PROJECT MANUAL

August 23, 2017

For The

ROBERTSON COUNTY SOLID WASTE/RECYCLING CONVENIENCE CENTER
South Main Street
Cedar Hill, Tennessee

HFR DESIGN
Brentwood, Tennessee
HFR Project No. 2016172.00

Owner
ROBERTSON COUNTY GOVERNMENT
Springfield, Tennessee

HFR DESIGN
214 Centerview Drive Suite 300
Brentwood, Tennessee 37027
Tel (615) 370-8500
Fax (615) 370-8530

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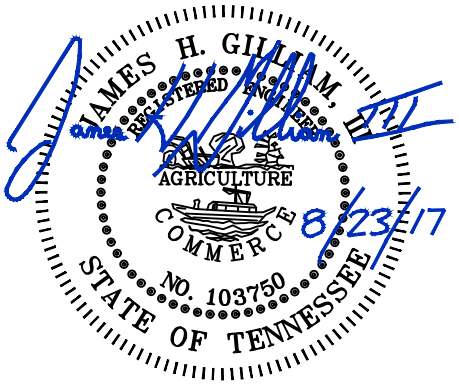
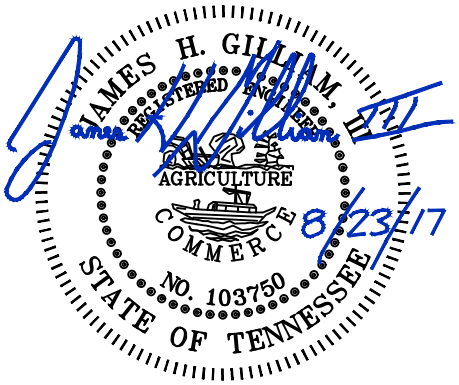


ROBERTSON CO. SOLID WASTE/RECYCLING CONVENIENCE CTR.
Cedar Hill, TN
HFR Project No. 2016172.00
ICT Project No. 170325

Site and Infrastructure Subgroup



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DOCUMENT 001116
INVITATION TO BID

HFR DESIGN, Inc.
214 Centerview Drive, Suite 300
PO Box 1974
Brentwood, TN 37024-1974
Attention: Jim Gilliam; jgilliam@hfrdesign.com

PROJECT:
ROBERTSON COUNTY SOLID WASTE/RECYCLING CONVENIENCE CENTER
South Main Street
Cedar Hill, Tennessee

Issue Date: August 23, 2017

Architect's Project Number: 2016172.00

OWNER:
Robertson County Tennessee
c/o Mr. Jody Stewart, Finance Director
523 South Brown Street
Springfield, Tennessee 37172

General Contractors are invited to submit a hard copy bid to the Owner located at the above address before 2:00 P.M., Thursday, September 14, 2017, for the following project: Approximately 0.6 acres; generally consisting of clearing and stripping, rough grading, finish grading, gravel paving, drainage structures, and associated plumbing and electrical work; chain link fencing, concrete paving.

Bid Documents for a Stipulated Price/Sum contract may be obtained in hard copy or electronic format from the office of the Architect/Engineer. Hard copies of Bid Documents may be obtained upon receipt of a deposit by check made payable to HFR DESIGN, INC. in the amount of $ 150.00 for one set. Electronic copies of Bid Documents may be obtained free of charge upon presentation of a valid email address to Architect/Engineer.

Documents can only be obtained by general contract and mechanical and electrical subcontract Bidders. Others may view the Bid Documents at the office of the Architect/Engineer, and the following construction associations:

Associated General Contractors
Builders Exchange
ConstructConnect (Formerly CMD, Reed Construction Data)
Dodge Data and Analytics
Nashville Contractors Association

Additional sets may be purchased as indicated in Instructions to Bidders. Contact: Trey Arnold, HFR DESIGN, Inc. tarnold@hfrdesign.com

A Five Percent Bid Security is required. Refer to other Bidding requirements described in Document 002113 - Instructions to Bidders. Bidders are required to present evidence of proper licensure per State Contractor's Licensing Law.

Bidders are invited to attend a Pre-Bid Conference to be held at the project site, at 10:00 A.M. on Tuesday, September 5, 2017.

END OF INVITATION TO BID

DOCUMENT 002113
INSTRUCTIONS TO BIDDERS

1.1 DEFINITIONS

A. Bid Documents: Contract Documents supplemented with Invitation to Bid, Instructions to Bidders, Bid Form, Bid Form Attachment, Bid Securities, identified herein.

B. Contract Documents: Defined in AIA A201 Article 1 including issued Addenda.

C. Bid: A complete and properly signed proposal to do the Work for the sums stipulated therein, submitted following Bidding Documents.

D. Base Bid: The sum stated in Bid for which Bidder offers to perform Work described in the Bidding Documents as the base, to which Work may be added or from which Work may be deleted for sums stated in Alternate Bids.

E. Alternate: An amount stated in the Bid to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

F. Unit Price: An amount stated as a price per unit of measurement for materials, equipment or services, or a portion of the Work as described in Bidding Documents. Include Unit Prices in the Base Bid.

G. Prime Bidder: Person or entity, usually a General Contractor, properly licensed in the appropriate classification, who submits a Bid.

H. Sub-bidder: Person or entity, properly licensed in the appropriate classification, usually a subcontractor or material supplier, who submits a bid to a Bidder for materials, equipment or labor for a portion of the Work.

1.2 BIDDER'S REPRESENTATIONS

A. The Bidder by making a Bid represents that:
1. The Bidder has carefully read and understands Bidding Documents and has found them complete and free from ambiguities and sufficient for the purpose intended; further that,
2. The Bid is made following the Bidding Documents; further that,
3. The Bidder has read and understands Bidding Documents to the extent that such documentation relates to the Work for which the Bid is submitted, for other portions of the Project, if any, being bid concurrently or presently under construction; further that,
4. The Bidder has visited the site, become familiar with local conditions under which Work is to be done and has correlated the Bidder's personal observations with requirements of proposed Contract Documents. Contractors will not be given extra payment for conditions which can be decided by examining site and Documents; further that,
5. Neither the Bidder nor any of the Bidder's employees, agents, intended suppliers or subcontractors have relied upon any verbal, telephone or fax representations, allegedly authorized or unauthorized from the Owner, or the Owner's employees or agents including architects, engineers or consultants, in assembling the bid figure; and further that,
6. The bid figure is based solely upon the Bid documents and properly issued written addenda and not upon any other written representation.

1.3 COPIES OF BIDDING DOCUMENTS

A. Prime Contract Bidders may obtain Bidding Documents at the office of the Architect/Engineer for deposit sum identified in Invitation to Bid for hard copies or free of charge in electronic format. Bidding Documents will not be issued directly to Sub-bidders or others unless specifically offered in the Invitation to Bid. Deposit is fully refundable.

B. Extra complete sets of Bidding Documents may be purchased by Bidders and Sub-Bidders, major Subcontractors and material suppliers at cost which is not refundable. The cost per set is $ 150.00.

C. Individual sheets of Drawings and pages of Project Manual may not be purchased.

D. One set of Bid Documents can be obtained by general contract bidders. Mechanical, plumbing and electrical subcontractors may obtain one set of Bidding Documents from issuing office for deposit sum identified in Invitation to Bid or free of charge for electronic format.

E. Request for Bidding Documents will be honored by Architect/Engineer upon receipt of deposit made payable to HFR DESIGN, INC. addressed as follows:
HFR DESIGN, INC.
ARCHITECTS/ENGINEERS/PLANNERS/INTERIORS
214 Centerview Drive, Suite 300
PO Box 1974
Brentwood, TN 37024-1974
Attention: Mr. Trey Arnold (tarnold@hfrdesign.com)

F. Bidders shall use complete sets of Bidding Documents in preparing Bids; neither Owner nor Architect/Engineer assumes responsibility for errors or misinterpretations resulting from use of incomplete sets of Bidding Documents.

G. In making copies of Bidding Documents available on above terms, Owner and Architect/Engineer do so only for purposes of obtaining Bids on the Work and do not confer a license or grant permission for any other use of Bidding Documents.

1.4 INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

A. Carefully study and compare Bidding Documents with each other and with other work being bid concurrently or presently under construction to the extent that it relates to Work for which Bid is submitted. Report at once to Architect/Engineer errors, inconsistencies, or ambiguities discovered.

1.5 QUESTIONS

A. Submit requests for clarification or interpretations of Bidding Documents to Architect/Engineer in writing, via email, or via fax transmission at least 7 calendar days before Bid opening date. Use Section 016364 or other form as approved by Architect/Engineer when requesting information from the Architect/Engineer.

B. Replies will be issued to Bidders by Addenda and will become a part of Contract Documents. Architect/Engineer and Owner will not make oral clarifications. Interpretations, corrections, and changes of Bidding Documents made in any manner other than Addenda will not be binding, and Bidders shall not rely upon them.

1.6 PRE-BID PRODUCT SUBSTITUTIONS

A. Where the Bid Documents stipulate a particular Product and indicate that substitutions will be considered by Architect/Engineer, send written request for approval of alternate products to Architect/Engineer in writing or via fax on Form 016232 or other form as approved by Architect/Engineer no later than 10 days before Bid date. Requests received after that date will not be considered. Verbal and telephone requests will not be considered.

B. Requests shall describe clearly product for which approval is requested and include complete data and samples required for Architect/Engineer's evaluation. Architect/Engineer will be sole judge of products' acceptability. Acceptable products will be identified in addenda.

C. The burden of proof of the merit of the proposed substitution is on the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

1.7 ADDENDA

A. Addenda will be available to all who are known by issuing office to have received Bidding Documents. Addenda will be sent to the email address provided when Bidding Documents were requested. Copies of Addenda will be made available for inspection whenever Bidding Documents are on file for that purpose.

B. No Addenda will be issued later than three calendar days prior to Bid opening date except an Addendum withdrawing request for Bids or one which includes a postponement of date for receipt of Bids which can be issued no later than two calendar days prior to Bid opening date.

C. Each Bidder shall ascertain prior to submitting a Bid that Bidder has received all Addenda issued, whether written, telephone or fax and Bidder shall acknowledge their receipt in Bid.

D. Addenda issued after receipt of Bids will be transmitted only to Bidders from whom Bids have been received and adequate time will be allowed for response thereto.

1.8 SITE EXAMINATION

A. Examine the site before submitting a Bid.

B. The Bidder is required to contact the Owner at the following phone number to arrange a date and time to visit the project site.

C. The currently occupied premises at the project site are open for examination by Bidders only during the following hours:
1. Monday through Friday: 9:00 a.m. to 4:00 p.m.
2. Weekends: Not available.

1.9 PRE-BID CONFERENCE

A. Bidders are invited to attend a Pre-Bid Conference as indicated in the Invitation to Bid.

B. Representatives of the Owner and Architect/Engineer and related personnel will be in attendance.

C. Summarized minutes of this meeting may or may not be circulated to attendees at the discretion of the Architect/Engineer. These minutes will be for information only and will not form a part of this Contract.

D. Information relevant to the Bid Documents will be recorded in an Addendum. Addenda will be the only binding contractual commitment to the Owner.

E. The following Agenda Outline may be used in the meeting:
   1. Open meeting; introduction of project stake holders.
   2. Confirm that Bidders have full Bid Pack and addenda to date.
   3. Verify that Wage Rates do not need to be incorporated in bidding documents.
   4. Review sequence & timetable for questions & addenda, and remind bidders that no changes are binding and no clarifications are reliable unless confirmed in writing by addenda.
   5. Review special bid structures, if applicable, such as Alternates and Unit Prices.
   6. Review special administration, if applicable, such as Scheduling and Commissioning.
   7. Review of Project and Contract Time; emphasizing structured Time Phases, site access restrictions, and Roof Bond and Warranty, if applicable.
   8. Remind bidders that conditional or qualified bids are unacceptable.
   9. Required plan for scheduling, coordinating, and monitoring the Work under the Project Contract.
   10. Confirm bid date and place.
   11. General requirements, bid packages, and bid opening procedures.
   12. Site tour.
   13. Questions and answers.
   14. Close meeting.

1.10 FORM AND STYLE OF BIDS

A. Fill in all blank spaces on Bid Form; failure to do so will be cause for rejection. No segregated Bids or assignments will be considered. No qualifying letters or statements will be considered.

B. Where so indicated by makeup of Bid Form, sums shall be expressed in both words and figures and in case of discrepancy between the two, the amount written in words shall govern.

C. Make Bids on unaltered Bid Forms furnished by Architect/Engineer. Submit one copy of Bid Form. Bids shall be signed by person or persons legally authorized to bind Bidder to contract with name typed or legibly printed below signature.

1.11 SUBMISSION OF HARD COPY BIDS

A. Submit Bid and Bid Security in a sealed opaque envelope. If any of these provisions conflict with appropriate statutes regarding bidders' disclosures in bid documents, then the statutes will take precedence. It is the Bidders' responsibility to comply with all applicable laws, rules and regulations no matter what these bid documents indicate.
   1. Identify envelopes with Project name, Bidder's name and address as licensed. Include information required by applicable state law, such as, but not limited to, the Prime Bidder's license number, expiration date thereof, and license classification. Include further information required by applicable state law, such as, but not limited to, sub-bidders' names, license numbers, expiration dates, and license classifications for electrical, plumbing, heating, ventilating and air conditioning, masonry work, and geo-thermal work applying to the bid. When the Prime Bidder is also doing any electrical, plumbing or HVAC work, masonry, or geo-thermal that information shall appear on the outside of the envelope.

2. For Prime Bids less than $25,000, provide the name of the Prime Bidder. If upon opening the envelope(s), the bid(s) is (are) in excess of $25,000, then the bid(s) shall be disqualified.
3. For sub-bids less than $25,000, provide the sub-bidders' names for the electrical, plumbing, heating, ventilating and air conditioning work as appropriate applying to the bid. If upon opening the envelope(s), sub-bid(s) is (are) in excess of $25,000, then the bid(s) shall be disqualified. If acceptance of alternate or combination of alternates changes subcontractor, so indicate.
4. For sub-bids less than $100,000, provide the sub-bidder's name for the masonry work as appropriate applying to the bid. If upon opening the envelope, sub-bid is in excess of $100,000, then the bid shall be disqualified.
5. For each vertical closed loop geothermal heating and cooling project, include company name, department of environment and conservation license number, classification (G, L or G, L) and the expiration date thereof on outside of bid envelope unless this portion of the work is less than $25,000.
6. Failure to comply with these provisions will void the Bid. Noncompliance with these provisions will result in the bid envelope's not being opened and the bid's not being considered.

B. Enclose sealed Bids sent by mail in a separate mailing envelope. Clearly mark mailing envelopes "SEALED BID ENCLOSED" on the face thereof.

C. To submit Bids, follow Invitation to Bid. It is the Bidder's responsibility to ensure receipt of his (or her) Bid, before time set and at place identified for receipt of Bids.

D. Include a fully executed Document 00450 - Drug Free Affidavit with the Bid.

E. Oral, telephonic, telegraphic, or email Bids are invalid and will not be considered.

1.12 REJECTION OF BIDS

A. Owner reserves right to accept or reject any or all Bids, reject a Bid not accompanied by a required Bid Security or by other data required by Bidding Documents, reject a Bid which is in any way incomplete, illegible, unsigned, improperly signed or sealed, obscure, or reject a Bid which contains arithmetical errors, erasures, alterations, or irregularities of any kind.

B. Evidence of collusion with intent to defraud or other illegal practices by Bidder may result in Bid disqualification by Owner before or after Bid opening.

C. Bids received after scheduled opening time will be returned to Bidder unopened.

1.13 BID SECURITY

A. A Bid Bond or cashiers' or certified check made payable to the Owner in the amount of 5 percent of Bid is required, pledging that Bidder will enter into a Contract with Owner on terms stated in Bid and will, if required, furnish bonds covering faithful performance of the Contract and payment of obligations arising thereafter. Provide hard copy of Bid Bond with the bid.

B. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds if required, the amount of the bid security shall be forfeited to Owner as liquidated damages, not as a penalty.

C. Issuing surety company shall be licensed to do business in state in which Project is located. Make Bid Bond payable to Owner. Attorney-in-fact who executes Bid Bond on behalf of surety shall attach a current hard copy of his (or her) power of attorney to Bid Bond.

D. The Owner will have right to retain bid security of Bidders to whom an award is being considered until either (a) Contract has been executed and bonds, if required, have been furnished, or (b) specified time has elapsed so that Bids may be withdrawn, or (c) all Bids have been rejected.

1.14 MODIFICATION OR WITHDRAWAL OF BID

A. Withdrawal of a submitted Bid before scheduled opening time requires a written request signed by a person legally authorized to bind Bidder to the Contract. Withdrawn Bids may be resubmitted. Withdrawn bids may be resubmitted up to the date and time designated for the receipt of Bids provided that they are then fully in conformance with these Instructions to Bidders.

B. Bid modifications shall be written as add or deduct only and require signature of a person legally authorized to bind Bidder to contract.

C. Bids shall not be withdrawn or modified after scheduled Bid opening time.

D. Bids shall not be withdrawn or canceled for time period stated in Bid Form subsequent to Bid opening without Owner's written permission.

1.15 OPENING OF BIDS

A. Bids will be opened publicly immediately after time for receipt of Bids. An abstract of Bids will be made available to Bidders.

1.16 ACCEPTANCE OF BID (AWARD)

A. Owner intends to award a Contract to lowest responsible Bidder provided Bid has been submitted following requirements of Bidding Documents and does not exceed funds available. Owner shall have right to waive informalities or irregularities in a Bid received and to negotiate contract terms with various Bidders following applicable laws in Owner's best interests.

1.17 PERFORMANCE BOND AND PAYMENT BOND

A. Furnish and pay for bonds covering faithful performance of Contract and payment of obligations arising therein. The cost of such bonds shall be included in the Bid.

1.18 TIME OF DELIVERY AND FORM OF BONDS

A. Deliver required bonds to Owner not later than three days following date of execution of Contract. If Work is commenced prior thereto in response to a letter of intent, Bidder shall, prior to commencement of the Work, submit evidence satisfactory to Owner that such bonds will be furnished and delivered following Bidding Documents.

B. Form of bonds shall be AIA A312, latest edition, Performance Bond and Labor and Material Payment Bond. Amount of bonds shall be 100 percent of the Contract Sum.

C. Bonds shall be dated on or after date of Contract.

D. Surety company shall be licensed to do business in state in which Project is located. Bonds signed by an attorney-in-fact shall have power of attorney attached.

1.19 POST BID SUBMITTALS - ADDITIONAL INFORMATION

A. The lowest Bidder shall submit the following information within 48 hours after closing time for receiving Bid Forms:
   1. A designation of the Work to be done with Bidder's own forces;
   2. The names of all Subcontractors proposed for principal portions of the Work.
   3. A Cost Breakdown to identify the Bid Form/Sum segmented into portions no less than the specification Divisions defined in the Project Manual.
   4. A list of equipment on hand and that which will need to be acquired.

B. The Bidder will be required to establish to the satisfaction of the Architect and the Owner reliability and responsibility of persons or entities proposed to furnish and perform Work described in Bidding Documents.

C. Prior to award of Contract, Architect/Engineer will notify Bidder in writing if either Owner or Architect/Engineer, after due investigation, has a reasonable objection to a person or entity proposed by Bidder.

D. If Owner or Architect/Engineer has reasonable objection to a proposed person or entity, Bidder may, at Bidder's option, (1) withdraw Bid, or (2) submit an acceptable substitute person or entity with an adjustment in Base bid or Alternate Bid to cover difference in cost occasioned by such substitution.

E. The Owner may accept adjusted bid price or disqualify Bidder. In event of either withdrawal or disqualification, bid security will not be forfeited.

F. Persons or entities proposed by Bidder and to whom Owner and Architect/Engineer have made no reasonable objection shall be used on Work for which they were proposed and shall not be changed except with written consent of Owner and Architect/Engineer.

1.20 EXECUTION OF CONTRACT

A. Form of Contract: AIA DOCUMENT A101, STANDARD FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR, where the Basis of Payment is a STIPULATED SUM - 2007 EDITION

END OF INSTRUCTIONS TO BIDDERS

DOCUMENT 004113
BID FORM

Submitted _____, 2017

TO:

Robertson County Tennessee
c/o Mr. Jody Stewart, Finance Director
523 South Brown Street
Springfield, Tennessee 37172

PROJECT:

ROBERTSON COUNTY SOLID WASTE/RECYCLING CONVENIENCE CENTER
South Main Street
Cedar Hill, Tennessee

SUBMITTED BY:

(Full name)

_____

(Full address)

_____

_____

License Number _____ Date of License: _____

Classification: _____ Monetary Limit: _____

Gentlemen:

1. The undersigned, as Bidder, hereby declares that this Bid is made without any expressed or implied connection (financial or otherwise) with any other person or company or parties making a bid on the above-named Project; and that this Bid is, in all respects, fair and in good faith without collusion or fraud.

2. The undersigned as Bidder acknowledges by his (or her) signature that he (or she) has visited and examined the site of the proposed construction and has received and examined the documents titled "Project Manual" for the Construction of the above-mentioned Project, Drawings and other documents and has included their provisions in his (or her) Bid.

3. The Bidder acknowledges that he (or she) has received the following Addenda. The modifications to the Bid Documents noted therein have been considered and all costs thereto are included in the Bid Sum.

   a. Addendum Number _____ Dated _____

   b. Addendum Number _____ Dated _____

   c. Addendum Number _____ Dated _____

4. In submitting this Bid, the Bidder agrees:

   a. To hold open his (or her) Bid for 45 days from the date shown above.

   b. To enter into and execute a Contract, if awarded, on the basis of this Bid and to furnish the required Bonds.

   c. To accomplish the Work per the Contract Documents.

   d. To provide in full and complete accordance with the shown, noted, described and reasonably intended requirements of Drawings and Specifications and the Contract Documents, to furnish all labor, materials, transportation and appliances to complete the work to the full and entire satisfaction of the Owner (with a definite understanding that no money will be allowed for extras except as set forth in the General Conditions, Special Provisions and Contract Documents), for the amounts listed below.

   e. To include all allowances described in Section 012113 in the Bid Sum.

   f. To begin the Work within ten (10) days after written notification of the acceptance of this Bid.

   g. To complete the Work in 75 calendar days from the date of the notice to proceed.

5. The Bidder proposes the following Unit Prices and agrees to their use as part of and included in the Base Bid in the Contract for Construction. The Total Price resulting from the estimated quantities below shall be included in the Base Bid.

ITEM No.	SCHEDULED ITEM Refer to Section 012213 - Measurement and Payment	UNIT OF MEAS.	UNIT PRICE Dollars and Cents	ESTIMATED QUANTITY	TOTAL PRICE Dollars and Cents
1	Over excavation and fill	CY	$___.___	100	$_____.___

6. The Bidder agrees to construct the Work of the Base Bid for this Project for the Lump Sum (Fixed) Price of (show amount in both words and figures). Base Bid includes Allowances and sums from Unit Prices.

   _____

   _____ ($_____) DOLLARS.

7. The Bidder agrees to include work of the following alternative as specified for the costs listed:

   ALTERNATE Number 1: Materials and Installation of Double Bituminous Surface Treatment; Add to the Base Bid the amount of:

   _____

   _____ ($_____) DOLLARS.

8. The Bidder acknowledges by his (or her) signature that he (or she) agrees to requirements contained in the Invitation to Bid and the Instructions to Bidders and, that should he (or she) fail to execute a Contract with the Owner, should the Owner award said Contract to him, that the Owner may rightfully collect the sum of the Bid Security.

9. The required Bid Security is attached to this Bid.

10. Iran Divestment Act: By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief that each bidder is not on the list created pursuant to §12-12-106.

BID FORM SIGNATURE(S)

Name of Firm: _____

Signed By: _____ Title: _____

Note: If a corporation, Bid must be signed by person authorized by the corporation by-laws to bind it to contract.

END OF BID FORM

DOCUMENT 004313
BID SECURITY FORMS

The Bid Security Form for the Project shall be: A.I.A. Document A310, Bid Bond, 1970 Edition, printed by American Institute of Architects, 1735 New York Avenue, N.W., Washington, D.C., 20006.

Application shall be decided by Architect/Engineer without further repetition in the Project Manual.

A copy will be made available upon request.

END OF BID SECURITY FORMS

DOCUMENT 004500
DRUG FREE AFFIDAVIT

(Must be attached to bid form upon submission)

STATE OF TENNESSEE DRUG-FREE WORKPLACE AFFIDAVIT

COUNTY OF_____ 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 and city department and project number
   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 ' 50-9-113, Tennessee Code Annotated.
5. That this affidavit is made on personal knowledge.

Further Affiant saith not.

_____

AFFIANT

SUBSCRIBED AND SWORN TO before me this _____day of _____, 2017.

_____

NOTARY PUBLIC

My commission expires:_____

END OF DRUG FREE AFFIDAVIT

AIA® Document A101™ – 2007

Standard Form of Agreement Between Owner and Contractor *where the basis of payment is a Stipulated Sum*

AGREEMENT made as of the day of in the year
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

and the Contractor:
(Name, legal status, address and other information)

for the following Project:
(Name, location and detailed description)

.

The Architect:
(Name, legal status, address and other information)

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

AIA Document A201™–2007, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

TABLE OF ARTICLES

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be the date of this Agreement unless a different date is stated below or provision is made for the date to be fixed in a notice to proceed issued by the Owner.
(Insert the date of commencement if it differs from the date of this Agreement or, if applicable, state that the date will be fixed in a notice to proceed.)

If, prior to the commencement of the Work, the Owner requires time to file mortgages and other security interests, the Owner's time requirement shall be as follows:

§ 3.2 The Contract Time shall be measured from the date of commencement.

§ 3.3 The Contractor shall achieve Substantial Completion of the entire Work not later than ( ) days from the date of commencement, or as follows:
(Insert number of calendar days. Alternatively, a calendar date may be used when coordinated with the date of commencement. If appropriate, insert requirements for earlier Substantial Completion of certain portions of the Work.)

Portion of Work	Substantial Completion Date

, subject to adjustments of this Contract Time as provided in the Contract Documents.
(Insert provisions, if any, for liquidated damages relating to failure to achieve Substantial Completion on time or for bonus payments for early completion of the Work.)

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be ($), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 The Contract Sum is based upon the following alternates, if any, which are described in the Contract Documents and are hereby accepted by the Owner:
(State the numbers or other identification of accepted alternates. If the bidding or proposal documents permit the Owner to accept other alternates subsequent to the execution of this Agreement, attach a schedule of such other alternates showing the amount for each and the date when that amount expires.)

§ 4.3 Unit prices, if any:
(Identify and state the unit price; state quantity limitations, if any, to which the unit price will be applicable.)

Item	Units and Limitations	Price Per Unit ($0.00)

§ 4.4 Allowances included in the Contract Sum, if any:
(Identify allowance and state exclusions, if any, from the allowance price.)

Item	Price

ARTICLE 5 PAYMENTS

§ 5.1 PROGRESS PAYMENTS

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the day of a month, the Owner shall make payment of the certified amount to the Contractor not later than the day of the month. If an Application for Payment is received by the Architect after the application date fixed above, payment shall be made by the Owner not later than ( ) days after the Architect receives the Application for Payment.
(Federal, state or local laws may require payment within a certain period of time.)

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 Subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

.1 Take that portion of the Contract Sum properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the Contract Sum allocated to that portion of the Work in the schedule of values, less retainage of percent (%). Pending final determination of cost to the Owner of changes in the Work, amounts not in dispute shall be included as provided in Section 7.3.9 of AIA Document A201™–2007, General Conditions of the Contract for Construction;

.2 Add that portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction (or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing), less retainage of percent (%);

.3 Subtract the aggregate of previous payments made by the Owner; and

.4 Subtract amounts, if any, for which the Architect has withheld or nullified a Certificate for Payment as provided in Section 9.5 of AIA Document A201–2007.

§ 5.1.7 The progress payment amount determined in accordance with Section 5.1.6 shall be further modified under the following circumstances:

.1 Add, upon Substantial Completion of the Work, a sum sufficient to increase the total payments to the full amount of the Contract Sum, less such amounts as the Architect shall determine for incomplete Work, retainage applicable to such work and unsettled claims; and
(Section 9.8.5 of AIA Document A201–2007 requires release of applicable retainage upon Substantial Completion of Work with consent of surety, if any.)

.2 Add, if final completion of the Work is thereafter materially delayed through no fault of the Contractor, any additional amounts payable in accordance with Section 9.10.3 of AIA Document A201–2007.

§ 5.1.8 Reduction or limitation of retainage, if any, shall be as follows:
(If it is intended, prior to Substantial Completion of the entire Work, to reduce or limit the retainage resulting from the percentages inserted in Sections 5.1.6.1 and 5.1.6.2 above, and this is not explained elsewhere in the Contract Documents, insert here provisions for such reduction or limitation.)

§ 5.1.9 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

§ 5.2 FINAL PAYMENT

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Section 12.2.2 of AIA Document A201–2007, and to satisfy other requirements, if any, which extend beyond final payment; and

.2 a final Certificate for Payment has been issued by the Architect.

§ 5.2.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect's final Certificate for Payment, or as follows:

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 INITIAL DECISION MAKER

The Architect will serve as Initial Decision Maker pursuant to Section 15.2 of AIA Document A201–2007, unless the parties appoint below another individual, not a party to this Agreement, to serve as Initial Decision Maker.

(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

§ 6.2 BINDING DISPUTE RESOLUTION

For any Claim subject to, but not resolved by, mediation pursuant to Section 15.3 of AIA Document A201–2007, the method of binding dispute resolution shall be as follows:
(Check the appropriate box. If the Owner and Contractor do not select a method of binding dispute resolution below, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.)

[ ] Arbitration pursuant to Section 15.4 of AIA Document A201–2007

[ ] Litigation in a court of competent jurisdiction

[ ] Other *(Specify)*

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2007.

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2007.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2007 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.
(Insert rate of interest agreed upon, if any.)

%

§ 8.3 The Owner's representative:
(Name, address and other information)

§ 8.4 The Contractor's representative:
(Name, address and other information)

§ 8.5 Neither the Owner's nor the Contractor's representative shall be changed without ten days written notice to the other party.

§ 8.6 Other provisions:

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 The Contract Documents, except for Modifications issued after execution of this Agreement, are enumerated in the sections below.

§ 9.1.1 The Agreement is this executed AIA Document A101–2007, Standard Form of Agreement Between Owner and Contractor.

§ 9.1.2 The General Conditions are AIA Document A201–2007, General Conditions of the Contract for Construction.

§ 9.1.3 The Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages

§ 9.1.4 The Specifications:
(Either list the Specifications here or refer to an exhibit attached to this Agreement.)

Section	Title	Date	Pages

§ 9.1.5 The Drawings:
(Either list the Drawings here or refer to an exhibit attached to this Agreement.)

Number	Title	Date

§ 9.1.6 The Addenda, if any:

Number	Date	Pages

Portions of Addenda relating to bidding requirements are not part of the Contract Documents unless the bidding requirements are also enumerated in this Article 9.

§ 9.1.7 Additional documents, if any, forming part of the Contract Documents:

.1 AIA Document E201™–2007, Digital Data Protocol Exhibit, if completed by the parties, or the following:

.2 Other documents, if any, listed below:
(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201–2007 provides that bidding requirements such as advertisement or invitation to bid, Instructions to Bidders, sample forms and the Contractor's bid are not part of the Contract Documents

unless enumerated in this Agreement. They should be listed here only if intended to be part of the Contract Documents.)

ARTICLE 10 INSURANCE AND BONDS

The Contractor shall purchase and maintain insurance and provide bonds as set forth in Article 11 of AIA Document A201–2007.

(State bonding requirements, if any, and limits of liability for insurance required in Article 11 of AIA Document A201–2007.)

Type of insurance or bond	**Limit of liability or bond amount ($0.00)**

This Agreement entered into as of the day and year first written above.

OWNER *(Signature)*	**CONTRACTOR** *(Signature)*
(Printed name and title)	*(Printed name and title)*

Additions and Deletions Report for

AIA® Document A101™ – 2007

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 13:36:22 on 05/14/2010.

PAGE 1

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Certification of Document's Authenticity

AIA® Document D401™ – 2003

I, , hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 13:36:22 on 05/14/2010 under Order No. 0573766898_1 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A101™ – 2007 - Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, as published by the AIA in its software, other than those additions and deletions shown in the associated Additions and Deletions Report.

_____

(Signed)

_____

(Title)

_____

(Dated)

DOCUMENT 006000
BONDS AND CERTIFICATES

The Bonds for the Project shall be:

A.I.A. Document A312, 2010 Edition, Performance and Payment Bond, printed by American Institute of Architects, 1735 New York Avenue, N.W., Washington, D.C., 20006.

Application shall be decided by Architect/Engineer without further repetition in the Project Manual.

A copy will be made available upon request.

Surety shall be licensed to do business in the state in which the Project is located.

END OF BONDS AND CERTIFICATES

AIA® Document A201™ – 2007

General Conditions of the Contract for Construction

for the following PROJECT:
(Name and location or address)
.

THE OWNER:
(Name, legal status and address)

THE ARCHITECT:
(Name, legal status and address)

TABLE OF ARTICLES

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

INDEX
(Numbers and Topics in Bold are Section Headings)

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 BASIC DEFINITIONS

§ 1.1.1 THE CONTRACT DOCUMENTS

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding requirements.

§ 1.1.2 THE CONTRACT

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 THE WORK

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 THE PROJECT

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by separate contractors.

§ 1.1.5 THE DRAWINGS

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

§ 1.1.6 THE SPECIFICATIONS

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 INSTRUMENTS OF SERVICE

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 INITIAL DECISION MAKER

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2 and certify termination of the Agreement under Section 14.2.2.

§ 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 CAPITALIZATION

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 INTERPRETATION

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and will retain all common law, statutory and other reserved rights, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce the Instruments of Service provided to them solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers may not use the Instruments of Service on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and the Architect's consultants.

§ 1.6 TRANSMISSION OF DATA IN DIGITAL FORM

If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents.

ARTICLE 2 OWNER

§ 2.1 GENERAL

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

§ 2.2.1 Prior to commencement of the Work, the Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. Thereafter, the Contractor may only request such evidence if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or the

portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.2 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.2.3 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.2.4 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.2.5 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.3 OWNER'S RIGHT TO STOP THE WORK

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.4 OWNER'S RIGHT TO CARRY OUT THE WORK

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect or failure. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

ARTICLE 3 CONTRACTOR

§ 3.1 GENERAL

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.2.3, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall make Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Architect and shall not proceed with that portion of the Work without further written instructions from the Architect. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any loss or damage arising solely from those Owner-required means, methods, techniques, sequences or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 LABOR AND MATERIALS

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work authorized by the Architect in accordance with Sections 3.12.8 or 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 WARRANTY

The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.6 TAXES

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 PERMITS, FEES, NOTICES, AND COMPLIANCE WITH LAWS

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions. If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor in writing, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may proceed as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 ALLOWANCES

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

.1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

.2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and

.3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 SUPERINTENDENT

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the name and qualifications of a proposed superintendent. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to the proposed superintendent or (2) that the Architect requires additional time to review. Failure of the Architect to reply within the 14 day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

§ 3.10.2 The Contractor shall prepare a submittal schedule, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, and shall submit the schedule(s) for the Architect's approval. The Architect's approval shall not unreasonably be delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 DOCUMENTS AND SAMPLES AT THE SITE

The Contractor shall maintain at the site for the Owner one copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Architect and shall be delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. Their purpose is to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Architect Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such written notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy, accuracy and

completeness of the services, certifications and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

§ 3.13 USE OF SITE

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 CUTTING AND PATCHING

§ 3.14.1 The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting and patching shall be restored to the condition existing prior to the cutting, fitting and patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor's consent to cutting or otherwise altering the Work.

§ 3.15 CLEANING UP

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 ACCESS TO WORK

The Contractor shall provide the Owner and Architect access to the Work in preparation and progress wherever located.

§ 3.17 ROYALTIES, PATENTS AND COPYRIGHTS

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications or other documents prepared by the Owner or Architect. However, if the Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Architect.

§ 3.18 INDEMNIFICATION

§ 3.18.1 To the fullest extent permitted by law the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

ARTICLE 4 ARCHITECT

§ 4.1 GENERAL

§ 4.1.1 The Owner shall retain an architect lawfully licensed to practice architecture or an entity lawfully practicing architecture in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 4.1.2 Duties, responsibilities and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified or extended without written consent of the Owner, Contractor and Architect. Consent shall not be unreasonably withheld.

§ 4.1.3 If the employment of the Architect is terminated, the Owner shall employ a successor architect as to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 4.2 ADMINISTRATION OF THE CONTRACT

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate For Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, except as provided in Section 3.3.1.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and report to the Owner (1) known deviations from the Contract Documents and from the most recent construction schedule submitted by the Contractor, and (2) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 COMMUNICATIONS FACILITATING CONTRACT ADMINISTRATION

Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Architect about matters arising out of or relating to the Contract. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The Architect's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may authorize minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more project representatives to assist in carrying out the Architect's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 DEFINITIONS

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a separate contractor or subcontractors of a separate contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

§ 5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to any such proposed person or entity or (2) that the Architect requires additional time for review. Failure of the Owner or Architect to reply within the 14 day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person or entity previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 SUBCONTRACTUAL RELATIONS

By appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, which the Contractor, by these Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

.1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor in writing; and

.2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon such assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the

Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided in Article 15.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to the construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces, the Owner shall be deemed to be subject to the same obligations and to have the same rights that apply to the Contractor under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6 and Articles 10, 11 and 12.

§ 6.2 MUTUAL RESPONSIBILITY

§ 6.2.1 The Contractor shall afford the Owner and separate contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Architect apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that the Owner's or separate contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a separate contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a separate contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or separate contractors as provided in Section 10.2.5.

§ 6.2.5 The Owner and each separate contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 OWNER'S RIGHT TO CLEAN UP

If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 GENERAL

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor and Architect; a Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor; an order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work.

§ 7.2 CHANGE ORDERS

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor and Architect stating their agreement upon all of the following:

.1 The change in the Work;
.2 The amount of the adjustment, if any, in the Contract Sum; and
.3 The extent of the adjustment, if any, in the Contract Time.

§ 7.3 CONSTRUCTION CHANGE DIRECTIVES

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

.1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
.2 Unit prices stated in the Contract Documents or subsequently agreed upon;
.3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
.4 As provided in Section 7.3.7.

§ 7.3.4 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 7.3.5 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.6 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.7 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the method and the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount

for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.7 shall be limited to the following:

.1 Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;

.2 Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;

.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;

.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; and

.5 Additional costs of supervision and field office personnel directly attributable to the change.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 MINOR CHANGES IN THE WORK

The Architect has authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes will be effected by written order signed by the Architect and shall be binding on the Owner and Contractor.

ARTICLE 8 TIME

§ 8.1 DEFINITIONS

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 PROGRESS AND COMPLETION

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 DELAYS AND EXTENSIONS OF TIME

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner or Architect, or of an employee of either, or of a separate contractor employed by the Owner; or by changes ordered in the Work; or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's control; or by delay authorized by the Owner pending mediation and arbitration; or by other causes that the Architect determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 CONTRACT SUM

The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.2 SCHEDULE OF VALUES

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit to the Architect, before the first Application for Payment, a schedule of values allocating the entire Contract Sum to the various portions of the Work and prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 9.3 APPLICATIONS FOR PAYMENT

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2., for completed portions of the Work. Such application shall be notarized, if required, and supported by such data substantiating the Contractor's right to payment as the Owner or Architect may require, such as copies of requisitions from Subcontractors and material suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or material supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or

encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

§ 9.4 CERTIFICATES FOR PAYMENT

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Architect determines is properly due, or notify the Contractor and Owner in writing of the Architect's reasons for withholding certification in whole or in part as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data comprising the Application for Payment, that, to the best of the Architect's knowledge, information and belief, the Work has progressed to the point indicated and that the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion and to specific qualifications expressed by the Architect. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed construction means, methods, techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment, or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 DECISIONS TO WITHHOLD CERTIFICATION

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- **.1** defective Work not remedied;
- **.2** third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;
- **.3** failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
- **.4** reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- **.5** damage to the Owner or a separate contractor;
- **.6** reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- **.7** repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.3 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or material or equipment suppliers to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Architect will reflect such payment on the next Certificate for Payment.

§ 9.6 PROGRESS PAYMENTS

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor no later than seven days after receipt of payment from the Owner the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and material and equipment suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay or to see to the payment of money to a Subcontractor, except as may otherwise be required by law.

§ 9.6.5 Contractor payments to material and equipment suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors and suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.7 FAILURE OF PAYMENT

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' written notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 SUBSTANTIAL COMPLETION

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 PARTIAL OCCUPANCY OR USE

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Section 11.3.1.5 and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 FINAL COMPLETION AND FINAL PAYMENT

§ 9.10.1 Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection and, when the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- **.1** liens, Claims, security interests or encumbrances arising out of the Contract and unsettled;
- **.2** failure of the Work to comply with the requirements of the Contract Documents; or
- **.3** terms of special warranties required by the Contract Documents.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 SAFETY PRECAUTIONS AND PROGRAMS

The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 SAFETY OF PERSONS AND PROPERTY

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to

- **.1** employees on the Work and other persons who may be affected thereby;
- **.2** the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors; and
- **.3** other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

§ 10.2.3 The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3, except damage or loss attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 INJURY OR DAMAGE TO PERSON OR PROPERTY

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 HAZARDOUS MATERIALS

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Architect in writing.

§ 10.3.2 Upon receipt of the Contractor's written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shut-down, delay and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall indemnify the Contractor for all cost and expense thereby incurred.

§ 10.4 EMERGENCIES

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 CONTRACTOR'S LIABILITY INSURANCE

§ 11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

.1 Claims under workers' compensation, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed;

.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;

.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;

.4 Claims for damages insured by usual personal injury liability coverage;

.5 Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;

.6 Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;

.7 Claims for bodily injury or property damage arising out of completed operations; and

.8 Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18.

§ 11.1.2 The insurance required by Section 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

§ 11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.

§ 11.1.4 The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Owner, the Architect and the Architect's Consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations.

§ 11.2 OWNER'S LIABILITY INSURANCE

The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance.

§ 11.3 PROPERTY INSURANCE

§ 11.3.1 Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

§ 11.3.1.1 Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect's and Contractor's services and expenses required as a result of such insured loss.

§ 11.3.1.2 If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance that will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, without so notifying the Contractor in writing, then the Owner shall bear all reasonable costs properly attributable thereto.

§ 11.3.1.3 If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles.

§ 11.3.1.4 This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.

§ 11.3.1.5 Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

§ 11.3.2 BOILER AND MACHINERY INSURANCE

The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insureds.

§ 11.3.3 LOSS OF USE INSURANCE

The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses due to fire or other hazards however caused.

§ 11.3.4 If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

§ 11.3.5 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment

property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, the Owner shall waive all rights in accordance with the terms of Section 11.3.7 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

§ 11.3.6 Before an exposure to loss may occur, the Owner shall file with the Contractor a copy of each policy that includes insurance coverages required by this Section 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 days' prior written notice has been given to the Contractor.

§ 11.3.7 WAIVERS OF SUBROGATION

The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

§ 11.3.8 A loss insured under the Owner's property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.3.10. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

§ 11.3.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

§ 11.3.10 The Owner as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Owner's exercise of this power; if such objection is made, the dispute shall be resolved in the manner selected by the Owner and Contractor as the method of binding dispute resolution in the Agreement. If the Owner and Contractor have selected arbitration as the method of binding dispute resolution, the Owner as fiduciary shall make settlement with insurers or, in the case of a dispute over distribution of insurance proceeds, in accordance with the directions of the arbitrators.

§ 11.4 PERFORMANCE BOND AND PAYMENT BOND

§ 11.4.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract.

§ 11.4.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 UNCOVERING OF WORK

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner's expense. If such Work is not in accordance with the Contract Documents, such costs and the cost of correction shall be at the Contractor's expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

§ 12.2 CORRECTION OF WORK

§ 12.2.1 BEFORE OR AFTER SUBSTANTIAL COMPLETION

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 AFTER SUBSTANTIAL COMPLETION

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.4.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or separate contractors caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 ACCEPTANCE OF NONCONFORMING WORK

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 GOVERNING LAW

The Contract shall be governed by the law of the place where the Project is located except that, if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 SUCCESSORS AND ASSIGNS

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to covenants, agreements and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate such assignment.

§ 13.3 WRITTEN NOTICE

Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at, or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice.

§ 13.4 RIGHTS AND REMEDIES

§ 13.4.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.

§ 13.4.2 No action or failure to act by the Owner, Architect or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach there under, except as may be specifically agreed in writing.

§ 13.5 TESTS AND INSPECTIONS

§ 13.5.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

§ 13.5.2 If the Architect, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.5.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner's expense.

§ 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by

such failure including those of repeated procedures and compensation for the Architect's services and expenses shall be at the Contractor's expense.

§ 13.5.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.5.5 If the Architect is to observe tests, inspections or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.5.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.6 INTEREST

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at such rate as the parties may agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

§ 13.7 TIME LIMITS ON CLAIMS

The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all claims and causes of action not commenced in accordance with this Section 13.7.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 TERMINATION BY THE CONTRACTOR

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:

.1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;

.2 An act of government, such as a declaration of national emergency that requires all Work to be stopped;

.3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or

.4 The Owner has failed to furnish to the Contractor promptly, upon the Contractor's request, reasonable evidence as required by Section 2.2.1.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, repeated suspensions, delays or interruptions of the entire Work by the Owner as described in Section 14.3 constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, including reasonable overhead and profit, costs incurred by reason of such termination, and damages.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' written notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 TERMINATION BY THE OWNER FOR CAUSE

§ 14.2.1 The Owner may terminate the Contract if the Contractor

.1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;

.2 fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;

.3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or

.4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the above reasons exist, the Owner, upon certification by the Initial Decision Maker that sufficient cause exists to justify such action, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

.1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;

.2 Accept assignment of subcontracts pursuant to Section 5.4; and

.3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay or interruption as described in Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

.1 that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or

.2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of written notice from the Owner of such termination for the Owner's convenience, the Contractor shall

.1 cease operations as directed by the Owner in the notice;

.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 CLAIMS

§ 15.1.1 DEFINITION

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim.

§ 15.1.2 NOTICE OF CLAIMS

Claims by either the Owner or Contractor must be initiated by written notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party must be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3 CONTINUING CONTRACT PERFORMANCE

Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents. The Architect will prepare Change Orders and issue Certificates for Payment in accordance with the decisions of the Initial Decision Maker.

§ 15.1.4 CLAIMS FOR ADDITIONAL COST

If the Contractor wishes to make a Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.5 CLAIMS FOR ADDITIONAL TIME

§ 15.1.5.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.5.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction.

§ 15.1.6 CLAIMS FOR CONSEQUENTIAL DAMAGES

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.6 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 INITIAL DECISION

§ 15.2.1 Claims, excluding those arising under Sections 10.3, 10.4, 11.3.9, and 11.3.10, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Initial Decision Maker with no decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of such request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of an initial decision, demand in writing that the other party file for mediation within 60 days of the initial decision. If such a demand is made and the party receiving the demand fails to file for mediation within the time required, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 MEDIATION

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.6 shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 ARBITRATION

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 CONSOLIDATION OR JOINDER

§ 15.4.4.1 Either party, at its sole discretion, may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Either party, at its sole discretion, may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as the Owner and Contractor under this Agreement.

Additions and Deletions Report for

AIA® Document A201™ – 2007

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 12:56:55 on 09/15/2009.

PAGE 1

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Certification of Document's Authenticity

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I, , hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 12:56:55 on 09/15/2009 under Order No. 1000392825_5 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A201™ – 2007 - General Conditions of the Contract for Construction, as published by the AIA in its software, other than those additions and deletions shown in the associated Additions and Deletions Report.

_____

(Signed)

_____

(Title)

_____

(Dated)

DOCUMENT 007300
SUPPLEMENTARY CONDITIONS

The following supplements modify the "General Conditions of the Contract for Construction," AIA Document A201, 2007 Edition. Where a portion of the General Conditions is modified or deleted by these Supplementary Conditions, unaltered portions of General Conditions will remain in effect. The paragraph numbering system of AIA Document A201, 2007 Edition is continued in the Supplementary Conditions.

ARTICLE 1 - GENERAL PROVISIONS

1.1 BASIC DEFINITIONS

1.1.6 THE SPECIFICATIONS: To Subparagraph 1.1.6 add the following:

“1.1.6.1 Sections of Division 1 - General Requirements, govern the execution of all sections of the specifications.

1.1.6.2 Furnish, Install and Provide: *Furnish* means to supply and deliver to project site, ready for installation. *Install* means to place in position for service or use. *Provide* means furnish and install, complete and ready for intended use.

1.1.6.3 ‘Indicated’: Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including ‘shown,’ ‘noted,’ ‘scheduled,’ and ‘specified’ have the same meaning as ‘indicated.’

1.1.6.4 ‘Match Existing’: When the phrase ‘match existing’ appears in the Contract Documents it shall be taken to mean that the new material being referenced shall have the same salient characteristics as those material(s) in existence or operation at the time under consideration.

1.1.6.5 ‘Salient Characteristics’ means those particular characteristics that specifically describe the essential physical and functional features of the material or service required. Depending upon the item being referenced, ‘salient characteristics’ could include manufacturer, model number, thickness, color, texture, size, performance, source, density, consistency, chemical constituents, absorbency, water repellence, coefficient of expansion and contraction, fire resistance, regulatory authority approval, testing agency labeling, Consumer Product Safety Commission approval, insulative qualities, tension, hardness, light transmission, light reflectance or sheen, deflection, chemical resistance, recycled content, volatile organic compounds emissions, acoustical qualities, light reflectance, seismic resistance, warranty, resistance to extremes in heat and humidity, abrasion, installation technique, surface preparation, or other factors as solely determined by the Architect.”

Add the following:

“1.1.9 PUNCH LIST

A punch list is a written list of items that are minor, uncompleted, or unacceptable items of the Work that do not interfere with the Owner’s use and occupancy of any part of the Project.”

1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

Add the following:

“1.2.1.1 In the event of conflicting provisions among the Contract Documents that were not called to the Owner’s or Architect’s attention prior to award of Contract, the Architect/Engineer shall decide which of the conflicting requirements shall govern, generally taking as a guideline the more stringent requirement, the more

expensive material, or the greater quantity of Work, unless, in the opinion of the Architect, another requirement is more appropriate. The Architect's decision shall be final in such case, and the Architect's decision shall not be further reviewable by arbitration or by litigation.

1.2.1.2 When there is a conflict or discrepancy between a reference standard and specifications or another referenced standard, the more stringent requirements shall apply."

ARTICLE 2 - OWNER

2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

2.2.3 Add the following to 2.2.3:

"The Contractor shall, within 21 days of receipt of any information furnished by the Owner pursuant to this paragraph, verify and confirm the accuracy of information so furnished. In case of any inaccuracies, the Contractor shall promptly notify the Owner, who shall correct any such inaccuracy. Failure to notify the Owner within the 21 days shall act to bar any claims by the Contractor arising from the inaccuracy of any such information."

2.3 OWNER'S RIGHT TO STOP THE WORK

2.3 Delete "repeatedly."

Add the following:

"2.5 OWNER'S RIGHT TO AUDIT

2.5.1 The Contractor shall keep full and accurate records of all costs incurred and items billed concerning the performance of the Work, which records shall be open to audit by the Owner or its authorized representatives during performance of the Work and until three years after Final Payment. In addition, the Contractor shall make it a condition of all subcontracts relating to the Work that all Subcontractors will keep accurate records of costs incurred and items billed concerning their work. In addition, the Contractor shall require that such records shall be open to audit by the Owner or its authorized representatives during performance of the Work and until two years after its completion."

ARTICLE 3 - CONTRACTOR

3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

Replace 3.2.1 with the following:

"3.2.1 Execution of the Contract by the Contractor is a representation that it has carefully examined the Contract Documents and the site and represents that it is thoroughly familiar with the nature and location of the Work, the site, the specific conditions under which the Work is to be done and all matters that may affect the Work or its performance. Because of such examinations and investigations, the Contractor further represents that it thoroughly understands the Contract Documents and their intent and purpose. The Contractor further represents that it is familiar with all applicable codes, ordinances, laws, regulations and rules as they apply to the Work. The Contractor further represents that it will abide by the same. Claims for additional time or additional compensation because of the Contractor's failure to follow the procedure and to familiarize itself with all local conditions and the Contract Documents will not be permitted."

3.2.2 Add the following to 3.2.2

"The accuracy of grades, elevations, dimensions or locations of existing conditions is not guaranteed by the Architect/Engineer or the Owner and the Contractor is responsible for verifying same."

Add the following:

“3.2.5 Should any words or numbers that are necessary to a clear understanding of the Work be illegible or omitted, should discrepancies exist between items indicated by graphic scale and those items’ indicated dimensions, or should an error or discrepancy occur in any of the Contract Documents, the Contractor shall immediately notify the Architect/Engineer of such omission, error or discrepancy, and the Contractor shall not continue with that portion of the Work until clarification is received. Use form as approved by Architect/Engineer when requesting information from the Architect. If the Contractor continues without so notifying the Architect, the Contractor shall be responsible for the cost of correcting same, including any resulting damage.

3.2.6 The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect/Engineer for the Architect/Engineer to evaluate and respond to the Contractor’s requests for information, where such information was available to the Contractor from a careful study and comparison of the Contract Documents, field conditions, other Owner-provided information, Contractor-prepared coordination drawings, or prior Project correspondence or documentation.”

3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

3.3.2 Add the following at the end of the paragraph, “and for any damages, losses, costs and expenses, such as, reasonable attorneys' fees, resulting from such acts and omissions.”

3.4 LABOR AND MATERIALS

Add the following Subparagraphs 3.4.4 and 3.4.5 to 3.4:

“3.4.4 After the Contract has been executed, the Owner and the Architect/Engineer will consider a formal request for the substitution of products in place of those specified only under the conditions set forth in the General Requirements (Division 1 of the Specifications).

3.4.5 By making requests for substitutions based on Subparagraph 3.4.2 above, the Contractor:

.1 represents that the Contractor has personally investigated the proposed substitute product and decided that it is equal or superior in all respects to that specified;

.2 represents that the Contractor will provide the same warranty for the substitution that the Contractor would for that specified;

.3 certifies that the cost data presented is complete and includes all related costs under this Contract except the Architect/Engineer's redesign costs and waives all claims for additional costs related to the substitution that subsequently become apparent;

.4 will coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects; and

.5 represents that the Contractor will reimburse the Owner for expenses incurred by the Architect/Engineer in providing services concerning evaluating substitutions proposed by the Contractor and making subsequent revisions to Drawings, Specifications and other documentation resulting therefrom.”

3.7 PERMITS, FEES, NOTICES, AND COMPLIANCE WITH LAWS

Subparagraph 3.7.1, add the following:

“3.7.1.1 In addition to the requirements of 3.7.1 Contractor shall secure and pay for building, mechanical, electrical and plumbing permits, zoning regulation fees and permits and engineering and inspection charges required by any governmental authority or other person or entity having jurisdiction over the work. Said permits shall include, without limitation, both temporary and permanent permits, land disturbance permits, building permits, certificates of occupancy, curb-breaking permits, highway entrance permits, water permits and all similar permits and certificates.

3.7.1.2 Include health and environmental impact fees because of water and sewer connections (including capacity fees, tap fees, impact fees, and all other similar fees) unless otherwise provided for in an allowance."

To Subparagraph 3.7.2 add the following:

"3.7.2.1 If the Contractor fails to give such notices, it shall be liable for and shall indemnify and hold harmless the Owner and the Architect/Engineer and their respective employees, officers and agents, against any resulting fines, penalties, judgments or damages, including reasonable attorneys' fees, imposed on or incurred by the parties indemnified hereunder."

3.7.3 Add, "If a delay or denial in securing a local permit occurs, the Contractor shall continue the Work, inform the Designer and the Owner of the situation, propose corrective measures, and continue to pursue the customary permits."

To Subparagraph 3.7.4 add the following:

"3.7.4.1 Information shown on the Drawings as to the location of existing utilities has been prepared from the most reliable data available to the Architect/Engineer. The Owner and the Architect/Engineer do not guarantee this information, and it shall be the Contractor's responsibility to decide the location, character and depth of existing utilities. The Contractor shall assist the utilities companies, by every means possible to decide said locations and the locations of recent additions to the system not shown."

3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

At the end of Subparagraph 3.10.1 add the following:

"The Owner's or Architect's silence as to a submitted schedule that exceeds time limits current under the Contract Documents shall not relieve the Contractor of his (or her) obligation to meet those time limits. The Owner's or Architect's silence shall not make the Owner or Architect/Engineer liable for any Contractor damages incurred because of increased construction time or not meeting those time limits. Similarly, the Owner's or Architect's silence as to a Contractor's schedule showing performance ahead of such time limits shall not create or infer any rights in favor of the Contractor for performance ahead of such time limits."

3.10.3 Add, "If commissioning activities are included in the Work, they shall not be a cause for delay or cost claims."

3.11 DOCUMENTS AND SAMPLES AT THE SITE

3.11 Add the following at the end of 3.11: "... before Substantial Completion."

3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

Add the following:

"3.12.11 The Contractor shall not submit any shop drawing that is merely a tracing or other copy of any of the Contract Documents. Each shop drawing shall be original work, prepared by the Contractor, or a subcontractor or supplier of the Contractor. The Architect/Engineer shall have the authority to reject any shop drawing that violates this provision, and no extension of the Contract Time or increase in the Contract Sum will be given because of such rejection."

Add the following to Article 3:

"3.19 CONTRACTOR'S QUALIFICATIONS

3.19.1 The Contractor represents and warrants the following to the Owner (besides any other representation and warranty given by the Contractor to the Owner) as an inducement to the Owner to enter into the Owner-Contractor Agreement, which representations and warranties shall survive the execution of the Contract Documents and final completion of the Work and final payment therefor:

3.19.1.1 The Contractor is financially solvent, able to pay its debts as they mature and possessed of sufficient working capital to complete the Work and perform its obligations under the Contract Documents in an efficient and component manner;

3.19.1.2 The Contractor can furnish the tools, materials, supplies, equipment and labor required to complete the Work and perform its obligations under the Contract Documents and has sufficient experience and competence to do so;

3.19.1.3 The Contractor is authorized to do business in the state where the Project is located and is properly licensed by all necessary governmental, public and other authorities having jurisdiction over the Project.

3.19.1.4 The person(s) executing the Owner-Contractor Agreement is properly authorized to do so;

3.19.1.5 The Contractor has visited the site and has become familiar with the Contract Documents and the conditions at the site; has correlated the Contract Documents with the site conditions and with all applicable codes, ordinances, regulations, laws and decrees; and knows of no reason that the Work cannot be done exactly as indicated on the Contract Documents, unless previously stated otherwise in writing to the Owner and the Architect/Engineer."

ARTICLE 4 - ARCHITECT

4.1 GENERAL

Omit paragraph 4.1.1 and in its place add the following paragraphs 4.1.1 and 4.1.1.1:

"4.1.1 The Architect/Engineer is the person lawfully licensed to practice architecture or engineering, or an entity lawfully practicing architecture or engineering identified as such in the Owner-Contractor Agreement and is referred to throughout the Contract Documents as if singular in number and masculine (or feminine) in gender. The term "Architect/Engineer" (A/E) means the Architect/Engineer or his (or her) authorized representative.

4.1.1.1 It is the intent to change the word 'Architect' to 'Architect/Engineer' throughout these documents."

4.2 ADMINISTRATION OF THE CONTRACT

Add the following:

"4.2.2.1 The Architect/Engineer shall not have the authority or responsibility to supervise or direct the Work."

ARTICLE 5 - SUBCONTRACTORS

5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

To Subparagraph 5.2.1, add the following Clauses 5.2.1.1 and 5.2.1.2:

"5.2.1.1 Within 30 days after execution of Owner-Contractor Agreement, the Contractor shall submit to the Architect/Engineer the names of persons or entities proposed as suppliers, vendors and manufacturers for products required for the Project and the names of the installing Subcontractor or Sub-subcontractor. Include an accurate itemized labor and material cost schedule showing all subcontractors' names, addresses, phone

numbers, nature of work, and subcontract costs. Unless the Architect/Engineer or Owner objects to any one or more subcontractors or material suppliers within seven (7) days after receipt of such list, it shall be deemed accepted.

5.2.1.2 Persons or entities proposed by Contractor and to whom Owner and Architect/Engineer have made no reasonable objection shall be used on Work for which they were proposed and shall not be changed except with written consent of Owner and Architect/Engineer."

Add the following to Article 5:

"5.5 OWNER PAYMENTS TO SUBCONTRACTORS

5.5.1 In case of any default hereunder by the Contractor, or in the event the Owner or the Architect/Engineer fails to approve any Application for Payment that is not the fault of a Subcontractor, the Owner may make direct payment to the Subcontractor, less appropriate retainage. In that event, the amount so paid the Subcontractor shall be deducted from the payments to the Contractor.

5.5.2 Nothing contained herein shall create any obligation on behalf of the Owner to make any payments to any Subcontractor and no payment by the Owner to any Subcontractor shall create any obligation to make any further payments to any subcontractor."

ARTICLE 7 - CHANGES IN THE WORK

7.1 GENERAL

Add the following Subparagraph 7.1.4 to 7.1:

"7.1.4 The combined overhead and profit included in the total cost to the Owner of a change in the Work shall be based on the following schedule:

.1 For the Contractor, for Work done by the Contractor's own forces, 15 percent of the cost.

.2 For the Contractor, for Work done by the Contractor's Subcontractor, 5 percent of the amount due the Subcontractor.

.3 For each Subcontractor or Sub-subcontractor involved, for Work done by that Subcontractor's or Sub-subcontractor's own forces, 15 percent of the cost.

.4 For each Subcontractor, for Work done by the Subcontractor's Sub-subcontractors, 5 percent of the amount due the Sub-subcontractor.

.5 Cost to which overhead and profit is to be applied shall be determined in accordance with Subparagraph 7.3.7.

.6 When both additions and credits are involved in any one change, the allowance for overhead and profit shall be figured on the basis of net increase, if any.

.7 To simplify checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials and Subcontracts. Labor and materials shall be itemized in the manner prescribed above. Where major cost items are Subcontracts, they shall be itemized also. Never will a change involving more than $500.00 be approved without such itemization."

7.3 CONSTRUCTION CHANGE DIRECTIVES

7.3.7 Make the following changes:

.1 Change to read, "Payroll Expense of labor."

.3 Change to read, "Rental costs of machinery and equipment rented from others, and not more than 80 percent of the Associated Equipment Distributors Nationally Averaged Rental Rates for Construction Equipment for machinery and equipment belonging to Contractor."

.5 Change to read, “Additional Direct Payroll Expense of superintendence directly attributable to authorized overtime;”

Add the following:

“.6 reasonable Direct Payroll Expense of project manager and clerical work directly attributable to estimating and coordinating the change, and.

.7 The following items shall be considered as costs when Contract Time is extended due to additional work or a cause defined in Section 8.3 under “Limited Damages for Delay,” and solely to the extent directly attributable to extension of time: field offices, sheds, phones, sanitary facilities, on-site utilities, drinking fountains, cleaning, safety programs, and other construction facilities and temporary controls not specifically required for additional work; costs of superintendence; superintendent’s vehicle and other general use vehicles, such as passenger vehicles and motorcycles, and excluding larger and more complex vehicles or combination of vehicles weighing more than 26,000 pounds, carrying hazardous materials, or transporting over 15 people including the driver.”

ARTICLE 8 – TIME

8.2 PROGRESS AND COMPLETION

8.2.2 In the first sentence, delete “knowingly.”

8.3 DELAYS AND EXTENSIONS OF TIME

8.3.1: Substitute "litigation" for "mediation and arbitration".

Add the following:

“8.3.1.1 Limited Damages for Delay: If an extension of time is granted to the Contractor under terms of this Contract on account of an act or failure to act that is contrary to the Contract Documents on the part of Owner or Architect/Engineer or an employee of either, or of a separate Contractor employed by Owner, then the Contractor may request reimbursement for costs defined in Section 7.3.6, plus the overhead and profit allowed in Section 7.1.4, notwithstanding any other provision contained in the Agreement.

8.3.1.2 No Damages for Delay: If an extension of time is granted to the Contractor under terms of this Contract on account of abnormal weather, acts of God, riots, civil commotion, acts of War, fire, unavoidable casualties, epidemics, quarantine restrictions, labor disputes, unusual delay in transportation, freight embargoes, or insolvency of subcontractors, sub-subcontractors, or suppliers, then the Contractor shall absorb all costs for General Conditions and General Requirements during the time extension, notwithstanding any other provision contained in the Agreement.

8.3.4 The Contractor shall have no claim for damages against the Owner by reason of delay if the date of Substantial Completion of the Work is within the agreed to Contract Time.”

ARTICLE 9 - PAYMENTS AND COMPLETION

9.3 APPLICATIONS FOR PAYMENTS

9.3.1 Add the following sentence to Subparagraph 9.3.1:

“The form of Application for Payment shall be a current authorized edition of AIA Document G702, Application and Certification for Payment, notarized and supported by a current authorized edition of AIA Document G703, Continuation Sheet.”

Add the following Clause 9.3.1.3 to 9.3.1:

“9.3.1.3 Until Substantial Completion, the Owner shall pay 95 percent of the amount due the Contractor because of progress payments. Owner shall pay Contractor retainage within 90 days of Substantial Completion. Contractor shall pay subcontractors their share of retainage within 10 days of Contractor’s receipt of retainage from Owner. Similar provisions apply to sub-subcontractors and material suppliers.”

9.5 DECISIONS TO WITHHOLD CERTIFICATION

Add the following Subparagraph to 9.5.1:

“.8 rejection of the Work or any of the Work by any governmental authority having jurisdiction over the Project, or by the Owner's lender.”

Add the following Subparagraph to 9.5:

“9.5.4 In the event the Contractor shall cause the Architect/Engineer to perform Additional Services and incur expenses concerning Change Orders, interpretations of the Contract Documents, defects or deficiencies in the Work, the Owner will withhold such compensation and expense from the next Payment due the Contractor and pay such amount to the Architect. The Contract Amount shall be reduced by such amount.”

“9.5.5 If the erosion control is not in place within 5 days of notification, the Owner will notify the Contractor the necessary erosion control measures are not installed. The Owner shall withhold payment to the contractor or hire a separate Contractor to perform the work. The cost for such work will be deducted from the contract amount through a change order.”

9.7 FAILURE OF PAYMENT

9.7 Modify paragraph 9.7 by changing from "seven" to "ten" each time “seven” appears.

9.8 SUBSTANTIAL COMPLETION

Add the following to 9.8.3:

“The Architect/Engineer will make only one inspection to decide Substantial Completion. If as a result of this inspection the Architect/Engineer determines that the Work is not substantially complete, either because of major items not completed, an excessive number of punch list items, or successive inspections requested by the Contractor, the Contractor will be charged at a rate of $1,000.00 per person per half day. The Owner will withhold such compensation and expense from the next Payment due the Contractor and pay such amount to the Architect/Engineer. The Contract Amount shall be reduced by such amount.”

9.10 FINAL COMPLETION AND FINAL PAYMENT

9.10.1 Add the following to 9.10.1:

“The Architect/Engineer will make only one inspection to decide Final Completion. If as a result of this inspection the Architect/Engineer determines that the Work is not finally complete, the Contractor will be charged a rate of $2,000.00 per person per day. The Owner will withhold such compensation and expense from the next Payment due the Contractor and pay such amount to the Architect/Engineer. The Contract Amount shall be reduced by such amount.”

Add the following:

“9.10.6 Besides any other damages, failure of the Contractor to achieve final completion within thirty (30) days after the specified date of Substantial Completion, subject to authorized extensions, will result in the

Contractor's being responsible for excess Architect's fees. Excess Architect's Fees include the cost of all necessary Architect's services, as decided by the Owner and Architect, incurred beyond the date of Substantial Completion. Excess Architect's fees will be deducted from the amount due the Contractor."

ARTICLE 10 - PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

Add the following:

"10.1.1 Contractor shall comply with requirements of Interim Life Safety Measures (ILSM) temporarily to compensate for hazards posed by existing Life Safety Code deficiencies and construction activities.

.1 Ensure exits provide free and unobstructed egress. Train personnel if alternative exits are designated.

.2 Ensure free and unobstructed access to emergency departments/services and for emergency services.

.3 Ensure fire alarm, detection and suppression systems are not impaired. Provide temporary, but equivalent systems when fire alarm systems are impaired. Inspect and test temporary systems monthly.

.4 Ensure temporary construction partitions are smoke tight and built of noncombustible materials.

.5 Provide additional firefighting equipment and train personnel to use the equipment.

.6 Prohibit smoking in or next to construction areas.

.7 Develop and enforce storage, housekeeping and debris removal policies and procedures that reduce flammable and combustible fire load to lowest level necessary for daily operations.

.8 Conduct a minimum of two fire drills per shift per quarter.

.9 Perform hazard surveillance of buildings, grounds and equipment with special attention to excavations."

10.2 SAFETY OF PERSONS AND PROPERTY

Add the following:

"10.2.4.1 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary, the Contractor shall give the Owner reasonable advance notice."

"10.2.9 A decision by the Owner to supplement or duplicate the security measures otherwise required to be done or provided by the General Contractor per these Contract documents shall not in any way relieve the General Contractor of its responsibility to safeguard and secure all Work and the Work Area or impose any liability or responsibility on the Owner for damages or loss because of trespass or theft."

ARTICLE 11 - INSURANCE AND BONDS

11.1 CONTRACTOR'S LIABILITY INSURANCE
11.1.1.1 Delete the semicolon at the end of Clause 11.1.1.1 and add, "including private entities performing Work at the site and exempt from the coverage because of number of employees or occupation, which entities shall maintain voluntary compensation coverage at the same limits specified for mandatory coverage for the duration of the Project;"

11.1.1.2 Delete the semicolon at the end of Clause 11.1.1.2 and add, “or persons or entities excluded by statute from the requirements of Clause 11.1.1.1 but required by the Contract Documents to provide the insurance required by that Clause;”

Add the following:

“11.1.1.9 Liability Insurance shall include all major divisions of coverage and be on a comprehensive basis including:

1. Premises Operations (including X, C and U coverages as applicable).
2. Independent Contractors' Protective.
3. Products and Completed Operations.
4. Personal Injury Liability with Employment Exclusion deleted.
5. Contractual, including specified provision for Contractor's obligation under Paragraph 3.18.
6. Owned, non-owned and hired motor vehicles.
7. Broad Form Property Damage including Completed Operations.

11.1.1.10 If the General Liability coverages are provided by a Commercial General Liability Policy on a claims-made basis, the policy date or Retroactive Date shall predate the Contract; the termination date of the policy or applicable extended reporting period shall be no earlier than the termination date of coverages required to be maintained after final payment, certified following Subparagraph 9.10.2.”

Add the following Clause 11.1.2.1 to 11.1.2:

“11.1.2.1 The insurance required by Subparagraph 11.1.1 shall be written for not less than the following limits, or greater if required by law:

1. Workers' Compensation:
   (a) State: Statutory
   (b) Applicable Federal (e.g., Longshoremen's): Statutory
   (c) Employer's Liability:
   $100,000.00 per Accident
   $1,000,000.00 Disease, Policy Limit
   $1,000,000.00 Disease, Each Employee

2. Comprehensive or Commercial General Liability (including Premises-Operations; Independent Contractors' Protective; Products and Completed Operations; Broad Form Property Damage):
   (a) Bodily Injury:
   $1,000,000.00 Each Occurrence
   $2,000,000.00 Aggregate
   (b) Property Damage:
   $1,000,000.00 Each Occurrence
   $2,000,000.00 Aggregate
   (c) Products and Completed Operations to be maintained for 2 years after final payment:
   $2,000,000.00 Aggregate
   (d) Property Damage Liability Insurance shall provide X, C and U coverage.
   (e) Broad Form Property Damage Coverage shall include Completed Operations.

3. Contractual Liability:
   (a) Bodily Injury:
   $1,000,000.00 Each Occurrence
   $2,000,000.00 Aggregate
   (b) Property Damage:
   $1,000,000.00 Each Occurrence

$2,000,000.00 Aggregate

4. Personal Injury, with Employment Exclusion deleted:
   $2,000,000.00 Aggregate
5. Business Auto Liability (including owned, non-owned and hired vehicles):
   (a) Bodily Injury:
   $1,000,000.00 Each Person
   $2,000,000.00 Each Occurrence
   (b) Property Damage:
   $1,000,000.00 Each Occurrence

6. If the General Liability coverages are provided by a Commercial Liability policy, the:
   (a) General Aggregate shall be not less than $2,000,000.00 and it shall apply, in total, to this Project only.
   (b) Fire Damage Limit shall be not less than $50,000.00 on any one Fire.
   (c) Medical Expense Limit shall be not less than $5,000.00 on any one person.

7. Umbrella Excess Liability:
   $1,000,000.00 over primary insurance
   $10,000.00 retention for self-insured hazards each occurrence"

11.1.3 Add the following to Subparagraph 11.1.3:

"If this insurance is written on the Comprehensive General Liability policy form, the Certificates shall be AIA Document G705, Certificate of Insurance. If this insurance is written on a Commercial General Liability policy form, ACORD form 25S will be acceptable."

11.3 PROPERTY INSURANCE

11.3.1 In the first sentence delete, "Unless otherwise provided, the", and delete, "without optional deductibles."

11.3.1.1 Add the following sentence, "The form of policy for this coverage shall be Completed Value." Add, "Such insurance carried by Owner will include a $10,000 deductible clause. The deductible is the responsibility of the Contractor."

11.4 PERFORMANCE BOND AND PAYMENT BOND

Delete Subparagraph 11.4.1 and substitute the following:

"11.4.1 The Contractor shall furnish bonds covering faithful performance of the Contract and payment of obligations arising by that. Bonds may be obtained through the Contractor's usual source and the cost of it shall be included in the Contract Sum. The amount of each bond shall be equal to 100 percent of the Contract Sum.

11.4.1.1 The Contractor shall deliver the required bonds to the Owner by three days following the date the Agreement is entered into, or if the Work is to be commenced prior thereto in response to a letter of intent, the Contractor shall, before the commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished.

11.4.1.2 The Contractor shall require the attorney-in-fact who executes the required bonds for the surety to affix thereto a certified and current copy of the power of attorney."

ARTICLE 13 - MISCELLANEOUS PROVISIONS
Add the following Paragraph 13.8 to Article 13:

“13.8 EQUAL OPPORTUNITY

13.8.1 The Contractor shall maintain policies of employment as follows:

13.8.1.1 The Contractor and the Contractor's Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex or national origin. No person shall be excluded from participation in or be denied benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance or any other funding source on the grounds of race, color, sex, national origin, or ancestry.

13.8.1.2 The Contractor shall take affirmative action to insure that applicants are employed and that employees are treated during employment without regard to their race, religion, color, sex or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the policies of non-discrimination.

13.8.1.3 The Contractor and the Contractor's Subcontractors shall, in all solicitations or advertisements for employees placed by them or on their behalf, state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex or national origin.”

Add the following:

“13.9 CONTRACTOR'S RESPONSIBILITY FOR ADDITIONAL ARCHITECTURAL FEES

13.9.1 If more than two submittals are required for any shop drawing or other submittal, the Contractor shall be liable for any Architect/Engineer's fees incurred because of such submittals. The Architect/Engineer's review of additional submittals will be made only with the consent of the Owner after notification by the Architect/Engineer. The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect/Engineer for evaluation of such additional submittals.

13.9.2 If the Work is not complete after submittal of the Contractor's written notice pursuant to Paragraph 9.10.1, the Contractor shall be liable for any Architect/Engineer's fees incurred for any inspection following the initial inspection after receipt of such notice.

13.9.3 If the Contractor defaults and causes the Architect/Engineer to provide additional services, the Contractor shall be responsible for same.

13.9.4 If the Contractor submits an extensive number of claims and the majority of such claims are rejected, the Contractor shall be responsible for any additional Architect/Engineer's fees and for any such rejected claims.

13.9.5 Any funds due under this paragraph shall be deducted by the Owner from the amounts due the Contractor for such additional Architect/Engineer's fees and paid directly to the Architect/Engineer.”

ARTICLE 15 – CLAIMS AND DISPUTES

15.1.5.2 Add, “Refer to No Damages for Delay provisions of 8.3.1.2 above.”

15.2 INITIAL DECISION

15.2.1 Substitute “litigation” for “mediation.”
15.2.5 Delete the last sentence.

15.2.6 Delete the provision and the sub-provision under it.

15.3 MEDIATION

Delete Article 15.3 Mediation in its entirety.

15.4 ARBITRATION

Delete Article 15.4 Arbitration in its entirety.

END OF SUPPLEMENTARY CONDITIONS

SECTION 011000
SUMMARY

PART 1 GENERAL

1.1 SUMMARY

A. General Description: Approximately 0.6 acres; generally consisting of clearing and stripping, rough grading, finish grading, gravel paving, drainage structures, and associated plumbing and electrical work; chain link fencing, concrete paving.

B. Project Address: South Main Street, Cedar Hill, Tennessee.

1.2 CONTRACT DESCRIPTION

A. Contract Type: Stipulated Price.

B. The Contractor will be furnished free of charge an electronic copy of Drawings and Project Manuals to perform the Work.

1.3 OWNER FURNISHED - CONTRACTOR INSTALLED PRODUCTS

A. Schedule of Owner Furnished - Contractor Installed Items: As indicated on Drawings.

B. Owner Responsibilities:
1. Arrange for delivery of shop drawings, product data, samples, manufacturer's instructions and certificates to Contractor.
2. Deliver supplier's bill of materials to Contractor.
3. Arrange and pay for delivery to site. Follow Progress Schedule.
4. Inspect deliveries jointly with Contractor.
5. Submit claims for transportation damage.
6. Arrange for replacement of damaged, defective, or missing items.
7. Arrange for manufacturer's field services. Arrange for and deliver manufacturer's warranties and bonds to Contractor.

C. Contractor Responsibilities:
1. Designate submittals and delivery date for each product in Progress Schedule.
2. Review shop drawings, product data, samples and other submittals. Submit to Architect/Engineer with notification of any observed discrepancies or problems anticipated because of nonconformance with Contract Documents.
3. Receive and unload products at site.
4. Inspect deliveries jointly with Owner, record shortages and damaged or defective items.
5. Handle products at site, including uncrating and storage.
6. Protect products from damage and from exposure to elements.
7. Assemble, install, connect, adjust and finish products.
8. Provide installation inspections required by public authorities.
9. Repair or replace items damaged by Contractor.

1.4 USE OF PREMISES

A. Limit use of site and premises to allow:
   1. Owner occupancy.
   2. Work by other contractors.
   3. Public usage.
   4. Continued Owner occupancy by the Owner's security force.

B. Coordinate use of premises under direction of Owner.

C. Assume full responsibility for protection and safekeeping of products under this Contract.

D. Obtain and pay for use of additional storage or work areas needed for operations under this Contract.

E. Limit site disturbance, including earthwork and clearing of vegetation, to 40 feet (12.2 m) beyond building perimeter; 10 (3.0 m) feet beyond surface walkways, patios, surface parking, and utilities less than 12 inches (300 mm) in diameter; 15 feet (4.5 m) beyond primary roadway curbs and main utility branch trenches; and 25 feet (7.62 m) beyond constructed areas with permeable surfaces (such as pervious paving areas, stormwater detention facilities, and playing fields) that require additional staging areas to limit compaction in the constructed area.

1.5 CONTRACTOR STAGING AREA REQUIREMENTS

A. Contractor Staging Areas: Provisions will be made for Contractor Staging Area at Pre-Construction Conference.
   1. Contractor shall use only site areas designated specifically by Owner as Contractor Staging Area for the Project.
   2. Contractor Staging Area for the Project shall be clearly indicated or marked by signage. Contractor shall remove equipment placed or located outside of areas designated for Contractor Staging Area to within Contractor Staging Area at no change in Contract Time and Contract Sum.
   3. Contractor shall keep access to Contractor Staging Areas and other construction access ways and thoroughfares clear at all times. Contractor shall provide traffic and parking control signage acceptable to Owner's Representative.

B. Cleanliness: Contractor shall keep Contractor Staging Area clear of trash and debris and in neat order. Contractor shall be responsible for cleanliness and order of assigned Contractor Staging Areas, as acceptable to Owner.

1.6 OWNER OCCUPANCY

A. Owner will occupy site and premises during entire construction period for conduct of his (or her) normal operations.

B. Cooperate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.

C. Schedule the Work to accommodate this requirement.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 012113
CASH ALLOWANCES

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements governing allowances.
   1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation. If necessary, additional requirements will be issued by Change Order.

B. Types of allowances may include the following:
   1. Lump-sum allowances.
   2. Unit-cost allowances.
   3. Quantity allowances.
   4. Contingency allowances.

1.2 RELATED DOCUMENTS

A. Section 012976 - Payment Procedures for procedures for submitting and handling Change Orders for allowances.

B. Section 012213 - Unit Prices for procedures for using unit prices.

C. Section 014000 - Quality Requirements for procedures governing the use of allowances for testing and inspecting.

D. Divisions 02 through 49 Sections for items of Work covered by allowances.

1.3 ACTION SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

1.4 INFORMATIONAL SUBMITTALS

A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.

C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.5 COSTS INCLUDED IN ALLOWANCES

A. Net cost of product to Contractor or subcontractor, less applicable trade discounts.

B. Delivery to site.

C. Applicable taxes.

1.6 CONTRACTOR COSTS INCLUDED IN CONTRACT SUM

A. Products handling at site including unloading, uncrating and storage.

B. Protection of products from elements and from damage.

C. Labor for installing and finishing.

D. Other expenses required to complete installation.

E. Contractor's and subcontractors' overhead and profit.

F. Premiums for bonds and insurance, permit fees and directly attributable costs of supervision and field office personnel.

1.7 ARCHITECT/ENGINEER RESPONSIBILITIES

A. Consult with Contractor in consideration of products, suppliers and installers.

B. Select products, obtain Owner's written decision and transmit full information to Contractor:
   1. Manufacturer, product, model or catalog number, accessories, attachments and finishes.
   2. Supplier and installer as applicable.
   3. Cost to Contractor, delivered to site and installed.

1.8 CONTRACTOR RESPONSIBILITIES

A. Assist Architect/Engineer in determining qualified suppliers and installers; obtain proposals when requested.

B. Make appropriate recommendations for Architect/Engineer consideration.

C. Promptly notify Architect/Engineer of any reasonable objections against supplier or installer.

D. On notification of selection execute purchase agreement with designated supplier and installer.

E. Arrange for and process shop drawings, product data and samples.

F. Arrange for delivery. Promptly inspect products for completeness, damage and defects. Submit claims for transportation damage.

G. Install, adjust and finish products.

H. Provide warranties for products and installation.

I. Notify Architect/Engineer promptly of anticipated effect on construction schedule by selections under consideration.

J. Designate in construction progress schedule delivery dates for items specified under each allowance.

K. Decide quantities required where applicable.

L. Comply with referenced specification sections for installation.

M. Include in Contract Sum allowances stated in Contract Documents.

1.9 ADJUSTMENT OF COSTS

A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
   1. Include installation costs in purchase amount only where indicated as part of the allowance.
   2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other margins claimed.
   3. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 SCHEDULE OF LUMP SUM ALLOWANCES

A. Electrical Service Connection Fees charged by Cumberland Electric Membership Corporation. Conduit, trenching, installation and concrete performed by the Contractor are not covered by the allowance and shall be figured in the Contractors Base Bid. Include in the Base Bid the allowance of $ 5,000.00.

B. Water Tap and Meter fee charged by Adams Cedar Hill Utility District for the ¾" water service and meter connection; include in the Base Bid the allowance of $1,500.

END OF SECTION

SECTION 012213
UNIT PRICES

PART 1 GENERAL

1.1 DEFINITION

A. Unit price is a price per unit of measurement for materials or services added to or deducted from the Contract Sum by appropriate modification, if estimated quantities of Work required by the Contract Documents are increased or decreased.

B. The total price resulting from the estimated quantities shall be included in the Contract Sum.

C. Each Unit Price multiplied by its Base Quantity constitutes an allowance included in the Contract Sum.

1.2 AUTHORITY

A. Measurement methods delineated in individual specification sections are intended to complement criteria in this section. In the event of conflict, requirements of individual specification section shall govern.

B. Take all measurements and compute quantities.

C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

1.3 UNIT QUANTITIES SPECIFIED

A. Quantities set forth in Bid Form are estimates. They are the basis on which bids will be compared and Contract Sum decided. Include Unit Price items in the Contract for Construction.

B. Payment will be made for Work actually done and measured. Owner reserves right to increase or decrease quantities indicated.

C. Keep a daily log of actual quantities of specified work units encountered, consumed, or expended. When submitting an application for payment which includes payment for Unit Price items, provide Designer a copy or report of the log which is acceptable to Designer. Actual quantities and the Contractor’s log are subject to verification by Designer.

D. Continuously monitor the consumption of each Base Quantity and the associated use of the allowance and the anticipated use to complete the Work. Do not exceed an allowance.

E. If actual Work requires more or fewer quantities than those quantities indicated, provide required quantities at unit sum/prices contracted.

F. Unit Prices for other Work are subject to negotiation between Owner and Contractor.

G. If cumulative adjustments fall below or exceed, or are expected to fall below or exceed, a cumulative twenty five percent (25%) of the Base Quantity, either party to the Contract may initiate renegotiation for a new unit price. Such a new unit price shall be made a part of the Contract by appropriate Modification, and will apply to adjustments which exceed a cumulative twenty five percent (25%) of the Base Quantity and have not already been made.

H. Final Contract Sum will be adjusted by Change Order to reflect actual quantities for Unit Price Items.

1.4 SUBMITTAL REQUIREMENTS

A. Submit data substantiating measurements of quantities in such detail as Architect/Engineer may require with Applications for Payment.

B. Architect/Engineer reserves right to check measurements of quantities of materials in place and to request further substantiating data from Contractor for purposes of confirming Contractor's Applications for Payment.

1.5 PAYMENT

A. Payment Includes: Full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of Work; overhead and profit, premiums for bonds and insurance, permit fees, taxes and directly attributable costs of supervision and field office personnel.

B. Final payment for Work governed by unit prices will be made on the basis of actual measurements and quantities accepted by Architect/Engineer multiplied by the unit sum/price for Work which is incorporated in or made necessary by Work.

1.6 DEFECT ASSESSMENT

A. Replace Work, or portions of Work, not conforming to specified requirements.

B. If, in the opinion of the Architect/Engineer, it is not practical to remove and replace Work, Architect/Engineer will direct one of the following remedies:
   1. Defective Work may remain, but unit sum/price will be adjusted to a new sum/price at the discretion of the Architect/Engineer.
   2. Defective Work will be partially repaired to the instructions of the Architect/Engineer and the unit sum/price will be adjusted to a new sum/price at the discretion of the Architect/Engineer.

C. Individual specification sections may modify these options or may identify a specific formula or percentage sum/price reduction.

D. The authority of the Architect/Engineer to assess the defect and identify payment adjustment, is final.

1.7 NON-PAYMENT FOR REJECTED PRODUCTS

A. Payment will not be made for any of the following:
   1. Products wasted or disposed of in a manner that is not acceptable.

2. Products decided as unacceptable before or after placement.
3. Products not completely unloaded from the transporting vehicle.
4. Products placed beyond the lines and levels of required Work.
5. Products remaining on hand after completion of Work.
6. Loading, hauling and disposing of rejected Products.

1.8 SCHEDULE OF UNIT PRICE ITEMS

A. Item No. 1 – Over excavation and fill as indicated in Section 312000 - Earthwork.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 012300
ALTERNATES

PART 1 GENERAL

1.1 SUBMISSION REQUIREMENTS

A. Submit Alternates with full description of the proposed Alternate and the affect on adjacent or related components.

B. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in the Owner-Contractor Agreement.

C. Coordinate related work and modify surrounding work to integrate the Work of each Alternate.

1.2 SELECTION AND AWARD OF ALTERNATES

A. Indicate variation of Bid Price for Alternates described below and list in Bid Form Document or any supplement to it, which requests a 'difference' in Bid Price by adding to or deducting from the base bid price.

B. Bid may be evaluated on base bid price. After determination of preferred bidder, consideration will be given to Alternates and Bid Price adjustments.

1.3 SCHEDULE OF ALTERNATES

A. Alternate No. 1 – Double Bituminous Surface Treatment, including materials and installation of bituminous material and aggregate for cover material, two applications of each, in accordance with Section 321216 - Bituminous Concrete Paving.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 012500
SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. This Section includes administrative and procedural requirements for
   1. Product substitutions; and comparable products.

1.2 RELATED DOCUMENTS

A. Section 016000 - Product Requirements for requirements for submitting comparable product submittals for products by listed manufacturers.

1.3 DEFINITIONS

A. Products Specified by Reference Standards or by Description Only: Any product meeting those standards or descriptions.

B. Products Specified by Naming One or More Manufacturers with a Substitute Paragraph or the words, “or equal”: Submit a request for substitution for any manufacturer not specifically named.

C. Products Specified by Naming Several Manufacturers without a Substitute Paragraph or the words, “or equal”: Products of named manufacturers meeting specifications; no options, no substitutions allowed.

D. Products Specified by Naming Several Manufacturers with a Substitute Paragraph and the words, "None Permitted": Products of named manufacturers meeting specifications; no options, no substitutions allowed.

E. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

F. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

G. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers. Specified manufacturers, other than Basis of Design manufacturer, shall provide custom color, profile, and pattern as required to match Basis of Design manufacturer’s color and pattern.

1.4 LIMITATIONS ON SUBSTITUTIONS

A. Only within 30 days after date of Owner-Contractor Agreement, will Architect/Engineer consider requests from Contractor for substitutions. Subsequently, substitutions may be considered only when a product becomes unavailable because of no fault of Contractor.

B. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals without separate written request, when requested directly by subcontractor or supplier, or when acceptance will require substantial revision of Contract Documents.

C. Substitute products shall not be ordered or installed without written acceptance.

D. Only one request for substitution will be considered for each product. When substitution is not accepted, provide specified product.

E. Architect/Engineer will decide acceptability of proposed substitution and will notify Contractor of acceptance or rejection in writing within a reasonable time.

1.5 REQUESTS FOR SUBSTITUTIONS

A. Submit separate request for each substitution. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.

B. Identify product by Specifications section and Article numbers. Provide manufacturer's name and address, trade name of product and model and catalog number. List fabricators and suppliers appropriate.

C. Attach product data as specified in Section 013300.

D. List similar projects using product, dates of installation and names of Architect/Engineer and Owner.

E. Give itemized comparison of proposed substitution with specified product, listing variations in quality, performance, durability, appearance and size. Reference to Specifications section and Article numbers.

F. Give comparison between proposed substitution and specified product including differences in composition and physical and chemical properties.

G. Give cost data comparing proposed substitution with specified product and amount of net change to Contract Sum.

H. List availability of maintenance services and replacement materials.

I. State effect of substitution on construction schedule and changes required in other work or products.

J. Notify Architect/Engineer when Contractor is aware of materials, equipment, or products that meet the aesthetic and programmatic intent of Contract Documents but that are more environmentally sensitive than materials, equipment or products specified or indicated in the Contract Documents. Substitutions under this provision are not subject to the 30 day cut-off time indicated above.

1.6 SUBSTITUTION SUBMITTAL PROCEDURES

A. Submit electronic (PDF) copy of request for substitution on Form 016232 to Architect/Engineer via email.

B. Architect/Engineer will review Contractor's requests for substitutions with reasonable promptness.

C. During the Bidding Period, Architect/Engineer will record acceptable substitutions in Addenda.

D. After award of Contract, Architect/Engineer will notify Contractor, in writing, of decision to accept or reject requested substitution with reasonable promptness.

E. For accepted products, submit shop drawings, product data and samples; follow Section 013000.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 012600
CONTRACT MODIFICATION PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.

B. Related Documents:
1. Section 012113 - Allowances for procedural requirements for handling and processing allowances.
2. Section 012213 - Unit Prices for administrative requirements for using unit prices.
3. Section 012500 - Substitution Procedures for administrative procedures for handling requests for substitutions made after Contract award.

1.2 MODIFICATION SUBMITTALS

A. Submit name of the individual authorized to receive change documents and be responsible for informing others in Contractor's use or Subcontractors of changes to the Work.

B. Change Order Forms: AIA G701 Change Order.

1.3 DOCUMENTATION OF CHANGE IN CONTRACT SUM/PRICE AND CONTRACT TIME

A. Maintain detailed records of work done on a time and material basis. Provide full information required for evaluation of proposed changes and to substantiate costs of changes in the Work.

B. Document each quotation for a change in cost or time with sufficient data to allow evaluation of the quotation.

C. On request, provide additional data to support computations:
1. Quantities of products, labor and equipment.
2. Taxes, insurance and bonds.
3. Overhead and profit.
4. Justification for any change in Contract Time. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
5. Credit for deletions from Contract, similarly documented.

D. Support each claim for additional costs and for work done on a time and material basis, with additional information:
1. Origin and date of claim.
2. Dates and times work was done and by whom.
3. Time records and wage rates paid.
4. Invoices and receipts for products, equipment and subcontracts, similarly documented.

1.4 CHANGE PROCEDURES

A. The Architect/Engineer will advise of minor changes in the Work not involving an adjustment to Contract Sum/Price or Contract Time as authorized by AIA A201 by issuing supplemental instructions on AIA Form G710 or other form as approved by Architect.

B. The Architect/Engineer may issue a Proposal Request which includes a detailed description of a proposed change with supplementary or revised Drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor will prepare and submit an estimate within 4 days.

C. The Contractor may propose a change by submitting a request for change to the Architect/Engineer, describing the proposed change and its full effect on the Work, with a statement describing the reason for the change and the effect on the Contract Sum/Price and Contract Time with full documentation and a statement describing the effect on Work by separate or other contractors. Document any requested substitutions; follow Section 016000.

D. Do not perform changes in the Work without an appropriately approved and executed Change Order or Construction Change Directive. The Owner will not pay for work performed by the Contractor or grant time extensions without an appropriately approved and executed Change Order or Construction Change Directive.

E. Refer to the Article on Change Orders in ITB Section 009/Contract.

1.5 CONSTRUCTION CHANGE DIRECTIVE

A. Architect/Engineer may issue a document, signed by the Owner, instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

B. The document will describe changes in the Work and will designate method of determining any change in Contract Sum/Price or Contract Time.

C. Promptly execute the change in Work.

1.6 STIPULATED SUM CHANGE ORDER

A. Based on Proposal Request and Contractor's fixed price quotation or Contractor's request for a Change Order as approved by Architect/Engineer.

1.7 UNIT PRICE CHANGE ORDER

A. For pre-decided unit prices and quantities, the Change Order will be executed on a fixed unit price basis.

B. For unit costs or quantities of units of work which are not pre-decided, execute Work under a Construction Change Directive.

C. Changes in Contract Sum/Price or Contract Time will be computed as specified for Time and Material Change Order.

1.8 TIME AND MATERIAL CHANGE ORDER

A. Submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.

B. Architect/Engineer will decide the change allowable in Contract Sum/Price and Contract Time as provided in the Contract Documents.

C. Maintain detailed records of work done on Time and Material basis.

D. Provide full information required for evaluation of proposed changes and to substantiate costs for changes in the Work.

1.9 EXECUTION OF CHANGE ORDERS

A. Execution of Change Orders: Architect/Engineer will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

1.10 CORRELATION OF CONTRACTOR SUBMITTALS

A. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum/Price.

B. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change and resubmit.

C. Promptly enter changes in Project Record Documents.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 012623
WEATHER DELAYS FOR OUTDOOR PROJECTS

PART 1 GENERAL

1.1 EXTENSIONS OF CONTRACT TIME

A. If the basis exists for an extension of time due to adverse weather conditions per the General Conditions, then the following provisions shall be observed.

1.2 STANDARD BASELINE FOR AVERAGE CLIMATIC CONDITIONS - TENNESSEE

A. Standard Baseline for Tennessee 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 Baseline is included in the Work and is not eligible for extension of Contract Time.

B. An extension of time because of weather may be granted only for the number of Weather Delay Days more than the number of days listed as the Standard Baseline for that month. The Owner has reviewed weather data from the National Oceanic and Atmospheric Administration and decided a Standard Baseline of average climatic range for the State of Tennessee.

STANDARD BASELINE FOR [NASHVILLE,] TENNESSEE					
Jan	Feb.	Mar	Apr.	May	June
12	11	12	11	11	9
July	Aug.	Sep.	Oct.	Nov.	Dec.
10	9	8	7	10	11

1.3 ADVERSE WEATHER AND WEATHER DELAY DAYS

A. Adverse weather means the occurrence of one or more of the following conditions that prevent exterior construction activity or access to the site within twenty-four hours:
1. Precipitation (rain, snow, or ice) more than 0.10 inch liquid measure.
2. Temperatures that do not rise above 32 degrees F by 10:00 a.m.
3. Temperatures that do not rise above that specified, if any, for the day's construction activity by 10:00 a.m.
4. Sustained wind more than 15 m.p.h.
5. Standing snow more than one inch.

B. Adverse Weather may include, if appropriate, "dry-out" days:
1. resulting from precipitation days that occur beyond the standard baseline;
2. only if there is a hindrance to site access and Contractor has taken all reasonable accommodations to avoid such hindrance; and,
3. at a rate no greater than one (1) make-up day for each day or consecutive days of precipitation beyond the standard baseline that total five-tenths inch (0.5 “) or more, liquid measure, unless specifically recommended otherwise by the Designer.

C. A Weather Delay Day may be counted if the official local Weather Bureau forecast is predicting a greater than thirty percent (30%) chance of the occurrence of adverse weather thereby causing the Contractor to determine that, in his professional opinion, it would be in the Owner's best interest not to perform any work that day that could result in possible damage to the interior of the structure or injury to its contents or occupants.

D. A Weather Delay Day may be counted if adverse weather prevents work on the project for 50 percent or more of the contractor's scheduled work day, including a weekend day or holiday if Contractor has scheduled construction activity that day.

1.4 DOCUMENTATION AND SUBMITTALS

A. Submit daily job site work logs showing which construction activities and to what extent activities have been affected by weather monthly.

B. To support claim for time extension submit actual weather data for the months involved obtained from nearest NOAA weather station or other independently verified source approved by Architect/Engineer at beginning of Project.
   1. Submit hourly data to support claims.
   2. Weather delay claims will not be permitted when conditions prompting claims did not occur during regular working hours.

C. Use Standard Baseline data for Tennessee provided in this Section when documenting actual delays because of weather more than the average climatic range.

D. Organize claim and documentation to simplify evaluation on a basis of calendar month periods, and submit following the procedures for claims established in the General Conditions.

E. If an extension of the Contract Time is appropriate, it shall be effected following the provisions of the General Conditions, and the applicable General Requirements.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 012976
PAYMENT PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

B. Related Documents:
1. Section 012113 – Cash Allowances for procedural requirements for handling and processing allowances.
2. Section 012213 - Unit Prices for administrative requirements for using unit prices.
3. Section 012500 - Substitution Procedures for administrative procedures for handling requests for substitutions made after Contract award.
4. Section 012600 – Contract Modification Procedures for administrative procedures for handling changes to the Contract.
5. Section 013000 – Administrative Procedures for administrative requirements governing preparation and submittal of Contractor's Construction Schedule and Submittals Schedule.

1.2 SCHEDULE OF VALUES

A. Submit typed schedule on AIA Form G703. Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule. After review by Architect/Engineer revise and resubmit as needed to respond to Architect/Engineer's review comments. Submit revised schedule with each Application for Payment, reflecting changes since previous submittal.

B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:
   a. Application for Payment forms with Continuation Sheets.
   b. Submittals Schedule.
   c. Contractor's Construction Schedule.
2. Submit the Schedule of Values to Architect at earliest possible date but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
   a. Include separate line items under Contractor and principal subcontracts for Project closeout requirements in an amount totaling five percent of the Contract Sum and subcontract amount.
4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
5. Identify separate line items for general conditions costs such as overhead, administrative, procedural and temporary items, mobilization, bonds, insurance, final cleaning, operation and maintenance manuals, record documents and facility start-up/commissioning.
6. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.

C. Provide a sub-schedule for each separate stage of Work.

D. As construction progresses revise schedule to list change orders with each application for payment as separate line items. Do not include costs or time changes to the Contract without an appropriate, executed Change Order or Construction Change Directive.

E. If the Contractor fails to submit the progress schedule within the time prescribed or the updated monthly schedule within the requested time, the Owner may withhold approval of progress payment estimates until such time as the Contractor submits the required progress schedules.

F. Revise Schedule of Values to Architect's satisfaction at any time during construction regardless of stage or percent complete. Revise as needed to respond to Architect's review comments. Submit revised schedule with next Application for Payment, reflecting changes since previous submittal.

1.3 APPLICATION FOR PAYMENT FORMAT

A. AIA G702 - Application and Certificate for Payment and AIA Document G703, Continuation Sheet. Computer generated versions of G702 are not acceptable. Computer generated versions of Continuation Sheet following exact format and wording of original may be acceptable if approved by Architect/Engineer in advance.

B. For each item, provide a column for listing the following:
1. Item Number
2. Description of work
3. Scheduled value, Previous Applications
4. Work in Place and Stored Materials under this Application
5. Authorized Change Orders
6. Total Completed and Stored to Date of Application
7. Percentage of Completion
8. Balance to Finish
9. Retainage.

1.4 APPLICATION FOR PAYMENT PREPARATION

A. Type required information. Execute certification by signature of authorized officer.

B. Use data on accepted Schedule of Values. Provide dollar value in each column for each line item for portion of Work done and for stored products.

C. List each authorized Change Order as an extension on continuation sheet, listing Change Order number and dollar amount as for an original item of Work.

D. Prepare Application for Final Payment as specified in Section 017300.

1.5 PAYMENT SUBMITTAL PROCEDURES

A. Transmit one "pencil" or draft copy of Application for Payment to Designer 5 days before actual Application is due. Designer will review and may return to Contractor with comments and other items in need of correction.

B. Submit six copies of each Application for Payment and updated Progress Schedule at times stipulated in Agreement.

C. Submit under transmittal letter as specified in Section 013000.

1.6 SUBSTANTIATING DATA

A. When Architect/Engineer requires substantiating information, submit data justifying line item amounts in question.

B. Provide one copy of data with cover letter for each copy of submittal. Show Application number and date and line item by number and description.

C. For materials stored off-site:
1. Statement identifying where materials are stored, and assuring that materials are tagged to identify them for use in the project.
2. Bill of sale for materials claimed.
3. Certificate of insurance covering materials claimed, recognizing Owner's right to make claims.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 013000
ADMINISTRATIVE PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Coordinating construction operations on Project.
   1. Administrative and supervisory personnel.

B. Documenting the progress of construction during performance of the Work.
   1. Contractor's Construction Schedule.

C. Paperless contracting.

D. Requests for Information (RFIs).

1.2 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
   1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.
   2. Predecessor Activity: An activity that precedes another activity in the network.
   3. Successor Activity: An activity that follows another activity in the network.

B. Cost Loading: The allocation of the Schedule of Values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum, unless otherwise approved by Architect/Engineer.

C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

E. Event: The starting or ending point of an activity.

F. Float: The measure of leeway in starting and completing an activity.
   1. Float time belongs to Owner.
   2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
   3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

G. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.

H. Major Area: A story of construction, a separate building, or a similar significant construction element.

I. Milestone: A key or critical point in time for reference or measurement.

J. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.

K. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

L. RFI: Request from Owner, Architect/Engineer, or Contractor seeking information required by or clarifications of the Contract Documents.

1.3 INFORMATIONAL SUBMITTALS

A. Contractor's Construction Schedule: Submit electronically via pdf, large enough to show entire schedule for entire construction period.

B. Construction Schedule Updating Reports: Submit with Applications for Payment.

C. Site Condition Reports: Submit at time of discovery of differing conditions.

D. Special Reports: Submit at time of unusual event.

E. Qualification Data: For scheduling consultant.
1. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting, with capability of producing CPM reports and diagrams within 24 hours of Architect/Engineer request.

1.4 REQUESTS FOR INFORMATION (RFIs)

A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, prepare and submit an RFI in the form specified.
1. Architect/Engineer will return RFIs submitted to Architect/Engineer by other entities controlled by Contractor with no response.
2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
1. Project name.
2. Project number.
3. Date.
4. Name of Contractor.
5. Name of Architect/Engineer.
6. RFI number, numbered sequentially.
7. RFI subject.
8. Specification Section number and title and related paragraphs, as appropriate.
9. Drawing number and detail references, as appropriate.
10. Field dimensions and conditions, as appropriate.
11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, state impact in the RFI.
12. Contractor's signature.

C. RFI Forms: Software-generated form with substantially the same content as indicated above, acceptable to Architect/Engineer.
1. Attachments shall be electronic files in Adobe Acrobat PDF format.

D. Architect/Engineer's Action: Architect/Engineer will review each RFI, determine action required, and respond. Allow ten working days for Architect/Engineer's response for each RFI. RFIs received by Architect/Engineer after 1:00 p.m. will be considered as received the following working day.

E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number.

F. On receipt of Architect/Engineer's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect/Engineer within seven days if Contractor disagrees with response.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 SUBMITTALS SCHEDULE

A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.

B. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.

C. Submit preliminary outline Schedules within 10 days after date of Owner-Contractor Agreement for coordination with Owner's requirements. After review, submit detailed schedules within 10 days modified to accommodate revisions recommended by Architect/Engineer.

3.2 CONSTRUCTION SCHEDULE

A. Bar-Chart Schedule: Submit preliminary horizontal bar-chart-type construction schedule within seven days of date established for commencement of the Work.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 60 days of construction.

3.3 COORDINATION DESCRIPTION

A. Coordinate scheduling and work of the various sections of Specifications to ensure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items to be installed later.

B. Coordinate sequence of Work to accommodate Owner occupancy.

C. Coordinate with Owner 72 hours in advance of anticipated interruptions to utilities service.

D. Coordinate with Owner 72 hours in advance of anticipated operations which are loud or noisy or which will generate disturbing quantities of structure born noise or vibration such as jack hammering or core drilling.

E. Interior finishes: Schedule construction operations with consideration for indoor air quality.

3.4 COORDINATION OF DOCUMENTS

A. Coordinate, collate and maintain sets of all Addenda, RFP's, and other forms of modification to Contract Documents with all required Contract Document sets.

3.5 COORDINATION OF CONTRACT CLOSEOUT

A. Coordinate completion and cleanup of work of separate sections in preparation for Substantial Completion.

B. After Owner occupancy of premises, coordinate access to site by various sections for correction of defective work and work not following Contract Documents, to minimize disruption of Owner's activities.

C. Assemble and coordinate closeout submittals specified in Section 017821 – Closeout Submittals and 017700 – Closeout Procedures.

3.6 PAPERLESS CONTRACTING

A. Architect/Engineer is committed fully to electronic commerce and paperless contracting initiatives. As such, correspondence, meeting minutes, field reports, requests for information (RFI's), requests for proposals (RFP's), Architect/Engineer's supplemental instructions (ASI's), cost itemizations, change orders, submittals (incoming and outgoing), digital photography, specifications, drawings, and other documents will be issued using electronic methods, i.e., electronic mail (e-mail) and project information management software by Newforma, Inc., Manchester, NH (www.newforma.com, 1.603.625.6212).

B. Have and maintain internet capability to send and receive documents in this manner. The Contractor will not be required to purchase Newforma Software, but will be given access to HFR, Inc Newforma's Info Exchange Server which is a WEB based interface. The Contactor as external project team member, through the HFR, Inc. Info Exchange Server enables external (as well as internal) project team members to:
   1. Use a Web browser to view and download uploaded file transfers sent to them by other project team members.
   2. Upload file transfers to selected project team members using a Web browser.
   3. View a transmittal log containing all incoming and outgoing file transfers that they were a part of.

C. Participate fully in this requirement at no additional cost to the Owner.

D. Architect/Engineer will not use Contractor's project management software.

END OF SECTION

SECTION 013119
PROJECT MEETINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Project meetings.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 PRECONSTRUCTION CONFERENCE

A. Architect/Engineer will schedule conference within 15 days after notice of award.

B. Attendance: Owner, Architect/Engineer and Contractor.

C. Agenda:
1. Distribution of Contract Documents.
2. Submittal of list of subcontractors, list of products, Schedule of Values, submittals schedule and progress schedule.
3. Designation of responsible personnel.
4. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal requests, change orders and Contract closeout procedures.
5. Scheduling.
6. Use of premises by Owner and Contractor.
7. Owner's requirements and occupancy.
8. Survey and building layout.
9. Security and housekeeping procedures.
10. Procedures for testing.
11. Procedures for maintaining record documents.
12. Requirements for startup of equipment.
13. Inspection and acceptance of equipment put into service during construction period.

3.2 PROGRESS MEETINGS

A. Schedule and administer construction progress meetings, called meetings and pre-installation conferences, monthly throughout progress of Work.

B. Make physical arrangements for meetings, prepare agenda with copies for participants and distribute notice of meeting to participants and to Architect/Engineer, four days in advance of meetings.

C. Preside at meetings, record minutes and distribute copies within a reasonable amount of time to Architect/Engineer, participants and those affected by decisions made.

D. Location of Meetings: Contractor's field office.

E. Attendance: Job superintendent, major subcontractors and suppliers; Owner and Architect/Engineer as appropriate to agenda topics for each meeting.

F. Minimum Agenda:
1. Approval of minutes of previous meetings.
2. Review of Work progress.
3. Field observations, problems and decisions.
4. Identification of problems which impede planned progress.
5. Review of submittals schedule and status of submittals.
6. Review of off-site fabrication and delivery schedules.
7. Maintenance of progress schedule.
8. Corrective measures to regain projected schedules.
9. Planned progress during succeeding work period.
10. Coordination of projected progress.
11. Maintenance of quality and work standards.
12. Effect of proposed changes on progress schedule and coordination.
13. Other business relating to Work.

3.3 CLOSEOUT MEETING

A. Convene closeout meeting at work site two weeks prior to Substantial Completion to review requirements for completion of Contract and to obtain submittal of necessary final documents.

B. Attendance is required of entities directly affecting, or affected by, work of the Section.

C. Notify Architect/Engineer four days in advance of meeting date.

D. Preside at meetings, record minutes and distribute copies within two days after meetings to participants, with two copies to Architect/Engineer.

G. Minimum Agenda:
1. Starting systems.
2. Testing, adjusting, and balancing.
3. Demonstration and training.
4. Contractor’s inspection of the Work.
5. Contractor’s preparation of an initial punch list.
6. Procedure to request Designer’s inspection to determine date of Substantial Completion.
7. Completion time for defective work.
8. Inspections by Authorities Having Jurisdiction.
9. Certificate of use or occupancy and transfer of insurance responsibilities.
10. Partial release of retainage.
11. Final cleaning.
12. Preparation for final inspection.
13. Closeout submittals.
14. Contractor’s demobilization of site.
15. Operations and Maintenance Manuals.

END OF SECTION

SECTION 013300
SUBMITTALS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Administrative and procedural requirements for submitting shop drawings, product data, samples, and other submittals.

B. Submittals Schedule.

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information that requires responsive action from Architect/Engineer. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."

B. Informational Submittals: Written and graphic information that does not require responsive action from Architect/Engineer. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

1. In accordance with General Conditions, the Architect/Engineer is not expected to take responsive action on Informational Submittals; however, when requested by the Contractor, Architect/Engineer will acknowledge receipt.

1.3 SUBMITTAL PROCEDURES

A. General: Electronic copies of CAD floor plan Drawings of the Contract Drawings will be provided by Designer for Contractor's use in preparing submittals upon receipt of an executed Electronic Data Release Form and fee, if required, by Architect/Engineer.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination

C. Deliver physical submittals to Designer at address listed on cover of Project Manual.

D. Deliver electronic copies of submittals to email address of Architect/Engineer or to extranet location designated for this Project.

E. Identify each submittal item with the following information:

1. Project Name and Location,
2. Architect/Engineer name, address, and job number,
3. Contractor,
4. Subcontractor,

5. Supplier and manufacturer,
6. Pertinent Drawing Sheet and Detail Number, and
7. Specification Section Number.

F. Deviations from Contract Documents, if any. Highlight, encircle, or otherwise specifically identify deviations from the Contract Documents on submittals.

G. Submittals which lack required identification information will be returned to Contractor with no action taken. No extensions in Contract time will be granted because of delays caused by Contractor's failure to follow procedure.

H. Transmit each item under AIA Form G810 or Designer-accepted transmittal form.

I. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and cloud or otherwise clearly indicate extent of revision.
3. Resubmit submittals until they are marked with approval notation from the Architect/Engineer with appropriate action stamp.

J. Upon receipt of approval, distribute print copies of approved drawings to affected trades. All affected trades shall cooperate in preparation of composite drawings to assure proper coordination.

PART 2 PRODUCTS

2.1 ACTION SUBMITTALS

A. General: Prepare and submit Action Submittals required by individual Specification Sections.
1. Submit electronic submittals directly to extranet specifically established for Project.

B. Submittals Schedule: Submit electronically via pdf. Arrange the following information in a tabular format:
1. Scheduled date for first submittal.
2. Specification Section number and title.
3. Submittal category (action or informational).
4. Name of subcontractor.
5. Description of the Work covered.
6. Scheduled date for Architect/Engineer’s final release or approval.
7. Scheduled date for fabrication.

C. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:
a. Manufacturer's written recommendations.
b. Manufacturer's product specifications.
d. Standard color charts.
e. Manufacturer's catalog cuts.
f. Wiring diagrams showing factory-installed wiring.
g. Printed performance curves.
h. Operational range diagrams.

i. Mill reports.
j. Standard product operation and maintenance manuals.
k. Compliance with specified referenced standards.
l. Testing by recognized testing agency.
m. Application of testing agency labels and seals.
n. Notation of coordination requirements.

4. Submit Product Data before or concurrent with Samples.
5. Number of Copies: Submit electronic copies of Product Data, unless otherwise indicated. Architect/Engineer will return copies. Print and mark up and retain one returned copy as a Project Record Document.
6. Do not submit manufacturer's specifications or installation instructions. Installation instructions and specifications will be returned to Contractor without review.

D. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base shop drawings on reproductions of the Contract Documents or standard printed data, unless submittal of CAD Drawings belonging to Architect/Engineer are otherwise permitted.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
a. Dimensions in US standard units such as feet and inches, pounds, and cubic feet per minute. Drawings that are submitted with metric measurements alone will be summarily rejected.
b. Identification of products.
c. Fabrication and installation drawings.
d. Roughing-in and setting diagrams.
e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
f. Shopwork manufacturing instructions.
g. Templates and patterns.
h. Schedules.
i. Design calculations.
j. Compliance with specified standards.
k. Notation of coordination requirements.
l. Notation of dimensions established by field measurement.
m. Relationship to adjoining construction clearly indicated.
n. Seal and signature of professional engineer if specified.
o. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings formatted electronically on sheets at least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 24 by 36 inches.
3. Number of Copies: Submit electronic copies of shop drawings, unless otherwise indicated. Architect/Engineer will return copies. Print and mark up and retain one returned copy as a Project Record Document.

E. Application for Payment: Comply with requirements specified in Section 012976 - Payment Procedures.

F. Schedule of Values: Comply with requirements specified in Section 012976 - Payment Procedures.

G. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
1. Name, address, and telephone number of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.

3. Drawing number and detail references, as appropriate, covered by subcontract.
4. Number of Copies: Submit pdfs of subcontractor list, unless otherwise indicated. Architect/Engineer will return copies.
   a. Mark up and retain one returned copy as a Project Record Document.

2.2 INFORMATIONAL SUBMITTALS

A. General: Prepare and submit Informational Submittals required by other Specification Sections.
   1. Number of Copies: Submit electronic copies of each submittal, unless otherwise indicated. Architect/Engineer will not return copies.
   2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
   3. Test and Inspection Reports: Comply with requirements specified in Section 014000 - Quality Requirements.

B. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.

C. Contractor's Construction Schedule: Comply with requirements specified in Section 013000 – Administrative Procedures.

D. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.

E. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

F. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

G. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
   1. Name of evaluation organization
   2. Date of evaluation
   3. Time period when report is in effect
   4. Product and manufacturers' names
   5. Description of product
   6. Test procedures and results.
   7. Limitations of use

H. Schedule of Tests and Inspections: Comply with requirements specified in Section 014000 - Quality Requirements.

I. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

J. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

K. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

L. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

M. Material Safety Data Sheets (MSDSs): Submit information directly to Owner if specifically required by Owner; do not submit to Architect/Engineer.
   1. Architect/Engineer will not review submittals that include MSDSs and will return the entire submittal for resubmittal.

PART 3 EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect/Engineer.

B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 COORDINATION OF SUBMITTALS

A. Schedule and coordinate specified submittals and work of the various sections of Specifications to ensure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items to be installed later.

B. Coordinate work of various sections having interdependent responsibilities for installing, connecting to and placing in service, such equipment.

C. Coordinate requests for substitutions to ensure compatibility of space, of operating elements and effect on work of other sections.

D. In instances where submittals affect the work of more than one trade, prepare and submit composite drawings which indicate and define the work under all affected trades, and obtain Designer approval.

E. Do not include proposed changes on shop drawings or other submittals; none will be considered approved under any circumstances. Even if a reviewed shop drawing or other submittal has

deviations from the Contract Documents, a submittal is not a Change Order and will not be considered to be an approval of such change or Contract deviation.

3.3 NONCOMPLYING SUBMITTALS

A. Submittals not in compliance with this Section will be returned by Architect/Engineer to Contractor for re-submittal with appropriate deficiencies noted. Time extensions will not be allowed for returned non-complying submittals.

B. The Designer will not review more than two submittals on any one item.

C. General: Architect/Engineer will not review submittals that do not bear Contractor's approval stamp and will return them without action.

D. Action Submittals: Architect/Engineer will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect/Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken.

E. Informational Submittals: Architect/Engineer will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect/Engineer will forward each submittal to appropriate party.

F. Partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.

G. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

H. Indicate surrounding materials and construction for coordination purposes. Submittals that do not adequately address installation specifics into project will be rejected.

I. “By Others”: Submittals which contain the words, “by others,” or other words which, in the sole opinion of the Architect/Engineer, by their interpretation could be taken to mean that individual components of the Work are not in contract, will be considered as non-compliant and will be returned to the Contractor without action.
   1. No delays or time extensions will be granted to the Contractor for failure to comply with this provision.
   2. The Architect/Engineer’s actions in this regard will be final and will not be subject to further review under provisions of arbitration or mediation.

END OF SECTION

SECTION 014000
QUALITY REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Administrative and procedural requirements for quality assurance and quality control.

1.2 RELATED SECTIONS

A. Section 014533 - Special Inspections and Procedures.

1.3 CONFLICTING REQUIREMENTS

A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect/Engineer for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect/Engineer for a decision before proceeding.

1.4 QUALITY CONTROL, GENERAL

A. Maintain quality control over suppliers, manufacturers, products, services, site conditions and workmanship, to produce work of specified quality.

B. Comply with manufacturers' written instructions and recommendations, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Perform work by persons qualified to produce workmanship of specified quality.

F. Provide submittals, test reports, certificates, and other quality control items as indicated on Structural Drawings under “Structural Quality Assurance Plan.”

G. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

H. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration and racking.

1.5 TOLERANCES

A. Monitor fabrication and installation tolerance control of Products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.

C. Adjust Products to appropriate dimensions; position before securing Products in place.

1.6 REFERENCES AND STANDARDS

A. For Products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard by date of issue current on date of Contract Documents, date for receiving bids, date of Owner-Contractor Agreement when there are no Bids, date specified in the individual specification sections, except where a specific date is established by code.

C. Obtain copies of standards where required by product specification sections.

D. Neither the contractual relationships, duties, nor responsibilities of the parties in Contract nor those of the Architect/Engineer shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

E. When required by individual Specifications section, obtain copy of standard. Maintain copy at jobsite during submittals, planning and progress of the specific work, until Substantial Completion.

F. Should specified reference standards conflict with Contract Documents, request clarification from Architect/Engineer before proceeding. Use Section 016364 when requesting information from the Architect/Engineer.

1.7 TESTING AND SPECIAL INSPECTION AGENCY SERVICES

A. Services of independent testing agency(ies), special Inspections, structural observations, and load testing during construction shall be paid for by Contractor. Laboratory shall perform inspections, tests and other services required by various Specification sections.

B. Firm used and personnel used to perform tests shall be approved in writing by Architect/Engineer.

C. Tests shall be done under direction of engineer registered in state in which Project is located.

D. Reports shall be submitted to Architect/Engineer in duplicate giving observations and results of tests, indicating compliance or non-compliance with specified standards and with Contract Documents.

E. Cooperate with Testing agency personnel. Furnish tools, samples of materials, design mix, equipment, storage and assistance as requested.
   1. Notify Architect/Engineer and Testing agency 48 hours prior to expected time for operations requiring testing services.
   2. Make arrangements with Testing agency and pay for additional samples and tests for Contractor's convenience.

F. Inspecting may occur on or off the project site. Perform off-site inspecting as required by the Architect/Engineer or the Owner.

G. Inspecting and testing does not relieve Contractor to perform Work to contract requirements.

H. Testing agency shall provide a letter on its letterhead addressed to Owner and signed by a signatory to the Testing agency certifying the fact that all testing required under this Contract has been completed. Include this letter with closeout documents under Section 017821 – Closeout Submittals and 017700 – Closeout Procedures.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.

B. Verify that existing substrate will structurally support new Work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Verify that utility services are available, of the correct characteristics, and in the correct locations.

3.2 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

END OF SECTION

SECTION 015000
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. This Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

1.2 TEMPORARY ELECTRICITY

A. Cost: By Contractor; provide and pay for power service required from utility source.

B. Provide power outlets for construction operations, with branch wiring and distribution boxes located as needed for construction purposes. Provide flexible power cords as needed for construction purposes.

C. Provide main service disconnect and overcurrent protection at convenient location.

D. Permanent convenience receptacles may be utilized during construction.

E. Do not "daisy-chain" temporary electrical wiring.

1.3 TEMPORARY WELDING

A. Perform welding per NFPA 51B.

B. Ground welding equipment as near as possible to welding electrode. Take ground wire from welding equipment, along with positive wire, to work site. Wires shall be loosely twisted. Welding ground shall be within 5'-0" or length of member being welded, whichever is less.

C. Electric motor-generator type welding equipment is permissible. Restrict welding to within a fabricated wire cage that is grounded and used in conjunction with an inductive choke in series. Use a radio frequency interference (RFI) choke within 1.5m (4'-11").

D. Do not "daisy-chain" welding leads. Route welding leads directly to construction enclosure where they are to be used.

E. Connect conduit, pipes and ducts entering and leaving construction enclosure to shielding material.

1.4 TELEPHONE SERVICE

A. Provide, maintain and pay for cellular telephone service for the superintendent. Provide electronic communication service, including electronic mail, in common-use facilities.

1.5 SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures.

B. Materials may be new or used, adequate for purpose, which will not create unsanitary conditions. Comply with ANSI Z4.3.

C. Toilet Facilities: Enclosed portable self-contained units or temporary water closets and urinals, secluded from public view. Provide separate facilities for men and women.

D. Provide facilities at time of site mobilization.

E. Clean areas of facilities daily, maintain in sanitary condition. Provide toilet paper, paper towels and soap in suitable dispensers.

F. Remove temporary facilities prior to Substantial Completion.

1.6 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas to allow for Owner's use of site, and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Protect non-owned vehicular traffic, stored materials, site and structures from damage.

C. Protect plant growth and trees scheduled to remain from injuries because of construction activities resulting in damage such as mechanical injuries and chemical poisoning. Provide a fenced in protection zone posted with signs to prevent activities within zone. Replace damaged plant life.
   1. If drip line is less than 9’-11” from trunk of tree then provide protection zone with a 10 feet radius around tree.
   2. If drip line is 10 feet or more, then provide protection zone equal to limits of critical root zone or a minimum distance of one and one-half times drip line radius, as measured from trunk of protected tree.

D. Do not perform operations involving concrete or gypsum board such that run off from either of these will soak into existing tree root systems. Do not spill wood preservative products such as pentachlorophenol into tree root areas. Do not clean paint brushes and tools over tree roots. Keep trees free of nails, screw eyes, and other fastening devices. Use posts, not trees, for signs, electrical wires and pulleys.

E. Renovate turf damaged during construction per Division 32 section “Seeding”.

1.7 WATER CONTROL

A. Grade site to drain. Maintain excavations and site free of standing water. Provide and operate drainage and pumping equipment.

B. Protect site from puddling or running water.

C. Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.

D. Minimize quantity of bare soil exposed at one time. Provide temporary measures such as berms, dikes and drains, to prevent water flow.

E. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

F. Take appropriate measures to ensure that detergents, paints, solvents, adhesives, oils, and other toxic hazardous substances do not get into soil and sediment separators.

G. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.

H. Stormwater Control: Comply with authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of storm water from heavy rains.

1.8 PROTECTION OF INSTALLED WORK

A. Provide temporary and removable protection for installed products. Control traffic in immediate area to minimize damage.

1.9 SECURITY

A. Provide security and facilities to protect Work, and Owner's operations from unauthorized entry, vandalism, or theft.

B. Coordinate with Owner's security program.

C. Protect Work from theft, vandalism, and unauthorized entry. Initiate program at project mobilization.

D. Maintain program throughout construction period until Owner occupancy.

1.10 ACCESS ROADS

A. Construction Exit: Stone-stabilized pad located at point(s) where traffic will be leaving site to public roadway.
   1. Excavate exit area 3” deep and clear area of vegetation and roots.
   2. Provide geotextile fabric full length and width of exit.
   3. Aggregate Size: ASTM D448, Size #1, 1-1/2” to 3-1/2” diameter stone, washed and well graded, 8” thick minimum.
   4. Pad Width: Full width of all points of vehicular access, 20 feet minimum.
   5. On sites where grade toward public roadway is greater than 2%, provide a waterbar diversion, 6”– 8” high with 3:1 side slopes, across construction exit foundation. Direct diverted run off to sediment trap or sediment basin.
   6. Inspect exit at end of each work day.
   7. Maintain exit in a condition that will prevent tracking or flow of material onto public rights-of-way.
   8. Immediately remove all materials spilled, dropped, washed, or tracked from vehicles or site onto roadways or into storm drains.

B. Designated existing on-site roads may be used for construction traffic.

C. Temporary roads shall follow natural contour of terrain where practical.

D. Do not cross streams without written permission from United States Army Corps of Engineers and appropriate state and local authorities.

E. Traffic Controls: Comply with requirements of authorities having jurisdiction.
   1. Protect existing site improvements to remain including curbs, pavement, and utilities.
   2. Maintain access for fire-fighting equipment and access to fire hydrants.

F. Do not perform vehicle maintenance activities on site.

1.11 PARKING

A. Arrange with Owner for temporary surface parking areas to accommodate construction personnel on site.

1.12 PROJECT INFORMATIONAL SIGNS

A. Painted informational signs of same colors and lettering as Project Identification sign, or standard products; size lettering to provide legibility at 100 foot distance.

B. Provide at each field office, storage shed and directional signs to direct traffic into and within site. Relocate from one location to another as Work progress requires.

C. Provide applicable municipal, state and other traffic agency directional traffic signs to and within site.

1.13 STORAGE AREAS AND SHEDS

A. Storage Sheds for Tools, Materials and Equipment: Weather tight, with heat and ventilation for Products requiring controlled conditions, with adequate space for organized storage and access and lighting for inspection of stored materials.

B. Store chemicals on construction site in a weatherproof building or container, or within a containment system. Store chemicals in a centralized location. Keep spill containment and cleanup materials at chemical storage area. Do not washout or pour leftover chemicals into the storm drain system. Train employees and subcontractors on proper use, storage, and disposal of chemicals.

1.14 MAINTENANCE AND CLEANING

A. Maintain approach walks free of sand and mud, construction materials and vehicles.

B. Maintain site clean and litter free with daily cleanup. Keep stored materials in neat, well organized stacks. Maintain site free of weeds.

C. Maintain grass to maintain a reasonably neat appearance during the Project. Keep grass to a maximum height of 6 inches within construction limits.

1.15 REMOVAL OF UTILITIES, FACILITIES AND CONTROLS

A. Remove temporary utilities, equipment, facilities, materials, prior to Substantial Completion inspection.

B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.

C. Clean and repair damage caused by installation or use of temporary work.

D. Restore existing and permanent facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 PRODUCTS

2.1 EQUIPMENT

A. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations.

B. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

C. Provide adequate number of protective helmets for visitors and one outdoor weather thermometer.

2.2 TURF RENOVATION

A. Renovate turf damaged by Contractor's operations, such as storage of materials or equipment and movement of vehicles.
1. Reestablish turf where settlement or washouts occur or where minor regrading is required.
2. Install new planting soil as required.

B. Remove sod and vegetation from diseased or unsatisfactory turf areas; do not bury in soil.

C. Remove topsoil containing foreign materials, such as oil drippings, fuel spills, stones, gravel, and other construction materials resulting from Contractor's operations, and replace with new planting soil.

D. Mow, dethatch, core aerate, and rake existing turf. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required.

E. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of them off Owner's property. Till stripped, bare, and compacted areas thoroughly to a soil depth of 6 inches (150 mm).

F. Apply initial fertilizer required for establishing new turf and mix thoroughly into top 4 inches (100 mm) of existing soil. Install new planting soil to fill low spots. Apply seed and protect with straw mulch as required for new turf. Water newly planted areas and keep moist until new turf is established.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 016000
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. This Section includes administrative and procedural requirements for
   1. Selection of products for use in Project;
   2. Product delivery, storage, and handling;
   3. Manufacturers' standard warranties on products.
   4. Special warranties.

1.2 RELATED DOCUMENTS

A. Section 012500 - Substitution Procedures: Administrative and procedural requirements for product substitutions and comparable products.

1.3 DEFINITIONS

A. Products: Means new material, machinery, components, equipment, fixtures and systems forming the Work. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components required for reuse.
   1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
   2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
   3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Comply with Specifications and referenced standards as minimum requirements.

C. Components required to be supplied in quantity within a Specification section shall be the same and shall be interchangeable.

D. Do not use materials and equipment removed from existing structure, except as specifically required, or allowed, by Contract Documents.

1.4 TRANSPORTATION AND HANDLING

A. Transport products by methods to avoid product damage; deliver in undamaged condition in manufacturer's unopened containers or packaging, dry.

B. Provide equipment and personnel to handle products by methods to prevent soiling or damage.

C. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct and products are undamaged.

D. Protect building materials made of organic material or those that could absorb moisture in transit from contact with moisture and from collecting organic matter such as leaves, soil or insects.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.

B. Delivery and Handling:
1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.

C. Store products with seals and labels intact and legible. Follow manufacturer's instructions. Store sensitive products in weather-tight enclosures; maintain within temperature and humidity ranges required by manufacturer's instructions.

D. For exterior storage of fabricated products, place on sloped supports above ground. Cover products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.

E. Store loose granular materials on solid surfaces in a well-drained area; prevent mixing with foreign matter.

F. Arrange storage to provide access for inspection. Periodically inspect to ensure products are undamaged and are maintained under required conditions.

G. After installation, provide coverings to protect products from damage from traffic and construction operations, remove when no longer needed.

1.6 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.

2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.

2. Specified Form: When specified forms are included with the Specifications, prepare a written document using appropriate form properly executed.

3. Refer to Divisions 02 through 49 Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Division 01 Section "Closeout Procedures."

D. Sample warranties may be required to be submitted for informational purposes.

1. The Architect/Engineer's action or inaction on such submitted sample warranties will not change the terms of the Construction Contract between the Owner and Contractor.

2. Proposed sample warranty language does not govern over the terms of the Construction Contract between the Owner and Contractor.

PART 2 PRODUCTS

2.2 PROHIBITED MATERIALS

A. Asbestos-containing materials.

B. Urea-formaldehyde foam insulation.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 016232
SUBSTITUTION REQUEST FORM

Submitted: _____, ____
Contract Date: _____, ____

TO: HFR DESIGN, INC.
214 Centerview Dr, Ste 300
Brentwood, TN 37027
Attention: Jim Gilliam

PROJECT:
ROBERTSON CO. SOLID WASTE/RECYCLING CONVENIENCE CTR.
Cedar Hill, TN

Specification Section No. and Title: _____ - _____

Specified Item:	Proposed Substitute:
_____	_____

Provide a direct, point-by-point, comparison of the *prominent, salient characteristics* of the proposed substitute against the specified item or system. Use separate sheet if necessary. *Leaving this portion blank or simply saying "None," "No differences" or the like may result in automatic rejection of proposed substitute by the Architect/Engineer.*

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

The following are attached: (__) Catalog Data; (__) Laboratory Tests; (__) Spec Data.

1. If the proposed substitute is accepted, then it will result in:
(___) No cost impact (___) A cost increase of $_____
(___) A cost decrease of $_____
(If change in cost is indicated, then provide a breakdown on an attached sheet.)

2.This Substitution will have the following effects on dimensions, gages, weights, other physical characteristics, wiring, piping, duct work and other mechanical and electrical items:
_____

3. This Substitution will have the following effects on other trades:
_____

4. The Substitution will have the following effect on construction Schedules:
_____

5. Manufacturer's warranties for the substitute(s) and the specified product(s) are (check one): (___) The Same (___) Different (if different, then explain below)
_____

6. Names, addresses and phone numbers of fabricators and suppliers for proposed substitute(s) are provided on an attached sheet, if applicable. (___) Attached (___) Not Applicable

7. The undersigned or the firm represented shall pay for additional studies, investigations, submittals, redesign and analysis by the Architect/Engineer required by this substitution request.

8. The undersigned party affirms that no financial or business relationship of any kind exists between itself and either the Owner or the Architect/Engineer; that neither the Owner nor the Architect/Engineer have ownership in whole or in part in the firm being proposed for the Architect/Engineer's consideration;

that neither the Owner nor the Architect/Engineer represent or distribute any of the proposed products; and that there is no reasonable cause for the Architect/Engineer to suspect an Apparent Conflict of Interest exists between any of these parties.
(___) No Apparent Conflicts (___) Possible Conflict of Interest (if Possible Conflict then explain on separate sheet)

When Substitutions are requested, follow applicable Contract Document requirements. After Bidding, substitutions are to be submitted only by the General Contractor and only within 30 days after date of Owner-Contractor Agreement. Do not order or install substitute products without Architect/Engineer's written acceptance.

SUBMITTED BY:

Company Name: _____
Type or print full name: _____
Telephone: (____) _____
Full address: _____
_____
Sign Here: _____

DO NOT WRITE BELOW THIS LINE.

****

REVIEWER COMMENTS

SPECIFICATION WRITER	INITIALS	DATE	CONSULTANT	INITIALS	DATE
ACCEPTED			ACCEPTED		
ACCEPTED AS NOTED			ACCEPTED AS NOTED		
REJECTED			REJECTED		

Comments:
_____
_____

For the Architect/Engineer: Accepted (____)Rejected (___)
_____ _____
(Signature)(Date)

END OF SECTION

SECTION 016364
REQUEST FOR INFORMATION

Project		RFI No.	_____
To	HFR DESIGN, INC. 214 Centerview Dr, Ste 300 Brentwood, TN 37027	Date	_____
Re:	ROBERTSON CO. SOLID WASTE/RECYCLING CONVENIENCE CTR. Cedar Hill, TN	Contract For	_____

Specification Section: _____ Paragraph: _____ Drawing Reference: _____ Detail: _____

Request:

Contractor's Suggested Resolution:

Signed by:

Architect's Response:

☐ Attachments:

Response From: HFR DESIGN, Inc. To: _____ Date Ret'd: _____

Signed by:

Copies: ☐ Owner ☐ Consultants ☐ _____ ☐ _____ ☐ _____ ☐ _____ ☐ File

SECTION 017300
EXECUTION REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Installation of the Work.

B. Use of site.

C. Field engineering.

D. Project surveying.

E. Facility startup.

1.2 RELATED DOCUMENTS

A. Section 017405 – Cleaning: Progress Cleaning.

B. Section 017700 - Closeout Procedures for Substantial Completion procedures, Final Completion procedures, warranties, final cleaning, and repair of the Work.

C. Section 017821 - Closeout Submittals for closeout submittals, project record documents, and operating and maintenance data binders.

1.3 SUBMITTALS

A. Field Engineering:
1. Submit evidence of Surveyor E&O insurance coverage in the form of an Insurance Certificate.
2. Submit name, address and telephone number of Surveyor before starting survey work.
3. Upon request, submit documentation verifying accuracy of survey work.
4. Submit a copy of registered site drawing and a certificate signed by Surveyor certifying that elevations and locations of improvements are in conformance, or nonconformance, with Contract Documents.
5. On completion of major site improvements, prepare a certified survey illustrating dimensions, locations, angles and elevations of construction and site work.

1.4 SURVEYOR QUALIFICATIONS

A. Employ a Land Surveyor registered in the State in which Project is located and acceptable to Architect/Engineer.

PART 2 PRODUCTS

Not applicable.

PART 3 EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, and other construction affecting the Work.
   1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
   2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
   1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
   2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
   3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
   1. Description of the Work.
   2. List of detrimental conditions, including substrates.
   3. List of unacceptable installation tolerances.
   4. Recommended corrections.

D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

3.3 USE OF SITE

A. Lands and Rights-of-Way: The Owner will furnish land and rights-of-way necessary for carrying out and completion of Work herein contemplated. The Owner will acquire said land and rights-of-way with reasonable promptness. If lands and rights-of-way are not obtained as herein contemplated before construction begins, then begin the Work upon such land and rights-of-way as the Owner may have acquired previously. No claim for damages at all will be allowed because of delay in obtaining remaining lands and rights-of-way.

B. Should the Owner be prevented or enjoined from proceeding with the Work, or from authorizing its prosecution, either before or after commencement, because of litigation, or because of the Owner's inability to obtain lands or rights-of-way for said Work, do not make claims for damage because of said delay, or withdraw from Contract except by consent of the Owner. Time for completion of Work will be extended to such time as the Owner decides will compensate for time lost by such delay, such determination to be set forth in writing.

3.4 WORK ON OR NEXT TO PRIVATE PROPERTY

A. Concerning Work done on or next to private property, take every precaution to avoid damage to owners' buildings, grounds and facilities. Be responsible for repair of damage to same. Carefully remove and protect fences, hedges, shrubs and other site items within construction limits. Install original hedges, shrubs and other site items when construction is completed.

B. Where ditches or excavations cross lawns, carefully remove sod before construction and replace sod when backfilling has been completed. If sod is damaged or not handled properly, replace it with new sod equal to existing sod at no additional expense to the Owner. Grade, fertilize and seed grassed areas, other than lawns, when construction is completed. Follow requirements set out in these Specifications. Restore private property owners' facilities and grounds to as good as or better than their original condition when construction is completed.

C. Remove large trees, or other facilities within actual construction limits that cannot be preserved and replaced. The Owner will assume responsibility for settling with property owner for loss of said trees or facilities within construction area. The trees and facilities to be removed will be designated on Drawings. Be solely and entirely responsible for damage to trees or facilities not so designated.

D. Support foundations next to an excavation that is to be carried below bottom of foundation by shoring, bracing, or underpinning. Be responsible for damage to said foundation.

3.5 WORK IN AN EASEMENT

A. Do not store equipment of any kind in easement without prior written consent of easement land owner. Be responsible for obtaining written approval from land owner and providing one copy to Owner.

B. Storage of equipment in easement shall be limited to period necessary to complete work on the line segment within easement.

C. Perform a pre-construction survey before beginning work in easement. Provide a copy of pre-construction survey with pictures to each effected property owner and Architect/Engineer.

3.6 FIELD ENGINEERING

A. Maintain complete, accurate log of control and survey work as it progresses. Verify locations of survey control points prior to starting work. Promptly notify Architect/Engineer of any discrepancies discovered.

B. Existing basic horizontal and vertical control points for the Project are those designated on Drawings.

C. Protect survey control points prior to starting site work and preserve permanent reference points during construction. Make no changes or relocations without prior written notice to Architect/Engineer.

D. Promptly report to Architect/Engineer the loss or destruction of any reference point or relocation required because of changes in grades or other reasons. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect/Engineer.

3.7 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
   1. Make vertical work plumb and make horizontal work level.
   2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
   3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
   4. Maintain minimum headroom clearance of 96 inches (2440 mm) in occupied spaces and 90 inches (2300 mm) in unoccupied spaces.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading more than that expected during normal conditions of occupancy.

E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.

F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other

portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect/Engineer.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

K. Ensure building envelope is weather-tight and permitted to dry before installation of interior walls, wood floors, ceilings or HVAC systems.

3.8 PROJECT SURVEY REQUIREMENTS

A. Establish a minimum of two permanent bench marks on site, referenced to data established by survey control points. Record locations, with horizontal and vertical data, on Project Record Documents.

B. Establish lines and levels, locate and lay out, by instrumentation and similar appropriate means:
1. Site improvements, including pavements; stakes for grading, fill and topsoil placement; utility slopes and invert elevations.
2. Batter boards for structures.
3. Building foundation, column locations and floor levels.
4. Controlling lines and levels required for mechanical and electrical trades.

C. Periodically verify layouts by same methods.

3.9 SURVEYS FOR MEASUREMENT AND PAYMENT

A. Perform surveys to decide quantities of unit cost and cost plus work, including control surveys to establish measurement lines. Notify Architect/Engineer prior to starting of work.

B. Contractor's engineer shall sign surveyor's field notes or keep duplicate field notes and shall calculate and certify quantities for payment purposes.

3.10 FACILITY STARTUP - PRELIMINARY

A. Submit preliminary schedule listing times and dates for start-up of each item of equipment in sequence two weeks prior to proposed dates. Submit manufacturer's representative reports within one week after start-up, listing satisfactory startup dates.

B. When specified in individual Sections, require manufacturer to provide authorized representative to be present at site to inspect, check and approve equipment installation prior to start-up; to supervise placing equipment in operation; and to provide a written report that equipment has been

properly installed and lubricated, is in accurate alignment, is free from any undue stress imposed by connecting lines or anchor bolts and has been satisfactorily operated under full load conditions. Follow Section 014000.

C. Verify that Project conditions comply with requirements. Verify that status of Work meets requirements for starting of equipment and systems. Coordinate sequence for start-up of various items of equipment. Notify Architect/Engineer 7 days prior to start-up of each item of equipment.

3.11 FACILITY STARTUP - ON SITE

A. Have Contract Documents, shop drawings, product data and operation and maintenance data at hand during entire start-up process. Verify that each piece of equipment has been checked for proper lubrication, drive rotation, belt tension, control sequence and other conditions which may cause damage.

B. Verify control systems are fully operational in automatic mode. Verify that tests, meter readings and specific electrical characteristics agree with those specified by electrical equipment manufacturer. Verify wiring to motors and controls required by mechanical work for operational smoke and fire protection demonstrations is complete. Verify wiring and support systems for equipment installed under separate contracts is complete and checked.

C. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.

D. Execute start-up under supervision of responsible manufacturer's representative. Place equipment in operation in proper sequence.

3.12 INSPECTION BY LOCAL GOVERNMENT AGENCIES

A. Be responsible for notification of government agencies to make required inspections. Notify Architect/Engineer 24 hours prior to inspections.

3.13 STATEMENT OF ADJUSTMENT OF ACCOUNTS

A. Prior to closeout submittals, submit final statement reflecting adjustments to Contract Sum indicating:
   1. Original Contract Sum.
   2. Previous change orders.
   3. Changes under allowances.
   4. Changes under unit prices.
   5. Deductions for uncorrected work.
   6. Deductions for reinspection fees.
   7. Other adjustments to Contract Sum.
   8. Total Contract Sum as adjusted.
   9. Previous payments.
   10. Sum remaining due.

B. Architect/Engineer will issue a final Change Order reflecting approved adjustments to Contract Sum not made previously by change orders.

3.14 APPLICATION FOR FINAL PAYMENT

A. Submit application for final payment; follow provisions of Conditions of the Contract. Final payment will not be made until closeout submittals have been received and approved by Architect/Engineer.

3.15 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturers' written instructions for temperature and relative humidity.

END OF SECTION

SECTION 017329
CUTTING AND PATCHING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Cutting and patching.

1.2 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other Work.

B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.3 QUALITY ASSURANCE

A. Structural Elements: When cutting and patching structural elements, notify Architect/Engineer of locations and details of cutting and await directions from Architect/Engineer before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.

B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
   1. Primary operational systems and equipment.
   2. Communication systems.
   3. Electrical wiring systems.

C. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect/Engineer's opinion, reduce the building's aesthetic qualities. Remove and provide new construction that has been cut and patched in a visually unsatisfactory manner.

D. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

E. Obtain Architect/Engineer approval prior to cutting or fitting any area not indicated where appearance, strength and integrity of work may be impaired.

PART 2 PRODUCTS

2.1 MATERIALS FOR CUTTING AND PATCHING

A. Primary Products: Those required for original installation. Do not incorporate salvaged or used materials in new construction except with permission of Architect/Engineer.

B. Product Substitution: For any change in materials, submit request for substitution.

C. New Materials: As specified in individual Product Sections. Match existing products and work for patching and extending work.

D. Decide type and quality of existing products by inspection and any necessary testing and workmanship by use of existing as standard. Presence of a product, finish, or type of work, requires that patching, extending, or matching shall be done as necessary to make Work complete and consistent with existing quality.

PART 3 EXECUTION

3.1 EXAMINATION FOR CUTTING AND PATCHING

A. Inspect existing conditions, prior to commencing Work, including elements subject to damage or movement during cutting and patching.

B. After uncovering existing Work, inspect conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.2 PREPARATION FOR CUTTING AND PATCHING

A. Provide supports to ensure structural integrity of the Work. Provide devices and methods to protect other portions of Project from damage. Provide protection from elements for areas which may be exposed by uncovering work. Maintain excavations free of water.

B. Cut, move or remove items as necessary for access to alterations and renovation Work to proceed. Replace and restore at completion. Remove unsuitable materials not marked for salvage, such as abandoned furnishings and equipment, rotted wood, rusted metals and deteriorated masonry and concrete. Replace materials as specified for finished work.
   1. Unbolt bolted connections. Unscrew screw connections.
   2. Do not pry apart members whose finish will thereby be damaged by chipping, crazing, or cracking, or whose structural integrity will thereby be impaired.
   3. Do not remove nails from woodwork from the finished or exposed side. Drive nails through or pull from the back so the head does not splinter the finished face.

C. Remove debris and abandoned items and items serving no useful purpose, such as abandoned piping, conduit and wiring from concealed and exposed spaces. Prepare surfaces and remove surface finishes to provide for proper installation of new work and new finishes.

D. Close openings in exterior surfaces to protect existing work and salvage items from weather and extremes of temperature and humidity.

E. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.

3.3 CUTTING AND PATCHING

A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
   1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Execute cutting, fitting and patching including excavation and fill, to complete Work and to:
   1. Fit the several parts together, to integrate with other work.
   2. Uncover work to install ill-timed work.
   3. Remove and provide new defective and non-conforming work.
   4. Remove samples of installed work for testing.
   5. Provide openings in non-structural elements for penetrations of mechanical and electrical work.
   6. Repair openings in non-structural elements left by removal of mechanical and electrical work.

C. Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage other Work and which will provide proper surfaces to receive patching and finishing. Cut rigid materials using masonry or core drill. Pneumatic tools will not be allowed without prior approval. Where new utility lines are indicated at existing walls and partitions, cut existing walls so as to embed utilities inside walls; patch walls after lines are installed for a neat, sanitary condition.

D. Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Restore work with new products. Follow requirements of Contract Documents. Fit work airtight to pipes, sleeves, ducts, conduit and other penetrations through surfaces.

E. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection. For an assembly, refinish entire unit.

F. Perform work on existing materials still under warranty in such a manner that does not void Owner's warranty. Coordinate work of alterations and renovations to expedite completion.

G. Perform cutting and removal work to remove minimum necessary and in a manner to avoid damage to adjacent work.

H. Install products as specified in individual Sections.

I. Inspect, repair, and/or replace existing accessible insulation within areas of renovation.

J. In areas of renovation, if existing lined ductwork to remain is reworked, then reseal liner seams and punctures.

3.4 TRANSITIONS

A. When new Work abuts or finishes flush with existing work, make a smooth and even transition. Patched Work shall match existing adjacent Work in texture and appearance so that the patch or transition is invisible at a distance of five feet.

B. When finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and provide trim appropriate to finished surface. Where new openings are cut into existing masonry walls, tooth new masonry into existing masonry.

3.5 REPAIR OF DAMAGED SURFACES

A. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections, with matching material. Repair substrate prior to patching the finish.

3.6 FINISHES

A. Finish surfaces as specified in individual Products Sections.

B. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

C. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

3.7 PROTECTION

A. Protect existing finishes, equipment and adjacent work which are scheduled to remain, from damage.

END OF SECTION

SECTION 017405
CLEANING

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for the following:
   1. Progress cleaning.

B. Related Document: Section 017700 - Closeout Procedures for final cleaning.

PART 2 PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 EXECUTION

3.1 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.
   1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
   2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F (27 deg C).
   3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, per regulations.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
   1. Remove liquid spills promptly.

D. Installed Work: Keep installed work clean. Clean installed surfaces per written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

F. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

G. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

H. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

I. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

END OF SECTION

SECTION 017600

PROTECTION OF INSTALLED CONSTRUCTION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes protection of installed construction.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturers' written instructions for temperature and relative humidity.

END OF SECTION 017600

SECTION 017700

CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
   1. Substantial Completion procedures.
   2. Final Completion procedures.
   3. Warranties.
   4. Final cleaning.
   5. Repair of the Work.

1.2 RELATED DOCUMENTS

A. Section 017821 - Closeout Submittals for closeout submittals, project record documents, and operating and maintenance data binders.

1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
   1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
   2. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
   3. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
   4. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs, damage or settlement surveys, property surveys, and similar final record information.
   5. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
   6. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
   7. Complete startup testing of systems.
   8. Submit test/adjust/balance records.
   9. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
   10. Advise Owner of changeover in heat and other utilities.
   11. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
   12. Complete final cleaning requirements, including touchup painting.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.4 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
   1. Submit a final Application for Payment per Division 01 Section "Payment Procedures."
   2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
   3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
   4. Submit pest-control final inspection report and warranty.
   5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
   1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.5 REINSPECTION FEES

A. Should status of completion of Work require reinspection by Architect/Engineer because of failure of Work to comply with Contractor's claims on initial inspection, Owner will deduct the amount of Architect/Engineer compensation for reinspection services from final payment to Contractor.

1.6 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit electronic copies of list (pdfs). Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
   1. Organize list of spaces in sequential order.
   2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
   3. Include the following information at the top of each page:
      a. Project name.
      b. Date.
      c. Name of Architect.
      d. Name of Contractor.
      e. Page number.

1.7 SUBMITTAL OF PROJECT WARRANTIES

A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
   1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
   2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
   3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

C. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
   1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
      a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances. Remove tree tags.
      b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
      c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
      d. Remove tools, construction equipment, machinery, and surplus material from Project site.
      e. Leave Project clean and ready for occupancy.

C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

3.2 REPAIR OF THE WORK

A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
   1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
   2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.
   3. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
   4. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
   5. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 017700

SECTION 017821
CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Closeout submittals.

B. Project record documents.

1.2 RELATED DOCUMENTS

A. Section 017700 - Closeout Procedures for Substantial Completion procedures, Final Completion procedures, warranties, final cleaning, and repair of the Work.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.1 CLOSEOUT SUBMITTALS

A. Prior to release of retainage submit the following:
   1. Evidence of Compliance with Requirements of Governing Authorities.
      a. Certificate of Occupancy.
      b. Certificates of Inspection required for mechanical and electrical systems.
   2. Project Record Documents.
   3. Operation and Maintenance Data.
   4. Warranties and Bonds.
   5. Evidence of Payment and Release of Liens following Conditions of the Contract - AIA Document G706A. A Release of Liens from each major subcontractor and supplier shall be attached to this document. The Contractor, at his (or her) option, may provide a bond in the amount of monies owed to subcontractors and suppliers for retainage. Each subcontractor and supplier shall confirm the amount owed by affidavit attached to the bond.
   6. Consent of Surety to Final Payment - AIA Document G707.
   7. Affidavit of Payment of Debts and Claims - AIA Document G706.
   8. Certificates of Insurance for Products and Completed Operations: Follow Supplementary Conditions.
   9. Project Contact List.

B. In addition to hard copies of required information, submit required information in PDF format, on a CD or series of CD's with the following folder structure:
   1. 01 Record Drawings
   2. 02 Project Contact List

3. 03 Warranties and Lien Waivers
4. 04 Permits, Letters of Completion, and AHJ Approval Documents
5. 05 Approved Submittals and Shop Drawings

C. Organize folders for 05 Approved Submittals and Shop Drawings and 06 O&M Manuals into sub-folders broken down by CSI division to which they pertain.

D. Zip files are not permitted.

3.2 PROJECT RECORD DOCUMENTS

A. In addition to requirements in General Conditions, maintain at the site for Owner one record copy of:
1. Contract Drawings.
2. Specifications.
3. Addenda.
4. Change Orders and other modifications to the Contract.
5. Reviewed shop drawings, product data and samples.
6. Field test records.
7. Inspection certificates.
8. Manufacturer's certificates.
9. Progress Schedule

B. Store Record Documents and Samples in Field Office apart from documents used for construction. Provide files, racks and secure storage for Record Documents and Samples.

C. Label and file Record Documents and Samples. Follow number listings in Table of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.

D. Maintain Record Documents in a clean, dry and legible condition. Do not use Record Documents for construction purposes.

E. Keep Record Documents and Samples available for inspection by Architect/Engineer.

3.3 RECORDING OF PROJECT RECORD DOCUMENTS

A. Promptly following Notice to Proceed, print and pay for one complete set of opaque drawings and a copy of the Project Manual comprising Contract Documents.

B. Record information on opaque drawings and in Project Manual.

C. Provide felt tip marking pens, maintaining separate colors for each major system, for recording information.

D. Record information concurrently with construction progress. Do not conceal any work until required information is recorded.

E. Contract Drawings and Shop Drawings: Legibly mark each item to record actual construction, including:
1. Measured depths of elements of foundation in relation to finish first floor datum.
2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of construction.
4. Field changes of dimension and detail.
5. Changes made by Modifications.
6. Details not on original Contract Drawings.
7. References to related shop drawings and Modifications.

F. Project Manual: Legibly mark each item to record actual construction, including:
1. Manufacturer, trade name and catalog number of each product actually installed, particularly optional items and substitute items.
2. Changes made by Addenda and Modifications.
3. Submit Project Manual digitally in PDF files with indicated PDF file naming convention. Submit Project Manual as one PDF file with each specification book marked.

G. Other Documents: Maintain manufacturer's certifications, inspection certifications, field test records, required by individual Specifications.

END OF SECTION

SECTION 024119

SELECTIVE STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Demolition and removal of selected site elements.

1.2 CLOSEOUT SUBMITTALS

A. Accurately record actual locations of capped utilities, subsurface obstructions and related items.

1.3 QUALITY ASSURANCE

A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project; 5 years' minimum experience.

1.4 REGULATORY REQUIREMENTS

A. Conform to applicable code for demolition work, dust control, products requiring electrical disconnection and re-connection, and related items.

B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Standards: Comply with ANSI A10.6 and NFPA 241.

D. Obtain required permits from authorities.

1.5 SCHEDULING

A. Schedule Work to precede new construction.

B. Perform noisy, ill-smelling, dusty, and similar work at times convenient to Owner.

1.6 EXISTING CONDITIONS

A. Conduct demolition to minimize interference with Owner's normal operations and with adjacent areas. Maintain protected egress and access at all times.

B. Notify Architect/Engineer of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

C. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations. Maintain fire-protection facilities in service during selective demolition operations.

1.7 PROCEDURAL REQUIREMENTS FOR HAZARDOUS MATERIALS

A. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
   1. If hazardous materials are suspected or encountered, immediately suspend work in suspected area of contamination, withdraw from area and notify Architect/Engineer and Owner in writing.
   2. Comply with requirements of EPA, Code of Federal Regulations, National Emissions Standards and OSHA regulations on hazardous materials and all other applicable Federal, State and local government regulations which are incorporated by reference.
   3. Do not resume work in affected area except by written agreement of Owner if material is hazardous and has not been rendered harmless.
   4. Resume work in affected area if material is found not to be hazardous materials or has been rendered harmless, by written agreement of Owner.
   5. Contractor will not be required to perform Work relating to hazardous materials without appropriate Change Order.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine products or materials before installation. Reject products or materials that are wet, moisture damaged, or mold damaged.

B. Verify that utilities have been disconnected and capped.

C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

D. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

E. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect/Engineer.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems: Maintain services/systems indicated to remain and protect them against damage during selective demolition operations.
   1. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.
   2. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and authorities having jurisdiction.
      a. Provide at least 72 hours' notice to occupants of affected buildings if shutdown of service is required during changeover.

B. Disconnect, remove and cap designated utility services within demolition areas. Arrange to shut off indicated utilities with utility companies.

1. If services/systems are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to buildings.

C. Remove dead end piping (risers with no flow, branches with no fixture). Empty risers, mains, and branches for future use shall remain.

3.3 PREPARATION

A. Protect existing items which are not indicated to be altered.

B. Mark location of disconnected utilities. Identify and indicate capping locations on Project Record Documents.

C. Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished until new construction elements are installed.

D. Locate trash and debris stockpile areas away from streams, storm drains, sinkholes and other sensitive features. Ensure that debris containment measures are in good working condition. Pick up and dispose of trash located throughout Project. Educate employees and subcontractors about proper waste disposal.

3.4 SPECIAL TECHNIQUES, GENERAL

A. Demolish in an orderly and careful manner. Protect existing foundation, supporting structural members and utilities which are to remain.
1. Proceed with selective demolition systematically, from higher to lower level.
2. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
3. Do not use cutting torches.
4. Dispose of demolished items and materials promptly.

B. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.
1. Pre-water areas being disturbed and continue to water during activity that produces fugitive dust.
2. Appropriately match water application equipment size and rates to soil and site characteristics including area.
3. Water can be applied by any suitable means such as trucks, hoses, and/or sprinklers appropriate for site characteristics.
4. Decreased need when natural crust present.

C. Store materials prone to leaching in covered dumpsters.

D. Remove and promptly dispose of contaminated, vermin infested, or dangerous materials encountered.

E. Remove materials to be re-installed or retained in manner to prevent damage. Store and protect products; follow Section 016000.

F. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect/Engineer, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.5 SPECIAL TECHNIQUES FOR SPECIFIC MATERIALS

A. Concrete: Use abrasive saws to remove portions of concrete slabs for achieving a clean, straight edge. Use core drilling for cutting openings in concrete to allow installation of new piping. The use of impact tools is prohibited.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from site as work progresses. Upon completion of work, leave areas of work in clean condition.
   1. Do not allow demolished materials to accumulate on-site.
   2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Do not burn or bury materials on site.

C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.7 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SECTION 030500

BASIC CONCRETE MATERIALS AND METHODS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:

1. Footings.
2. Foundation walls.
3. Slabs-on-grade.
4. Building frame members.
5. Building walls.
6. Concrete toppings.

1.2 ACTION SUBMITTALS

A. Shop Drawings: Submit placing drawings of reinforcing steel per ACI Detailing Manual 315 and Manual of Standard Practice by the Concrete Reinforcing Steel Institute.

1. Indicate reinforcement sizes, spacings, locations and quantities of reinforcing steel and wire fabric bending and cutting schedules, splicing, supporting and spacing devices.
2. Indicate formwork dimensioning, materials, arrangement of joints and ties.

B. Product Data: Provide data on void form materials, form release agents, and installation requirements, vapor barriers, curing compounds, joint devices, attachment accessories, admixtures and grout, and other products of this Section.

1. Moisture Vapor Reducing Admixture: Product test reports performed by a qualified independent testing agency evidencing compliance of products with specified requirements of moisture vapor transmission based on comprehensive testing of current products.

C. Submit proposed mix design per Chapter 5 of ACI 318-Latest Edition for each class of concrete prior to commencement of work. Report should be not more than six months old. Coordinate proposed mix design with requirements/recommendations of admixture and floor slab treatment products.

1.3 INFORMATIONAL SUBMITTALS

A. Preconstruction Test Reports: For proposed mix design, cement and aggregates.

1.4 QUALITY ASSURANCE

A. Concrete Producer: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified per NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

B. Adhesive anchor installers shall be certified by the ACI/CRSI certification program.

C. Perform work per ACI 318-Latest Edition, except manual straightedge methods to determine floor slab tolerances for random traffic pattern floors will not be permitted.

D. Maintain copy of ACI 301 on site.

E. Comply with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

F. Provide reinforcing steel made in the United States of America.

1.5 REGULATORY REQUIREMENTS

A. Conform to applicable codes for site.

1.6 PRECONSTRUCTION TESTING

A. Testing and analysis of concrete shall be done by an ACI-certified Concrete Field-Testing Technician, Grade I per Section 014000.

B. Submit proposed mix design per Chapter 5 of ACI 318-Latest Edition for each class of concrete to Architect/Engineer for review prior to commencement of work. Report should be not more than six months old.

C. Test of cement and aggregates will be done to ensure conformance with requirements stated herein.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage. Avoid damaging coatings on steel reinforcement.

B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Protection: Precautions shall be taken to avoid damage or contamination of any surfaces near the work zone.

PART 2 - PRODUCTS

2.1 FORM MATERIALS AND ACCESSORIES

A. Form Materials: Conform to ACI 301; either metal or wood.

1. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

a. Plywood, metal, or other approved panel materials.

2. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

B. Form Release Agent: Colorless material which will not stain concrete, absorb moisture or impair natural bonding or color characteristics of coating intended for use on concrete.

C. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

D. Construction Joints: Galvanized steel tongue and groove joint type profile, knockout holes to receive doweling.

E. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4-inch, minimum.

2.2 REINFORCEMENT MATERIALS

A. Reinforcing Steel: ASTM A615, 60 ksi yield grade, billet steel deformed bars; uncoated finish.

1. Reinforcing Bars, 3/8-inch Diameter: 40 ksi yield grade.

B. Welded Steel Wire Fabric: Plain type, ASTM A1064/A1064M; uncoated finish.

C. Fabricate concrete reinforcing per ACI 315, ACI 318, and ASTM A1064/A1064M, and CRSI Manual of Practice.

D. Bolsters, Chairs, Spacers and Other Devices: Sized and shaped for spacing, supporting and fastening reinforcement during placement of concrete.

1. Use wire bar type supports complying with CRSI instructions, unless otherwise shown on Drawings.
2. Do not use wood, brick, or other non-complying material.
3. For slabs on grade, use precast concrete bricks having tie wires embedded therein, or individual high chairs with welded plates on bottom.
4. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with either hot-dip galvanized or plastic-protected legs.

2.3 CONCRETE MATERIALS

A. Cement: ASTM C150 normal - Type 1 Portland, gray.

B. Fine and Coarse Aggregates: ASTM C33.

C. Water: ASTM C 94, potable, clean, and not detrimental to concrete.

2.4 ADMIXTURES

A. Air Entraining Admixture: ASTM C260, with the following limits:

1. Three (3) percent for maximum 2-inch aggregate,
2. Five (5) percent for maximum 3/4-inch aggregate and
3. Six (6) percent for maximum 1/2-inch aggregate.

2.5 CURING MATERIALS

A. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet; 4 mils thick minimum; glass fiber reinforced.

B. Curing Water: Clean and drinkable.

2.6 RELATED MATERIALS

A. Expansion- and Isolation-Joint Filler: Either of the following:

1. ASTM D 1751; asphalt impregnated fiberboard or felt, 1/2 -inch-thick; tongue and groove profile.
2. Processed board product made from granular crumb rubber derived from discarded truck tires and various low-density polymer products; 40 pcf density; fully compressible with recovery rate of minimum 95 percent.

B. Joint Sealant: Semi-flexible epoxy or polyurea joint filler designed, built, and installed to fill and waterproof joints in concrete; 690 psi minimum tensile strength per ASTM D638, 55 percent minimum tensile elongation per ASTM D638, 50 Shore A hardness per ASTM D2240. Color as selected by Architect/Engineer from manufacturer's premium range.

2.7 REPAIR MATERIALS

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8-inch (3.2 mm) and that can be feathered at edges to match adjacent floor elevations.

1. Cement Binder: ASTM C 150, Portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4-inch (3.2 to 6 mm) or coarse sand as recommended by underlayment manufacturer.
4. Compressive Strength: Not less than 4100 psi (29 MPa) at 28 days when tested per ASTM C 109/C 109M.

B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8-inch (3.2 mm) and that can be feathered at edges to match adjacent floor elevations.

1. Cement Binder: ASTM C 150, Portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
2. Primer: Product of overlayment manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4-inch (3.2 to 6 mm) or coarse sand as recommended by underlayment manufacturer.
4. Compressive Strength: Not less than 5000 psi (34.5 MPa) at 28 days when tested per ASTM C 109/C 109M.

2.8 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Mix concrete per ASTM C94, Alternative No. 2.

B. Exterior Concrete:

1. Compressive Strength (28 days): 4,000 psi minimum
2. Slump: 4 inch.
3. Maximum Water-Cementitious Materials Ratio: 0.45.

C. Foundation Concrete:

1. Compressive Strength (28 days): 4,000 psi minimum.
2. Slump: 4 inches.
3. Maximum Water-Cementitious Materials Ratio: 0.45.

D. Manhole Bases:

1. Minimum Cement Content: 6.0 bags (564 lbs) per cubic yard.
2. Minimum 28-Day Compressive Strength: 4,000 psi - average of any three cylinders.
3. Slump: 4 inches.
4. Maximum Water-Cementitious Materials Ratio: 0.45.

E. Concrete Used for Water/Sewer Work: Such as manholes and manhole bases, encasement of sewer lines, man-hole drop connections and inverts, catch basin base pads, valves bases for PVC pipe and cleanout base pads.

1. Minimum Cement Content: 5.0 bags (470 lbs.) per cubic yard.
2. Minimum 28-Day Compressive Strength: 4,000 psi - average of any three cylinders.
3. Slump: 4 inches.
4. Maximum Water-Cementitious Materials Ratio: 0.45.

F. Add air entraining agent ASTM C260 to mix for concrete exposed to freeze-thaw cycling.

G. Use water reducing admixtures.

H. Calcium Chloride: Admixtures shall not exceed 0.1 percent chloride ions.

PART 3 - EXECUTION

3.1 FORMWORK ERECTION

A. Verify lines, levels and measurement before proceeding with formwork.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation and slopes, and position indicated, within tolerance limits of ACI 117.

C. Hand trim sides and bottom of earth forms; remove loose dirt.

D. Align form joints.

E. Coordinate work of other sections in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors and other inserts.

F. Chamfer exterior corners and edges of permanently exposed concrete.

G. Reuse forms to greatest extent possible without damaging structural integrity of concrete and without damaging aesthetics of exposed concrete.

3.2 FOUNDATIONS

A. Make foundations in neat lines. Foundation excavations shall be free of loose or wet materials. Concrete may be placed directly against soil without forming.

B. Have foundation excavations inspected by a geotechnical engineer before placing concrete. Ensure bearing surfaces are consistent with design requirements.

C. Where soft areas are encountered, undercut area and replace with compacted fill or concrete. Place fill in layers not to exceed 8 inches and compact to 98% Standard Proctor Density (ASTM D698).

3.3 INSERTS, EMBEDDED COMPONENTS AND OPENINGS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

B. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

C. Provide formed openings where required for work to be embedded in and passing through concrete members.

D. Coordinate work of other sections in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors and other inserts.

E. Install concrete accessories straight, level and plumb.

F. Place formed construction joint device in floor slabs. Provide #6 x 3'-0" smooth dowels at 12-inches on center across joint. Do not continue slab reinforcing across joint. Install keyways, reglets, recesses, and the like, for easy removal.

G. Place bond breaker at penetrations, isolation joints, and related items. Extend bond breaker from bottom of slab to within 1/4-inch of finished slab surface.

3.4 REINFORCEMENT PLACEMENT

A. Place, support and secure reinforcement against displacement per CRSI's "Manual of Standard Practice." Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

B. Do not cut or puncture vapor barrier. Repair damage and reseal vapor barrier before placing concrete

C. Locate reinforcing splices where indicated and required. At splices lap reinforcing steel 30 bar diameters with 2'-0" minimum and wire together.

D. Provide corner bars for bars meeting at intersections. Size and number of corner bars shall be equal to larger of bars intersecting.

E. Maintain concrete cover around reinforcing as follows:

1. Beams: 1-1/2-inches
2. Supported Slabs and Joists: 3/4-inch
3. Column Ties: 1-1/2-inches
4. Walls (below grade exterior face): 2-inches
5. Walls (below grade interior face): 3/4-inch
6. Walls (above grade): 3/4-inch
7. Footings and Concrete Formed or Cast against Earth: 3 inches
8. Footings and Concrete with Formed Edges: 2-inches
9. Slabs on Fill: 3/4-inch

3.5 PLACING CONCRETE

A. Notify Architect/Engineer minimum 24 hours prior to commencement of concreting operations.

1. Place concrete per ACI 301.
2. Hot Weather Placement: ACI 305.
3. Cold Weather Placement: ACI 306.

B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Designer.

C. Separate slabs on grade from vertical surfaces with 1/2 -inch-thick joint filler. Place joint filler in floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete. Apply sealant in floor joints per manufacturer's instructions.

D. Vibrate concrete with mechanical vibrators per ACI 301. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

E. Mixing equipment: Return excess concrete to supplier; minimize water used to wash equipment.

F. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
2. Maintain reinforcement in position on chairs during concrete placement.
3. Screed slab surfaces with a straightedge and strike off to correct elevations.
4. Slope surfaces uniformly to drains where required.

5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

3.6 FORM REMOVAL

A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.

B. Remove formwork progressively and per code requirements.

3.7 FLOOR FINISHING

A. Place floor slabs in pattern as indicated on Drawings.

B. Control Joints: Saw cuts shall be 1/8 -inch-wide by 1/4th the slab thickness, one inch deep minimum. Commence saw cutting as soon as finished concrete can be cut and produce a smooth edge. Complete saw cuts before 8 hours have passed after placing. Provide reinforcement in continuous joints.

1. Provide saw cut control joints on centerlines of columns or at a spacing of 30 times concrete thickness whichever is smaller.
2. Provide diamond shaped isolation joints at columns.
3. Provide control joints at other locations as indicated on Drawings.
4. The proportion of length to width ratio shall not exceed 1.5:1.0.

C. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.
2. Terminate full-width joint-filler strips not less than 1/2-inch (13 mm) or more than 1 inch (25 mm) below finished concrete surface and fill with epoxy or polyurea joint sealant as specified in this Section.
3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

D. Fill sawn joints and construction joints with sealant. All sawed joints shall be filled to full depth. Construction joints shall be filled with silica sand to a depth that will allow for not less than one inch of joint sealant. Follow manufacturer recommendations for mixing and placing and timing of installation. Razor cut bulging joints as required to finish joint flush with adjacent floor surfaces.

E. Finish surfaces as scheduled.

F. Filling-In: Fill in holes and openings left in concrete, including passage of work by other trades.

G. Equipment Bases and Foundations: Provide reinforced concrete with anchor bolts for machine and equipment bases and foundations.

H. Non-Shrink Grout: Grout column base plates, equipment bases and other locations noted on Drawings.

3.8 CURING AND PROTECTING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.

C. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

D. Cure concrete per ACI 308.1-11, by one or a combination of the following methods:

1. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12-inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

3.9 TOLERANCES - FLATNESS AND LEVELNESS

A. Consolidate, strike off and level concrete to an overall flatness and levelness value of FF 20/FL 15 and minimum local value of FF 15/FL 10 per ASTM E1155, except as indicated.

B. Pitch floors to drains 1/4-inch per foot nominal.

C. Per Section 014000, provide test results certified by an independent laboratory indicating actual flatness and levelness values achieved within 24 hours after floor is finished. Provide results of testing within 72 hours of tests.

D. Correct floor slabs failing flatness and levelness criteria by grinding, planing, skimming, re-topping, removal or replacement as required to bring flatness and levelness to within specified tolerances.

3.10 FIELD QUALITY CONTROL

A. Special inspection and testing shall be done; refer to Section 014000 and Section 014533.

B. Testing agency shall perform the following per ASTM C172, ASTM C31, ACI 318: 318: 5.6, 5.8:

1. Five (5) Concrete Test Cylinders: Not less than one test per day and taken for every 150 or less cubic yards of each class of concrete placed.
2. One (1) Additional Test Cylinder: Taken during cold weather concreting and be cured on job site under same conditions as concrete it represents.
3. Slump Test: ASTM C 143/C 143M; one test at point of placement for each composite sample or set of cylinders, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.

4. Air Content: ASTM C 231, pressure method, for normal-weight concrete; ASTM C 173/C 173M, volumetric method, for structural lightweight concrete; one test for each composite sample or set of cylinders, but not less than one test for each day's pour of each concrete mixture.
5. Weight Test: ASTM C 567, fresh unit weight of concrete; one test for each composite sample or set of cylinders, but not less than one test for each day's pour of each concrete mixture.
6. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each composite sample or set of cylinders.

C. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

D. Continuously inspect the following:

1. Bolts installed in concrete before and during concrete placement where allowable loads have been increased.
2. Welding, Reinforcing Steel
   a. Resisting flexural and axial forces per AWS D1.4 and ACI 318, 3.5.2.
   b. Shear reinforcement per AWS D1.4 and ACI 318, 3.5.2.

E. Periodically inspect the following:

1. Reinforcing per ACI 318: 3.5, 7.1-7.7.
2. Welding of reinforcing steel per AWS D1.4 and ACI 318, 3.5.2.
3. Use of required mix design per ACI 318: Ch. 4, 5.2 – 5.4.
4. Maintenance of specified curing temperature and techniques per ACI 318: 5.11 – 5.13.
5. In-situ concrete strength per ACI 318: 6.2.
6. Formwork for shape, location, and dimensions per ACI 318: 6.1.1.
7. Welding, Reinforcing Steel: Verification of weldability of reinforcing steel other than ASTM A706 per AWS D1.4 and ACI 318, 3.5.2.

F. Provide Special Inspector advanced noticed of construction milestones as follows:

1. Reinforcing Steel: Not less than 24 hours before scheduled concrete placement.
2. Structural Concrete: Minimum of 24 hours before placement of structural concrete.
3. Spread Footing Foundations: After foundation reinforcing is placed and before pouring concrete at first group foundations to be poured.

G. Test results shall be reported in writing to Architect/Engineer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests will contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

H. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

3.11 CONCRETE SURFACE REPAIRS

A. Modify or replace concrete not conforming to required lines, details and elevations.

B. Defective Concrete: Repair and patch defective areas.

C. Patching Mortar: Mix dry-pack patching mortar, consisting of one part Portland cement to two and one-half parts fine aggregate passing a No. 16 (1.18-mm) sieve, using only enough water for handling and placing.

D. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2-inch (13 mm) in any dimension in solid concrete, but not less than 1 inch (25 mm) in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
2. Repair defects on surfaces exposed to view by blending white Portland cement and standard Portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect/Engineer.

E. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, pop outs, honeycombs, rock pockets, crazing and cracks in excess of 0.016 inch (0.41 mm) wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
2. After concrete has cured at least 14 days, correct high areas by grinding.
3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer per manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
5. Correct other low areas scheduled to remain exposed with a repair overlayment. Cut out low areas to ensure a minimum repair overlayment depth of 1/4-inch (6 mm) to match adjacent floor elevations. Prepare, mix, and apply repair overlayment and primer per manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
6. Repair defective areas, except random cracks and single holes 1 inch (25 mm) or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch (19-mm) clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
7. Repair random cracks and single holes 1 inch (25 mm) or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and

loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

F. Perform structural repairs of concrete, subject to Architect/Engineer's approval, using epoxy adhesive and patching mortar.

G. Repair materials and installation not specified above may be used, subject to Architect/Engineer's approval.

H. Cleaning: Use water washing techniques. Ensure water pressure is not such as to damage off-form finish. Use of detergents or chemicals may be permitted after testing and evaluation effect on off-form finish (texture and color) by application to test panel prior to general use. Use products in dilution ratio established on test panels. All surfaces shall be rinsed thoroughly after any cleaning operation.

3.12 SCHEDULE OF FLOOR SLAB FINISHES

A. Non-slip light to medium broom finish at exterior concrete. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.

END OF SECTION

SECTION 055000

METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Steel framing and supports for applications where framing and supports are not specified in other Sections.
   2. Metal bollards.

1.2 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel per the following:

   1. AWS D1.1, "Structural Welding Code--Steel."

1.3 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication and indicate measurements on Shop Drawings.

   1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating metal fabrications without field measurements. Coordinate wall and other contiguous construction to ensure that actual dimensions correspond to established dimensions.
   2. Provide allowance for trimming and fitting at site.

1.4 COORDINATION

A. Coordinate installation of anchorages for metal fabrications. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

B. Coordinate installation of steel weld plates and angles for casting into concrete that are specified in this Section but required for work of another Section. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces, unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

C. Steel Tubing: ASTM A 500, cold-formed steel tubing.

D. Steel Pipe: ASTM A 53/A 53M, standard weight (Schedule 40), unless another weight is indicated or required by structural loads.

2.2 FASTENERS

A. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM F1554, Grade 36 (ASTM F 568M, Property Class 4.6); with hex nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.

B. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, nuts and, where indicated, flat washers; ASTM F 593 (ASTM F 738M) for bolts and ASTM F 594 (ASTM F 836M) for nuts, Alloy Group 1 (A1).

C. Anchor Bolts: ASTM F 1554, Grade 36.

1. Provide hot-dip or mechanically deposited, zinc-coated anchor bolts where item being fastened is indicated to be galvanized.

D. Eyebolts: ASTM A 489.

E. Machine Screws: ASME B18.6.3 (ASME B18.6.7M).

F. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).

G. Plain Washers: Round, ASME B18.22.1 (ASME B18.22M).

H. Lock Washers: Helical, spring type, ASME B18.21.1 (ASME B18.21.2M).

I. Cast-in-Place Anchors in Concrete: Anchors capable of sustaining, without failure, a load equal to four times the load imposed, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.

1. Threaded or wedge type; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, hot-dip galvanized per ASTM A 153/A 153M.

J. Expansion Anchors: Anchor bolt and sleeve assembly with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.

1. Material for Anchors in Exterior Locations: Alloy Group 1 (A1) stainless-steel bolts complying with ASTM F 593 (ASTM F 738M) and nuts complying with ASTM F 594 (ASTM F 836M).

2.3 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select per AWS specifications for metal alloy welded.

B. Zinc-Rich Primer: MPI #18, organic, or MPI #19, inorganic.
   1. Acceptable Products:
      a. Benjamin Moore & Co., Corotech, “Organic Zinc-Rich Primer V170-79.”
      b. Carboline Company; “Carbozinc 11 VOC.”
      c. PPG Architectural Finishes, Inc.; Amercoat, “Ameron Dimetcote 9HS D9HS,” “Dimetcote 9 Inorganic Zinc Silicate Primer D9,” or High Performance Coatings “Metalhide One-Pac Inorganic Zinc Rich Primer 97-676.”
      d. Sherwin-Williams Company (The), Protective and Marine, “Corothane I GalvaPac Zinc Primer, B65G00011,” “Zinc Clad V,” “Zinc Clad II Ethyl Silicate B69V3/B69D11,” or “Zinc Clad XI B69V11/B69D11.”
      e. Tnemec Company, Inc.; “Tneme-Zinc 90-97.”

C. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.

D. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications. Do not use grout containing calcium sulfate dehydrate, gypsum, Plaster of Paris, or calcium salt at exterior locations or interior locations subject to moisture.

2.4 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32-inch (1 mm), unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work true to line and level with accurate angles and surfaces and straight edges.

E. Weld corners and seams continuously to comply with the following:

   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.

4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts, unless otherwise indicated. Locate joints where least conspicuous.

G. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

1. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2-inches (3.2 by 38 mm), with a minimum 6-inch (150-mm) embedment and 2-inch (50-mm) hook, not less than 8 inches (200 mm) from ends and corners of units and 24 inches (600 mm) o.c., unless otherwise indicated.

2.5 METAL BOLLARDS

A. Fabricate metal bollards from Schedule 40 steel pipe.

2.6 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish metal fabrications after assembly.

2.7 STEEL AND IRON FINISHES

A. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:

1. Exteriors (SSPC Zone 1B) and Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
2. Interiors (SSPC Zone 1A): SSPC-SP 3, "Power Tool Cleaning."

B. Shop Priming: Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes and those to be embedded in concrete, sprayed-on fireproofing, or masonry, unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag bolts, and other connectors.

E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

3.2 INSTALLING METAL BOLLARDS

A. Anchor bollards in place with concrete footings. Center and align bollards in holes 3 inches (75 mm) above bottom of excavation. Place concrete and vibrate or tamp for consolidation. Support and brace bollards in position until concrete has cured.

B. Fill bollards solidly with concrete, mounding top surface to shed water.

3.3 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.

B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Division 09 painting Sections.

C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION 055000

SECTION 099000

PAINTS AND COATINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. This Section includes surface preparation and field painting of exposed exterior items and surfaces.

1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.

B. Paint exposed surfaces of pipe bollards.

1.2 ACTION SUBMITTALS

A. Submittals: Follow Section 013300.

B. Product Data: For each paint system indicated. Include primers.

1. Material List: An inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application to nomenclature indicated in this Section. Identify each material by manufacturer's catalog number and general classification.

2. Manufacturer's Information: Manufacturer's technical information, including label analysis for each coating material.

3. ***DO NOT submit Material Safety Data Sheets (MSDS)***. Submittals containing MSDS's will be rejected summarily without further consideration or review by the Architect/Engineer.

C. Samples for Verification: Submit 2 samples for each type of paint system, substrate, and in each color and gloss of topcoat indicated.

1. Submit Samples on rigid backing, 8 inches (200 mm) square minimum.

2. Step coats on Samples to show each coat required for system.

3. Label each coat of each Sample.

4. Label each Sample for location and application area.

1.3 QUALITY ASSURANCE

A. Product Manufacturer Qualifications: Company specializing in manufacturing quality paint and finish products with eight years' experience.

B. Single Source Responsibility: Provide primers and undercoat paint produced by the same manufacturer as the finish coats.

C. Applicator: A firm or individual with five years' experience experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.

D. Products of this Section shall not contain urea formaldehyde.

1.4 REGULATORY REQUIREMENTS

A. Conform to applicable code for flame/fuel/smoke rating and volatile organic compounds content requirement for products of this Section.

B. Comply with ANSI A13.1 for lettering, colors and viewing angles of identification materials, unless indicated otherwise.

C. Comply with appropriate federal, state and local regulations for lead, chromates and other heavy metals.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle products to and at site per Section 016000.

B. Deliver paint materials in sealed original, labeled containers, bearing manufacturer's name, type of paint, brand name, color designation and instructions for mixing and reducing.

C. Provide adequate storage facilities. Store paint materials at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F in well ventilated area or at temperature extremes as recommended by manufacturer.

D. Take precautionary measures to prevent fire hazards and spontaneous combustion.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Do not install products of this Section when environmental conditions are not within limits as recommended by manufacturer.

B. Maintain appropriate environmental conditions during and after installation of products of this Section.

C. Provide continuous ventilation and heating facilities to maintain surface and ambient

temperatures above 45 degrees F for 24 hours before, during and 72 hours after application of finishes.

D. Do not apply exterior coatings during rain or snow or when relative humidity is above manufacturer's recommended limits.

1.7 PROJECT CONDITIONS

A. Sequence application to the following:

1. Do not apply finish coats until paintable sealant has cured/dried per manufacturer’s recommendations.

PART 2 PRODUCTS

2.1 MATERIALS GENERAL

A. Material Compatibility: Provide primers, undercoaters, and finish-coat materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience

B. Coatings: Ready mixed except field catalyzed coatings. Pigments fully ground maintaining a soft paste consistency, readily and uniformly disperses to a complete homogeneous mixture. Good flowing and brushing properties and dries or cures free of streaks or sags.

C. Accessory Materials: Linseed oil, shellac, turpentine and other materials not specifically indicated but required to achieve the finishes specified, of high quality and approved manufacturer.

D. Stencils: Standard fiberboard stencils, prepared for required applications with letter sizes generally complying with instructions of ANSI A13.1 for piping and similar applications, but not less than 1-1/4 -inch-high letters for duct work and not less than 3/4 -inch-high letters for access door signs and similar operational instructions.

E. Stencil Paint: Standard exterior type stenciling enamel; black, except where white provides greater visual contrast on application substrate and except as otherwise indicated; brushing grade or pressurized spray can form and grade.

F. Identification Paint: Standard identification enamel of colors indicated or, if not otherwise indicated for systems, comply with ANSI A13.1 for colors.

2.2 FINISHES AND COLORS

A. Refer to schedule at end of Section for surface finish. Unless Finish Legend indicates surface is not to receive a finish, all designated surfaces shall receive the indicated finish.

2.3 SYSTEM DESCRIPTION

A. Provide primers recommended by manufacturer for indicated substrates. Provide primers tinted to match top coats or tinted using manufacturer's monochromatic gray basecoat system. Provide finish coats compatible with prime paints. Provide barrier coats over incompatible shop primers. Provide products from manufacturer's highest quality lines.

B. Provide exterior finish coats appropriate for exterior applications and designed, built, and installed to minimize fading, chalking, cracking, flaking, scaling, alligatoring, checking, wrinkling, staining, peeling and blistering.

C. Provide finished painted surfaces that are uniform in appearance, color and sheen; free of foreign material, lumps, skins, runs, sags, holidays, misses, strike through or insufficient coverage; free of drips, spatters, overspray, or spills; when viewed from 5' 0" under normal lighting conditions and viewing positions.

2.4 PAINT MATERIALS

A. Alkyd, Exterior, Gloss; performance equal to MPI 9: Alkyd resins; intended for use on new and previously painted primed exterior wood and metal surfaces, trim, doors and frames; 2.0 mils minimum dry film thickness or as recommended by manufacturer, whichever is greater; 428 g/L VOC's maximum; 33% volume solids minimum.

1. Devoe Div., PPG Paints:

    a. Devoe High Performance Coatings "Devguard 4308 Alkyd Gloss Industrial Enamel 4308"

2. Benjamin Moore:

    a. "V200 Corotech Alkyd Urethane Gloss Enamel"

3. Farrell-Calhoun: "Tuff-Boy 800 Line Interior/Exterior Industrial Gloss Enamel"

4. PPG Paints: "Porter Paints PP4210 Series Glyptex Int/Ext Gloss WR Alkyd Enamel"

5. Sherwin Williams:

    a. "Industrial & Marine Seaguard 1000 Marine Enamel, White N41W00620"

PART 3 EXECUTION

3.1 INSPECTION

A. Verify that substrate conditions are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be painted prior to commencement of work. Report any

condition that may potentially affect proper application. Do not commence until such defects have been corrected.

C. Beginning of installation means acceptance of substrate.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in “MPI Architectural Painting Specification Manual” applicable to substrates and paint systems indicated.

B. Remove or mask electrical plates, surface hardware, fittings and fastenings, prior to painting operations. Carefully store, clean and replace these items on completion of work in each area. Do not use solvent to clean hardware that may remove permanent lacquer finish.

C. Correct minor defects and clean surfaces which affect work of this Section.

D. Steel and Iron Surfaces: Prepare steel and iron surfaces per SSPC SP 1 – Solvent Cleaning by removing all visible oil, grease, soil, drawing and cutting compounds, and other soluble contaminants. Then prepare steel and iron surfaces per SSPC SP 2, Hand Tool Cleaning for concealed surfaces and SSPC SP 3, Power Tool Cleaning for exposed surfaces. Hand tool cleaning removes all loose mill scale, loose rust, and other detrimental foreign matter. It is not intended that adherent mill scale, rust, and paint be removed by this process. Mill scale, rust, and paint are considered adherent if they cannot be removed by lifting with a dull putty knife. Power Tool Cleaning removes all loose mill scale, loose rust, and other detrimental foreign matter. It is not intended that adherent mill scale, rust, and paint be removed by this process. Mill scale, rust, and paint are considered adherent if they cannot be removed by lifting with a dull putty knife).

3.3 APPLICATION

A. Apply products of this Section to surfaces as indicated in schedule at end of this Section and on Drawings. Follow manufacturer's instructions.

B. Do not apply finishes on surfaces that are not dry. Apply each coat to uniform consistency.

C. Unless indicated otherwise apply one prime coat and two finish coats to surfaces scheduled to receive finishes under this Section.

D. Each coat of paint is to be slightly darker than preceding coat unless otherwise approved by Architect/Engineer. Sand lightly between coats if required to achieve required finish. Allow each coat of finish to dry before following coat is applied, unless directed otherwise by manufacturer.

3.4 PROTECTION

A. Protect elements surrounding the work of this Section from damage or disfiguration. Repair damage to other surfaces caused by work of this Section.

B. Furnish drop cloths, shields and protective methods to prevent spray or droppings from disfiguring other surfaces.

C. Remove empty paint containers from site.

3.5 CLEANING

A. As work proceeds and upon completion, promptly remove paint where spilled, splashed or spattered. During progress of work maintain premises free from any unnecessary accumulation of tools, equipment, surplus materials and debris.

B. Collect cotton waste, cloths and material which may constitute a fire hazard, place in closed metal containers and remove from site daily. Upon completion of work leave premises neat and clean.

3.6 SURFACES TO BE FINISHED

A. Do Not Paint or Finish the Following Items:

1. Items fully factory-finished unless specifically noted.

2. Fire rating labels, equipment serial number and capacity labels.

3. Stainless steel items.

B. Paint the surfaces described below under Schedule.

C. Refer to schedule at end of Section for surface finish. All designated surfaces shall receive the indicated finish.

3.7 SHOP PRIMED ITEMS FOR SITE FINISHING

A. Metal Fabrications (Section 055000): Exposed surfaces of items such as steel bollards.

3.8 SCHEDULE EXTERIOR SURFACES

A. Ferrous Metal, Shop Primed –Gloss:

1. One coat of zinc rich primer; (touch up).

2. Two coats of Alkyd, Exterior, Gloss; finish coats.

END OF SECTION

SECTION 260100
GENERAL PROVISIONS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 WORK INCLUDED

A. Secondary power wiring and distribution system.

B. Lighting control equipment.

C. Electrical control systems and interlock wiring.

1.2 RELATED WORK

A. Foundations and pads required for equipment furnished under this division of the specifications.

B. Field painting, except such painting as is required to maintain shop coat painting and factory finish painting.

C. Electrical control systems and interlock wiring as required by mechanical drawings, specifications or manufacturer's schematics.

D. Flashing of conduits into roofing and outside walls.

1.3 QUALITY ASSURANCE

A. Comply with applicable local, state and federal codes.

B. Comply with applicable requirements of recognized industry associations which promulgate standards for the various trades.

C. Employ only qualified journeymen for this work. Employ a competent qualified electrician to supervise the work.

1.4 STANDARDS

A. Perform work specified in Division 26 in accordance with standards listed below including amendments or revisions. When these specifications are more stringent, they take precedence. In case of conflict, obtain a decision from the Designer.

B. National Fire Codes (NFPA) including, but not limited to following: NFPA-70 - National Electrical Code. 2014 Edition.

C. Applicable Codes: International Building Code. Latest Edition.

D. Should any work be construed as being contrary to or not conforming to aforementioned codes, such alleged confliction to be brought to attention of Engineer in writing ten (10) days prior to bid

date for review so that such point in question may be resolved. All work to be installed in strict conformity with applicable codes without additional cost to Owner.

E. Contractor to submit and/or file with proper authorities all necessary specifications and drawings as required by governing authorities.

1.5 SUBMITTALS

A. Within fifteen (15) days after contract has been awarded, Contractor to submit to Designer for review a complete list of materials, equipment, and accessories proposed for use, listing the item and manufacturer's name only.

B. Based upon aforementioned approved listing, Contractor to submit One (1) electronic PDF copy of COMPLETE BROCHURES AND SHOP DRAWINGS OF ALL MATERIALS, FIXTURES, AND EQUIPMENT that he proposes to use giving the names of manufacturers, trade name and specific catalog numbers.

C. Brochures to be submitted in time to allow fifteen (15) days from date of receipt in Engineer's office before final approval or disapproval is required to meet construction schedule. Submittals to bear Contractor's stamp of approval evidencing he has examined and checked same and information contained therein is in accordance with contract requirements, and any deviations to be clearly marked. Approval of shop drawings not to be construed as permitting departure from the contractual documents.

D. Above-mentioned brochures to be submitted and approved before any materials are ordered.

E. Brochures: Submit complete descriptions, illustrations, specification data, etc. of all materials, fittings, devices, fixtures, special systems, etc., including the following:
1. Panelboards.
2. Wiring devices and plates.
3. Motor starters and contactors.
4. Disconnect switches.
5. Enclosed circuit breakers.
6. Lighting, including lamps.

F. Proposed items to be clearly indicated when other items are shown on same sheet. When proposing items other than those specified, brochures to contain both specified item sheets and proposed item sheets for ease of comparison. On request from Designer, samples shall be submitted and/or set up, as directed, for inspection and approval. Samples will be returned to Contractor.

1.6 OPERATING AND MAINTENANCE MANUALS

A. Prior to final acceptance of the project, furnish to Owner complete bound sets of operation and maintenance manuals of instructions for operation and maintenance of all pieces of equipment and systems provided under this division of specifications.

B. Manuals to also include all submittal data on all materials and equipment. Clearly indicate items provided on this project. A list giving name and address of nearest supply house carrying spare parts and name of Installation Contractor to be given to Owner.

C. Verbally instruct Owner's representatives. Contractor to obtain letter signed by the owner's representative indicating that the in-service training has been completed.

D. Three sets of the following data are required:
   1. Operating and maintenance instructions.
   2. Spare parts lists.
   3. Copies of approved submittal data.

E. Arrange each set of data in an orderly way, and bind each set in a separate 3-ring, hard-cover binder.

F. As soon as data accumulates, prepare one of the sets and deliver to the Owner's Representative, continuously updating this set as additional data is obtained.

G. At completion of work, submit two complete sets of data to the Owner's Representative for distribution to the proper parties.

1.7 DELIVERY AND STORAGE

A. Insofar as possible, deliver items in manufacturers' original unopened packaging. Where this is not practical, cover items with protective materials, to keep them from being damaged. Use care in loading, transporting, unloading, and storage to keep items from being damaged.

B. Store items in a clean dry place and protect from damage.

C. All damaged painted surfaces of equipment to be touched up to match original paint.

1.8 RECORD DRAWINGS

A. Keep a set of blueline prints at the job site exclusively for recording deviations from the drawings.

B. Record locations and depths of buried and concealed conduits from fixed easily identifiable objects, such as building walls. Where conduits are concealed in walls, indicate distances off of building corners or other building features not likely to be disturbed by future alterations.

C. Mark deviations in colored pencils so that work of various systems can be easily identified.

D. When work is completed, record all deviations on clean sepia copies of drawings.

E. Submit three sepia copies of completed "record drawings" to Owner's Representative for distribution.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. All materials and equipment used in carrying out these specifications to be American made unless approved otherwise by the Owner and to be new and have UL listing, or listing by other

recognized testing laboratory when such listings are available. Specifications and drawings indicate name, type, and catalog numbers of materials and equipment to be used as "standards" shall not be construed as limiting competition. Contractor may at his option, use materials and equipment when, in the judgment of the Designer, they are equivalent to that specified.

PART 3 EXECUTION

3.1 COORDINATION

A. Intent:
   1. These sections of specifications and drawings form a complete set of documents for the electrical work of this project. Neither is complete without the other. Any item mentioned in one shall be as binding as though mentioned in both.
   2. The intent of these specifications and drawings is to form a guide for a complete electrical installation. Where an item is reasonably necessary for a complete system but not specifically mentioned, such as pull boxes, fittings, expansion fittings, support hangers, etc., provide same without additional cost to Owner.
   3. Electrical layouts indicated on drawings are diagrammatical only. Exact location of outlets to be governed by project conditions. The Designer reserves the right to make any reasonable changes (approximately 6 feet) in location of junction boxes, or equipment prior to roughing-in of such without additional cost to Owner.

B. Deviations:
   1. No deviations from specifications and drawings to be made without full knowledge and consent of Designer.
   2. Should Contractor find during progress of work that existing conditions make desirable a modification of the requirements of any particular item, report such item promptly to Designer for his decision and instructions.

C. Insofar as it is possible to determine in advance, leave proper chases and openings. Place all outlets, anchors, sleeves, and supports prior to pouring concrete or installation of masonry work. Should contractor neglect doing this, any cutting and/or patching required to be done is at this contractor's expense.

D. Visit site and be informed of conditions under which work must be performed. No subsequent allowance will be made because of error or failure to obtain necessary information to completely estimate and perform work involved.

E. Designer to be mediating authority in all design related deviations and disputes arising on the project.

F. Coordinate to assure that proper points of service transformer locations, voltage characteristics and capacity of service are in accordance with contract drawings.

3.2 CUTTING AND PATCHING

A. Repair or replace routine damage caused by cutting in performance of this contract.

B. Correct unnecessary damage caused due to installation of electrical work, brought about through carelessness or lack of coordination.

C. Repairs to be performed with materials which match existing materials and to be installed in accordance with appropriate sections of these specifications.

3.3 TRENCHING, EXCAVATION, BACKFILLING, AND REPAIRS

A. Provide trenching, excavation, and backfilling necessary for performance of electrical work.

B. Trenching and excavation to be unclassified. No extra will be paid in event that rock is encountered.

C. Backfilling to be carefully done using only clean earth thoroughly tamped and compacted below and above embedded items.

3.4 FOUNDATIONS AND PADS

A. Provide foundations and pads required for equipment provided under this division of specifications. Coordinate proper size and location of foundations, pads, anchor bolts, and other items to be built into structure.

B. Concrete to be in accordance with concrete division of these specifications.

3.5 TESTS

A. On completion of work, installation to be entirely free from grounds, short circuits, and open circuits. Perform a thorough operational test in presence of Owner or his representative. Balance all circuits so that feeders to panels be not more than 10% out of balance between phases with all available load energized and operating. Furnish all labor, materials and instruments for above tests.

B. Furnish Owner, as a part of closing file, a copy of such tests including identification of each circuit and readings recorded, also the main service ground test as described in Section 260526 of these specifications. Test information to be furnished to Owner includes ampere readings of all panels and major circuit breakers, insulation resistance reading of motors and transformers.

C. Prior to final observation and acceptance, test, leave in satisfactory operating condition all electrical systems and equipment including but not limited to the following:
   1. Electrical distribution system.
   2. Ground fault protection system.
   3. Electric safety devices.

3.6 INSPECTION FEES AND PERMITS

A. Obtain and pay for all necessary permits and inspection fees required for electrical installation.

3.7 IDENTIFICATION OF EQUIPMENT

A. Properly identify all starters, contactors, relays, safety switches and panels with permanently attached black (normal power) or red (essential systems) phenolic plates with 1/4" white

engraved lettering on the face of each attached, with two sheet metal screws. Starters and relays connected by the electrical tradesman to be identified by him whether furnished by him or others.

3.8 OBSERVATIONS

A. When field observation services are a part of the project scope, Engineer's office will provide periodic observation of the progress of work specified herein. Purpose of the observation is to ensure compliance of Contractor's work with specifications and drawings. Engineer's office will also observe tests required of Contractor as called for in other sections of specifications.

B. Specifications and drawings represent work to be done in view of total project requirements. Final location of conduits, fixtures, panels, switchboards, etc., to eliminate possible conflict with other trades is responsibility of Contractor. Contractor to provide all supervision required for his personnel to ensure that installation is made in accordance with specifications and drawings and all safety rules and regulations are observed. In event of conflicts of work on project with other trades, Contractor to make every reasonable effort to resolve conflict through meetings and discussions with other parties involved, by preparation of drawings or other appropriate action. Only after this has been done shall the Engineer's assistance be requested.

C. When Engineer is requested to visit project to aid in resolution of conflicts or for witnessing tests, he shall be given a minimum of 48 hours notice prior to time his presence is required at job site.

D. Cost of Engineer's time for general observation or test observance as described herein is to be borne by Engineer except in those cases where Engineer has been requested to visit project and upon visiting finds Contractor has caused Engineer an unnecessary visit. It shall be deemed an unnecessary visit in the following circumstances.
   1. Due to lack of supervision on Contractor's part.
   2. Test is not ready for observation.
   3. Engineer is placed in role of determining reason system or equipment is not operating properly, only to find that Contractor has not fulfilled his responsibility in troubleshooting, etc.
   4. Contractor requests a trip to check off final punch list items and it is found that no attempt has been made by Contractor to correct previous punch list items.
   5. Contractor will be billed for Engineer's time for making unnecessary visit at the rate of $400 per day plus mileage and living expenses.

3.9 WARRANTY-GUARANTEE

A. Designer reserves right to accept or reject any part of installation which does not successfully meet requirements as set out in these specifications.

B. Contractor shall and hereby does guarantee all work installed under this division shall be free from defects in workmanship and materials for a period of one year from date of final acceptance, whichever is earliest. The above parties further agree that they will repair and replace any defective material or workmanship which becomes defective within the terms of this warranty-guarantee.

END OF SECTION

SECTION 260519
CONDUCTORS - 600 VOLT AND BELOW

PART 1 GENERAL

1.1 WORK INCLUDED

A. Provide a complete system of conductors for lighting, power, and controls throughout building.

B. Refer to drawings for sizes of conductors.

PART 2 PRODUCTS

2.1 CONDUCTORS - POWER AND LIGHTING

A. Provide 98% conductivity copper conductors with 600-volt insulation.

B. Interior conductors shall be Type THHN-2/THWN-2 insulation.

C. 600-volt insulation for conductors installed in underground raceways shall have XLP (cross-linked polyethylene) insulation, Type XHHW-2.

D. For feeder and branch circuit conductors No. 12 AWG and No. 10 AWG, provide solid type.

E. For all control and motor circuits, and all conductors No. 8 AWG and larger, provide stranded type.

F. Conductors shall be manufactured by Triangle, Phelps Dodge, Southwire, or approved substitute.

G. Provide white or gray colored neutral conductors; provide black or color coded phase conductors.

H. Provide No. 14 AWG stranded type THHN fixture conductors, for conductors entering fixtures and in stems of pendant fixtures.

I. Provide type THHN stranded conductors, 90 degrees C for conductors running through continuous rows of fluorescent fixtures.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install pull boxes in circuits or feeders over 100' long.

B. All conductors shall be continuous from origin to panel or equipment termination without splices where possible. Where splices and taps are necessary or are required, they shall be made in splice boxes with suitable connectors.

C. Make all splices or connections only at outlet, pull or junction boxes.

D. Use pulling compound to pull conductors except conductors from isolation transformers.

E. Install instrument and data connection conductor in separate raceways from all other conductors. Separate control wiring from power wiring in separate raceways. Separation distances shall be as specified by control system manufacturer or as listed in IEEE Standard 518, whichever is greater.

F. Bend radius on conductors shall be less than the limitations listed by the cable manufacturer.

G. Deliver all conductors to job site new and in original wrapping, package or reel.

H. All conductors and connections shall test free of grounds, shorts, and opens.

I. For 20-amp, 120-volt branch circuits, provide No. 10 wire in lieu of No. 12 wire for any branch circuit in excess of 90 linear feet to prevent excessive voltage drop. Where branch circuit exceeds 175 linear feet, use No. 8 wire.

J. Use Ideal wing nuts, Scotchlok Type Y, R, G, or B, or approved equivalent connectors for fixture connections at outlet boxes.

K. Make feeder taps and joints with OZ type T, PT, PM or PTS, or approved equivalent clamp connectors as manufactured by Kupler, or with approved compression sleeves. Wrap connectors with No. 10 electro-seal or approved equivalent plastic filler and vinyl tape.

L. Leave a minimum of 8" slack wire in every outlet box whether it be in use or left for future use.

M. Color code conductors as follows:

CONDUCTOR COLOR CODE		
	120/208 Volt	277/480 Volt
Phase A	Black	Brown
Phase B	Red	Orange
Phase C	Blue	Yellow
Neutral	White	Gray
Ground	Green	Green

N. Use factory color coded conductors where commercially available. If not, use black wire and band with color tape.

END OF SECTION

SECTION 260526
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 WORK INCLUDED

A. The entire system of raceways and equipment to be grounded in accordance with Article No. 250 of latest edition of National Electrical Code and any local regulation or governmental governing authority.

PART 2 PRODUCTS

2.1 EQUIPMENT REQUIREMENTS

A. Main service panelboard shall be bonded to street side of first flange or coupling of incoming main water line serving project with heavy-duty ground clamp in accordance with Article 250.104 of N.E.C. The grounding electrode conductor shall be sized in accordance with Table 250.66 of N.E.C. An additional ground wire of same size shall be run to a tripod grounding rod system driven in ground outside foundation of building. This system shall consist of three 3/4" x 10' copperweld ground rods driven in ground in an equilateral triangular configuration with a minimum of 15' spacing between each. Connection of each ground rod to one another shall be made using a conductor of same size as being run for main service ground. Building steel shall be connected to ground bus on main service with a conductor the same as required on the service. This ground will be in addition to the previously specified grounds.

2.2 GROUND CLAMPS

A. OZ Electrical Manufacturing Company, Steel City, Appleton, or approved substitute.

B. Feeder circuits to panels, motor control centers, etc., shall have a separate green grounding conductor in conduit sized in accordance with Table 250.122 of N.E.C.

C. All branch circuits shall have a separate green grounding conductor installed in same conduit as phase and neutral conductor from panel ground bus to device. The grounding conductor shall be sized in accordance with Table 250.122 of N.E.C.

D. Flexible conduit will not be approved as achieving continuity of ground. All flexible conduit shall have a jumper wire sized to ampacity of branch breaker and shall be connected to conduit system on both ends; this applies to fixtures, motors, controls, etc.

PART 3 EXECUTION

3.1 INSTALLATION

A. Effectively bond all grounding conductors to grounding electrodes, equipment enclosures and ground busses.

B. Provide a shunt path around main water meter by bonding around both sides of meter to assure continuity.

C. Locate all grounding attachments away from areas subject to physical damage. Provide protective covering as required.

D. Clean all non-conductive surfaces on equipment to be grounded, to assure good electrical continuity.

E. Ground on main service shall be tested to obtain no greater than 10 ohms using 3-Point Fall of potential test. Test data shall be submitted to Engineer for review and such test data shall become a part of the final brochure.

END OF SECTION

SECTION 260529
SUPPORTING DEVICES AND HANGERS

PART 1 GENERAL

1.1 WORK INCLUDED

A. Provide a system of supporting devices and hangers to ensure secure support or bracing for conduit, electrical equipment, including safety switches, fixtures, panelboards, outlet boxes, junction boxes, cabinets, etc.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Provide appropriate supporting devices and hangers as manufactured by Erico Products, Inc., Steel City, Rayco, or approved substitute:
1. Vertical flange clamps (beam clamps).
2. "Z" purlin clips.
3. Conduit clips.
4. Universal clamps (Beam clamps).
5. Beam clamps (set screw type).
6. Combination push-in conduit clips.
7. Combination conduit hanger clamps.
8. Flexible conduit clips.
9. Special combination conduit clips.
10. One hole steel straps.
11. Minerallac conduit hangers.

PART 3 EXECUTION

3.1 INSTALLATION

A. Secure conduits to within 3' of each outlet box, junction box, cabinet, fitting, etc., and at intervals not to exceed ten feet (10') for EMT and IMC conduit and in accordance with Table 344.30 (B) (2) for Rigid Steel conduit.

B. Install clamps secured to structure for feeder and other conduits routed against the structure. Use drop rods and hangers or racks to support conduits run apart from the structure.

C. Furnish and install suitable angle iron, channel iron or steel metal framing with accessories to support or brace electrical equipment including safety switches, fixtures, panelboards, outlet boxes, etc.

D. Paint all supporting metal not otherwise protected, with rust inhibiting primer and then with a finish coat if appropriate to match the surrounding metal surfaces. (Prepainted or galvanized support material is not required to be painted or repainted.)

E. Use of chains, perforated iron, bailing wire, or tie wire for supporting conduit runs will not be permitted.

END OF SECTION

SECTION 260534
RACEWAYS AND CONDUIT SYSTEMS

PART 1 GENERAL

1.1 WORK INCLUDED

A. Provide a complete conduit system with associated couplings, connectors, and fittings.

B. Conduits shall be mechanically and electrically continuous from outlet to outlet and from outlets to cabinets, pull or junction boxes.

1.2 SUBMITTALS

A. Submittal for products furnished under this section is not required.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. RGS conduit shall be hot-dip galvanized, or electrogalvanized steel by Triangle, Raco, Allied, or approved substitute. Catalog numbers used below are those of Raco and shall be considered as standards.

B. Erickson couplings, Raco 1502-1516 for RGS, shall be used where neither length of conduit can be rotated.

C. RGS conduit connectors from 1/2” to 4” trade sizes shall use compression type, Raco 1802-1816.

D. Grounding bushings shall be Raco 1212-1296.

E. Insulated bushings shall be Raco 1402-1416.

F. Weatherproof hub shall be Raco 1702-1716, complete with sealing "O" ring or sealing locknuts.

G. Provide polyvinyl chloride (PVC) conduit, Type 40, and associated couplings, connectors, and fittings. PVC conduit shall be UL listed and 90 degrees C UL rated.

2.2 RIGID GALVANIZED STEEL (RGS)

A. Conduit Use:
   1. Interior and exterior exposed primary service conduit.
   2. Interior and exterior exposed secondary service conduit.
   3. Exterior exposed branch circuits.

2.3 POLYVINYL CHLORIDE (PVC)

A. Use PVC for:
   1. Service entrance conduits for power encased in concrete.
   2. Service entrance conduits for telephone.
   3. Exterior feeders encased in concrete.
   4. Exterior underground branch circuits.
   5. Primary power conduits encased in concrete.

B. PVC conduit shall not be used for feeders or branch circuits inside the building.

PART 3 EXECUTION

3.1 INSTALLATION

A. Minimum size of conduits shall be 1/2 inch.

B. Conduit joints shall be cut square, threaded, reamed smooth, and drawn up tight so conduit ends will butt in couplings, connectors, and fittings.

C. Make bends or offsets with standard ells or field bends with an approved bender.

D. Run conduits concealed in floor slabs, below slabs, or in walls in direct line with long sweep bends or offsets. Run exposed conduits and conduits run above lay-in ceilings parallel to and at right angles to building lines. Group multiple conduit runs in banks.

E. Secure conduits to all boxes and cabinets with two locknuts and bushings so system will be electrically continuous from service to all outlets.

F. Cap ends of conduits to prevent entrance of water and other foreign material during construction.

G. Complete conduit systems before pulling conductors.

H. Conduits shall be divided according to voltage and amperage service level. Conduits of different voltage levels shall be physically separated by the following distances unless otherwise specified on the drawings by the electrical engineer or control system supplier.
   1. Level 1 conduits shall contain low level input/output signal conductors including RTD cables, thermocouple cables, and 4-20 mA d.c. cables from field transmitters.
   2. Level 2 conduits shall contain all conductors for 24 volts d.c. power and signal.
   3. Level 3 conduits shall contain all conductors for 120 volt a.c. power to the PLC control cabinets, motor control circuits, field devices requiring 120-volt power, etc.
   4. Level 4 conduits shall contain all conductors for 120 volts d.c. control power greater than 3 amps, all 120 volts a.c. power greater than 20 amps, and all power circuits with voltage ratings higher than 120 volts a.c. (277, 480, 4160, 13,200 volts etc.). Examples include 480-volt motor feeds, 5-kV feeders, and 120-volt lighting circuit and input/output devices such as limit switches and solenoid valves.
   5. Conduits shall be physically separated from each other by the following distances:

SPACING REQUIREMENTS (IN INCHES) FOR METALLIC CONDUITS			
From Level	To Level 2	To Level 3	To Level 4
Level 1	Minimum 1"	Minimum 6"	Minimum 26"
Level 2	0"	Minimum 6"	Minimum 26"
Level 3	Minimum 6"	0"	Minimum 18"

6. Levels 1, 2, and 3 conductors shall additionally be routed away from sources of high voltage or RF radiation such as switchgear, transformers, radio transmitters, and repeaters. Minimum separation from these sources of interference shall be 5 feet.
7. Data highway communications cable are generally considered Level 1 conductors; however, special requirements apply for routing to assure a low noise environment. Refer to electrical drawings and controls supplier requirements for special considerations before routing these conduits.

I. Where conduits of different levels must cross, the minimum separations shall be maintained, and they shall cross at right angles.

J. Provide cable supports in conduits rising vertically in accordance with the National Electrical Code, Article 300-19.

K. Provide nylon pull cord in all empty conduits. Steel wire not acceptable as pull wire.

L. Conduits which pass through floor slabs (except ground floor) shall be sealed with concrete grout. Seal around conduits or other wiring materials passing through partitions, which extend to the underside of the slab above, and those passing through smoke partitions and fire-rated walls. Refer to appropriate details on architectural and mechanical drawings.

M. Conduits which enter crawl space, tunnels, and basements from outside the building shall be grouted-in to prevent entry of gases, vapors, insects, or rodents to these spaces from street mains.

N. Conduit not serving elevator equipment shall not be permitted to pass through elevator shafts or elevator equipment rooms.

O. Where RGS conduit is installed in a cabinet, junction box, pull box, or auxiliary gutter, conductors shall be protected by an insulated bushing. Locknuts shall be installed on conduit outside and inside enclosure.

P. In areas where enclosed and gasketed fixtures and weatherproof devices are specified, where rigid conduit enters a sheet metal enclosure, junction box and outlet box, and not terminated in a threaded hub, a steel, or malleable iron nylon insulated hub, complete with recessed sealing "O" ring or sealing locknut shall be used.

Q. In concrete slabs, block up conduit from forms and securely fasten in place. All conduits in slabs shall have a minimum of 1-1/2 inches concrete coverage above and below.

R. Encase in 4 inches of 1:2:4 mix concrete on all sides all feeder conduits laid below ground outside building foundation line.

S. Where conduits running overhead pass through building expansion joints they shall be connected by flexible metal conduit of same size with sufficient slack to allow conduits on either side of expansion joint to move a minimum of 3 inches in any direction. Provide supports as required on each side of expansion joint, all in accordance with seismic requirements of specific area.

T. Conduits for feeders and branch circuits shall be terminated directly into panelboard enclosure without the use of pull boxes, junction boxes, wireways, or auxiliary gutters, unless the panelboard enclosure does not provide sufficient surface area for all conduits. Where such cases exist, the contractor shall notify the Designer. In no case will splices in such boxes, wireways, etc., be permitted.

U. Failure to route conduit through building without interfering with other equipment and construction shall not constitute a reason for an extra charge. Equipment, conduit, and fixtures shall fit into available spaces in building and shall not be introduced into building at such times and manner as to cause damage to structure. Equipment requiring servicing shall be readily accessible.

3.2 PVC

A. Use threaded fittings for all connectors and adapters.

B. Provide code sized ground conductors in all power conduit runs.

C. Provide 1/4-inch nylon pull rope in all primary power and incoming telephone service entrance conduits.

D. Encase all PVC conduit in reinforced concrete with a minimum of 4-inch encasement on all sides except exterior branch circuits.

E. No PVC shall emerge from the ground or the concrete slab or encasement. PVC shall convert to galvanized rigid metal prior to its emergence.

F. Make bends with standard ells or with an approved heat bender.

END OF SECTION

SECTION 260537
OUTLET BOXES

PART 1 GENERAL

1.1 WORK INCLUDED

A. Provide each fixture, switch, receptacle, communication devices, and other wiring devices with a galvanized outlet box of appropriate size and depth for its particular location and use unless indicated otherwise.

1.2 SUBMITTALS

A. Submittals are not required for items furnished under this section.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Outlets and junction boxes shall be Steel City or approved substitute.

B. Provide 4" square x 1-1/2" deep boxes for switches and receptacles in drywall partitions. Use square cut plaster rings of proper gauge and depth.

C. Provide 2-1/2" x 3-3/4" one gang masonry boxes for switches and receptacles installed in concrete block walls not plastered. For increased cubic capacity provide 3-1/2" x 3-3/4" one gang masonry boxes. Where more than two conduits enter the box from one direction, provide 4" square boxes with square cut device covers not less than 1" deep specifically designed for this purpose. Use round edge plaster rings only if the block walls are to be plastered. Use sectional or gangable type outlet boxes only in dry wall construction.

D. For all systems boxes, provide 4-11/16" square outlet boxes with square cut device corners for block walls or round edge plaster rings for plastered walls. Single gang device boxes are not acceptable.

E. Permanent barriers shall be furnished in multi-gang boxes if the voltage between adjacent wiring devices exceeds 300 volts.

F. Provide galvanized malleable iron fittings with threaded hubs for screw connections and with the proper type covers for switches and receptacles served by exposed conduit. Use pressed steel outlet only for ceiling fixture outlets.

G. Provide galvanized malleable iron condulets with threaded hubs and covers and with proper configurations for all changes of direction of exposed conduits. Standard conduit ells may be used if they do not interfere or damage or mar the appearance of the installation.

H. Provide rectangular boxes for floor outlets. Boxes to be 2-gang or 3-gang, fully adjustable before and after concrete pour, Steel City No. 642-643. Cover to be Steel City No. P64-D4/P6DS, aluminum, with duplex screw cover for duplex receptacle. Carpet flange to be lexan

type. Fittings to be Steel City No. SFH50, satin aluminum for high tension and Steel City No. SFH50-TEL, satin aluminum for low tension. For boxes in elevated slabs less than four inches thick, use Steel City 642 and 643-SC.

PART 3 EXECUTION

3.1 INSTALLATION

A. Locate boxes to prevent moisture from entering or accumulating within them.

B. Use boxes of sufficient cubic capacity to accommodate the number of conductors to be installed. See Article #370 of the latest edition of the National Electrical Code.

C. Effectively close unused openings in boxes with metal plugs or plates.

D. Set recessed boxes so that front edges are flush with finished surfaces.

E. Secure boxes to surfaces upon which they are mounted or embed boxes in concrete or masonry. Support boxes from structural members with approved braces.

F. Install blank device plates on outlet boxes left for future use.

G. Provide bushings in holes through which cords or conductors pass.

H. Install boxes so that the covers will be accessible at all times.

I. Outlet boxes in walls shall not be mounted back to back. Where drawings show outlets on both sides of the same wall, the boxes shall be staggered sideways and connected with short nipples to prevent passage of sound. Where outlets are mounted on both sides of same fire wall they are to be staggered a minimum of 24 inches to maintain the ratings of the wall.

J. Where required to hang a specified fixture, provide a fixture stud of the no-bolt, self-locking type on ceiling outlets.

END OF SECTION

SECTION 260538
PULL AND JUNCTION BOXES

PART 1 GENERAL

1.1 WORK INCLUDED

A. Provide pull and junction boxes of appropriate size and depth or as indicated on the drawings and as specified hereinafter.

1.2 SUBMITTALS

A. Submittals of products furnished under this section are not required.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS/MATERIALS

A. Pull and junction boxes shall be by Hoffman or approved substitute.

B. For interior work, provide galvanized sheet metal boxes of code thickness with lapped and welded joints, 3/4 inch flanges, screw covers, etc.

C. For exterior work, provide galvanized sheet metal boxes of code thickness with lapped and welded joints, 3/4 inch flanges, bolted covers with full gaskets forming a completely water-tight assembly, equal to Hoffman, Concept Series.

D. For exterior work in graded areas outside the building, provide heavy duty sidewalk junction boxes externally flanged for flush mounting. Covers to be fully gasketed, watertight and secured with plated screws or bolts. Crouse-Hinds Type WJB or approved substitute. See detail on drawings for size.

PART 3 EXECUTION

3.1 INSTALLATION

A. Provide junction boxes as shown on drawings and otherwise where required, sized according to number of conductors in box or type of service to be provided. Minimum junction box size 4 inches square and 2-1/8 inches deep. Provide screw covers for junction boxes.

B. Use minimum 16 gauge steel for pull boxes and provide with screw cover.

C. Install boxes in conduit runs wherever necessary to avoid long runs or excessive bends. Do not exceed 100 foot runs, or three 90 degree bends, without pull boxes.

D. Rigidly secure boxes to walls or ceilings. Use of conduit as a support is not acceptable.

E. Install boxes in accessible locations. Size boxes in accordance with Articles No. 312 and No. 314 of the latest edition of the National Electrical Code.

F. Install boxes so that the covers will be accessible at all times.

G. Do not install pull or junction boxes for joint use of line voltage and signal or low voltage controls unless all conductors are insulated for the highest voltage being used in the same box. Emergency system and normal system circuits shall not be routed through a common pull or junction box.

END OF SECTION

SECTION 262101
OVERHEAD ELECTRIC SERVICE

PART 1 GENERAL

1.1 WORK INCLUDED

A. Service will be overhead and will be a 115/208-volt, 3-phase, 4-wire.

B. System will be serviced by Cumberland Electric Membership Corporation.

PART 2 PRODUCTS

2.1 MATERIALS

A. Service to be grounded in accordance with latest edition of National Electric Code, Article No. 250, and any special requirements as required by municipal, state, or federal authorities having jurisdiction.

B. Metering to be provided by power company.

C. Dead-end clevis or rack to be provided by power company but installed as directed by power company by Division 26.

D. Service drop conductors to be provided by power company.

E. Meter base to be provided and installed by Division 26 on building where indicated on drawings. Division 26 to provide a 1-1/4" empty conduit from meter base up to a point near feed-through current transformers, to be coordinated with power company.

PART 3 EXECUTION

3.1 INSTALLATION

A. Division 26 shall provide the secondary conduit, wire, and service heads from point of attachment on building, back to the distribution switchgear as indicated on drawings.

3.2 SERVICE COORDINATION

A. Division 26 shall be responsible for coordination with power company to determine the final exact location of point of service and shall furnish a breakdown of loads as shown on drawings for the power company.

END OF SECTION

SECTION 262416
PANELBOARDS

PART 1 GENERAL

1.1 WORK INCLUDED

A. Provide circuit breaker type panelboards as indicated on drawings and as specified in this section.

B. Refer to drawings for numbers of branch circuits, their ratings, number of poles, arrangements, etc.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS/EQUIPMENT

A. Provide panelboards by Square D, G.E., Siemens, Cutler-Hammer, or approved substitute. Square D type designations are used to indicate type and quality of panelboards.

B. Lighting panelboards for 120/208-volts, 3-phase, 4-wire service shall be Square D type NQOD.

C. Lighting and power panelboards and their associated circuit breakers shall be furnished with a short-circuit current rating greater than the available fault current shown on the panel schedules.

D. Series rated panelboards are not acceptable.

E. Provide panelboards of circuit breaker, dead-front safety type, UL labeled and meeting all applicable requirements of the National Electrical Manufacturers Association.

F. Provide panelboards with lugs (both main lugs and branch circuit lugs) suitable and UL approved for copper 75 degree C rated conductors.

G. Provide shunt trip and GFI breakers where indicated on panel schedule.

H. Provide electrically isolated neutral bars.

I. Provide separate ground bars complete with lugs or connectors on bar.

J. Provide panel doors equipped with chrome-plated locks and catches, all keyed alike. Provide two keys for each lock. Provide fronts with adjustable indicating trim clamps.

K. Provide thermal magnetic circuit breakers which are fully rated and temperature rated for a 40 degree C ambient. Breakers shall be quick-make, quick-break type with trip indication shown by handle position other than ON or OFF and with a common trip on all multi-pole breakers.

L. Where specific panelboard types, breaker types, or adjustable breaker devices are shown on the drawings, and the contractor elects to use another manufacturer or type, contractor will be responsible for additional cost incurred by the designer for evaluation of breaker coordination.

PART 3 EXECUTION

3.1 INSTALLATION

A. Ground separate ground bars to panel boxes and to the main service entrance ground bus with a code-sized grounding conductor installed in the same conduit as the phase and neutral conductors.

B. Install all circuits which use a common neutral in accordance with the latest edition of the National Electrical Code, Article Nos. 210-4, 210-5, 215-4, and 220-4d. Balance all circuits to achieve not greater than 10% unbalanced neutral current in panel feeders.

C. Provide six circuit breaker handle lock-on devices for each lighting panelboard for installation by the contractor on circuits as directed by the Owner to prevent unauthorized personnel from turning off circuits to controls, unit heaters, clocks, night lights, etc. Turn the spare lock-on devices over to the Owner for his use.

D. Provide typed directory cards mounted under plastic on the doors of all panelboards. The directories shall indicate the type of devices being served, including the space number or space names in which the devices or fixtures are located.

E. Provide engraved Bakelite nameplates for all the circuit breakers in use on power panelboards. Indicate the device, panel, or motor being served with 1/4" high letters. Provide nameplates without engraving for the spare breakers and/or spaces. Secure all nameplates to the panelboard trim with two roundhead sheet metal screws.

F. Provide engraved Bakelite nameplates on the visible face of all lighting and power panels indicating the panel designation in 3/8" letters. Secure the nameplates with a minimum of two round-head sheet metal screws. Normal power nameplates shall be black and emergency power nameplates shall be red.

G. Provide 7 sets of final as-built drawings for the panels after delivery of the panels for distribution by the Owner.

END OF SECTION

SECTION 262818
SAFETY SWITCHES

PART 1 GENERAL

1.1 WORK INCLUDED

A. Provide horsepower-rated, quick-make, quick-break, safety switches provided with the number of poles and fuses as required.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS/EQUIPMENT

A. Safety switches shall be as manufactured by General Electric, Square D Company, Cutler-Hammer, or approved substitute.

B. For 208- and 240-volt circuits, use general-duty type switches with Class R fuse clips. For 480-volt circuits, use heavy-duty type switches with Class R fuse clips.

C. Switches shall have arc shields, shall be of enclosed construction and fusible or non-fusible as indicated. Switches shall be rated for either 250-volt AC or 600-volt AC service as required.

D. Safety switches for all part-winding or two-speed motors requiring remote disconnect to be similar to Square D Series HLL-660, six-pole.

E. Switches shall have Electrical Interlock Kit with one normally open and one normally closed contact.

F. All switches shall be capable of interrupting locked rotor current of motor which it serves.

G. Enclosures to be NEMA-1 for interior use and NEMA-3R for exterior use unless noted otherwise.

H. Provide dual-element Bussman type FRN (250 volt) or type FRS (600 volt) fuses for any fusible safety switch serving a motor circuit.

I. For non-motor loads, provide dual element Bussman type LPN (250 volt) or type LPS (600 volt).

PART 3 EXECUTION

3.1 INSTALLATION

A. Provide non-fusible switches at remote motor locations (raintight where required) as indicated on drawings.

B. Provide fusible disconnects at package A/C units, fused as specified on unit nameplate.

C. Mount switches to walls or adjacent to equipment enclosures using unistruts with a minimum of four bolts using toggle anchors for masonry construction, Phillips "Red Head" anchors for poured concrete construction and bolts, jumbo washers, lock washers and nuts for equipment enclosure mounting.

D. All safety switches to be identified with Bakelite nameplates.

END OF SECTION

SECTION 265600
EXTERIOR LIGHTING AND LAMPS

PART 1 GENERAL

1.1 WORK INCLUDED

A. Provide labor, materials, equipment and services necessary for installation of all exterior lighting fixtures, lamps, poles, pole bases etc. for:
   1. Area lighting.
   2. Parking lot and access roads.

B. Refer to details and arrangements shown on drawings.

C. Provide concrete bases as required for type of arrangements indicated.

D. Concrete bases as required for type of arrangements indicated shall be installed under Division 03. Coordinate with other divisions for proper size of bases, anchor bolt arrangements, conduit stub-ups to pole bases, etc.

E. Fixtures, poles, and appurtenances, shall be suitable for exterior use, shall be UL listed, and shall be of standard design for intended application.

1.2 SUBMITTALS

A. Submit for approval prior to purchasing fixtures complete shop drawings and brochures including photometrics for each type of exterior lighting system specified. Shop drawings and brochures shall be specific and shall include all pertinent data and accessories. If substitute fixtures are proposed, include cuts of both specified fixture and proposed equivalent fixtures including photometrics of both fixtures.

B. If requested by Designer, submit a sample fixture which will be returned after inspection by Designer.

C. Designer reserves right to accept any fixture as an approved equivalent.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Lighting fixtures as indicated on Lighting Fixture Schedule.

B. Contactors and selector switches shall be Square D or approved substitute.

C. Photocells: Tork.

D. Lighting Contactors: Square D or approved substitute.

2.2 MATERIALS

A. Provide luminaire and pole assemblies as scheduled.

B. Luminaires, including all components, shall be designed to meet extreme temperature (low), moisture, and wind conditions in area.

C. Poles: Steel round or square, designed for wind load in the area of installation.

D. All 150-1500 watt metal halide luminaires shall be equipped with a proper ballast that is in compliance with the minimum requirements of the Energy Independence and Security Act of 2007 (EISA of 2007). Luminaires shall be marked with the circle E symbol indicating compliance with EISA.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install parking lot/roadway luminaires and poles on concrete bases. Provide all anchor bolts and bolt hole circle templates. Adjust luminaires to correct tilt and lamp all fixtures.

B. Contractor to adjust or rotate area and roadway lighting at night to maximize light utilization in intended areas.

C. Ground all luminaires to poles and all poles to equipment grounding conductor or to separate 3/4" diameter x 10' copperweld ground rod driven at base of each pole.

D. Each pole mounted outside lighting luminaire shall have its conductors spliced to the branch circuit connectors in the pole base. Provide a Tron waterproof fuse holder with time delay fuse (1.5 X luminaire current) in the pole base for each ungrounded conductor for each luminaire.

END OF SECTION

SECTION 311000
CLEARING AND STRIPPING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Protecting existing trees, shrubs, groundcovers, plants, and, grass to remain.

B. Removing existing trees, shrubs, groundcovers, plants, and, grass.

C. Clearing and grubbing.

D. Stripping and stockpiling topsoil.

E. Removing above- and below-grade site improvements.

F. Disconnecting, capping or sealing, and abandoning site utilities in place.

1.2 MATERIAL OWNERSHIP

A. Except for stripped topsoil or other materials indicated to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.3 CLOSEOUT SUBMITTALS

A. Record drawings, per Division 1, identifying and accurately locating capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.4 REGULATORY REQUIREMENTS

A. Conform to applicable code for environmental requirements, disposal of debris, burning debris on site, and related issues.

B. Coordinate clearing Work with utility companies.

1.5 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations

B. Do not commence site clearing operations until temporary erosion and sedimentation control measures are in place.

C. Utility Locator Service: Notify utility locator service for area where Project is located before site clearing.

PART 2 PRODUCTS

2.1 MATERIALS

A. Satisfactory Sub-Soil Materials: Requirements for satisfactory subsoil materials are specified in Section 312000 - Earthwork.

B. Topsoil: Refer to 329201 - Seeding for finish grading, including preparing and placing topsoil and planting soil for lawns.

PART 3 EXECUTION

3.1 PREPARATION

A. Verify that existing plant life designated to remain, is tagged or identified.

B. Identify a waste area for placing removed materials.

C. Protect bench marks and existing structures from damage or displacement. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TREE PROTECTION

A. Protect trees, plant growth and features designated to remain, as final landscaping under Section 017600.

1. Do not store construction materials, debris, or excavated material within fenced area.
2. Do not permit vehicles, equipment, or foot traffic within fenced area.
3. Maintain fenced area free of weeds and trash.

B. Do not excavate within tree protection zones, unless otherwise indicated.

C. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by Designer.
1. Employ an arborist, licensed in jurisdiction where Project is located, to submit details of proposed repairs and to repair damage to trees and shrubs.
2. Replace trees that cannot be repaired and restored to full-growth status, as determined by Designer.

3.3 UTILITIES

A. Locate, identify and protect utilities that remain, from damage. Arrange with utility companies to shut off indicated utilities.

B. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services per requirements indicated:

C. Excavate for and remove underground utilities indicated to be removed.

3.4 CLEARING AND GRUBBING

A. Clear areas required for access to site and execution of Work. Remove obstructions, trees, shrubs, grass, and other vegetation to permit installation of new construction.
   1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
   2. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.
   3. Grind stumps and remove roots, obstructions, and debris extending to a depth of 18 inches below exposed subgrade.
   4. Use only hand methods for grubbing within tree protection zone.
   5. Chip removed tree branches and dispose of off-site.

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
   1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches, and compact each layer to a density equal to adjacent original ground

C. Take a minimum of 80% of logs that meet commercial standards to a sawmill for processing into lumber, pulp, or other use. Do not bury, burn, chip, or landfill logs.

3.5 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil to depths indicated on Drawings in a manner to prevent intermingling with underlying subsoil or other waste materials.

   1. Remove subsoil and non-soil materials from topsoil, including trash, debris, weeds, roots, and other waste materials.

C. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.

   1. Limit topsoil stockpiles slopes to 2:1.
   2. Do not stockpile topsoil within tree protection zones.
   3. Dispose of excess topsoil as specified for waste material disposal.
   4. Do not stockpile topsoil over debris including but not limited to building materials, plaster, plants, paints, road base type materials, petroleum based chemicals, and other harmful materials.
   5. Scarify areas of construction-compacted subsoil before placing topsoil.

3.6 SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.

B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
   1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut length of existing pavement to remain before removing existing pavement. Saw-cut faces vertically.
   2. Paint cut ends of steel reinforcement in concrete to remain to prevent corrosion

3.7 DISPOSAL

A. Disposal: Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

B. Burning tree, shrub, and other vegetation waste is permitted per burning requirements and permitting of authorities having jurisdiction. Control such burning to produce the least smoke or air pollutants and minimum annoyance to surrounding properties. Burning of other waste and debris is prohibited.

END OF SECTION

SECTION 312000

EARTHWORK

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Excavating and filling for rough grading the site including outside of building perimeter beyond neat scheduled lines of footings.

B. Preparing subgrades for pavements, turf and grasses.

C. Subsurface drainage backfill and base course for walls and trenches.

D. Excavating and backfilling trenches for utilities and pits for buried utility structures.

1.2 UNIT PRICES

A. Part of the Work of this Section is under a Unit Price, refer to Section 012213. Unit Price shall be defined as follows:
   1. Contract Unit Price per cubic yard includes the required “Over Excavation and Fill” resulting from unsuitable subgrade encountered during the grading process (including the required excavation, disposal of materials, and required fills compacted in place).
   2. The utilization of this quantity will be as recommended by the on-site geotechnical engineer/Special Inspector and approved by the Architect/Engineer as grading operations encounter unsuitable soils.
   3. Unit measurement shall be determined by site measurements and verified by the Special Inspector.
   4. This unit price does not include materials required to bring existing subgrade elevations up to final subgrade elevations (whether on-site materials are able to be utilized or off-site materials are required). All fill materials required to bring existing subgrade elevations up to final subgrade elevations shall be included in the base bid lump sum.

B. Fill Material: By the cubic yard. Any of the following as approved by Geotechnical Engineer.
   1. Soil/Rock Mixture, Rock, Drainage and Aggregate Fills: Includes supplying fill materials, stockpiling, scarifying substrate surface, placing where required, and compacting.
   2. Concrete Fill: Includes supplying materials, forming, mixing and placing where required, and curing.

1.3 ACTION SUBMITTALS

A. Submittals: Follow Section 013300.

B. Product Data: Geotextile.

C. Samples: 12-by-12-inch (300-by-300-mm) Sample of geotextile.

1.4 INFORMATIONAL SUBMITTALS

A. Submittals: Follow Section 013300.

B. Field quality control reports.

C. Submit two copies of following test reports:
1. Test reports on borrow material.
2. Field density test reports.
3. One optimum moisture-maximum density curve for each type of soil encountered.
4. Report of actual unconfined compressive strength.
5. Results of bearing tests of each strata tested.

1.5 QUALITY ASSURANCE

A. Codes and Standards: Comply with requirements of governing authorities having jurisdiction.

B. Inspection and Testing: Provide inspection and testing per Section 014000.

C. Suitable Material: Fill material to be placed will be approved by testing agency.

1.6 PROJECT CONDITIONS

A. Existing Utilities: Locate existing underground utilities in areas of work prior to beginning any work or ordering any materials. Any materials ordered or work performed before the horizontal and vertical location of existing utilities is at Contractor's risk. Protect utilities indicated to remain in place. If uncharted or mischarted utilities are encountered, immediately notify Architect/Engineer and utility owner. Keep services and facilities in operation under direction of utility Owner.

B. Repair damaged utilities to satisfaction of utility owner.

C. Neither Owner nor Architect/Engineer will be responsible for damages to mischarted or uncharted utilities.

D. Do not interrupt existing utilities that are in use without written permission of Architect/Engineer and then only after temporary services have been provided. Coordinate with utility owner for shutdown of service. Provide minimum 48-hour notice to Architect/Engineer and receive written notice to proceed before interrupting any utility.

1.7 EXPLOSIVES

A. Use of explosives is not permitted.

1.8 PROTECTION OF PERSONS AND PROPERTY

A. Barricade open excavations occurring as part of this work and post warning lights. Operate warning lights as recommended by authorities having jurisdiction.

B. Protect structures, utilities, sidewalks, pavements and other facilities indicated to remain in place from damage caused from possible settlement, lateral movement, undermining, washout and other hazards created by excavation.

C. Protect plant growth and trees scheduled to remain under Section 017600.

PART 2 PRODUCTS

2.1 MATERIALS

A. Earth Fill: Soil free of roots and organic material, debris and other material considered deleterious by testing agency. Soil selected shall consist of residual clay with a plasticity index (PI) of less than 20. Sources may occur within designated borrow areas or within on-site areas which are to be excavated. Soil shall be free of rock fragments greater than 2-inches in maximum dimension.

B. Soil/Rock Mixture: Organic free, on-site or borrowed soil mixed with rock fragments less than 18 inches in maximum dimension. Percentage of rock within fill shall be limited by testing agency to maintain a satisfactory mixture which, when compacted, will form an essentially impervious and stable mass containing no significant voids.

C. Rock Fill: Well graded shot rock having a maximum fragment size of 30 inches. Rock fill shall be reasonably free of soil and shall generally include a range of particle sizes from 30 inches downward to 1 inch in maximum dimension. Permissible quantity of material finer than 1 inch including soil, will be decided by testing agency based on stability of initial lifts of fill placed.

D. Except for soils that are a byproduct of a building and building site development process, do not mine offsite borrow material from either of the following:
   1. Prime farmland, unique farmland, or farmland of statewide importance.
   2. Land that has not been previously developed or has a history of only agricultural use (Greenfield sites) where development is prohibited by the Authority Having Jurisdiction (AHJ).

E. Drainage Fill/Course: Narrowly graded mixture of washed crushed stone, or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch (37.5-mm) sieve, not more than 10 percent passing a No. 4 (4.75 mm) sieve, and not more than 5 percent passing a No. 8 (2.36 mm) sieve; no clay, silt, or organic materials.

F. Aggregate Fill: Crushed stone, TDOT 903.05 "Class B" crusher-run.

G. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

H. Base Course for Portland Cement Concrete Paving: Refer to Section 321313.

I. Base Course for Bituminous Concrete Paving: Refer to Section 321216.

J. Topsoil: Refer to 329201 - Seeding for finish grading, including preparing and placing topsoil and planting soil for lawns.

K. Lean Concrete:
1. Cement: ASTM C150 normal - Type 1 Portland.
2. Fine and Coarse Aggregates: ASTM C33.
3. Water: Clean and not detrimental to concrete.
4. Mix concrete to a compressive strength (28 days) of 3,000 psi per ASTM C94, Alternative 2.

PART 3 EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

B. Prepare subgrade for earthwork operations including removal of vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface under Section 311000 – Clearing and Stripping.

C. Protect and maintain erosion and sedimentation controls during earthwork operations.

D. Examination of Conditions: Examine areas of work and notify Architect/Engineer, in writing, of conditions that would hinder proper completion of work. Do not proceed until unsatisfactory conditions have been corrected.

E. In cases where gas, sewer, or other pipe is encountered, pipe shall not be displaced nor molested unless necessary, in which case it shall be replaced in good condition as promptly as is possible.

3.2 EXCAVATION

A. Excavation including rock removal is unclassified and includes excavation to subgrade elevations indicated, regardless of character of materials, abandoned or inactive infrastructures, or other obstructions encountered. Same price shall be considered for excavation whether it be earth, rock, or other obstructions.

B. Unauthorized Excavation: Removal of material beyond indicated elevations or dimensions without approval of Architect/Engineer shall be at Contractor's expense.
1. Under footings, foundation bases, or retaining walls, fill unauthorized excavation by extending indicated bottom elevation of footing or base to excavation bottom, without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position, when acceptable by Architect/Engineer.
2. Elsewhere, backfill and compact unauthorized excavations as specified for authorized excavations of same classification, unless otherwise required by Architect/Engineer or testing agency.

C. Additional Excavation: If unsuitable bearing is encountered at required elevations, continue excavation until acceptable bearing is found and replace excavated material as required by geotechnical engineer with testing firm.

D. Extra work for authorized excavation carried beyond elevations and dimensions indicated will be paid for by Owner based on unit prices indicated on Bid Form and based on quantities calculated on neat scheduled size of excavation under change order provisions of Section 012213.

E. Stability of Excavations: Slope sides of excavations to comply with applicable codes. Shore and brace where sloping is not possible. Maintain sides and slopes in safe condition until completion of backfilling.

F. Shoring and Bracing: Comply with applicable code requirements for shoring and bracing.
1. Provide materials that are in good serviceable condition. Carry down shoring and bracing as excavation progresses and maintain in place as long as excavations are open.
2. Where removal of shoring may permit lateral movement of soil under adjacent structures, provide steel or pressure treated wood sheet piling to be cut off and left in place.

G. Dewatering: Prevent water from flowing into excavations and from flooding site and surrounding areas. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation. Immediately remove accumulated water from excavations to prevent conditions detrimental to stability of subgrades and footings. Provide and maintain dewatering systems necessary to convey water away from excavations.

H. Material Storage: Stockpile satisfactory material where indicated until required for backfill or fill. Place, grade and shape stockpiles for proper drainage. Do not stockpile material at edge of excavation. Dispose of excess soil and waste material.

I. Excavation for Structures: Conform to dimensions and elevations shown within a tolerance of plus or minus 0.10 feet. Extend a sufficient distance from footings and foundations to permit placing and removal of formwork, installation of services, other construction and for observation by Architect/Engineer. Do not disturb bottom of excavations. Excavate by hand to final grade just before placing reinforcing. Trim bottoms to leave solid base for concrete.

J. Excavation for Pavements: Cut surface under pavements to comply with cross sections, elevations and grades.

3.3 EXCAVATION FOR TRENCHES

A. Excavate trenches uniformly to a width sufficient to provide working room.

B. Excavate trenches to depth indicated or required. Piping trenches to have ample depth to establish flow lines and inverts indicated.

C. Trench excavation for pipe lines shall be of sufficient width to allow for proper laying of pipe and caulking-up of joints and shall be of sufficient depth to give 2'-6" minimum cover over tops of hubs. If it is necessary to excavate deeper to avoid obstructions or to give a uniform grade, no extra charge will be allowed for the additional depth.

D. Care shall be taken to give piping a uniform bearing throughout its length. Holes for bells of pipe shall be excavated large enough so that bell or hub will clear the ground.

E. Where solid rock is encountered, carry excavation 6 inches below required elevation and backfill with a 6 inch layer of crushed stone or gravel before installing pipe.

F. Grade bottoms of trench by hand.

3.4 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and satisfactory excavated soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
   1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.
   2. Protect and clearly mark stockpiled topsoil.

3.5 BACKFILL AND FILL

A. Place acceptable fill in layers to required subgrade elevations, for each area classification listed below.
   1. For site filling, in excavations, under grassed areas, under walks or pavements, use satisfactory excavated or borrow material.

B. Backfill excavations as soon as work permits

C. Ground Surface Preparation: Remove vegetation, debris, unsatisfactory soil materials and obstructions prior to placing fills. Break up slopes steeper than one vertical to four horizontal to ensure bonding of fill.
   1. Where fill is to be placed on slopes that are 2H:1V or greater, bench fill into existing slope a minimum of 2 feet horizontally for every 4 feet of vertical distance.
   2. Over build fill slopes that are to be 2H:1V or greater a minimum of 2 feet horizontally for full height of filled slope. Remove over-built fill upon completion to expose properly compacted fill.
   3. If existing ground is below required density, break up surface, condition to optimum moisture content and compact to required depth and percentage of maximum density.

D. Placement and Compaction: Place fill in 8 inch maximum layers for compaction with heavy equipment, 4 inch maximum layers for fill compacted with hand-operated tampers.
   1. Before compaction, if required, moisten or aerate each layer to provide optimum moisture content. Compact each layer to required percentage of maximum dry density or relative dry density for each area classification. Do not place fill on surfaces that are muddy, frozen, or contain frost or ice.
   2. Place backfill evenly adjacent to structures, to required elevations. Prevent wedging action against structures by carrying material uniformly around structure to approximately same elevation each lift.

3.6 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations as follows:
   1. Under grass and planted areas, use satisfactory soil material.
   2. Under walks and pavements, use satisfactory soil material.
   3. Under steps and ramps, use engineered fill.
   4. Under building slabs, use engineered fill.
   5. Under footings and foundations, use engineered fill.

C. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.7 COMPACTION

A. Before compacting and filling, proof-roll area with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding as directed by testing agency. Remove soft spots, fill and compact to required density. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph.

B. Control soil compaction during construction providing minimum percentage of density specified for each area classification indicated below.

C. Percentage of Maximum Density Requirements: Compact soil to not less than the listed percentages of dry density for soils which exhibit a well-defined moisture density relationship, follow ASTM D698 (Standard Proctor); and not less than listed percentages of relative density, follow ASTM D4253, for soils which will not exhibit a well-defined moisture-density relationship.
1. Pavements: Compact top 12-inches of subgrade and each layer of backfill or fill material at 98 percent maximum dry density or 90 percent relative dry density for cohesionless soil material.
2. Lawn or Unpaved Areas: Compact top 6 inches of subgrade and each layer of backfill or fill material at 90 percent maximum dry density.
3. Walkways: Compact top 6 inches of subgrade and each layer of backfill or fill material at 98 percent maximum dry density or 90 percent relative dry density.

D. Moisture Control: Where subgrade or layer soil material shall be moisture conditioned before compaction, uniformly apply water to surface of subgrade, or layer of soil material, to prevent free water appearing on surface during or subsequent to compaction operations.

E. Do not proof-roll wet or saturated subgrades. Remove and provide new, or scarify and air dry, soil material that is too wet to permit compaction to specified density.

F. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing or pulverizing until moisture content is reduced to a satisfactory value. Reuse stockpiled material only after dried to proper moisture content.

G. Where storm water lines are in trenches under pavement, install and compact backfill in 6” lifts.

3.8 GRADING

A. Uniformly grade areas within limits of grading under this Section, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated, or between such points and existing grades.

B. Grading Outside Building Lines: Slope grade away from buildings to drain away water and prevent ponding.

C. Grading Tolerances: Finish subgrade surfaces free from irregular surface changes and to following tolerances above or below required subgrade elevations.

1. Lawns and Unpaved Areas: Finish areas to receive topsoil to within not more than 0.10 foot above or below required subgrade elevations.
2. Walks: Shape surface of areas under walks to line, grade and cross-section, with finish surface not more than 0.10 foot above or below required subgrade elevations.
3. Pavements: Shape surface of areas under pavement to line, grade and cross-section, with finish surface not more than 1/2-inch above or below required subgrade elevations when tested with a 10 foot straight edge.

D. Compaction: After grading, compact subgrade surfaces to depth and percentage of maximum density for each area classification.

3.9 SOILS REUSE AND RESTORATION

A. Before placing stockpiled or imported topsoil, comply with the following
1. Clear area of debris including, but not limited to building materials, plaster, paint, road base type materials, petroleum based chemicals, and other harmful materials.
2. If topsoil has been stockpiled for several months, apply glyphosate to control weeds before topsoil is moved.
3. Scarify construction compacted subsoil, except as follows:
   a. In areas of existing tree roots.
   b. On inaccessible slopes.
   c. On or adjacent to trenching and drainage installations.
   d. On areas intended by design to be compacted such as abutments, footings, and inslopes.
4. Mix in first lift of replaced soil into scarification zone to improve transition between subsoil and overlying soil horizons.

B. Restore soils disturbed during construction in areas that will not be covered by buildings, structures, or hardscapes. Cultivate and amend with organic matter to a depth of 12-inches. Additionally, comply with three of the following:
1. Compaction: Do not exceed bulk densities per the following as measured using a soil cone penetrometer per ASAE S313.3:

SURFACE RESISTANCE (PSI)		SUBSURFACE RESISTANCE (PSI)	
ALL TEXTURES SAND	SAND	SILT	CLAY
110	260	260	225

2. Infiltration Rates shall be restored to levels comparable with site's reference soil per ASTM D3385 or ASTM D5093, or alternative method approved by the AHJ.
3. Soil Biological Function of soil's mineralizable nitrogen will be permitted as a proxy assessment of biological activity.
4. Soil Chemical Characteristics appropriate for plant growth shall be restored, including pH, cation exchange capacity, and nutrient profiles, to levels comparable with site's reference soil.

3.10 SUBBASE AND BASE COURSES

A. Place subbase and base course on subgrades free of mud, frost, snow, or ice to a tolerance of +0 inches and minus ¾ inches.

B. On prepared subgrade, place subbase and base course under pavements and walks as follows:
3. Shape subbase and base course to required crown elevations and cross-slope grades.

4. Place subbase and base course 6 inches (150 mm) or less in compacted thickness in a single layer.
5. Place subbase and base course that exceeds 6 inches (150 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick.
6. Compact subbase and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight per ASTM D 698.

C. Pavement Shoulder: Place Shoulder along edges of subbase and base course to prevent lateral movement. Construct Shoulder, at least 12-inches (300 mm) wide, of satisfactory soil materials and compact simultaneously with each subbase and base layer to not less than 95 percent of maximum dry unit weight per ASTM D 698.

3.11 FIELD QUALITY CONTROL

A. Special inspection and testing will be done per Section 014000 and Section 014533.

B. Continuous Inspection during Construction: Testing agency will inspect and approve or take other appropriate action on sub-grades and fill layers to ensure compliance with indicated materials, densities, and lift thicknesses during placement and compaction for areas under concrete slab on grade.

C. Periodic Inspection during Construction: Testing agency will inspect and approve or take other appropriate action on the following:
1. Verify materials below footings are adequate to achieve design bearing capacity.
2. Verify excavations are to proper depth and have reached proper material.
3. Perform classification and testing of controlled fill materials.
4. Before placement of controlled fill, observe subgrade and verify site has been prepared properly.

D. Testing agency will perform testing, per ASTM D2922 (nuclear method).
1. Check and adjust calibration curves if necessary by procedure described in ASTM D2922, paragraph, "ADJUSTING CALIBRATION CURVE." ASTM D2922 results in a wet unit weight of soil and when using this method use ASTM D3017 to decide moisture of soil.
2. Check calibration curves furnished with moisture gages along with density calibration checks as described in ASTM D3017. Make calibration checks of both density and moisture gages at beginning of Project on each different type of material encountered and at intervals as required by Architect/Engineer or testing agency.

E. Frequency of Compaction Testing:
1. Paved Areas: One field density test of subgrade every 2,000 square feet, but not less than three tests. For each compacted fill layer, one field density test for every 2,000 square feet, but no less than three tests.

F. If compacted subgrade or fills which have been placed do not meet specified densities provide additional compaction and testing at no expense to Owner.

G. Eliminate standing water or pool areas.

3.12 MAINTENANCE

A. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris.

B. Repair and re-establish grades in settled, eroded and rutted areas to specified tolerances.

C. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, re-shape and compact to required density prior to further construction.

D. Grade and reseed areas where soil is borrowed and where soils are dumped.

3.13 DISPOSAL OF EXCESS AND WASTE MATERIALS

A. Transport acceptable excess excavated material to designated soil storage areas on Owner's property. Stockpile soil or spread as required by Architect/Engineer.

B. Transport waste material, including unacceptable excavated material, trash and debris off Owner's property and dispose of as indicated.

C. Materials excavated shall be disposed of to interfere as little as possible with public travel.

END OF SECTION

SECTION 313700
RIPRAP

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Section Includes:
   1. Riprap, rock, concrete, or other material used as a hard, artificial shoreline facing to reduce erosion.

1.2 QUALITY ASSURANCE

A. Follow Municipality of Robertson County Public Work's standard.

B. Installer Qualifications: An employer of workers trained and approved by manufacturer.

PART 2 PRODUCTS

2.1 MATERIALS

A. Riprap: Class A-1 designation, machined rip-rap; varying in size from two inches to 15 inches with no more than 20 percent by weight being less than 4 inches; essentially free of sand, dust, and organic materials; uniformly distributed stone sizes throughout mix.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not place riprap over frozen or spongy subgrade surfaces.

B. Verify slopes and ground surface are trimmed to lines and sub-grades required by Contract Documents and are thoroughly compacted by use of hand tamps.

3.2 INSTALLATION

A. Place riprap at culvert pipe ends, at embankment slopes and related items as indicated on Drawings. Place riprap by hand or machine so that surfaces will be embedded and even with surface of slope or ground adjoining it at both top and bottom.

B. Place riprap upon prepared foundation. Set stones as closely together as is practicable to reduce voids to a minimum. Bed each stone with depth perpendicular to surface upon which it is set.

C. Place each main stone against adjoining stones with sides and ends in contact. Place stone in such manner as to stagger joints insofar as possible.

D. Place into position.

E. Place in a staggered pattern. Remove foreign matter from surfaces.

F. Installed Thickness: 12 inches average, plus or minus 2 inches.

G. After placement, spray with water to moisten the bagged mix. Maintain moist for 24 hours.

END OF SECTION

SECTION 321216
BITUMINOUS CONCRETE PAVING

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes
   1. Double bituminous surface treatment consisting of a bituminous mat composed of mineral aggregate bonded with bituminous material.

1.2 ACTION SUBMITTALS

A. Submittals: Follow Section 013300.

B. Submit proposed mix design for: Double bituminous surface treatment.

C. Include gradations of aggregates and intended temperature of complete mixture for each course (between 250 and 325 degrees F) at time it is dumped from mixer.

1.3 INFORMATIONAL SUBMITTALS

A. Field quality control reports.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: A paving-mix manufacturer registered with and approved by authorities having jurisdiction or the department of transportation of the state in which Project is located.
   1. Obtain materials from same source throughout.

B. Installer Qualifications: Imprinted-asphalt manufacturer's authorized installer who is trained and approved for installation of imprinted asphalt required for this Project.

C. Regulatory Requirements: Follow Tennessee Department of Transportation (TDOT) specifications Highway Standards.

D. Conform to applicable sections of appropriate Department of Transportation for State in which Project is located. In the event of conflicts between this Specification and the appropriate State standards, the State standards shall take precedence.

1.5 CONNECTIONS TO PUBLIC ROADS

A. Obtain required permit, post bond and show evidence of carriage of Public Liability Insurance in kind and amount as required by governmental authority having jurisdiction.

B. Construct connections to public roads in a manner and with materials that will meet approval of governmental authority having jurisdiction.

1.6 ENVIRONMENTAL REQUIREMENTS

A. No frozen materials will be permitted. No paving may be applied on frozen surfaces.

B. Construct double bituminous surface treatment only between April 15 and October 1, when atmospheric temperature is above 70 degrees F in the shade, and when base is dry.

PART 2 PRODUCTS

2.1 AGGREGATES

A. General: Use materials and gradations that have performed satisfactorily in previous installations.

B. Aggregate for Base Course: Per TDOT 903.05 for crushed stone Type A Base, Grade "D."

2.2 ASPHALT MATERIALS

A. Double Bituminous Surface Treatment: Bituminous mat composed of mineral aggregate bonded with bituminous materials; constructed on a designated surface per TDOT specifications and in conformity with lines, grades, and cross sections indicated on Drawings.
   1. Emulsified Asphalt: RS-2 or CRS-2 per TDOT 904.03.
   2. Mineral Aggregate: Conform to TDOT 903.14.

B. Water: Potable.

2.3 AUXILIARY MATERIALS

A. Sand: ASTM D 1073 or AASHTO M 29, Grade Nos. 2 or 3.

PART 3 EXECUTION

3.1 INSPECTION

A. Verify compacted subgrade is dry and ready to support paving and imposed loads.

B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph (5 km/h).

C. Dress up sub-grade by filling low spots, compacting soft spots and cutting down high areas as necessary to ensure that elevations and grading of sub-grade is correct, to allow specified thicknesses of materials specified to be installed and to meet finished grades indicated on Drawings.

D. Verify gradients and elevations are correct. Establish and maintain required lines and elevations.

E. Beginning of installation means acceptance of substrate.

3.2 SURFACE PREPARATION

A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.

3.3 PLACING MINERAL AGGREGATE BASE

A. After sub-grade is prepared, install a mineral aggregate base course.

B. Waterbind, apply, and roll base course with not less than a 10-ton roller. Calcium chloride will not be permitted. Construct base course in compacted thickness(es) as indicated on Drawings. Apply base course in two layers of equal thickness, not to exceed 4 inches each. Follow TDOT 303 Highway Standards.

C. Repair damage to subgrade or base before asphalt is installed.

D. Prime coat entire surface of base course as indicated on Drawings.

E. Apply prime coat per manufacturer's instructions. Use clean sand to blot excess prime coat. Apply prime coat to contact surfaces of curbs and gutters. Coat surfaces of manhole and catch basin frames with oil to prevent bonding with asphalt paving.

3.4 PLACING DOUBLE BITUMINOUS SURFACE TREATMENT

A. In general, comply with TDOT 404. Ensure that surface to be treated complies with applicable section of TDOT Division II, Part 2-Bases and Subgrade Treatments.

B. Apply bituminous material at the rate of 0.30 – 0.38 gallon per square yard, not more than 6” wider than width covered by immediate spread of cover aggregate. Each with of spread shall be not less than one-half surface to be treated.

C. Begin and end each spread on building paper. Remove and dispose of paper after use. Treat areas inaccessible to automated equipment by hand sprays. If less than full roadway width is being treated, do not spread aggregate on inside 6” of either first or second application until adjacent lane has been treated.

D. Uniformly cover each application of bituminous material with dry, No. 7 size mineral aggregate at the rate of 24 - 30 pounds per square yard. Back truck on aggregate being spread; do not drive truck on or over uncovered bituminous material. Do not spread more bituminous material than can be immediately covered with aggregate.

E. Achieve uniform coverage of aggregate using equipment conforming to TDOT standards.

F. Allow first application of bituminous material and aggregate to cure for a length of time as directed by Architect/Engineer before performing second application.

G. Immediately after spreading cover aggregate, roll surface per TDOT standards with a pneumatic tired, then a steel wheel rolling vehicle, in an amount and in the sequence as directed by Architect/Engineer.

H. Apply second bituminous material application in same manner as the first at a uniform rate of 0.20 – 0.35 gallon per square yard, minimum. Uniformly cover each application of bituminous material with dry, No. 8 size mineral aggregate at the rate of 16 – 28 pounds per square yard. Roll second application per the first application.

I. Restore shoulders disturbed by construction at no additional expense to Owner.

J. Maintain work per TDOT standards for 10 days.

3.5 TOLERANCES

A. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.

B. Compacted Scheduled Thickness:
   1. If average thickness is deficient by no more than 1/4" and no individual measurement is deficient by more than 5/8", then pavement meets design requirements.
   2. If average thickness is deficient by more than 1/4", or if individual thickness determination is deficient by more than 5/8", then pavement thickness does not meet design requirements.

C. Variation from True Elevation: Within 1/2 inch.

3.6 PATCHING EXISTING PAVEMENT AND CLEAN-UP

A. Restore paved surfaces, concrete curbs and asphalt curbs damaged by construction to meet approval of local authorities having jurisdiction and Architect/Engineer.

B. Remove debris and clean-up working area.

3.7 FIELD QUALITY CONTROL

A. Perform inspection and field analysis under testing provisions of Section 014000. One test shall be performed for each of the indicated criteria for every 2,000 square yards.

B. Testing Agency: A qualified independent testing and inspecting agency shall perform field tests and inspections and prepare test reports.
   1. Testing agency shall conduct and interpret tests and state in each report whether tested Work complies with or deviates from specified requirements.

C. In-Place Density: Testing agency shall take samples of uncompacted paving mixtures and compacted pavement per ASTM D 979 or AASHTO T 168.

3.8 PROTECTION

A. Immediately after placement, protect pavement from mechanical injury until Substantial Completion per Section 017600.

END OF SECTION

SECTION 321313
PORTLAND CEMENT CONCRETE PAVING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. This Section includes exterior cement concrete pavement for the following:
   1. Driveways and roadways
   2. Parking lots
   3. Curbs and gutters

1.2 ACTION SUBMITTALS

A. Submittals: Follow Section 013300.

B. Product Data: Include data on joint filler and admixtures

C. Design Mixtures: For each concrete pavement mixture. Include alternate mixture designs when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1.3 INFORMATIONAL SUBMITTALS

A. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated, based on comprehensive testing of current materials:
   1. Aggregates. Include service record data indicating absence of deleterious expansion of concrete due to alkali-aggregate reactivity.

B. Material Certificates: Signed by manufacturers certifying that each of the following materials complies with requirements:
   1. Cementitious materials
   2. Steel reinforcement and reinforcement accessories
   3. Fiber reinforcement
   4. Admixtures
   5. Curing compounds
   6. Applied finish materials
   7. Bonding agent or epoxy adhesive
   8. Joint fillers

C. Field quality control test reports.

D. Source quality control reports.

1.4 CLOSEOUT SUBMITTALS

A. Record Documents: Record date, location of pour, quantity, air temperature and test samples taken. Submit with record documents.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products who complies with ASTM C 94/C 94M requirements for production facilities and equipment.
   1. Manufacturer certified per NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

B. Testing Agency Qualifications: An independent agency qualified per ASTM C 1077 and ASTM E 329 for testing indicated, as documented per ASTM E 548.
   1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, per ACI CP-01 or an equivalent certification program.

C. ACI Publications: Follow ACI 301 and ACI 302.

D. Concrete Testing Service: Engage and pay for a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

E. Obtain cementitious materials from same source throughout.

F. Ensure that ramped or sloped sidewalks are no longer than 30 feet, no steeper than 8.33% with a cross slope (perpendicular to path of travel) is no greater than 2%.

G. Conform to applicable sections of appropriate Department of Transportation for State in which Project is located. In the event of conflicts between this Specification and the appropriate State standards, the State standards shall take precedence.

1.6 PROJECT CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

B. Do not place concrete when base surface temperature is less than 40 degrees F, or surface is wet or frozen.

PART 2 PRODUCTS

2.1 FORMS

A. Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces; conform to ACI 301. Use flexible or curved forms for curves with a radius of 100 feet (30.5 m) or less.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surface.

2.2 REINFORCEMENT

A. Reinforcing Steel: ASTM A615; 60 ksi yield grade; deformed billet steel bars, unfinished.

B. Welded Steel Wire Fabric: Plain type, ASTM A1064/A1064M; in flat sheets; unfinished.

C. Tie Wire: Annealed steel, minimum 16 gage size.

D. Dowels: ASTM A615; 40 ksi yield grade, plain steel, unfinished.

E. Tie Bars: ASTM A 615/A 615M, Grade 60 (Grade 420), deformed.

F. Hook Bolts: ASTM F1554, Grade 36 (ASTM F568M, Property Class 4.6), internally and externally threaded. Design hook-bolt joint assembly to hold coupling against pavement form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.

G. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports per CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete, and as follows:
   1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.

2.3 AGGREGATES

A. General: Use materials and gradations that have performed satisfactorily in previous installations.

B. Aggregate for Sub-Base Course: Per TDOT 903.05 for crushed stone Type A Base, Grade "D" Highway Standards.

2.4 CONCRETE MATERIALS

A. Portland Cement: ASTM C150 Air Entraining-Type IA, Portland type, gray color.
   1. Fly Ash: ASTM C 618, Class F.

B. Fine and Coarse Aggregates: ASTM C33; Class 4S, uniformly graded.

C. Water: Clean and not detrimental to concrete.

D. Air Entrainment: ASTM C260, 6 percent.

2.5 CURING MATERIALS

A. Clear Waterborne Membrane-Forming Curing Compound: ASTM C309, Type 1, Class B.

B. Water: Clean and not detrimental to concrete.

2.6 ACCESSORIES

A. Expansion- and Isolation-Joint Filler: Either of the following:
   1. ASTM D 1751, asphalt impregnated fiberboard or felt, 1/2 -inch-thick; tongue and groove profile.

2. Processed board product made from granular crumb rubber derived from discarded truck tires and various low density polymer products; 40 pcf density; fully compressible with recovery rate of minimum 95 percent.

B. Sealant: Polyurethane base, ASTM C920, Type S, single component; Grade P, Use T, self-leveling type; moisture curing; withstand movement of plus or minus 25 percent of joint width; Shore A hardness of 15 to 50; non-staining; non bleeding; color as selected by Architect/Engineer from manufacturer's premium range. Coal tar sealants will not be permitted.

C. Cleaning: Dilute acid etch solution consisting of a 5:1 mixture of water and hydrochloric (muriatic) acid.

2.7 CONCRETE MIXTURES

A. Mix concrete per ASTM C94, Alternative 2. Furnish batch certificates for each batch discharged and used in the Work. On site batch mixing will not be permitted.

B. Provide concrete of the following characteristics:
1. Compressive Strength: As indicated on Drawings.
2. Air Entrainment: 5 to 8 percent.
3. Slump Range: 8 inch for concrete with Type A admixture; 3 inch for other concrete.
4. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.45.

C. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement per ACI 301 requirements.

D. Use accelerating admixtures in cold weather only when approved by Architect/Engineer. Use of admixtures will not relax cold weather placement requirements.

E. Use set-retarding admixtures during hot weather only when approved by Architect/Engineer.

F. Use calcium chloride only when approved by Architect/Engineer.

G. Add air entraining agent to concrete mix for concrete work exposed to exterior.

2.8 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete per ASTM C 94/C 94M and ASTM C 1116. Furnish batch certificates for each batch discharged and used in the Work.
1. When air temperature is between 85 deg F (30 deg C) and 90 deg F (32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

2.9 SOURCE QUALITY CONTROL

A. Provide mix design per Section 014000.

B. Submit proposed mix design of each class of concrete to appointed firm for review prior to commencement of work.

C. Tests on cement and aggregates will be done to ensure conformance with specified requirements.

D. Test samples per ACI 301.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify compacted subgrade and granular base are ready to support paving and imposed loads.

B. Verify gradients and elevations of base are correct.

C. Proof-roll prepared sub-base below concrete pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding.
   1. Completely proof-roll sub-base in one direction and repeat in perpendicular direction. Limit vehicle speed to 3 mph.
   2. Proof-roll with a loaded 10-wheel tandem-axle dump truck weighing not less than 15 tons.
   3. Sub-base with soft spots and areas of pumping or rutting exceeding depth of 1/2-inch require correction per requirements in Section 312000 Earthwork.

D. Moisten base to minimize absorption of water from fresh concrete.

E. Notify Architect/Engineer minimum 24 hours prior to commencement of concreting operations.

F. Beginning of installation means acceptance of existing conditions.

3.2 PREPARATION

A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 FORMING

A. Place and secure forms to correct location, dimension and profile.

B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.

C. Place joint fillers vertical in position, in straight lines. Secure to formwork during concrete placement.

3.4 STEEL REINFORCEMENT

A. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement. Place steel reinforcement at top mid-height of slabs-on-grade.

D. Install welded wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

E. Interrupt reinforcement at contraction joints.

3.5 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edgings true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated. When joining existing pavement, place transverse joints to align with previously placed joints, unless otherwise indicated.

B. Place expansion joints at 20 foot intervals to correct elevation and profile. Align curb, gutter and sidewalk joints.

C. Place concrete to grid pattern.

D. Place joint filler between paving components and building or other appurtenances. Recess top of filler 1/2-inch for sealant.

E. Contraction Joints: Form weakened-plane contraction joints, at 5 foot intervals, between sidewalks and curbs, between curbs and gutters, and as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:
   1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 1/4-inch (6-mm) radius. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover marks on concrete surfaces.

F. Edging: Tool edges of pavement, gutters, curbs, and joints in concrete after initial floating with an edging tool to a 1/4-inch (6-mm) radius. Repeat tooling of edges after applying surface finishes. Eliminate tool marks on concrete surfaces.

3.6 PLACING CONCRETE

A. Inspection: Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast in. Notify other trades to permit installation of their work.

B. Remove snow, ice, or frost from subbase surface and reinforcement before placing concrete. Do not place concrete on frozen surfaces.

C. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

D. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.

E. Do not add water to concrete during delivery or at Project site. Do not add water to fresh concrete after testing.

F. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

G. Consolidate concrete per ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.

H. Place concrete in two operations; strike off initial pour for entire width of placement and to the required depth below finish surface. Lay welded wire fabric or fabricated bar mats immediately in final position. Place top layer of concrete, strike off, and screed.

I. Screed pavement surfaces with a straightedge and strike off.

J. Commence initial floating using bull floats or darbies to impart an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

K. Curbs and Gutters: When automatic machine placement is used for curb and gutter placement, submit revised mix design and laboratory test results that meet or exceed requirements. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing as specified for formed concrete. If results are not approved, remove and provide new with formed concrete.

L. When adjoining pavement lanes are placed in separate pours, do not operate equipment on concrete until pavement has attained 85 percent of its 28-day compressive strength.

M. Hot Weather Placement: Comply with ACI 305.

N. Cold Weather Placement: Comply with ACI 306.

O. Ensure reinforcement, inserts, embedded parts and formed joints are not disturbed during concrete placement.

P. Place concrete continuously between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.

3.7 FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Paving: Light to medium broom; immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.

C. Sidewalk Paving: Light to medium broom, radius to 1/2-inch radius and trowel joint edges.

D. Curbs and Gutters: Light to medium broom.

E. Inclined Vehicular Ramps: Broom perpendicular to slope.

F. Place curing compound on exposed concrete surfaces immediately after finishing. Follow manufacturer's instructions.

3.8 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with ACI 306.1 for cold-weather protection.

C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply per manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

E. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows:
   1. Moist Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
      a. Water.
      b. Continuous water-fog spray.
      c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.
   2. Curing Compound: Apply uniformly in continuous operation by power spray or roller per manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.9 PAVEMENT TOLERANCES

A. General: Comply with tolerances of ACI 117 for a maximum gap of a 13-mm (½-in.) under a 3-m (10-ft) straightedge.

B. Slope (in direction of travel): Plus 0.5 percent, no requirement for minus

C. Cross slope (perpendicular to travel): Plus 0.5 percent, no requirement for minus.

D. Abrupt Changes in Elevation: 1/4-inch, maximum.

3.10 FIELD QUALITY CONTROL

A. Field inspection and testing shall be done per Section 014000.

B. Testing agency shall take cylinders and perform slump and air entrainment tests following ACI 301.

C. Three concrete test cylinders shall be taken for every 50 or less cubic yards of each class of concrete placed each day.

D. One additional test cylinder shall be taken during cold weather and be cured on site under same conditions as concrete it represents.

E. One slump test shall be taken for each set of test cylinders taken.

F. One air entrainment test shall be taken for each set of test cylinders taken.

G. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature and test samples taken. Submit with record documents.

H. Pay for subsequent tests made necessary by failure of work to conform to Contract requirements.

3.11 REPAIRS AND PROTECTION

A. Remove and provide new concrete pavement that is broken, damaged, or defective or that does not comply with requirements in this Section.

B. Drill test cores, where directed by Architect/Engineer, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with portland cement concrete bonded to pavement with epoxy adhesive.

C. Protect concrete from premature drying, excessive hot or cold temperatures, mechanical injury, and other damage. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur

D. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

E. Protect pavement markings from damage and wear during remainder of construction period. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

SECTION 323113
CHAIN LINK FENCES AND GATES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. This Section includes the following.
   1. Chain-Link Fences: Industrial.
   2. Gates: Swing.
   3. Concrete post fill.

1.2 ACTION SUBMITTALS

A. Submittals: Follow Section 013300.

B. Product Data:
   1. Fence and gate posts, rails, and fittings.
   2. Chain-link fabric, reinforcements, and attachments.
   3. Gates and hardware.
   4. Accessories: Barbed wire.

C. Shop Drawings: Show locations of fences, gates, posts, rails, tension wires, details of extended posts, extension arms, gate swing, or other operation, hardware, and accessories. Indicate materials, dimensions, sizes, weights, and finishes of components. Include plans, gate elevations, sections, details of post anchorage, attachment, bracing, and other required installation and operational clearances.

D. Submit proposed mix design per Chapter 5 of ACI 318-95 for each class of concrete to Architect/Engineer for review prior to commencement of work. Report should be not more than six months old.

1.3 QUALITY ASSURANCE

A. In general, conform to standards of the CLFMI.

B. Manufacturer Qualifications: Company specializing in commercial quality chain link fencing with three years' experience and a member of the CLFMI and member of the American Fence Association (AFA).

C. Installer Qualifications: Company specializing in commercial quality chain link fencing installation with three years' experience and approved by manufacturer.

D. Installation: ASTM F567 and as indicated.

1.4 DELIVERY, STORAGE AND HANDLING

A. Deliver products to site, store and protect products per Section 016000.

B. Protect wire fabric from moisture in transit, in storage and prior to installation by covering with water resistant covering.

1.5 WARRANTY

A. Provide warranty.

B. Provide 10-year warranty against fabric failure because of rust or corrosion.

PART 2 PRODUCTS

2.1 CHAIN LINK FENCE FABRIC

A. General: Provide fabric in one-piece heights measured between top and bottom of outer edge of selvage knuckle or twist according to "CLFMI Product Manual" and requirements indicated.

B. Fence Fabric: Commercial grade woven wire fabric 2 inch diamond mesh steel wire, interwoven, with core wire of 9 gage, 0.148 inch diameter, 1,290 pounds breaking load. Fabrics shall be knuckled at both selvages. Twisted selvages will not be permitted.
1. ASTM A392, Class 1 zinc coating, galvanized after weaving, 1.2 oz/sf of uncoated wire surface.

C. Primer for Galvanized Touch-up: Organic zinc rich primer; lead and chromate free; 45% solids by volume minimum; 82% minimum metallic zinc content by weight in dry applied film; color to match adjacent area.

2.2 FENCE FRAMWORK

A. Framework:
1. ASTM F1043, Group IC Heavy Industrial Fence Framework, cold-formed, steel pipe; minimum yield strength of 50,000 psi. Coat external surfaces with a 1.0 +/- 0.1 oz/sf coating of zinc, 30 +/-15 micrograms of chromate per square inch and clear, high performance, verifiable polymer. Coat internal surfaces per ASTM F1234, Type B, zinc 0.9 oz/sf minimum or Type D, zinc-rich based organic coating having a 91 per cent zinc powder loading, 0.3 mils thick minimum.

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2.3 CONCRETE MIX

A. Concrete: ASTM C94, Alternative 2; normal Portland Cement; 3000 psi at 28 days; 3 inch slump; 3/4-inch sized aggregate.

2.4 COMPONENTS

A. Intermediate Line Posts: Steel pipe in sizes as follows:
1. Up to 6'-0" High Fabric: 2.00 inch minimum outside diameter.
2. Up to 8'-0" High Fabric: 2.38 inch minimum outside diameter.
3. Up to 10'-0" High Fabric: 2.88 inch minimum outside diameter.

4. Up to 12’-0” High Fabric: 3.50 inch minimum outside diameter.
5. Up to 14-0” High Fabric: 4.00 inch minimum outside diameter.

B. End, Corner and Terminal or Pull Posts: Steel pipe one size larger than intermediate line posts.

C. Top, brace, bottom and intermediate rails, 1.660 in. (42.2 mm) OD.

D. Top, Bottom, and Brace Rail: 1.66 inch diameter, plain end, sleeve coupled steel pipe.

E. Tension Wire: ASTM A824; Marcelled (spiralled or crimped) 7 gage minimum thickness steel, single strand, Type I aluminum coating of 0.40 oz per sq ft or Type II zinc coating of 1.20 oz per sq ft.

2.5 ACCESSORIES

A. Caps: Cast steel or malleable iron, galvanized; sized to post dimension, set screw retained; designed, built, and installed to exclude moisture from posts.

B. Sleeves, Bands, Clips, Rail Ends, Tension Bars, Fasteners and Fittings: Galvanized steel; ASTM F626.

C. Wire Ties: ASTM F626; 9 gage aluminum or 11 gage galvanized steel wire.

D. Extension Arms: Cast steel, to accommodate 3 strands of barbed wire, single arm, sloped to 45 degrees; top wire approximately 12-inches horizontally from fence line and other wires spaced uniformly between top of fence fabric and outside strand; of sufficient strength to withstand a weight of 250 pounds applied at outer strand of barbed wire.

E. Barbed Wire: Three strands of twisted wire with 4 point barbs on 5 inch spacing; 12-1/2 line wire gage with 14 gage barbs; ASTM A121 zinc coated or ASTM A585 aluminum coated barbed wire.

F. Hinges: One hundred eighty degree gate hinges per leaf of adequate strength for gate and with large bearing surfaces for clamping in position.
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G. Latches: Plunger bar arrangement to use center stop except that for single gate openings 10'-0" wide and less a fork type latch may be provided. Arrange latches for locking; accessible from both sides of gate.

H. Stops: Provide a center stop consisting of a device arranged to be set in concrete and to use plunger bar of latch of double gates.

I. Fence Signs: None permitted.

J. Provide gates with self-latching devices.

2.6 SWING GATES

A. Swing Gates: Comply with ASTM F 900 for double swing gate types.
1. Metal Pipe and Tubing: Galvanized steel; comply with ASTM F 1043 and ASTM F 1083 for materials and protective coatings.

B. Frames and Bracing: Fabricate members from round, galvanized steel tubing with outside dimension and weight per ASTM F 900 and the following:
   1. Gate Fabric Height: 2-inches (50 mm) less than adjacent fence height.
   2. Leaf Width: As indicated.
   3. Frame Members: Tubular steel, 1.66 inches (42 mm) round for 6’-0” wide or less; 1.90 inches (48 mm) round for over 6’-0” wide.

C. Frame Corner Construction: Welded and 5/16-inch- (7.9-mm-) diameter, adjustable truss rods for panels 5 feet (1.52 m) wide or wider. Touch up welds with zinc rich paint per ASTM F900.

D. Extended Gate Posts and Frame Members: Extend gate posts and frame end members above top of chain-link fabric at both ends of gate frame 12-inches (300 mm) as required to attach barbed wire assemblies.

E. Gate Filler: Chain link fence as specified in this Section. Gate filler shall extend entire gate length (including clear opening and counterbalance) and shall be secured at each end of gate frame by standard fence industry tension bars and tied at each vertical member with standard fence industry ties. Welding will not be permitted for attachment of fence fabric to frames.

F. Hardware: Latches permitting operation from both sides of gate, hinges, center gate stops and keepers for each gate leaf more than 5 feet (1.52 m) wide. Fabricate latches with integral eye openings for padlocking; padlock not included; padlock accessible from both sides of gate.

G. Swing Gate Posts: Steel pipe in sizes as follows:
   1. Up to 6'-0" Wide Gate Leaf: 2.88 inch minimum outside diameter, 4.64 lb/ft minimum weight.
   2. Up to 13'-0" Wide Gate Leaf: 4.00 inch minimum outside diameter, 8.65 lb/ft minimum weight.
   3. Up to 18'-0" Wide Gate Leaf: 6.63 inch minimum outside diameter, 18.02 lb/ft minimum weight.
   4. Up to 23'-0" Wide Gate Leaf: 8.63 inch minimum outside diameter, 27.12 lb/ft minimum weight.

2.7 FABRICATION TOLERANCES

A. Nominal Height of Fabric: Plus or minus one inch.

B. Mesh Size: Plus or minus 1/8-inch.

C. Wire Diameter: Plus or minus 0.005 inch; decided as average of two readings measured to nearest 0.001 inch taken at right angles to each other on straight portion of parallel sides of mesh.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install framework, fabric, accessories and gates per ASTM F567 and more stringent requirements specified.

B. Provide fence of height indicated.

C. Space line posts at intervals not exceeding 10 feet.

D. Set posts plumb, in concrete footings, with top of footing 2-inches above finish grade. Slope top of concrete for water runoff.
   1. Footing Diameter: Four times largest cross section of post.
   2. Footing Depth Below Finish Grade: 24 inches plus an additional 3 inches for each 1'-0" increase in fence height over 4'-0."

E. Top Rail: Install per ASTM F 567, maintaining plumb position and alignment of fencing. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.

F. Bottom Rails: Install, spanning between posts.

G. Carriage bolts used for fittings shall be installed with the head on the secure side of the fence. All bolts shall be peened over to prevent removal of the nut.

H. Brace each gate, corner, pull and end post back to adjacent line post with horizontal center brace rail and diagonal truss rods. Install brace rail, one bay from end and gate posts.

I. Install center and bottom brace rail on corner posts.

J. Terminal Posts: Locate terminal end, corner, and gate posts per ASTM F 567. Locate terminal pull posts at changes in horizontal or vertical alignment of 15 degrees or more and at intervals of 400 feet maximum.

K. Position bottom of fabric 2-inches above finished grade. Provide raked installation to follow finished grade.

L. Fasten fabric to top rail, braces and bottom tension wire with wire ties spaced at maximum 24 inches on center. Fasten fabric to line posts with wire ties maximum 14 inches on center. Bend end of wire ties to minimize hazard to persons and clothing.

M. Attach fabric to end, corner and gate posts with 3/16 by 3/4-inch tension bars and heavy 11 gage tension bar clips spaced 14 inches on center. Attach fabric to top rail at 24 inches on center.

N. Install bottom tension wire stretched taut between terminal posts.

O. Install barbed wire support arms sloped outward and attach barbed wire; tension and secure.

P. After installation, touch-up field cuts, scratched and damaged surfaces with primer. Touch-up damage to galvanized components with zinc-based paint per ASTM A780.

3.2 GATE INSTALLATION

A. Install gates with fabric and barbed wire overhang to match fence and as indicated in ASTM F567. Install latch, catches, drop bolt, foot bolts and sockets,, and three hinges per leaf.

B. Provide concrete center drop to foundation depth and drop rod retainers at center of double gate openings.

C. Gates shall be plumb in the closed position.

D. Hinge and latch offset opening space from the gate frame to the post shall be no greater than 3 in. in the closed position.

E. Double gate drop bar receivers shall be set in a concrete footing sized as indicated on Drawings. Gate leaf holdbacks shall be installed for all double gates.

3.3 ERECTION TOLERANCES

A. Set line, corner, terminal and gate posts plumb to within 5 degrees, (+/- 1 degree) in two planes.

B. Set corner, terminal and gate posts to resist 70 pound force applied to top of post with no more than 1 inch deflection.

C. Set line posts to resist 38 pound force applied to top of post with no more than 1 inch deflection.

END OF SECTION

SECTION 329201
SEEDING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Seeding.

B. Turf renovation.

C. Turf maintenance.

D. Soils

1.2 ACTION SUBMITTALS

A. Submit data for grass species and location of grass source. Include classification, botanical name, common name, mixture percentage of species, percent purity, quality grade, field location and state certification.

1.3 CLOSEOUT SUBMITTALS

A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of seed and grass during a calendar year. Submit before expiration of required maintenance periods.

1.4 QUALITY ASSURANCE

A. Soil-Testing Laboratory Qualifications: An independent laboratory or university laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

B. Native Plant Species: Newly landscaped areas shall contain not less than 75% native plant species.

1.5 REGULATORY REQUIREMENTS

A. Comply with regulatory agencies for fertilizer and herbicide composition.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and Federal laws, as applicable.

B. Bulk Materials:
   1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing seed areas or plants.

2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.
4. Do not handle topsoil until it is dry enough to work without damaging soil structure.

1.7 FIELD CONDITIONS

A. Coordinate planting periods with initial maintenance periods to provide required maintenance from date of Substantial Completion.

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions per manufacturer's written instructions.

C. Comply with planting schedule under Part 2 – Products. Any planting outside of this schedule shall be performed under Section 015713 - Erosion and Sediment Control as a temporary measure until such time as schedule required by this Section can be implemented.

1.8 MAINTENANCE SERVICES

A. Initial Seed Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until acceptable seed is established but for not less than 60 days from date of planting completion.

PART 2 PRODUCTS

2.1 SEED

A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.

B. Seed Mixture: An equal blend of 4 varieties of turf type tall fescue; Turf Type Tall fescue seed shall be any variety listed in the top 25 from the National Turfgrass Evaluation Program, http://www.ntep.org, most current release.
1. In Tennessee, do not seed Kentucky Bluegrass from March 20 – June 20.
2. Do not seed Fescue Kentucky 31 at any time.

C. Seed Species:
1. Not less than 95 percent germination.
2. Not less than 85 percent pure seed.
3. Not more than 0.5 percent weed and crop seeds.

2.2 SOIL AMENDMENT MATERIALS

A. Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
   1. Composition: Nitrogen, phosphorous, and potassium in 18-24-12 proportions.

B. Soil Organic Matter: Comply with ASTM D2974. Use organic matter shall be renewable with a 50-year cycle. Sphagnum peat moss or organic amendments that contain sphagnum peat moss will not be permitted.

2.3 MULCHES

A. Straw Mulch: Provide air-dry, clean, weed free, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.

2.4 PESTICIDES

A. General: Pesticide, registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

B. Pre-Emergent Herbicide: Not permitted.

C. Post-Emergent Herbicide (Selective and Nonselective): Effective for controlling weed growth that has already germinated.
   1. Emerged Broadleaf Weeds: 2,4-D, dicamba, mecoprop (MCPP) and triclopyr.
   2. Emerged Crabgrasses in Mature Turf: Fenoxaprop (e.g., Acclaim® Extra), monosodium acid methanearsonate (MSMA) and quinclorac (e.g., Drive®).

2.5 PLANTING SOILS

A. Topsoil: ASTM D5268, natural, fertile, agricultural soil typical of locality that sustains vigorous plant growth, from well drained site, free of flooding, not in frozen or muddy condition, not less than 6 percent organic matter and pH value of 5.5 to 7.0. Free from deleterious materials such as lead, subsoil, slag, clay, stones 0.75 inch or larger in any dimension, lumps, live plants, roots, live Bermuda grass roots, sticks, weeds, broken glass, paint chips, plastic, and other foreign matter to the extent indicated.
   1. Topsoil Source: Reuse surface soil stockpiled on-site. Amend existing in-place surface soil to produce topsoil. Verify suitability of stockpiled surface soil to produce topsoil. Supplement with imported or manufactured topsoil from off-site sources when quantities are insufficient.
   2. Soluble salts shall be no higher than 500 parts per million.
   3. Topsoil shall not contain more than 5% by volume of gravel, stones, and rocks.
   4. Materials passing the No. 4 (4.75 mm) sieve
      a. Organic material: 2 to 20
      b. Sand content: 20 to 60
      c. Silt and clay content: 35 to 70
   5. Total permissible deleterious materials: 5% by mass.
   6. Heavy clay and organics such as peat or muck will not be permitted.
   7. Add lime as necessary to achieve indicated pH levels.

PART 3 EXECUTION

3.1 EXAMINATION

A. Submit a soil sample for testing six weeks before the intended planting date.

B. Examine areas to be planted for compliance with requirements and other conditions affecting performance.
   1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
   2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
   3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
   4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

D. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination and replace with new planting soil.

E. Beginning of installation means acceptance of existing site conditions.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
   1. Protect grade stakes set by others until directed to remove them.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

C. Scarify subsoil to a depth of 4 inches, where topsoil is to be placed. Repeat cultivation areas where equipment has compacted subgrade.

D. Limit seed subgrade preparation to areas to be planted.

E. Newly Graded Subgrades: Prepare subsoil to eliminate uneven areas and low spots. Maintain lines, levels, profiles and contours. Make change in grade gradual. Blend slopes into level areas.

   1. Protect existing underground improvements from damage.
   2. Remove foreign materials, undesirable plants and their roots, and debris. Do not bury foreign material.
   3. Remove contaminated subsoil and foreign materials collected during cultivation
   4. Spread topsoil to depth of 6 inches over area to be seeded. Place during dry weather and on dry, unfrozen subgrade. Provide imported topsoil if a sufficient quantity is not available on site.
   5. Cultivate topsoil to depth of 6 inches with mechanical tiller. Cultivate inaccessible areas by hand. Rake until surface is smooth.

F. Unchanged Subgrades: If seed is to be planted in areas unaltered or undisturbed by excavating, grading, or surface-soil stripping operations, prepare surface soil as follows:

1. Remove existing grass, vegetation, and seed. Do not mix into surface soil.
2. Loosen surface soil to a depth of at least 6 inches (150 mm).
3. Apply fertilizers and other materials per Article “Soil Amendments” below.
4. Till soil to a homogeneous mixture of fine texture.

G. Remove stones larger than 1 inch (25 mm) in any dimension and sticks, roots, trash, and other extraneous matter.

H. Legally dispose of waste material, including grass, vegetation, and seed, off Owner's property.

I. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2-inch (13 mm) of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.

J. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

K. Before planting, restore planting areas if eroded or otherwise disturbed after finish grading.

3.3 SOIL AMENDMENTS

A. Apply fertilizer per manufacturer's instructions and as indicated by soil tests. Apply fertilizer at the rate of 5 lbs. per 1,000 S.F.

B. Apply after smooth raking of topsoil and prior to installation of seed.

C. Apply fertilizer 3 - 7 days before laying seed.

D. Mix thoroughly into upper 2-inches of topsoil.

E. Lightly water to aid the dissipation of fertilizer.

F. Scarify upper 3 inches of topsoil.

3.4 SEEDING

A. Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph (8 km/h).
1. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
2. Do not use wet seed or seed that is moldy or otherwise damaged.
3. Do not seed against existing trees. Limit extent of seed to outside edge of planting saucer.

B. Sow seed at a total rate of 5 lb/1000 sq. ft. (0.9 kg/92.9 sq. m).

C. Rake seed lightly into top 1/8-inch (3 mm) of soil, roll lightly, and water with fine spray.

D. Protect seeded areas with slopes not exceeding 1:6 by spreading straw mulch. Spread uniformly at a minimum rate of 2 tons/acre (42 kg/92.9 sq. m) to form a continuous blanket 1-1/2-inches (38 mm) in loose thickness over seeded areas. Spread by hand, blower, or other suitable equipment.

3.5 TURF RENOVATION

A. Renovate existing turf where indicated.

B. Renovate turf damaged by Contractor's operations, such as storage of materials or equipment and movement of vehicles.
   1. Reestablish turf where settlement or washouts occur or where minor regrading is required.
   2. Install new planting soil as required.

C. Remove sod and vegetation from diseased or unsatisfactory turf areas; do not bury in soil.

D. Remove topsoil containing foreign materials, such as oil drippings, fuel spills, stones, gravel, and other construction materials resulting from Contractor's operations, and replace with new planting soil.

E. Mow, dethatch, core aerate, and rake existing turf.

F. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required.
   1. Do not use post-emergence herbicides until grasses are mature enough to withstand the herbicide treatment.
   2. Do not use pre-emergence herbicides.

G. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of them off Owner's property.

H. Till stripped, bare, and compacted areas thoroughly to a soil depth of 6 inches (150 mm).

I. Apply soil amendments and initial fertilizer required for establishing new turf and mix thoroughly into top 4 inches (100 mm) of existing soil. Install new planting soil to fill low spots.

J. Apply seed and protect with straw mulch as required for new turf.

K. Water newly planted areas and keep moist until new turf is established.

3.6 TURF MAINTENANCE

A. Apply 1/2 pound of N per 1,000 square feet three to five weeks after seedlings emerge from soil. Do not apply nitrogen if plants are stressed by high or low temperatures.

B. Mow grass at regular intervals to maintain at a maximum height of 2-inches. Do not cut more than 1/3 of grass blade at any one mowing.

C. Neatly trim edges and hand clip where necessary.

D. Immediately remove clippings after mowing and trimming.

E. Water immediately after completing each day of installing seed. Water shall be applied at least 3 times per week to supplement rainfall, at a rate sufficient to ensure moist soil conditions to a minimum depth of 1 inch. Run-off, puddling, and wilting shall be prevented. Unless otherwise directed, watering trucks shall not be driven over seed areas. Watering of other adjacent areas or plant material shall be prevented.

F. Roll surface to remove minor depressions of irregularities.

G. Top dress to 1/2" depth with fine sand one month after laying seed. Drag seeded areas after top dressing to fill voids in seams.

H. Control growth of weeds. Apply herbicides per manufacturer's instructions. Remedy damage resulting from improper use of herbicides.
   1. Do not use post-emergence herbicides until grasses are mature enough to withstand the herbicide treatment.
   2. Do not use pre-emergence herbicides.

I. Immediately replace seed in areas showing root growth failure, deterioration, bare or thin spots and eroded areas. Replace seed and seedlings showing evidence of fungal and insect attack.

J. Protect seeded areas with warning signs during maintenance period.

K. Remove fallen leaves from seeded areas.

3.7 SATISFACTORY SEED

A. Seed installations shall meet the following criteria:
   1. Satisfactory Seeded Seed: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. (0.92 sq. m) and bare spots not exceeding 5 by 5 inches (125 by 125 mm).

B. Use specified materials to reestablish seed that does not comply with requirements and continue maintenance until seed is satisfactory.

3.8 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by seed work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.

C. Remove non-degradable erosion-control measures after grass establishment period.

END OF SECTION

SECTION 331100
WATER DISTRIBUTION SYSTEM

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Water-distribution piping and specialties outside the building for the following:
   1. Water services.

B. Utility-furnished products include water meters that will be furnished to the site, ready for installation.

1.2 ACTION SUBMITTALS

A. Submittals: Follow Section 013300.

B. Product Data: Submit manufacturer's product data for pipe and fittings, valves, and accessories.

1.3 CLOSEOUT SUBMITTALS

A. Accurately record actual locations of piping mains, valves, connections and invert elevations.

B. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

C. Disinfection report; record:
   1. Type and form of disinfectant used.
   2. Date and time of disinfectant injection start and time of completion.
   3. Test locations.
   4. Initial and 24 hour disinfectant residuals (quantity in treated water) in ppm for each outlet tested.
   5. Date and time of flushing start and completion.
   6. Disinfectant residual after flushing in ppm for each outlet tested.

D. Bacteriological report; record:
   1. Date issued, project name and testing agency name, address and telephone number.
   2. Time and date of water sample collection.
   3. Name of person collecting samples.
   4. Test locations.
   5. Initial and 24 hour disinfectant residuals in ppm for each outlet tested.
   6. Coliform bacteria test results for each outlet tested.
   7. Certification that water conforms, or fails to conform, to bacterial standards of Robertson County.
   8. Bacteriologist's signature and authority.

E. Project Record Documents: Record actual locations of piping mains, valves, connections, thrust restraints, and invert elevations. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.4 QUALITY ASSURANCE

A. Manufacturers: Firms regularly engaged in manufacture of water distribution system materials of types and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. Installer Qualifications: Firm with at least 2 years of successful installation experience on exterior water distribution system projects similar to this project.

C. Follow utility district instructions for installation procedures.

D. Valves: Manufacturer's name and pressure rating marked on valve body; approved by FM, listed by UL.

E. Pipe: Manufacturer's name, working pressure, National Sanitation Foundation approval and latent production code rated on pipe body.

F. Follow ANSI/AWWA C651.

1.5 REGULATORY REQUIREMENTS

A. Conform to applicable code or regulation for performing work of this Section.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, protect and handle products to site per Section 016000.

B. Deliver and store valves in shipping containers with labeling in place.

PART 2 PRODUCTS

2.1 GENERAL

A. Furnish materials complying with referenced regulatory requirement.

2.2 MATERIALS - PIPE

A. Copper Tubing: ASTM B88, Type K annealed:
   1. Fittings: ANSI/ASME B16.18, cast copper, or ANSI/ASME B16.22, wrought copper.
   2. Joints: Compression connection or ANSI/AWS A5.8, BCuP silver braze.

2.3 GATE VALVES 3 INCHES MAXIMUM

A. Brass or bronze body, non-rising stem, inside screw, single wedge or disc, compression ends, with control rod, post indicator, extension box and two valve keys.

2.4 BALL VALVES 2-INCHES MAXIMUM

A. Brass body, teflon coated brass ball, rubber seats and stem seals, Tee stem pre-drilled for control rod, AWWA compression inlet end, compression outlet with electrical ground connector, with control rod, extension box and valve key.

2.5 MISCELLANEOUS VALVES

A. Valve Boxes: Adjustable valve boxes with cover.

2.6 BEDDING MATERIALS

A. Bedding: Aggregate fill and earth fill types as specified in Section 312000.

2.7 ACCESSORIES

A. Anchorages: Provide anchorages for tees, plugs, caps, and bends per NFPA No. 24.
   1. Clamps, Straps and Washers: Steel, ASTM A506.
   2. Rods: Steel, ASTM A575.
   3. Rod Couplings: Malleable iron, ASTM A197.
   4. Bolts: ASTM F1554, GRADE 36.
   5. Cast Iron Washers: ASTM A126, Class A.

B. Reduced Pressure Back Flow Preventer: Provide products approved by local and state agencies and as recommended by manufacturer for use in service indicated.

C. Thrust Blocks: 3000 psi concrete, ASTM C94, Alternative 2, ready-mixed concrete, 400 pounds of cement per cubic yard; water reducing admixture ASTM C494, Type A.

D. Saddles: Factory-fabricated products to comply with governing regulations; bronze.

PART 3 EXECUTION

3.1 GENERAL

A. Install materials complying with referenced regulatory requirement.

3.2 EXAMINATION

A. Verify existing conditions.

B. Verify that building service connection and municipal utility water main size, location and invert are as indicated.

3.3 PREPARATION

A. Ream pipe and tube ends and remove burrs.

B. Remove scale and dirt, on inside and outside, before assembly.

C. Prepare pipe connections to equipment with flanges or unions.

3.4 BEDDING

A. Excavate pipe trench for work of this Section. Follow Section 312000. Hand trim excavation for accurate placement of pipe to elevations indicated.

B. Place aggregate fill type bedding material at trench bottom, level fill materials in one continuous layer not exceeding 6 inches compacted depth, compact to 95 percent.

C. Backfill around sides and to top of pipe with aggregate fill, tamped in place and compacted to 95 percent.

D. Backfill over pipe to finish grade per Section 312000.

E. Maintain optimum moisture content of bedding material to attain required compaction density.

3.5 INSTALLATION - PIPE

A. Maintain separation of water main from sewer piping per code.

B. Install pipe to indicated elevation to within tolerance of 5/8-inches.

C. Route pipe in straight line.

D. Install pipe to allow for expansion and contraction without stressing pipe or joints.

E. Install access fittings to permit disinfection of water system.

F. Form and place concrete for thrust blocks at each elbow or change of direction of pipe main.

G. Establish elevations of buried piping to ensure not less than 3'-0" of cover.

H. Shape bed of each piece of pipe so that each individual piece of pipe will have a uniform bearing. Lay pipe in a straight line and grade without kinks or sags.

I. Before each piece of pipe is lowered into trench, swab pipe thoroughly to ensure its being clean. Lower each piece of pipe separately unless special permission is given otherwise by Architect/Engineer. Prevent injury to pipe coating.

J. Do not lay pipe or castings which are known to be defective. If defective pipe or special casting is discovered after it has been laid in line, remove and provide new it with a satisfactory section of pipe or special casting. In case a length of pipe is cut to fit in a line, cut it as to leave a smooth end at right angles to longitudinal axis of pipe. When Contractor is not actually laying pipe, plug pipe.

K. After installation, apply a full coat of asphalt or other acceptable corrosion-retarding material to surfaces of rods and clamps.

L. At taps on PVC pipe, install a saddle.

M. Joint Adaptors: Make joints between cast iron pipe and other types of pipe with standard manufactured cast iron adaptors and fittings.

N. Place pipe under roads by boring per requirements of State Highway Dept. Lay pipe off pavement. Make borings with steel casing pipe with water line inside. No open cuts will be permitted on city roads. Some open cuts may be permitted on county-maintained roads if approved by County Highway Department.

O. Where water lines cross ditches or culverts, place line under invert of same at such a depth as to provide adequate cover. Line shall begin to slope on either side of ditch or culvert at a sufficient distance to hold a uniform gradient in line without sags or short breaks.

P. In cases where gas, sewer, or other pipe is encountered, replace it in good condition as promptly as is possible.

Q. Install trace wire continuous buried 6 inches below finish grade, above pipe line; coordinate with Section 312000.

R. Backfill trench per Section 312000.

3.6 SEPARATION OF WATER MAINS AND SEWERS

A. Parallel Installation: Under normal conditions lay water mains at least 10 feet horizontally from sanitary sewer, storm sewer or sewer manhole, whenever possible; measure distance edge-to-edge.

B. Unusual Conditions: When local conditions prevent a horizontal separation of 10 feet, a water main may be laid closer to a storm or sanitary sewer provided that bottom of water main is at least 18 inches above top of sewer.

C. Crossings: Under normal conditions lay water mains crossing house sewers, storm sewers or sanitary sewers to provide a separation of at least 18 inches between bottom of water main and top of sewer.

D. Unusual Conditions: When local conditions prevent desired vertical separation as described above, protect water mains passing under sewers by providing:
   1. A vertical separation of at last 18 inches between bottom of sewer and top of water main;
   2. Adequate structural support for sewers to prevent excessive deflection of joints and settling on and breaking water mains;
   3. Length of water pipe which can be centered at point of crossing so that joints will be equidistant and as far as possible from sewer.

E. No water pipe shall pass through or come into contact with part of a sewer or sewer manhole.

3.7 SERVICES CONNECTIONS

A. Provide water service to utility company requirements with reduced pressure backflow preventer and water meter.

B. Provide sleeve in retaining wall for service main. Support with reinforced concrete bridge. Calk enlarged sleeve watertight.

3.8 INSPECTION

A. Interior Inspection: Inspect pipe to decide whether line displacement or other damage has occured.

B. If inspection indicates poor alignment, debris, displaced pipe, infiltration or other defects, correct such defects to satisfaction of Architect/Engineer.

3.9 CLEANING

A. Cleaning Pipe: Clear interior of pipe of dirt and other superflous material as work progresses. Maintain swab or drag in line and pull past each joint as it is completed.

B. Place plugs in end of uncompleted pipe at end of day or whenever work stops.

3.10 FIELD QUALITY CONTROL

A. Field inspection and testing shall be done per Section 014000.

B. Compaction testing shall be done following ASTM D698 (Standard Proctor).

C. If tests indicate Work does not meet specified requirements, remove Work, replace and retest at no cost to Owner.

D. Assist laboratory with hydrostatic testing and flushing of completed pipe lines per NFPA No. 13 and 24 unless more stringent test required by local authorities having jurisdiction.

E. Assist laboratory with operational testing of valves by opening and closing under water pressure to ensure proper operation.

F. Assist laboratory with testing pipe under 125 pounds pressure. This may be done from valve to valve or by plugging open end of pipe. Make test in presence of Architect/Engineer. Inspect each joint thoroughly and make joints watertight, before backfilling about joint. Furnish equipment and material for testing. Duration of each pressure test shall be at least two hours.

G. Assist laboratory with conducting a leakage test after pressure test has been satisfactorily completed. Furnish pump, pipe, connections, gauges and measuring devices and other necessary apparatus. Furnish necessary assistance to conduct test. Duration of each leakage test shall be two hours and during test main shall be subjected to 125 psi pressure.

H. Leakage is defined as quantity of water to be supplied into newly laid pipe, or valve section thereof, necessary to maintain specified leakage test pressure after pipe has been filled with water and air expelled. Test each valve section separately unless otherwise approved by Architect/Engineer. Each valve section shall be watertight as no leakage will be allowed. Perform leakage and pressure tests per methods set forth in Section 13, Hydrostatic Tests AWWA Standards C600-80.

I. If test of pipe laid discloses leakage greater than that specified, locate and repair defective joints until leakage is within specified tolerance.

J. Assist laboratory with testing samples per ANSI/AWWA C651.

END OF SECTION

SECTION 331300
DISINFECTION OF WATER DISTRIBUTION SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Disinfection of domestic water systems.

1.2 INFORMATIONAL SUBMITTALS

A. Test Reports: Indicate results comparative to specified requirements.

B. Certificate: Certify that cleanliness of water distribution system meets or exceeds specified requirements.

C. Qualification Data: For testing agency.

D. Field quality control reports.

1.3 CLOSEOUT SUBMITTALS

A. Disinfection report; record:
1. Type and form of disinfectant used.
2. Date and time of disinfectant injection start and time of completion.
3. Test locations.
4. Initial and 24-hour disinfectant residuals (quantity in treated water) in ppm for each outlet tested.
5. Date and time of flushing start and completion.
6. Disinfectant residual after flushing in ppm for each outlet tested.

B. Bacteriological report; record:
1. Date issued, project name and testing agency name, address and telephone number.
2. Time and date of water sample collection.
3. Name of person collecting samples.
4. Test locations.
5. Initial and 24-hour disinfectant residuals in ppm for each outlet tested.
6. Coliform bacteria test results for each outlet tested.
7. Certification that water conforms, or fails to conform, to bacterial standards of state in which Project is located.
8. Bacteriologist's signature and authority.

1.4 QUALITY ASSURANCE

A. Follow ANSI/AWWA C651.

1.5 QUALITY ASSURANCE

A. Water Treatment Firm: Company specializing in disinfecting potable water systems specified in this Section with minimum three years documented experience.

B. Testing agency: Company specializing in testing potable water systems, certified by the State in which the Project is located.

1.6 REGULATORY REQUIREMENTS

A. Conform to applicable code or regulation for performing work of this Section.

B. Provide certificate of compliance from authority having jurisdiction indicating approval of water system.

PART 2 PRODUCTS

2.1 DISINFECTION CHEMICALS

A. Chemicals: ANSI/AWWA B300, Hypochlorite.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that piping system has been cleaned, inspected, and pressure tested.

B. Perform scheduling and disinfection activity with startup, testing, adjusting and balancing, demonstration procedures, including coordination with related systems.

3.2 SPECIAL TECHNIQUES

A. Provide and attach required equipment to perform Work of this Section.

B. Inject treatment disinfectant into piping system sufficient to ensure a chlorine dosage of at least 50 ppm in the lines. While solution is being applied, water shall be allowed to escape at ends of lines until tests indicate that a dosage of at least 50 ppm has been obtained throughout the pipe.

C. Maintain disinfectant in system for 24 hours. A residual of at least 25 ppm should be present in pipe at end of 24-hour period.

D. Flush, circulate and clean until required cleanliness is achieved; use municipal domestic water. A bacteriological sample will be taken and submitted for approval to the State Health Department by the Contractor before lines are put into service. If samples are positive, lines shall be disinfected until a negative sample is obtained.

E. Replace permanent system devices removed for disinfection.

F. Pressure test system to 200 psi. Repair leaks and re-test.

3.3 FIELD QUALITY CONTROL

A. Provide and pay for analysis and testing of treated water.

B. Test samples per ANSI/AWWA C651.

END OF SECTION

SECTION 334100

STORM DRAINAGE PIPING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Site storm sewerage gravity-flow, non-pressure, drainage piping, fittings and accessories, and bedding.

B. Catch basins, area drains, site surface drainage, and related items.

1.2 RELATED SECTIONS

A. Section 312000 – Earthwork: Excavating for sewer system piping; backfilling over piping up to subgrade elevation.

B. Section 030500 – Basic Concrete Materials and Methods: Concrete type for catch basin base pad construction.

1.3 DEFINITIONS

A. Bedding: Fill placed under, beside and directly over pipe, prior to subsequent backfill operations.

1.4 SUBMITTALS FOR REVIEW

A. Submittals: Follow Section 013000.

B. Product Data: Provide data indicating pipe, pipe accessories and gaskets.

1.5 PROJECT RECORD DOCUMENTS

A. Submit record documents according to Section 017000.

B. Accurately record location of pipe runs, connections, catch basins, cleanouts and invert elevations.

C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities.

1.6 QUALITY ASSURANCE

A. Installer: Firm specializing and experienced in storm sewer system work for not less than 2 years.

1.7 FIELD MEASUREMENTS

A. Verify that field measurements and elevations are as indicated.

PART 2 PRODUCTS

2.1 CONCRETE PIPE AND ACCESSORIES

A. Reinforced Concrete Pipe: ASTM C76, Class III with Wall Type B for less than 54 inch diameter or Type C for 54 inch diameter or greater, mesh reinforcement; tongue and groove end joints.

1. Reinforced Concrete Pipe Joint Device: Butyl..

2.2 PIPE ACCESSORIES

A. Lean Concrete:

1. Cement: ASTM C150 normal - Type 1 Portland.

2. Fine and Coarse Aggregates: ASTM C33.

3. Water: Clean and not detrimental to concrete.

4. Mix concrete to a compressive strength (28 days) of 3,000 psi according to ASTM C94, Alternative 2.

2.3 AREA DRAINS

A. Lid and Frame: Cast iron construction, traffic bearing, manufactured by John Bouchard and Sons, Nashville, TN, NEENAH Foundry, Neenah, WI, or approved substitute.

1. Lid Design: As shown.

2. Nominal Lid and Frame Size: Size as indicated on Drawings.

B. Area Drain: Reinforced precast concrete sections, lipped male/female dry joints, nominal shaft diameter in size as indicated on Drawings.

2.4 BEDDING MATERIALS

A. Bedding: Drainage fill as specified in Section 312000.

2.5 CONCRETE MATERIALS

A. Form Materials: Conform to ACI 301.

B. Reinforcing Steel: ASTM A615, 60 ksi yield grade, billet steel deformed bars; uncoated finish.

C. Welded Steel Wire Fabric: Plain type, ASTM A185; uncoated finish.

D. Cement: ASTM C150 normal - Type 1 Portland.

E. Fine and Coarse Aggregates: ASTM C33.

F. Water: Clean and not detrimental to concrete.

G. Air Entraining Admixture: ASTM C260, with the following limits: 3 percent for maximum 2 inch aggregate, 5 percent for maximum 3/4 inch aggregate and 6 percent for maximum 2 inch aggregate.

H. Concrete Used for Water/Sewer Work: Such as manholes and manhole bases, encasement of sewer lines, man-hole drop connections and inverts, catch basin base pads, valves bases for PVC pipe and cleanout base pads.

1. Minimum Cement Content: 5.0 bags (470 lbs.) per cubic yard.

2. Minimum 28-Day Compressive Strength: 3,000 psi - average of any three cylinders.

3. Slump: 4 to 6 inches.

I. Add air entraining agent ASTM C260 to mix for concrete exposed to freeze-thaw cycling.

PART 3 EXECUTION

3.1 INSPECTION

A. Examine areas and conditions under which storm sewer system work is to be installed. Notify Architect/Engineer in writing of conditions detrimental to proper and timely completion of the work.

B. Verify that trench cut is ready to receive work and excavations, dimensions and elevations are as indicated on layout drawings.

C. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

D. Inspect pipe before installation to detect any apparent defects. Mark defective materials with white paint and promptly remove from site.

3.2 PREPARATION

A. Hand trim excavations to required elevations. Correct over excavation with fine aggregate or lean concrete.

B. Remove large stones or other hard matter which could damage piping or impede consistent backfilling or compaction.

C. Beginning of installation means acceptance of existing conditions.

3.3 BEDDING

A. Excavate pipe trench according to Section 312000 for Work of this Section. Hand trim excavation for accurate placement of pipe to elevations indicated.

B. Place bedding material at trench bottom, level materials in continuous layers not exceeding 6 inches compacted depth.

C. Maintain optimum moisture content of bedding material to attain required compaction density.

3.4 CONCRETE WORK

A. Verify lines, levels and measurement before proceeding with formwork. Hand trim sides and bottom of earth forms; remove loose dirt. Align form joints. Coordinate work of other sections in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors and other inserts.

B. Provide formed openings where required for work to be embedded in and passing through concrete members. Coordinate work of other sections in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors and other inserts. Install concrete accessories straight, level and plumb.

C. Place, support and secure reinforcement against displacement. Locate reinforcing splices where indicated and required. At splices lap reinforcing steel 30 bar diameters with 2'-0" minimum and wire together.

D. Place concrete according to ACI 301. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads. Remove formwork progressively and according to code requirements.

3.5 INSTALLATION – NONPRESSURE PIPE

A. Install concrete pipe according to applicable provisions of the American Concrete Pipe Association "Concrete Pipe Field Manual", unless otherwise indicated.

B. Place circular concrete pipe with elliptical reinforcing so that the reference lines indicating top of pipe are not more than 5 degrees from vertical plane through the longitudinal axis of the pipe.

C. Lay pipe beginning at low point of a system, true to grades and alignment indicated with unbroken continuity of invert.

D. Place bell ends or groove end of pipe facing upstream.

E. Install gaskets according to manufacturer's instructions for use of lubricants, cements and other special installation requirements.

F. Clear interior of pipe of dirt and other superfluous material as work progresses. Maintain a swab or drag in the line and pull past each joint as it is completed. In large, accessible pipe, brushes and brooms may be used for cleaning.

G. Place plugs in ends of uncompleted pipe at end of the day or whenever work stops.

H. Flush lines between manholes if required to remove collected debris.

I. Make joints between cast iron pipe and other types of pipe with standard manufactured cast iron adapters and fittings.

3.6 BACKFILLING

A. Install aggregate to the spring line of pipe in lawn areas; install aggregate to subgrade of pipe in paved areas, compact to 95 percent.

B. Backfill trenches with lean concrete, where they are within 18 inches of structure footings and which are carried below bottoms of such footings or which pass under footings. Place concrete level with bottom of adjacent footings.

C. Use care in backfilling utility trenches to avoid damage or displacement of pipe systems.

D. Refer to Drawings for manhole requirements.

E. To minimize local area traffic interruptions, allow no more than 100 feet between pipe laying and the point of complete backfilling.

3.7 INSTALLATION – AREA DRAINS

A. Form bottom of excavation clean and smooth to correct elevation.

B. Form and place cast-in-place concrete base pad, with provisions for storm sewer pipe end sections.

C. Level top surface of base pad to receive concrete shaft sections.

D. Establish elevations and pipe inverts for inlets and outlets as indicated.

E. Install area drain device according to manufacturer's directions in locations as indicated. Remove grate and place sack in opening. Hold out approximately 6" of sack outside frame. Replace grate to hold sack in place.

3.8 FIELD QUALITY CONTROL

A. Field inspection and testing will be done according to Section 014000.

B. Request inspection prior to and immediately after placing aggregate cover over pipe.

C. Interior Inspection: Inspect pipe to decide whether line displacement or other damage has occurred.

1. Make inspections after lines between manholes, or manhole locations, have been installed and approximately two feet of backfill is in place and at completion of project.

2. If the inspection indicates poor alignment, debris, displaced pipe, infiltration or other defects, take whatever steps are necessary to correct such defects.

D. Compaction testing will be done according to ASTM D698 (Standard Proctor).

E. If tests indicate Work does not meet specified requirements, remove Work, replace and retest..

3.9 PROTECTION

A. Protect finished Work according to Section 015000.

B. Protect pipe and aggregate cover from damage or displacement until backfilling operation is in progress.

END OF SECTION