Request for Proposal, 16MCO512 Electrical Work for Midland County Horseshoe Amphitheater

Date Required:  March 10, 2016
Time Required:  2:00pm  Local Time

INTRODUCTION:
Midland County, hereafter called County, invites sealed proposals from interested qualified Vendors, hereinafter called Vendors, to provide electrical work for the Amphitheater. The following pages provide general information about the requirements and specifications for the package.

This request for proposal ("RFP") is part of a competitive procurement process which provides qualified vendors with a fair opportunity for their commodities and services to be considered, and to provide information concerning their expertise and experience in providing similar services to other customers. The RFP process provides a competitive negotiation platform, wherein price or cost is not the sole determinative factor. This process, designed to best serve the interests of the County, allows the County the flexibility to negotiate with interested, qualified Vendors (following designation by the Commissioners Court, one at a time) to arrive at a mutually agreeable relationship.

SITE SURVEY:
A Site Survey will be held at the Midland County Horseshoe. We will meet at the Pavilion Flag Poles at 1:00pm on Tuesday February 23, 2016 and will promptly begin the survey of the site, which is just east of the Pavilion.

Midland County Horseshoe Arena and Pavilion
2514 Arena Trail
Midland, TX  79701

QUESTIONS:
If further information is required, please contact the Midland County Purchasing Department. All requests for information must be submitted in writing. Responses to all questions received will be sent to each Contractor/Vendor known to have copies of the Request for Proposal. Requests for information may be faxed to 432-688-4914 or e-mailed to pur103@co.midland.tx.us. All questions should be submitted on or before 5:00pm on Friday February 26, 2016. Questions received after said date and time will not receive a response. Answers and clarifications which are considered to materially change the solicitation will be issued as written addenda to the original RFP and will be posted to the Midland County website at www.co.midland.tx.us. Solution providers are responsible for ensuring all answers to questions are reviewed prior to bid submittal and that all issued added are properly acknowledged with their submitted proposal response. Midland County will not be responsible for any verbal exchange between the vendor and an employee of Midland County.
16MCO512, Due Thursday March 10, 2016, at 2:00 PM

COPIES AND RECEIPT:
Please submit one (1) original, three (3) copies, and an electronic copy on USB drive of the proposal. An executed copy of the Proposal Affidavit SIGNED AND NOTARIZED (Page 10) must be included in each submission. Please note that if no Proposal Affidavit is included, the response will be rejected. Midland County is exempt from all state and federal taxes. Tax exempt certificates are available upon request.

All responses should be submitted in a sealed envelope, marked on the outside,

Electrical Work for Midland County Horseshoe Amphitheater 16MCO512

________________________
Company Name

Responses must be received by 2:00pm Local Time on Thursday March 10, 2016. Late proposals will be rejected and returned without being opened. The clock in the Purchasing Agent’s office is the official time piece for this submission. If interested, Contractors may use mail or express systems to deliver their proposal to the Purchasing Department; they should insure that they are tendered to the carrier in plenty of time to reach the Purchasing Department by the time and date required. Facsimile transmitted proposals shall not be accepted.

SUBMISSION LOCATION: All bids which are mailed, shipped, delivered, etc. should be addressed as follows:

Midland County Purchasing Department
Midland County Courthouse
Attention: Kristy Engeldahl, Purchasing Agent
500 N. Loraine Street, Suite 1101
Midland, Texas  79701

DOCUMENTATION SUBMISSION:
The respondent must submit all required documentation. Failure to provide requested information may result in rejection of the proposal.

ALTERATION OF PROPOSAL:
A proposal may be altered, modified or amended by a Vendor at any time, prior to the time and date set forth above as the submission deadline. Alterations, modifications or amendments to a proposal must be made in the offices of the Purchasing Department. Any interlineations, alteration or erasure made on a proposal before the submission deadline must be initialed by the signer of the proposal, guaranteeing authenticity. A proposal may not be altered, modified or amended after the submission deadline.

WITHDRAWAL:
A proposal may not be withdrawn or canceled by the respondent for a period of sixty (60) days following the date designated for the receipt of proposals, and respondent so agrees upon submittal of their proposal.
CONFLICT OF INTEREST:
No public official shall have interest in this contract, in accordance with Vernon's Texas Codes annotated Local Government Code Title 5, Subtitle C, Chapter 171. Vendor is required to sign affidavit form included in Proposal documents.

Chapter 176 of the Texas Local Government Code requires a vendor who enters or seeks to enter into a contract for the sale or purchase of real property, goods, or services with a local governmental entity or local government officer thereof to file a conflict of interest disclosure questionnaire with the governmental entity prescribed.

A Conflict of Interest Questionnaire Form (CIQ) (see pages 11 and 12) must be submitted not later than the seventh (7th) business day after the date the vendor begins discussion, negotiation, applies or response to a request for proposal or bids, or correspondence in writing related to a potential contract with the local governmental entity. Midland County asks that you return this form along with your response to the RFP.

SILENCE OF SPECIFICATIONS:
The apparent silence of these specifications as to any detail of the apparent omission from it of a detailed description concerning any point, shall be regarded as meaning that only the best commercial practices are to prevail. All interpretations of these specifications shall be made on the basis of this statement.

CONFIDENTIALITY:
Contents of the proposals will remain confidential until the contract is awarded. At that time the contents will be made public under the Texas Public Information Act; except for any portion of a proposal which has been clearly marked as a trade secret or proprietary data (the entire proposal may not be so marked). Proposals will be opened, and the name of the firm submitting the proposal read aloud, acknowledged, at 2:05pm on Thursday March 10, 2016, in the Purchasing Department Conference Room located in the Midland County Courthouse, Suite 1101. All respondents or other interested parties are invited to attend the opening.

Vendors are hereby notified that the Owner strictly adheres to all statutes, court decisions, and opinions of the Texas Attorney General with respect to disclosure of public information.

ADDITIONAL INFORMATION AND DEMONSTRATION, NEGOTIATIONS:
Prior to award, selected Vendors may be asked to provide further information concerning their proposal, up to and including presentations/demonstrations. The Midland County Commissioners Court reserves the right to reject any and all proposals or waive formalities as deemed in the best interests of Midland County. The County may also enter into discussions and revisions of proposals after submission and before award for the purpose of obtaining the best and final offer, and to accept the proposal deemed most advantageous to Midland County.

This request for proposal (RFP) is part of a competitive procurement process which is designed to best serve the interests of the County in obtaining complicated commodities and/or services. It also provides interested Contractors with a fair opportunity for their goods and services to be
considered. The RFP process is designed to be a competitive negotiation platform, where price is not required to be the sole determinative factor. Also, the County has the flexibility to negotiate with interested vendors (one at a time) to arrive at a mutually agreeable relationship. Negotiations will be arranged with vendors in a hierarchal order, starting with the vendor selected as the primary. If a contract cannot be negotiated, negotiations will, formally and in writing, end with that Vendor and proceed to move to the second vendor, and so forth until a contract is negotiated.

RIGHTS OF THE CONTRACTING AUTHORITY:
Midland County reserves the right to withdraw this RFP at any time and for any reason. Midland County also has the right to terminate its selection process at any time and to reject all responses, or all proposals. Receipt of the proposal materials by Midland County or submission of a proposal to Midland County confers no rights upon the vendor nor obligates Midland County in any manner.

Midland County intends to use the AIA Contract as shown in ATTACHMENT A.

All costs associated with the preparation or submittal of proposals shall be borne by the vendor, and no cost shall be sustained by Midland County.

ORAL COMMITMENT:
Vendors should clearly understand that any verbal representations made or assumed to be made during any discussions held between representatives of an vendor and any Midland County personnel or official are not binding on Midland County.

WAIVER OF CLAIMS:
Submission of a proposal indicates Vendor’s acceptance of the evaluation technique and Vendor’s recognition that some subjective judgments must be made by the County during the determination of qualification.

SELECTION CRITERIA:
Price is a primary consideration, however, it is not the only consideration to be used in the selection. The product and/or service to be provided is also of major importance. Midland County will require that the successful vendor provide a representative for all County related business, service, billing, installation, activation and termination of said service. The evaluation criteria and factors are identified on page 9.

ORDINANCES AND PERMITS:
The Contractor/Vendor agrees, during the performance of the work, to comply with all applicable Federal, State, or local code and ordinances.
INVOICES:
Invoices are to be mailed to P.O. Box 421, Midland, Texas 79702 and should cite the applicable Purchase Order Number. Any and all notices or other communications required or permitted by any contract awarded as a result of this RFP shall be served on or given to Midland County, in writing, by personal delivery to the Purchasing Agent of Midland County, Texas, or by deposit with the United States Mail, postage prepaid, registered or certified mail, return receipt requested, addressed to the Midland County Purchasing Agent 500 N. Loraine Suite 1101 Midland, TX 79701, or at such other address as may have been specified by written notice to Vendor.

INSURANCE:
The awarded Vendor will maintain such insurance as will protect the Vendor and the County from claims under the Workers' Compensation Acts, and any amendments thereof, and from any other claims for damages from personal injury, including death, which may arise from operations under this agreement, whether such operations be by themselves or by any sub-Contractor, or anyone directly or indirectly employed by either of them. Current Certificate of such insurance shall be furnished to Midland County and shall show all applicable coverage(s).

Other insurance requirements are:
- General Liability (including completed operations) with a $1,000,000 per occurrence limit and $2,000,000 general aggregate.
- Commercial Automobile Liability with a limit of no less than $1,000,000. The coverage will also extend liability to hired and non-owned autos.
- Workers' Compensation with limit of $1,000,000 for Employers Liability.
- We also require a minimum umbrella (or follow form excess policy covering over general liability, auto liability and workers compensation) of no less than $2,000,000.

Midland County will require the selected Vendor to name Midland County as an additional for both the general liability and auto liability. A waiver of subrogation in favor of the County is required for the workers compensation. If the additional insured status or waiver of subrogation is not blanket, please send a copy of the actual endorsements prior to commencement of any work.

INDEMNIFICATION:
The Vendor shall defend, indemnify and save whole and harmless the County and all its officers, agents and employees from and against any and all demands, claims, suits, or causes of action of any character, name, kind or description brought for, or on account of, arising out of or in connection with the Vendor’s performance or non-performance of any obligation of Vendor or any negligent act, misconduct or omission of the Vendor in the performance of its contractual obligations. The Vendor shall defend, indemnify, save, and hold harmless the County and its officers, agents, representatives and employees from and against any and all demands, claims, suits, or causes of action of any character, name, kind or description brought for, on account of, arising out of or in connection with Vendor’s product or service.
STATUS OF INDEPENDENT CONTRACTOR:
Vendor shall be considered an independent contractor, for all purposes. Vendor will not at any
time, directly or indirectly, act as an agent, servant, representative or employee of the County.
Vendor will not take any action which is intended to create any commitments, duties, liabilities
or obligations on behalf of the County, without prior written consent of the County.

PARTIAL INVALIDITY:
In the event any one or more of the provisions contained in this RFP or any contract resulting
therefore, for any reason, be held to be invalid, illegal or unenforceable in any respect, such
invalidity, illegality or unenforceability shall not affect any other provision of this RFP or any
contract resulting therefore and this RFP or the contract resulting therefore shall be construed
as if such invalid, illegal or unenforceable provision had never been contained herein.

CONTRACT TERMINATION:
Non-performance of the Vendor/Contractor in terms of specifications or noncompliance with
terms of this contract shall be basis for termination of the contract by the County. Termination
in whole or in part, by the County may be made at its option and without prejudice to any other
remedy to which it may be entitled at law or in equity, or elsewhere under this contract, by
giving (60) sixty days written notice to the Contractor/Vendor with the understanding that all
work being performed under this contract shall cease upon the date specified in such notice.
The County shall not pay for work, equipment, services or supplies which are unsatisfactory.
Contractor/Vendor may be given reasonable opportunity prior to termination to correct any
deficiency. This, however, shall in no way be construed as negating the basis for termination
for non-performance. The right to terminate the notice thereof is controlled by these proposal
specifications and is not subject to being altered by contract.

LAW GOVERNING:
The parties under contract shall be subject to all Federal laws and regulations, and all rules and
regulations of the State of Texas. The laws of the State of Texas shall govern the interpretation
and application of the contract; regardless of where any disagreement over its terms should
arise or any case of action arise.

REMEDIES:
The successful vendor and Midland County agree that both parties have all rights, duties, and
remedies available as stated in the Uniform Commercial Code.

VENUE:
It is hereby agreed that the contract will be made in Midland, Midland County, Texas, and any
dispute arising as a result of it shall be governed by the laws of the State of Texas for the
purpose of any law suit, and the parties agree that such lawsuit shall be brought in Midland
County, Texas.
FUNDING CONTINGENCY:
Any contract awarded pursuant to this RFP shall be contingent on sufficient funding and authority being made available in each fiscal period by the appropriate officials of Midland County. If sufficient funding or authority is not made available, the contract shall become null and void.

ASSIGNMENT:
The Contractor shall not sell, assign transfer or convey this contract in whole or in part, without the prior written consent of the County.
SPECIFICATION

PURPOSE:
Midland County is in need of a company to provide electrical work at the Midland County Horseshoe for the purpose of creating an Amphitheater, according to the attached design.

SUBCONTRACTOR AND/OR SUPPLIER IDENTIFICATION:
Should the Bidder subcontract any work, the Bidder shall indicate below the name of each subcontractor and/or supplier the bidder will use in the performance of the contract. The Bidder shall specify the work to be performed by the subcontractor or the materials to be provided by the supplier. Any changes in subcontractor and/or supplier listed below shall require prior approval by the Purchasing Office.

Vendors shall also verify that the Vendor can and will deliver the performance and payment bonds referred to below. In the event that a Vendor cannot make this verification, this may be grounds to reject the Vendor.

CONSTRUCTION LOCATION:
The Amphitheater is designed to be east of the Midland County Horseshoe Pavilion.

SPECIFICATIONS:
- All electrical work will need to be completed according to the design documents provided by Vandergriff and Dunaway, see ATTACHMENT B and ATTACHMENT C.
- Vendor will provide an estimated number of days that will be needed to complete this project. However, all work is to be completed by May 15, 2016. Liquid damaged will be assessed at $250 per day after May 15, 2016
- County will provide non-potable water.
- County will provide electrical power adjacent to job site.
- County will provide concrete spoils and washout pit.
- County will provide construction toilets.
- Concrete, fencing, masonry, irrigation, landscape, and sod work may be going on concurrently to this project. The scope of said concurrent work is not included in this RFP.
EVALUATION PROCESS:
The County will award to the bidder that submits a bid which represents the “best value” to the County. The best value shall not be based solely upon price but the bid which receives the highest cumulative score for each of the evaluation factors delineated herein.

CRITERIA:
Completed Proposal Form, see section 00 42 00 of ATTACHMENT C, is required. Company Affidavit, page 10, is required.

Tab 1 Previous Related Experience: (10 points, maximum)
- Indicate experience with publicly funded facilities of same approximate size and type as the anticipated project.
- Indicate safety record on previous projects.
- Indicate whether Vendor has had similar contracts terminated prior to completion or whether a bonding company surety has had to pay funds under a bond of the Vendor.

Tab 2 Identity and Location of Vendor: (5 points, maximum)
- Indicate the exact legal name of Vendor, its type of legal organization, its State of organization, its mailing address, the office/business location of the Vendor from which the Project will be managed; and, address Vendor’s availability to the Project and the County and the response time.

Tab 3 Personnel: (10 points, maximum)
- Indicate the superintendent of this project.

Tab 4 Duration to Complete: (20 points, maximum)
- Indicate the length of time that it will take the Vendor to complete this work.

Tab 5 References: (Include name, address, and phone number of contact): (5 points, maximum)
- Indicate (3 minimum) general references who can attest to the Vendor’s ability, performance, and safety record.

Tab 6 Cost: (50 points, maximum)
- Indicate the Vendor’s proposed price for the concrete work.
- Pricing MUST include $10,000.00 contingency allowance.
REQUIRED FORM
COMPANY AFFIDAVIT

The affiant, ___________________________ states with respect to this submission to County:

I (we) hereby certify that if the contract is awarded to our firm that no member or members of the governing body, elected official or officials, employee or employees of said County, or any person representing or purporting to represent the County, or any family member including spouse, parents, or children of said group, has received or has been promised, directly or indirectly, any financial benefit, by way of fee, commission, finder's fee or any other financial benefit on account of the act of awarding and/or executing a contract.

I hereby certify that I have full authority to bind the company and that I have personally reviewed the information contained in the RFP and this submission, and all attachments and appendices, and do hereby attest to the accuracy of all information contained in this submission, including all attachments and exhibits.

I acknowledge that any misrepresentation will result in immediate disqualification from any consideration in the submission process.

I further recognize that County reserves the right to make its award for any reason considered advantageous to the County. The company selected may be without respect to price or other factors.

Signature ___________________________ Date ___________________________

Name ___________________________ Phone ___________________________

Title _______________________________________________________________

Firm Name ___________________________________________________________
Type of business organization (corporation, LLC, partnership, proprietorship)

Address _____________________________________________________________

County, State, Zip ____________________________________________________

Notary Seal Below
CONFLICT OF INTEREST QUESTIONNAIRE
For vendor doing business with local governmental entity

This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session.

This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor meets requirements under Section 176.006(a).

By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. See Section 176.006(a-1), Local Government Code.

A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.

1. Name of vendor who has a business relationship with local governmental entity.

2. Check this box if you are filing an update to a previously filed questionnaire. (The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)

3. Name of local government officer about whom the information is being disclosed.
   
   Name of Officer

4. Describe each employment or other business relationship with the local government officer, or a family member of the officer, as described by Section 176.003(a)(2)(A). Also describe any family relationship with the local government officer. Complete subparts A and B for each employment or business relationship described. Attach additional pages to this Form CIQ as necessary.

   A. Is the local government officer or a family member of the officer receiving or likely to receive taxable income, other than investment income, from the vendor?
      
      ☐ Yes ☐ No

   B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer or a family member of the officer AND the taxable income is not received from the local governmental entity?
      
      ☐ Yes ☐ No

5. Describe each employment or business relationship that the vendor named in Section 1 maintains with a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership interest of one percent or more.

6. Check this box if the vendor has given the local government officer or a family member of the officer one or more gifts as described in Section 176.003(a)(2)(B), excluding gifts described in Section 176.003(a-1).

7. Signature of vendor doing business with the governmental entity

   Date
CONFLICT OF INTEREST QUESTIONNAIRE
For vendor doing business with local governmental entity

A complete copy of Chapter 176 of the Local Government Code may be found at http://www.statutes.legis.state.tx.us/Docs/LG/htm/LG.176.htm. For easy reference, below are some of the sections cited on this form.

**Local Government Code § 176.001(1-a):** “Business relationship” means a connection between two or more parties based on commercial activity of one of the parties. The term does not include a connection based on:

(A) a transaction that is subject to rate or fee regulation by a federal, state, or local governmental entity or an agency of a federal, state, or local governmental entity;
(B) a transaction conducted at a price and subject to terms available to the public; or
(C) a purchase or lease of goods or services from a person that is chartered by a state or federal agency and that is subject to regular examination by, and reporting to, that agency.

**Local Government Code § 176.003(a)(2)(A) and (B):**

(a) A local government officer shall file a conflict disclosure statement with respect to a vendor if:

(2) the vendor:

(A) has an employment or other business relationship with the local government officer or a family member of the officer that results in the officer or family member receiving taxable income, other than investment income, that exceeds $2,500 during the 12-month period preceding the date that the officer becomes aware that:
   (i) a contract between the local governmental entity and vendor has been executed; or
   (ii) the local governmental entity is considering entering into a contract with the vendor;

(B) has given to the local government officer or a family member of the officer one or more gifts that have an aggregate value of more than $100 in the 12-month period preceding the date the officer becomes aware that:
   (i) a contract between the local governmental entity and vendor has been executed; or
   (ii) the local governmental entity is considering entering into a contract with the vendor.

**Local Government Code § 176.006(a) and (a-1)**

(a) A vendor shall file a completed conflict of interest questionnaire if the vendor has a business relationship with a local governmental entity and:

(1) has an employment or other business relationship with a local government officer of that local governmental entity, or a family member of the officer, described by Section 176.003(a)(2)(A);

(2) has given a local government officer of that local governmental entity, or a family member of the officer, one or more gifts with the aggregate value specified by Section 176.003(a)(2)(B), excluding any gift described by Section 176.003(a-1); or

(3) has a family relationship with a local government officer of that local governmental entity.

(a-1) The completed conflict of interest questionnaire must be filed with the appropriate records administrator not later than the seventh business day after the later of:

(1) the date that the vendor:
   (A) begins discussions or negotiations to enter into a contract with the local governmental entity; or
   (B) submits to the local governmental entity an application, response to a request for proposals or bids, correspondence, or another writing related to a potential contract with the local governmental entity; or

(2) the date the vendor becomes aware:
   (A) of an employment or other business relationship with a local government officer, or a family member of the officer, described by Subsection (a);
   (B) that the vendor has given one or more gifts described by Subsection (a); or
   (C) of a family relationship with a local government officer.
AIA® Document A107™ – 2007

Standard Form of Agreement Between Owner and Contractor for a Project of Limited Scope

AGREEMENT made as of the Seventeenth day of February in the year 2016
(In words, indicate day, month and year.)

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

MIDLAND COUNTY
500 N. Loraine Street
Suite 1100
Midland, Texas 79701

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

To Be Determined

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

MIDLAND COUNTY AMPHITHEATER - Electrical Package
2514 Arena Trail
Midland, Texas 79701

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

VANDERGRIFF GROUP ARCHITECTS, PC
312 N. Big Spring Street, Suite 100
Midland, Texas 79701
Telephone Number: (432) 687-0781

The Owner and Contractor agree as follows.

That Midland County shall provide:

1. Non potable water.
2. Electrical power adjacent to job site.
3. Construction toilets, as necessary.
4. Concrete spoils and washout pit.

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ARTICLE 1 THE WORK OF THIS CONTRACT
The Contractor shall execute the Work described in the Contract Documents, except as specifically indicated in the
Contract Documents to be the responsibility of others.

ARTICLE 2 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION
§ 2.1 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.)

March 15, 2016

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

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expires on 01/12/2017, and is not for resale.
§ 2.3 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.)

May 15, 2016

<table>
<thead>
<tr>
<th>Portion of Work</th>
<th>Substantial Completion Date</th>
</tr>
</thead>
</table>

, 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 3 CONTRACT SUM

§ 3.1 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 one of the following:

(Check the appropriate box.)

[ ] Stipulated Sum, in accordance with Section 3.2 below

[ ] Cost of the Work plus the Contractor’s Fee, in accordance with Section 3.3 below

[ ] Cost of the Work plus the Contractor’s Fee with a Guaranteed Maximum Price, in accordance with Section 3.4 below

(Based on the selection above, complete Section 3.2, 3.3 or 3.4 below.)

§ 3.2 The Stipulated Sum shall be (Bid Price), subject to additions and deductions as provided in the Contract Documents.

§ 3.2.1 The Stipulated 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.)

A. Performance and Payment Bonds – Add Alternate #1,

§ 3.2.2 Unit prices, if any:

(Identify and state the unit price, and state the quantity limitations, if any, to which the unit price will be applicable.)

<table>
<thead>
<tr>
<th>Item</th>
<th>Units and Limitations</th>
<th>Price Per Unit ($0.00)</th>
</tr>
</thead>
</table>

§ 3.2.3 Allowances included in the stipulated sum, if any:

(Identify allowance and state exclusions, if any, from the allowance price.)

<table>
<thead>
<tr>
<th>Item</th>
<th>Allowance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contingency</td>
<td>$10,000.00 (Ten Thousand Dollars)</td>
</tr>
</tbody>
</table>

(Paragraphs deleted)
ARTICLE 4 PAYMENTS
§ 4.1 PROGRESS PAYMENTS
§ 4.1.1 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.

§ 4.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month.

§ 4.1.3 Provided that an Application for Payment is received by the Architect not later than the first business day of a month, the Owner shall make payment of the certified amount to the Contractor not later than the 30 days following receipt. If an Application for Payment is received by the Architect after the date fixed above, payment shall be made by the Owner not later than 30 business days after the Architect receives the Application for Payment.

(Federal, state or local laws may require payment within a certain period of time.)

§ 4.1.4 Retainage, if any, shall be withheld as follows:

Five Percent (5%) per Pay Application

§ 4.1.5 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.)

5 % Five percent per annum

§ 4.2 FINAL PAYMENT
§ 4.2.1 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 18.2, and to satisfy other requirements, if any, which extend beyond final payment;

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

§ 4.2.2 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 5 DISPUTE RESOLUTION
§ 5.1 BINDING DISPUTE RESOLUTION
For any claim subject to, but not resolved by, mediation pursuant to Section 21.3, the method of binding dispute resolution shall be as follows:

(Insert box(es) and/or text, as appropriate.)

[  ] Arbitration pursuant to Section 21.4 of this Agreement

[ X ] Litigation in a court of competent jurisdiction in Texas
ARTICLE 6  ENUMERATION OF CONTRACT DOCUMENTS
§ 6.1 The Contract Documents are defined in Article 7 and, except for Modifications issued after execution of this Agreement, are enumerated in the sections below.

§ 6.1.1 The Agreement is this executed AIA Document A107–2007, Standard Form of Agreement Between Owner and Contractor for a Project of Limited Scope.

§ 6.1.2 The Supplementary and other Conditions of the Contract:

<table>
<thead>
<tr>
<th>Document</th>
<th>Title</th>
<th>Date</th>
<th>Pages</th>
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</thead>
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§ 6.1.3 The Specifications:
(Either list the Specifications here or refer to an exhibit attached to this Agreement.)

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
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<td>Seal Page</td>
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<td>List of Drawing Sheets</td>
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<td>Proposal Form</td>
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<td>Administrative Requirements</td>
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<td>Request for Interpretation</td>
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<td>01 33 00</td>
<td>Submittal Procedures</td>
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<td>Startup Procedures</td>
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### 6.1.4 The Drawings:

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

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<thead>
<tr>
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<tr>
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<td>Cover Overall Site Plan/Cover Sheet</td>
<td>02/17/2016 02/17/2016</td>
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<tr>
<td>A-101</td>
<td>Site Plan Fencing and Landscaping Plan</td>
<td>02/17/2016 02/17/2016</td>
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<tr>
<td>A-110</td>
<td>Enlarged Site Plan</td>
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<tr>
<td>A-121</td>
<td>Site Details</td>
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<td>A-122</td>
<td>Site Details</td>
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<tr>
<td>E-000</td>
<td>Electrical Site Plan</td>
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<td>E-001</td>
<td>Electrical Schedules and Details</td>
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<tr>
<td>C-100</td>
<td>Grading Plan</td>
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<td>C-200</td>
<td>Drainage Plan</td>
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<td>Phase I Grading Plan</td>
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<td>Sheet 3</td>
<td>Phase I Drainage Plan</td>
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<tr>
<td>Sheet 4</td>
<td>Erosion Control Plan</td>
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### 6.1.5 The Addenda, if any:

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<tr>
<th>Number</th>
<th>Date</th>
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</table>

Portions of Addenda relating to bidding requirements are not part of the Contract Documents unless the bidding requirements are enumerated in this Article 6.

### 6.1.6 Additional documents, if any, forming part of the Contract Documents:

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User Notes:

(2020428377)
.1 Exhibit A, Determination of the Cost of the Work, if applicable.
.2 AIA Document E201™-2007, Digital Data Protocol Exhibit, if completed, or the following:
.3 Other documents:
(List here any additional documents that are intended to form part of the Contract Documents.)

ARTICLE 7  GENERAL PROVISIONS
§ 7.1 THE CONTRACT DOCUMENTS
The Contract Documents are enumerated in Article 6 and consist of this Agreement (including, if applicable, Supplementary and other Conditions of the Contract), Drawings, Specifications, Addenda issued prior to the execution of this Agreement, other documents listed in this Agreement and Modifications issued after execution of this Agreement. 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. 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 to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 7.2 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 between any persons or entities other than the Owner and the Contractor.

§ 7.3 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.

§ 7.4 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.

§ 7.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE
§ 7.5.1 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.

§ 7.5.2 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.

§ 7.6 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 transmission, unless otherwise provided in the Agreement or in the Contract Documents.

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User Notes:
ARTICLE 8 OWNER
§ 8.1 INFORMATION AND SERVICES REQUIRED OF THE OWNER
§ 8.1.1 The Owner shall furnish all necessary surveys and a legal description of the site.

§ 8.1.2 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.

§ 8.1.3 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 9.6.1, the Owner shall secure and pay for other necessary approvals, easements, assessments and charges required for the construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 8.2 OWNER’S RIGHT TO STOP THE WORK
If the Contractor fails to correct Work which is not in accordance with the requirements of the Contract Documents, or repeatedly fails to carry out the 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 is 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.

§ 8.3 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, without prejudice to any other remedy the Owner may have, may correct such deficiencies and may deduct the reasonable cost thereof, including Owner’s expenses and compensation for the Architect’s services made necessary thereby, from the payment then or thereafter due the Contractor.

ARTICLE 9 CONTRACTOR
§ 9.1 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR
§ 9.1.1 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.

§ 9.1.2 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 8.1.1, 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.

§ 9.1.3 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.

§ 9.2 SUPERVISION AND CONSTRUCTION PROCEDURES
§ 9.2.1 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.
§ 9.2.2 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.

§ 9.3 LABOR AND MATERIALS
§ 9.3.1 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.

§ 9.3.2 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 skilled in tasks assigned to them.

§ 9.3.3 The Contractor may make a substitution only with the consent of the Owner, after evaluation by the Architect and in accordance with a Modification.

§ 9.4 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 under normal usage.

§ 9.5 TAXES
The County is a tax exempt entity and shall supply the Contractor a Tax Exemption Certificate.

§ 9.6 PERMITS, FEES, NOTICES, AND COMPLIANCE WITH LAWS
§ 9.6.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as 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.

§ 9.6.2 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. 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.

§ 9.7 ALLOWANCES
The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. The Owner shall select materials and equipment under allowances with reasonable promptness. Allowance amounts shall include the costs to the Contractor of materials and equipment delivered at the site and any required taxes, less applicable trade discounts. Allowance amounts shall not include the Contractor’s costs for unloading and handling at the site, labor, installation, overhead, and profit.

§ 9.8 CONTRACTOR’S CONSTRUCTION SCHEDULES
§ 9.8.1 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.

§ 9.8.2 The Contractor shall perform the Work in general accordance with the most recent schedule submitted to the Owner and Architect.
§ 9.9 SUBMITTALS
§ 9.9.1 The Contractor shall review for compliance with the Contract Documents and submit to the Architect Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in coordination with the Contractor’s construction schedule and in such sequence as to allow the Architect reasonable time for review. 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. The Work shall be in accordance with approved submittals.

§ 9.9.2 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents.

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

§ 9.11 CUTTING AND PATCHING
The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly.

§ 9.12 CLEANING UP
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 material from and about the Project.

§ 9.13 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.

§ 9.14 ACCESS TO WORK
The Contractor shall provide the Owner and Architect access to the Work in preparation and progress wherever located.

§ 9.15 INDEMNIFICATION
§ 9.15.1 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 9.15.1.

§ 9.15.2 In claims against any person or entity indemnified under this Section 9.15 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 9.15.1 shall not be limited by a limitation on amount or type of
damages, compensation or benefits payable by or for the Contractor or Subcontractor under workers’ compensation acts, disability benefit acts or other employee benefit acts.

ARTICLE 10 ARCHITECT

§ 10.1 The Architect will provide administration of the Contract 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, unless otherwise modified in writing in accordance with other provisions of the Contract.

§ 10.2 The Architect will visit the site at intervals appropriate to the stage of the construction 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 safety precautions and programs in connection with the Work, since these are solely the Contractor’s rights and responsibilities under the Contract Documents.

§ 10.3 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.

§ 10.4 Based on the Architect’s evaluations of the Work and 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.

§ 10.5 The Architect has authority to reject Work that does not conform to the Contract Documents and to require inspection or testing of the Work.

§ 10.6 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.

§ 10.7 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 will make initial decisions on all claims, disputes and other matters in question between the Owner and Contractor but will not be liable for results of any interpretations or decisions rendered in good faith.

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

§ 10.9 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.

ARTICLE 11 SUBCONTRACTORS

§ 11.1 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.

§ 11.2 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 the Subcontractors or suppliers for each of the principal portions of the Work. The Contractor shall not contract with any Subcontractor or supplier to whom the Owner or Architect has made reasonable written objection within ten
days after receipt of the Contractor’s list of Subcontractors and suppliers. 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. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 11.3 Contracts between the Contractor and Subcontractors shall (1) require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by the 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 the Contract Documents, assumes toward the Owner and Architect, and (2) allow the Subcontractor the benefit of all rights, remedies and redress against the Contractor that the Contractor, by these Contract Documents, has against the Owner.

ARTICLE 12 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 12.1 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 21.

§ 12.2 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 activities with theirs as required by the Contract Documents.

§ 12.3 The Owner shall be reimbursed by the Contractor for costs incurred by the Owner which are payable to a separate contractor because of delays, improperly timed activities or defective construction of the Contractor. The Owner shall be responsible to the Contractor for costs incurred by the Contractor because of delays, improperly timed activities, damage to the Work or defective construction of a separate contractor.

ARTICLE 13 CHANGES IN THE WORK

§ 13.1 By appropriate Modification, changes in the Work may be accomplished after execution of the Contract. The Owner, without invalidating the Contract, may order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, with the Contract Sum and Contract Time being adjusted accordingly. Such changes in the Work shall be authorized by written Change Order signed by the Owner, Contractor and Architect, or by written Construction Change Directive signed by the Owner and Architect.

§ 13.2 Adjustments in the Contract Sum and Contract Time resulting from a change in the Work shall be determined by mutual agreement of the parties or, in the case of a Construction Change Directive signed only by the Owner and Architect, by the Contractor’s cost of labor, material, equipment, and reasonable overhead and profit (10% overhead and 5% profit), unless the parties agree on another method for determining the cost or credit. Pending final determination of the total cost of a Construction Change Directive, the Contractor may request payment for Work completed pursuant to the Construction Change Directive. The Architect will make an interim determination of the amount of payment due for purposes of certifying the Contractor’s monthly Application for Payment. When the Owner and Contractor agree on adjustments to the Contract Sum and Contract Time arising from a Construction Change Directive, the Architect will prepare a Change Order.

§ 13.3 The Architect will have 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 shall be effected by written order and shall be binding on the Owner and Contractor. The Contractor shall carry out such written orders promptly.

§ 13.4 If concealed or unknown physical conditions are encountered at the site that differ materially from those indicated in the Contract Documents or from those conditions ordinarily found to exist, the Contract Sum and Contract Time shall be equitably adjusted as mutually agreed between the Owner and Contractor; provided that the Contractor provides notice to the Owner and Architect promptly and before conditions are disturbed.
ARTICLE 14 TIME

§ 14.1 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.

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

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

§ 14.4 The date of Substantial Completion is the date certified by the Architect in accordance with Section 15.4.3.

§ 14.5 If the Contractor is delayed at any time in the commencement or progress of the Work by changes ordered in the Work, by labor disputes, fire, unusual delay in deliveries, abnormal adverse weather conditions not reasonably anticipatable, unavoidable casualties or any causes beyond the Contractor's control, or by other causes which 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, subject to the provisions of Article 21.

ARTICLE 15 PAYMENTS AND COMPLETION

§ 15.1 APPLICATIONS FOR PAYMENT

§ 15.1.1 Where the Contract is based on a Stipulated Sum or the Cost of the Work with a 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, 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 in reviewing the Contractor's Applications for Payment, using AIA Document G702.

(Paragraph deleted)

§ 15.1.3 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 stored, and protected from damage, off the site at a location agreed upon in writing.

§ 15.1.4 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 other encumbrances adverse to the Owner's interests.

§ 15.2 CERTIFICATES FOR PAYMENT

§ 15.2.1 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 15.2.3.

§ 15.2.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluations 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.

§ 15.2.3 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 15.2.2 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 15.2.1. If the Contractor and the 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 9.2.2, 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.

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

§ 15.3 PROGRESS PAYMENTS
§ 15.3.1 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment, 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 similar manner.

§ 15.3.2 Neither the Owner nor Architect shall have an obligation to pay or see to the payment of money to a Subcontractor except as may otherwise be required by law.

§ 15.3.3 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.

§ 15.4 SUBSTANTIAL COMPLETION
§ 15.4.1 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.

§ 15.4.2 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.

§ 15.4.3 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. When the Architect determines that the Work or designated portion thereof is substantially complete, the Architect will issue a Certificate of Substantial Completion which shall establish the date of Substantial Completion, establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and 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.

§ 15.4.4 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.

§ 15.5 FINAL COMPLETION AND FINAL PAYMENT
§ 15.5.1 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 stated in Section 15.5.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 15.5.2 Final payment shall not become due until the Contractor has delivered to the Owner a complete release of all liens arising out of this Contract or receipts in full covering all labor, materials and equipment for which a lien could be filed, or 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 costs and reasonable attorneys' fees.

§ 15.5.3 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.

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

ARTICLE 16 PROTECTION OF PERSONS AND PROPERTY
§ 16.1 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. 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.

The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, rules and regulations, and lawful orders of public authorities bearing on safety of persons and property and their protection from damage, injury or loss. The Contractor shall promptly remedy damage and loss to property 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 16.1.2 and 16.1.3, except for damage or loss attributable to acts or omissions of the Owner or Architect 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 9.15.
§ 16.2 HAZARDOUS MATERIALS
§ 16.2.1 The Contractor is responsible for compliance with the requirements of 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. 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 shutdown, delay and start-up.

§ 16.2.2 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 16.2.1 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.

§ 16.2.3 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.

ARTICLE 17 INSURANCE AND BONDS
§ 17.1 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, insurance for protection from claims under workers’ compensation acts and other employee benefit acts which are applicable, claims for damages because of bodily injury, including death, and claims for damages, other than to the Work itself, to property which may arise out of or result from the Contractor’s operations and completed operations under the Contract, whether such operations be by the Contractor or by a Subcontractor or anyone directly or indirectly employed by any of them. This insurance shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater, and shall include contractual liability insurance applicable to the Contractor’s obligations under Section 9.15. Certificates of Insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work. Each policy shall contain a provision that the policy will not be canceled or allowed to expire until at least 30 days’ prior written notice has been given to the Owner. 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.

§ 17.2 OWNER’S LIABILITY INSURANCE
The Owner shall be responsible for purchasing and maintaining the Owner’s usual liability insurance.

§ 17.3 PROPERTY INSURANCE
§ 17.3.1 Unless otherwise provided, the Contractor 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 on an “all-risk” or equivalent policy form, including builder’s risk, in the amount of the initial Contract Sum, plus the value of subsequent modifications and cost of materials supplied and 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 15.5 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 17.3.1 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and sub-subcontractors in the Project.
§ 17.3.2 The Owner shall file a copy of each policy with the Contractor before an exposure to loss may occur. 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.

§ 17.3.3 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 12, 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 Section 17.3 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 12, 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.

§ 17.3.4 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. 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.

§ 17.4 PERFORMANCE BOND AND PAYMENT BOND

§ 17.4.1 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.

§ 17.4.2 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 18 CORRECTION OF WORK

§ 18.1 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, unless compensable under Section A.2.7.3 in Exhibit A, Determination of the Cost of the Work.

§ 18.2 In addition to the Contractor’s obligations under Section 9.4, 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 15.4.3, 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.

§ 18.3 If the Contractor fails to correct nonconforming Work within a reasonable time, the Owner may correct it in accordance with Section 8.3.

§ 18.4 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.
§ 18.5 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Article 18.

ARTICLE 19 MISCELLANEOUS PROVISIONS

§ 19.1 ASSIGNMENT OF CONTRACT
Neither party to the Contract shall assign the Contract without written consent of the other, except that 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.

§ 19.2 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 21.4.

§ 19.3 TESTS AND INSPECTIONS
Tests, inspections and approvals of portions of the Work required by the Contract Documents or by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities shall be made at an appropriate time. Unless otherwise provided, the Owner 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 the costs to the Contractor.

§ 19.4 COMMENCEMENT OF STATUTORY LIMITATION PERIOD
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 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 19.4.

ARTICLE 20 TERMINATION OF THE CONTRACT

§ 20.1 TERMINATION BY THE CONTRACTOR
If the Architect fails to certify payment as provided in Section 15.2.1 for a period of 30 days through no fault of the Contractor, or if the Owner fails to make payment as provided in Section 4.1.3 for a period of 30 days, the Contractor may, upon seven additional days’ written notice to the Owner and the 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.

§ 20.2 TERMINATION BY THE OWNER FOR CAUSE

§ 20.2.1 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.

§ 20.2.2 When any of the above reasons exists, the Owner, upon certification by the Architect that sufficient cause exists to justify such action, may, without prejudice to any other remedy the Owner may have and after giving the Contractor seven days’ written notice, terminate the Contract and take possession of the site and of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor and may finish the Work by whatever reasonable method the Owner may deem expedient. Upon 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.
§ 20.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 20.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 20.2.4 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 Architect, upon application, and this obligation for payment shall survive termination of the Contract.

§ 20.3 TERMINATION BY THE OWNER FOR CONVENIENCE
The Owner may, at any time, terminate the Contract for the Owner’s convenience and without cause. 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 21 CLAIMS AND DISPUTES
§ 21.1 Claims, disputes and other matters in question arising out of or relating to this Contract, including those alleging an error or omission by the Architect but excluding those arising under Section 16.2, shall be referred initially to the Architect for decision. Such matters, except those waived as provided for in Section 21.8 and Sections 15.5.3 and 15.5.4, shall, after initial decision by the Architect or 30 days after submission of the matter to the Architect, be subject to mediation as a condition precedent to binding dispute resolution.

§ 21.2 If a claim, dispute or other matter in question relates to or is the subject of a mechanic’s lien, the party asserting such matter may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 21.3 The parties shall endeavor to resolve their disputes by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with their 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 this Agreement, and filed with the person or entity administering the mediation. The request may be made concurrently with the binding dispute resolution 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, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 21.4 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 the Construction Industry Arbitration Rules in effect on the date of this Agreement. 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 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.

§ 21.5 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).

§ 21.6 Any party to an arbitration 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 a Claim not described in the written Consent.
§ 21.7 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.

§ 21.8 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.

3. liquidated damages beyond the Contract completion date shall equal $250.00 (Two Hundred Fifty Dollars) per calendar day.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party’s termination in accordance with Article 20. Nothing contained in this Section 21.8 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

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

OWNER (Signature)

Mike Bradford, County Judge  (Printed name and title)

CONTRACTOR (Signature)

(Printed name and title)
1. DO NOT SCALE DRAWINGS.
2. FIELD VERIFY EXISTING CONDITIONS PRIOR TO WORK. NOTIFY ARCHITECT IF DISCREPANCIES ARISE IN THE FIELD WHICH MAY ALTER DESIGN PRIOR TO COMMENCEMENT OF WORK.
3. GENERAL CONTRACTOR SHALL COORDINATE ALL SITE MECHANICAL, ELECTRICAL AND GENERAL CONSTRUCTION WORK SHOWN AT VARIOUS LOCATIONS THROUGHOUT THE SITE DRAWINGS WHETHER OR NOT CROSS-REFERENCED. MECHANICAL AND ELECTRICAL ITEMS MAY OCCUR WHICH ARE NOT SHOWN ON SITE PLANS.
4. REFERENCE LANDSCAPE PLANS FOR NEW LANDSCAPED AREAS.
5. REFERENCE PLUMBING DRAWINGS FOR LOCATION OF NEW SPRINKLER HEADS.
A. DESCRIPTION OF WORK

B. USE AND OCCUPANCY CLASSIFICATION (CHAPTER 3)

C. SPECIAL USES:

D. GENERAL BUILDING HEIGHTS AND AREAS (CHAPTER 5)

E. FIRE PROTECTION SYSTEMS (CHAPTER 9)

F. MEANS OF EGRESS (CHAPTER 10)

G. PLUMBING SYSTEMS (CHAPTER 29)
1. DO NOT SCALE DRAWINGS.
2. FIELD VERIFY EXISTING CONDITIONS PRIOR TO WORK. NOTIFY ARCHITECT IF DISCREPANCIES ARISE IN THE FIELD WHICH MAY ALTER DESIGN PRIOR TO COMMENCEMENT OF WORK.
3. GENERAL CONTRACTOR SHALL COORDINATE ALL SITE MECHANICAL, ELECTRICAL AND GENERAL CONSTRUCTION WORK SHOWN AT VARIOUS LOCATIONS THROUGHOUT THE SITE DRAWINGS WHETHER OR NOT CROSS-REFERENCED. MECHANICAL AND ELECTRICAL ITEMS MAY OCCUR WHICH ARE NOT SHOWN ON SITE PLANS.
4. SEE SPECIFICATIONS FOR PLANT AND TREE DESIGNATIONS.
5. FENCING CONTRACTOR TO PROVIDE ALL CONCRETE BASES FOR FENCE POSTS
6. FENCING CONTRACTOR TO PROVIDE CONCRETE MOW STRIP AT VASE OF DECORATIVE FENCING WHERE SHOWN ON DRAWINGS

GENERAL NOTES

NO SOD
CONCRETE MOW STRIP
BELOW DECORATIVE FENCING
SOD

KEYNOTES

03.14 12" W x 4" DEEP CONCRETE MOW STRIP
03.15 EXTENTS OF CONCRETE MOW STRIP
04.02 MASONRY RETAINING WALL
05.02 DECORATIVE METAL FENCING
05.03 DECORATIVE METAL FENCING 6'-0" HIGH W/ 1' X 4" DEEP MOW STRIP WHERE NOTED
05.04 DECORATIVE METAL FENCING VARIES REF. ELEVATIONS.
05.05 DECORATIVE METAL FENCING GATE
05.09 6' CHAIN LINK FENCE
05.10 PAIR OF 6' CHAIN LINK FENCE GATES
05.13 8' DECORATIVE METAL FENCING GATE
05.14 12' DECORATIVE METAL FENCING GATE ON WHEELS
05.15 EXISTING SIGNAGE

LEGEND

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SHEET: A-102
PROJECT: 01515
DATE: 2/17/2016
MIDLAND COUNTY AMPHITHEATER
MIDLAND COUNTY
ELECTRICAL BID PACKAGE
REVISION NO. DATE: DESCRIPTION:
Midland, TX 79701 2/17/2016
COUNTY OF MIDLAND, TEXAS
Plans for the Construction of

PHASE I GRADING & DRAINAGE IMPROVEMENTS
To Serve

MIDLAND COUNTY AMPHITHEATER
**EXISTING LEGEND**

<table>
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<th>Description</th>
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<td>Existing Gas Meter</td>
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**GENERAL NOTES**

1. The project is located in Midland, Texas, and is subject to the approval of the City Planning and Zoning Commission.
2. The project is subject to the approval of the Midland County Planning and Zoning Commission.
3. The project is subject to the approval of the Texas Department of Transportation.
4. The project is subject to the approval of the Midland County Water Department.

**PLOTTED INFORMATION**

- **Plotted By:** Stephens, Brett
- **Plotted On:** Monday, December 14, 2015
- **Plotted At:** 9:46:37 AM

**FILE INFORMATION**

- **Filename:** PHASE 1 GENERAL NOTES.dwg
- **Full Path:** G:\Production500\002000\2049\Design\002\Drawings\Plot Sheets\PHASE 1 GENERAL NOTES.dwg
Project Manual

Midland County Amphitheatre
2514 Arena Trail
Midland, Texas 79701

Electrical Bid Package

February 17, 2016

VGA Project #: 01515

SET # ________________
MIDLAND COUNTY AMPHITHEATRE – PROJECT NO. 01515
VANDERGRIFF GROUP ARCHITECTS, PC

Date: February 17, 2016

PROJECT MANUAL FOR:
Midland County Amphitheatre
2514 Arena Trail
Midland, Texas 79701

ARCHITECT OF RECORD:

Mark R. Pelletier, AIA
VANDERGRIFF GROUP ARCHITECTS, PC
312 N. Big Spring St., Suite 100 Midland, Texas 79701
(432) 687-0781
(432) 687-5205 fax
Divisions 0 through 1, 4 through 7 and 9

CONSULTING STRUCTURAL ENGINEER:

Achille Kodom, P.E.
EAKOM Engineering & Consulting
405 N. Marienfeld Street, Suite 210
Midland, Texas 79701
(432) 789-1390
Division 3

CONSULTING CIVIL ENGINEER:

James Brett Stephens, P.E.
DUNAWAY ASSOCIATES, LP
4000 N. Big Spring Street, Suite 101
Midland, Texas 79705
(432) 699-4889
Division 22

CONSULTING MEP ENGINEER:

James Holloway, P.E.
AGNEW ASSOCIATES, INC.
14205 Burnet Road, Suite 200 Austin, Texas 78728
(512) 828-0753
(512) 310-0750 fax
Division 26
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DIVISION 22 – PLUMBING
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26 05 26 Grounding and Bonding for Electrical Systems
26 05 29 Hangers and Supports for Electrical Systems
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26 05 43 Underground Ducts & Raceway for Elect. Systems
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LIST OF DRAWINGS INCLUDED

The following drawings indicate the Work to be performed under this Contract and are made part of these Specifications.

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<td>4</td>
<td>EROSION CONTROL PLAN</td>
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END OF SECTION 00 01 15
Ms. Kristy Engeldahl  
Purchasing Agent  
Midland County  
500 North Loraine Street, Suite 1101  
Midland, Texas 79701

Dear Ms. Engeldahl:

The undersigned, having carefully examined the project manual, drawings, and related documents dated February 10, 2016 and entitled:

Electrical Package  
Midland County Amphitheater  
2514 Arena Trail  
Midland, Texas 79701

All as prepared by Vandergriff Group Architects, having made an on-site inspection of the premises and all other conditions affecting the cost and/or execution of the work, proposes to furnish all materials, labor, and equipment necessary to complete the work in accordance with said documents, of which this proposal is a part, for the following sum:

NOTE: PLEASE MARK “ADD” OR “DEDUCT” ON ALL ALTERNATES.

A. BASE PROPOSAL, Lump Sum: ____________________________________________

__________________________________________ Dollars ($__________)

B. ALTERNATE NO. 1 – (PERFORMANCE AND PAYMENT BOND AS INDICATED FOR BASE BID.)

For a Lump Sum: ____________________________________________

__________________________________________ Dollars ($__________)

Add/Deduct  
(Circle One)

Note: All amounts shall be shown in both written and figure form. In case of discrepancy between the written amount and the figure, the written amount will govern.
The undersigned acknowledges receipt of _____ addenda to the Proposal Documents as follows:

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<th>No.</th>
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(The Proposer is to fill in I.D. Number and date of each thereby acknowledging receipt of addenda).

If awarded the contract, the undersigned agrees to commence Work under this contract on or before a date to be specified in a written Notice to Proceed and to bring the project to Substantial Completion within ________ calendar days (fill in number of days) from the Notice to Proceed, however in no case later than May 15, 2016 from notice to proceed.

We agree to hold our proposal open beyond the Proposal Date for thirty (30) days.

If notified of the acceptance of this proposal within five (5) days of the time set for the opening of proposals, proposer agrees within ten (10) days of notification, to execute a contract on AIA Document A101, Standard Form of Agreement Between Owner and Contractor for the above work, for the agreed upon compensation.

PROPOSAL SECURITY, as defined in the Instructions to Proposers, which the Undersigned agrees to disposition of, as stated in Instructions to Proposers, is attached to this Proposal.

Upon acceptance of the Proposal by Owner and acceptance of Alternate No. 1, contractor shall furnish, at the time of the signing of the Contact, a PERFORMANCE BOND AND LABOR/MATERIAL PAYMENT BOND, in the amount of 100% of the Contract Price and proof of insurance. Surety shall meet requirements specified in Supplementary General Conditions.

I further agree as follows:

1. To submit, along with this proposal form, the following selection criteria information;
   • The number of calendar days required for substantial completion.
   • Resume and references of office project manager and superintendent.
   • Experience record.
   • List of proposed subcontractors (delivered to Midland County within 24 hours of proposed opening).

2. To submit (if required by the Architect) Insurance claims and litigation during last three years.

Selection of the Contractor shall be based on the price, proposed time and the bidder who provides goods or services at the best value for Midland County.

It is understood that the Owner reserves the right to accept or reject any and all Proposals and to waive all formalities in accordance with State law.
IMPORTANT NOTICE:

If Proposer is a Corporation, set forth the legal name of the Corporation, State of incorporation together with the signature of the officer or officers authorized to sign contracts on behalf of the corporation.

If Proposer is a Partnership, set forth the name of the firm together with the signature of the partner or partners authorized to sign contracts on behalf of the partnership.

The undersigned affirms that they are duly authorized to execute this proposal, that this company, corporation, firm, partnership or individual has not prepared this proposal in collusion with any other proposer, and that the contents of this proposal as to prices, terms or conditions of said proposal have not been communicated by the undersigned, not by any employee or agent to any other person engaged in this type of business prior to the official opening of this proposal.

Respectfully Submitted,

By: ________________________________
   (Authorized Signature)
Title: ________________________________
Date: ________________________________

Business Name, Mailing Address or P.O. Box and Zip Code
________________________________________________________
________________________________________________________
________________________________________________________

(SEAL: If Proposer is by Corporation)

Telephone Number with Area Code _________________
FAX Number with Area Code _________________

Fill in the applicable information:
A Corporation, chartered in the State of ________________________________, authorized to do business in the State of Texas.
A Partnership, composed of ________________________________, and ________________________________, and ________________________________
An Individual operating under the name of ________________________________

Corporate Seal:
SECTION 01 11 00
SUMMARY OF WORK

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. Drawings, General Conditions of the Contract for Construction, Supplementary Conditions and Division 1 - General Requirements apply to Work of this section.

1.02 SECTION INCLUDES

A. Project; Work covered by Contract Documents.
B. Work under other contracts.
C. Work by Owner.
D. Owner supplied products.
E. Contractor use of site and premises.
F. Work Sequence.
G. Owner occupancy.

1.03 PROJECT: WORK COVERED BY CONTRACT DOCUMENTS

A. Without force or effect, Work of the total Project is generally described as follows:
   1. The Work comprises the concrete work for the completion of an Amphitheatre facility to the prepared mound at the Midland County Horseshoe Pavilion located at 2514 Arena Trail, Midland, Texas. It includes concrete flatwork, retaining walls, walkways, sidewalks ramps, Banner Pole Bases, Entry gate bases, foundation walls and trench drains. All rebar and steel reinforcement is part of the concrete package.

1.04 WORK UNDER OTHER CONTRACTS

There are no other separate contracts running consecutively at this time.

1.05 WORK BY OWNER

Items noted “NIC” (Not in Contract), or "Owner furnish/Owner installed" (OF/OI) will be furnished and installed by Owner during the construction period of this contract.

1.06 OWNER SUPPLIED PRODUCTS

A. Owner’s Responsibilities:
   1. Arrange for and deliver Owner reviewed Shop Drawings, Product Data, and Samples to contractor.
2. Arrange and pay for Product delivery to site.
3. On delivery, inspect Products jointly with Contractor.
4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
5. Arrange for manufacturer’s warranties, inspections and service.

B. Contractor’s Responsibilities:
1. Review Owner reviewed Shop Drawings, Product Data, and Samples.
2. Receive and unload Products at site; inspect for completeness or damage, jointly with Owner.
3. Handle, store and install finish Products.
4. Repair or replace items damaged after receipt.

1.07 CONTRACTOR USE OF SITE AND PREMISES

A. Limit use of site and premises to allow:
1. Owner occupancy.
2. Work by Others and Work by Owner.
3. Use of site and adjacent premises by public for scheduled activities.

B. Construction Operations: Limited to areas indicated on drawings.

1.08 OWNER OCCUPANCY

A. The Owner will occupy the existing building during entire period of construction for the conduction of normal operations.

B. Cooperate with Owner to minimize conflict, and to facilitate Owner’s operations. Schedule the Work to accommodate these requirements.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION 01 11 00
SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. Drawings, General Conditions of the Contract for Construction, Supplementary Conditions and Division 1 - General Requirements apply to Work of this section.

B. Drawings, Standard General Conditions of the Construction Contract, Supplementary Conditions and Division 1 - General Requirements apply to Work of this section.

C. Drawings, Construction Contract Clauses, Supplementary Conditions and Division 1 - General Requirements apply to Work of this section.

1.02 SECTION INCLUDES

A. Coordination.

B. Field engineering.

C. Electronic files.

D. Material Safety Data Sheets (MSDS)

E. Preconstruction meeting.

F. Request for information.

G. Site mobilization meeting.

H. Progress meetings.

I. Pre-installation meetings.

J. Cutting and patching.

1.03 COORDINATION

A. Coordinate scheduling, submittals, and Work of the various sections of the Project Manual to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

B. Verify that utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate Work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

C. Coordinate space requirements and installation of mechanical and electrical Work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and
conduit, as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

D. In finished areas, except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

E. Large Apparatus: Any large piece of apparatus which is to be installed in any space in the building, and which is too large to permit access through windows, doorways or shafts, shall be brought to the job by the Contractor involved and placed in the space before the enclosing structure is completed.

F. Items which require electrical connections shall be coordinated with Division 16 for:
   1. Voltage
   2. Phase
   3. Ampacity
   4. No. and size of wires
   5. Wiring diagrams
   6. Starter size, details and location
   7. Control devices and details

G. Coordinate completion and clean up of Work of separate sections in preparation for Substantial Completion.

H. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner’s activities.

1.04 FIELD ENGINEERING

A. Employ a Land Surveyor registered in the State of Texas and acceptable to Architect.

B. Locate and protect survey control and reference points.

C. Control datum for survey is that shown on drawings.

D. Verify set-backs and easements, confirm drawing dimensions and elevations.

E. Provide field engineering services. Establish elevations, lines, and levels, utilizing recognized engineering survey practices.

F. Submit a copy of registered site drawing and certificate signed by the Land Surveyor that the elevations and locations of the Work are in conformance with the Contract Documents.

1.05 ELECTRONIC FILES

A. Electronic drawing files are available for purchase from the Architect upon request. Cost of the files is $100.00 per drawing sheet. Only the Contractor or his subcontractors and sub-subcontractors may purchase an electronic file. Contact the Architect’s office to request the electronic file needed. An electronic file will be provided in Revit format of
the release currently used by the Architect. File will be provided on a CD or transferred electronically.

B. Prior to delivery of the file, purchaser shall sign an electronic file transfer release form provided by the Architect (sample of form included in this section). Payment for an electronic file shall occur upon delivery of file to purchaser.

C. Electronic file shall be used only for the production of information required by this project and shall not be used in any other form (in whole or part).

1.06 MATERIAL SAFETY DATA SHEETS (MSDS)

A. Comply with the most current requirements of the Department of State Health Services, Texas Asbestos Health Protection Rules (TAHPR), Title 25., HEALTH SERVICES, Part I, Chapter 295-Occupational Health, § 295.34-Asbestos Management in Facilities and Public Buildings, paragraph (i) as a minimum and as outlined below.

1. Submit MSDS on all products used in construction of Project.

2. Submit MSDS in 8 ½ x 11 inch format text pages, bound in three D-ring binders with durable plastic covers.

3. Prepare binder cover with printed title “MATERIAL SAFETY DATA SHEETS (MSDS)”, Title of Project, Project Address, Owner’s Name, Address and Phone, and Date of Construction Completion.

4. Internally subdivide the binder contents with permanent page dividers, organized into the 16 Division CSI format, with tab title clearly printed under reinforced laminated plastic tabs.

5. Prepare a table of contents, listing each of the 16 Divisions headings and listing each material/product under each heading by manufacturer and material/product name.

6. Submit two complete, identical binders of the aforementioned information and in the prescribed format.

7. Submit binders each month with Application for Payment. Binders shall include all MSDS for materials/products delivered or installed in Project since the previous month’s Application for Payment.

8. Failure to submit updated MSDS binders will cause Application for Payment to be held by Architect (not submitted to Owner for processing) until such time updated MSDS binders are received and reviewed for compliance by Architect.

1.07 PRECONSTRUCTION MEETING

A. Architect will schedule a meeting after Notice to Proceed.

B. Attendance Required: Owner, Architect, Engineer, Contractor and major Subcontractors.

C. Agenda:

1. Confirm submission of executed bonds and insurance certificates with contract.

2. Distribution of Contract Documents (if not previously distributed).

3. Submission of list of Subcontractors, list of products, Schedule of Values, and progress schedule (if not previously submitted).


5. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders and Contract
   a. Use of premises by Owner and Contractor.
   b. Owner's requirements.
   c. Construction facilities and controls provided by Owner.
   d. Temporary utilities provided by Owner.
   e. Survey and building layout.
   f. Security and housekeeping procedures.
   g. Schedules.
   h. Procedures for testing.
   i. Procedures for maintaining record documents.
   j. Requirements for start-up of equipment.
   k. Inspection and acceptance of equipment put into service during construction period.

D. Record minutes and distribute copies within three days after meeting to participants with two copies to Architect and those affected by decisions made.

1.08 REQUEST FOR INFORMATION

A. Contractor shall use Architect’s standard form when submitting Requests For Information (RFI). Architect will issue a copy of this form to Contractor in both hard copy and electronic media. Only Contractor can submit RFIs to Architect. RFI requests from subcontractors or material suppliers will not be considered.

B. All information indicated on the form to be provided by Contractor shall be complete before a request can be submitted to the Architect’s office. Requests with incomplete information will be returned to the Contractor. Submission of a complete RFI request by Contractor does not constitute an RFI until Architect makes the determination. If Architect determines that request can not be answered with the information provided in the Contract Documents, Architect will then assign an RFI tracking number. Requests determined by Architect not to be an RFI will be returned to Contractor without being assigned an RFI tracking number. A transmittal document returning the denied RFI request will be provided with a response indicating action to be taken by Contractor.

C. If request and proposed solution cannot fit on the form, an attachment may be identified in the Request or Contractor Proposed Solution areas, then attached to the form and submitted to Architect. RFIs may contain more than one item when the items are related issues. Otherwise, only one item shall be addressed on each RFI request.

D. Architect’s response to the RFI will be in writing on the same form, or by attachment and issued to Contractor and Owner.

E. Responses from Architect will not change any requirement of the Contract Documents. Should Contractor believe an RFI response to cause a change to the Contract, Contractor shall give written notice to Architect in accordance with the requirements in the Contract. Written notice shall include specific reasons and an order of magnitude of Cost and/or Time that Contractor deems appropriate based on the Architect’s RFI response. Contractor’s written notice does not constitute a Change Order, but provide a basis for further review and discussion with the Architect.
1.09 SITE MOBILIZATION MEETING

A. Architect will schedule a meeting at the Project site prior to Contractor occupancy.

B. Attendance Required: Architect, Special Consultants, Contractor, Contractor's Superintendent, and major Subcontractors.

C. Agenda:
   1. Use of premises by Owner and Contractor.
   2. Owner's requirements.
   3. Construction facilities and controls provided by Owner.
   4. Temporary utilities provided by Owner.
   5. Survey and building layout.
   7. Schedules.
   8. Procedures for testing.
  10. Requirements for start-up of equipment.
  11. Inspection and acceptance of equipment put into service during construction period.

D. Record minutes and distribute copies within three days after meeting to participants with three copies to Architect and those affected by decisions made.

1.10 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the Work at minimum of once a week. At times of decreased activity progress meetings may be scheduled every two weeks.

B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

C. Attendance Required: Job superintendent, major Subcontractors and suppliers, Architect as appropriate to agenda topics for each meeting.

D. Agenda:
   1. Review 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.
  12. Effect of proposed changes on progress schedule and coordination.
  13. Other business relating to Work.
E. Record minutes, and distribute copies within three days to Architect, participants, and those affected by decisions made.

1.11 PRE-INSTALLATION MEETING

A. When required in individual specification Sections, convene a pre-installation meeting at Work site prior to commencing Work of the Section.

B. Require attendance of parties directly affecting, or affected by, Work of the specific Section.

C. Notify Architect four days in advance of meeting date.

D. Prepare agenda and preside at meeting.
   1. Review conditions of installation, preparation and installation procedures.
   2. Review coordination with related Work.

E. Record minutes, and distribute copies within three days after meeting to participants, with three copies to Architect.

PART 2 - PRODUCTS

2.01 EQUIPMENT ELECTRICAL CHARACTERISTICS AND COMPONENTS

A. Motors: Specific motor type is specified in individual specification sections.

B. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Size terminal lugs to NFPA 70, include lugs for terminal box.

C. Cord and Plug: Provide minimum 6 foot cord and plug including grounding connector for connection to electric wiring system. Cord of longer length is specified in individual specification sections.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.

B. Examine and verify specific conditions described in individual specification sections.

C. Verify that utility services are available, of the correct characteristics, and in the correct location.

3.02 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 any manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 CUTTING AND PATCHING

A. Employ skilled and experienced installer to perform cutting and patching.

B. Submit written request in advance of cutting or altering elements which affects:
   1. Structural integrity of element.
   2. Integrity of weather-exposed or moisture-resistant elements.
   3. Efficiency, maintenance, or safety of element.
   5. Work of Owner or separate contractor.

C. 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 or correct ill-timed Work.
   3. Remove and replace defective and non-conforming Work.
   4. Remove samples of installed Work for testing.
   5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.

D. Execute Work by methods which will avoid damage to other Work, and provide proper surfaces to receive patching and finishing.

E. Cut rigid materials using masonry saw or core drill.

F. Restore Work with new products in accordance with requirements of Contract Documents.

G. Fit Work tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

H. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.

I. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit.

J. Identify any hazardous substance or condition exposed during the Work to the Architect for decision or remedy.

3.04 ATTACHMENTS

A. Request for Information Form.

B. Electronic Data Transfer Form

END OF SECTION 01 30 00
REQUEST FOR INTERPRETATION

Date: ____________________________  RFI#: _________________________________

To: Vandergriff Group Architects  From: _________________________________
    Midland, Texas

Project: Midland County Amphitheatre  Address: _________________________________
    Midland, Texas

Phone: _________________________________  Fax: _________________________________

VGA Project #: 01515

*Items to be completed by Contractor before submittal to architect review.

* Specification Section/Paragraph No.: ___________  * Drawing Reference/Detail No.________

- Request:

- Contractor Proposed Solution

- Signed by:  * Response needed in _____ Days

Sent to:

Response:

☐ Attachments:

Response From:  To:  Date Rec’d:  Date Ret’d:

Signed by:

Copies:  ☐ Owner  ☐ Consultants  ☐ __________________________  ☐ __________________________
Hold Harmless and Indemnification Agreement for Electronic File(s) ______________________
_____________________________________________________________________________

In consideration of Vandergriff Group providing certain electronic media to the recipient, the recipient covenants and agrees to be bound by the following:

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Name: ___________________________________________ e-mail address: _____________________

Signed:___________________________________________   Date:_____________________ _________

The above person is duly authorized to sign on the behalf of ____________________________________

Company Name

VGA@ VANDERGRIFF-GROUP.COM
PART 1 – GENERAL

1.01 DESCRIPTION

A. This Section specifies administrative and procedural requirements for handling and processing Shop Drawings, Product Data, Samples, Project Information and Contract Closeout Information submittals.

B. Provisions of this Section take precedence over provisions in General Conditions of the Contract for Construction governing Shop Drawings, Product Data, Samples, Project Information and Contract Closeout Information Submittals.

C. Submittals are not to be used as means for substitution requests.

D. Submittals that include substitutions will be returned without review or action.

E. Contact Architect in event of non-availability of specified product due to strikes, lockouts, bankruptcy, production discontinuance, proven shortage, or similar occurrences.

F. Notify Architect, in writing, with substantiating data as soon as non-availability becomes apparent.

G. Notify in time to avoid delay in construction.

H. Appropriateness and accuracy of calculations is responsibility of Contractor, and Contractor’s Professional Structural Engineer when such calculations are required to be professionally sealed.

I. When professional or other certification of performance criteria of materials, systems or equipment is required by Contract Documents, Architect shall be entitled to rely upon accuracy and completeness of such calculations and certifications.

1.02 DEFINITIONS

A. General:
   1. Submittals are NOT Contract Documents.
   2. Purpose of submittal is to demonstrate for those portions of Work, for which submittals are required by Contract Documents, the way Contractor proposed to conform to information given and design concept expressed in Contract Documents.

B. “Contractor”: The term Contractor shall mean Construction Manager and Contractor(s) when used in this section.

C. “Shop Drawing” Action Submittals:
   1. Drawings to scale, diagrams, schedules and other data specially prepared for Work by Contractor or a Subcontractor, sub-subcontractor, manufacturer,
supplier or distributor to illustrate some portion of Work.

D. “Product Data” Action Submittals:
1. Illustrations, standard schedules, performance charts, instructions, brochures, color charts, performance curves, diagrams, test data and other information furnished by Contractor to illustrate material, product, equipment or system for some portion of Work.

E. “Sample Action” Submittals:
1. Physical examples which illustrate size, kind, pattern, texture, materials, equipment, systems or Workmanship and establish standards by which Work will be judged.
2. Samples also include job site Mock-ups and sample construction.

F. “Project Information” Submittals:
1. Items pertaining to quality control and Owner information which do not require review or response by Architect and are to be retained for project file only.
2. Examples include but are not limited to:
   4. Certifications.
   5. Design calculations.
   6. Coordination drawings.
   7. Architect may review at its sole discretion, for general compliance with Contract Documents only.
   8. Review will not constitute a detailed check of submitted design calculations.

G. “Contract Closeout Information” Submittals:
1. Items pertaining to quality control and Owner information, which are required at Substantial or Final Completion, and do not require review or response by Architect.
2. Examples:
   a. Pre-occupancy test reports.
   b. Warranties.
   c. Operation and maintenance data.
   d. Owner instruction reports.
   e. Record documents.
   f. Extra materials or tools.

H. Acceptable Manufacturers and Products (Base and Optional): See Section 01605.

1.03 SUBMITTALS (Required BY this section)

A. Project information:

1.04 SCHEDULE OF SUBMITTALS

A. Complete Schedule of Submittals shall include Shop Drawings, Product Data, Samples, Project Information, and Contract Closeout Information required by specification section Submittal paragraphs.
1. Contractor or Subcontractors may require submittals for their coordination purposes even when submittals are not required by Contract Documents for Architect’s review. Do not include or submit such submittals to Architect.
2. Do not include or submit MSDS information.
3. Do not include or submit items not required to be submitted by Contract Documents.
4. Indicate proposed submittal dates for each submittal.
5. Arrange submittals by specification section:
   a. Submittals shall include items from one specification section only.
   b. Submit Shop Drawings, Product Data, and Project Information (except for Field Test Reports) items specified in a section at same time for a complete review.
      1) Shop Drawings: Individual submittal item. Subparagraphs represent description of items to include.
         a) Indicate additional submittals that will be generated as result of dividing required submittal by building, floor, area of a floor, or other subdivision.
         1) Product Data: Individual submittal item. Subparagraphs represent description of items to include as part of single submittal.
         2) Sample and Information submittals: Each subparagraph represents an individual submittal item.

6. Indicate submittals that will be provided to agencies having jurisdiction. Schedule sufficiently in advance of date required to allow agency reasonable time for review, and Contractor resubmission if necessary, and to cause no delay in Work or in activities of Owner or other contractors.
7. Schedule submittals sufficiently in advance of date required to allow Architect reasonable time for review, and Contractor's resubmission if necessary, and to cause no delay in Work or in activities of Owner or other contractors.
8. Allow at least two weeks for Architect's review and processing of each submittal, excluding mailing.
9. Do not submit large quantities of submittals at one time.
10. Schedule Contract Closeout Information submittals during last quarter of construction period and prior to Substantial Completion. See specific specification sections for requirements.

B. Partial payment requests may be withheld until satisfactory Schedule of Submittals has been received.

1.05 SHOP DRAWINGS

A. Shop Drawing Action Submittals are required as called for in each specification section Submittal paragraph.
   1. Do not use Contract Drawings as Shop Drawings.

B. Unless otherwise agreed to by Architect, submit two (2) high quality, high contrast reproducible bond paper copy of each Shop Drawing, unless quantity is indicated elsewhere. Architect will only return the original bond paper copy of each.
   1. Blue lines, sepias or third generation prints or faxes are not acceptable.
   2. Additional copies may be required by other entities, but Architect will not accept or return.
   3. Drawings shall be 610 x 915 mm 24 x 36 IN or not larger than 760 x 1065 mm 30
4. Allow clear space, approximately 25,806 mm² 40 SQ IN, for approval stamps on right hand side of document.
5. Provide title block indicating; Project name, Project number, drawing number, and name of entity preparing submittal.
6. Do not fold.
7. Submit in mailing tube.

1.06 PRODUCT DATA

A. Product Data Action Submittals are required as called for in each specification section Submittal paragraph.

B. Unless otherwise agreed to by Architect, submit two (2) originals, or high quality high contrast bond paper copies, unless quantity is indicated elsewhere that are suitable for reproduction of Product Data items such as equipment brochures, product catalog cuts of fixtures, standard catalog items, etc.
   1. Faxes or third generation copies are not acceptable.
   2. Additional copies may be required by other entities; however, Architect may not return them.
   3. Include index if multiple items under specification section are included in submittal.
   4. Mark each copy to show exact item, model, and options submitted for review.
   5. Include scale details, sizes, dimensions, performance characteristics, capacities, wiring diagrams, controls and other pertinent data.
   6. Data shall be 215 x 280 mm or 215 x 355 mm 8-1/2 x 11 IN or 8-1/2 x 14 IN maximum.
   7. Do not fold.
   8. Submit in envelope large enough for submitted items.

1.07 SAMPLES

A. Sample Action Submittals are required in applicable specification section Submittal paragraph.
   1. Identify samples with manufacturer’s name, item, use, type, Project designation, specification section or drawing detail reference, color, range, texture, finish and other pertinent data.
   2. Submit samples to address indicated, or Project site if required or requested.
   3. Samples shall have a label affixed or attached thereto of sufficient size to accommodate Contractor’s and Architect’s approval stamp.
   4. Architect may retain samples for comparison purposes.

1.08 PROJECT INFORMATION AND CONTRACT CLOSEOUT INFORMATION

A. Project Information and Contract Closeout Information submittals are required as called for by specification section Submittal paragraph.

B. Unless otherwise agreed to by Architect, submit to Architect’s for records one (1) original, or high quality high contrast copy of submittal suitable for reproduction, unless quantity is indicated elsewhere, submittal. Submit quantity indicated in specifications sections to Owner.
1. Architect is not required to return submittal.
2. Include pertinent data.
3. Information shall be 215 x 280 mm or 215 x 355 mm 8-1/2 x 11 IN or 8-1/2 x 14 IN maximum.
4. Do not fold. Submit in envelope large enough for submitted items.

1.09 TRANSMITTAL – GENERAL

A. Contractor is responsible for making submissions.
   1. Submit items to Contractor for transmittal to office of the Architect: Vandergriff Group Architects

B. Transmit items with Submittal Transmittal form included at end of this section, or supplied by Architect, or of a similar format approved in advance by Architect.
   1. If submittal is based on an "Optional" manufacturer listed in Part 2 of technical specification sections, instead of "Base" manufacturer listed, then submit completed form titled "Optional Product/System Comparison" included at end of this section along with Submittal Transmittal form.
      a. "Optional Product/System Comparison" form is not required to be submitted if "Optional" manufacturer product name, product number or model number or both are specifically listed in technical specification sections.
   2. Contact Architect for copy made for Project.
   3. Indicate Project name, Architect's project number, specification section title, description of submitted items or systems, manufacturer and submittal type on transmittal form.
   4. Indicate submitted date, approval and sign in appropriate space on transmittal form.
   5. Submittal Transmittal form shall stay with submittal throughout its routing.
      a. Make copy for file if necessary.
   6. Indicate submittal number in space provided on Submittal Transmittal form. Following submittal numbering system shall be used:
      a. Identify each submittal using applicable 5 or 6 digit specification section number from Contract Documents.
      b. After section number, indicate sequence number. First submittal of section series would be numbered “######-1”, next would be “######-2”, etc.
      c. If returned for re-submission, add a designation character. Second submission would be “######-1A”, third would be “######-1B”, etc.

C. Submit submittals required by Contract Documents according to approved Schedule of Submittals.

D. Submittals shall only include items from one specification section.
   1. Project Information Submittals and Contract Closeout Information Submittals shall be submitted separately from other submittals required by specification section.
   2. Submit all items specified in section at same time for complete review, except Contract Closeout Information Submittals.

E. Do not submit following:
   1. Submittals not required by specification section Submittal paragraph.
   2. Submittals required by other contractors or trades for their coordination that are
3. Submittal of products, systems or manufactures not specified.
4. Submittal of substitution.
5. Submittal of MSDS information.
6. Information on only a portion of a submittal.
7. Large quantities of submittals at one time.

F. Do not mark copies with highlighters that black out information, or turn opaque when reproduced, or will not scan or reproduce legibly.

1.10 CONTRACTOR AND SUBCONTRACTOR ACTION

A. Direct specific attention in writing with submittal or on submittal, indicating deviations from requirements of Contract Documents.
1. Contractor shall not be relieved of responsibility for any deviation from requirements of Contract Documents by Architect’s approval of submittals unless, (1) Contractor has informed Architect in writing of such deviation at time of submission, and (2) Architect has given written approval to specific deviation as a minor change in Work, or (3) a Change Order or Construction Change Directive has authorized the deviation.
2. Completed Work shall match appearance of approved samples and mock-ups.

B. Contractor represents and warrants that submittals shall be prepared by persons and entities possessing expertise and experience in the trade for which submittal is prepared, and if required by Architect or applicable law, by a licensed Professional Engineer or Structural Engineer (or other specialized Engineer) where so stipulated.

C. Contractor is responsible for confirmation and correlation of dimensions at Project site; for information that pertains solely to fabrication processes or to techniques of construction; and for coordination of Work of trades.

D. Contractor and Subcontractor shall review submittal required by Contract Documents for compliance with Contract Documents, approve and submit to Architect.

E. Submittal to Architect indicates Contractor, Subcontractor represent they have:
1. Reviewed submittal for compliance with the Contract Documents;
2. Determined and verified field measurements, and field construction criteria related thereto, or will do so;
3. Determined and verified quantities, materials, performance criteria, installation requirements, catalog numbers and similar data related thereto;
4. Determined substitutions have not been included;
5. Checked, determined, verified and coordinated information contained within such submittals with requirements of Work, Contract Documents and other submittals;
6. Certified that submittal is in compliance with Contract Documents, and have approved the submittal.

F. Resubmit items returned by Architect and marked “Revise and Resubmit” or “Not Approved” until approval is received.
1. Direct specific attention, in writing, or on resubmitted submittals to revisions other than those requested by Architect on previous submittals.
2. Bubble or otherwise clearly identify all changes from previous submittal.
3. Tag each re-submittal with a designation that reuses the previous submittal number and a suffix designating the re-submittal sequence in accordance with the numbering system indicated in this section.

G. Contractor shall reproduce and distribute copies of submittals after Architect’s review to:
1. Project site: Copy of “approved” or “approved as noted” submittals for use by Contractor’s field staff and Architect’s representatives.
2. Subcontractor/vendor.
3. Other Contractors, Subcontractors or vendors as may be required for coordination purposes.
4. Owner: Copy of “approved” or “approved as noted” submittals.
5. Authorities having jurisdiction: Copy of “approved” or “approved as noted” submittals if required by Authority Having Jurisdiction (AHJ).
6. Inspector (if any): Copy of “approved” or “approved as noted” submittals.

H. Contractor shall not be relieved from responsibility for coordination with other submittals or for errors or omissions in submittals by Architect’s approval thereof.

I. Material lists and quantity information included in submittals are sole responsibility of Contractor.

J. Where a submittal is required by Specifications, any related Work performed prior to Architect’s review and approval of the pertinent submission will be sole expense and responsibility of Contractor.

1.11 ARCHITECT ACTION on SUBMITTALS: SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

A. Architect will review and approve or take other appropriate action upon Contractor’s submittals, but only for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.
1. Such review and action is limited to only those submittals identified in Contract Documents.
2. Architect’s review of such submittals is not conducted for purpose of determining accuracy and completeness of other details such as dimensions, quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain responsibility of the Contractor.
3. Architect’s review or approval of a specific item shall not indicate approval of an assembly of which the item is a component.
4. Architect’s review or approval shall not constitute a review of safety or health precautions, or of any construction means, methods, techniques, sequences or procedures.
5. Architect’s approval of a resubmission shall not apply to revisions that Contractor has not directed specific attention to in writing on resubmitted submittals, other than those requested by Architect on previous submittal.

B. Architect’s action will be taken with such reasonable promptness as to cause no delay in Work or in activities of Owner, Contractor or separate contractors, while allowing sufficient time in Architect’s professional judgment to permit adequate review by Architect, Architect’s consultants, and Owner, if needed.
1. Architect’s obligation to review or approve submittals and to return them with
reasonable promptness is conditional upon prior review and approval of submittals by Contractor, and Contractor’s transmittal of submittals in accordance with Contract Documents and approved Schedule of Submittals.

C. Items not submitted in accordance with provisions of this section may be returned, without review or action.
   1. Submittals which do not indicate Contractor has reviewed submittal for compliance with Contract Documents, and approved submittal.
   2. Submittals which are not required by Contract Documents.
   3. Submittal on items not approved for use by Contract Documents.
   4. Submittals which include information from more than one specification section.
   5. Project Information Submittals or Contract Closeout Information Submittals included with other submittals required by specification section Submittal paragraph.
   6. Submittals required by other contractors or trades for their coordination that are not required by specification section Submittal paragraph.
   7. Submittal of products, systems, or manufactures not specified.
   8. Submittal of substitution.
   10. Information on only a portion of a submittal.
   11. If approved Submittal Transmittal form was not used.

D. If a submittal must be delayed for coordination with other submittals not yet submitted, Architect may, as an option, either return submittal with no action or notify Contractor of other submittals which must be received before submittal will be reviewed.

E. Additional copies of submittals not required or requested may not be returned.

F. Architect may review Project Information Submittals or Contract Closeout Information Submittals at its sole discretion, for general compliance with design concept expressed in Contract Documents.

G. Architect will post reviewed submittal and shop drawing information indicating comments and action taken for the Contractor’s use and distribution on HDR’s FTP (File Transfer Protocol) website. Additional information will be provided at the pre-construction conference in regard to accessing the website and reviewed submittal information.
   1. Architect is not required to return Project Information and Contract Closeout Information submittals.

1.12 ATTACHMENTS

A. Submittal Transmittal

B. Option Product/Systems Comparison

END OF SECTION 01 33 00
**PROJECT:** Midland County Amphitheatre  

**ARCH PROJ. NO.:** 01515  

**SPECIFICATION TITLE:**  

**MANUFACTURER:**  

☐ “Base” Manufacturer  ☐ “Optional” Manufacturer  

(Do not submit on manufacturers not listed in specifications)  

(Complete attached Optional Product/System Comparison form if manufacturer is an “Optional” manufacturer)  

**DESCRIPTION OF SUBMITTED ITEM:**  

**TYPE:** ☐ Shop Drawing ☐ Product Data ☐ Sample ☐ Project Information ☐ Project Closeout  

**NOTE 1:** Submittal transmittal to Architect indicates Contractor, and subcontractor has reviewed for compliance with Contract Documents and has approved submittal.  

**NOTE 2:** THIS TRANSMITTAL FORM SHALL STAY WITH SUBMITTAL THROUGHOUT ROUTING. COPY FOR FILE.  

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**ACTION LEGEND:** (Indicate in ACTION TAKEN column above)  

A REVIEWED  

B MAKE CORRECTIONS NOTED  

X REJECTED  

R REVISE AND RESUBMIT  

**COMMENTS:**  

☐ SEE ATTACHED COMMENTS  

☐ SEE ENCLOSED SUBMITTAL FOR COMMENTS  

☐ SUPPLEMENTAL INFORMATION REQUIRED  

---
OPTIONAL PRODUCT/SYSTEM COMPARISON

IF SUBMITTING ON A MANUFACTURER LISTED AS "OPTIONAL" IN TECHNICAL SPECIFICATIONS, COMPLETE THIS FORM, AND SUBMIT WITH FIRST SUBMITTAL TRANSMITTAL FOR PRODUCT
(Note: Form not required if "Optional" manufacturer product name, product number or model number or both are specifically listed in technical specification sections)

PROJECT: Midland County Amphitheatre

VGA 01515

SUBMITTAL NO: ____________________ - ______________

SECTION NUMBER | | | |
SEQUENCE NUMBER | | | |
RE-SUBMITTAL CHARACTER | | |

Specification Section No.: ______________________________________
Article(s)/paragraph(s): ______________________________________

PRODUCT / SYSTEM COMPARISON:
Provide a one-to-one comparison with ALL specified product(s)

<table>
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<tr>
<th>SPEC DESIGNATION (IF ANY)</th>
<th>BASE MANUFACTURER’S PRODUCT/SYSTEM</th>
<th>SUBMITTED MANUFACTURER’S PRODUCT/SYSTEM</th>
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EFFECT OF PRODUCT:
Optional affects other parts of Work:   No No Yes Yes (If yes, explain below)
Optional requires dimensional revision or redesign of structure or mechanical and electrical Work: No No Yes Yes (If yes, explain below)
Same warrantee provided as specified base product: No No Yes Yes (If yes, explain below)
Explanation: ______________________________________

____________________________________

____________________________________

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____________________________________

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Midland County Amphitheatre 01 33 00 – 1 – Attachment B
VGA 01515
Optional Product/ System Comparison Form
STATEMENT OF CONFORMANCE OF PRODUCT OR SYSTEM TO CONTRACT REQUIREMENTS:
Supplier, Subcontractor and Contractor in making submittal of Optional manufacturer’s product or system, or in using an Optional manufacturer’s product or system represent:

☐ They will coordinate installation of proposed product or system into Work, to include necessary changes or modifications or both to the Work, including additional costs to other contractors, when such changes result solely from the use of an Optional Manufacturer.

ACKNOWLEDGEMENTS:
FOLLOWING FIRM HEREBY REQUESTS CONSIDERATION OF OPTIONAL PRODUCT OR SYSTEMS:

Requested by (Firm):
Acknowledged by (print & sign): ___________________________ Date: __________
Position: ___________________________ Phone: __________

Subcontractor:
Acknowledged by (print & sign): ___________________________ Date: __________
Position: ___________________________ Phone: __________

Contractor:
Acknowledged by (print & sign): ___________________________ Date: __________
Position: ___________________________ Phone: __________

☐ Recommend approval:

CONSTRUCTION MANAGER’S ACKNOWLEDGMENT AND RECOMMENDATION:
☐ Do not recommend approval for following reasons:
☐ Returned to requester - Need more information:
Comment:
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

Construction Manager:
Acknowledged by (print & sign): ___________________________ Date: __________
Position: ___________________________
PART 1 – GENERAL

1.01 SUMMARY

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.

1.02 SUMMARY

A. This section includes:
   1. Environmental goals for project.
   2. Waste management procedures.

1.03 DEFINITIONS

A. Waste Materials: Large and small pieces of materials indicated which are excess to contract requirements and generally include materials salvaged from existing construction and items of trimmings, cuttings, and damaged goods resulting from new installations which cannot be effectively used in Work.

B. Type A Finishes: Material and finishes with potential for short-term levels of off gassing from chemicals inherent in their manufacturing process, or which are applied in form requiring vehicles or carriers for spreading which release high level or particulate matter in process of installation and/or curing. Including, but not limited to:
   1. Adhesives, sealants, and glazing compounds, specifically those with petrochemical vehicles or carriers.
   2. Wood preservatives, finishes, and paint.
   3. Control and/or expansion joint fillers.

1.04 SUBMITTALS

A. General: Submit in accordance with Section 01340.

B. Informational Submittals: Submit following:
   1. Construction waste management plan. Submit revisions to plan at time of revisions.

1.05 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with applicable codes, laws rules, and regulations of authorities having jurisdiction concerning waste management and indoor air quality.

B. Certifications
   1. Contractor’s certification that construction waste materials have been disposed of
in accordance with Contractor’s submitted waste management plan.

1.07 PROJECT CONDITIONS

A. Environmental Requirements: Comply with requirements of other sections as appropriate.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

3.01 PREPARATION

A. Waste Management Plan: Before start of construction, prepare construction waste management plan on procedures to collect, segregate, and dispose of construction wastes and debris.
   1. Identify materials by categories to be recycled and corresponding recycling facilities.
   2. Include education and training procedures for construction personnel.
   3. Include procedures to enforce conformance to plan.

3.02 WASTE MANAGEMENT

A. General: Maximize salvage and recycling of waste materials from construction operations.
   1. Implement waste management from start of construction through to final completion.
   2. Comply with requirements of submitted waste management plan.

B. Construction Waste Materials for Recycling: Include salvage and recycling of following:
   1. Land clearing debris such as stumps and trees.
   2. Concrete, Masonry, and Other Inert Fill Material: Concrete; brick; rock; clean soil not intended for other on-site use; broken up asphalt pavement containing no ABC stone, clay concrete or other contaminants; and other inert material.
      a. Concrete and Masonry: Separate reinforcement and other metals.
   3. Metals: Metal scrap including iron, steel, stainless steel, galvanized sheet steel, zinc, lead, copper, brass, bronze, and aluminum.
      a. Separate metal by type.
   4. Cardboard: Clean, corrugated cardboard such as used for packaging, etc.
   5. Paper: Discarded office refuse such as unwanted files, correspondence, etc.
   6. Other Mixed Construction and Demolition Waste: Solid waste resulting solely from construction, remodeling, repair, or demolition operations on pavement, buildings, or other structures exclusive of waste materials listed in this section including roofing materials, insulation materials, floor finishes, wall finishes, ceiling finishes.

C. Non-Recyclable Construction Waste Materials: Collect and segregate non-recyclable waste for delivery to permitted landfill site:
   1. Mixed Solid Waste: Solid waste usually collected as municipal service, exclusive
of waste materials listed above.

2. Hazardous Waste: Comply with applicable codes, laws, rules, and regulations.

END OF SECTION 01 35 43
PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. Drawings, General Conditions of the Contract for Construction, Supplementary Conditions and Division 1 - General Requirements apply to Work of this section.

1.02 SECTION INCLUDES

A. Quality assurance.

B. Schedule of references.

1.03 QUALITY ASSURANCE

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.

C. Obtain copies of standards when required by Contract Documents.

D. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding?

E. The contractual relationship duties and responsibilities of the parties in Contract nor those of the Architect shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.04 SCHEDULE OF REFERENCES

<table>
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<tr>
<th>AA</th>
<th>Aluminum Association</th>
<th>(202) 862-5100</th>
</tr>
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<td></td>
<td>900 19th St., NW</td>
<td></td>
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<tr>
<td></td>
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<td><a href="http://www.aluminum.org">www.aluminum.org</a></td>
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<tr>
<td>AABC</td>
<td>Associated Air Balance Council</td>
<td>(202) 737-0202</td>
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<tr>
<td>AAMA</td>
<td>American Architectural Manufacturers Association</td>
<td>(847) 303-5664</td>
</tr>
<tr>
<td></td>
<td>1827 Walden Office Sq., Suite 104</td>
<td></td>
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<td>Schaumburg, IL 60173-4268</td>
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</table>
| AASHTO      | American Association of State Highway and Transportation Officials  
444 North Capitol St., NW, Suite 249  
Washington, DC 20001  
[www.aashto.org](http://www.aashto.org) |
| AATCC       | American Association of Textile Chemists and Colorists  
P.O. Box 12215  
One Davis Drive  
Research Triangle Park, NC 27709-2215  
[www.aatcc.org](http://www.aatcc.org) |
| ABMA        | American Bearing Manufacturers Association  
1200 19th St., NW, Suite 300  
Washington, DC 20036-2422  
[www.abma-dc.org](http://www.abma-dc.org) |
| ACGIH       | American Conference of Governmental Industrial Hygienists  
1330 Kemper Meadow Dr. Suite 600  
Cincinnati, Ohio 45240  
[www.acgih.org](http://www.acgih.org) |
| ACI         | American Concrete Institute  
P.O. Box 9094  
Farmington Hills, MI 48333  
[www.aci-int.org](http://www.aci-int.org) |
| ADC         | Air Diffusion Council  
104 South Michigan Ave., Suite 1500  
Chicago, IL 60603 |
| ADSC        | The International Association of Foundation Drilling  
9696 Skillman Street, Suite 280  
Dallas, TX 75243  
[www.adsc-iafd.com](http://www.adsc-iafd.com) |
| AF&PA       | American Forest and Paper Association  
1111 19th St., NW, Suite 800  
Washington, DC 20036  
[www.afandpa.org](http://www.afandpa.org) |
| AGA         | American Gas Association  
400 N. Capitol St., NW  
Suite 450  
Washington, DC, 20001  
[www.agaa.org](http://www.agaa.org) |
| AGC         | Associated General Contractors of America  
333 John Carlyle Street  
Suite 200  
Alexandria, VA 22314  
[www.agc.org](http://www.agc.org) |
AHA  American Hardboard Association
1210 W. Northwest Hwy
Palatine, IL 60067
www.hardboard.org
(847) 934-8800

AI  Asphalt Institute
Research Park Drive
P.O. Box 14052
Lexington, KY 40512-4052
www.asphaltinstitute.org
(606) 288-4960

AIA  American Institute of Architects

AISC  American Institute of Steel Construction
One East Wacker Dr., Suite 3100
Chicago, IL 60601-2001
www.aisc.org
(312) 670-2400

AISI  American Iron and Steel Institute
1101 17th St., NW, Suite 1300
Washington, DC 20036
www.steel.org
(202) 452-7100 (800) 277-3850

AITC  American Institute of Timber Construction
7012 S. Revere Pkwy, Suite 140
Englewood, CO 80112
www.aitc-glulam.org
(303) 792-9559

AMCA  Air Movement and Control Association International, Inc.
30 W. University Dr.
Arlington Heights, IL 60004-1893
www.amca.org
(847) 394-0150

ANSI  American National Standards Institute
1819 L. Street, N.W.
Washington, DC 20036
www.ansi.org
(202) 293-8020

APA/EWA  APA-The Engineered Wood Association
P.O. Box 11700
Tacoma, WA 98411-0700
www.apawood.org
(253) 565-6600

API  American Petroleum Institute
1220 L St., NW
Washington, DC 20005-4070
www.api.org
(202) 682-8000

AREMA  American Railway Engineering and Maintenance-of-Way Association
8201 Corporate Drive, Suite 1125
Landover, MD 02785-2230
www.arema.org
(301) 459-3200
ARI  Air-Conditioning and Refrigeration Institute  
4301 Fairfax Dr., Suite 425  
Arlington, VA 22203  
www.ari.org  
(703) 524-8800

ARRA  Asphalt Recycling and Reclaiming Association  
#3 Church Circle, PMB 250  
Annapolis, MD 21401  
www.arra.org  
(410) 267-0023

ASCE  American Society of Civil Engineers  
World Headquarters  
1801 Alexander Graham Bell Dr.  
Reston, VA 20191-4400  
www.asce.org  
(800) 548-2723  
(703) 295-6300

ASHRAE  American Society of Heating, Refrigerating and Air-Conditioning Engineers  
1791 Tullie Circle, NE  
Atlanta, GA 30329  
www.ashrae.org  
(800) 527-4723  
(404) 636-8400

ASME  American Society of Mechanical Engineers  
3 Park Ave.  
New York, NY 10016-5990  
www.asme.org  
(800) 843-2763

ASPA  American Sod Producers Association

ASPE  American Society of Plumbing Engineers  
8614 W. Catalpa Avenue  
Suite 1007  
Chicago, IL 60656-1116  
www.aspe.org:8080  
(773) 693-2773

ASSE  American Society of Sanitary Engineering  
901 Canterbury, Suite A  
Westlake, OH 44145  
www.asse-plumbing.org  
(440) 835-3040

ASTM  American Society for Testing and Materials  
100 Barr Harbor Dr.  
West Conshohocken, PA 19428-2959  
www.astm.org  
(601) 832-9585
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<td>AWPA</td>
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<td>(212) 297-2122</td>
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<td>355 Lexington Avenue, 17th floor</td>
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<td>Brick Institute of America</td>
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<td>CDA</td>
<td>Copper Development Association Inc.</td>
<td>(800) 232-3282</td>
<td>(212) 251-7200</td>
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<td>CGA</td>
<td>Compressed Gas Association</td>
<td>(703) 412-0900</td>
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<td>(630) 584-1919</td>
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<td>Cast Iron Soil Pipe Institute</td>
<td>(423) 892-0137</td>
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<td>CLFMI</td>
<td>Chain Link Fence Manufacturers Institute</td>
<td>9891 Broken Land Pkwy, Suite 300 Columbia, MD 21046</td>
<td>(301) 596-2583</td>
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<td>CRSI</td>
<td>Concrete Reinforcing Steel Institute</td>
<td>933 N. Plum Grove Rd. Schaumburg, IL 60173-4758</td>
<td>(847) 517-1200</td>
</tr>
<tr>
<td>CSSB</td>
<td>Cedar Shake and Shingle Bureau</td>
<td>P.O. Box 1178 Sumas, WA 98295</td>
<td>(604) 462-8961</td>
</tr>
<tr>
<td>CTI</td>
<td>Cooling Technology Institute</td>
<td>530 Wells Fargo Drive, Suite 218 Houston, TX 77090</td>
<td>(281) 583-4087</td>
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<tr>
<td>DASMA</td>
<td>Door and Access Systems Manufacturers Association International</td>
<td>1300 Summer Avenue Cleveland, OH 44115-2851</td>
<td>(216) 241-7333</td>
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<td>DHI</td>
<td>The Door and Hardware Institute</td>
<td>14150 Newbrook Dr., Suite 200 Chantilly, VA 20151</td>
<td>(703) 222-2010</td>
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<td>DOT</td>
<td>Department of Transportation</td>
<td>400 7th Street, S.W. Washington D.C. 20590</td>
<td>(202) 366-4000</td>
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<td>EIMA</td>
<td>EIFS Industry Members Association</td>
<td>3000 Corporate Center Dr., Suite 270 Morrow, GA 30260</td>
<td>(800) 294-3462 (770) 968-7945</td>
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<td>EJDC</td>
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<td>American Consulting Engineers Council 1015 15th Street, N.W. Washington, DC 20005</td>
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<td>Expansion Joint Manufacturers Association</td>
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<td>(914) 332-0040</td>
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<td>US EPA/NSCEP P.O. Box 42419 Cincinnati, Ohio 45242</td>
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<td>FAA</td>
<td>Federal Aviation Administration</td>
<td>800 Independence Ave., SW Washington, DC 20591</td>
<td>(202) 366-4000</td>
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<td>FCC</td>
<td>Federal Communications Commission</td>
<td>445 12th Street, SW Washington, DC 20554</td>
<td>(888) 225-5322</td>
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<tr>
<td>FM</td>
<td>FM Global Corporate Headquarters.</td>
<td>P.O. Box 7500 Johnston, RI 02919</td>
<td>(781) 762-4300</td>
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<tr>
<td>FS</td>
<td>Federal Specification Unit</td>
<td>General Services Admin. Federal Supply Service FSS Acquisition Management Center Environmental Programs and Engineering Policy Division Washington, DC 20406</td>
<td>(703) 305-5682</td>
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<td>GA</td>
<td>Gypsum Association</td>
<td>810 First St., NE, Suite 510 Washington, DC 20002</td>
<td>(202) 289-5440</td>
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<td>GANA</td>
<td>Glass Association of North America</td>
<td>2945 Southwest Wanamaker Dr., Suite A Topeka, KS 66614</td>
<td>(785) 271-0208</td>
</tr>
<tr>
<td>HI</td>
<td>Hydronics Institute</td>
<td>Division of Gas Appliance Manufacturers Association</td>
<td>(703) 525-7060</td>
</tr>
<tr>
<td>HMMA</td>
<td>Hollow Metal Manufacturers Association</td>
<td>Division of NAAMM</td>
<td>(312) 332-0405</td>
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<td>HPMA</td>
<td>Hardwood Plywood Manufacturers Association</td>
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<tr>
<td>HPW</td>
<td>H.P. White Laboratory</td>
<td>3114 Scarboro Road Street, Maryland 21154-1822</td>
<td>(410) 838-6550</td>
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<td>HPVA</td>
<td>Hardwood Plywood and Veneer Association</td>
<td>P.O. Box 2789 Reston, VA 20195-0789</td>
<td>(703) 435-2900</td>
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<tr>
<td>IAS</td>
<td>International Approval Services</td>
<td>U.S. Operations 8501 E. Pleasant Valley Rd. Cleveland, Ohio 44131-5575</td>
<td>(216) 524-4990</td>
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<tr>
<td>ICBO</td>
<td>International Conference of Building Officials</td>
<td>5360 Workman Mill Road Whittier, California 90601-2298</td>
<td>(800) 284-4406</td>
</tr>
<tr>
<td>ICC</td>
<td>International Code Council</td>
<td>5203 Leesburg Pike #708 Falls Church, VA 22041</td>
<td>(703) 931-4533</td>
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<tr>
<td>IEEE</td>
<td>Institute of Electrical and Electronics Engineers</td>
<td>3 Park Ave., 17th Floor New York, NY 10016-5997</td>
<td>(212) 419-7900</td>
</tr>
<tr>
<td>IES</td>
<td>Illuminating Engineering Society of North America</td>
<td>120 Wall Street, 17th Floor New York, NY 10005</td>
<td>(212) 248-5000</td>
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<td>ILI</td>
<td>Illinois Limestone Institute of America</td>
<td>400 Stone City Bank Building, Bedford, IN 47421</td>
<td>(812) 275-4426</td>
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<td>IMIAC</td>
<td>International Masonry Industry All-Weather Council</td>
<td>42 East Street, Annapolis, MD 21401</td>
<td>(410) 280-1305</td>
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<td>IMSA</td>
<td>International Municipal Signal Association</td>
<td>PO BOX 539, Newark, NY 14513-0539</td>
<td>(315) 331-2182</td>
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<td>ISWA</td>
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<td>KCMA</td>
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<td>1899 Preston White Dr., Reston, VA 20191-5435</td>
<td>(703) 264-1690</td>
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<td>LPI</td>
<td>Lightning Protection Institute</td>
<td>3335 N. Arlington Heights Rd., Arlington Heights, IL 60004</td>
<td>(800) 488-6864</td>
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<td>MBMA</td>
<td>Metal Building Manufacturers Association</td>
<td>1300 Sumner Ave., Cleveland, OH 44115-2851</td>
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<td>60 Revere Dr., Suite 500, Northbrook, IL 60062</td>
<td>(847) 480-9138</td>
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<td>MIA</td>
<td>Marble Institute of America</td>
<td>30 Eden Alley, Suite 301, Columbus, OH 43215</td>
<td>(614) 228-6194</td>
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</table>
ML/SFA  Metal Lath/Steel Framing Association
     P.O. Box 3928
     Birmingham, AL 35208
     [www.naamm.org](http://www.naamm.org)

MSS  Manufacturers Standardization Society of the Valve
     and Fittings Industry
     127 Park St., NE
     Vienna, VA 22180-4602
     [www.mss-hq.com](http://www.mss-hq.com)

NAA  National Arborist Association
     Route 101, P.O. Box 1094
     Amherst, NH 03031-1094
     [www.natlarb.com](http://www.natlarb.com)

NAAMM  National Association of Architectural Metal
     Manufacturers
     8 South Michigan Ave., Suite 1000
     Chicago, IL 60603
     [www.naamm.org](http://www.naamm.org)

NAAMM  North American Association of Mirror Manufacturers
     (Division of GANA)
     2945 Southwest Wanamaker Dr., Suite A
     Topeka, KS 66614
     [www.glasswebsite.com](http://www.glasswebsite.com)

NACE  NACE International
     1440 South Creek Drive
     Houston, TX 77084
     [www.nace.org](http://www.nace.org)

NAIMA  North American Insulation Manufacturers Association
     44 Canal Center Plaza, Suite 310
     Alexandria, VA 22314
     [www.naima.org](http://www.naima.org)

NBGQA  National Building Granite Quarries Association, Inc.
     1220 L. St., NW, Suite 100-167
     Washington, DC 20005
     [www.nbqga.com](http://www.nbqga.com)

NBS  National Bureau of Standards

NCMA  National Concrete Masonry Association
     2302 Horse Pen Rd.
     Herndon, VA 20171-3499
     [www.ncma.org](http://www.ncma.org)
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<td>NCRP</td>
<td>National Council on Radiation Protection and Measurement</td>
<td>7910 Woodmont Ave., Suite 800, Bethesda, MD 20814-3095</td>
<td>(301) 657-2652</td>
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<td>NEBB</td>
<td>National Environmental Balancing Bureau</td>
<td>8575 Grovemont Circle, Gaithersburg, MD 20877</td>
<td>(301) 977-3698</td>
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<td>NECA</td>
<td>National Electrical Contractors Association</td>
<td>3 Bethesda Metro Center, Suite 1100, Bethesda, MD 20814</td>
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<td>NELMA</td>
<td>Northeastern Lumber Manufacturers Association</td>
<td>272 Tuttle Rd., P.O. Box 87A, Cumberland Center, ME 04021</td>
<td>(207) 829-6901</td>
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<td>NEMA</td>
<td>National Electrical Manufacturers Association</td>
<td>1300 N 17th St., Suite 1847, Rosslyn, VA 22209</td>
<td>(703) 841-3200</td>
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<td>NETA</td>
<td>International Electrical Testing Association</td>
<td>P.O. Box 687, 106 Stone St., Morrison, CO 80465</td>
<td>(303) 697-8441</td>
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<td>NFoPA</td>
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<td>NFPA</td>
<td>National Fire Protection Association</td>
<td>One Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101</td>
<td>(800) 344-3555 (617) 770-3000</td>
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<td>NFRC</td>
<td>National Fenestration Rating Council</td>
<td>1300 Spring St., Suite 500, Silver Spring, MD 20910</td>
<td>(301) 589-6372</td>
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<td>NHLA</td>
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<td>NIBS</td>
<td>National Institute of Building Sciences</td>
<td>1090 Vermont Ave., NW, Suite 700, Washington, DC 20005-4905</td>
<td>(202) 289-7800</td>
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NIST   National Institute of Standards and Technology  
      100 Bureau Dr., MS 2150  
      Gaithersburg, MD 20899-2150  
      www.nist.gov  
      (301) 975-4025  

NLA   National Lime Association  
      200 North Glebe Rd., Suite 800  
      Arlington, VA 22203  
      www.lime.org  
      (703) 243-5463  

NLGA   National Lumber Grades Authority  
       #406-First Capital Pl.  
       960 Quayside Dr.  
       New Westminster, BC V3M 6G2  
       CANADA  
       www.nlga.org  
       (604) 524-2393  

NOFMA   National Oak Flooring Manufacturers Association  
       P.O. Box 3009  
       Memphis, TN 38173-0009  
       www.nofma.org  
       (901) 526-5016  

NPCA   National Paint and Coatings Association  
      1500 Rhode Island Ave., NW  
      Washington, DC 20005  
      www.paint.org  
      (202) 462-6272  

NRCA   National Roofing Contractors Association  
      O'Hare International Center  
      10255 W. Higgins Rd., Suite 600  
      Rosemont, IL 60018  
      www.roofonline.org  
      (847) 299-9070  

NSF   NSF International  
      P.O. Box 130140  
      Ann Arbor, MI 48113-0140  
      www.nsf.org  
      (734) 769-8010  
      (800) 673-6275  

NSPI   National Spa and Pool Institute  
      2111 Eisenhower Ave.  
      Alexandria, VA 22314  
      www.nspi.org  
      (703) 838-0083  

NSWMA   National Solid Wastes Management Association  
       Environmental Industry Associations  
       4301 Connecticut Ave NW, Suite 300  
       Washington, DC 20008  
       www.envasns.org/nswma/Default.htm  
       (800)424-2869  

Midland County Amphitheatre  
VGA 01515  
01 42 19 – 12  
Reference Standards
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<td>NTMA</td>
<td>National Terrazzo and Mosaic Association</td>
<td>110 E. Market St., Suite 200-A, Leesburg, VA 20176</td>
<td>(800) 323-9736, (703) 779-1022</td>
<td><a href="http://www.ntma.com">www.ntma.com</a></td>
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<tr>
<td>NUCA</td>
<td>National Utility Contractors Association</td>
<td>4301 North Fairfax Dr., Suite 360, Arlington, VA 22203-1627</td>
<td>(703) 358-9300</td>
<td><a href="http://www.nuca.com">www.nuca.com</a></td>
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<td>NWDDA</td>
<td>National Wood Window &amp; Door Manufacturers Association</td>
<td>1400 East Touhy Avenue, Suite 470, Des Plaines, IL 60018</td>
<td>(800) 223-2301</td>
<td><a href="http://www.nwwda.org">www.nwwda.org</a></td>
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<td>PCA</td>
<td>Portland Cement Association</td>
<td>5420 Old Orchard Rd., Skokie, IL 60077</td>
<td>(847) 966-6200</td>
<td><a href="http://www.portcement.org">www.portcement.org</a></td>
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<td>PCI</td>
<td>Precast/Prestressed Concrete Institute</td>
<td>209 W. Jackson Blvd., Chicago, IL 60606-6938</td>
<td>(312) 786-0300</td>
<td>www pci.org</td>
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<td>PDCA</td>
<td>Painting and Decorating Contractors of America</td>
<td>3913 Old Lee Hwy., Suite 33-B, Fairfax, VA 22030</td>
<td>(703) 359-0826</td>
<td><a href="http://www.pdca.com">www.pdca.com</a></td>
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<td>PDI</td>
<td>Plumbing and Drainage Institute</td>
<td>45 Bristol Dr., South Easton, MA 02375</td>
<td>(800) 589-8956</td>
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<td>1717 W. Northern Ave., Suite 114, Phoenix, AZ 85021</td>
<td>(602) 870-7540</td>
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<td>RILEM</td>
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<td>33 1 47 40 23 97</td>
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<td>RIS</td>
<td>The Redwood Inspection Service</td>
<td>(707) 444-3024</td>
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<td>630 J Street</td>
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<td>RCSHSB</td>
<td>Southern Cypress Manufacturers Association</td>
<td>(877) 607-7262</td>
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<td>Rubber Manufacturers Association</td>
<td>(202) 682-4846</td>
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<td>SDI</td>
<td>Steel Deck Institute</td>
<td>(847) 462-1930</td>
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<td>P.O. Box 25</td>
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<td>Fox River Grove, IL 60021</td>
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<td>Steel Door Institute</td>
<td>(440) 899-0010</td>
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<td>30200 Detroit Rd.</td>
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<td>SGCC</td>
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<td>(315) 646-2234</td>
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<td>401 N. Michigan Ave.</td>
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<td>SJI Steel Joist Institute</td>
<td>3127 10th Ave., North Ext. Myrtle Beach, SC 29577-6760</td>
<td>(843) 626-1995</td>
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<td>SMACNA Sheet Metal and Air Conditioning Contractors' National Association</td>
<td>4201 Lafayette Center Dr. Chantilly, VA 20151-1209</td>
<td>(703) 803-2980</td>
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<td>SPIB Southern Pine Inspection Bureau</td>
<td>4709 Scenic Hwy Pensacola, FL 32504-9094</td>
<td>(850) 434-2611</td>
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<td>SPRI Single Ply Roofing Institute</td>
<td>200 Reservoir St., 309 A Needham, MA 02494</td>
<td>(781) 444-0242</td>
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<tr>
<td>SSPC SSPC: The Society for Protective Coatings</td>
<td>40 24th St., 6th Floor Pittsburgh, PA 15222-4656</td>
<td>(800) 837-8303, (412) 281-2331</td>
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<tr>
<td>STI Steel Tank Institute</td>
<td>570 Oakwood Rd. Lake Zurich, IL 60047</td>
<td>(847) 438-8265</td>
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<td>SWI Steel Window Institute</td>
<td>1300 Sumner Ave. Cleveland, OH 44115-2851</td>
<td>(216) 241-7333</td>
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<tr>
<td>SWRI Sealant, Waterproofing and Restoration Institute</td>
<td>2841 Main St. Kansas City, MO 64108</td>
<td>(816) 472-7974</td>
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<td>TCA Tile Council of America, Inc.</td>
<td>100 Clemson Research Blvd. Anderson, S.C. 29625</td>
<td>(864) 646-8453</td>
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<td>TIA/EIA Telecommunications Industry Association/Electronic Industries Alliance</td>
<td>2500 Wilson Blvd., Suite 300 Arlington, VA 22201</td>
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<td>TMS</td>
<td>The Masonry Society</td>
<td>3970 Broadway, Suite 201-D Boulder, CO 80304-1135</td>
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<td>Truss Plate Institute</td>
<td>583 D'Onofrio Dr., Suite 200 Madison, WI 53719</td>
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<td>TPI</td>
<td>Turfgrass Producers International</td>
<td>1855-A Hicks Rd. Rolling Meadows, IL 60008</td>
<td>(800) 405-8873</td>
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<td><a href="http://www.turfgrassod.org">www.turfgrassod.org</a></td>
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<td>UL</td>
<td>Underwriters Laboratories Inc.</td>
<td>333 Pfingsten Rd. Northbrook, IL 60062-2096</td>
<td>(847) 272-8800</td>
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<td>WCLIB</td>
<td>West Coast Lumber Inspection Bureau</td>
<td>P.O. Box 23145 Portland, OR 97281</td>
<td>(503) 639-0651</td>
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<td>Window and Door Manufacturers Association</td>
<td>1400 E. Touhy Ave., Suite 470 Des Plaines, IL 60018</td>
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<td>WH</td>
<td>Intertek Testing Services</td>
<td>Warnock Hersey Listing Services 3210 American Drive Mississauga, Ontario Canada L4V 1B3</td>
<td>(905) 678-7820</td>
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<td>WIC</td>
<td>Woodwork Institute of California</td>
<td>3164 Industrial Blvd. West Sacramento, CA 95691</td>
<td>(916) 372-9943</td>
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<tr>
<td>WRI</td>
<td>Wire Reinforcement Institute</td>
<td>W.R.I. Technical Director 301 E. Sandusky Street Findlay, Ohio 45840-0450</td>
<td>(419) 425-9473</td>
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PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION 01 42 19
PART 1 – GENERAL

1.01 GENERAL

A. Owner shall employ and pay for the services of an Independent Testing Laboratory to perform specified services and testing.

B. Employment of laboratory shall in no way relieve Contractor’s obligations to perform the Work of the Contract.

1.02 RELATED REQUIREMENTS

A. Inspections and testing required by laws, ordinances, rules, regulations, orders or approvals of public authorities.

B. Inspections and testing required by Contract Documents: Respective sections of Specifications.

C. Certification of products: Respective sections of Specifications.

1.03 QUALIFICATIONS OF LABORATORY:

A. Meet “Recommended Requirements for Independent Laboratory Qualification”, published by American Council of Independent Laboratories.

B. Meet basic requirements of ASTM E 329, “Practice for Use in the Evaluation of Inspection and Testing Agencies as Used in Construction” and ASTM E543, “Practice for Determining the Qualification of Nondestructive Testing Agencies.”

C. Authorized to operate in the State of Texas.

D. Acceptable to Architect/Engineer and approved in writing by Owner.

E. Under the direction of a Registered Engineer licensed in the State of Texas and having a minimum of five (5) years engineering experience in inspection and testing of construction materials.

F. Testing equipment calibrated at twelve (12) month intervals by devices of accuracy traceable to either National Bureau of Standards or accepted values of natural physical constants. Submit copies of certificates of calibration.

G. Voluntarily participate in American Association of Laboratory (A2LA) accreditation program.

1. Laboratory shall possess a current Scope of Accreditation Certificate in type of tests required for the project.

2. Testing and inspection services performed at laboratory facility which has received A2LA accreditation, unless Owner specifically approves an alternate
A2LA accredited laboratory or an acceptable project QA/QC program which provides for an adequate "extension" of accredited laboratory. Such an "extended" laboratory which will operate more than a year must be separately assessed and accredited. A temporary field or project laboratory operating less than a year shall be under the full time supervision of management from an accredited laboratory. Test reports produced by the temporary field or project laboratory shall be signed by one of the accredited laboratory's signatories.

H. Inspectors and technicians with demonstrated competence in performing relevant tests and inspections and under direct supervision of persons meeting following requirements:
   1. NICET Level II Certification in concrete, soils; or ACI Level II Certification in concrete.
   2. AWS Certified Welding Inspector in structural steel field.
   3. ASNT Level II Certification in Radiographic or Ultrasonic Nondestructive Testing of shop and field welding.

1.04 AUTHORITY AND DUTIES OF LABORATORY

A. Cooperate with Owner, Architect and Contractor; provide qualified personnel after due notice.

B. Perform specified inspections, sampling and testing of materials and methods of construction.

C. Promptly notify Owner, Architect and Contractor of observed irregularities or deficiencies of Work or products.

D. Laboratory is not authorized to:
   1. Release, revoke, alter or enlarge on requirements of Contract Documents.
   2. Approve or accept any portion of the Work.
   3. Perform any duties of the Contractor.

E. Promptly submit written report of each test and inspection; 1 copy each to Architect, 1 copy to Structural Engineer and Owner and one copy to Contractor. Each report shall include:
   1. Date issued.
   2. Project title and number.
   3. Testing laboratory name, address and telephone number.
   4. Name and signature of laboratory inspector/technician and responsible reviewer.
   5. Date and time of sampling or inspection.
   6. Record of temperature and weather conditions.
   7. Date of test.
   8. Identification of product and Specification Section.
   9. Location of sample or test in the Project.
   10. Type of inspection or test.
   11. Results of tests and compliance with Contract Documents.
   12. Interpretation of test results that indicate unsatisfactory conditions.

F. Submit certificates of testing, inspection or approval that are required by laws, ordinances, rules, regulations, orders or approval of public authorities. Submit same number of copies as required for tests and inspections.
G. Combining tests from various buildings or differing areas into a single report shall be prohibited. Each test report shall be limited to a single building or area.

1.05 CONTRACTOR'S RESPONSIBILITIES

A. Cooperate with laboratory personnel and provide access to Work or to manufacturer's operations.

B. Deliver to laboratory adequate quantities of representative samples of materials proposed for use and which require testing.

C. Notify laboratory and Owner sufficiently in advance of operations (minimum of 48 hours) to allow for laboratory assignment of personnel and scheduling of tests.

D. Furnish incidental labor and facilities:
   1. To provide access to Work to be tested.
   2. To obtain and handle samples at Project site or at source of product to be tested.
   3. For storage and curing of test samples.

E. For Owner's Quality Assurance inspection and testing, furnish same incidental labor and facilities specified in this Article for Contractor's Quality Control Testing.

F. Make arrangements with laboratory and pay for additional samples and tests required for Contractor's convenience, including additional compressive strength tests required to confirm strength requirements for early form recovery.

G. Make arrangements with laboratory and pay for services to perform additional inspections, sampling and testing required when initial tests indicate Work does not comply with Contract Documents.

H. Coordinate and integrate inspection and testing services with Contractor's Quality Control Plan/Program, including:
   1. Compile and submit a complete list of inspections and tests required by the Contract Documents. List shall include test name, frequency, specification reference, and estimate of quantities.
   2. Record results of inspections and test conducted at site on appropriate Quality Control Reports.
   3. Record results of off-site inspections and tests on appropriate Quality Control Reports.

1.06 OWNER'S QUALITY ASSURANCE INSPECTION AND TESTING

A. The Owner may, from time to time, perform additional Quality Assurance inspections and testing in accordance with the General Conditions.
   1. The Owner will employ and pay for services of an independent testing laboratory to perform any additional Quality Assurance inspections and testing.

B. Quality Assurance inspections and testing conducted by the Owner's Quality Assurance Laboratory shall not relieve the Contractor from performing inspections and tests required by the Contract Documents or regulatory agencies.

C. The Owner reserves the right to utilize the Contractor's on-site Quality Control Laboratory Facilities, if any, for incidental handling, curing or storage of Quality
Assurance samples.

PART 2 – PRODUCTS

Not Applicable.

PART 3 – EXECUTION

Not Applicable.

END OF SECTION 01 45 29
SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS
A. Drawings, General Conditions of the Contract for Construction, Supplementary Conditions and Division 1 - General Requirements apply to Work of this section.

1.02 SECTION INCLUDES
A. Temporary Utilities: Electricity, water, and sanitary facilities.
B. Temporary Controls: Barriers, enclosures and fencing, protection of the Work, and water control.
C. Construction Facilities: Parking, progress cleaning, project signage, and temporary buildings.

1.03 RELATED SECTIONS
A. Section 01 77 00 – Closeout Procedures: Final cleaning.

1.04 TEMPORARY ELECTRICITY
A. Temporary electrical service will be provided by Owner via outlets available within facility.
B. Owner shall pay cost of reasonable amount of energy used. Exercise measures to conserve energy.
C. Power Service Characteristics Available: Verify at site.
D. Permanent convenience receptacles may be utilized during construction.

1.05 TEMPORARY WATER SERVICE
A. Connect to existing water source as directed by the Owner for construction operations.
B. Owner shall pay cost of reasonable amount of water used. Exercise measures to conserve water.

1.06 TEMPORARY SANITARY FACILITIES
A. County will provide and maintain required portable facilities and enclosures. Privy pits shall not be used. Permanent building facilities shall not be used during construction operations.
1.07 **BARRIERS**

A. Provide barriers to prevent unauthorized entry to construction areas, and to protect adjacent properties from damage from construction operations.

B. Provide protection for plant life designated to remain. Replace damaged plant life.

C. Protect non-owned vehicular traffic, stored materials, site and structures from damage.

D. Provide barricades required by governing authorities for public rights-of-way.

1.08 **WATER CONTROL**

A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

1.09 **PROTECTION OF INSTALLED WORK**

A. Protect installed Work and provide special protection where specified in individual specification sections.

B. Provide temporary and removable protection for installed Products. Control activity in immediate Work area to minimize damage.

C. Provide protective coverings at railings and other finished products.

D. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer. Stage area shall not be used for storage.

F. Prohibit traffic from landscaped areas.

1.10 **SECURITY**

A. Provide security and facilities to protect Work, and existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

1.11 **PROGRESS CLEANING**

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove waste materials, debris, and rubbish from site and dispose off-site at intervals as required to maintain clean site. Maximum interval for exterior clean-up shall be daily.

**PART 2 – PRODUCTS**

Not Used.
PART 3 – EXECUTION

Not Used.

END OF SECTION 01 50 00
SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 – GENERAL

1.01 SUMMARY

A. Drawings, General Conditions of the Contract for Construction, Supplementary Conditions and Division 1 - General Requirements apply to Work of this section.

1.02 SECTION INCLUDES

A. Products.
B. Product Delivery, Storage and Handling.
C. Product options.
D. Substitutions.

1.03 RELATED SECTIONS

A. Section 01 4529 – Testing Laboratory Services.

1.04 PRODUCTS

A. Products: Means new material, components, equipment, fixtures, and systems forming the Work and 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.

B. Do not use materials and equipment removed from existing premises, except as specifically permitted by the contract documents.

C. Provide interchangeable components of the same manufacturer, for similar components.

D. Materials required to match existing Work and not otherwise specified, shall be equal to the existing Work in quality, color and finish. Workmanship and installation shall be comparable to adjacent existing Work. The Architect shall be the sole authority in determination of acceptable Work.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery
1. Deliver materials, products and equipment to the project site in manufacturer's original, unopened containers or packaging, with identifying labels intact and legible.
2. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.
3. Provide equipment and personnel to handle products by methods to prevent
soiling, disfigurement, or damage.

4. Arrange deliveries in accord with the construction schedule and in ample time to facilitate inspection prior to installation to avoid unnecessary delays in the construction process.

B. Storage
1. Store and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible.
2. Store sensitive products in weather-tight, climate controlled enclosures.
3. For exterior storage of fabricated products, place on sloped supports, above ground.
4. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to avoid condensation or potential degradation of products.
6. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
7. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.
8. Materials, products and equipment may be stored off site in a bonded and insured warehouse approved by the Architect and Owner. Pay all costs incurred for off-site storage facilities. Products properly stored in off-site storage facilities may be included in progress pay requests with written approval of the Architect.

C. Handling
1. Handle materials, products and equipment in a manner prescribed by manufacturer or specified to protect from damage during storage and installation.

1.06 PRODUCT OPTIONS

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

B. Products Specified byNaming One or More Manufacturers: Products of manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named in accordance with the following article.

1.07 SUBSTITUTIONS

A. Instructions to proposers specify time restrictions for submitting requests for substitutions during the bidding period to requirements specified in this section.

B. Substitutions may be considered when a product becomes unavailable through no fault of the Contractor.

C. Document each request with complete data substantiating compliance of proposed substitution with contract documents.
D. A request constitutes a representation that the bidder:
1. Has investigated proposed product and determined that it meets or exceeds the
good level of the specified product.
2. Will provide the same warranty for the substitution as for the specified product.
3. Will coordinate installation and make changes to other Work which may be
required for the Work to be complete with no additional cost to Owner.
4. Waives claims for additional costs or time extension which may subsequently
become apparent.
5. Will reimburse Owner for review or redesign services associated with re-approval
by authorities.

E. Substitutions will not be considered when they are indicated or implied on shop drawing
or product data submittals, without separate written request, or when acceptance will
require revision to the contract documents.

F. Substitution Submittal Procedure:
1. Submit four copies of request for substitution for consideration. Limit each
request to one proposed substitution.
2. Submit shop drawings, product data, and certified test results attesting to the
proposed product equivalence. Burden of proof is on proposer.
3. The Architect will notify Contractor, in writing, of decision to accept or reject
request.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION 01 60 00
SECTION 01 61 00
COMMON PRODUCT REQUIREMENTS

PART 1 – GENERAL

1.01 SUMMARY

A. The performance of product, material, or system is result of manufacturing, fabrication, installation procedures, use, and maintenance:
   1. Therefore, Architect endeavors to specify quality levels for products, materials, or systems that are advertised to conceptually meet performance goals and desired attributes for the project.
      a. For most conceptually equal systems and materials, Architect may specify multiple manufactures.
      b. In some cases, based on quality and attribute goals for project, the number of manufacturers may be limited.

1.02 DEFINITIONS

A. Following definitions are applicable to acceptable manufacturers and products listed in technical specification sections:
   1. "Base" manufacturer:
      a. Manufacturer listed as "Base" in Part 2 of specification section.
      b. Manufacturer listed as "Base" is particular manufacturer of a specific product used as basis of design.
   2. "Optional" manufacturer:
      a. Manufacturer listed as "Optional" in Part 2 of specification section.
      b. More than one manufacturer may be listed as "Optional."
      c. Manufacturers listed as "Optional" are particular manufacturers of products similar to specific product used as basis of design.
      d. Listing manufacturer as "Optional" indicates acceptance of that manufacturer as supplier of a product, but only to the extent product complies with specified requirements, including salient qualities provided by "Base" manufacturer's product.
         1) Salient qualities include, but are not necessarily limited to following:
            a) Purpose and function.
            b) Material and finish.
            c) Strength, durability and other applicable physical properties.
            d) Compatibility and performance attributes for indicated application.
            e) Capacity and operating characteristics, where applicable.
            f) Size and configuration to extent required for fit with adjoining and adjacent conditions and within spatial limitations.
            g) Appearance, including exposed dimensions, profile, texture, pattern and color, where visible to personnel in finished space, or from exterior.
            e. Contractor is responsible for costs to provide dimensional, operational,
structural, utility or any other related adjustments to fit an "Optional" manufacturer's product into the Work.

f. See Section 01 3300, “Optional Product/System Comparison Form”.

3. "Base Product:"
   a. Term indicates specific product or system used as basis for design.
   b. Manufactures listed as "Optional Manufactures" may submit their equivalent products, but only if product complies with specified requirements, including salient qualities of "Base Product."
      1) Products proposed by "Optional" manufactures must also comply with descriptive requirements listed in technical specification.
      2) Optional Products that obviously differ in appearance and quality of "Base Product" will be rejected.
   c. Refer to preceding paragraph for additional requirements.

END OF SECTION 01 6100
SECTION 01 71 23
FIELD ENGINEERING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.

1.02 SUMMARY

A. This Section specifies administrative and procedural requirements for field engineering services including, but not necessarily limited to, the following:
   1. Land survey Work required for layout of site. Site shall include work by General Contractor and that of the Owner for the work areas including site improvements, parking areas, and site utilities.

B. All costs shall be included in the contract sum.

1.03 SUBMITTALS

A. Certificates: Submit a certificate signed by the Land Surveyor or Professional Engineer certifying that the location and elevation of improvements comply with the Contract Documents.

B. Project Record Documents: Submit a record of Work performed and record survey data as required under provisions of Sections “Submittals” and “Contract Closeout”.

1.04 QUALITY ASSURANCE

A. Surveyor: Engage a Registered Land Surveyor to perform land surveying services required.

Part 2 – PRODUCTS

Not Applicable.

Part 3 – EXECUTION

3.01 EXAMINATION

A. The Owner will identify existing control points and property and property line corner stakes.

B. Verify layout information shown on the Drawings, in relation to the property survey and existing benchmarks before proceeding to lay out the Work. Locate and protect existing benchmarks and control points. Preserve permanent reference points during construction.
   1. Do not change or relocate benchmarks or control points without prior written
approval. Promptly report lost or destroyed reference points, or requirements to relocate reference points because of necessary changes in grades or locations.

2. Promptly replace lost or destroyed project control points. Base replacements on the original survey control points.

C. Establish and maintain a minimum of two permanent benchmarks on the site, referenced to data established by survey control points.
   1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.

D. Existing utilities and equipment: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning site work, investigate and verify the existence and location of underground utilities and other construction.
   1. Prior to construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer and water service piping.

3.02 PERFORMANCE

A. Working from lines and levels established by the property survey, establish benchmarks and markers to set lines and levels at each story of construction and elsewhere as needed to properly locate each element of the Project. Calculate and measure required dimensions within indicated or recognized tolerances. Do not scale Drawings to determine dimensions.
   1. Advise entities engaged in construction activities of marked lines and levels provided for their use.
   2. As construction proceeds, check every major element for line, level and plumb.

B. Site Improvements. Locate and lay out site improvements, including pavements, stakes for grading, fill and topsoil placement, utility slopes and invert elevations by instrumentation and similar appropriate means.

C. Existing Utilities: Furnish information necessary to adjust, move or relocate existing structures, utility poles, lines, services or other appurtenances located in, or affected by construction. Coordinate with local authorities having jurisdiction.

END OF SECTION 01 71 23
PART 1 – GENERAL

1.01 RELATED DOCUMENTS
A. Drawings, General Conditions of the Contract for Construction, Supplementary Conditions and Division 1 – General Requirements apply to Work of this Section.

1.02 SECTION INCLUDES
A. Starting systems.
B. Demonstration and instructions.
C. Testing, adjusting, and balancing.

1.03 RELATED SECTIONS
A. Section 01 45 29 – Testing Laboratory Services: Manufacturers field reports.
B. Section 01 77 00 – Project Closeout: System operation and maintenance data and extra materials.

1.04 STARTING SYSTEMS
A. Coordinate schedule for start-up various equipment and systems.
B. Notify Architect seven days prior to start-up of each item.
C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, or other conditions which may cause damage.
D. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
E. Verify wiring and support components for equipment are complete and tested.
F. Execute start-up under supervision of responsible manufacturer’s representative and contractor’s personnel in accordance with manufacturer’s instructions.
G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
H. Submit a written report in that equipment or system has been properly installed and is functioning correctly.
1.05 DEMONSTRATION AND INSTRUCTIONS

A. Demonstrate operation and maintenance of products to Owner’s personnel two weeks prior to date of final inspection.

B. For equipment or systems requiring seasonal operation, perform demonstration for other season.

C. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owners’ personnel in detail to explain all aspects of operation and maintenance.

D. Demonstrate start-up operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at agreed-upon times, at equipment location.

E. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION 01 75 16
PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this section.

1.02 SECTION INCLUDES

A. Administrative and procedural requirements for project closeout, including but not limited to:
   1. Inspection procedures.
   2. Project record document submittal.
   3. Operating and maintenance manual submittal.
   4. Submittal of warranties.
   5. Final cleaning.

1.03 RELATED SECTIONS

A. Closeout requirements for specific construction activities are included in the appropriate sections in Divisions 1 through 2.

1.04 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for certification of substantial completion, complete the following. List exceptions in the request.
   1. In the application for payment that coincides with, or first follows, the date substantial completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete. Include supporting documentation for completion as indicated in these contract documents and a statement showing an accounting of changes to the contract sum.
      a. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.
   2. Advise Owner of pending insurance change-over requirements.
   3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
   4. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities.

B. Final Site Visit for Substantial Completion Procedures: On receipt of a request for site visit, the Architect will either proceed with site visit, "Punch List", or advise the Contractor of unfilled requirements. The Architect will prepare the certificate of substantial completion following site visit, or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.
   1. The Architect will repeat site visit when requested and assured by the Contractor that the Work has been completed.
1.05 **FINAL ACCEPTANCE**

A. Preliminary Procedures: Before requesting final site visit for certification of final acceptance and final payment, complete the following.
   1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
   2. Submit an updated final statement, accounting for final additional changes to the contract sum.
   3. Submit a certified copy of the Architect's final site visit list, "Punch List", of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Architect.
   4. Submit consent of surety to final payment.
   5. Submit a final liquidated damages settlement statement.
   6. Submit certified and executed final "Release or Waiver of Liens" for the Contractor, all subcontractors, material suppliers and all other entities which have supplied Work, materials or products to the job.

B. Re-inspection Procedure: The Architect will revisit the Work upon receipt of notice that all the Work, including Punch List items from earlier site visits, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Architect.
   1. Upon completion of first re-inspection, the Architect will prepare a certificate of final acceptance, or advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.

**PART 2 – PRODUCTS**

Not Used.

**PART 3 – EXECUTION**

3.01 **FINAL CLEANING**

A. General: General cleaning during construction is required by the general conditions and included in Section 01 50 00 "Temporary Facilities and Controls".

B. Removal of Protection: Remove temporary protection and facilities installed for protection of the Work during construction.

C. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.
   1. Where extra materials of value remaining after completion of associated Work have become the Owner's property, arrange for disposition of these materials as directed.

**END OF SECTION 01 77 00**
# MIDLAND COUNTY AMPHITHEATER

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SECTION 260500

COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Electrical equipment coordination and installation.
   2. Sleeves for raceways and cables.
   3. Sleeve seals.
   5. Common electrical installation requirements.

1.3 DEFINITIONS

A. Retain abbreviations that remain after this Section has been edited.

B. "Furnish, Provide, Install": Whenever the words "furnish", "provide", "furnish and install," "provide and install", and/or similar phrases occur, it is the intent that the materials and equipment described be furnished, installed and connected under this Division of the Specifications, complete for operation unless specifically noted to the contrary.

C. Materials: Where a material is described in detail, listed by catalogue number or otherwise called for, it shall be the Contractor's responsibility to furnish and install the material.

D. "Shall": The use of the word "shall" conveys a mandatory condition to the contract.

E. "Section": "This section" always refers to the section in which the statement occurs.

F. "Project": "The project" includes all work in progress during the construction period.

G. Multiple Items: In describing the various items of equipment, in general, each item will be described singularly, even though there may be a multiplicity of identical or similar items.

1.4 ELECTRICAL LINES:

A. General: In general, the electrical lines to be installed under these Specifications shall be run as indicated, as specified herein, as required by particular conditions at the site, and
as required to conform to the generally accepted standards as to complete the work in a neat and satisfactorily workable manner. The following is a general outline concerning the running of electrical lines and is to be excepted where the drawings or conditions at the building necessitate deviating from these standards.

B. General Construction: The Contractor shall thoroughly acquaint himself with the details of the construction and finishes before submitting his bid as no allowances will be made because of the Contractor's unfamiliarity with these details. Place all inserts in masonry walls while they are under construction. All concealed lines shall be installed as required by the pace of the general construction to precede that general construction.

C. Field Conditions: The electrical Drawings do not give exact details as to elevations of electrical lines, exact locations, etc., and do not show all the offsets, and other installation details. The Contractor shall carefully lay out his work at the site to conform to the architectural and structural conditions, to avoid all obstruction, to conform to details of installation supplied by the manufacturers of the equipment to be installed, and thereby to provide an integrated, satisfactorily operating installation.

D. Locations of Electrical Devices: The electrical Drawings show diagrammatically the locations of the various electrical outlets and apparatus and the method of circuiting and controlling them. Exact locations of these outlets and apparatus shall be determined by reference to the general Drawings and to all detail drawings, equipment drawings, roughing-in drawings, etc., by measurements at the building, and in cooperation with other sections, and in all cases shall be subject to the approval of the Architect. The Architect reserves the right to make any reasonable change in location of any outlet or apparatus before installation (within 10 feet of location shown on drawings) or after installation if an obvious conflict exists, without additional cost to the Owner.

E. Space Requirements: The Contractor shall be responsible for the proper fitting of his material and apparatus into the space. Should the particular equipment that any bidder proposes to install require other space conditions than those indicated on the drawings, he shall arrange for such space with the Architect before submitting his bid. Should changes become necessary on account of failure to comply with this clause, the Contractor shall make such necessary changes at his (the Contractor's) own expense.

F. Working Drawings: The Contractor shall submit scale working drawings of all his apparatus and equipment which in any way varies from these Specifications and Drawings. The Architect shall check these variations from the Specifications and Drawings before the work is started. Before the work proceeds, the contractor shall correct any interference with the structural conditions.

G. Order of Precedence: Order of precedence shall be observed in laying-out the conduit in order to fit the material into the space above the ceiling and in the chases and walls. The installation shall be coordinated with the work of all other trades. The following order shall govern:

H. Items affecting the visual appearance of the inside of the building such as lighting fixtures, outlets, panelboards, etc. Coordinate all items to avoid conflicts at the site.
I. Lines requiring grade to function such as sewers.

J. Large ducts and pipes with critical clearances.

K. Conduit, water lines, and other lines whose routing is not critical and whose function bends and offsets would not impair.

L. Equipment Connections: Conduits serving outlets on items of equipment shall be run in the most appropriate manner. Where the equipment has built-in chases, the lines shall be contained therein. Where the equipment is of the open type, the lines shall be run as close as possible to the underside of the top and in a neat and inconspicuous manner.

M. Exceptions and Inconsistencies: Exceptions and inconsistencies in Drawings and Specifications shall be brought to the Architect's attention before the contract is signed. Otherwise, the Contractor shall be responsible for any and all changes and additions that may be necessary to accommodate his particular apparatus, material, or equipment.

N. Intent of Drawings and Specifications: The Contractor shall distinctly understand that the work described herein and shown on the accompanying drawings shall result in a finished and working job, and any item required to accomplish this intent shall be included whether specifically mentioned or not.

O. Examination of Drawings and Specifications: Each bidder shall examine the Drawings and Specifications for the General Construction. If these documents show any item requiring work under Division 26 and that work is not indicated on the respective Electrical drawings, he shall notify the Architect in sufficient time to clarify before bidding. If no notification is received, the Contractor is assumed to require no clarification, and shall install the work as indicated on the General Drawings in accordance with the Specifications.

1.5 DIMENSIONS:

A. General: Before ordering any material or doing any work, the Contractor shall verify all dimensions, including elevations, and shall be responsible for the correctness of the same. No extra charge or compensation will be allowed on account of differences between actual dimensions and measurements indicated on the drawings. Any difference that may be found shall be submitted to the Architect for consideration before proceeding with the work.

1.6 INSPECTION OF SITE:

A. General: The accompanying Drawings do not indicate completely the existing electrical installations. The bidders for the work under these sections of the Specifications shall inspect the existing installations and thoroughly acquaint themselves with conditions to be met and the work to be accomplished in removing and modifying the existing work, and in installing the new work in the present building and underground serving to and from that structure. Failure to comply with this shall not constitute grounds for any additional payments in connection with removing or modifying any part of the existing installations and/or installing any new work.
1.7 ELECTRICAL WIRING:

A. Description: All electric wiring of every character, both for power supply, for pilot and control, for temperature control, for communications, etc. will be done under Division 26 of these Specifications. Every electrical current consuming device furnished as a part of this project, or furnished by the Owner and installed in this project, shall be completely wired under Division 26. Verification of exact location, method of connection, number and size of wires required, voltage requirements, and phase requirements is the responsibility of the Contractor under Division 26. If conflicts occur between the drawings and the actual requirements, actual requirements shall govern.

1.8 PROGRESS OF WORK:

A. General: The Contractor shall keep himself fully informed as to the progress of the work and do his work at the proper time without waiting for notification from the Architect or Owner.

1.9 MANUFACTURER'S DIRECTIONS:

A. General: All manufactured articles shall be applied, installed and handled as recommended by the manufacturer.

1.10 MATERIALS AND WORKMANSHIP:

A. Materials: All materials shall be new unless otherwise specified and of the quality specified. Materials shall be free from defects and undamaged. All materials of a type for which the Underwriters Laboratories, Inc. have established a standard shall be listed by the Underwriters Laboratories, Inc. and shall bear their label.

B. Samples: The Architect reserves the right to call for samples of any item of material offered in substitution, together with a sample of the specified material, when, in the Architect's opinion, the quality of the material and/or the appearance is involved and it is deemed that an evaluation of the two materials may be better made by visual inspection. This shall be limited to lighting fixtures, wiring devices, and similar items and shall not be applicable to major manufacturers' items of equipment.

C. Transportation: The Contractor shall be responsible for transportation of his materials to and on the job, and shall be responsible for the storage and protection of these materials and work until the final acceptance of the job.

D. Appurtenances: The Contractor shall furnish all necessary scaffolding, tackle, tools and appurtenances of all kinds, and all labor required for the safe and expeditious execution of his contract.

E. Workmanship: The workmanship shall in all respects be of the highest grade and all construction shall be done according to the best practice of the trade.
1.11 PROTECTION OF APPARATUS:

A. General: The Contractor shall at all times take such precautions as may be necessary to properly protect his new apparatus from damage. This shall include the erection of all required temporary shelters to adequately protect any apparatus stored in the open on the site, the cribbing of any apparatus above the floor of the construction, and the covering of apparatus in the uncompleted building with tarpaulins or other protective covering. Failure on the part of the Contractor to comply with the above to the entire satisfaction of the Architect will be sufficient cause for the rejection of the pieces of apparatus in question.

1.12 PERMITS, FEE, ETC.:

A. General: The Contractor under each section of these Specifications shall arrange for a permit from the local authority. The Contractor shall arrange for all utility services, including electric services. If any charges are made by any of the utility companies due to the work on this project, the Contractor shall pay these charges, including charges for metering, connection, street cutting, etc. The Contractor shall pay for any inspection fees or other fees and charges required by ordinance, law, codes and these Specifications.

1.13 TESTING:

A. General: The Contractor under each division shall at his own expense perform the various tests as specified and required by the Architect and as required by the State and local authorities. The Contractor shall furnish all fuel and materials necessary for making tests.

1.14 LAWS, CODES AND ORDINANCES:

A. General: All work shall be executed in strict accordance with all local, state and national codes, ordinances and regulations governing the particular class of work involved, as interpreted by the inspecting authority. The Contractor shall be responsible for the final execution of the work under this heading to suit those requirements. Where these Specifications and the accompanying drawings conflict with these requirements, the Contractor shall report the matter to the Architect, shall prepare any supplemental drawings required illustrating how the work may be installed so as to comply and, on approval, make the changes at no cost to the Owner. On completion of the various portions of the work the installation shall be tested by the constituted authorities, approved and, on completion of the work, the Contractor shall obtain and deliver to the Owner a final certificate of acceptance.

1.15 COOPERATION:

A. General: The contractor for the work under each section of these Specifications shall coordinate his work with the work described in all other sections of the Specifications to the end that, as a whole, the job shall be a finished one of its kind, and shall carry on his work in such a manner that none of the work under any section of these Specifications shall be handicapped, hindered or delayed at any time.
1.16 COORDINATION OF TRADES:

A. General: The Contractor shall be responsible for resolving all coordination required between trades. For example, items furnished under Divisions 21, 22 and 23 which require electrical connections shall be coordinated with Division 26 for:

1. Voltage
2. Phase
3. Ampacity
4. No. and size of wires
5. Wiring diagrams
6. Starter size, details and location
7. Control devices and details

B. Ceiling Mounted Items: Items installed in/on finished ceilings shall be coordinated with the ceiling construction. The Contractor under each section shall conform to the reflected ceiling plan and shall secure details and/or samples of the ceiling materials as necessary to insure compatibility. Any device not conforming to this requirement shall be replaced by the Contractor at his expense.

C. Electrical Items: All items specified under Divisions 26 shall be installed tight, plumb, level, square and symmetrically placed in relation to the work of other trades.

1.17 CUTTING AND PATCHING:

A. General: The Contractor for work specified under each section shall perform all structural and general construction modifications and cut all openings through either roof, walls, floors or ceilings required to install all work specified under that section or to repair any defects that appear up to the expiration of the guarantee. All of this cutting shall be done under the supervision of the Architect and the Contractor shall exercise due diligence to avoid cutting openings larger than required or in wrong locations.

B. Structural Members: No cutting shall be done to any of the structural members that would tend to lessen their strength, unless specific permission is granted by the Architect to do such cutting.

C. Patching: The Contractor for work under each section shall be responsible for the patching of all openings cut to install the work covered by that section and to repair the damage resulting from the failure of any part of the work installed hereunder.

D. Coordination: Before bidding, the Contractor shall review and coordinate the cutting and patching required with all trades.

E. Existing Surfaces: In all spaces where new work under Division 26 is installed and no other alteration or refinishing work is shown or called for, existing floors, walls and ceilings shall be restored to match existing conditions. Workmen skilled in the affected trade shall do all cutting and patching.

F. Masonry Walls: Where openings are cut through masonry walls, the Contractor under each respective section shall provide and install lintels or other structural supports to protect the remaining masonry and adequate support shall be provided during the cutting.
operation to prevent any damage to the masonry occasioned by the operation. All structural members, supports, etc. shall be of the size, shape, and installed as directed by the Architect.

1.18 PAINTING:

A. General: Painting for Division 26 shall be as follows:

B. If the factory finish on any apparatus or equipment is marred, it shall be touched up and then given one coat of half-flat-half-enamel, followed by a coat of machinery enamel of a color to match the original. Paint factory primed surfaces.

C. Paint all exposed conduit, boxes, cabinets, hangers and supports, and miscellaneous metal.

D. Generally, painting is required on all surfaces such that no exposed bare metal is visible.

1.19 LARGE APPARATUS:

A. General: Any large piece of apparatus which is to be installed in any space in the building, and which is too large to permit access through windows, doorways or shafts, shall be brought to the job by the Contractor involved and placed in the space before the enclosing structure is completed.

1.20 RELOCATION OF EXISTING INSTALLATIONS:

A. General: There are portions of the existing electrical system that shall remain in use to serve the finished building in conjunction with the indicated new installations. By actual examination at the site, each bidder shall determine those portions of the remaining present installations, which must be relocated to avoid interference with the installations of new work of his particular trade and that of all other trades. All such existing installations that interfere with new installations shall be relocated by the Contractor under the Division in which the existing material normally belongs, and in a manner as directed by the Architect. For example where existing conduit and electrical equipment interferes with the installation of new work; it shall be relocated under Division 26. Failure to become familiar with the extent of the relocation work involved shall not relieve the Contractor of responsibility and shall not be used as a basis for additional compensation.

1.21 INSTALLATION DRAWINGS:

A. General: It shall be incumbent upon the Contractor to prepare special drawings as called for elsewhere herein or as directed by the Architect to coordinate the work under each section, to illustrate changes in his work, to facilitate its concealment in finished spaces to avoid obstructions or to illustrate the adaptability of any item of equipment which he proposes to use. These drawings shall be used in the field for the actual installation of the work. Unless otherwise directed, they shall not be submitted for approval but three copies shall be provided to the Architect for his information.
1.22 ROUGH-IN AND MAKE FINAL CONNECTION FOR EQUIPMENT:

A. General: The shop drawings for all equipment are hereby made a part of these Specifications. The Contractor under each section of the Specifications shall rough-in for the exact item to be furnished on the job, whether in another section of the Specifications or by the Owner. The Contractor shall refer to all drawings and other sections of the Specifications for the scope of work involved for the new equipment, and by actual site examination determine the scope of the required equipment connections for the Owner furnished equipment.

B. Discrepancies: Should any of the equipment furnished require connections of a nature different from that shown on the drawings, report the matter to the Architect and finally connect as directed by the Architect. Minor differences in the equipment furnished and that indicated on the drawings will not constitute ground for additional payment to the Contractor.

1.23 TEMPORARY POWER AND LIGHTING

A. General: Engage the appropriate local utility company to install temporary service. Where company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with company recommendations.

B. Arrange with company and existing users for a time when service can be interrupted, if necessary, to make connections for temporary services.

C. Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.

D. Obtain easements to bring temporary utilities to the site where the Owner's easements cannot be used for that purpose.

E. Use Charges: Cost or use charges for temporary facilities are not chargeable to the Owner or Architect. Neither the Owner nor Architect will accept cost or use charges as a basis of claims for Change Orders.

F. Temporary Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload-protected disconnects, automatic ground-fault interrupters, and main distribution switch gear. All temporary power for construction will be provided by Contractor. Owner will pay bills when submitted for payment.

G. Install electric power service underground, except where overhead service must be used.

H. Power Distribution System: Install wiring overhead and rise vertically where least exposed to damage. Where permitted, power wiring circuits not exceeding 125 Volts, ac 20 Ampere rating, and lighting circuits may be nonmetallic sheathed cable where overhead and exposed for surveillance. All circuits must be ground-fault circuit interrupter protected.
I. Electrical Outlets: Provide properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-Volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button, and pilot light for connection of power tools and equipment. Provide four gang outlets, spaced so 100 foot cords can reach any areas. Provide separate 120 VAC, 20 amp GFCI circuit for each four gang outlet.

J. Electrical Power Cords: Provide grounded extension cords. Use hard-service cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.

K. Temporary Lighting: When overhead floor or roof deck has been installed, provide temporary lighting with local switching:
   1. Install and operate temporary lighting that will fulfill security and protection requirements without operating the entire system. Provide temporary lighting that will provide adequate illumination for construction operations and traffic conditions.

L. Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered-glass enclosures where exposed to breakage. Provide exterior fixtures where exposed to moisture.

M. Provide three 100-W incandescent lamps per 500 sq. ft. (45 sq. m), uniformly distributed, for general lighting, or equivalent illumination.

N. Provide two 100-W incandescent lamps every 50 feet (15 m) in traffic areas.

O. Install exterior-yard site lighting that will provide adequate illumination for construction operations, traffic conditions, and signage visibility when the work is being performed.

1.24 COORDINATION

A. Coordinate arrangement, mounting, and support of electrical equipment:
   1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
   2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
   3. To allow right of way for piping and conduit installed at required slope. So connecting raceways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.

B. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.

C. Coordinate location of access panels and doors for electrical items that are behind finished surfaces or otherwise concealed. Access doors and panels are specified in Division 08 Section "Access Doors and Frames."
D. Coordinate sleeve selection and application with selection and application of firestopping specified in Division 07 Section "Penetration Firestopping".

PART 2 - PRODUCTS

2.1 SLEEVES FOR RACEWAYS AND CABLES

A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.

B. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.

2.2 SLEEVE SEALS

A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.
   1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
      (a) Metraflex Co.
      (b) Pipeline Seal and Insulator, Inc.
   2. Sealing Elements: EPDM interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of raceway or cable.
   3. Pressure Plates: Stainless steel. Include two for each sealing element.
   4. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements. Include one for each sealing element.

2.3 GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

PART 3 - EXECUTION

3.1 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

A. Comply with NECA 1.

B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.

C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.

D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such
a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.

E. Right of Way: Give to piping systems installed at a required slope.

F. Field Conditions: The electrical Drawings do not give exact details as to elevations of electrical lines, exact locations, etc., and do not show all the offsets, and other installation details. The Contractor shall carefully lay out his work at the site to conform to the architectural and structural conditions, to avoid all obstruction, to conform to details of installation supplied by the manufacturers of the equipment to be installed, and thereby to provide an integrated, satisfactorily operating installation.

G. Locations of Electrical Devices: The electrical Drawings show diagrammatically the locations of the various electrical outlets and apparatus and the method of circuiting and controlling them. Exact locations of these outlets and apparatus shall be determined by reference to the general Drawings and to all detail drawings, equipment drawings, roughing-in drawings, etc., by measurements at the building, and in cooperation with other sections, and in all cases shall be subject to the approval of the Architect. The Architect reserves the right to make any reasonable change in location of any outlet or apparatus before installation (within 10 feet of location shown on drawings) or after installation if an obvious conflict exists, without additional cost to the Owner.

H. Space Requirements: The Contractor shall be responsible for the proper fitting of his material and apparatus into the space. Should the particular equipment that any bidder proposes to install require other space conditions than those indicated on the drawings, he shall arrange for such space with the Architect before submitting his bid. Should changes become necessary on account of failure to comply with this clause, the Contractor shall make such necessary changes at his (the Contractor's) own expense.

I. Equipment Connections: Conduits serving outlets on items of equipment shall be run in the most appropriate manner. Where the equipment has built-in chases, the lines shall be contained therein. Where the equipment is of the open type, the lines shall be run as close as possible to the underside of the top and in a neat and inconspicuous manner.

3.2 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Electrical penetrations occur when raceways, cables, wireways, or cable trays penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.

B. Concrete Slabs and Walls: Install sleeves for penetrations. Install sleeves during erection of slabs and walls.

C. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.

D. Cut sleeves to length for mounting flush with both surfaces of walls.

E. Extend sleeves installed in floors 2 inches (50 mm) above finished floor level.
F. Size pipe sleeves to provide 1/4-inch (6.4-mm) annular clear space between sleeve and raceway or cable, unless indicated otherwise.

G. Seal space outside of sleeves with grout for penetrations of concrete and masonry  

   1. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.

H. Interior Penetrations of Non-Fire-Rated Walls and Floors: Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Division 07 Section "Joint Sealants."

I. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at raceway and cable penetrations. Install sleeves and seal raceway and cable penetration sleeves with firestop materials. Comply with requirements in Division 07 Section "Penetration Firestopping."

J. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.

K. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch (25-mm) annular clear space between pipe and sleeve for installing mechanical sleeve seals.

L. Underground, Exterior-Wall Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch (25-mm) annular clear space between raceway or cable and sleeve for installing mechanical sleeve seals.

3.3 SLEEVE-SEAL INSTALLATION

A. Install to seal exterior wall penetrations.

B. Use type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.4 FIRESTOPPING

A. Apply firestopping to penetrations of fire-rated floor and wall assemblies for electrical installations to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 07 Section "Penetration Firestopping."

3.5 SELECTIVE ELECTRICAL DEMOLITION

A. Disconnect and remove all electrical apparatus, electrically operated equipment and devices as required in order to complete the demolition phase of the project as shown on the drawings. Where a wall or partition is shown to be removed, remove all electrical devices in that wall or partition even if the device is not shown on the drawings.
Removal of a piece of electrical or electrically operated equipment includes removing all associated raceway and wiring back to source. Source is defined as the panelboard where the circuit conductors originate or the nearest junction box that contains part of the affected circuit that is not affected by demolition or construction. Reroute all electrical circuitry passing through removed walls or partitions.

B. Remove all unused or vacated panel circuit breakers and install blanking plates. Re-label directory as “Space.”

C. Re-route all conduits that will conflict with openings in walls, floors and roofs for access or for mechanical piping, ducts and new electrical conduits, or new mechanical equipment, piping, and ducts.

D. Conduits which are poured into slabs or roof decks and thus positively and effectively concealed, are the only facilities which if required to be moved, are not included in this provision, but shall be handled as a change in the Contract.

E. Reconnect all circuits in re-routed conduits to perform the existing function.

F. Existing conduit abandoned in place by the demolition phase of the project may be reused if it is concealed, meets the requirements of the drawings and is installed according to this set of specifications.

G. Provide a junction box in the ceiling as required to maintain raceway continuity where walls containing devices are removed.

H. Existing wall outlet boxes, whether retained for wiring or left empty, shall be covered by a standard-sized blank plate. Close all openings in boxes in suspended ceilings.

I. Maintain accessibility of all boxes containing wiring.

J. Restore all ceiling in existing areas, removed for installation of new work, to original condition.

K. Where conduits rising from the floor are to be abandoned, cut conduit off below floor level and patch floor to be level and of same finish. Cut into existing floors carefully only where specifically shown and patch and refinish the floor.

L. Circuit breakers installed in existing panelboards shall be of the same type and manufacture as the panelboard.

M. Prior to cutting or coring any existing structural component of the building, obtain permission of the structural engineer.

END OF SECTION 260500
SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. This Section includes the following:
      1. Building wires and cables rated 600 V and less.
      2. Connectors, splices, and terminations rated 600 V and less.

1.3 DEFINITIONS
   A. EPDM: Ethylene-propylene-diene terpolymer rubber.
   B. NBR: Acrylonitrile-butadiene rubber.

1.4 ACTION SUBMITTALS
   A. Product Data: For each type of product indicated.

1.5 INFORMATIONAL SUBMITTALS
   A. Field quality-control test reports.

1.6 QUALITY ASSURANCE
   A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
   B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES
   A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Alcan Products Corporation; Alcan Cable Division.
3. General Cable Corporation.
4. Senator Wire & Cable Company.
5. Southwire Company.

B. Copper Conductors: Comply with NEMA WC 70.

C. Conductor Insulation: Comply with NEMA WC 70 for Types THHN-THWN

D. Multiconductor Cable: Comply with NEMA WC 70 for Type SO with ground wire.

2.2 CONNECTORS AND SPLICES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AFC Cable Systems, Inc.
3. O-Z/Gedney; EGS Electrical Group LLC.
4. 3M; Electrical Products Division.
5. Tyco Electronics Corp.

B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Copper Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Service Entrance: Type THHN-THWN, single conductors in raceway

B. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN-THWN, single conductors in raceway

C. Feeders Installed below Raised Flooring: Type THHN-THWN, single conductors in raceway
D. Exposed Branch Circuits, Including in Crawlspace: Type THHN-THWN, single conductors in raceway

E. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway

F. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN-THWN, single conductors in raceway

G. Branch Circuits Installed below Raised Flooring: Type THHN-THWN, single conductors in raceway

H. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, strain relief device at terminations to suit application.

I. Class 1 Control Circuits: Type THHN-THWN, in raceway.

J. Class 2 Control Circuits: Type THHN-THWN, in raceway

3.3 INSTALLATION OF CONDUCTORS AND CABLES

A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.

B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

D. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

E. Support cables according to Division 26 Section "Hangers and Supports for Electrical Systems."

F. Identify and color-code conductors and cables according to Division 26 Section "Identification for Electrical Systems."

3.4 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

B. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.
3.5 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Division 26 Section "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.6 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Division 07 Section "Penetration Firestopping."

3.7 FIELD QUALITY CONTROL

A. Testing: Contractor shall Perform tests and inspections and prepare test reports.

B. Tests and Inspections:

1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors for compliance with requirements.


C. Test Reports: Prepare a written report to record the following:

1. Test procedures used.
2. Test results that comply with requirements.
3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

D. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION 260519
SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, including General and Supplementary
      Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. Section Includes: Grounding systems and equipment.

1.3 ACTION SUBMITTALS
   A. Product Data: For each type of product indicated.

1.4 INFORMATIONAL SUBMITTALS
   A. Informational Submittals: Plans showing dimensioned as-built locations of grounding features
      specified in "Field Quality Control" Article, including the following:
      1. Test wells.
      2. Ground rods.
      3. Ground rings.
      4. Grounding arrangements and connections for separately derived systems.
      5. Grounding for sensitive electronic equipment.

   B. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS
   A. Operation and Maintenance Data: For grounding to include in emergency, operation, and
      maintenance manuals. In addition to items specified in Division 01 Section "Operation and
      Maintenance Data," include the following:
      1. Instructions for periodic testing and inspection of grounding features at test wells, ground
         rings, grounding connections for separately derived systems based on NFPA 70B.

         a. Tests shall determine if ground-resistance or impedance values remain within
            specified maximums, and instructions shall recommend corrective action if values
            do not.
         b. Include recommended testing intervals.
1.6 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 CONDUCTORS

A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

B. Bare Copper Conductors:
   4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
   5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
   6. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
   7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

C. Grounding Bus: Predrilled rectangular bars of annealed copper, 1/4 by 4 inches in cross section, with 9/32-inch holes spaced 1-1/8 inches apart. Stand-off insulators for mounting shall comply with UL 891 for use in switchboards, 600 V. Lexan or PVC, impulse tested at 5000 V.

2.2 CONNECTORS

A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.

B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, pressure type with at least two bolts.
   1. Pipe Connectors: Clamp type, sized for pipe.

C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

D. Bus-bar Connectors: Mechanical type, cast silicon bronze, solderless compression-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.
2.3 GROUNDING ELECTRODES

A. Ground Rods: Copper-clad steel 3/4 inch by 10 feet in diameter.

PART 3 - EXECUTION

3.1 APPLICATIONS

A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.

B. Underground Grounding Conductors: Install bare copper conductor, No. 2/0 AWG minimum.

   1. Bury at least 24 inches below grade.

C. Isolated Grounding Conductors: Green-colored insulation with continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection, with alternating bands of green and yellow tape, with at least three bands of green and two bands of yellow.

D. Grounding Bus: Install in electrical and telephone equipment rooms, in rooms housing service equipment, and elsewhere as indicated.

   1. Install bus on insulated spacers 2 inches minimum from wall, 6 inches above finished floor unless otherwise indicated.
   2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down to specified height above floor; connect to horizontal bus.

E. Conductor Terminations and Connections:

   1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
   2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
   3. Connections to Ground Rods at Test Wells: Bolted connectors.

3.2 GROUNDING AT THE SERVICE

A. Equipment grounding conductors and grounding electrode conductors shall be connected to the ground bus. Install a main bonding jumper between the neutral and ground buses.

3.3 GROUNDING UNDERGROUND DISTRIBUTION SYSTEM COMPONENTS

A. Comply with IEEE C2 grounding requirements.

B. Grounding Manholes and Handholes: Install a driven ground rod through manhole or handhole floor, close to wall, and set rod depth so 4 inches will extend above finished floor. If necessary,
install ground rod before manhole is placed and provide No. 1/0 AWG bare, tinned-copper conductor from ground rod into manhole through a waterproof sleeve in manhole wall. Protect ground rods passing through concrete floor with a double wrapping of pressure-sensitive insulating tape or heat-shrunk insulating sleeve from 2 inches above to 6 inches below concrete. Seal floor opening with waterproof, nonshrink grout.

C. Grounding Connections to Manhole Components: Bond exposed-metal parts such as inserts, cable racks, pulling irons, ladders, and cable shields within each manhole or handhole, to ground rod or grounding conductor. Make connections with No. 4 AWG minimum, stranded, hard-drawn copper bonding conductor. Train conductors level or plumb around corners and fasten to manhole walls. Connect to cable armor and cable shields according to written instructions by manufacturer of splicing and termination kits.

D. Pad-Mounted Transformers and Switches: Install two ground rods and ground ring around the pad. Ground pad-mounted equipment and noncurrent-carrying metal items associated with substations by connecting them to underground cable and grounding electrodes. Install tinned-copper conductor not less than No. 2 AWG for ground ring and for taps to equipment grounding terminals. Bury ground ring not less than 6 inches from the foundation.

3.4 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits.

B. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.

C. Water Heater, Heat-Tracing, and Antifrost Heating Cables: Install a separate insulated equipment grounding conductor to each electric water heater and heat-tracing cable. Bond conductor to heater units, piping, connected equipment, and components.

D. Isolated Grounding Receptacle Circuits: Install an insulated equipment grounding conductor connected to the receptacle grounding terminal. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service unless otherwise indicated.

E. Signal and Communication Equipment: In addition to grounding and bonding required by NFPA 70, provide a separate grounding system complying with requirements in TIA/ATIS J-STD-607-A.

1. For telephone, alarm, voice and data, and other communication equipment, provide No. 4 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.

2. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-by-4-by-12-inch grounding bus.

3. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.
F. Metal Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.

3.5 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

B. Ground Bonding Common with Lightning Protection System: Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system. Bond electrical power system ground directly to lightning protection system grounding conductor at closest point to electrical service grounding electrode. Use bonding conductor sized same as system grounding electrode conductor, and install in conduit.

C. Ground Rods: Drive rods until tops are 2 inches below finished floor or final grade unless otherwise indicated.

1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.

2. For grounding electrode system, install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.

D. Test Wells: Ground rod driven through drilled hole in bottom of handhole. Handholes are specified in Division 26 Section "Underground Ducts and Raceways for Electrical Systems," and shall be at least 12 inches deep, with cover.

1. Test Wells: Install at least one test well for each service unless otherwise indicated. Install at the ground rod electrically closest to service entrance. Set top of test well flush with finished grade or floor.

E. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.

1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.

2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.

3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.

F. Grounding and Bonding for Piping:

1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of
the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.

2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.

3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.

3.6 LABELING

A. Comply with requirements in Division 26 Section "Identification for Electrical Systems" Article for instruction signs. The label or its text shall be green.

B. Install labels at the telecommunications bonding conductor and grounding equalizer.

1. Label Text: "If this connector or cable is loose or if it must be removed for any reason, notify the facility manager."

3.7 FIELD QUALITY CONTROL

A. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

B. Tests and Inspections:

1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.

2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.

3. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, and at individual ground rods. Make tests at ground rods before any conductors are connected.

   a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.

   b. Perform tests by fall-of-potential method according to IEEE 81.

C. Grounding system will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

E. Report measured ground resistances that exceed the following values:
1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10 ohms.
2. Power and Lighting Equipment or System with Capacity of 500 to 1000 kVA: 5 ohms.
3. Power and Lighting Equipment or System with Capacity More Than 1000 kVA: 3 ohms.
4. Power Distribution Units or Panelboards Serving Electronic Equipment: 3 ohm(s).
5. Manhole Grounds: 10 ohms.

F. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION 260526
SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY
A. This Section includes the following:
   1. Hangers and supports for electrical equipment and systems.
   2. Construction requirements for concrete bases.

1.3 DEFINITIONS
A. EMT: Electrical metallic tubing.
B. IMC: Intermediate metal conduit.
C. RMC: Rigid metal conduit.

1.4 PERFORMANCE REQUIREMENTS
A. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

1.5 ACTION SUBMITTALS
A. Product Data: For the following:
   1. Steel slotted support systems.
   2. Nonmetallic slotted support systems.

1.6 QUALITY ASSURANCE
A. Comply with NFPA 70.
1.7 COORDINATION

A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 03.

B. Coordinate installation of roof curbs, equipment supports, and roof penetrations. These items are specified in Division 07 Section "Roof Accessories."

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Allied Tube & Conduit.
      b. Cooper B-Line, Inc.; a division of Cooper Industries.
      c. ERICO International Corporation.
      d. GS Metals Corp.
      e. Thomas & Betts Corporation.
      f. Unistrut; Tyco International, Ltd.
      g. Wesanco, Inc.
   2. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
   3. Channel Dimensions: Selected for applicable load criteria.

B. Raceway and Cable Supports: As described in NECA 1 and NECA 101.

C. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

D. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.

E. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

F. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
   1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1) Hilti Inc.
2) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
3) MKT Fastening, LLC.
4) Simpson Strong-Tie Co., Inc.; Masterset Fastening Systems Unit.

2. Mechanical-Expansion Anchors: Insert-wedge-type, stainless steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
   a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      1) Cooper B-Line, Inc.; a division of Cooper Industries.
      2) Empire Tool and Manufacturing Co., Inc.
      3) Hilti Inc.
      4) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
      5) MKT Fastening, LLC.

3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
6. Toggle Bolts: All-steel springhead type.

PART 3 - EXECUTION

3.1 APPLICATION

A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.

B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch in diameter.

C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.

   1. Secure raceways and cables to these supports with two-bolt conduit clamps.

D. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.
3.2 SUPPORT INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.

B. Raceway Support Methods: In addition to methods described in NECA 1, EMT, IMC, and RMC may be supported by openings through structure members, as permitted in NFPA 70.

C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.

D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:

1. To Wood: Fasten with lag screws or through bolts.
2. To New Concrete: Bolt to concrete inserts.
3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
4. To Existing Concrete: Expansion anchor fasteners.
5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches (100 mm) thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches (100 mm) thick.
6. To Steel: Welded threaded studs complying with AWS D1.1/D1.1M, with lock washers and nuts or Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69.
7. To Light Steel: Sheet metal screws.
8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.

E. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

3.3 CONCRETE BASES

A. Construct concrete bases of dimensions indicated but not less than 4 inches (100 mm) larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.

B. Use 3000-psi (20.7-MPa), 28-day compressive-strength concrete. Concrete materials, reinforcement, and placement requirements are specified in Division 03 Section "Cast-in-Place Concrete."

C. Anchor equipment to concrete base.
1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor bolts to elevations required for proper attachment to supported equipment.
3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

3.4 PAINTING

A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.

1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.

B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 260529
SECTION 260533 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Metal conduits, tubing, and fittings.
   2. Nonmetal conduits, tubing, and fittings.
   3. Metal wireways and auxiliary gutters.
   4. Nonmetal wireways and auxiliary gutters.
   5. Surface raceways.
   7. Handholes and boxes for exterior underground cabling.

B. Related Requirements:
   1. Division 26 Section "Underground Ducts and Raceways for Electrical Systems" for exterior ductbanks, manholes, and underground utility construction.

1.3 DEFINITIONS

A. EMT: Electrical metallic tubing.

B. FMC: Flexible metal conduit.

C. LFMC: Liquidtight flexible metal conduit.

D. RNC: Rigid nonmetallic conduit.

E. GRC: Galvanized rigid steel conduit.

1.4 ACTION SUBMITTALS

A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.
1.5 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Conduit routing plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of items involved:
   1. Structural members in paths of conduit groups with common supports.
   2. HVAC and plumbing items and architectural features in paths of conduit groups with common supports.

B. Source quality-control reports.

PART 2 - PRODUCTS

2.1 METAL CONDUITS, TUBING, AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, provide products by the following:
   1. AFC Cable Systems, Inc.
   3. Anamet Electrical, Inc.
   4. Electri-Flex Company.
   5. O-Z/Gedney; a brand of EGS Electrical Group.
   6. Picoma Industries, a subsidiary of Mueller Water Products, Inc.
   7. Republic Conduit.
   8. Robroy Industries.
   10. Thomas & Betts Corporation.
   11. Western Tube and Conduit Corporation.
   12. Wheatland Tube Company; a division of John Maneely Company.

B. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. GRC: Comply with ANSI C80.1 and UL 6.

D. EMT: Comply with ANSI C80.3 and UL 797.

E. FMC: Comply with UL 1; zinc-coated steel.

F. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

G. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.
   1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886 and NFPA 70.
   2. Fittings for EMT:
      a. Material: Steel.
b. Type: Compression with insulated throats so not to damage the insulation during wire pulling operations.

3. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.

2.2 NONMETALLIC CONDUITS, TUBING, AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. AFC Cable Systems, Inc.
2. Anamet Electrical, Inc.
3. Arnco Corporation.
4. CANTEX Inc.
5. CertainTeed Corp.
7. Electri-Flex Company.
8. Kraloy.
9. Lamson & Sessions; Carlon Electrical Products.
10. Niedax-Kleinhuis USA, Inc.
11. RACO; a Hubbell company.
12. Thomas & Betts Corporation.

B. Listing and Labeling: Nonmetallic conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.

D. LFNC: Comply with UL 1660.

E. Fittings for RNC: Comply with NEMA TC 3; match to conduit or tubing type and material.

F. Fittings for LFNC: Comply with UL 514B.

G. Solvent cements and adhesive primers shall have a VOC content of 510 and 550 g/L or less, respectively, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

H. Solvent cements and adhesive primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.3 METAL WIREWAYS AND AUXILIARY GUTTERS

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Cooper B-Line, Inc.
2. Hoffman; a Pentair company.
4. Square D; a brand of Schneider Electric.

B. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 1 unless otherwise indicated, and sized according to NFPA 70.

1. Metal wireways installed outdoors shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

D. Wireway Covers: Hinged type unless otherwise indicated.

E. Finish: Manufacturer's standard enamel finish.

2.4 NONMETALLIC WIREWAYS AND AUXILIARY GUTTERS

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Allied Moulded Products, Inc.
2. Hoffman; a Pentair company.
3. Lamson & Sessions; Carlon Electrical Products.
4. Niedax-Kleinhuis USA, Inc.

B. Listing and Labeling: Nonmetallic wireways and auxiliary gutters shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Description: Fiberglass polyester, extruded and fabricated to required size and shape, without holes or knockouts. Cover shall be gasketed with oil-resistant gasket material and fastened with captive screws treated for corrosion resistance. Connections shall be flanged and have stainless-steel screws and oil-resistant gaskets.

D. Fittings and Accessories: Couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings shall match and mate with wireways as required for complete system.

E. Solvent cements and adhesive primers shall have a VOC content of 510 and 550 g/L or less, respectively, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

F. Solvent cements and adhesive primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
2.5 SURFACE RACEWAYS

A. Listing and Labeling: Surface raceways and tele-power poles shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Surface Nonmetallic Raceways: Two- or three-piece construction, complying with UL 5A. Product shall comply with UL 94 V-0 requirements for self-extinguishing characteristics. Product shall be Panduit T-70 or Twin 70 Series, mechanically held only.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
   a. Panduit Corp.

2.6 BOXES, ENCLOSURES, AND CABINETS

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Adalet.
2. Cooper Technologies Company; Cooper Crouse-Hinds.
3. EGS/Appleton Electric.
5. FSR Inc.
6. Hoffman; a Pentair company.
7. Hubbell Incorporated; Killark Division.
8. Kraloy.
10. Mono-Systems, Inc.
12. RACO; a Hubbell Company.
13. Robroy Industries.
14. Spring City Electrical Manufacturing Company.
15. Stahlin Non-Metallic Enclosures; a division of Robroy Industries.
17. Wiremold / Legrand.

B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.

C. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.

D. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, [aluminum, Type FD, with gasketed cover.

E. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.

F. Metal Floor Boxes:

1. Material: Cast metal.
2. Type: Fully adjustable.
3. Shape: Rectangular.
4. Listing and Labeling: Metal floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

G. Nonmetallic Floor Boxes: Nonadjustable, round.
   1. Listing and Labeling: Nonmetallic floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

H. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb. Outlet boxes designed for attachment of luminaires weighing more than 50 lb shall be listed and marked for the maximum allowable weight.

I. Paddle Fan Outlet Boxes: Nonadjustable, designed for attachment of paddle fan weighing 70 lb.
   1. Listing and Labeling: Paddle fan outlet boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

J. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

K. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, cast aluminum with gasketed cover.

L. Box extensions used to accommodate new building finishes shall be of same material as recessed box.

M. Device Box Dimensions: 4 inches square by 2-1/8 inches deep.

N. Gangable boxes are allowed.

O. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 1 with continuous-hinge cover with flush latch unless otherwise indicated.
   1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
   3. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.

P. Cabinets:
   1. NEMA 250, Type 1 galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
   2. Hinged door in front cover with flush latch and concealed hinge.
   3. Key latch to match panelboards.
   4. Metal barriers to separate wiring of different systems and voltage.
   5. Accessory feet where required for freestanding equipment.
   6. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2.7 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING

A. General Requirements for Handholes and Boxes:

1. Boxes and handholes for use in underground systems shall be designed and identified as defined in NFPA 70, for intended location and application.
2. Boxes installed in wet areas shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Polymer-Concrete Handholes and Boxes with Polymer-Concrete Cover: Molded of sand and aggregate, bound together with polymer resin, and reinforced with steel, fiberglass, or a combination of the two.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
   a. Armorcast Products Company.
   b. Carson Industries LLC.
   d. NewBasis.
   e. Oldcastle Precast, Inc.; Christy Concrete Products.
   f. Synertech Moulded Products; a division of Oldcastle Precast, Inc.
   g. Hubble Quazite.

2. Standard: Comply with SCTE 77.
3. Configuration: Designed for flush burial with integral closed bottom unless otherwise indicated.
4. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
5. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
6. Cover Legend: Molded lettering, as indicated for each service.
7. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.

2.8 SOURCE QUALITY CONTROL FOR UNDERGROUND ENCLOSURES

A. Handhole and Pull-Box Prototype Test: Test prototypes of handholes and boxes for compliance with SCTE 77. Strength tests shall be for specified tier ratings of products supplied.

1. Tests of materials shall be performed by an independent testing agency.
2. Strength tests of complete boxes and covers shall be by either an independent testing agency or manufacturer. A qualified registered professional engineer shall certify tests by manufacturer.
3. Testing machine pressure gages shall have current calibration certification complying with ISO 9000 and ISO 10012 and traceable to NIST standards.
PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Outdoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed Conduit: Rigid steel conduit.
2. Concealed Conduit, Aboveground: EMT.
3. Underground Conduit: RNC, Type EPC-40-PVC, direct buried
4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.

B. Indoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed, Not Subject to Physical Damage: EMT.
2. Exposed, Not Subject to Severe Physical Damage: EMT.
3. Exposed and Subject to Severe Physical Damage: GRC. Raceway locations include the following:
   a. Loading dock.
   b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
   c. Mechanical rooms.
4. Concealed in Ceilings and Interior Walls and Partitions: EMT.
5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
6. Damp or Wet Locations: GRC.
7. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 nonmetallic in institutional and commercial kitchens and damp or wet locations.

C. Minimum Raceway Size: 1/2-inch trade size.

D. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Rigid Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
3. EMT: Use compression-type fittings. Comply with NEMA FB 2.10.
4. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.

E. Install surface raceways only where submitted and approved by the Architect, Owner or Engineer.

F. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F.
G. Metal-clad type MC cable shall be used only above accessible ceilings and for runs of 6’ or less.

3.2 INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.

B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

C. Complete raceway installation before starting conductor installation.

D. Comply with requirements in Division 26 Section "Hangers and Supports for Electrical Systems" for hangers and supports.

E. Arrange stub-ups so curved portions of bends are not visible above finished slab.

F. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches (300 mm) of changes in direction.

G. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.

H. A. Support conduit within 12 inches (300 mm) of enclosures to which attached.

I. Stub-ups to Above Recessed Ceilings:
   1. Use EMT or RMC for raceways.
   2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.

J. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

K. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.

L. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.

M. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.

N. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.
O. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.

P. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.

Q. Surface Raceways:
   1. Install surface raceway with a minimum 2-inch radius control at bend points.
   2. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inches and with no less than two supports per straight raceway section. Support surface raceway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.

R. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.

S. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
   1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
   2. Where an underground service raceway enters a building or structure.
   3. Where otherwise required by NFPA 70.

T. Comply with manufacturer's written instructions for solvent welding RNC and fittings.

U. Expansion-Joint Fittings:
   1. Install in each run of aboveground RNC that is located where environmental temperature change may exceed 30 deg F and that has straight-run length that exceeds 25 feet (7.6 m). Install in each run of aboveground RMC and EMT conduit that is located where environmental temperature change may exceed 100 deg F (55 deg C) and that has straight-run length that exceeds 100 feet (30 m).
   2. Install type and quantity of fittings that accommodate temperature change listed for each of the following locations:
      a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F temperature change.
      b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F temperature change.
      c. Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F temperature change.
      d. Attics: 135 deg F temperature change.
   3. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F of temperature change for PVC conduits. Install
fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per deg F of temperature change for metal conduits.

4. Install expansion fittings at all locations where conduits cross building or structure expansion joints.

5. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.

V. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches of flexible conduit for recessed and semirecessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.

1. Use LFMC in damp or wet locations subject to severe physical damage.

2. Use LFMC or LFNC in damp or wet locations not subject to severe physical damage.

W. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.

X. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.

Y. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.

Z. Locate boxes so that cover or plate will not span different building finishes.

AA. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.

BB. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

CC. Set metal floor boxes level and flush with finished floor surface.

DD. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.

3.3 INSTALLATION OF UNDERGROUND CONDUIT

A. Direct-Buried Conduit:

1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom as specified in Division 31 Section "Earth Moving" for pipe less than 6 inches in nominal diameter.

2. Install backfill as specified in Division 31 Section "Earth Moving."

3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12
inches of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in Division 31 Section "Earth Moving."

4. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through floor.
   
a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete for a minimum of 12 inches on each side of the coupling.
   
b. For stub-ups at equipment mounted on outdoor concrete bases and where conduits penetrate building foundations, extend steel conduit horizontally a minimum of 60 inches from edge of foundation or equipment base. Install insulated grounding bushings on terminations at equipment.

5. Depth: Install top of conduit at least 30 inches below finished grade, unless otherwise indicated. Install top of conduit at least 12 inches below finished grade where conduit is installed under building slabs. Conduit shall not be installed within the structural slab.

6. Underground Warning Tape: Comply with requirements in Division 26 Section "Identification for Electrical Systems."

3.4 INSTALLATION OF UNDERGROUND HANDHOLES AND BOXES

A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances.

B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.

C. Elevation: In paved areas, set so cover surface will be flush with finished grade. Set covers of other enclosures 1 inch above finished grade.

D. Install handholes with bottom below frost line, below grade.

E. Field-cut openings for conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

3.5 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Division 26 Section "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.6 FIRESTOPPING

A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Division 07 Section "Penetration Firestopping."

3.7 PROTECTION

A. Protect coatings, finishes, and cabinets from damage and deterioration.
1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 260533
SECTION 260543 - UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Conduit, ducts, and duct accessories for direct-buried and concrete-encased duct banks, and in single duct runs.
   2. Handholes and boxes.

1.3 DEFINITION

A. RNC: Rigid nonmetallic conduit.

1.4 ACTION SUBMITTALS

A. Product Data: For the following:
   1. Duct-bank materials, including separators and miscellaneous components.
   2. Ducts and conduits and their accessories, including elbows, end bells, bends, fittings, and solvent cement.
   3. Accessories for manholes, handholes, boxes.
   4. Warning tape.
   5. Warning planks.

B. Shop Drawings for Precast or Factory-Fabricated Underground Utility Structures: Include plans, elevations, sections, details, attachments to other work, and accessories, including the following:
   1. Duct entry provisions, including locations and duct sizes.
   2. Reinforcement details.
   3. Frame and cover design and manhole frame support rings.
   4. Ladder details.
   5. Grounding details.
   6. Dimensioned locations of cable rack inserts, pulling-in and lifting irons, and sumps.
   7. Joint details.

C. Shop Drawings for Factory-Fabricated Handholes and Boxes Other Than Precast Concrete: Include dimensioned plans, sections, and elevations, and fabrication and installation details, including the following:
1. Duct entry provisions, including locations and duct sizes.
2. Cover design.
4. Dimensioned locations of cable rack inserts, and pulling-in and lifting irons.

1.5 QUALITY ASSURANCE

A. Comply with ANSI C2.
B. Comply with NFPA 70.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver ducts to Project site with ends capped. Store nonmetallic ducts with supports to prevent bending, warping, and deforming.

B. Store precast concrete and other factory-fabricated underground utility structures at Project site as recommended by manufacturer to prevent physical damage. Arrange so identification markings are visible.

C. Lift and support precast concrete units only at designated lifting or supporting points.

1.7 PROJECT CONDITIONS

A. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electrical service according to requirements indicated:

1. Notify Owner no fewer than seven days in advance of proposed interruption of electrical service.
2. Do not proceed with interruption of electrical service without Owner's written permission.

1.8 COORDINATION

A. Coordinate layout and installation of ducts, manholes, handholes, and boxes with final arrangement of other utilities, site grading, and surface features as determined in the field.

B. Coordinate elevations of ducts and duct-bank entrances into manholes, handholes, and boxes with final locations and profiles of ducts and duct banks as determined by coordination with other utilities, underground obstructions, and surface features. Revise locations and elevations from those indicated as required to suit field conditions and to ensure that duct runs drain to manholes and handholes, and as approved by Architect.
PART 2 - PRODUCTS

2.1 CONDUIT


B. RNC: NEMA TC 2, Type EPC-40-PVC, UL 651, with matching fittings by same manufacturer as the conduit, complying with NEMA TC 3 and UL 514B.

2.2 PRECAST CONCRETE HANDHOLES AND BOXES

A. Comply with ASTM C 858 for design and manufacturing processes.

B. Description: Factory-fabricated, reinforced-concrete, monolithically poured walls and bottom unless open-bottom enclosures are indicated. Frame and cover shall form top of enclosure and shall have load rating consistent with that of handhole or box.
   1. Frame and Cover: Weatherproof steel frame, with hinged steel access door assembly with tamper-resistant, captive, cover-securing bolts.
      a. Cover Hinges: Concealed, with hold-open ratchet assembly.
      b. Cover Handle: Recessed.
   2. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
   3. Cover Legend: Molded lettering, As indicated for each service.
   4. Configuration: Units shall be designed for flush burial and have closed bottom, unless otherwise indicated.
   5. Extensions and Slabs: Designed to mate with bottom of enclosure. Same material as enclosure.
      a. Extension shall provide increased depth of 12 inches.
      b. Slab: Same dimensions as bottom of enclosure, and arranged to provide closure.
   6. Windows: Precast openings in walls, arranged to match dimensions and elevations of approaching ducts and duct banks plus an additional 12 inches vertically and horizontally to accommodate alignment variations.
      a. Windows shall be located no less than 6 inches from interior surfaces of walls, floors, or frames and covers of handholes, but close enough to corners to facilitate racking of cables on walls.
      b. Window opening shall have cast-in-place, welded wire fabric reinforcement for field cutting and bending to tie in to concrete envelopes of duct banks.
      c. Window openings shall be framed with at least two additional No. 4 steel reinforcing bars in concrete around each opening.
   7. Duct Entrances in Handhole Walls: Cast end-bell or duct-terminating fitting in wall for each entering duct.
      a. Type and size shall match fittings to duct or conduit to be terminated.
      b. Fittings shall align with elevations of approaching ducts and be located near interior corners of handholes to facilitate racking of cable.
8. Handholes and larger shall have inserts for cable racks and pulling-in irons installed before concrete is poured.

2.3 HANDHOLES AND BOXES OTHER THAN PRECAST CONCRETE

A. Description: Comply with SCTE 77.

2. Configuration: Units shall be designed for flush burial and have closed bottom, unless otherwise indicated.
3. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure.
4. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
5. Cover Legend: Molded lettering, As indicated for each service.
6. Direct-Buried Wiring Entrance Provisions: Knockouts equipped with insulated bushings or end-bell fittings, selected to suit box material, sized for wiring indicated, and arranged for secure, fixed installation in enclosure wall.
7. Handholes 12 inches wide by 24 inches long and larger shall have factory-installed inserts for cable racks and pulling-in irons.

B. Polymer Concrete Handholes and Boxes with Polymer Concrete Cover: Molded of sand and aggregate, bound together with a polymer resin, and reinforced with steel or fiberglass or a combination of the two.

2.4 PRECAST MANHOLES

A. Comply with ASTM C 858 and with interlocking mating sections, complete with accessories, hardware, and features.

1. Windows: Precast openings in walls, arranged to match dimensions and elevations of approaching ducts and duct banks plus an additional 12 inches vertically and horizontally to accommodate alignment variations.
   a. Windows shall be located no less than 6 inches from interior surfaces of walls, floors, or roofs of manholes, but close enough to corners to facilitate racking of cables on walls.
   b. Window opening shall have cast-in-place, welded wire fabric reinforcement for field cutting and bending to tie in to concrete envelopes of duct banks.
   c. Window openings shall be framed with at least two additional No. 4 steel reinforcing bars in concrete around each opening.

2. Duct Entrances in Manhole Walls: Cast end-bell or duct-terminating fitting in wall for each entering duct.
   a. Type and size shall match fittings to duct or conduit to be terminated.
   b. Fittings shall align with elevations of approaching ducts and be located near interior corners of manholes to facilitate racking of cable.

B. Concrete Knockout Panels: 1-1/2 to 2 inches thick, for future conduit entrance and sleeve for ground rod.
C. Joint Sealant: Asphaltic-butyl material with adhesion, cohesion, flexibility, and durability properties necessary to withstand maximum hydrostatic pressures at the installation location with the ground-water level at grade.

2.5 UTILITY STRUCTURE ACCESSORIES

A. Manhole Frames, Covers, and Chimney Components: Comply with structural design loading specified for manhole.

1. Frame and Cover: Weatherproof, gray cast iron complying with ASTM A 48/A 48M, Class 30B with milled cover-to-frame bearing surfaces; diameter, 26 inches.
   a. Cover Finish: Non-skid finish shall have a minimum coefficient of friction of 0.50.
   b. Special Covers: Recess in face of cover designed to accept finish material in paved areas.

2. Cover Legend: Cast in. Selected to suit system.
   a. Legend: "ELECTRIC-LV" for duct systems with power wires and cables for systems operating at 600 V and less.
   b. Legend: "ELECTRIC-HV" for duct systems with medium-voltage cables.
   c. Legend: "SIGNAL" for communications, data, and telephone duct systems.

B. Manhole Sump Frame and Grate: ASTM A 48/A 48M, Class 30B, gray cast iron.

C. Pulling Eyes in Concrete Walls: Eyebolt with reinforcing-bar fastening insert, 2-inch- diameter eye, and 1-by-4-inch bolt.

   1. Working Load Embedded in 6-Inch, 4000-psi Concrete: 13,000-lbf minimum tension.

D. Pulling Eyes in Nonconcrete Walls: Eyebolt with reinforced fastening, 1-1/4-inch- diameter eye, rated 2500-lbf minimum tension.

E. Pulling-In and Lifting Irons in Concrete Floors: 7/8-inch- diameter, hot-dip galvanized, bent steel rod; stress relieved after forming; and fastened to reinforcing rod. Exposed triangular opening.

   1. Ultimate Yield Strength: 40,000-lbf shear and 60,000-lbf tension.

F. Bolting Inserts for Concrete Utility Structure Cable Racks and Other Attachments: Flared, threaded inserts of noncorrosive, chemical-resistant, nonconductive thermoplastic material; 1/2-inch ID by 2-3/4 inches deep, flared to 1-1/4 inches minimum at base.

   1. Tested Ultimate Pullout Strength: 12,000 lbf minimum.

G. Expansion Anchors for Installation after Concrete Is Cast: Zinc-plated, carbon-steel-wedge type with stainless-steel expander clip with 1/2-inch bolt, 5300-lbf rated pullout strength, and minimum 6800-lbf (30-kN) rated shear strength.

H. Cable Rack Assembly: Steel, hot-dip galvanized, except insulators.
1. **Stanchions:** T-section or channel; 2-1/4-inch nominal size; punched with 14 holes on 1-1/2-inch centers for cable-arm attachment.

2. **Arms:** 1-1/2 inches wide, lengths ranging from 3 inches with 450-lb minimum capacity to 18 inches with 250-lb minimum capacity. Arms shall have slots along full length for cable ties and be arranged for secure mounting in horizontal position at any vertical location on stanchions.

3. **Insulators:** High-glaze, wet-process porcelain arranged for mounting on cable arms.

I. **Cable Rack Assembly:** Nonmetallic. Components fabricated from nonconductive, fiberglass-reinforced polymer.

   1. **Stanchions:** Nominal 36 inches high by 4 inches wide, with minimum of 9 holes for arm attachment.

   2. **Arms:** Arranged for secure, drop-in attachment in horizontal position at any location on cable stanchions, and capable of being locked in position. Arms shall be available in lengths ranging from 3 inches with 450-lb minimum capacity to 20 inches with 250-lb minimum capacity. Top of arm shall be nominally 4 inches wide, and arm shall have slots along full length for cable ties.

J. **Duct-Sealing Compound:** Nonhardening, safe for contact with human skin, not deleterious to cable insulation, and workable at temperatures as low as 35 deg F. Capable of withstanding temperature of 300 deg F without slump and adhering to clean surfaces of plastic ducts, metallic conduits, conduit coatings, concrete, masonry, lead, cable sheaths, cable jackets, insulation materials, and common metals.

K. **Fixed Manhole Ladders:** Arranged for attachment to roof or wall and floor of manhole. Ladder and mounting brackets and braces shall be fabricated from nonconductive, structural-grade, fiberglass-reinforced resin.

L. **Cover Hooks:** Heavy duty, designed for lifts 60 lbf and greater. Two required.

2.6 **SOURCE QUALITY CONTROL**

A. Test and inspect precast concrete utility structures according to ASTM C 1037.

B. **Nonconcrete Handhole and Pull-Box Prototype Test:** Test prototypes of manholes and boxes for compliance with SCTE 77. Strength tests shall be for specified tier ratings of products supplied.

   1. Tests of materials shall be performed by a independent testing agency.

   2. Strength tests of complete boxes and covers shall be by either an independent testing agency or the manufacturer. A qualified registered professional engineer shall certify tests by manufacturer.

   3. Testing machine pressure gages shall have current calibration certification complying with ISO 9000 and ISO 10012, and traceable to NIST standards.
PART 3 - EXECUTION

3.1 UNDERGROUND DUCT APPLICATION

A. Ducts for Electrical Cables Over 600 V: RNC, NEMA Type EPC-40-PVC, in concrete-encased duct bank, unless otherwise indicated.

B. Ducts for Electrical Feeders 600 V and Less (Concrete Encased): RNC, NEMA Type EPC-40-PVC, in concrete-encased duct bank, unless otherwise indicated.

C. Ducts for Electrical Feeders 600 V and Less: RNC, NEMA Type EPC-40-PVC, in direct-buried duct bank, unless otherwise indicated.

D. Ducts for Electrical Branch Circuits: RNC, NEMA Type EPC-40-PVC, in direct-buried duct bank, unless otherwise indicated.

E. Underground Ducts for Telephone, Communications, or Data Utility Service Cables: RNC, NEMA Type EPC-40-PVC, in concrete-encased duct bank, unless otherwise indicated.

F. Underground Ducts for Telephone, Communications, or Data Circuits: RNC, NEMA Type EPC-40-PVC, in direct-buried duct bank, unless otherwise indicated.

3.2 UNDERGROUND ENCLOSURE APPLICATION

A. Handholes and Boxes for 600 V and Less, Including Telephone, Communications, and Data Wiring:

1. Units in Roadways and Other Deliberate Traffic Paths: Precast concrete. AASHTO HB 17, H-10 structural load rating.
2. Units in Driveway, Parking Lot, and Off-Roadway Locations, Subject to Occasional, Nondeliberate Loading by Heavy Vehicles: Polymer concrete, SCTE 77, Tier 15 structural load rating.
3. Units in Sidewalk and Similar Applications with a Safety Factor for Nondeliberate Loading by Vehicles: Polymer concrete units, SCTE 77, Tier 8 structural load rating.
4. Units Subject to Light-Duty Pedestrian Traffic Only: Fiberglass-reinforced polyester resin, structurally tested according to SCTE 77 with 3000-lbf vertical loading.

B. Manholes: Precast concrete.

1. Units Located in Roadways and Other Deliberate Traffic Paths by Heavy or Medium Vehicles: H-20 structural load rating according to AASHTO HB 17.
2. Units Not Located in Deliberate Traffic Paths by Heavy or Medium Vehicles: H-10 load rating according to AASHTO HB 17.

3.3 EARTHWORK

A. Excavation and Backfill: Comply with Division 31 Section "Earth Moving," but do not use heavy-duty, hydraulic-operated, compaction equipment.
B. Restore surface features at areas disturbed by excavation and reestablish original grades, unless otherwise indicated. Replace removed sod immediately after backfilling is completed.

C. Restore areas disturbed by trenching, storing of dirt, cable laying, and other work. Restore vegetation and include necessary topsoiling, fertilizing, liming, seeding, sodding, sprigging, and mulching. Comply with Division 32 Sections "Turf and Grasses" and "Plants."

D. Cut and patch existing pavement in the path of underground ducts and utility structures according to Division 01 Section "Cutting and Patching."

3.4 DUCT INSTALLATION

A. Slope: Pitch ducts a minimum slope of 1:300 down toward manholes and handholes and away from buildings and equipment. Slope ducts from a high point in runs between two manholes to drain in both directions.

B. Curves and Bends: Use 5-degree angle couplings for small changes in direction. Use manufactured long sweep bends with a minimum radius of 48 inches, both horizontally and vertically, at other locations, unless otherwise indicated.

C. Joints: Use solvent-cemented joints in ducts and fittings and make watertight according to manufacturer's written instructions. Stagger couplings so those of adjacent ducts do not lie in same plane.

D. Duct Entrances to Manholes and Concrete and Polymer Concrete Handholes: Use end bells, spaced approximately 10 inches o.c. for 5-inch ducts, and vary proportionately for other duct sizes.

1. Begin change from regular spacing to end-bell spacing 10 feet (3 m) from the end bell without reducing duct line slope and without forming a trap in the line.
2. Direct-Buried Duct Banks: Install an expansion and deflection fitting in each conduit in the area of disturbed earth adjacent to manhole or handhole.
3. Grout end bells into structure walls from both sides to provide watertight entrances.

E. Building Wall Penetrations: Make a transition from underground duct to rigid steel conduit at least 10 feet outside the building wall without reducing duct line slope away from the building, and without forming a trap in the line. Use fittings manufactured for duct-to-conduit transition. Install conduit penetrations of building walls as specified in Division 26 Section "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

F. Sealing: Provide temporary closure at terminations of ducts that have cables pulled. Seal spare ducts at terminations. Use sealing compound and plugs to withstand at least 15-psig hydrostatic pressure.

G. Pulling Cord: Install 100-lbf- test nylon cord in ducts, including spares.

H. Concrete-Encased Ducts: Support ducts on duct separators.

1. Separator Installation: Space separators close enough to prevent sagging and deforming of ducts, with not less than 4 spacers per 20 feet of duct. Secure separators to earth and to ducts to prevent floating during concreting. Stagger separators approximately 6 inches
between tiers. Tie entire assembly together using fabric straps; do not use tie wires or reinforcing steel that may form conductive or magnetic loops around ducts or duct groups.

2. Concreting Sequence: Pour each run of envelope between manholes or other terminations in one continuous operation.
   a. Start at one end and finish at the other, allowing for expansion and contraction of ducts as their temperature changes during and after the pour. Use expansion fittings installed according to manufacturer's written recommendations, or use other specific measures to prevent expansion-contraction damage.
   b. If more than one pour is necessary, terminate each pour in a vertical plane and install 3/4-inch reinforcing rod dowels extending 18 inches into concrete on both sides of joint near corners of envelope.

3. Pouring Concrete: Spade concrete carefully during pours to prevent voids under and between conduits and at exterior surface of envelope. Provide red dye in concrete during the mixing process. Do not allow a heavy mass of concrete to fall directly onto ducts. Use a plank to direct concrete down sides of bank assembly to trench bottom. Allow concrete to flow to center of bank and rise up in middle, uniformly filling all open spaces. Do not use power-driven agitating equipment unless specifically designed for duct-bank application.

4. Reinforcement: Reinforce concrete-encased duct banks where they cross disturbed earth and where indicated. Arrange reinforcing rods and ties without forming conductive or magnetic loops around ducts or duct groups.

5. Forms: Use walls of trench to form side walls of duct bank where soil is self-supporting and concrete envelope can be poured without soil inclusions; otherwise, use forms.

6. Minimum Space between Ducts: 3 inches between ducts and exterior envelope wall, 2 inches between ducts for like services, and 4 inches between power and signal ducts.

7. Depth: Install top of duct bank at least 24 inches below finished grade in areas not subject to deliberate traffic, and at least 30 inches below finished grade in deliberate traffic paths for vehicles, unless otherwise indicated.

8. Stub-Ups: Use manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through the floor.
   a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete.
   b. Stub-Ups to Equipment: For equipment mounted on outdoor concrete bases, extend steel conduit horizontally a minimum of 60 inches from edge of base. Install insulated grounding bushings on terminations at equipment.

9. Warning Tape: Bury warning tape approximately 12 inches above all concrete-encased ducts and duct banks. Align tape parallel to and within 3 inches of the centerline of duct bank. Provide an additional warning tape for each 12-inch increment of duct-bank width over a nominal 18 inches. Space additional tapes 12 inches apart, horizontally.

I. Direct-Buried Duct Banks:
   1. Support ducts on duct separators coordinated with duct size, duct spacing, and outdoor temperature.
   2. Space separators close enough to prevent sagging and deforming of ducts, with not less than 4 spacers per 20 feet of duct. Secure separators to earth and to ducts to prevent
displacement during backfill and yet permit linear duct movement due to expansion and contraction as temperature changes. Stagger spacers approximately 6 inches between tiers.

3. Excavate trench bottom to provide firm and uniform support for duct bank. Prepare trench bottoms as specified in Division 31 Section "Earth Moving" for pipes less than 6 inches in nominal diameter.

4. Install backfill as specified in Division 31 Section "Earth Moving."

5. After installing first tier of ducts, backfill and compact. Start at tie-in point and work toward end of duct run, leaving ducts at end of run free to move with expansion and contraction as temperature changes during this process. Repeat procedure after placing each tier. After placing last tier, hand-place backfill to 4 inches over ducts and hand tamp. Firmly tamp backfill around ducts to provide maximum supporting strength. Use hand tamper only. After placing controlled backfill over final tier, make final duct connections at end of run and complete backfilling with normal compaction as specified in Division 31 Section "Earth Moving."

6. Install ducts with a minimum of 3 inches between ducts for like services and 6 inches between power and signal ducts.

7. Depth: Install top of duct bank at least 30 inches below finished grade, unless otherwise indicated. Install top of duct bank at least 12 inches below finished grade where duct is installed under building slabs. Duct shall not be installed within the structural slab.

8. Set elevation of bottom of duct bank below the frost line.

9. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through the floor.

   a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete.
   b. For equipment mounted on outdoor concrete bases, extend steel conduit horizontally a minimum of 60 inches from edge of equipment pad or foundation. Install insulated grounding bushings on terminations at equipment.

10. Underground Warning Tape: Comply with requirements in Division 26 Section "Identification for Electrical Systems."

3.5 INSTALLATION OF CONCRETE MANHOLES, HANDHOLES, AND BOXES

A. Cast-in-Place Manhole Installation:

   1. Finish interior surfaces with a smooth-troweled finish.
   2. Windows for Future Duct Connections: Form and pour concrete knockout panels 1-1/2 to 2 inches thick, arranged as indicated.
   3. Cast-in-place concrete, formwork, and reinforcement are specified in Division 03 Section "Cast-in-Place Concrete."

B. Precast Concrete Handhole and Manhole Installation:

   1. Comply with ASTM C 891, unless otherwise indicated.
   2. Install units level and plumb and with orientation and depth coordinated with connecting ducts to minimize bends and deflections required for proper entrances.
   3. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.
C. Elevations:

1. Manhole Roof: Install with rooftop at least 15 inches (380 mm) below finished grade.
2. Manhole Frame: In paved areas and trafficways, set frames flush with finished grade. Set other manhole frames 1 inch (25 mm) above finished grade.
3. Install handholes with bottom below the frost line, as determined for site conditions.
4. Handhole Covers: In paved areas and trafficways, set surface flush with finished grade. Set covers of other handholes 1 inch above finished grade.
5. Where indicated, cast handhole cover frame integrally with handhole structure.

D. Drainage: Install drains in bottom of manholes where indicated. Coordinate with drainage provisions indicated.

E. Manhole Access: Circular opening in manhole roof; sized to match cover size.

1. Manholes with Fixed Ladders: Offset access opening from manhole centerlines to align with ladder.

F. Waterproofing: Apply waterproofing to exterior surfaces of manholes after concrete has cured at least three days. Waterproofing materials and installation are specified in Division 07 Section "Elastomeric Sheet Waterproofing or Thermoplastic Sheet Waterproofing." After ducts have been connected and grouted, and before backfilling, waterproof joints and connections and touch up abrasions and scars. Waterproof exterior of manhole chimneys after mortar has cured at least three days.

G. Hardware: Install removable hardware, including pulling eyes, cable stanchions, and cable arms, as required for installation and support of cables and conductors and as indicated.

H. Fixed Manhole Ladders: Arrange to provide for safe entry with maximum clearance from cables and other items in manholes.

I. Field-Installed Bolting Anchors in Manholes and Concrete Handholes: Do not drill deeper than 3-7/8 inches for manholes and 2 inches for handholes, for anchor bolts installed in the field. Use a minimum of two anchors for each cable stanchion.

J. Warning Sign: Install "Confined Space Hazard" warning sign on the inside surface of each manhole cover.

3.6 INSTALLATION OF HANDHOLES AND BOXES OTHER THAN PRECAST CONCRETE

A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting ducts to minimize bends and deflections required for proper entrances. Use box extension if required to match depths of ducts, and seal joint between box and extension as recommended by the manufacturer.

B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.

C. Elevation: In paved areas and trafficways, set so cover surface will be flush with finished grade. Set covers of other handholes 1 inch above finished grade.
D. Install handholes and boxes with bottom below the frost line as determined for site conditions.

E. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare space for future cables, but short enough to preserve adequate working clearances in the enclosure.

F. Field-cut openings for ducts and conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

G. For enclosures installed in asphalt paving and subject to occasional, nondeliberate, heavy-vehicle loading, form and pour a concrete ring encircling, and in contact with, enclosure and with top surface screeded to top of box cover frame. Bottom of ring shall rest on compacted earth.

1. Concrete: 3000 psi, 28-day strength, complying with Division 03 Section "Cast-in-Place Concrete," with a troweled finish.
2. Dimensions: 10 inches wide by 12 inches deep.

3.7 GROUNDING

A. Ground underground ducts and utility structures according to Division 26 Section "Grounding and Bonding for Electrical Systems."

3.8 FIELD QUALITY CONTROL

A. Perform the following tests and inspections and prepare test reports:

1. Demonstrate capability and compliance with requirements on completion of installation of underground ducts and utility structures.
2. Pull aluminum or wood test mandrel through duct to prove joint integrity and test for out-of-round duct. Provide mandrel equal to 80 percent fill of duct. If obstructions are indicated, remove obstructions and retest.
3. Test manhole grounding to ensure electrical continuity of grounding and bonding connections. Measure and report ground resistance as specified in Division 26 Section "Grounding and Bonding for Electrical Systems."

B. Correct deficiencies and retest as specified above to demonstrate compliance.

3.9 CLEANING

A. Pull leather-washer-type duct cleaner, with graduated washer sizes, through full length of ducts. Follow with rubber duct swab for final cleaning and to assist in spreading lubricant throughout ducts.

B. Clean internal surfaces of manholes, including sump. Remove foreign material.

END OF SECTION 260543
SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:
   1. Identification for raceways.
   2. Identification of power and control cables.
   3. Identification for conductors.
   5. Warning labels and signs.
   6. Instruction signs.
   7. Equipment identification labels.
   8. Miscellaneous identification products.

1.3 ACTION SUBMITTALS

A. Product Data: For each electrical identification product indicated.

B. Samples: For each type of label and sign to illustrate size, colors, lettering style, mounting provisions, and graphic features of identification products.

1.4 QUALITY ASSURANCE

A. Comply with NFPA 70.


C. Comply with ANSI Z535.4 for safety signs and labels.

D. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

1.5 COORDINATION

A. Coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's

B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

C. Coordinate installation of identifying devices with location of access panels and doors.

D. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 POWER RACEWAY IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway size.

B. Colors for Raceways Carrying Circuits at 600 V or Less:
   1. Black letters on an orange field.
   2. Legend: Indicate voltage.

C. Self-Adhesive Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

2.2 POWER AND CONTROL CABLE IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.

B. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

2.3 CONDUCTOR IDENTIFICATION MATERIALS

A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.

2.4 FLOOR MARKING TAPE

A. 2-inch-wide, 5-mil pressure-sensitive vinyl tape, with black and white stripes and clear vinyl overlay.
2.5 UNDERGROUND-LINE WARNING TAPE

A. Tape:
   1. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
   2. Printing on tape shall be permanent and shall not be damaged by burial operations.
   3. Tape material and ink shall be chemically inert, and not subject to degrading when exposed to acids, alkalis, and other destructive substances commonly found in soils.

2.6 WARNING LABELS AND SIGNS


B. Self-Adhesive Warning Labels: Factory-printed, multicolor, pressure-sensitive adhesive labels, configured for display on front cover, door, or other access to equipment unless otherwise indicated.

C. Warning label and sign shall include, but are not limited to, the following legends:
   1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
   2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES (915 MM)."

2.7 INSTRUCTION SIGNS

A. Engraved, laminated acrylic or melamine plastic, minimum 1/16 inch thick for signs up to 20 sq. inches and 1/8 inch thick for larger sizes.
   1. Engraved legend with black letters on white face.
   2. Punched or drilled for mechanical fasteners.
   3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

2.8 EQUIPMENT IDENTIFICATION LABELS

A. Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Adhesive backed, with white letters on a dark-gray background. Minimum letter height shall be 3/8 inch (10 mm).

2.9 CABLE TIES

A. General-Purpose Cable Ties: Fungus inert, self extinguishing, one piece, self locking, Type 6/6 nylon.
   2. Tensile Strength at 73 deg F, According to ASTM D 638: 12,000 psi .
3. Temperature Range: Minus 40 to plus 185 deg F.

B. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self extinguishing, one piece, self locking, Type 6/6 nylon.
   2. Tensile Strength at 73 deg F, According to ASTM D 638: 12,000 psi.
   3. Temperature Range: Minus 40 to plus 185 deg F.

C. Plenum-Rated Cable Ties: Self extinguishing, UV stabilized, one piece, self locking.
   2. Tensile Strength at 73 deg F, According to ASTM D 638: 7000 psi.
   3. UL 94 Flame Rating: 94V-0.
   4. Temperature Range: Minus 50 to plus 284 deg F.
   5. Color: Black.

2.10 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Paint: Comply with requirements in Division 09 painting Sections for paint materials and application requirements. Select paint system applicable for surface material and location (exterior or interior).

B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Verify identity of each item before installing identification products.

B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.

C. Apply identification devices to surfaces that require finish after completing finish work.

D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.

E. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.

F. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors,
at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.

G. Aluminum Wraparound Marker Labels and Metal Tags: Secure tight to surface of conductor or cable at a location with high visibility and accessibility.

H. Cable Ties: For attaching tags. Use general-purpose type, except as listed below:
   1. Outdoors: UV-stabilized nylon.
   2. In Spaces Handling Environmental Air: Plenum rated.

I. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line at 6 to 8 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches overall.

J. Painted Identification: Comply with requirements in Division 09 painting Sections for surface preparation and paint application.

3.2 IDENTIFICATION SCHEDULE

A. Accessible Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive vinyl labels with the wiring system legend and system voltage. System legends shall be as follows:
   2. Power.
   3. UPS.

B. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color-coding conductor tape to identify the phase.

   1. Color-Coding for Phase and Voltage Level Identification, 600 V or Less: Use colors listed below for ungrounded service, feeder, and branch-circuit conductors.
      a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG, if authorities having jurisdiction permit.
      b. Colors for 208/120-V Circuits:
         1) Phase A: Black.
         2) Phase B: Red.
         3) Phase C: Blue.
      c. Colors for 480/277-V Circuits:
         1) Phase A: Brown.
         2) Phase B: Orange.
         3) Phase C: Yellow.

C. Power-Circuit Conductor Identification, more than 600 V: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color coding conductor tape.
D. Install instructional sign including the color-code for grounded and ungrounded conductors using adhesive-film-type labels.

E. Conductors to Be Extended in the Future: Attach marker tape to conductors and list source.

F. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.
   1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
   2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.

G. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber cable.
   1. Limit use of underground-line warning tape to direct-buried cables.
   2. Install underground-line warning tape for both direct-buried cables and cables in raceway.

H. Workspace Indication: Install floor marking tape to show working clearances in the direction of access to live parts. Workspace shall be as required by NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.

I. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive warning labels.
   2. Identify system voltage with black letters on an orange background.
   3. Apply to exterior of door, cover, or other access.
   4. For equipment with multiple power or control sources, apply to door or cover of equipment including, but not limited to, the following:
      a. Power transfer switches.
      b. Controls with external control power connections.

J. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.

K. Emergency Operating Instruction Signs: Install instruction signs with white legend on a red background with minimum 3/8-inch-high letters for emergency instructions at equipment used for power transfer.

L. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power,
lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.

1. Labeling Instructions:
   a. Indoor Equipment: Self-adhesive, engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on 1-1/2-inch-high label; where two lines of text are required, use labels 2 inches high.
   b. Outdoor Equipment: Engraved, laminated acrylic or melamine label.
   c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
   d. Unless provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.

2. Equipment to Be Labeled:
   a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be self-adhesive, engraved, laminated acrylic or melamine label.
   b. Enclosures and electrical cabinets.
   c. Access doors and panels for concealed electrical items.
   d. Switchgear.
   e. Switchboards.
   f. Transformers: Label that includes tag designation shown on Drawings for the transformer, feeder, and panelboards or equipment supplied by the secondary.
   g. Substations.
   h. Emergency system boxes and enclosures.
   i. Motor-control centers.
   j. Enclosed switches.
   k. Enclosed circuit breakers.
   l. Enclosed controllers.
   m. Variable-speed controllers.
   n. Push-button stations.
   o. Power transfer equipment.
   p. Contactors.
   q. Remote-controlled switches, dimmer modules, and control devices.
   r. Battery-inverter units.
   s. Battery racks.
   t. Power-generating units.
   u. Monitoring and control equipment.
   v. UPS equipment.

END OF SECTION 260553
SECTION 265600 - EXTERIOR LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Exterior luminaires with lamps and ballasts.
2. Luminaire-mounted photoelectric relays.
3. Poles and accessories.
4. Luminaire lowering devices.

B. Related Sections:

1. Division 26 Section "Interior Lighting" for exterior luminaires normally mounted on exterior surfaces of buildings.

1.3 DEFINITIONS

A. CCT: Correlated color temperature.
B. CRI: Color-rendering index.
C. HID: High-intensity discharge.
D. LER: Luminaire efficacy rating.
E. Luminaire: Complete lighting fixture, including ballast housing if provided.
F. Pole: Luminaire support structure, including tower used for large area illumination.
G. Standard: Same definition as "Pole" above.

1.4 STRUCTURAL ANALYSIS CRITERIA FOR POLE SELECTION

A. Dead Load: Weight of luminaire and its horizontal and vertical supports, lowering devices, and supporting structure, applied as stated in AASHTO LTS-4-M.

B. Ice Load: Load of 3 lbf/sq. ft., applied as stated in AASHTO LTS-4-M Ice Load Map.
C. Wind Load: Pressure of wind on pole and luminaire and banners and banner arms, calculated and applied as stated in AASHTO LTS-4-M.

1. Basic wind speed for calculating wind load for poles exceeding 49.2 feet in height is 100 mph.
   a. Wind Importance Factor: 1.0.
   c. Velocity Conversion Factors: 1.0.

2. Basic wind speed for calculating wind load for poles 50 feet high or less is [100 mph].
   a. Wind Importance Factor: 1.0.
   c. Velocity Conversion Factors: 1.0.

1.5 ACTION SUBMITTALS

A. Product Data: For each luminaire, pole, and support component, arranged in order of lighting unit designation. Include data on features, accessories, finishes, and the following:

1. Physical description of luminaire, including materials, dimensions, effective projected area, and verification of indicated parameters.
2. Details of attaching luminaires and accessories.
3. Details of installation and construction.
4. Luminaire materials.
5. Photometric data based on laboratory tests of each luminaire type, complete with indicated lamps, ballasts, and accessories.
   a. Testing Agency Certified Data: For indicated luminaires, photometric data shall be certified by a qualified independent testing agency. Photometric data for remaining luminaires shall be certified by manufacturer.
6. Photocell relays.
7. Ballasts, including energy-efficiency data.
8. Lamps, including life, output, CCT, CRI, lumens, and energy-efficiency data.
10. Means of attaching luminaires to supports, and indication that attachment is suitable for components involved.
11. Anchor bolts for poles.
12. Manufactured pole foundations.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
2. Anchor-bolt templates keyed to specific poles and certified by manufacturer.
3. Design calculations, certified by a qualified professional engineer, indicating strength of screw foundations and soil conditions on which they are based.
4. Wiring Diagrams: For power, signal, and control wiring.

C. Samples: For products designated for sample submission in the Exterior Lighting Device Schedule. Each Sample shall include lamps and ballasts.

1.6 INFORMATIONAL SUBMITTALS

A. Pole and Support Component Certificates: Signed by manufacturers of poles, certifying that products are designed for indicated load requirements in AASHTO LTS-4-M and that load imposed by luminaire and attachments has been included in design. The certification shall be based on design calculations by a professional engineer.

B. Qualification Data: For qualified agencies providing photometric data for lighting fixtures.

C. Field quality-control reports.

D. Warranty: Sample of special warranty.

1.7 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For luminaires and poles to include in emergency, operation, and maintenance manuals.

1.8 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Lamps: One for every 100 of each type and rating installed. Furnish at least one of each type.

2. Glass and Plastic Lenses, Covers, and Other Optical Parts: One for every 100 of each type and rating installed. Furnish at least one of each type.

3. Ballasts: One for every 100 of each type and rating installed. Furnish at least one of each type.

4. Globes and Guards: One for every 20 of each type and rating installed. Furnish at least one of each type.

1.9 QUALITY ASSURANCE

A. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by an independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as defined by OSHA in 29 CFR 1910.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

D. Comply with NFPA 70.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Package aluminum poles for shipping according to ASTM B 660.

B. Store poles on decay-resistant-treated skids at least 12 inches above grade and vegetation. Support poles to prevent distortion and arrange to provide free air circulation.

C. Handle wood poles so they will not be damaged. Do not use pointed tools that can indent pole surface more than 1/4 inch deep. Do not apply tools to section of pole to be installed below ground line.

D. Retain factory-applied pole wrappings on fiberglass and laminated wood poles until right before pole installation. Handle poles with web fabric straps.

E. Retain factory-applied pole wrappings on metal poles until right before pole installation. For poles with nonmetallic finishes, handle with web fabric straps.

1.11 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace products that fail in materials or workmanship; that corrode; or that fade, stain, perforate, erode, or chalk due to effects of weather or solar radiation within specified warranty period. Manufacturer may exclude lightning damage, hail damage, vandalism, abuse, or unauthorized repairs or alterations from special warranty coverage.

1. Warranty Period for Luminaires: Five years from date of Substantial Completion.
2. Warranty Period for Metal Corrosion: Five years from date of Substantial Completion.
3. Warranty Period for Color Retention: Five years from date of Substantial Completion.
4. Warranty Period for Poles: Repair or replace lighting poles and standards that fail in finish, materials, and workmanship within manufacturer's standard warranty period, but not less than three years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In Lighting Fixture Schedule where titles below are column or row headings that introduce lists, the following requirements apply to product selection:

1. Absolutely NO substitutions will be accepted.

2.2 GENERAL REQUIREMENTS FOR LUMINAIRES

A. Luminaires shall comply with UL 1598 and be listed and labeled for installation in wet locations by an NRTL acceptable to authorities having jurisdiction.
1. LER Tests Fluorescent Fixtures: Where LER is specified, test according to NEMA LE 5 and NEMA LE 5A as applicable.
2. LER Tests HID Fixtures: Where LER is specified, test according to NEMA LE 5B.

B. Lateral Light Distribution Patterns: Comply with IESNA RP-8 for parameters of lateral light distribution patterns indicated for luminaires.

C. Metal Parts: Free of burrs and sharp corners and edges.

D. Sheet Metal Components: Corrosion-resistant aluminum unless otherwise indicated. Form and support to prevent warping and sagging.

E. Housings: Rigidly formed, weather- and light-tight enclosures that will not warp, sag, or deform in use. Provide filter/breather for enclosed luminaires.

F. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position. Doors shall be removable for cleaning or replacing lenses. Designed to disconnect ballast when door opens.

G. Exposed Hardware Material: Stainless steel.

H. Plastic Parts: High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.

I. Light Shields: Metal baffles, factory installed and field adjustable, arranged to block light distribution to indicated portion of normally illuminated area or field.

J. Reflecting surfaces shall have minimum reflectance as follows unless otherwise indicated:
   1. White Surfaces: 85 percent.
   2. Specular Surfaces: 83 percent.
   3. Diffusing Specular Surfaces: 75 percent.

K. Lenses and Refractors Gaskets: Use heat- and aging-resistant resilient gaskets to seal and cushion lenses and refractors in luminaire doors.

L. Luminaire Finish: Manufacturer's standard paint applied to factory-assembled and -tested luminaire before shipping. Where indicated, match finish process and color of pole or support materials.

M. Factory-Applied Finish for Steel Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

   1. Surface Preparation: Clean surfaces to comply with SSPC-SP 1, "Solvent Cleaning," to remove dirt, oil, grease, and other contaminants that could impair paint bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning," or SSPC-SP 8, "Pickling."
2. Exterior Surfaces: Manufacturer's standard finish consisting of one or more coats of primer and two finish coats of high-gloss, high-build polyurethane enamel.
   a. Color: As selected by Architect from manufacturer's full range.

N. Factory-Applied Finish for Aluminum Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
   1. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
   2. Class I, Clear Anodic Finish: AA-M32C22A41 (Mechanical Finish: medium satin; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.

O. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps and ballasts. Labels shall be located where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.
   1. Label shall include the following lamp and ballast characteristics:
      a. "USES ONLY" and include specific lamp type.
      b. Lamp diameter code (T-4, T-5, T-8, T-12), tube configuration (twin, quad, triple), base type, and nominal wattage for fluorescent and compact fluorescent luminaires.
      c. Lamp type, wattage, bulb type (ED17, BD56, etc.) and coating (clear or coated) for HID luminaires.
      d. Start type (preheat, rapid start, instant start) for fluorescent and compact fluorescent luminaires.
      e. ANSI ballast type (M98, M57, etc.) for HID luminaires.
      f. CCT and CRI for all luminaires.

2.3 FLUORESCENT BALLASTS AND LAMPS

A. Ballasts for Low-Temperature Environments:
   1. Temperatures 0 Deg F and Higher: Electronic type rated for 0 deg F starting and operating temperature with indicated lamp types.
   2. Temperatures Minus 20 Deg F and Higher: Electromagnetic type designed for use with indicated lamp types.

B. Ballast Characteristics:
   1. Power Factor: 90 percent, minimum.
   2. Sound Rating: Class A.
   3. Total Harmonic Distortion Rating: Less than 10 percent.
   6. Transient-Voltage Protection: Comply with IEEE C62.41.1 and IEEE C62.41.2, Category A or better.
C. Low-Temperature Lamp Capability: Rated for reliable starting and operation with ballast provided at temperatures minus 20 deg F and higher.

2.4 BALLASTS FOR HID LAMPS

A. Comply with ANSI C82.4 and UL 1029 and capable of open-circuit operation without reduction of average lamp life. Include the following features unless otherwise indicated:

1. Ballast Circuit: Constant-wattage autotransformer or regulating high-power-factor type.
2. Minimum Starting Temperature: Minus 22 deg F.
3. Normal Ambient Operating Temperature: 104 deg F.
4. Ballast Fuses: One in each ungrounded power supply conductor. Voltage and current ratings as recommended by ballast manufacturer.

B. Auxiliary, Instant-On, Quartz System: Factory-installed feature automatically switches quartz lamp on when fixture is initially energized and when momentary power outages occur. System automatically turns quartz lamp off when HID lamp reaches approximately 60 percent of light output.

C. High-Pressure Sodium Ballasts: Electromagnetic type with solid-state igniter/starter and capable of open-circuit operation without reduction of average lamp life. Igniter/starter shall have an average life in pulsing mode of 10,000 hours at an igniter/starter-case temperature of 90 deg C.

1. Instant-Restrike Device: Integral with ballast, or solid-state potted module, factory installed within fixture and compatible with lamps, ballasts, and mogul sockets up to 150 W.
   a. Restrike Range: 105- to 130-V ac.
   b. Maximum Voltage: 250-V peak or 150-V ac rms.

2. Minimum Starting Temperature: Minus 40 deg F.

2.5 HID LAMPS

A. High-Pressure Sodium Lamps: ANSI C78.42, CRI 21 (minimum), CCT color temperature 1900 K, and average rated life of 24,000 hours, minimum.

B. Pulse-Start, Metal-Halide Lamps: Minimum CRI 65, and CCT color temperature 4000 K.

C. Ceramic, Pulse-Start, Metal-Halide Lamps: Minimum CRI 80, and CCT color temperature 4000 K.

2.6 GENERAL REQUIREMENTS FOR POLES AND SUPPORT COMPONENTS

A. Structural Characteristics: Comply with AASHTO LTS-4-M.
1. Wind-Load Strength of Poles: Adequate at indicated heights above grade without failure, permanent deflection, or whipping in steady winds of speed indicated in "Structural Analysis Criteria for Pole Selection" Article.

2. Strength Analysis: For each pole, multiply the actual equivalent projected area of luminaires and brackets by a factor of 1.1 to obtain the equivalent projected area to be used in pole selection strength analysis.

B. Luminaire Attachment Provisions: Comply with luminaire manufacturers' mounting requirements. Use stainless-steel fasteners and mounting bolts unless otherwise indicated.

C. Mountings, Fasteners, and Appurtenances: Corrosion-resistant items compatible with support components.
   1. Materials: Shall not cause galvanic action at contact points.
   3. Anchor-Bolt Template: Plywood or steel.

D. Handhole: Oval-shaped, with minimum clear opening of 2-1/2 by 5 inches, with cover secured by stainless-steel captive screws.

E. Concrete Pole Foundations: Cast in place, with anchor bolts to match pole-base flange. Concrete, reinforcement, and formwork are specified in Division 03 Section "Cast-in-Place Concrete."

F. Power-Installed Screw Foundations: Factory fabricated by pole manufacturer, with structural steel complying with ASTM A 36/A 36M and hot-dip galvanized according to ASTM A 123/A 123M; and with top-plate and mounting bolts to match pole base flange and strength required to support pole, luminaire, and accessories.

G. Breakaway Supports: Frangible breakaway supports, tested by an independent testing agency acceptable to authorities having jurisdiction, according to AASHTO LTS-4-M.

2.7 STEEL POLES

A. Poles: Comply with ASTM A 500, Grade B, carbon steel with a minimum yield of 46,000 psig; one-piece construction up to 40 feet in height with access handhole in pole wall.
   1. Shape: As indicated on the Light Fixture Schedule.
   2. Mounting Provisions: Butt flange for bolted mounting on foundation or breakaway support.

B. Steel Mast Arms: Single-arm type, continuously welded to pole attachment plate. Material and finish same as pole.

C. Brackets for Luminaires: Detachable, cantilever, without underbrace.
   1. Adapter fitting welded to pole, allowing the bracket to be bolted to the pole mounted adapter, then bolted together with stainless-steel bolts.
2. Cross Section: Tapered oval, with straight tubular end section to accommodate luminaire.
3. Match pole material and finish.

D. Pole-Top Tenons: Fabricated to support luminaire or luminaires and brackets indicated, and securely fastened to pole top.

E. Steps: Fixed steel, with nonslip treads, positioned for 15-inch vertical spacing, alternating on opposite sides of pole; first step at elevation 10 feet above finished grade.

F. Grounding and Bonding Lugs: Welded 1/2-inch threaded lug, complying with requirements in Division 26 Section "Grounding and Bonding for Electrical Systems," listed for attaching grounding and bonding conductors of type and size listed in that Section, and accessible through handhole.

G. Cable Support Grip: Wire-mesh type with rotating attachment eye, sized for diameter of cable and rated for a minimum load equal to weight of supported cable times a 5.0 safety factor.

H. Factory-Painted Finish: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

1. Surface Preparation: Clean surfaces to comply with SSPC-SP 1, "Solvent Cleaning," to remove dirt, oil, grease, and other contaminants that could impair paint bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1, "White Metal Blast Cleaning," or with SSPC-SP 8, "Pickling."

2. Interior Surfaces of Pole: One coat of bituminous paint, or otherwise treat for equal corrosion protection.

3. Exterior Surfaces: Manufacturer's standard finish consisting of one or more coats of primer and two finish coats of high-gloss, high-build polyurethane enamel.
   a. Color: As selected by Architect from manufacturer's full range.

2.8 ALUMINUM POLES

A. Poles: Seamless, extruded structural tube complying with ASTM B 429/B 429M, Alloy 6063-T6 with access handhole in pole wall.

B. Poles: ASTM B 209, 5052-H34 marine sheet alloy with access handhole in pole wall.

1. Shape: As indicated on the Light Fixture Schedule.

2. Mounting Provisions: Butt flange for bolted mounting on foundation or breakaway support.

C. Pole-Top Tenons: Fabricated to support luminaire or luminaires and brackets indicated, and securely fastened to pole top.

D. Grounding and Bonding Lugs: Welded 1/2-inch threaded lug, complying with requirements in Division 26 Section "Grounding and Bonding for Electrical Systems," listed for attaching
grounding and bonding conductors of type and size listed in that Section, and accessible through handhole.

E. Brackets for Luminaires: Detachable, with pole and adapter fittings of cast aluminum. Adapter fitting welded to pole and bracket, then bolted together with stainless-steel bolts.

1. Tapered oval cross section, with straight tubular end section to accommodate luminaire.
2. Finish: Same as luminaire.

F. Prime-Coat Finish: Manufacturer's standard prime-coat finish ready for field painting.

G. Aluminum Finish: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

1. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
2. Class I, Clear Anodic Finish: AA-M32C22A41 (Mechanical Finish: medium satin; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.

2.9 DECORATIVE POLES

A. Pole Material:

1. Cast ductile iron.
2. Cast gray iron, according to ASTM A 48/A 48M, Class 30.
3. Cast aluminum.
5. Spun concrete.
6. Steel tube, covered with closed-cell polyurethane foam, with a polyethylene exterior.

B. Mounting Provisions:

1. Bolted to concrete foundation.
2. Embedded.

C. Fixture Brackets:

1. Cast ductile iron.
2. Cast gray iron.
3. Cast aluminum.

D. Pole Finish: As selected by Architect from manufacturer's full range.

2.10 PRESTRESSED CONCRETE POLES

A. Poles: Manufactured by centrifugal spin-casting process.

1. Shape: Round, tapered.
3. Finishing: Capped at top and plugged at bottom. Seat each steel reinforcing strand with epoxy adhesive.
4. Grounding: Continuous copper ground wire cast into pole. Terminate at top of pole and attach to 24-inch lightning rod.

B. Cure with wet steam and age for a minimum of 15 days before installation.

C. Fabricate poles with a hard, nonporous surface that is resistant to water, frost, and road and soil chemicals and that has a maximum water-absorption rate of 3 percent.

D. Cast aluminum nameplate into pole wall at approximately 5 feet above ground line, listing name of manufacturer, Project identifier, overall height, and approximate weight.

E. Pole Brackets: Comply with ANSI C136.13.

F. Finish Color: Provided by color material complying with ASTM C 979, uniformly impregnated throughout the pole concrete. Color material shall provide a uniform, stable, permanent color and be as follows:
   1. Inert, and carbon free.
   2. Unaffected by environmental conditions and contaminants including, but not limited to, UV solar radiation, salts, and alkalis.

G. Finish Texture: Standard form.

2.11 POLE ACCESSORIES

A. Duplex Receptacle: 120 V, 20 A in a weatherproof assembly complying with Division 26 Section "Wiring Devices" for ground-fault circuit-interrupter type.
   1. Recessed, 12 inches above finished grade.
   2. Nonmetallic polycarbonate plastic or reinforced fiberglass, weatherproof in use, cover, that when mounted results in NEMA 250, Type 3R enclosure.
   3. With cord opening.
   4. With lockable hasp and latch that complies with OSHA lockout and tag-out requirements.

B. Minimum 1800-W transformer, protected by replaceable fuses, mounted behind access cover.

C. Base Covers: Manufacturers' standard metal units, arranged to cover pole's mounting bolts and nuts. Finish same as pole.

D. Transformer Type Base: Same material and color as pole. Coordinate dimensions to suit pole's base flange and accept indicated accessories.

2.12 LOWERING SYSTEM FOR LUMINAIRES

A. Arrange system to lower luminaire assembly to a servicing position within 36 inches of finished grade in winds up to 30 mph and to provide for manual plug connection to electrical power in the lowered position for testing.
B. Coordinate with luminaire and pole manufacturers for assembly details, wind-load and vibration analysis, and compatibility of materials for electrolysis-free attachment and connection for luminaire mounting assembly, lowering device, lowering cable, and portable winch.

C. Structural and Mechanical Design: Use a minimum safety factor of 5.0 for static and dynamic loads of load-bearing components, including cable.

D. Luminaire Mounting and Disconnect Arrangement: Multiple ring-mounted luminaires, arranged for lowering and rising as a group.
   1. Electrical cable for normal operating power to luminaires automatically disconnects at a weatherproof multipin connector within the pole-top lowering head at the beginning of the lowering cycle and reconnects when luminaire or luminaire assembly is raised to the operating position.

E. Lowering Device: Weatherproof, cast-aluminum housing and multiple mechanical latches. Moving parts of latching assembly shall be located in the portion of the unit that is lowered to the servicing position. Positive latching in the operating position shall be indicated to the operator at the base of the pole by a clear visual signal, or by other means acceptable to Owner or authorities having jurisdiction.

F. Lowering Cable: stainless-steel aircraft cable.

G. Portable Winch: 120-V electric type. One required.
   2. Winch Raise-Lower Control: Remote-control station with 15 feet of cable.

H. Winch Transformer: Portable, totally enclosed, encapsulated, single-phase, dry type. Primary rated at lighting-circuit voltage; secondary rated at 120 V. Permanent, primary and secondary, twist-locking plug connectors on pigtails shall match pole-base power outlet and winch plug.

PART 3 - EXECUTION

3.1 LUMINAIRE INSTALLATION

A. Install lamps in each luminaire.

B. Fasten luminaire to indicated structural supports.
   1. Use fastening methods and materials selected to resist seismic forces defined for the application and approved by manufacturer.

C. Adjust luminaires that require field adjustment or aiming.

3.2 POLE INSTALLATION

A. Alignment: Align pole foundations and poles for optimum directional alignment of luminaires and their mounting provisions on the pole.
B. Clearances: Maintain the following minimum horizontal distances of poles from surface and underground features unless otherwise indicated on Drawings:

1. Fire Hydrants and Storm Drainage Piping: 60 inches.
3. Trees: 15 feet from tree trunk.

C. Concrete Pole Foundations: Set anchor bolts according to anchor-bolt templates furnished by pole manufacturer. Concrete materials, installation, and finishing requirements are specified in Division 03 Section "Cast-in-Place Concrete."

D. Foundation-Mounted Poles: Mount pole with leveling nuts, and tighten top nuts to torque level recommended by pole manufacturer.

1. Use anchor bolts and nuts selected to resist seismic forces defined for the application and approved by manufacturer.
2. Grout void between pole base and foundation. Use nonshrink or expanding concrete grout firmly packed to fill space.
3. Install base covers unless otherwise indicated.
4. Use a short piece of 1/2-inch- diameter pipe to make a drain hole through grout. Arrange to drain condensation from interior of pole.

E. Embedded Poles with Tamped Earth Backfill: Set poles to depth below finished grade indicated on Drawings, but not less than one-sixth of pole height.

1. Dig holes large enough to permit use of tampers in the full depth of hole.
2. Backfill in 6-inch layers and thoroughly tamp each layer so compaction of backfill is equal to or greater than that of undisturbed earth.

F. Embedded Poles with Concrete Backfill: Set poles in augered holes to depth below finished grade indicated on Drawings, but not less than one-sixth of pole height.

1. Make holes 6 inches in diameter larger than pole diameter.
2. Fill augered hole around pole with air-entrained concrete having a minimum compressive strength of 3000 psi at 28 days, and finish in a dome above finished grade.
3. Use a short piece of 1/2-inch- diameter pipe to make a drain hole through concrete dome. Arrange to drain condensation from interior of pole.
4. Cure concrete a minimum of 72 hours before performing work on pole.

G. Raise and set poles using web fabric slings (not chain or cable).

3.3 BOLLARD LUMINAIRE INSTALLATION

A. Align units for optimum directional alignment of light distribution.

B. Install on concrete base with top 4 inches above finished grade or surface at bollard location. Cast conduit into base, and shape base to match shape of bollard base. Finish by troweling and rubbing smooth. Concrete materials, installation, and finishing are specified in Division 03 Section "Cast-in-Place Concrete."
3.4 INSTALLATION OF INDIVIDUAL GROUND-MOUNTING LUMINAIRES

A. Install on concrete base with top 4 inches above finished grade or surface at luminaire location. Cast conduit into base, and finish by troweling and rubbing smooth. Concrete materials, installation, and finishing are specified in Division 03 Section "Cast-in-Place Concrete."

3.5 CORROSION PREVENTION

A. Aluminum: Do not use in contact with earth or concrete. When in direct contact with a dissimilar metal, protect aluminum by insulating fittings or treatment.

B. Steel Conduits: Comply with Division 26 Section "Raceway and Boxes for Electrical Systems." In concrete foundations, wrap conduit with 0.010-inch-thick, pipe-wrapping plastic tape applied with a 50 percent overlap.

3.6 GROUNDING

A. Ground metal poles and support structures according to Division 26 Section "Grounding and Bonding for Electrical Systems."

1. Install grounding electrode for each pole unless otherwise indicated.
2. Install grounding conductor pigtail in the base for connecting luminaire to grounding system.

B. Ground nonmetallic poles and support structures according to Division 26 Section "Grounding and Bonding for Electrical Systems."

1. Install grounding electrode for each pole.
2. Install grounding conductor and conductor protector.
3. Ground metallic components of pole accessories and foundations.

3.7 FIELD QUALITY CONTROL

A. Inspect each installed fixture for damage. Replace damaged fixtures and components.

B. Illumination Observations: Verify normal operation of lighting units after installing luminaires and energizing circuits with normal power source.

1. Verify operation of photoelectric controls.

C. Illumination Tests:

1. Measure light intensities at night. Use photometers with calibration referenced to NIST standards. Comply with the following IESNA testing guide(s):

d. IESNA LM-64, "Photometric Measurements of Parking Areas."

e. IESNA LM-72, "Directional Positioning of Photometric Data."

D. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

3.8 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain luminaire lowering devices.

END OF SECTION 265600