation is available or when unsuitable material is encountered and undercutting is authorized. Borrow materials shall be obtained from Contractor-furnished Borrow area located off the job site.
- D. Rock Excavation. This item shall be the excavation of rock to a depth as determined by the Engineer. Rock excavation quantities and limits shall be authorized by the Engineer prior to excavation.

PART 3. EXECUTION

3.01 INSPECTION

- A. The Contractor shall inspect the site and inform himself of actual grades, levels, and other conditions under which work is to be performed.

3.02 EXCAVATION

- A. General Requirements:
 - 1. Excavation shall consist of removal of material for preparing the structures and foundations to the lines and grades indicated removal of objectionable material, and removal to obtain fill materials for embankments.
 - 2. Excavate to the dimensions and elevations indicated or noted.
 - 3. Excavated material which, in the opinion of the Engineer, is suitable for incorporation in the site and road embankments or other backfills shall be placed directly therein or stockpiled for future use.
 - 4. Materials which are unsuitable as foundation, or site and road embankment or other backfill material, in the opinion of the Engineer, will be ordered wasted and shall be disposed of in approved areas.
 - 5. Shore, brace, sheet, and slope excavations as required to prevent caving, erosion, danger to persons and structures, or interference with construction operations and as required to comply with safety laws.
 - 6. Keep excavations free of water at all times. Grade excavated areas to prevent ponding of water.

- B. Provisions for Formwork Construction:
 - 1. Extend excavations sufficient distance from walls and footings to permit replacing and removal of forms, installation of services, and inspection.
 - 2. Trim excavation walls and bottoms to reasonable smooth lines and grades.
- C. Earth Forms: Requirements for earth forms for foundations are stated in CONCRETE FORMWORK Section.
- D. Over-Depth Excavations: Care shall be exercised not to excavate below the grades shown on the drawings, or as directed by the Engineer. Any such excessive excavation shall be backfilled to grade with suitable earth thoroughly compacted, and by and at the expense of the Contractor.
- E. Removal of Below-Grade Construction or Obstructions: Remove all existing construction or obstructions wherever they occur below new grade within immediate area of new construction, new paving, or new planting areas.
- F. Undercutting: Hardpan, loose rock, or other material unsatisfactory for subgrades, roads, shoulders, or any areas intended for turving shall be excavated to a minimum depth of 12 inches (300 mm), or to the depth specified by the Engineer, below the subgrade. Muck, peat, matted roots, or other yielding material, unsatisfactory for subgrade foundation, shall be removed to the depth specified. Unsuitable materials shall be disposed of at locations off site. This excavated material shall be paid for at the contract unit price per cubic yard for undercut. The excavated area shall be refilled with suitable material, obtained from the grading operations or borrow areas or replaced with granular backfill as directed and thoroughly compacted by rolling.
- G. Rock Excavating: Rock, shale, boulders, or other rock type material unsatisfactory for subgrades, roads, shoulders, or any areas intended for turving shall be excavated to a minimum depth of 12 inches (300 mm), or to the depth specified by the Engineer, below the subgrade. Unsuitable materials shall be disposed of at locations off site. This excavated material shall be paid for at the contract unit price per cubic yard for rock excavation. The excavated area shall be refilled with suitable material, obtained from the grading operations or borrow areas or replaced with granular backfill as directed and thoroughly compacted by rolling.

3.03 EMBANKMENT AND BACKFILLING

- A. General Requirements:
 - 1. Do not place fill or backfill until forms, rubbish and other deleterious materials have been removed, waterproofing measures completed, and areas have been approved by the Engineer.
 - 2. Spread fill material in layers not to exceed 6 inch depth before compaction unless compaction of thicker layers is approved by the Engineer. Sprinkle material without sufficient moisture to compact properly; permit material with excess moisture to dry to proper water content. Thoroughly mix soil and water by blading and disking before compacting.
 - 3. Adequately brace and shore footings, walls, etc. against which backfill is to be placed to prevent displacement or damage during placement.
 - 4. Import approved fill if site excavations do not produce sufficient quantity or approved quality.
 - 5. There shall be NO separate payment for suitable materials removed, manipulated, and

replaced in order to obtain the required depth of density and all costs shall be considered a subsidiary obligation of excavation. No extra payment will be made for reworking material to obtain specified density even in the event that areas which have been initially accepted for compaction require reworking due to rainfall, drying out or other reasons.

6. No material shall be classified as unsuitable for embankment or backfill solely because of excess moisture. Contractor shall dry such material by scarifying and disking until the proper moisture content is obtained.
7. Compact layer to the specified density. Layers shall be started full out to the slope stakes and shall be carried substantially horizontal with sufficient crown or slope to provide satisfactory drainage during construction.
8. When, in the opinion of the Engineer, the surface of any compacted layer is too smooth to bond properly with the succeeding layer, it shall be scarified and recompacted before the succeeding layer is placed thereon.
9. No embankment or backfill shall be placed on frozen ground.
10. In general, the embankment section shall be homogeneous.
11. No frozen earth, snow, ice, or other frozen materials shall be placed in the embankment or backfill.
12. All partially completed embankment and backfill shall be kept thoroughly drained and dry.

B. Minimum Compaction Requirements:

1. Compact non-granular fill materials to the density specified below as determined by ASTM D698 (Standard Proctor).
 - a. Fill under foundations and concrete floors on grade: 98 percent of optimum.
 - b. Fill under paving: 95 percent of optimum.
 - c. General Site Fill: 90 percent of optimum.
 - d. Other backfill: 90 percent of optimum.
2. Compact granular fill materials for which impact compaction will produce a well-defined moisture-density relationship curve to the density specified below as determined by ASTM D698 (Standard Proctor).
 - a. Fill under foundation and concrete floors on grade: 100 percent of optimum.
 - b. Fill under paving: 97 percent of optimum.
 - c. General site fill: 90 percent of optimum.
 - d. Other backfill: 90 percent of optimum.
3. Compact granular fill materials of a free-draining type for which impact compaction will not produce a well-defined moisture-density relationship curve to the density specified below as determined by ASTM D 4253 and D4254.
 - a. Fill under foundations and concrete floors on grade: 80 percent of relative density.
 - b. Fill under paving: 80 percent of relative density.
 - c. General site fill: 70 percent of relative density.
 - d. Other backfill: 70 percent of relative density.
4. Do not compact soil in planting areas.
5. If proper compaction techniques or adequate moisture control are not maintained by the Contractor, compactive efforts shall be repeated until satisfactory results are obtained.

C. Compacting:

1. Compact by power tamping, rolling, or combinations thereof as required to meet the compaction specified and as approved by the Architect/Engineer. Where impractical to use rollers in close proximity to structures, pipes, etc., compact by mechanical tamping. Scarify and recompact any layer not attaining compaction until required density is obtained.

3.04 BORROW MATERIALS

- A. Borrow Excavation: At Contractor's expense obtain suitable borrow materials from approved sources off of the project site. Before excavating in borrow areas, strip the area as specified hereinbefore. Borrow materials shall be free of wood, rubbish, vegetable matter, topsoil, and other unsuitable and/or non-compactible materials. All borrow pits shall be opened up to expose the vertical face of various strata of acceptable material to enable obtaining a uniform product. Borrow pits shall be excavated to regular lines and they shall be drained and left in a neat, presentable condition with all slopes dressed uniformly.

3.05 MISCELLANEOUS EARTHWORK

A. Spreading Topsoil and Finish Grading:

1. After completion of rough grading and after substantial completion of other construction operations, spread the stockpiled topsoil to a 4 inch uniform depth over all filled areas and all cut areas, except areas which are covered by buildings, structures, or paving.
2. Before placing the topsoil, remove all construction debris, wood, concrete, and masonry materials, and other unsuitable materials, and scarify the underlying surfaces to at least 2 inch depth. Then spread the topsoil and perform all finish grading to the indicated lines and elevations, to provide smooth and uniform final surfaces.

B. Unsuitable Subgrade:

1. Where the required subgrade elevations are uncompactable or otherwise unstable and will not provide satisfactory support for the structure at the indicated soil bearing values, extend the excavations to depths as required to reach a subgrade having at least the indicated soil bearing value. Before placing concrete, backfill the excavations up to the indicated subgrade elevations with one of the granular backfill materials specified in Article 2.01 D, compacted as specified hereinbefore or filled with concrete, all as authorized by the Architect/Engineer.

3.06 EROSION CONTROL

- A. Provide temporary silt fences with hay bales between the project site, including borrow areas, and the adjacent drainage system for the purpose of erosion control. Erosion control structures shall conform to applicable local City, County, State and Federal regulations.
- B. The temporary silt fence shall consist of woven wire fence attached to posts with geotextile fabric attached to the upper grade side of the fence. The geotextile fabric shall be anchored into the soil.
- C. Hay bales shall be placed along the upper grade side of the silt fence for the entire length of the fence. Bales shall be either hay or straw containing a minimum of five cubic feet of material. Bales shall be anchored securely to the ground with wooden stakes driven through the bales into the ground.
- D. Maintain the erosion control structure in satisfactory condition until an approved cover of grass is

established to prevent erosion, for the duration of the project, or until removal is approved, whichever occurs first.

3.07 GRADING

- A. Begin grading only after debris and construction materials are removed from area concerned.
- B. Grade areas to conform to contour lines and elevations indicated. Round abrupt changes in slopes. Regrade any areas that have settled to the required levels.
- C. Insure finished grades and surfaces drain to area drain, gutters, etc.
- D. Prevent erosion of freshly graded areas during construction and until permanent drainage and erosion control measures are installed.

3.8 PREPARATION OF EMBANKMENT AREA

- A. Where an embankment is to be constructed to a height of 4 feet (120 m) or less, all sod and vegetable matter shall be removed from the surface upon which the embankment is to be placed, and the cleared surface shall be completely broken up by plowing or scarifying to a minimum depth of 6 inches (150 mm). This area shall then be compacted as indicated in paragraph 3.05,C. When the height of fill is greater than 4 feet (120 m), sod not required to be removed shall be thoroughly disked and recompactd to the density of the surrounding ground before construction of embankment.
- B. Benching. During the construction of embankments where fill materials must be placed on natural and/or man-made slopes steeper than 4:1 (horizontal to vertical), the existing slopes shall be benched at maximum vertical distances of 5 feet with minimum bench widths of 15 feet and maximum back slopes of 2:1 (horizontal to vertical). Where existing slopes approach 2:1 (horizontal to vertical) the back slope shall be near vertical.
- C. No direct payment shall be made for the work performed under this section. The necessary clearing and grubbing and the quantity of excavation removed will be paid for under the other items of work.

3.9 FORMATION OF EMBANKMENTS

- A. Embankments shall be formed in successive horizontal layers of not more than 8 inches (200 mm) in loose depth for the full width of the cross section, unless otherwise approved by the Engineer.
- B. The grading operations shall be conducted, and the various soil strata shall be placed, to produce a soil structure as shown on the typical cross section or as directed. Materials such as brush, hedge, roots, stumps, grass and other organic matter, shall not be incorporated or buried in the embankment.
- C. Operations on earthwork shall be suspended at any time when satisfactory results cannot be obtained because of rain, freezing, or other unsatisfactory conditions of the field. The Contractor shall drag, blade, or slope the embankment to provide proper surface drainage.
- D. The material in the layer shall be within +/-2 percent of optimum moisture content before rolling to obtain the prescribed compaction. In order to achieve a uniform moisture content throughout the layer, wetting or drying of the material and manipulation shall be required when necessary. Should the material be too wet to permit proper compaction or rolling, all work on all of the affected portions of the embankment shall delayed until the material has dried to the required moisture content. Sprinkling of dry material to obtain the proper moisture content shall be done with approved equipment that will sufficiently distribute the water. Sufficient equipment to furnish

the required water shall be available at all times. Samples of all embankment materials for testing, both before and after placement and compaction, will be taken for each 500 square yards. Based on these tests, the Contractor shall make the necessary corrections and adjustments in methods, materials or moisture content in order to achieve the correct embankment density.

- E. The in-place field density shall be determined in accordance with ASTM D1556 or ASTM D2167 or ASTM D2922 and ASTM D3017.
- F. Compaction areas shall be kept separate, and no layer shall be covered by another until the proper density is obtained.
- G. During construction of the embankment, the Contractor shall route his/her equipment at all times, both when loaded and when empty, over the layers as they are placed and shall distribute the travel evenly over the entire width of the embankment. The equipment shall be operated in such a manner that hardpan, cemented gravel, clay, or other chunky soil material will be broken up into small particles and become incorporated with the other material in the layer.
- H. In the construction of embankments, layer placement shall begin in the deepest portion of the fill; as placement progresses, layers shall be constructed approximately parallel to the finished pavement grade line.
- I. When rock and other embankment material are excavated at approximately the same time, the rock shall be removed from the project site and the other material shall be used as fill or removed from the site as applicable. Stones or fragmentary rock larger than 4 inches (100 mm) in their greatest dimensions will not be allowed in the top 6 inches (150 mm) of the subgrade. Rock or boulders shall be removed from the site at Contractor's expense.
- J. When the excavated material consists predominantly of rock fragments of such size that the material cannot be placed in layers of the prescribed thickness without crushing, pulverizing or further breaking down the pieces, such material shall be removed from the job site.
- K. Frozen material shall not be placed in the embankment nor shall embankment be placed upon frozen material.
- L. There will be no separate measurement of payment for compacted embankment, or subgrade and all costs incidental to placing in layers, compacting, diskings, watering, mixing, sloping, and other necessary operations for construction of embankments will be included in the contract price for other items.

3.10 FINISHING AND PROTECTION OF SUBGRADE

- A. After the subgrade has been substantially completed the full width shall be conditioned by removing any soft or other unstable material which will not compact properly. The resulting areas and all other low areas, holes or depressions shall be brought to grade with suitable select material. Scarifying, blading, rolling and other methods shall be performed to provide a thoroughly compacted subgrade shaped to the lines and grades shown on the plans.
- B. Grading of the subgrade shall be performed so that it will drain readily. The Contractor shall take all precautions necessary to protect the subgrade from damage. He/she shall limit hauling over the finished subgrade to that which is essential for construction purposes.
- C. All ruts or rough places that develop in a completed subgrade shall be smoothed and recompacted.
- D. No subbase, or surface course shall be placed on the subgrade until the subgrade has been approved by the Engineer.

3.11 HAUL

- A. All hauling will be considered a necessary and incidental part of the work. Its cost shall be considered by the Contractor and included in the contract unit price for the pay of items of work involved. No payment will be made separately or directly for hauling on any part of the work.

3.12 TOLERANCES

- A. General Excavation
 - 1. Excavations shall not exceed 1/10 foot variation from dimensions and elevations shown or noted.
 - 2. Embankment and backfill shall be placed within tolerance of plus or minus 1/10 foot.
 - 3. Grading shall be done within plus or minus 1/10 foot typically.
- B. Pavement Bases and Subbases. In those areas upon which a subbase or base course is to be placed, the top of the subgrade shall be of such smoothness that, when tested with a 16-foot (4.8 m) straightedge applied parallel and at right angles to the centerline, it shall not show any deviation in excess of 1/2-inch (12 mm), or shall not be more than 0.05-foot (.015 m) from true grade as established by grade hubs or pins. Any deviation in excess of these amounts shall be corrected by loosening, adding, or removing materials; reshaping; and recompacting by sprinkling and rolling.

3.13 FIELD QUALITY CONTROL

- A. Make required inspections and tests including, but not necessarily limited to:
 - 1. Visually inspect on-site and imported fill and backfill, making such tests and retests as are necessary to determine compliance with the Contract requirements and suitability for the proposed purpose.
 - 2. Make field density tests on samples from in-place material as required.
 - 3. As pertinent, inspect and test the scarifying and recompacting of cleaned subgrade; inspect the progress of excavating, filling, and grading; make density tests at fills and backfills; and verify compliance with provisions of the Contract Documents and governmental agencies having jurisdiction.
- B. Make and distribute necessary reports and certificates.
- C. At Contractor's expense remove, replace, and recompact all embankment and backfill which fails to comply with the specified compaction density requirements.
- D. The Contractor Shall Provide the Following:
 - 1. Notify the Engineer 24 hours prior to any excavation, embankment, or backfill operations.
 - 2. Pay costs for additional inspections and tests due to initial noncompliance with Contract Documents.

END OF SECTION

SECTION 02220 TRENCHING AND BACKFILLING

PART 1. GENERAL

1.01 SECTION INCLUDES

- A. Section includes materials, equipment, excavation, and installation for the following:
 - 1. Trench Excavation
 - 2. Backfill and Compaction

1.02 RELATED SECTIONS

- A. DIVISIONS 0 and 1 - CONTRACT DOCUMENTS AND GENERAL REQUIREMENTS: These shall apply to all work in this section.
- B. Section 16112 - UNDERGROUND DUCTS

1.03 REFERENCES

- A. Published Specifications, standards, tests, or recommended methods of trade, industry, or governmental organizations apply to work in this section where cited in Section 01090 - REFERENCE DOCUMENTS, and as listed below:
 - 1. IEEE Std 525

PART 2. PRODUCTS

2.01 MATERIALS

- A. Granular Backfill Materials
 - 1. Material of predominately natural sand or natural sand containing minor amounts of fine gravel, crushed gravel, or stone. Materials shall contain no topsoil, silty or potentially swelling clay, organic material, trash, lumber and sticks.
 - 2. Material shall not contain sharp or angular stone material, and any other rock, stone or foreign material that might damage buried pipe, cable, or similar materials.
 - 3. Use only where specified by the Contract Drawings as necessary for bedding material of pipe, cable, trench way, or other buried device.
- B. Common Backfill
 - 1. Excavated material developed in the work, containing no topsoil, organic material, trash, lumber or stick, stones, broken concrete or brick of such size as to damage the Work specified or shown on the Contract Drawings and Specifications.

PART 3. EXECUTION

3.01 EXAMINATION

- A. Verify that required trenching has been completed and trenches are clear of obstacles and ready for duct installation.
- B. Verify location of all underground piping, substation grounding grid, or other materials within the area to be trenched.

3.02 INSTALLATION

A. Trench Excavation

- 1. Where well established sod can be removed, it shall be carefully stripped and properly stored away from trenching area so as to prevent damage.
- 2. Trenches for cables, duct, or grounding grid conductors may be excavated manually or with mechanical trenching equipment. Trenching needed close to existing structures or foundations where damage can occur shall be done manually.
- 3. Unless otherwise indicated in the Contract Drawings and Specifications, conduit and duct trenches shall be excavated to a minimum depth of twenty-four (24) inches below finished grade.
- 4. Trenches for installation of grounding grid conductor shall be excavated to depth specified in Section 16395 - SUBSTATION GROUNDING.
- 5. Excavate all cable trenches for single-duct lines to a width of not less than six (6) inches nor more than twelve (12) inches or as shown in the Contract Drawings and Specifications. The trench for 2 or more ducts installed at the same level shall be proportionately wider or as shown in the Contract Drawings. Trenches for installation of grounding grid conductors shall be excavated to the width required for the installation.
- 6. Trench bottoms for ducts without concrete encasement or grounding grid conductors shall be made to conform accurately to grade so as to provide uniform support for the duct along its entire length. The bottom surface of trenches shall be essentially smooth and free from coarse aggregate.
- 7. Trenches shall be opened the complete length before duct or grounding grid conductor is installed so that if any obstructions are encountered, proper provisions can be made to avoid them.
- 8. If perched water is encountered, inform Engineer and Owner immediately. Construct trenches or drain system as directed in field by Engineer.
- 9. For ducts without concrete encasement, a layer of fine earth material as specified in Article 2.01 A of this Document, at least 4 inches thick shall be placed in the bottom of the trench as bedding for the duct. The bedding material shall be tamped and compacted to 100 percent of optimum density and as determined by ASTM D698 (Standard Proctor).
- 10. The bottom of trenches for the installation of grounding grid conductor shall be compacted to 95 percent density as determined by ASTM D698 (Standard Proctor), and 80 percent relative density as determined by ASTM D4253 and D4254 for the granular soils which are of the free-draining type for which impact will not produce a well-defined moisture-density relationship curve.

B. Backfilling

1. After ducts have been properly installed, the trench shall be backfilled in layers not to exceed eight inches in thickness with excavated material as specified in Article 2.01 B of this Section.
2. Compact all materials to 95 percent density as determined by ASTM D698 (Standard Proctor), and 80 percent relative density as determined by ASTM D4253 and D4254 for the granular soils which are of the free-draining type for which impact will not produce a well-defined moisture-density relationship curve.
3. Compact by power tamping, rolling, or combinations thereof as approved by the Engineer. Where impractical to use rollers in close proximity to foundations compact by mechanical tamping. Scarify and recompact any layer not attaining compaction until required density is obtained.
4. Do not allow compaction equipment to come in contact with pipes, conduit, cables, cable trenches, duct banks, or concrete.
5. Backfill shall be completed to the lines and grades shown on the Contract Drawings and Specifications.
6. Trenches shall not be excessively wet and shall not contain pools of water during backfilling operations.
7. The trench shall be completely backfilled and tamped level with the adjacent surface; except that, when sod is to be placed over the trench, the backfilling shall be stopped at a depth equal to the thickness of the sod to be used, with proper allowance for settlement.
8. Any excess excavated material shall be removed and disposed of in accordance with instructions issued by the Engineer.
9. Where sod has been removed, it shall be replaced as soon as possible after the backfilling is completed. All areas disturbed by the trenching, storing of materials, cable laying, and other work shall be restored to its original condition. The restoration shall include any necessary top soiling, fertilizing, liming, seeding, sprigging, or mulching. The Contractor shall be held responsible for maintaining all disturbed surfaces and replacements until final acceptance.

END OF SECTION

SECTION 03100 CONCRETE FORMWORK

PART 1. GENERAL

1.01 SECTION INCLUDES

- A. Formwork for cast-in-place concrete, complete with shoring, bracing and anchorage.

1.02 RELATED SECTIONS

- A. DIVISIONS 0 and 1 - CONTRACT DOCUMENTS AND GENERAL REQUIREMENTS: These shall apply to all work included in this section.
- B. Section 03200 - CONCRETE REINFORCEMENT.
- C. Section 03300 - CAST-IN-PLACE CONCRETE.
- D. Section 03800 - CONCRETE TESTS AND INSPECTIONS

1.03 REFERENCES

- A. Published Specifications, standards, tests, or recommended methods of trade, industry, or governmental organizations apply to work of this section where cited in Section 01090 - REFERENCE STANDARDS and listed by abbreviations noted below:
 - 1. ACI 347 - "Recommended Practice for Concrete Formwork".
 - 2. ACI 301 - "Specifications for Structural Concrete".

1.04 SUBMITTALS

- A. Shop drawings shall be submitted for approval in accordance with Section 01300 - SUBMITTALS and Section 01340 - SHOP DRAWINGS.
- B. Items to be submitted:
 - 1. Manufacturer's literature describing products.
 - 2. Samples: Only as requested.

PART 2. PRODUCTS

2.01 GENERAL

- A. Form Design and Shoring: The design and engineering of the formwork and shoring, as well as its construction and installation, shall be the responsibility of the Contractor. Formwork shall be designed for loads and lateral pressures outlined in ACI 347 and as required by the applicable controlling building codes. Design considerations, allowable stresses and other applicable requirements shall conform to ACI 347 and the controlling local building code.
- B. Allowable Tolerances: Formwork shall produce concrete within the following tolerance limits unless otherwise noted.
 - 1. Tolerances for formed surfaces for buildings shall conform to ACI 301.

2. Tolerances for formed surfaces for all other concrete structures shall conform to those outlined in ACI 347, unless otherwise noted.
- C. Cooperation: Fully cooperate with other trades and other sections for the installation of embedded items. Provide suitable templates, inserts, and sleeves for setting items not placed in the forms.

2.02 MATERIALS

- A. Forms shall be plywood, metal, fiber glass, and/or lumber, as specified below. Form materials furnished shall be new, except that metal and fiberglass forms previously used elsewhere will be permitted, provided that they are free of objectionable holes, dents, distortions, and other defects. After initial use on this project, form materials may be reused thereon provided they will produce acceptable concrete surfaces.
 1. Framing, backing, bracing, shoring, and other formwork shall be No. 2 Common or better lumber.
 2. Smooth surface forms shall be used for all exposed concrete surfaces including, but not limited to, foundations, piers, beams, steps, pads, and slab edges and shall be moisture resistant commercial standard Douglas fir concrete form type plywood, at least five ply, bearing APA grade trade-mark, unless otherwise approved.
 3. Unfinished surface forms may be used for all concealed concrete, and may be No. 2 Common or better lumber, metal or other type of form material.
 4. Earth forms may be used as side forms of footings where soil conditions are suitable and approved by the Engineer.
- B. Form Ties shall be of the snap tie type which can be removed to at least 1-1/2 inches below concrete surfaces leaving an opening no larger than the tie rod diameter, without cones.
 1. Provide ties with integral water stops for all structures which are intended to prevent intrusion of ground or other water.
- C. Form sealer shall be non-staining mineral oil or other approved coating.
 1. Form release agent for surfaces intended to receive an applied coating or finish must be compatible with the applied coating or finish.

PART 3. EXECUTION

3.01 CONSTRUCTION

- A. Construct and erect forms to types, shapes, lines, and grades shown on the drawings with as few joints as practical to insure straight, plumb, level, and smooth concrete surfaces with all angles sharp and true to line and to facilitate safe form removal without damage to concrete. Forms shall have sufficient strength to safely support all construction loads, with no appreciable bulging, sagging, movement, or leakage of mortar, and be clean of all debris at time of concreting.
- B. Camber forms where necessary to maintain specified tolerances.
- C. Provide 3/4 by 3/4 inch chamfer strips in formwork at exposed external corners, including but not limited to those on foundations, piers, pads, beams, slab edges, and equipment bases, but not including those on steps.

- D. Pad, Slab Forms:
 - 1. Establish levels and set screeds.
 - 2. Depress where required or shown or noted.
 - 3. Slope to drain where required or shown or noted.
- E. Earth forms for footings (if approved by the Engineer) shall be cut to sizes and elevations indicated. If dry, all earth or rock surfaces shall be moistened prior to concrete placement.
 - 1. Provide forms for footings wherever concrete cannot be placed against solid earth excavation.
- F. Contact face of forms shall be coated with approved coating; or wood forms may be thoroughly wetted except in freezing weather. Oil coating must be applied and excess wiped off before placing reinforcement.

3.02 OPENINGS IN CONCRETE CONSTRUCTION

- A. Formed Openings: Provide these where required.
- B. Cutting Openings: where openings are required in new in-place or existing concrete construction, cut these only at approved locations, as follows:
 - 1. Small opening for pipes, conduits, etc.: cut these with suitable rotary core type drills, without spalling the concrete; do not use star drills, chisels, or similar impact type tools, unless otherwise approved.

3.03 REMOVAL

- A. Remove forms only with approval, and in a manner that will insure complete safety of the structures. Where the structure as a whole is supported by shores, the forms for beam and girder sides, columns, and similar vertical surfaces may be removed after 24 hours, provided that the concrete has hardened sufficiently to prevent its injury by form removal. Do not in any case remove supporting forms or shoring until the structural members have acquired sufficient strength to safely support their weight and the load which will be placed thereon. Use every precaution to avoid spalling or otherwise damaging concrete by form removal.

END OF SECTION

SECTION 03200 CONCRETE REINFORCEMENT

PART 1. GENERAL

1.01 SECTION INCLUDES

- A. Reinforcing steel bars, welded steel wire fabric for cast-in-place concrete, complete with tie wire, bar supports, splices and other reinforcing devices.

1.02 RELATED SECTIONS

- A. DIVISIONS 0 and 1 - CONTRACT DOCUMENTS AND GENERAL REQUIREMENTS: These shall apply to all work included in this section.
- B. Section 03100 - CONCRETE FORMWORK.
- C. Section 03300 - CAST-IN-PLACE CONCRETE.
- D. Section 03800 - CONCRETE TEST AND INSPECTIONS.

1.03 REFERENCES

- A. Published Specifications, standards, tests, or recommended methods of trade, industry, or governmental organizations apply to work in this section where cited in Section 01090 - REFERENCE STANDARDS and listed below:
 - 1. ACI 315 - "Manual of Standard Practice for Detailing Reinforced Concrete Structures."
 - 2. ACI 318 - "Building Code Requirements for Reinforced Concrete."
 - 3. CRSI - "Manual of Standard Practice."
 - 4. CRSI - "Reinforcing Bar Splices."
 - 5. CRSI - "Placing Reinforcing Bars."

1.04 SUBMITTALS

- A. Shop drawings shall be submitted for approval in accordance with Section 01300 - SUBMITTALS and Section 01340 - SHOP DRAWINGS.
- B. Manufacturer's literature describing products, if requested.
- C. Shop Drawings: Show bending and placing details, size, and location of reinforcing steel.

1.05 STORAGE AND HANDLING

- A. Store reinforcing and accessories in manner to prevent excessive rusting and fouling with grease, dirt, or other bond-weakening coatings.
- B. Take precautions to maintain identification after bundles are broken.

PART 2. PRODUCTS

2.01 REINFORCING STEEL

- A. All reinforcement shall be detailed and fabricated in accordance with ACI 315 and CRSI "Manual of Standard Practice."
- B. Reinforcing bars shall be deformed type conforming to ASTM A615 "Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement," Grade 60 or as indicated on the drawings.
- C. Welded Wire Fabric shall conform to ASTM A185.

2.02 REINFORCING BAR SUPPORTS

- A. Bar supports shall conform to the "Bar Support Specifications" in CRSI "Manual of Standard Practice."
 - 1. All bar supports in contact with formwork for surfaces which will be exposed to view or exposed to weather shall be CRSI Class 1, plastic-protected, or CRSI Class 2, stainless steel protected, as approved.
 - 2. For other areas, unless otherwise indicated: CRSI Class 3, bright basic.
 - 3. On ground: wire bars Class 3 with sand plates.
- B. Tie wire shall be black annealed wire, 16-1/2 gauge minimum.

PART 3. EXECUTION

3.01 PLACEMENT

- A. General:
 - 1. Place reinforcing steel in accordance with the recommended practices in "Placing Reinforcing Bars" by CRSI, as indicated on the drawings and outlined herein.
 - 2. Do not bend or straighten any reinforcing steel in a manner which will weaken or damage the material, nor heat reinforcing steel for bending or straightening.
 - 3. All splices of reinforcement, minimum concrete cover, placing tolerances and bar spacings shall conform to ACI 318 and to recommended practices in "Reinforcement Anchorages, Lap, Splices and Connections" by CRSI.
- B. Supports:
 - 1. Reinforcing steel shall be accurately placed, in the forms adequately supported and secured against displacement within the tolerances outlined in ACI 318.
 - 2. Provide spaces, chains, bolsters, and other metal accessories to support all reinforcing steel and secure in proper position before and during concrete placement.
- C. Splices shall be as indicated on the drawings. Generally splice bottom bars at points of support and top bars at mid-span of pads, slabs, and beams. Avoid splices at points of maximum tensile stress. Stagger horizontal and vertical splices. Splices will not be permitted unless approved by

- the Engineer.
- D. Reinforcing steel shall not be welded.
 - E. Protection Against Rust:
 - 1. Where there is danger of rust staining adjacent surfaces, wrap reinforcement with impervious tape or otherwise prevent rust staining.
 - 2. Remove protective materials and clean reinforcement as required before preceding with concrete placement.
 - F. Prior to concrete placement, verify reinforcement has been properly bent, positioned, and secured in accordance with drawings; and remove ice, oil, grease, dirt, or other bond-weakening coatings.

END OF SECTION

SECTION 03300 CAST-IN-PLACE CONCRETE

PART 1. GENERAL

1.01 SECTION INCLUDES

- A. Cast-in-place concrete complete with water stops, and anchorage items including slots, inserts, anchors, and bolts.

1.02 RELATED SECTIONS

- A. DIVISIONS 0 and 1 - CONTRACT DOCUMENTS AND GENERAL REQUIREMENTS: These shall apply to all work included in this section.
- B. Section 03100 - CONCRETE FORMWORK.
- C. Section 03200 - CONCRETE REINFORCEMENT.
- D. Section 03800 - CONCRETE TESTS AND INSPECTIONS.

1.03 REFERENCE STANDARDS AND CODES

- A. Published Specifications, standards, tests, or recommended methods of trade, industry or governmental organizations apply to work in this section where cited in Section 01090 - REFERENCE STANDARDS and listed below:
 - 1. ASTM - American Society for Testing and Materials.
 - 2. ACI - American Concrete Institute's.
 - 3. FS - Federal Specifications.
- B. Materials and work shall conform to the requirements of standards, codes, and recommended practices required in this section. In conflicts between industry standards, required standards and this specification, or this specification and the local building code, the more stringent requirement shall govern.
 - 1. Applicable Standards and Codes:
 - a. ACI 301 - "Specifications for Structural Concrete for Buildings."
 - b. ACI 318 - "Building Code Requirement for Reinforced Concrete."
 - c. ASTM C94 - "Standard Specification for Ready-Mixed Concrete."

1.04 QUALITY ASSURANCE

- A. Concrete work shall conform to all requirements of ACI 301 "Specifications for Structural Concrete for Buildings, except as modified and supplemented herein.

1.05 SUBMITTALS

- A. Shop drawings shall be submitted for approval in accordance with Section 01300 - SUBMITTALS and Section 01340 - SHOP DRAWINGS.
- B. Manufacturer's literature describing products.
- C. Contractor shall prepare and submit for approval preliminary mix design for each class of concrete specified.
- D. Contractor shall name his source of supply for concrete materials and submit cement and reports of quality tests for approval.

- E. Representative samples only as requested.

1.06 STORAGE OF MATERIALS

- A. Store concrete materials in a manner which will effectively segregate each type of material from each other, prevent contamination of materials, and protect the materials from damage by weather and other causes.

1.07 INSPECTION AND TESTING

- A. See Section 03800 - CONCRETE TESTS AND INSPECTIONS.
- B. The Engineer and testing laboratory shall have free access to all points where concrete materials are stored, proportioned or mixed, and all materials, equipment and methods used shall be subject to their inspection, tests, and approval.
- C. Daily reports of pouring shall be furnished, giving the date, location, and yardage of pour, specifying materials, proportions, consistencies and class of concrete used, the test cylinder number representing pour, and the weather conditions prevailing.

PART 2. PRODUCTS

2.01 MATERIALS

- A. Cement: ASTM C150, Type I or Type II, unless otherwise approved. Use only one brand of cement throughout the project unless otherwise approved by the Architect/Engineer.
- B. Aggregates for normal weight concrete shall conform to ASTM C33:
 - 1. Coarse aggregate: crushed limestone.
 - 2. Fine aggregate: clean sand.
- C. Water: Clean and potable, free from impurities detrimental to concrete.
- D. Admixtures: Use only when conditions of use are approved, or as specified elsewhere in these specifications.
 - 1. Water reducing admixture: Eucon WR-75 by the Euclid Chemical Company, Pozzolith 200N by Master Builders or Plastocrete 160 by Sika Chemical Corporation. The admixture shall conform to ASTM C494, Type A, and not contain more chloride ions than are present in municipal drinking water.
 - 2. Water reducing, retarding admixture: Eucon Retarder-75 by the Euclid Chemical Company, Pozzolith XR by Master Builders or Plastiment by Sika Chemical Corporation. The admixture shall conform to ASTM C494, Type D, and not contain more chloride ions than are present in municipal drinking water.
 - 3. High range water reducing admixture (superplasticizer): Eucon37 by the Euclid Chemical Company or Sikament by Sika Chemical Corporation. The admixture shall conform to ASTM C494, Type F or G, and not contain more chloride ions than are present in municipal drinking water.
 - 4. Non-Corrosive, Non-Chloride Accelerator: "Accelguard 80" by The Euclid Chemical Company or "Darex Set Accelerator" by W.R. Grace. The admixture shall conform to ASTM C494, Type C or E, and not contain more chloride irons than are present in municipal drinking water. The admixture manufacturer must have long term non-corrosive

test data from an independent testing laboratory (of at least a year's duration) using an acceptable accelerated corrosion test method such as that using electrical potential measures.

5. Air Entraining Admixture: Conform to ASTM C260.
 6. Calcium Chloride: Calcium chloride, thicyanates or admixtures containing more than 0.05 percent chloride ions are not permitted.
 7. Certification: Written conformance to above mentioned requirements and the chloride ion content of the admixture will be required from the admixture manufacturer prior to mix design review by the Engineer.
- E. Bonding Compound: Euco Weld by the Euclid Chemical Company or Weldcrete by the Larsen Company. The compound shall be a polyvinyl acetate, rewettable type.
- F. Epoxy Adhesive: Euco Epoxy #452 or #352 by the Euclid Chemical Company or Sikadur Hi-Mod by Sika Chemical Corporation. The compound shall be a two component, 100 percent solids, 100 percent reactive compound suitable for use on dry or damp surfaces.
- G. Non-Slip Aggregate: Aluminum oxide type. Non-slip by the Euclid Chemical Company, Frictex NS by Sonneborn Contect, Fut-Sure by General Abrasive Company, Exolon Anti-Slip by the Exolon Company or approved equal.
- H. Non-Shrink Grout: Factory premixed grout containing metallic aggregates or mineral aggregates and requiring only addition of water at the site. "Firmix" (metallic) or "Euco NS" (non-metallic) by The Euclid Chemical Company, "Embeco 153" (metallic) or "masterflow 713" (non-metallic) by Master Builders. The grout shall conform to CRD-621, "Corps of Engineers Specifications for Non-Shrink Grout".
- I. Curing Materials:
1. Waterproof Paper: ASTM C171, Type 1, regular. Same as Fortifiber Corporation's Orange Label Sisalkraft, or approved equal.
 2. Sheet Plastic: Polyethylene, 4 mils thick, fungus resistant.
 3. Curing compounds conforming to ASTM 309, of types and for use only as approved.
 - a. Curing compounds shall not be used on any surface against which additional concrete or other cementitious materials are to be bonded.
- J. Curing and Sealing Compound: Super Rez Seal or Super Pliocure by the Euclid Chemical Company or Masterseal 66 by Master Builders. The Compound shall conform to Federal Specification TT-C-800A, 30 percent solids content minimum, and have test data from an independent laboratory indicating a maximum moisture loss of 0.030 grams per square cm. when applied at a coverage rate of 300 square feet per gallon. Manufacturer's certification required.
- K. Dissipating Resin Curing Compound: The compound shall be a dissipating resin type compound, conforming to ASTM C309, Type I, "Kurez DR" by The Euclid Chemical Company or approved equal. The film must chemically break down in a two to four week period after application.
1. Curing compounds shall not be used on any surface against which additional concrete or other cementitious materials are to be bonded.
- L. Expansion Joint Fillers:
1. ASTM D1751 - "Specification for Preformed Expansion Joint Fillers for Concrete Paving

- and Structural Construction (Nonextruding and Resilient Bituminous Types)."
2. ASTM D1752 - "Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction."
 3. Verify compatibility of joint filler with sealant specified.
- M. Waterstops:
1. Waterstop RX-102 for concrete thickness applications of 5 inches to 8 inches and Waterstop RX-101 for concrete thickness applications of greater than 8 inches, or as shown on the Contract Drawings. CETSEAL-Adhesive shall be used to secure Waterstop-RX to concrete, metal or PVC surfaces.
 2. PVC ribbed type, as manufactured by Vinylex Corporation, Knoxville, TN, "Vinylex", W. R. Grace and Company "Servicised/Durajoint," or equal, at least six inches wide by 3/16 inch thick, or as approved.
 3. Labyrinth type, plasticized polyvinyl as manufactured by Water Seals, Inc., Chicago, IL, or approved equal, size as indicated.
- N. Anchorage Items: Cast-in-place slots, bolts, and inserts for anchoring masonry finish and mechanical items to concrete shall be of the types indicated and/or required to accommodate the subsequently installed fastening devices.
- O. Vapor Barrier: 6 mil (0.5 mm thick) clear polyethylene film, type recommended for below grade application.

2.02 CONCRETE QUALITIES REQUIRED

- A. Strength: Specified compressive strength at 28 days shall be a minimum of 4,000 psi at locations indicated on the drawings.
1. Average strength shall exceed specified compressive strength as required in accordance with ACI 318.
- B. Water-Cement Ratio: All concrete subjected to freezing and thawing shall have a maximum water-cement ratio of 0.40 by weight. All concrete required to be watertight shall have a maximum water-cement ratio of 0.45.
- C. Minimum Cement Content:
1. 5-1/2 sacks per cubic yard for coarse aggregate size No.467 (1-1/2 maximum).
 2. Six sacks per cubic yard for coarse aggregate size No. 57 (one inch maximum) or No. 67 (3/4 inch maximum).
- D. Air Content: All concrete subjected to freezing and thawing after curing and/or required to be watertight shall be air entrained. Total air content as determined in accordance with ASTM C173 shall be:
1. 5 ("1) percent for coarse aggregate size No. 467 (1-1/2 inch maximum).
 2. 6 ("1) percent for coarse aggregate size No. 57 (one inch maximum) or No. 67 (3/4 inch maximum).
 3. All interior slabs to receive a surface hardener or subject to abrasion shall have a maximum total air content of three percent.

- E. Slump: As determined by ASTM C143 for concrete to be vibrated:
 - 1. Footings: three inches maximum, one inch minimum.
 - 2. Pads, slabs, and beams: four inches maximum, two inches minimum.

PART 3. EXECUTION

3.01 PRODUCTION OF CONCRETE

- A. Concrete shall be ready-mixed, batched, mixed, and transported in accordance with ASTM C94, "Standard Specification for Ready-Mixed Concrete."
 - 1. Plant equipment and facilities shall conform to the "Checklist for Certification of Ready-Mixed Concrete Production Facilities: of the National Ready-Mixed Concrete Association.

3.02 PREPARATION

- A. Approval: Prior to placing concrete, give the Engineer sufficient advance notice of each proposed placing. Do not place any concrete on any subgrade or in any formwork until the subgrade, formwork, reinforcing steel, anchor bolts, and other embedded items for the placement involved have been inspected and approved by the Engineer.
- B. Bonding and Grouting: Before depositing new concrete on or against concrete which has set, treat existing concrete surfaces which will receive additional concrete, as follows: thoroughly roughen existing concrete surfaces and remove laitance, foreign matter, and loose particles; retighten forms at junction of existing and new concrete; dampen (but do not saturate) existing concrete surfaces; and slush existing concrete surface with cement-sand grout of proportions similar to those of the concrete. Grout coat shall be as thick as practicable on vertical surfaces, and at least 2 inch thick on horizontal surfaces. Place new concrete before grout has attained its initial set.
- C. Install construction joints at locations indicated on drawings. Except where indicated, no construction joints will be permitted without prior specific approval. Vertical construction joints in wall footings shall be reduced to a minimum. Construction joints in slabs and walls, where permitted, shall be located and made so that the strength and usefulness of the structure will not be impaired.
 - 1. Unless otherwise indicated, the unit of operation shall not exceed the following in any horizontal direction: suspended slabs, 50 feet; slabs on grade intended to retain water or other liquid, 50 feet; other slabs on grade, 20 feet; walls intended to retain water or other liquid, 20 feet; other walls, 40 feet.
- D. Expansion joints shall be provided at locations indicated on drawings. Joint filler shall be as specified. Do not permit reinforcement or other embedded metal items bonded to concrete (except dowels bonded on only one side of joint) to extend through any expansion joint.
- E. Contraction joints shall be provided at locations indicated on the drawings and as directed by the Architect/Engineer.
 - 1. Contraction joints may be formed, tooled or sawed approximately equal to 1/3 the thickness of slab.
- F. Install waterstops as indicated and/or as required to provide watertight structures. Arrange all waterstops to provide continuous seals in all joints between the separate concrete placements in

each such structure. Carefully fit all waterstops to form turns, tees, crosses, and other arrangements as required to provide a complete, continuous water seal in all joints subject to leakage. Heat weld all joints in waterstops, and install as recommended by manufacturer.

1. Waterstop shall be securely held in position so that it will not be displaced during concreting. Exercise care to avoid contamination of waterstop surface by form coatings or other substances which would adversely affect bonding.
 2. Waterstop-RX shall be installed with WB-Adhesive per manufacturer's instructions. Apply adhesive and allow to dry to "black" in color. Remove release paper and firmly press the entire length of Waterstop-RX onto the adhesive. Install waterstop within 2 hours of applying adhesive. Tightly butt joint ends together – do not overlap. Do not apply in standing water and do not pre-hydrate.
- G. Placing Embedded Items: Waterstops and other embedded items shall be positioned accurately and securely against displacement. Voids in sleeves, inserts, and anchor slots shall be filled temporarily with readily removable material to prevent entry of concrete into voids.
- H. Anchor bolts shall be set with templates according to Engineer approved shop drawings.
- I. Slabs on grade shall be placed on properly leveled and thoroughly compacted sub-grades or granular fill, as indicated. All sub-soils for slabs shall be approved before placing concrete.
- J. Concrete Foundations for Equipment: Provide concrete pads required under all equipment. Set anchor bolts in concrete as required. Pads shall be steel trowel finished on all top exposed surfaces.

3.03 PLACEMENT

- A. Conveying: Convey concrete from mixer to forms as rapidly as practicable without segregation or loss of ingredients, continuously and at such a rate that no unfinished area will be left exposed or unworked before the concrete takes its initial set. Do not deposit concrete that has initially set. Cast concrete within one hour after adding water unless otherwise noted. Retempering of concrete which has partially set will not be permitted.
- B. Take precautions to avoid displacement of reinforcement and formwork.
- C. Chute Placement: When concrete is conveyed by chute, maintain a continuous flow of concrete. Chute shall be of metal or metal-lined wood, with sections set at approximately the same slope, which shall not be less than one vertical to three horizontal, and not more than one vertical to two horizontal. Discharge end of chute shall be provided with a drop chute to prevent segregation. If height of discharge end of chute is more than three times the thickness of the layer being deposited, but not more than four feet above surface of concrete in forms, use a spout with its lower end maintained as near surface of deposit as practicable. When pouring is intermittent, chute shall discharge into a hopper. Clean chutes thoroughly before and after each run. Discharge waste materials and flushing water outside forms. Raised runways for wheeling concrete to place shall be provided when necessary.
- D. Deposit concrete in approximately horizontal layers of 12 to 18 inches as near as possible to its final position. Do not allow concrete to drop vertically more than 3 or 4 feet, nor through a cage of reinforcing steel except when an elephant trunk or tremie is used.
1. Elephant trunks or tremies shall be used in deep piers and footings to prevent free fall of concrete and to allow placement through cage of reinforcement.
- E. Keep forms and reinforcement clean above pour line by removing clinging concrete with wire brush before casting next lift.

- F. Continuously place concrete in units so that each unit will be monolithic in construction. Concrete placement rate shall be such that surface of concrete will not have attained initial set before additional concrete is placed in the construction unit involved.
- G. Compaction: During and immediately after depositing concrete compact each layer by mechanical internal vibrating equipment supplemented by hand spading, rodding, and tamping, as required. Do not use vibrators to transport concrete inside of forms. Form vibrators shall not be used. Internal vibrators shall maintain not less than 5,000 impulses per minute when submerged in the concrete; maintain at least one vibrator as a stand-by. Limit vibrator duration to the time necessary to produce satisfactory consolidation without causing objectionable segregation. Do not insert vibrator into lower courses which have begun to set. Apply vibrators at uniformly spaced points not farther than the visible effectiveness of the machine. Vibrate thoroughly all concrete at all waterstops to insure their complete embedment in solid concrete.
- H. Hot Weather Concreting: Conform to ACI 305R and following requirements when mean daily temperature rises above 85 degrees Fahrenheit.
 - 1. Temperature of concrete as placed shall be lowest temperature practicable but not higher than 85 degrees Fahrenheit, unless approved otherwise by the Engineer.
 - 2. Crushed ice in lieu of water will be approved to maintain concrete below maximum temperature.
 - 3. Addition of water-reducing retarders will be permitted only if the Engineer/Architect approves and mix is redesigned.
 - 4. Concrete shall be discharged within 45 minutes after adding water.
- I. Cold Weather Concreting: Conform to ACI 306R and following requirements when mean daily temperature falls below 40 degrees Fahrenheit.
 - 1. Reinforcement, forms, or ground to receive concrete shall be completely free from frost.
 - 2. Minimum temperature of concrete as placed shall be 50 degrees Fahrenheit.
 - 3. Concrete shall be maintained at temperature no lower than 50 degrees Fahrenheit for minimum seven day period after placement.
 - 4. Use of calcium chloride or calcium chloride containing admixtures will not be permitted.

3.04 REPAIR OF SURFACE DEFECTS

- A. Fin and Protrusion Removal: Immediately after form removal, remove fins and other unnecessary protrusions flush with concrete surfaces.
- B. Filling and Patching: Surface defects including tie holes, shall be repaired immediately after form removal using one of the following appropriate methods.
 - 1. For concrete surfaces to receive rubbed finish: as soon as practicable after form removal, fill and patch tie holes honeycombs, voids, and other unnecessary holes, as follows:
 - a. Remove all loose material.
 - b. Wet concrete for 8 hours before patching.
 - c. Mop surface to receive patch, with slurry of cement and water.
 - d. Fill with "dry" grout of sand and cement in the same proportions as those of the concrete, except with only enough water added to provide a mix that will "ball" in the hand. Force grout into cavities with the greatest practicable pressure.
 - e. Finish surface to match adjacent area.

- f. Cure fill as specified under curing.
2. For concrete surfaces to receive waterproof coating and finish: as soon as practicable after form removal, fill and patch tie holes, honeycombs, voids, and other unnecessary holes with commercially prepared patching material.

3.05 FINISHING OF FORMED SURFACES

- A. Immediately after forms have been removed and concrete surfaces have been repaired as specified under "Repair of Surface Defects" concrete surfaces shall be given one or more of the following finishes in locations indicated or specified hereinafter. When completed the finished exposed concrete surfaces shall be free of defects, with corners, jambs, arrises, and angles straight, plumb, true to line, and level, as applicable.
- B. Rubbed Finish: Immediately after form removal, completely rub and finish the concrete surfaces with abrasive stones, as required to obtain uniform and approved surface texture and color.
- C. Waterproof Coating and Finish: Remove all form release products and membrane curing compounds and apply a waterproof coating. Coating shall be as recommended by the manufacturer for this application, strictly waterproof and shall bond securely to the concrete surfaces.
 1. Waterproof coating shall be Standard Dry Wall Products "Thoroseal" mixed with Acryl 60 bonding agent, or an equal waterproof coating, applied in two coats in strict accordance with the manufacturer's printed instructions to produce a sand textured finish.

3.06 CONCRETE SLAB FINISHES

- A. General: Finish concrete pads and slabs as specified below. Dusting of wearing surfaces with dry materials will not be permitted. In preparation for finishing, strike off true to the required finished elevations and grades. Pads and slabs shall be level with a tolerance of 1/8 inch in 10 feet.
- B. Wood Float Finish: Finish by tamping the concrete with suitable tools to force the coarse aggregate away from the surface, then screeding and floating with straight edges to bring the surface to the required finished elevation. While the concrete is still green but sufficiently hard to bear a man's weight without deep imprint, wood float the surface to a true even plane with no coarse aggregate visible using sufficient pressure on the wood floats to bring moisture to the surface.
- C. Steel Trowel Finish: First wood float finish as specified in the paragraph above. Then hand finish the concrete with a steel trowel to produce a smooth impervious surface free from trowel marks.

3.07 WATER TIGHTNESS OF CONCRETE STRUCTURES

- A. All concrete structures which are intended to prevent entry of water into the structure, shall be strictly watertight.
- B. Promptly repair and permanently leakproof all cracks and other defects through which water or other liquids leak before and during the guarantee period, as approved.

3.08 CURING

- A. General: Take curing measures immediately after casting and extend period according to the Engineer's recommendation based upon prevailing temperature, wind, and relative humidity.
 1. Keep concrete continuously moist for minimum 14 days after casting.

2. Maintain concrete temperature at minimum 50 degrees Fahrenheit for seven days after casting.
 3. Avoid alternate wetting and drying and fluctuations of concrete temperature.
 4. Protect fresh concrete from direct rays of sun, rain, drying winds, soiling, and damage.
 5. Do not permit curing method to affect adversely finishes or treatments applied to finished concrete.
- B. Curing Methods for Pads/Slabs: Cure all concrete surfaces with one or a combination of the following methods. Where a specific curing procedure is not specified, at the Contractor's selection, one or more of the following methods shall be used.
1. Water curing: keep concrete surfaces continuously wet with clean water during the curing period by immersion, maintaining a continuous flow of water over the surface, continuous spraying, continuous sprinkling or a combination of these. For all curing methods, the difference in temperature between the water used for curing and the concrete shall not exceed 20 degrees Fahrenheit.
 2. Wet coverings: cover the concrete surfaces with burlap, cotton mats, sand, earth, or other suitable moisture retaining materials and keep these materials saturated during the curing period. Lap all fabrics at least 8 inches at all joints. On exposed concrete, do not use any type covering which will discolor the concrete surface.
 3. Waterproof coverings: as soon as possible after finishing, thoroughly wet the concrete surfaces and cover the concrete surfaces with waterproof paper or plastic film immediately after wetting. For a period of at least 8 hours after the concrete has taken its initial set, maintain a continuous flow of clean water over the concrete surface under the covering. Lap all joints in the covering at least 8 inches and provide weights and other means and methods to keep the waterproof covering in direct contact with the concrete during the curing period.
 4. Membrane forming curing compounds: an approved liquid membrane forming curing compound may be used after one of the curing methods specified above has been used for at least 24 hours after the concrete has taken its initial set. The membrane forming curing compound shall be applied in strict accordance with the manufacturer's printed instructions. Apply in two coats at right angles to each other at a rate of 200 square feet coverage per gallon per coat unless otherwise recommended by the manufacturer. Apply coats uniformly and free of pinholes, gaps, puddles, and runs.

END OF SECTION

SECTION 03800 CONCRETE TESTS AND INSPECTIONS

PART 1. GENERAL

1.01 SECTION INCLUDES

- A. See Project Conditions for further information.
 - 1. Testing Laboratory Services
 - 2. Concrete Form work.
 - 3. Concrete Reinforcement.
 - 4. Cast-in-Place Concrete.

1.02 RELATED SECTIONS

- A. DIVISION 0 and 1 - CONTRACT DOCUMENTS and GENERAL REQUIREMENTS: These shall apply to all work in this section.
- B. Section 02370 - DRILL CONCRETE PIERS.
- C. Section 03100 - CONCRETE FORM WORK.
- D. Section 03200 - CONCRETE REINFORCEMENT.
- E. Section 03300 - CAST - IN - PLACE CONCRETE

1.03 REFERENCE STANDARDS

- A. Published Specifications, standards, tests, or recommended methods of trade, industry, or governmental organizations apply to work in this section where cited in Section 01090 - REFERENCE STANDARDS and in the listing below.
 - 1. ACI 318 - American Concrete Institute's "Building Code Requirements for Reinforced Concrete".
 - 2. AWS D1.4 - American Welding Society's "Reinforcing Steel Welding Code".
 - 3. ASTM C31 – "Test Methods of Making & Curing Concrete Test Specimens in the Field"
 - 4. ASTM C143 – "Test Methods for Slump of Portland Cement Concrete"
 - 5. ASTM C157 – "Test Method for Length Change of Hardened Hydraulic Cement Mortar and Concrete"

1.04 SUBMITTALS

- A. Shop drawings and manufacturer's literature shall be submitted for approval in accordance with Section 01300 - SUBMITTALS and Section 01340 - SHOP DRAWINGS.
- B. Submittals shall consist of, but not limited to, the following:

1. Certified copies of mix designs for each concrete class specified including compressive strength and drying shrinkage test reports.
 2. Certification that materials meet requirements specified.
 3. Samples only as requested by the Engineer.
 4. Samples of specified materials from stockpiles proposed for use if requested: cement, 100 pounds; aggregates, 50 pounds fine, 100 pounds each coarse grading, 50 pounds lightweight.
 5. Certification from vendor that samples originate from and are representative of each lot proposed for use.
- C. The Testing Agency shall submit reports on tests and inspections performed to the Engineer/Architect, Contractor and the material suppliers.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Supply labor, transport, and on-site storage facilities required by the Testing Agency and for this section for taking and preparing samples for testing.

1.06 PROJECT CONDITIONS

- D. Provide the Testing Agency with free access to places whether on or off the job site where materials are stored, proportioned, mixed, or fabricated, to places where equipment is stored or serviced, and to job site during times of preparation, installation, erection, placement, curing, and patching.
- E. Sequencing, Scheduling: Notify the Engineer/Architect and Testing Agency in sufficient time prior to fabrication, field welding, mixing, or placement to permit testing and inspecting without delaying work.

PART 2. PRODUCTS

2.01 CAST-IN-PLACE CONCRETE

- A. The Testing Agency and This Section Under This Contract Shall:
1. Review mix designs, certificates of compliance, and samples of materials the Contractor proposes to use.
 2. Test and inspect materials, as necessary, in accordance with ACI 318, for compliance with requirements specified in Section 03300 - CAST-IN-PLACE CONCRETE and Section 02370 - DRILLED CONCRETE PIERS.
 3. Take samples as required from the designated sources.
 4. Inspect plant prior to any work to verify following:
 - a. Plant is equipped with approved metering devices for determining moisture content of fine aggregate.
 - b. Other plant quality controls are adequate.

PART 3. EXECUTION

3.01 CAST-IN-PLACE CONCRETE

- A. The Testing Agency and This Section Under This Contract Shall:
1. Inspect concrete placement.
 2. Test concrete to control slumps according to ASTM C143.
 3. Test concrete for required compressive strength as follows:
 - a. Make and cure four specimen cylinders according to ASTM C31 for each 25 cubic yards, or fraction thereof, of each class **poured at site each day**.
 - b. Retain one cylinder for seven day test and three for 28 day test.
 - c. Number each cylinder 1A, 1B, 1C, 1D, 2A, 2B, 2C, 2D, etc; date each set; and keep accurate record of pour each set represents.
 - d. Transport specimen cylinders from job to laboratory after field curing a minimum of two days.
 - e. Base strength value on average of three cylinders taken for 28 day test.
 - f. One (1) additional test cylinder shall be taken during cold weather concreting and cured on the job site under the same conditions as the concrete represented.
 - g. One (1) slump test shall be taken for each set of test cylinders.
 - h. Record time, date and foundations represented by each cylinder.
- B. This Section shall submit ticket for each batch of concrete delivered to job site. Ticket shall bear following information:
1. Design mix number for the Testing Laboratory.
 2. Signature or initials of ready mix representative.
 3. Time of batching.
 4. Weight of cement, aggregates, water, and admixtures in each batch with maximum aggregate size.
 5. Total volume of concrete in each batch.
 6. Indication that all ingredients are as previously certified or approved for use as required.
 7. Notation to indicate equipment was checked for contaminants prior to batching.
 8. Time and location of final placing.

END OF SECTION

**SECTION 16112
UNDERGROUND DUCTS**

PART 1. GENERAL

1.01 SECTION INCLUDES

- A. Section includes materials, equipment, fabrication, and installation for the following:
 - 1. Underground Conduit & Duct Systems.

1.02 RELATED SECTIONS

- A. DIVISIONS 0 AND 1 – CONTRACT DOCUMENTS AND GENERAL REQUIREMENTS:
These shall apply to all work in this section.
- B. Section 02200 – EARTHWORK
- C. Section 02220 – TRENCHING AND BACKFILLING
- D. Section 03300 – CAST-IN-PLACE CONCRETE
- E. Section 03800 – CONCRETE TESTS AND INSPECTIONS

1.03 REFERENCE STANDARDS

- A. Published Specifications, standards, tests, or recommended methods of trade, industry, or governmental organizations apply to work in this section where cited in Section 01090 – REFERENCE STANDARDS and listed below:
 - 1. IEEE Std. 525

1.04 DEFINITIONS

- A. National Electric Safety Code (2002), Section 32: “NOTE 1: While it is often the practice to use **duct** and **conduit** interchangeably, **duct**, as used herein, is a single enclosed raceway for conductors or cable; **conduit** is a structure containing one or more ducts; and conduit system is the combination of conduit, conduits, manholes, handholes, and/or vaults joined to form an integrated whole.”

1.05 SUBMITTALS

- A. Shop drawings and manufacturer’s literature shall be submitted for approval in accordance with Section 01300 – SUBMITTALS and Section 01340 – SHOP DRAWINGS.
- B. Submittals shall consist of, but not limited to the following:
 - 1. Manufacturer Catalog Data Sheets.
 - 2. Contractor shall prepare and submit for approval preliminary mix design for each class of concrete specified and used under this section.

3. Contractor shall prepare and submit for approval duct/conduit system backfill mix design used under this section
 4. Contractor shall name his source of supply for concrete materials and submit cement and reports of quality tests for approval, as required in Section 03300 – CAST-IN-PLACE CONCRETE and Section 03800 – CONCRETE TEST AND INSPECTIONS.
- C. Final Drawings shall be provided prior to shipment in accordance with Section 01720 – PROJECT RECORD DOCUMENTS.
- D. As-Built Record Drawings: As-Built Record Drawings include coordinates (same reference coordinate system as incorporated into the Contract Drawings) of point of tangent, end points of ducts, duct banks, and conduit systems, beginning and end points deviations from a straight line, several mid points of long sweep turns, and top of duct or duct bank elevations. Measurements within the substation fence may be referenced to the center of a minimum of two foundations or survey coordinate system referenced to the permanent construction benchmark. Ducts and duct banks located outside of the substation shall be referenced to appropriate state plane coordinate system and permanent construction benchmark within the substation.

PART 2. PRODUCTS

2.01 MATERIALS

A. Ducts:

1. General:

- a Conduits shall be complete with all couplings, adaptors, bends, and supports as required or shown on the Contract Drawings. All couplings and fittings shall be the products of the conduit manufacturer and shall be secured to the conduit with an adhesive in strict accordance with the manufacturer's recommendations.
- b Conduit shall be straight and true and shall be furnished in lengths of 20 feet. A cross section taken at any point perpendicular to duct shall not vary more than 1/8 inch from a true circle.

2. Control and Low Voltage (600 volts and below) Ducts:

- a Ducts for direct burial Control and Low Voltage underground duct bank/conduit systems shall be electrical grade PVC Schedule 40. The conduit size shall be as indicated on the Contract Drawings.
- b Ducts for concrete encased Control and Low Voltage underground duct bank/conduit systems shall be electrical grade PVC DB-60. The conduit size shall be as indicated on the Contract Drawings.

B. Encasement Concrete:

1. Concrete with a minimum 28 day strength of 1500 psi shall be used for duct encasement or as shown on the Contract Drawings.

C. Direct Burial Duct/Conduit System Backfill:

1. Control and Low Voltage (600 volts and below) Ducts: Backfill material for control and low voltage ducts and conduit system shall be composed of "Fine Aggregate" material with a maximum size of 3/8 inch with 95% of material passing the No. 4 sieve. Material shall consist of natural sand, fines from stone, gravel, granite, limestone, or as approved by Engineer. Backfill **over** the Duct Bank/Conduit System shall be as specified in Section 02220 – TRENCHING AND BACKFILLING or as indicated in the Contract Drawings.

D. Encasement Concrete:

1. Encasement concrete for conduit duct banks shall be Excavatable Flowable Fill (EFF) with a compressive strength of not more than 100 PSI at 28 days or as shown on the Contract Drawings.

2.02 ACCESSORIES

- A. End bells are required to provide smooth and rounded surfaces at the edge of the duct to prevent injury to the cable during normal movement. End bells shall also be provided where conduits enter manholes or building walls.
- B. Non-metallic duct spacers shall be used for the construction of the duct bank.

PART 3. EXECUTION

3.01 EXAMINATION

- A. Verify that required trenching has been completed and trenches are clear of obstacles and ready for duct installation.

3.02 PREPARATION

- A. All field cuts of PVC ducts shall be made with a saw or other tool designed for the purpose. Cuts shall be smooth and square to conduit axis. The cut end of conduit shall be reamed smooth. Field-cut conduits shall be joined with double-ended couplings designed for the purpose.
- B. Each threaded joint shall be cleaned to remove all of the cutting oil before the application of a thread compound.

3.03 INSTALLATION

- A. General:
 1. As-Built record drawings shall be kept current during the construction work. Drawing data shall include: end points of ducts, duct banks, and conduit systems, beginning and end points deviations from a straight line, several mid points of long sweep turns, and top of duct or duct bank elevations. Measurements within the substation fence may be referenced to the center of a minimum of two foundations

or survey coordinate system referenced to the permanent construction benchmark. Ducts and duct banks located outside of the substation shall be referenced to appropriate state plane coordinate system and permanent construction benchmark within the substation.

2. Conduit system and ducts shall be installed as indicated on Conduit and Cable Plan Drawings and Conduit and Cable Schedule.
3. Conduit shall be installed in not less than 20-foot lengths, except at the ends of runs or at bends. Conduit shall be free of cracks and chipped ends.
4. Duct bank shall be laid in such a manner as to allow any water in duct system to drain to one of the adjacent manholes.
5. Conduit shall be installed with a minimum continuous slope of 3 inches per 100 feet. Conduit shall slope downward from one manhole to the next or in both directions from a high point between the manholes. Pockets or traps where moisture may accumulate shall be avoided.
6. Top of Control and Low Voltage power (600 volt and below) conduit shall be a minimum of eighteen (18) inches below subgrade or twenty-four (24) inches below final grade or as shown on Contract Drawings.
7. All ducts shall be tightly joined and sealed with PVC rated sealer/cement to be approved by the Engineer. Joints shall be staggered approximately 12 inches with spacers approximately 6 feet apart. Any duct section having a defective joint shall not be installed.
8. Duct bank/conduit systems composed of multiple ducts shall be constructed with non-metallic spacers manufactured for the purpose. Contractor shall request specific approval from the Engineer for alternate construction methods.
9. Duct bank/conduit systems to be concrete encased shall be secured to the bottom/sides of the trench to prevent movement or floating during placement of concrete.
10. **Any use of rebar, wire ties, or other metallic materials to construct or secure the duct bank shall not form any metallic loop around one (1) or more ducts of a multiple duct conduit system.**
11. Contractor shall request specific approval from the Engineer of the use of metallic duct fittings, couples, sections, elbows, etc. unless required by the Contract Drawings.
12. Duct bank/conduit system shall be direct buried with the specified backfill or concrete encased as indicated on the Contract Drawings. Backfill within the ducts is specified in this Section 16112. Backfill **over** the Duct Bank/Conduit System shall be as specified in Section 02220 – TRENCHING AND BACKFILLING or as indicated in the Contract Drawings.
13. A minimum of 4 inches of concrete shall be installed below, above, and on both sides of the bank, or as shown on the Contract Drawings.

14. Concrete curbs or other means of protection shall be provided where ducts other than RMC (rigid metal conduits) turn upward out of floor or foundation slabs.
15. All duct encased in concrete shall have their ends plugged or capped before the concrete is poured.
16. Spare ducts, as shown on Contract Drawings, shall be sealed with plugs manufactured by the conduit vendor for this purpose.
17. All ducts installed shall be provided with a nylon pull rope for pulling cables to be installed.
18. Conduits terminating in equipment, enclosures, and control house shall be sealed with appropriated duct seal material to prevent condensation.
19. Horizontal or vertical changes in direction, within duct runs, exceeding a total of 15 degrees shall be accomplished by long sweep bends having a minimum radius of curvature of 60 inches, or as shown on the Contract Drawings.
20. Control and low voltage power conduits/ducts shall use manufactured elbows having a minimum radius of 36 inches, or as shown on the Contract Drawings, for the vertical run at the end of the conduit run. Standard radius bends or elbows of smaller radius or other fittings shall not be used.

3.04 ADJUSTING

- A. When changes in the formation of a bank of conduits within a duct run are necessary, the transition shall be accomplished in as straight alignment as possible, maintaining continuous earth support under the conduits.

3.05 CLEANING

- A. After the installation is complete, a flexible duct rodding device shall be passed through each completed conduit to check for continuity and cleanliness.
- B. Following the duct rodding device, a mandrel not loess than $\frac{1}{4}$ inch smaller than the inside diameter of the conduit preceded by a wire brush tied to the same string shall be pulled through the conduit once in each direction.
- C. If difficulty is encountered in passage of the duct rodding device or mandrel, a series of wire brushes shall be drawn through the conduit, once in each direction, using a trailing line. The wire brushes shall be $\frac{1}{8}$ inch less in diameter than the diameter of the conduit, and if the correct size cannot be passed through on the initial attempt, the operation must be repeated until accomplished as specified.
- D. When the conduit is partially or fully obstructed with mud, dirt, or gravel, the duct shall be flushed clean by use of water from a long flushing nozzle attached to a water hose, which shall be pushed into the conduit and applied until the conduit is clear. After cleaning, the procedure outlined above for rodding and wire brushing shall be followed.
- E. Any damaged conduit shall be replaced with a new conduit.

END OF SECTION

SECTION 16120
LOW VOLTAGE POWER, CONTROL & FIBER OPTIC CABLES

PART 1. GENERAL

1.01 SECTION INCLUDES

- A. Section includes the material and installation for low voltage (600 Volt) power, control and fiber optic cable, terminations, and marking.

1.02 RELATED SECTIONS

- A. DIVISIONS 0 and 1 - CONTRACT DOCUMENTS AND GENERAL REQUIREMENTS: These shall apply to all work in this section.
- B. Section 16112 - UNDERGROUND DUCTS

1.03 REFERENCE STANDARDS

- A. Published Specifications, standards, tests, or recommended methods of trade, industry, or governmental organizations apply to work in this section where cited in Section 01090 - REFERENCE STANDARDS and listed below:
 - 1. ANSI/ICEA S-73-532 – Standard for Control, Thermocouple Extension, and Instrumentation Cables.
 - 2. NFPA 70: National Electric Code (NEC)

1.04 SUBMITTALS

- A. Shop drawings and manufacturer's literature shall be submitted for approval in accordance with Section 01300 - SUBMITTALS and Section 01340 - SHOP DRAWINGS.
- B. Submittals shall consist of, but are not limited to the following:
 - 1. Cable pulling calculations:
 - a. Pulling tension.
 - b. Sidewall pressure.
 - c. Direction of pull.
 - 2. Cable Materials.
 - a. Jacket.
 - b. Insulation.
 - c. Shielding.
 - 3. Cable lubricant.
 - 4. Terminal blocks.
 - 5. Cable tags.

- C. Preliminary cable test data shall be submitted to the Engineer for approval before the cables are connected to substation equipment. **Failure to submit the required cable test data may, at Engineer's direction, require the Contractor to disconnect cables, retest, and reconnect cables at no additional cost to the Owner.**

PART 2. PRODUCTS

2.01 MATERIALS

- A. Low Voltage Power and Control Cable
1. All conductors shall be copper unless otherwise specified on the Contract Drawings.
 2. Number of conductors and conductor size shall be as shown in the Conduit and Cable Schedule.
 3. Low Voltage Power shall be type USE underground service entrance cable or as indicated on the Cable Schedule of the Contract Drawings.
 4. Control cable shall be type TC tray cable or as indicated on the Cable Schedule of the Contract Drawings.
 5. Conductor Insulation shall be Ethylene-Propylene Rubber (EPR) rated for 90°C dry/75°C wet conditions. Cable shall be rated for 600 Volts AC, 250 Volts DC.
 6. Jacketing for single conductor and multiple conductor cables shall be thermoset Chlorinated Polyethylene (CPE).
 7. Circuits using single conductors or multiple conductor cables shall be identified in accordance with ICEA/NEMA Method 1. Color sequence E-1 shall be used for AC power circuits. Color sequence E-2 shall be used for all DC power, control, and instrument transformer secondary circuits. See Table below:

Conductor No.	AC Power Circuits (Method 1, E-1)		DC Power, Control, & Instrument Circuits (Method 1, E-2)	
	Base Color	Tracer	Base Color	Tracer
1	Black	--	Black	--
2	White	--	Red	--
3	Red	--	Blue	--
4	Green	--	Orange	--
5	Orange	--	Yellow	--
6	Blue	--	Brown	--
7	White	Black	Red	Black
8	Red	Black	Blue	Black
9	Green	Black	Orange	Black
10	Orange	Black	Yellow	Black
11	Blue	Black	Brown	Black
12			Black	Red
13			Blue	Red
14			Orange	Red
15			Yellow	Red
16			Brown	Red
17			Black	Blue
18			Red	Blue
19			Orange	Blue
21			Yellow	Blue
22			Black	Orange
23			Red	Orange
24			Blue	Orange

B. Instrumentation Cable

1. Instrumentation cable shall be Okonite type PLTC, 300 Volts AC, multiple pair or multiple triads, AWG No. 18, copper conductor - No substitute.
2. Instrumentation cables used to carry analog signals shall have individually shielded pairs or triads with an overall shield. Instrumentation cables used to carry status signals shall have an overall shield. The number of pairs or triads and conductor size shall be as shown on the Conduit and Cable Schedule.
3. Instrumentation cable identification shall be black and white in pairs or black, red, and white when triads are specified, with the white wire numerically printed for group identification.

C. Lubricant

1. Cable pulling lubricant shall be Polywater J for installation temperatures of 20°F to 120°F or Polywater WJ for installation temperatures of -20°F to 120°F. Contractor shall verify the specified lubricant is compatible with the cable proposed.

2.02 ACCESSORIES

A. Connectors

1. Pressure grip solderless lugs of the **uninsulated** ring-tongue type shall be used for all control, power, instrument transformer secondary, and instrumentation wiring. Spade lugs will not be permitted.
2. Appropriate connectors for the specific wire size and type shall be used.
3. Fiber Optic cable connectors shall be V-Pin connectors suitable for use with SEL 2810 MT/MR transceivers.

B. Terminal Blocks

1. For power circuits, General Electric Type EB25 or Marathon 1500 Series molded base terminal blocks shall be used. Blocks shall be 600 Volts AC, 20 amps, with barriers between terminals and terminal marking strips.
2. For current circuits, 4-point shorting type terminal blocks shall be used.
3. For control circuits and potential transformer circuits, test disconnect link terminal blocks shall be used. States Type NT or Stanwick Electrical Products Type SLS shall be used.

C. Cable Supports

1. Vertical runs of cable in conduit shall be supported with conduit type cable supports at boxes and terminations in equipment. Kellum or as approved woven type basket grips shall be used where required.

PART 3. EXECUTION

3.01 PREPARATION

- A. Review calculations of cables for direction of pull, maximum tensions, and sidewall pressure. A tension measuring device shall be used when calculations indicate allowable cable stresses may be approached.
- B. **The Contractor is cautioned to review the lower maximum pulling tension limits of Fiber Optic Cable as compared to low voltage power and control cables.**
- C. All conductors and cables shall be handled with care. Cables that have been damaged by equipment or inappropriate handling will not be accepted.
- D. Cable manufacturer's recommendations regarding installation temperature limits shall be specifically followed. Cables shall not be installed when temperatures are below the manufacturer's limits.
- E. The inside of conduit and raceways shall be dry and clean before cables are pulled.

- F. Contractor shall not make final connections of the cables to substation equipment until cables have successfully passed all test requirements. **Failure to gain approval of the required cable test data may, at Engineer's direction, require the Contractor to disconnect cables, retest, and reconnect cables at no additional cost to the Owner.**

3.02 INSTALLATION

- A. Install all conductors and cables in conformance with all applicable code, regulations, and standard industry practices.
- B. Cables shall be installed in accordance with manufacturer's installation recommendations relative to maximum pulling tensions and minimum bending radii. Contractor shall use the necessary guides, rollers, pulleys, sheaves and other installation and pulling aids to prevent abrasion, elongation and other damage to cables during installation.
- C. Lubricants shall be used to lower pulling tensions and to minimize cable damage.
- D. Cable shall be installed in underground duct banks, cable tray, direct burial, PVC conduit, or rigid conduit as shown on the contract drawings and as indicated in the Conduit and Cable Schedule.
- E. Split rubber grommet/protection shall be provided on cable tray edges at all points where cables lay on the edges.
- F. Cable and wiring shall be installed continuously between equipment terminal points without intermediate splices or taps.
- G. Cable ends shall be sealed at all times during storage and installation to prevent entrance of moisture. The contractor shall replace or purge the cable of any moisture as directed by the Engineer at no additional cost to the Owner.
- H. Cable shall be properly supported during and after installation.
- I. Cables shall be clamped and tied for proper support at each terminal block or connection such that all strain on the cable will not be transmitted to the terminal connections.
- J. Tie or cable together single conductor cables of each individual circuit in all equipment, at each box, manhole, and handhole.
- K. Cables shall be identified with cable tags at cable terminations and at intermediate points such as manholes and handholes. Cable Tags shall be engraved flexible plastic laminate of 1" minimum diameter attached to the cable with Ty-Wrap ties. Tags shall be yellow with black engraving.
- L. When the control cable is larger than No. 8 AWG and is not color coded (i.e. all black conductors with the conductor number printed on the conductor insulation), the individual conductors of each cable shall be color coded with colored tape to match the color code listed above for the control cable function.
- M. Pulling lines shall be attached to cables with suitable equipment to prevent damage during cable pulling procedures. Pulling eyes attached to the conductor shall be used were appropriate for the cable type.

- N. Where Fiber Optic cables with pre-installed V-Pin Connectors are to be installed, cable pull attachments manufactured for the purpose to protect the connectors, shall be used.
- O. All conduit and ducts shall be sealed after cable installation with suitable duct sealer. Spare conduits and ducts shall be sealed after installation of pull rope.

3.03 TESTING

- A. Testing shall be in accordance with procedures set forth in Section 16970 - SUBSTATION CALIBRATION AND TESTING.
- B. The minimum acceptable insulation resistance is listed in Section 16970 - SUBSTATION CALIBRATION AND TESTING.
- C. Cables/ conductors that do not pass the minimum insulation resistance test shall be replaced as directed by the Engineer at no additional cost to the Owner.

END OF SECTION

SECTION 163200 PACKAGE GENERATOR SYSTEM

PART 1 GENERAL

1.1 SECTION INCLUDES

Generator with all necessary accessories.

1.2 RELATED SECTIONS

DIVISION 03 - CONCRETE.

SECTION – 16120 LOW VOLTAGE POWER, CONTROL & FIBER OPTIC CABLES

1.3 SYSTEM DESCRIPTION

Provide standby power system for supply of power in event of failure to normal supply, consisting of 100 kW Diesel Generators (Fire Stations #3, #4) and 25 kW Diesel Generators (Fire Stations #6, #7) complete with fittings, connections, auxiliaries, control panels, safety devices, and meters necessary for complete operating system.

Provide fully automatic operation so that unit takes load within 10 seconds after receiving a start command signal from the controller. The unit shall provide output power at the prescribed level from the controller. On receipt of a stop command from the controller, shut down generator, returning to starting condition ready for another operating cycle.

Capable of delivering capacity 100 kW (Fire Stations #3, #4) and 25 kW (Fire Stations #6, #7) at sea level and capable of delivering capacity at installed location after consideration of applicable derating factors. Generator supplier shall be responsible for generator and fuel system to provide operational standby power.

1.4 SUBMITTALS

Shop drawings shall be submitted for approval in accordance with Section 01301 – SUBMITTALS and Section 01341 – SHOP DRAWINGS.

Submittals shall consist of, but not limited to, the following:

1. Shop Drawings.
 - a. Bill of Material
 - b. Plan and elevation views with overall and interconnection point dimensions
 - c. Installed weight
 - d. Shipping size
 - e. Enclosure Anchorage Design
 - f. Fuel consumption rate curves at various loads
 - g. Ventilation and combustion air requirements
 - h. Electrical diagrams including schematic and interconnection diagrams
2. Product data showing dimensions, weights, ratings, interconnection points, and internal wiring diagrams for:
 - a. Engine
 - b. Generator
 - c. Control panel
 - d. Battery rack
 - e. Battery charger

- f. Exhaust silencer
- g. Vibration isolators
- h. Remote annunciator
3. Foundation Requirements:
 - a. Loading and moment reactions for operational, wind, and seismic loading.
 - b. Controlling load condition.
 - c. Anchor Bolt specifications (materials) and layout.
4. Schematics.
5. Wiring Connection Diagrams.
6. Current Transformer Data.
7. Nameplate and Engraving Drawing.
8. Bill of Materials.
9. Installation Instructions.
10. Operating Instructions.
11. Final Certified Test Reports.

Submit manufacturer's installation and instructions under provisions of Section 01720, Project Record Documents and this section.

1.5 PROJECT RECORD DOCUMENTS

Submit record documents under provisions of Section 01720.

Accurately record location of engine generator and mechanical and electrical connections.

1.6 OPERATION AND MAINTENANCE DATA

Submit operation and maintenance data under provisions of Section 01720.

Include instructions for normal operation, routine maintenance requirements, service manuals for engine, oil sampling and analysis for engine wear, and emergency maintenance procedures.

1.7 QUALIFICATIONS

Manufacturer: Company specializing in packaged engine generator system with minimum three years documented experience.

Supplier: Authorized or Franchised distributor of engine generator manufacturer with service facilities within 35 miles of project site.

1.8 DELIVERY, STORAGE, AND HANDLING

Deliver products to site under provisions of Division 01.

Store and protect products under provisions of Division 01.

Accept packaged engine generator set and accessories on site in crates and verify damage.

Protect equipment from dirt and moisture by securely wrapping in heavy plastic.

1.9 WARRANTY

Provide five year warranty under provisions of Division 01.

1.10 MAINTENANCE SERVICE

Furnish service and maintenance of packaged engine generator system for one year from Date of Substantial Completion.

1.11 EXTRA MATERIALS

Submit maintenance materials under provisions of Division 01.

Furnish one set of tools required for preventative maintenance of the engine generator system. Package tools in adequately sized metal tool box.

Provide two additional sets of each fuel, oil, and air filter element required for the engine generator system.

PART 2 PRODUCTS

2.1 MANUFACTURERS

The manufacturer specified is intended to indicate the standard of quality of materials in this section; other manufacturers will be acceptable. Submit for acceptance.

2.2 ENGINE GENERATOR

Emergency generator shall be Onan, Caterpillar, Kohler or approved equal.

100 kW Diesel Generators (Fire Stations #3, #4)

25 kW Diesel Generators (Fire Stations #6, #7)

Epa Certified for Stationary Emergency Standby

UL 2200 Listing.

Digital Control Panel

IBC Seismic Factory Certification

Governor

Alternator Space Heater

105C Temp Rise Over 40C Ambient

Alternator

UL 2200 Sound Attenuated Level 2 Outdoor Enclosure with Enclosure Silencer

Dual Wall Based Fuel Tank with Fill Pipe and Lock Cap

Audio and Visual Fuel Alarm

Vent Pipe and Emergency Fuel Pipe

NFPA Bundle

Generator Running and Fault Relay

Wet Battery

Jacket Water Heater

Current Transformer

Collant Reservoir

Low Coolant Level Shutdown

Baffle Kit Shipped Loose

Enclosure Spare GFCI Outlet

UL, 100% Rated Circuit Breaker: 400A LSI (Fire Station #3, #4)

UL, 100% Rated Circuit Breaker: 100A LSI (Fire Station #6, #7)

Local Annunciator

Automatic Transfer Switch: 600 Amp, 3 Pole, Service Entrance Rated, NEMA 3R, with Heater & Thermostat (Fire Stations #3, #4)

Automatic Transfer Switch: 400 Amp, 3 Pole, Service Entrance Rated, NEMA 3R, with Heater & Thermostat (Fire Stations #6, #7)

PART 3 EXECUTION

3.1 INSTALLATION

Emergency Generator and Accessories:

1. Freight on Jobsite
2. Factory Test at 0.8 Power Factor
3. Manufacturing Start-Up Services with Building and Owner Training
4. Turn-Key Installation Including:
 - Concrete Pad for Generator
 - Cutting and Patching Existing Concrete for New Setting of Generator and ATS
 - If Necessary - Crane for Setting Equipment
 - Installation of ATS and all Electrical Connections back to Transformer Alarm Sensor Conduit and Wiring Inside to Inside of Building
 - Necessary Labor and Materials (All Work to be done during normal working hours)

Testing and Adjusting: Make performance tests, by simulating power failure with cold engine at least three times, and operating emergency generator unit at least 15 minutes per start, under as nearly full load as practicable. Make all necessary adjustments for satisfactory operation. Run engine generator for 4 hours after last power failure then transfer to normal powers.

END OF SECTION