PROJECT MANUAL

For

LONCY LEAKE BASEBALL FIELD RENOVATION

MESQUITE, TX

June 2021

City of Mesquite RFP No. 2021-062

Project No. 42769

HALFF ASSOCIATES

1201 N. BOWSER RD.
RICHARDSON, TX 75081

214.346.6304

SECTION 00 01 07

CERTIFICATION

Halff Associates

LANDSCAPE ARCHITECTURE

1201 N. Bowser Rd.
Richardson, TX 75081
214.346.6268
David McCaskill, PLA

06.11.2021

Metropolitan Infrastructure, PLLC

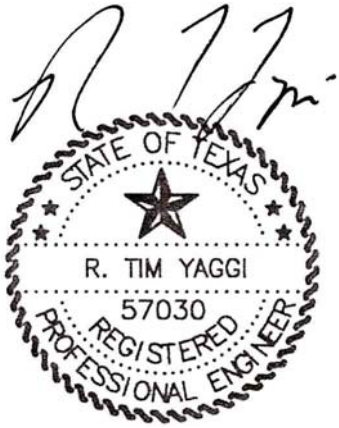
CIVIL ENGINEERING / SURVEYING

1413 EAST IH-30, Suite 3
Garland, Texas 75043
214.534.7830
Louis Frisbie, PE

Yaggi Engineering, Inc.

ELECTRICAL ENGINEERING

5840 West I-20, Ste. 270
Arlington, Texas 76017
817.483.2373
R. Tim Yaggi, PE



06-10-2021

The Texas Board of Architectural Examiners, P. O. Box 12337, Austin, TX 78711-2337 or Guadalupe, Suite 2-350, Austin, TT 78701-3942, (512) 305-9000, has jurisdiction over individuals licensed under the Landscape Architects Registration Law, Texas Civil Statutes, and Article 249c.

SECTION 00 01 10

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MESQUITE
TEXAS
Real. Texas. Service.

REQUEST FOR PROPOSALS (RFP) NO. 2021-062

CLOSING DATE AND TIME: July 8, 2021 - 2:00 P.M.

LONCY LEAKE BALLFIELD RENOVATION: CONSTRUCTION

PROPOSALS SHALL BE SUBMITTED ON THIS FORM

The City of Mesquite, Texas invites sealed proposals from all qualified vendors desiring to furnish the City with the **Loncy Leake Ballfield Renovation: Construction**, complying with the following specifications as listed herein.

A pre-proposal conference will be held **at 2:00 p.m. on Tuesday, June 22, 2021 at Loncy Leake Ballfield at City Lake Park, 200 Parkview Street, Mesquite, TX 75149**. Although it is not required, prospective Proposers are encouraged to attend this conference.

A sealed copy of the bid proposal may be submitted by courier or hand delivered to Ryan Williams, Manager of Purchasing, City of Mesquite, 1515 N. Galloway, Mesquite, Texas 75149. Proposals may also be mailed to Ryan Williams, Manager of Purchasing, City of Mesquite, P.O. Box 850137, Mesquite, Texas 75185-0137. Mark envelope in lower left corner "RFP NO. 2021-062; Loncy Leake Ballfield Renovation: Construction so that the proposals will not be opened until the appointed hour. Proposals may also be submitted by courier, hand delivered **in a sealed envelope or box** to Ryan Williams, Manager of Purchasing, City of Mesquite, 1515 N. Galloway Avenue, Mesquite, Texas 75149. Proposals submitted must be received before proposal closing on Thursday, July 8, 2021 at 2:00 p.m. Faxed bid proposals will not be accepted.

GENERAL CLAUSES AND CONDITIONS

1. If you have questions regarding the preparation of your proposal you may contact: purchasing@cityofmesquite.com.

2. Vendors who do not respond to this particular proposal, but who want to remain on our mailing list for future opportunities shall indicate “NO PROPOSAL” on the face of this page by putting the date and signed by the authorized representative of your company and return this page to the Purchasing office. Your assistance in this matter is greatly appreciated.

3. Protection of Resident Workers: The City of Mesquite actively supports the Immigration and Nationality Act (INA) which includes provisions addressing employment eligibility, employment verification, and nondiscrimination. Under the INA, employers may hire only persons who may legally work in the United States (i.e., citizens and nationals of the U.S.) and aliens authorized to work in the U.S. The employer must verify the identity and employment eligibility of anyone to be hired, which includes completing the Employment Eligibility Verification Form (I-9). The Contractor shall establish appropriate procedures and controls so no services or products under the Contract Documents will be performed or manufactured by any worker who is not legally eligible to perform such services or employment

4. Laws and Ordinances: The Contractor shall at all times observe and comply with all Federal, State and local laws, ordinances and regulations which in any manner affect the Contract or the work, and shall indemnify and save harmless the City against any claim arising from the violation of any such laws, ordinances and regulations whether by the Contractor or his employees.

5. Proposals must be **received as one (1) original and one (1) copy**, on this form, prior to the closing date and time to be considered. Proposals must be submitted in sufficient time to be received and time-stamped at the above location on or before the published date and time shown on the RFP. The City of Mesquite will not be responsible for mail delivered from the post office. Proposals received after the published time and date cannot be considered and will be returned unopened.

6. Proposals will be received and publicly acknowledged at the location, date and time stated above. Only the name of the proposers responding to this request for proposal shall be released at the proposal opening. Other information submitted by the proposer shall not be released by the City during the proposal evaluation process or prior to contract award. At no time will confidential information, as noted by the proposer, be released.

7. Proposer shall attach official documentation from the State of Texas or other qualified certification agency of M/WBE status of your company with bid/proposal. This data is for informational purposes only and will not affect the bid proposal award.

8. A completed W-9 form will be required within five business days by the apparent low proposer once notification has been received.

9. In submitting an offer, respondent certifies that they have not participated in nor have they been party to any collusion, price fixing or any other illegal or unethical agreements with any company, firm or person concerning the pricing offered.

10. The attached Non-Exclusion Affidavit for General Contractors must be signed, notarized and submitted with bid proposal.

11. A representative of the proposing entity who is authorized to enter into contract on behalf of the proposing entity must manually sign proposals in ink. The person signing the proposal must indicate his/her title along with signature. Proposals received without proper signature will not be considered.

12. The prices quoted in this bid proposal shall be F.O.B. Mesquite and cover costs for packaging, delivery, and handling, REGARDLESS OF THE SIZE OF ORDER, to the project site Loncy Leake Ballfield at City Lake Park, 200 Parkview Street, Mesquite, TX.

13. Any ambiguity in the bid proposal as a result of omission, error, lack of clarity or non-compliance by the proposer with specifications, instructions and all conditions shall be construed in favor of the City.

14. The City of Mesquite reserves the right to reject any and all proposals, waive formalities and to make award of bid proposal as may be deemed to the best advantage of the City. No proposal may be withdrawn within forty-five (45) days after date of opening.

15. This Contract may be terminated at any time with thirty-(30) days written notice by either the City of Mesquite or successful proposer.

16. The City is not liable for any cost incurred by Proposers in replying to this RFP. This includes costs to determine the nature of the proposal, submitting, negotiating, presentations or any other costs a vendor would incur in responding to the RFP.

17. Proposers shall complete all information requested and blanks provided shall be filled in on the provided forms. Failure to completely describe the merchandise being proposed may result in rejection of your bid proposal.

18. The City is exempt from all sales and excise taxes.

19. The City of Mesquite reserves the right to evaluate variations from these specifications. If exceptions are made, proposer shall state wherein the merchandise fails to meet these specifications. Failure to completely describe the merchandise being proposed may result in rejection of your proposal.

20. It shall be understood all proposals, responses, inquiries or correspondence relating to or in reference to this RFP, and all reports, charges and proposal or referencing information submitted in response to this RFP shall become the property of the City, and will not be returned. The City will use discretion with regard to disclosure of proprietary information contained in any response, but cannot guarantee information will not be made public. As a governmental entity, the City is subject to making records available for disclosure.

21. All restrictions on the use of data contained within a proposal and all confidential information must be clearly stated in the RFP. Proprietary information submitted in a proposal, or in response to the RFP, will be handled in accordance with the Texas Open Records Law and other applicable state statutes.

22. Quantities are estimated and based on projected usage. It is specifically understood and agreed that these quantities are approximate and any increased quantities will be paid at the regular quoted price. The contractor shall not have any claim against the City of Mesquite for any quantities ordered that are less than the estimated bid proposal amount.

23. It is the vendor's responsibility to check for any addendums that might have been issued before the proposal closing date and time.

24. Cooperative Purchasing: As permitted under the Texas Local Government Code, Chapter 791025, other *government entities may wish to also participate under the same terms and conditions contained in this contract* (piggyback). Each entity wishing to piggyback must have prior authorization from the City of Mesquite and vendor. If such participation is authorized, all purchase orders will be issued directly from and shipped directly to the

entity requiring supplies/services. The City of Mesquite shall not be held responsible for any orders placed, deliveries made or payment for supplies/services ordered by these entities. Each entity reserves the right to determine their participation in this contract.

Successful proposer agrees to extend prices to all entities that have entered into or will enter into joint purchasing interlocal cooperation agreements with the City of Mesquite _____Yes _____No.

25. The proposal evaluation process will occur after the closing date. The City's evaluation and clarification process will commence. An evaluation team will review the proposals. Financial terms will not be the sole determining factor in this award. Other criteria described in this RFP will be considered, as well as any other factors the evaluation team determines may affect the suitability of the proposal for the City's requirements. A Proposer's submission of a proposal constitutes their acceptance of the evaluation technique.

26. The insurance requirements are included in the proposal document. Proposers agree to provide and to maintain the required types of insurance for the term of the contract. An original certificate of insurance will be required within 10 business days by the apparent low proposer once notification has been received.

27. *All Proposers must submit*, with proposal, either a Bid Bond on the form provided herein, a Cashier's Check or Certified Check in the amount of five percent (5%) of the total bid proposal.

28. The Contract, Performance bond and Payment bond forms are included for proposers information so that proposers may be familiar with their contents and requirements. **Proposer shall not fill in or execute these forms at time of proposal submittal. Upon award of the proposal, the awarded vendor will be required to execute the contract.**

SPECIAL PROVISIONS

1. The successful proposer's rights and duties awarded by the contract may not be assigned to another without written consent of the City signed by the City's authorized agent. Such consent shall not relieve the assigned of liability in the event of default by the assignee.

2. Any deviations from specifications and alternate proposals must be clearly shown with complete information provided by the proposer. They may or may not be considered by the City.

3. No oral statement of any person shall modify or otherwise change, or affect the terms, conditions or specifications stated in the resulting contract. All change orders to the contract will be made in writing and shall not be effective unless signed by an authorized representative of the City.

4. The City shall have the right to modify this order subject to an adjustment in the price in accordance with the applicable provisions of the purchase order, if any, or pursuant to mutual agreements. No agreement or understanding to modify this order shall be binding on the City unless it is in writing and signed by an authorized representative of the City.

5. The City reserves the right to require additional technical and pricing information and negotiate all elements which comprise the Vendor's proposal to ensure that the best possible consideration be afforded to all concerned. The City reserves the right to accept all or part of any proposal, to reject any or all proposals and to re-solicit for proposals.

6. All questions must be submitted via email by **2:00 p.m. on Tuesday, June 29, 2021** to Ryan Williams, Manager of Purchasing at purchasing@cityofmesquite.com prior to proposal closing date.

7. Proposers shall submit a total of three (3) references.

8. Proposers shall fill out the following required documents, as noted in the bid proposal. If the following forms are not included, the bid proposal may be considered non-responsive.

Check List:

- ☐ Conflict of Interest Questionnaire
- ☐ Non-Exclusion Affidavit for General Contractors
- ☐ Prohibition On Contracts With Companies Boycotting Israel - House Bill 89 Form
- ☐ References
- ☐ Bid Bond, Performance Bond, Payment Bond
- ☐ Schedule of Proposed Items
- ☐ Contractor's Signature Page
- ☐ Secretary of State Filing Certificate
- ☐ IRS W9 Form

PROPOSED CONSTRUCTION SCHEDULE

Loncy Leake Ballfield Renovation: Construction

(Loncy Leake Ballfield at City Lake Park, 200 Parkview Street, Mesquite, TX 75149)

Advertising	June 10 and June 17, 2021
Pre-bid Conference at Site	June 22, 2021
Deadline for Proposals to be submitted	July 8, 2021
City Council Award Project	August 16, 2021
Contract Notice to Proceed	August 23, 2021
Interim Completion Date (Inside Fence)	September 14, 2021
Construction Substantial Completion	February 28, 2022
(Construction Calendar Days	**192 days)**
Final Completion within 30 days of substantial Completion	
(Total Contract Calendar Days	**162 Days)**

CONTRACTING WITH THE CITY OF MESQUITE

Updated: January 8, 2016

Conflict of Interest Questionnaire
And Disclosure of Interested Parties (Form 1295)

YOU WILL BE REQUIRED TO COMPLY WITH THE FOLLOWING:

Chapter 176 of the Texas Local Government Code is an ethics law that was initially enacted by the Texas Legislature with HB 914 in 2005 that requires disclosure of employment and business relationships local government officers may have with contractors, consultants and vendors who conduct business with local government entities. The law applies to any written contract for the sale or purchase of real property, goods or services. Further information regarding Texas Conflict of Interest laws and the ***Conflict of Interest Questionnaire*** (FORM CIQ) can be found at the Texas Ethics Commission web site at the following web address:

https://www.ethics.state.tx.us/filinginfo/conflict_forms.htm
PLEASE COMPLETE THE ATTACHED FORM CIQ AND SUBMIT WITH YOUR RESPONSE.

Section 2252.908 of the Texas Government Code was enacted in 2015, by the Texas Legislature pursuant to HB 1295, which provides that a governmental entity may not enter into certain contracts with a business entity on or after January 1, 2016, unless the business entity submits a disclosure of interested parties (FORM 1295) to the governmental entity at the time the business entity submits the signed contract to the governmental entity. Further information regarding the disclosure of interested parties law and FORM 1295 can be found at the Texas Ethics Commission web site at the following web address:

https://www.ethics.state.tx.us/whatsnew/elf_info_form1295.htm
PLEASE DO NOT COMPLETE FORM 1295 UNTIL YOU HAVE BEEN NOTIFIED OF CONTRACT AWARD AND REQUESTED TO ELECTRONICALLY FILE FORM 1295 WITH THE TEXAS ETHICS COMMISSION.

CONFLICT OF INTEREST QUESTIONNAIRE

FORM CIQ

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.

OFFICE USE ONLY

Date Received

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 conflicts 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.

Standards of Conduct

The City of Mesquite conducts business with the public, business partners, vendors and contractors under a set of rules to ensure that all City officials and employees discharge their duties in a manner designed to promote public trust and confidence in our city. This code of ethics, titled Standards of Conduct, is taken from the Mesquite City Code, Chapter 2, Art. IV, Sec 2-123.

The City wants you to be aware of the rules that its employees are required to follow while performing their services to you. A violation of state or federal statutes may occur if these rules are broken. It is hoped that by outlining these rules for you, your experience in dealing with the City of Mesquite will be both rewarding and satisfactory.

Acceptance of Gifts or Gratuities

Accepting gifts or gratuities by employees in consideration for the performance of their duties, or as an appreciation for their performance, is strictly prohibited.

- Please do not offer employees any gift, loans or any other thing of value.
- Employees may not receive any fee or compensation for their services from any source other than the City, so please don't offer.
- Please do not offer to buy meals for employees.
- Employees may accept coffee, tea, soft drinks, snacks, etc. when attending meetings in your office.
- Letters to supervisors for exceptional service by employees are always welcome.

Conflicts of Interest

Employees are prohibited from engaging in any outside activities that conflict with, or have the appearance of conflicting with, the duties assigned to them in the employment of the City.

- Please do not ask employees for any special favor or consideration that is not available to every other citizen.
- Please do not ask an employee to disclose any information that is not available to every other citizen through normal public information channels.
- Please do not offer to compensate the employee by offering to hire, or do business with any business entity of the employee or family member
- Do not ask employees to represent you or your company or make any recommendations on your behalf other than those that are a part of their official duties with the City.
- Please do not ask employees to endorse the products or services of your company.
- Please do not ask employees to hand out or post advertising materials.

Solicitation by City Employees

Employees may not solicit gifts, loans, or any other items of value from people doing City business that will be used by them personally.

- If you are asked to pay a fee for services that you believe is improper or illegal, please contact the City's ethic's officer at **972-329-8723**. (payments should only be made to designated cashiers or clerks)
- Employees are prohibited from taking retaliatory action against you for failing to comply with any request unless the request is within the scope of the employee's official duties for the City.

Use of City Equipment, Facilities and Resources

Use of City equipment, facilities and resources is authorized only for City purposes and for those activities permitted by City ordinance and policy.

- Please do not ask employees to use City equipment to run errands or perform tasks for your benefit.
- Employees may not perform tasks, nor conduct any business not related to their official duties while on City time.

Your Rights and Expectations

When dealing with employees of the City of Mesquite you have the right to honest, fair and impartial treatment. You may expect prompt, courteous and professional service from our employees who are expected to understand and practice good customer service skills. Employees are tasked to uphold the public trust through the ethical performance of their duties. We understand that the enforcement of regulatory guidelines and codes may sometimes be a cause for concern; however, you may rest assured that we are responsible to all of the citizens of Mesquite and our goal is to serve them to the best of our ability.

Should you have any concerns or questions concerning this information or the conduct of any of our employees please contact the City's ethics officer at 972-329-8723. All calls to the City's ethics officer are confidential and your name (or any other identifying information) will not be disclosed.

Cliff Keheley
City Manager

INSURANCE VERIFICATION PROGRAM
LETTER OF AUTHORITY

TO: All Awarded Vendors

RE: Insurance Verification

Dear Vendor:

The City of Mesquite has provided Insurance Certificate Administrators (ICA) authority to monitor certificates of insurance, endorsements and other policy information from our vendors and contractors. ICA will request, receive, evaluate and order corrections from such companies.

ICA will provide the City of Mesquite with verification that any insurance document your agent or insurer certifies conforms to the contract requirements.

It is necessary that you have your agent or insurer promptly cooperate with ICA by having them provide the information ICA requests.

All correspondence regarding certificates of insurance and insurance policy information for the City of Mesquite should be sent to the following address. There is no need to provide copies to the City of Mesquite.

City of Mesquite
c/o ICA
input@icaprogram.com
P.O. Box 2566
Fort Worth, TX 76113-2566
Phone: 817-332-5313

Please forward the enclosed instructions to your agent/broker. Thank you for your cooper

INSURANCE

A. AMOUNTS OF INSURANCE

Contractor agrees to provide and to maintain the following types and amounts of insurance, for the term of this Contract.

Type		**Amount**
1.	Worker's Compensation and Employer's Liability	Statutory Limits $100,000 per occurrence
2.	Commercial (Public Liability) including but not limited to:	Bodily Injury: $500,000 per person $1,000,000 per occurrence and
	A. Premises/Operations	
	B. Independent Contractors	
	C. Personal Injury	Property Damage:
	D. Products/Complete Operations	$500,000 per occurrence
	E. Contractual Liability (insuring above indemnity provisions)	with general aggregate of $1,000,000
3.	Business (Commercial) Automobile Policy:	Combined Single Limit/ $500,000

The preceding amounts notwithstanding, the City reserves the right to increase the minimum required insurance to be effective thirty (30) days after notice is sent to the address provided herein. The Contractor may pass through to the City all costs for obtaining the increase in the insurance coverage.

B. OTHER INSURANCE REQUIREMENTS

The Contractor understands that it is its sole responsibility to provide the required Certificate and that failure to comply within 10 business days after notice of award and according to the requirements of this article shall be a cause for termination of this Contract.

For any pesticide spraying performed, the City of Mesquite will require the successful bidder to carry Pollution Liability Insurance and Environmental Impairment Liability Insurance.

Insurance required herein shall be issued by a company or companies of sound and adequate financial responsibility and authorized to do business in the State of Texas. All policies shall be subject to examination and approval by the City Attorney's office for their adequacy as to form, content, form of protection, and providing company.

Insurance required by this Contract for the City, as additional insured shall be primary

insurance and not contributing with any other insurance available to City, under any third party liability policy.
The Contractor further agrees that with respect to the above required insurances, the City shall:

1. Be named as additional insured/or an insured, on all required insurance except workers' compensation. Blanket Endorsements are acceptable in meeting this requirement if copies of the endorsements are provided along with the certificate. If using a form that has specific boxes labeled for additional insured, checking those specific boxes is acceptable in meeting this requirement as well.

2. Be provided with a waiver of subrogation, in favor of the City on all required insurance. Blanket Endorsements are acceptable in meeting this requirement if copies of the endorsements are provided along with the certificate. If using a form that has specific boxes labeled for waiver of subrogation, checking those specific boxes is acceptable in meeting this requirement as well.

3. Be provided with an unconditional 30 days' advance written notice of cancellation or material change.

4. Prior to execution of this Agreement, proof of insurance shall be provided through the office of the City Secretary with either their original Certificate of Insurance or their insurance policy evidencing the above requirements. Thereafter, new certificates or copies of the policies shall be furnished prior to the expiration date of any prior certificate.

C. <u>ADDITIONAL WORKER'S COMPENSATION INSURANCE REQUIREMENTS</u>

1. Definitions:
Certificate of coverage ("certificate") A copy of a certificate of insurance, a certificate of authority to self-insure issued by the commission, or a coverage agreement showing statutory Worker's Compensation insurance coverage for the person's or entity's employees providing services on a project, for the duration of the project.

Duration of the project - includes the time from the beginning of the work on the project until the contractors'/person's work on the project has been completed and accepted by the governmental entity.

Persons providing services on the project (subcontractor" in 406.096) - includes all persons or entitles performing all or part of the services the contractor has undertaken to perform on the project, regardless of whether that person contracted directly with the contractor and regardless of whether that person has employees. This includes, without limitation, independent contractors, subcontractors, leasing companies, motor carriers, owner-operators, employees of any such entity or employees of any entity, which furnishes persons to provide services on the project. "Services" include, without limitation, providing, hauling, or other service related to a project. "Services" does not include activities unrelated to the project, such as food/beverage vendors, office supply deliveries,

and delivery of portable toilets.

2. The contractor shall provide coverage, based on proper reporting of classification codes and payroll amounts and filing of any coverage agreements. Which meets the statutory requirements of Texas Labor Code, Section 401.011 (44) for all employees of the contractor providing services on the project, for the duration of the project.

3. The Contractor must provide a certificate of coverage to the governmental entity prior to being awarded the contract.

4. If the coverage period shown on the contractor's current certificate of coverage ends during the duration of the project, the contractor must, prior to the end of the coverage period, file a new certificate of coverage with the governmental entity showing that coverage has been extended.

5. The contract shall obtain from each person providing services on a project, and provide to the governmental entity:

   (a) a certificate of coverage, prior to that person beginning work on the project, so the governmental entity will have on file certificates of coverage for all persons providing services on the project; and

   (b) no later than seven days after receipt by the contractor, a new certificate of coverage showing extension of coverage, if the coverage period shown on the current certificate of coverage ends during the duration of the project.

6. The Contractor shall retain all required certificates of coverage for the duration of the project and for one year thereafter.

Non-Exclusion Affidavit for General Contractors

Federal, state, and local government agencies, not-profits, and other organizations that use federal money to fund all or part of any program or project are required to follow specific requirements regarding the use of such federal funds. One of these requirements is that no contract, subcontract, grant, financial assistance, or other forms of assistance provided using federal funds may be awarded to individuals or entities that have been suspended, debarred, or otherwise excluded from participation in federally funded programs.

The U.S. federal government maintains a Web site known as the "System for Award Management" (SAM) at www.sam.gov. One of the purposes of the SAM Web site is to provide a comprehensive list of all individuals, firms, and other entities that have been suspended, debarred, or otherwise excluded from participation in federally funded contracts, subcontracts, grants, etc. SAM provides a simple means of helping government, non-profit agencies, and other organizations ensure that they do not award federally-funded grants, contracts, subcontracts, or other financial or non-financial benefits to any individual, firm, or other entity that has been excluded by any agency from participation in such federally funded activities.

I, _____ (Contractor Representative), hereby certify that neither I nor _____ (Name of the company or organization I represent) nor any subcontractors that I or said company may employ to work on any federally funded activity have been suspended, debarred, or otherwise excluded by any federal agency from participation in any federally funded activity. I further acknowledge my understanding that, before entering into a contract with me or with the company or organization I represent, City of Mesquite staff will perform a search on www.sam.gov to verify whether I, the organization I represent, or any subcontractors I may employ to work on any federally funded activity, have been excluded from participation in any federally funded activity.

_____ _____

Signature of Contractor Representative Date

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

_____

Notary Public in and for _____ County, _____ (Insert State Name)

PROHIBITION ON CONTRACTS WITH COMPANIES BOYCOTTING ISRAEL

Chapter 2271 of the Texas Government Code, provides that the City may not enter into a contract* with a company for goods or services unless the contract contains a written verification from the company that it: (i) does not Boycott Israel; and (ii) will not Boycott Israel during the term of the contract.

"Boycott Israel" is defined to mean refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations specifically with Israel, or with a person or entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made for ordinary business purposes. "Company" is defined to mean a for-profit organization, association, corporation, partnership, joint venture, limited partnership, limited liability partnership, or limited liability company, including a wholly owned subsidiary, majority-owned subsidiary, parent company, or affiliate of those entities or business associations that exists to make a profit. The term "company" does not include a sole proprietorship.

*** The requirement applies only to a contract that: (1) is between the City and a company with 10 or more full-time employees; and (2) has a value of $100,000 or more that is to be paid wholly or partly from City funds.**

I,_____, the _____
(Name of Certifying Official) (Title or Position of Certifying Official)

of _____, does hereby verify on behalf of said
(Name of Company)

company to the City of Mesquite that said company does not Boycott Israel and will not Boycott Israel during the term of this contract.

_____
Signature of Certifying Official

_____
Title

_____
Date of Certification

REFERENCES

Using the format outlined below, please provide three current client references and three former client references for which you provided the same services. References should be based on the office that shall be providing services to THE CITY.

Reference 1

Organization name:	Contact and title:
Address:	Phone number:
Effective date of contract:	Number of enrolled employees:
Description of services provided:	

Reference 2

Organization name:	Contact and title:
Address:	Phone number:
Effective date of contract:	Number of enrolled employees:
Description of services provided:	

Reference 3

Organization name:	Contact and title:
Address:	Phone number:
Effective date of contract:	Number of enrolled employees:
Description of services provided:	

PROPOSAL EVALUATION

RFP shall be awarded to the best-quoted proposal. The proposals will be evaluated on the factors outlined below which shall be applied to all eligible, responsive proposals in selecting the successful offerer. Award of a contract may be made without discussion with proposers after responses are received. Proposals should, therefore, be submitted on the most favorable terms.

Sealed Proposal Submission

Proposals shall be sealed and clearly marked with the Proposer's name and return address, and indicate the proposal number and title. Facsimile or e-mail submitted proposals will not be accepted. Responses received after the deadline cannot be considered and will be returned unopened. The City is not responsible for delays occasioned by the U.S. Postal Service, the internal mail delivery system of the City, or any other delivery method employed by the Proposer.

Proposers or their authorized representatives are expected to fully inform themselves as to the general terms and conditions, requirements and specification of this Proposal Invitation before submitting proposals. Failure to do so will be at the proposers own risk.

CRITERIA FOR EVALUATION IN ORDER OF IMPORTANCE:

1. Price based on hourly wage or service 30%
2. Quality of Service 25%
3. Safety 10%
4. Proposed Construction Equipment 10%
5. Reference 15%
6. NOT USED
7. Pre-Bid Conference 5%
8. Request Time to Complete Project 5%

Negotiations may be conducted with responsible proposers who submit proposals determined to be susceptible of being selected for award. **All proposers will be accorded fair and equal treatment with respect to any opportunity for negotiation and revision of proposals.** Revisions to proposals may be permitted after submission and before award for the purpose of obtaining best and final offers.

Loncy Leake Ballfield Renovation: Construction
REQUEST FOR PROPOSAL 2021-062; BEST VALUE SCORING MATRIX

To be completed by City Staff using the information provided in the proposal by the Bidder.

SELECTION CRITERIA:					
	POINTS		***WEIGHT***		***SCORE***
1. CONTRACT PRICE (Base Bid)	***30***	***X***	***1***	***=***	
The bidder with the lowest bid price will receive the maximum number of points, which is 15 points. The bidder with the next lowest price will receive a point score that is based on dividing their price into the lowest bid price and multiplying the resulting percentage by the total points; example using $100,000 as the low bid and $110,000 as second low bid: calculated as follows: $100,000/$110,000 X 15 x 2 = 27. Note: the contract price score is double weighted (multiplied by 2).					
2. QUALITY OF THE VENDOR'S GOODS OR SERVICES	**25**	**X**	**1**	**=**	
The evaluation is based on the vendor history and experience with the City and the staff's research of the vendor's performance on similar type projects. Items of concern are: the quality of the workmanship of constructed improvements, the customer service during and after construction, and ability to meet deadlines. As well as the thoroughness and completeness of the proposal.					
3. BIDDER'S SAFETY PROGRAM	***10***	***X***	***1***	***=***	
Bidder should describe and/or attached its construction site safety program illustrating a proactive approach to safety on the job.					
4. BIDDER'S PROPOSED CONSTRUCTION EQUIPMENT	***10***	***x***	***1***	***=***	
City staff needs to know that the bidders own or can obtain the proper equipment to successfully complete the project. Bidders proposing improper equipment will score lower. The Bidder must list the model, make, year, and whether the equipment is owned.					
5. BIDDER'S SUBMITTAL OF REFERENCES	***15***	***x***	***1***	***=***	
Bidder shall submit 3 references of completed projects of similar scope and of similar cost which represents their services. These projects shall have been completed within the past three (3) years. Contact name, phone numbers, and a brief project description are required. The City shall contact these references to evaluate their experience with the Bidder. Bidders will be scored on this input.					
6. NOT USED					
7. PRE-BID CONFERENCE ATTENDANCE	***5***	***x***	***1***	***=***	
The bidders in attendance who arrive on time and stay until the end of the conference will receive a full score. The Bidders who arrive late or leave early will receive three (3) points. The Bidders who do not attend will receive a zero (0) score. Signing the attendance sheet at the Pre-bid Conference is the responsibility of the Bidder.					
8. BIDDER'S REQUESTED TIME TO COMPLETE THE PROJECT	***5***	***x***	***1***	***=***	
Time is of the essence to complete this project. Bidders that provide completion times greater than the duration indicated in this document will be downgraded relative to other bids received.					

TOTAL POSSIBLE SCORE = 100

PROPOSAL INFORMATION

LONCY LEAKE BALLFIELD RENOVATION: CONSTRUCTION

SCOPE OF WORK

The Mesquite Parks and Recreation Department (MPAR) has a project to renovate and upgrade elements of the existing Loncy Leake Ballfield located in City Lake Park at 200 Parkview Street, Mesquite, Texas. Construction Services are needed to provide these improvements. Services may include but are not necessarily limited to the following:

Demolition of existing concrete parking lot paving and sidewalks, and removal of chain link fencing. Provide excavation as necessary to install a subsurface drainage. Regrade areas to accommodate new concrete paving, sidewalks, and perimeter fencing. Construct new covered dugouts and an entry feature of masonry and ornamental fencing. Replace existing ballfield lights with new units. Provide irrigation modifications and landscaping.

The Contractor shall provide temporary construction barriers and supply all equipment, products and labor to complete renovation work as specified in the contract documents.

SCHEDULE OF PROPOSED ITEMS

Loncy Leake Ballfield Renovation: Construction

PLEASE PROVIDE A PRICE QUOTE FOR THE FOLLOWING:

For acquisition, delivery, installation, materials, labor, cleanup, incidentals and all appurtenances, and guarantee, all per plans, specifications, complete and in place. In the event of additions/deletions to the contract items, the price per unit shall be used to determine change order amounts.

ITEM NO.	EST QTY	UNIT	DESCRIPTIONS IN WORDS	UNIT COST	TOTAL
			General		
1	1	LS	Mobilization		
2	410	LF	Silt fence installation and removal		
3	2	EA	Inlet Protection		
4	444	LF	Construction Fence		
			Demolition		
5	2	EA	Tree Protection (installation and removal)		
6	291	LF	Sawcut, removal existing Concrete (Curb and Gutter)		
7	4,188	SF	Sawcut, removal existing Asphalt Road removal		
8	3,793	SF	Sawcut, removal existing Concrete Paving		
9	338	LF	Existing 4" Pavement Marking removal		
10	3	EA	Existing Accessible Parking Sign removal and disposal		
11	602	LF	Existing Foul line and Fence removal and disposal		
12	2	EA	Existing Dugout removal and disposal		
13	1	LS	Existing Backstop removal and disposal		
			Earthwork		
14	1	LS	Grading		
15	1	LS	Remove Existing Infield Surfacing and Re-install		
16	1	LS	Top dress Outfield		
			Paving		
17	367	SY	6" Vehicular paving		
18	247	LF	6" Reinforced Concrete Curb and Gutter		
19	592	SY	5" Pedestrian paving		
20	650	SF	Stained Concrete Bands (includes only staining)		
21	2	EA	ADA Ramp		
22	245	LF	4" Solid White Pavement Marking (Surface Preparation, Sealer, Complete in Place)		
23	1	LS	Accessible parking paint striping		

			Structures and Amenities		
24	105	LF	6' Galv. chain warm up area fencing		
25	225	LF	6' Galv. chain link perimeter fencing		
26	2	EA	Double Gate		
27	2	EA	Pedestrian access gate		
28	330	LF	6' Vinyl Outfield fence		
29	90	LF	Backstop		
30	90	LF	Brick pony wall at backstop		
31	324	LF	Outfield wall (Champion Wall)		
32	2	EA	Dugouts (includes fencing, slab, wall and roof panel)		
33	3	EA	Flagpoles		
34	2	EA	Foul poles		
35	1	LS	Honor wall - brick wall		
36	2	EA	Brick Columns		
37	1	LS	Scoreboard		
38	1	ls	Distance vinyl numbers and cap strip		
39	1	:LS	Pitching mound		
40	4	EA	Accessible parking sign		
			Landscape		
41	3	EA	3" Cal. Texas Red Oak		
42	15,526	SF	Solid sod turfgrass		
			Lighting and Electric		
43	1	LS	Ballfield lighting and Electrical		
			Irrigation		
44	1	LS	Irrigation (infield)		

Total Base Bid Proposal of Item "1" complete and in place, for the sum of: _____ Dollars and _____ Cents **(written) LUMP SUM**	**$_____** **(figures)** **LUMP SUM**

ALTERNATES

ITEM NO.	EST. QTY.	UNIT	DESCRIPTION WITH UNIT PRICES WRITTEN IN WORDS	UNIT PRICE (IN FIGURES)	TOTAL (IN FIGURES)
Alt.1	1	LS	Alternate #1: CHANGE work associated with Providing a wood picket outfield fence in lieu of the vinyl panels as indicated in details. Work fully performed, complete and in place for the REDUCED sum of: _____Dollars and _____Cents Per Lump Sum.	$_____	$_____

ITEM NO.	EST. QTY.	UNIT	DESCRIPTION WITH UNIT PRICES WRITTEN IN WORDS	UNIT PRICE (IN FIGURES)	TOTAL (IN FIGURES)
Alt.2	1	LS	Alternate #2: CHANGE work associated with Providing a premanufactured dugout roof structure in lieu of the roof structure as indicated in details. Work fully performed, complete and in place for the REDUCED sum of: _____Dollars and _____Cents Per Lump Sum.	$_____	$_____

ITEM NO.	EST. QTY.	UNIT	DESCRIPTION WITH UNIT PRICES WRITTEN IN WORDS	UNIT PRICE (IN FIGURES)	TOTAL (IN FIGURES)
Alt.3	1	LS	Alternate #3: DELETE work associated with Providing two (2) baseball sculptures on top of the entry wall as indicated in details. Work fully performed, complete and in place for the REDUCED sum of: _____Dollars and _____Cents Per Lump Sum.	$_____	$_____

Project shall be substantially complete no later than February 28, 2022.

All substitutions as an "OR EQUAL" must be approved in writing by the City at least three (3) business days prior to proposal opening.

It is understood that the quantities of work shown in the schedule of bid proposal items are approximate only and are subject to increase or decrease and the undersigned proposer offers to do the work at the unit price as stated in the schedule of proposal items.

Questions

Proposers are asked to examine this RFP upon request. All questions or clarifications shall only be directed in writing via fax or e-mail to 972-216-6397 or email at purchasing@cityofmesquite.com before the designated deadline for written questions. Questions received after the date specified above may not receive response. Any contact or attempt to contact any other employee of the City regarding this RFP may result in the immediate disqualification of the Proposer. Oral and other interpretations or clarifications will be without legal effect. Only questions answered by formal written addenda will be binding.

TERMINATION FOR DEFAULT

The City of Mesquite reserves the right to enforce the performance of this contract in any manner prescribed by law or deemed to be in the best interest of the City in the event of breach or default of this contract. City of Mesquite reserves the right to terminate the contract immediately in the event the successful bidder fails to:

- Meet delivery or completion schedules
- Otherwise perform in accordance with the accepted proposal

Breach of contract or default authorizes the City to award to another bidder, purchase elsewhere, and charge the full increase in cost to the defaulting bidder.

BID BOND

Bidders shall submit a Cashier's or Certified Check or a Bid Bond from a reliable surety company in the amount of five percent (5%) of bid. If a Bid Bond is submitted, the forms provided herein must be complete and signed by a surety licensed to do business in Texas. Bid security should be enclosed in the same envelope with the bid. Bids without the required bid security are subject to disqualification.

The required bid security shall serve as a guarantee that the successful bidder will enter into a contract and execute any additional bond and guarantee forms provided within ten (10) days after notice of award of contract. If no additional bonds are required, said bid security shall serve as a guarantee that the successful bidder will deliver all material, equipment and/or services in accordance with the bid and specifications.

Such security financially protects the City against a bidder's failure to do any of the above and is subject to forfeiture as liquidated damages if the successful bidder fails or refuses to enter into the contract for any of the following reasons: 1) The successful bidder fails to provide insurance as required in the contract documents within five (5) business days of notification that bidder is the apparent low bidder. 2) The successful bidder fails, within ten (10) calendar days from award of the bid by the Mesquite City Council, to submit properly executed performance and payment bonds as required by the Contract. If no performance and payment bonds are required, such security is subject to forfeiture as liquidated damages if the successful bidder fails or refuses to deliver all materials, equipment and /or services in accordance with the bid and specifications.

If applicable, the city shall retain the bid security submitted by the two next lowest bidders until the successful bidder executes the contract and bonds and provides all insurance as required herein. If no additional bonds are required, the bid security will be retained until delivery of all materials, equipment and / or services in accordance with the bid and specifications. If either of the next two low bidders becomes the low bidder, that bidder shall be subject to the forfeiture provisions stated above. Bid security submitted by all other bidders shall be returned as soon as practicable after the bid opening.

BID BOND

Bond No.: _____
(by Surety)

STATE OF TEXAS §
§ **KNOW ALL MEN BY THESE PRESENTS:**
COUNTY OF DALLAS §

THAT_____, of the City of _____, _____County, State of Texas (hereinafter referred to as "Principal"), and _____, authorized under the laws of the State of Texas to act as Surety on bonds for principals (hereinafter referred to as "Surety") are held and firmly bound unto the City of Mesquite (hereinafter referred to as "City") in the penal sum of $_____ (an amount equal to 5% of the approximate total amount of the bid or if the bid is based upon alternates and/or addenda, at least 5% of the greatest amount bid by the bidder or Principal herein as evidenced in the Bid Proposal) for the payment whereof, the said Principal and Surety bind themselves, and their heirs, administrators, executors, successors and assigns, jointly and severally, by these presents;

WHEREAS the Principal has submitted on or about this date, a bid proposal offering to perform the following: **LONCY LEAKE BALLFIELD RENOVATION: CONSTRUCTION AND CITY CONTRACT NO. 2021-062** in accordance with the specifications and terms and conditions related thereto, to which reference is hereby made;

NOW, THEREFORE, the condition of this obligation is such that if the said Principal's offer as stated in the bid proposal is accepted by the City, and the said Principal executes and returns to the City the number of original counterparts of the contract required by the City, on the forms provided by the City, for the materials, equipment and/or services described herein and also executes and returns the same number of Performance, Payment and Maintenance Bonds, if required, on the forms provided by the City, within the time provided in the specifications, then this obligation is null and void, otherwise, it is to remain in full force and effect;

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument on this _____ day of _____, 2021.

PRINCIPAL:	**SURETY:**
_____ Signature	_____ Signature
_____ Printed Name	_____ Printed Name
_____ Title	_____ Title
_____ Company	_____ Company
_____ Street Address	_____ Street Address *(P. O. Box is not acceptable)*
_____ City State Zip Code	_____ City State Zip Code
_____ Phone Number *(Dallas Telephone Number)*	

SURETY'S DALLAS COUNTY REGISTERED AGENT FOR SERVICE (REQUIRED):

Printed Name: _____

Title: _____

Company: _____

Street Address: _____
(P. O. Box is not acceptable)

_____
City State Zip Code

Phone Number: _____
(Dallas County Telephone Number)

(Attach dated Power of Attorney for Surety)

and with full knowledge for the requirements, do hereby agree to furnish the coverage in full accordance with the specifications and requirements.

I certify that _____ and its response complies with these
(Name of Organization)
specifications.

_____
Signature

_____
Type/Print Name

_____
Title

_____
Date

NOTICE

The following blank spaces in the contract are not to be filled in by the Proposer at the time of submitting his proposal. The contract form is submitted at this time to familiarize the Proposer with the form of contract, which the successful Proposer will be required to execute.

CONTRACT

STATE OF TEXAS §
§ KNOW ALL MEN BY THESE PRESENTS:
COUNTY OF DALLAS §

THIS CONTRACT is made and entered into on _____, _____, 2021 by and between the **CITY OF MESQUITE, TEXAS**, a municipal corporation, of the County of Dallas and State of Texas, acting through Cliff Keheley, City Manager, hereinafter termed the CITY, and _____, a _____, located at _____ hereinafter termed the CONTRACTOR.

WITNESSETH: That for and in consideration of the mutual covenants hereinafter set forth, the CITY and CONTRACTOR agree as follows:

I. DESCRIPTION OF WORK

The CONTRACTOR shall perform all of the work as specified in the contract documents such work generally described as:

LONCY LEAKE BALLFIELED RENOVATION: CONSTRUCTION
CITY CONTRACT NO. 2021-062

Plans and Specifications prepared by:

HALFF ASSOCIATES, INC.

All work shall be performed at the CONTRACTOR'S own proper cost and expense to furnish all the materials, supplies, machinery, equipment, tools, superintendence, labor, insurance, bonds and other accessories and services necessary to complete the work, in accordance with the Contract documents.

II. CONTRACT DOCUMENTS

The Contract documents shall consist of the following:

1. this Contract;
2. all addenda issued prior to award of Contract;
3. the bid specifications including the advertisement for bid, instruction to bidders, bidder's bid form, plans, and drawings (if any);
4. the City of Mesquite General Design Standards;
5. the *North Central Texas Council of Governments Public Works Construction Standards*, *Fifth Edition (November 2017), Division 100 General Provision*, as amended and supplemented by the City of Mesquite by Addendum (hereinafter referred to as the "General Provisions");
6. a Performance Bond in the sum of ONE HUNDRED PERCENT (100%) of the total Contract price, which Bond shall be in a form acceptable to the City, shall guarantee the work in accordance with the plans and specifications for a period of one (1) year after acceptance by the City, and shall provide for repair or replacement of all defects due to faulty material and/or workmanship that appear within a period of one (1) year from the date of acceptance by the City;
7. a Payment Bond in the sum of ONE HUNDRED PERCENT (100%) of the total

Contract price; and

8. the Contractor's bid/proposal and any other documents identified as pertaining to this Contract, all of which have been identified by the CITY and the CONTRACTOR.

These Contract documents constitute the entire agreement between the CITY and CONTRACTOR, and all are as fully a part of this Contract as if attached to or repeated herein. The Contract documents are complementary and what is called for by one shall be as binding as if called for by all. In the event of an inconsistency in any of the provisions of the Contract documents, the inconsistency shall be resolved by giving precedence to the Contract documents in the order in which they are listed above. The Contract may be altered, amended or modified only as provided in the general or special provisions.

III. TIME OF COMMENCEMENT, COMPLETION AND LIQUIDATED DAMAGES

The work to be performed under this Contract shall be commenced by the CONTRACTOR upon final execution of this Contract and notice from the CITY to proceed. All work to be performed under this Contract shall be completed by _____**, 2022**, subject to extensions of time provided in accordance with the Contract documents. Time is of the essence in this Contract and it is understood by the CONTRACTOR and CITY that actual damages caused by the failure of the CONTRACTOR to complete the work within the stated time are impractical or extremely difficult to fix or ascertain, and that per diem deduction from the Contract price shall be retained by the CITY as payment by the CONTRACTOR of liquidated damages, and not as penalty for such failure. Such liquidated damages to be assessed and retained are set forth in the General Provisions.

IV. CONTRACT PRICE

The CITY shall pay the CONTRACTOR for the performance of the work, subject to additions and deductions by change order or as otherwise provided in the provisions of this Contract, in current funds the Contract sum, which has been bid as a separated contract in compliance with the Texas Tax Code, as follows:

Total sum: _____($_____)

V. CONTRACT ADMINISTRATION

This Contract shall be administered on behalf of the CITY by the Director of Parks and Recreation Department or his/her designatee (referred to herein as "City Representative") and the CONTRACTOR shall fully comply with any and all instructions from said City Representative. With execution and delivery of the Contract, the CONTRACTOR shall furnish and file with the CITY in the amounts herein required, performance and payment bonds in accordance with the provisions of V.T.C.A. Government Code, Chapter 2253 if this is a public work contract in excess of fifty thousand dollars ($50,000.00).

VI. LABOR CLASSIFICATION AND MINIMUM WAGE SCALE

The CONTRACTOR is required to follow all provisions of Chapter 2258 of the Texas Government Code in the hiring and payment of all skilled and unskilled labor used on this

Contract. The CONTRACTOR must pay the prevailing wage rates as shown on the attached Wage Decision.

VII. DISCLOSURE OF CONFLICTS OF INTEREST AND COMPLIANCE WITH OTHER APPLICABLE LAWS

The CONTRACTOR shall at all times observe and comply with all Federal, State and local laws, ordinances and regulations including all amendments and revisions thereto, which in any manner affect the CONTRACTOR or the services and/or items to be provided, specifically and not limited to any ethics laws. In particular, the CONTRACTOR is put on notice that the CITY will require the CONTRACTOR to comply with Chapter 176 of the Texas Local Government Code by completing the attached Conflict of Interest questionnaire (FORM CIQ) and returning the completed FORM CIQ to the CITY. Additionally, CONTRACTOR must comply with Section 2252.908 of the Texas Government Code, which was enacted in 2015 by the Texas Legislature pursuant to HB 1295, providing that a governmental entity may not enter into certain contracts with a business entity on or after January 1, 2016, unless the business entity submits a disclosure of interested parties (FORM1295) to the governmental entity at the time the business entity submits the signed contract to the governmental entity. Further information regarding the disclosure of interested parties law and instructions on filing FORM1295 can be found at the Texas Ethics Commission web site at the following web address:

https://www.ethics.state.tx.us/whatsnew/elf_info_form1295.htm

VIII. INSURANCE

The CONTRACTOR agrees to provide and to maintain the types and amounts of insurance set forth in the General Provisions attached hereto, and to include the CITY as an additional insured in all policies providing coverage for the term of this Contract.

IX. CHOICE OF LAW, VENUE AND CONTRACT INTEPRETATION

The Parties agree that the laws of the State of Texas shall apply to this Contract, and that it is performable in Dallas County, Texas. Exclusive venue shall lie in Dallas County, Texas. Although this Contract is drafted by the CITY, should any part be in dispute, the parties agree this Contract shall not be construed more favorably for either Party.

X. SEVERABILITY

If any part of this Contract shall be stricken for any reason whatsoever or found to be invalid or unenforceable, that part will be severed and the remainder of this Contract will continue in full force and effect.

XI. SURVIVAL

Any liabilities or obligations of a Party for acts or omissions prior to the cancellation or termination of this Contract, and any other provisions of this Contract which, by their terms, are contemplated to survive (or to be performed after) termination of this Contract, shall survive cancellation or termination thereof.

XII. MISCELLANEOUS

Pursuant to Section 2271.002, Texas Government Code, unless otherwise exempt, if the

CONTRACTOR employs 10 or more full-time employees and the Contract has a value of $100,000 or more, the CONTRACTOR hereby (i) represents that it does not boycott Israel, and (ii) subject to or as otherwise required by applicable federal law, including without limitation 50 U.S.C. Section 4607, agrees it will not boycott Israel during the term of the Agreement. As used in the immediately preceding sentence, "boycott Israel" shall have the meaning given such term in Section 2271.001, Texas Government Code.

CONTRACTOR further represents that (i) it does not engage in business with Iran, Sudan or any foreign terrorist organization and (ii) it is not listed by the Texas Comptroller under Section 2252.153, Texas Government Code, as a company known to have contracts with or provide supplies or services to a foreign terrorist organization. As used in the immediately preceding sentence, "foreign terrorist organization" shall have the meaning given such term in Section 2252.151, Texas Government Code.

XIII. AUTHORITY TO SIGN

The undersigned officers and/or agents of the parties hereto are the properly authorized officials and have the necessary authority to execute this Contract on behalf of the parties hereto.

IN WITNESS WHEREOF, the CITY and CONTRACTOR have executed this Contract in the year and day first written above.

CITY OF MESQUITE
(CITY)

By: _____
Cliff Keheley, City Manager

ATTEST:

By: _____
Sonja Land, City Secretary

APPROVED AS TO FORM:

By: _____
City Attorney or Designee

_____
(CONTRACTOR)

BY: _____
(Owner/President)

ATTEST:

_____

PERFORMANCE BOND

Bond No. _____

STATE OF TEXAS §
§ KNOW ALL MEN BY THESE PRESENTS:
COUNTY OF DALLAS §

THAT _____, of the City of _____, _____ County, State of Texas, (hereinafter referred to as "Principal"), and **_____** (hereinafter referred to as "Surety"), authorized under the laws of the State of Texas to act as Surety on bonds for principals are held and firmly bound unto the **City of Mesquite** (hereinafter referred to as "City") in the penal sum of **$_____** (not less than 100% of the approximate total amount of the Contract as evidenced in the Proposal) for the payment whereof, the said Principal and Surety bind themselves, and their heirs, administrators, executors, successors and assigns, jointly and severally, by these presents:

WHEREAS the Principal has entered into a certain written contract with the City, dated the _____day of _____, 2021, for the **LONCY LEAKE BALLFIELD RENOVATION: CONSTRUCTION AND CITY CONTRACT NO. 2021-062** to which said Contract is hereby referred to and made a part hereof and as fully and to the same extent as if copied at length herein;

NOW, THEREFORE, the condition of this obligation is such that if the said Principal fully and faithfully executes the work and performance of the Contract in accordance with the Plans, Specifications and Contract Documents, including any extensions thereof, and according to the true intent and meaning of said Contract and the Plans and Specifications hereto annexed, then this obligation shall be void; otherwise, to remain in full force and effect.

PROVIDED, HOWEVER, that this Bond is executed pursuant to the provisions of V.T.C.A. Government Code Chapter 2253, Public Work Performance and Payment bonds, as amended, and Article 53.201 of the Property Code, and all liabilities on this Bond shall be determined in accordance with the provisions of said articles to the same extent as if they were fully copied at length herein.

Surety, for value received, stipulates and agrees that the Bond shall automatically be increased by the amount of any change order or supplemental agreement which increases the contract price with or without notice to the Surety and that no change, extension of time, alteration or addition to the terms of the Contract, or to the work performed thereunder, or the Plans, Specifications or Drawings accompanying the same shall in any way affect its obligation on this Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder.

Surety must be approved by the Texas State Board of Insurance under Article 7.19-1 of the Insurance Code and authorized under the laws of Texas to act a surety on bonds for principals.

Surety agrees that the bond provides for the repairs and/or replacement of all defects due to faulty materials and workmanship that appear within a period of **one (1) year** from the

date of completion and acceptance of the improvement by the City.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument on this the ___ day of _____, 2021.

PRINCIPAL:	**SURETY:**
_____	_____
Signature	Signature
_____	_____
Printed Name	Printed Name
_____	_____
Title	Title
_____	_____
Company	Company
_____	_____
Street Address	Street Address *(P. O. Box is not acceptable)*
_____	_____
City State Zip Code	City State Zip Code
_____	
Phone Number *(Dallas Telephone Number)*	

SURETY'S DALLAS COUNTY REGISTERED AGENT FOR SERVICE (REQUIRED):

Printed Name: _____

Title: _____

Company: _____

Street Address: _____
(P. O. Box is not acceptable)

_____
City State Zip Code

Phone Number: _____
(Dallas County Telephone Number)
(Attach dated Power of Attorney for Surety)

PAYMENT BOND

Bond No. _____

STATE OF TEXAS §
§ KNOW ALL MEN BY THESE PRESENTS:
COUNTY OF DALLAS §

THAT _____, of the City of _____, _____County, State of Texas, (hereinafter referred to as Principal), and **_____** (hereinafter referred to as "Surety"), authorized under the laws of the State of Texas to act as Surety on bonds for principals are held and firmly bound unto the City of Mesquite (hereinafter referred to as "City") in the penal sum of **$_____** (an amount not less than 100% of the approximate total amount of the Contract) for the payment whereof, the said Principal and Surety bind themselves, and their heirs, administrators, executors, successors and assigns, jointly and severally, by these presents:

WHEREAS the Principal has entered into a certain written contract with the City, dated the ___ day of _____, 2021, for the **LONCY LEAKE BALLFIELD RENOVATION: CONSTRUCTION AND CITY CONTRACT NO. 2021-062** to which said Contract is hereby referred to and made a part hereof and as fully and to the same extent as if copied at length herein;

NOW, THEREFORE, the condition of this obligation is such that the bond guarantees the full and proper protection of all claimants supplying labor and material in the prosecution of the work provided for in said Contract and for the use of each claimant, and that conversely should the Principal faithfully perform said Contract and in all respects duly and faithfully observe and perform all and singular the covenants, conditions and agreements in and by said Contract agreed to by the Principal, and according to the true intent and meaning of said Contract, and the claims and specifications hereto annexed, then this obligation shall be void; otherwise, to remain in full force and effect.

PROVIDED, HOWEVER, that this Bond is executed pursuant to the provisions of V.T.C.A. Government Code Chapter 2253, Public Work Performance and Payment bonds, as amended, and Article 53.201 of the Property Code, and all liabilities on this Bond shall be determined in accordance with the provisions of said articles to the same extent as if they were fully copied at length herein.

Surety, for value received, stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract, or to the work performed thereunder, or the Plans, Specifications or Drawings accompanying same shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder.

Surety must be approved by the Texas State Board of Insurance under Article 7.19-1 of the Insurance Code and authorized under the laws of Texas to act a surety on bonds for principals.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument on this the ___ day of _____, 2021.

PRINCIPAL:	**SURETY:**
_____	_____
Signature	Signature
_____	_____
Printed Name	Printed Name
_____	_____
Title	Title
_____	_____
Company	Company
_____	_____
Street Address	Street Address *(P. O. Box is not acceptable)*
_____	_____
City State Zip Code	City State Zip Code
_____	
Phone Number *(Dallas Telephone Number)*	

SURETY'S DALLAS COUNTY REGISTERED AGENT FOR SERVICE (REQUIRED):

Printed Name: _____

Title: _____

Company: _____

Street Address: _____
(P. O. Box is not acceptable)

_____
City State Zip Code

Phone Number: _____
(Dallas County Telephone Number)

(Attach dated Power of Attorney for Surety)

SECTION TS

TECHNICAL SPECIFICATIONS

SECTION TS
TECHNICAL SPECIFICATIONS

Drawings:

Prepared by Halff Associates Inc., Richardson, Texas
Issued June 11, 2021 for RFP 2021-062

Sheet Index:

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L 1.02 LAYOUT PLAN
L 1.03 ENLARGEMENT PLAN
L 1.04 GRADING AND EROSION CONTROL PLAN
L 1.05 LANDSCAPE PLAN
L 2.01 DETAILS
L 2.02 DETAILS
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L 2.04 DETAILS
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IR 1.01 IRRIGATION PLABN
E1.1 SITE PLAN ELECTRICAL DEMOLITION PLAN
E1.2 SITE PLAN SPORTS LIGHTING ELECTRICAL
E1.3 SPORTS LIGHTING SCHEDULES AND SCOREKEPPER DETAILS
E1.4 SITE PLAN SPORTS LIGHTING DIMENSION PLAN
E1.5 SITE PLAN SPORTS LIGHTING PHOTOMETRIC CALCULATIONS
E2.1 ONE LINE DIAGRAM AND PANEL SCHEDULES
E4.1 SPORTS LIGHTING POLE ELEVATIONS
E4.2 ELECTRICAL DETAILS
E4.3 MUSCO STRUCTURAL POLE BASE DETAILS
S1.00 STRUCTURAL GENERAL NOTES
S1.01 STRUCTURAL DETAILS

Specifications:

Prepared by Halff Associates, Inc., Richardson, Texas
Issued June 11, 2021 for RFP 2021-062

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00 01 07 – Certification Page
00 01 10 – Table of Contents
00 72 00 – General Conditions

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01 25 00 – Contract Modifications Procedures
01 25 13 – Substitution Procedures

01 29 00 – Payment Procedures
01 31 00 – Project Meetings, Management and Coordination
01 32 33 – Photographic Documentation
01 33 00 – Submittal Procedures
01 41 00 – Testing Laboratory Services
01 51 00 – Temporary Utilities and Facilities
01 57 13 – Temporary Erosion Sediment and Water Pollution Control
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01 60 00 – Product Requirements
01 63 00 – Substitutions and Product Options
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26 05 10 – General Requirements for Electrical Work
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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 53 – Identification for Electrical Systems
26 05 73 – Arc-Flash Study
26 22 00 – Mini Power Zones
26 24 16 – Panelboards
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DIVISION 31 – EARTHWORK

31 10 00 – Site Preparation
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32 92 00 – Turfgrass Planting
32 93 43 – Tree Planting
32 94 00 – Irrigation System

SECTION 01 10 00

SUMMARY OF THE WORK

PART 1 – GENERAL

1.01 PROJECT INFORMATION

A. Project Identification: Loncy Leake Baseball Field Renovation

B. Project Location: Mesquite, Texas

C. Owner:
   1. Owner's Project Manager: City of Mesquite – Parks and Recreation Department
      1515 N. Galloway
      Mesquite, Texas 75149
   2. Owner's Project Manager: Robert Blankenship

D. Landscape Architect: Halff Associates
   1201 N. Bowser Road
   Richardson, Texas 75081
   214.346.6268
   1. Project Manager: David Buchanan

1.02 WORK COVERED BY CONTRACT DOCUMENTS

A. The work covered by the contract documents consists of furnishing all labor, materials, services and equipment required in conjunction with or properly incidental to the construction of the Legends Baseball Field. Construction activities shall include the following:
   1. Demolition and removal
   2. Erosion Control
   3. Grading
   4. Concrete Paving and Construction
   5. Storm Drainage
   6. Lighting / Electrical Service
   7. Grass Planting
   8. Masonry
   9. Standing Seam Metal Shade Coverings
   10. Tree Planting
   11. Irrigation
   12. Chain Link Fencing
   13. Backstop
   14. Athletic and Site Accessories
   15. Outfield Fencing

1.03 ALTERNATE BID ITEM

A. Alternate Bid Item shall include the following:
   1. Alternate Bid no. 1 – Painted wood outfield fence in lieu of the vinyl panel fence.
   2. Alternate Bid no. 2 – Premanufactured dugout roof structure.
   3. Alternate Bid no. 3 – Delete the precast concrete baseballs on top of the Honor Wall.

.

1.04 OWNER SUPPLIED ITEMS (NOT IN CONTRACT)

A. OWNER will provide the bases, pitching rubbers and home plates. CONTRACTOR will be responsible for installing the anchors for the bases.

B. OWNER will provide the dugout benches.

1.05 ACCESS TO THE SITE

A. General: CONTRACTOR shall access the site for construction operations from Parkview Street.

B. CONTRACTOR shall submit a Construction Staging Plan for approval by the OWNER prior to the start of construction.

C. The construction staging area shall not interfere with the existing parking lots.

1.06 DAMAGE TO EXISTING IMPROVEMENTS

A. Any damage to existing improvements and utilities on and adjacent to the site shall be repaired at the CONTRACTOR'S expense.

B. CONTRACTOR shall make a photographic record of damage to existing improvements on or near the construction site to create a record of the existing condition of these improvements.

1.07 WORK RESTRICTIONS

A. On-Site Work Hours: Limit work to normal business working hours of 7:00 AM to 7:00 PM.
B. Saturday Work Hours: 9:00 AM to 6:00 PM. (Confirm and coordinate with Owner prior to commencing work on Saturdays)

1.08 SCHEDULE

A. The project should be completed by February 22, 2022.
B. There will be an interim completion date. All the work on the field including topdressing the outfield, installing the irrigation and sodding the infield should be completed no later than August 24, 2021.

END OF SECTION

SECTION 01 25 00

CONTRACT MODIFICATIONS PROCEDURES

PART 1 – GENERAL

1.01 SUMMARY

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

1.02 MINOR CHANGES IN THE WORK

A. Landscape Architect may issue supplemental instructions authorizing minor changes in the Work, not involving adjustments to the Completion Date or Contract Sum.

1.03 PROPOSAL REQUESTS

A. OWNER – Initiated Proposal Requests: Landscape Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum and/or Completion Date. If necessary, the description will include supplemental or revised Drawings or Specifications.
   1. Proposal Requests issued by the Landscape Architect are for information only. Do not consider them instructions either to stop work progress or execute the proposed change.
   2. After receipt of the Proposal Request and within the time specified in the Proposal Request the CONTRACTOR will submit a quotation estimating any adjustments to the Contract Sum and/or Completion date necessary to execute the requested change.
      a. Include an itemized description of the Work items impacted by the requested change and the cost associated with these Work items.
      b. Include all applicable taxes, delivery charges, equipment rentals, etc.
      c. Include cost of labor and supervision directly attributable to the requested Work items.

B. CONTRACTOR – Initiated Proposal Requests: If latent or unforeseen conditions require modifications to the Contract, the CONTRACTOR may propose changes to the Work by submitting a request for a change to the Landscape Architect.
   1. Include a statement outlining reasons for the requested change and the impact of this change on the Work. Provide a detailed description of the proposed change. Indicate the impact of the proposed change on the Contract Sum and/or the Completion Date.
   2. Include an itemized description of the Work items impacted by the requested change and the cost associated with these Work items.
   3. Include all applicable taxes, delivery charges, equipment rentals, etc.
   4. Include cost of labor and supervision directly attributable to the requested Work items.

1.04 CHANGE ORDER PROCEDURE

A. Upon the OWNER'S approval of the Proposal Request the Landscape Architect will issue a Change Order for Signatures by the OWNER and the CONTRACTOR on AIA Document G701.

END OF SECTION

SECTION 01 25 13

SUBSTITUTION PROCEDURES

PART 1 – GENERAL

1.01 SUMMARY

A. This section includes administrative and procedural requirements for substitutions

1.02 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment and methods of construction from those required by the Contract Documents and proposed by the CONTRACTOR.
   1. Substitutions for Cause: Changes proposed by the CONTRACTOR that are required due to changed Project conditions, such as unavailability of product, regulatory changes or unavailability of required warranty terms.
   2. Substitution for Convenience: Changes proposed by the CONTRACTOR or OWNER that are not required in order to meet other Project requirements but may offer advantages to the CONTRACTOR or OWNER.

1.03 SUBMITTALS:

A. Substitution Requests: Submit three (3) copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
   1. Substitution Request Form: CONTRACTOR to provide their own form.
   2. Documentation: Show compliance with requirements for substitutions and the following, as applicable
      a. Statement indicating why the specified product, fabrication or installation cannot be provided, if applicable.
      b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the OWNER and separate CONTRACTORs that may be necessary to accommodate the proposed substitution.
      c. Detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Include annotated copy of applicable specification sections. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
      d. Product Data, including drawings and descriptions of products, fabrication and installation procedures.
      e. Samples, where applicable or requested.
      f. Certificates and qualification data, where applicable or requested.
      g. List of similar installations on completed projects with project names and addresses and names and addresses of the design professionals and OWNERs.
      h. Material test reports form a qualified testing agency indicating and interpreting test results for compliance with the requirements indicated.
      i. Research reports evidencing compliance with building code in effect for the Project.

j. Detailed comparison of CONTRACTOR'S construction schedule using the proposed substitution with the products specified for the Work, including effect on the overall Contract Time. If the specified product or method of construction cannot be provided within the Contract Time, include a letter from the manufacturer, on the manufacturer's letterhead, stating date of receipt of the purchase order, lack of availability or delays in delivery.
k. Cost information, including a proposal of change, if any, in the Contract Sum.
l. CONTRACTOR'S certification that the proposed substitution complies with the requirements in the Contract Documents except as indicated in the substitution request, is compatible with related materials and is appropriate for the applications indicated.
m. CONTRACTOR'S waiver of rights to additional payment or time that may subsequently become necessary because of the failure of the proposed substitution to produced the specified results.

3. Landscape Architect's Action: If necessary, the Landscape Architect, will request additional information or documentation for evaluation within seven (7) days of receipt of a request for substitution. The Landscape Architect will notify the CONTRACTOR of acceptance or rejection of the proposed substitution within fifteen (15) days of receipt of the request or seven (7) days of receipt of additional information or documentation, whichever if the later.
   a. Forms of Acceptance: Change Order, Construction Change Directive or Landscape Architect's Supplemental Instructions for minor changes in the Work.
   b. Use product specified if the Landscape Architect does not issue a decision on the use of a proposed substitution within the time allotted.

1.04 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of the proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by the manufacturers.

1.05 PROCEDURES

A. Coordination: Modify or adjust affected Work as necessary to integrate Work of the approved substitutions.

PART 2 – PRODUCTS

2.01 SUBSTITUTIONS

A. Substitution for Cause: Submit requests for substitution immediately upon discovery or need for change, but not later than fifteen (15) days prior to the time required for preparation and review of related submittals.
   1. Conditions: Landscape Architect will consider the CONTRACTOR'S request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, the Landscape Architect will return the request without action, except to record noncompliance with the following requirements:
      a. Requested substitution is consistent with the Contract Documents and will produce the specified results.
      b. Substitution request is fully documented and properly submitted.

c. Requested substitution will not adversely affect CONTRACTOR'S construction schedule.
d. Requested substitution has received the necessary approvals of the authorities having jurisdiction.
e. Requested substitution is compatible with other portions of the Work.
f. Requested substitution has been coordinated with other portions of the Work.
g. Requested substitution provides the specified warranty.
h. If requested substitution involves more than one CONTRACTOR, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products and is acceptable to all CONTRACTORs involved.

B. Substitution for Convenience: Not allowed, unless otherwise indicated.

C. Substitution for Convenience: The Landscape Architect will consider the CONTRACTOR'S request for substitution if received within sixty (60) days after the Notice to Proceed. Requests received after that time may be considered or rejected at the discretion of the Landscape Architect.
1. Conditions: Landscape Architect will consider the CONTRACTOR'S request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, the Landscape Architect will return the request without action, except to record noncompliance with the following requirements:
a. Requested substitution offers the OWNER a substantial advantage in cost, time, energy conservation or other considerations, after deducting additional responsibilities the OWNER may assume. The OWNER'S additional responsibilities may include compensation to the Landscape Architect for redesign and evaluation services, increased cost of other construction by the OWNER and similar considerations.
b. Requested substitution does not require extensive revisions to the Contract Documents.
c. Requested substitution is consistent with the Contract Documents and will produce the indicated results.
d. Substitution request is fully documented and properly submitted.
e. Requested substitution will not adversely affect CONTRACTOR'S construction schedule.
f. Requested substitution has received the necessary approvals of the authorities having jurisdiction.
g. Requested substitution is compatible with other portions of the Work.
h. Requested substitution has been coordinated with other portions of the Work.
i. Requested substitution provides the specified warranty.
j. If requested substitution involves more than one CONTRACTOR, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products and is acceptable to all CONTRACTORs involved.

PART 3 – EXECUTION (Not Used)

END OF SECTION

SECTION 01 29 00

PAYMENT PROCEDURES

PART 1 – GENERAL

1.01 SUMMARY

A. This section specifies administrative and procedural requirements to prepare and process applications for payment.

1.02 DEFINITIONS

A. Schedule of Values: A statement furnished by the CONTRACTOR allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing CONTRACTOR'S Applications for Payment.

1.03 SCHEDULE OF VALUES

A. Coordination: coordinate preparation of the Schedule of Values with preparation of the CONTRACTOR'S Construction Schedule.
   1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:
      a. Application for payment form
      b. Submittal Schedule
      c. CONTRACTOR'S Construction Schedule
   2. Submit the Schedule of Values to the Landscape Architect at the earliest possible date but not later than seven (7) days before the scheduled submittal of the initial Application for Payment.
   3. Sub-schedules: Where the work is separated into phases requiring separately phased payments, providing sub-schedules showing values correlated with each phase of payment.

A. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.
   1. Identification: Include the following Project identification on the Schedule of Values:
      a. Project name and location
      b. Name of the Landscape Architect
      c. Bid Number
      d. CONTRACTOR'S name and address
      e. Date of submittal
   2. Submit a draft of AIA Document G703 Continuation Sheets.
   3. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
      a. Related Specification Section or Division
      b. Description of the Work

c. Name of sub-CONTRACTOR
d. Name of manufacturer or fabricator
e. Name of supplier
f. Change Order (numbers) that affect value
g. Dollar Value
i. Percentage of the Contract Sum to the nearest one-hundredth percent, adjusted to a total of one hundred (100%) percent.

4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Application for Payments and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal sub-contract amounts, where appropriate. **Include separate line items under the required principal sub-contracts for operation and maintenance manuals, punch list activities, Project Record Documents and demonstration and training in the amount of five (5%) percent of the Contract Sum.**
5. Round amounts to the nearest whole dollar, total shall equal the Contract Sum.
6. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
   a. Differentiate between items stored on-site and items stored off-site. Include evidence of an insured or bonded warehouse.
7. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
8. Allowances: Provide a separate line item in the Schedule of Values for each allowance. Show line item value of unit cost allowances, as a product of the unit cost, multiplied by the measured quantity. Use information indicated in the Contract Documents to determine quantity.
9. Each item in the Schedule of Values and Application for Payments shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
   a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at the CONTRACTOR'S option.
10. Schedule Updating: Update and resubmit the Schedule of Values before the next Application for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.04 APPLICATION FOR PAYMENT

A. Each Application for Payment shall be consistent with the previous application and payments approved by the Landscape Architect and paid for by the OWNER.
   1. Initial Application for Payment, Application for Payment at the time for Substantial Completion, and final Application for Payment that involves additional requirements.

B. Payment Application Times: The date for each progress payment is indicated in the Agreement between the OWNER and the CONTRACTOR. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.

C. Payment Application Times: Progress payments shall be submitted to the Landscape Architect at a time to be specified and agreed upon at the Pre-Construction Conference. The period covered by each Application for Payment is one month, ending on the **last day of the month.**

D. Payment Application Forms: Use AIA Document G702 and AIA Document G703 Continuation Sheets as the form for the Application for Payment.

E. Application Preparation: Complete every entry on the form. Notarize and execute by a person authorized to sin legal documents on behalf of the CONTRACTOR. The Landscape Architect will return incomplete applications without action.
   1. Entries shall match data on the Schedule of Values and CONTRACTOR'S Construction Schedule. Use updated schedules if revisions were made.
   2. Include amounts of Change Orders and Construction Change Directives issued before the last day of the construction period covered by the application.

F. Transmittal: **Submit three (3) signed and notarized original copies** of each Application for Payment to the Landscape Architect by a method ensuring receipt within twenty-four (24) hours. One copy shall include waivers of lien and similar attachments if required.
   1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about the application.

G. Waiver of Mechanic's Lien: With each Application of Payment, submit a waiver of mechanic's lien from every entity who is lawfully entitled to file a mechanic's lien (including sub-CONTRACTORs, and suppliers) arising out of the Contract and related to the Work covered by the payment.
   1. Submit partial waivers on each item for the amount requested in previous applications, after deducting for retainage, on each item.
   2. When an application shows completion of an item, submit final or full waivers.
   3. The OWNER reserves the right to designate which entities involved in the Work must submit waivers.
   4. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to the OWNER.

H. Initial Application for Payment: **Administrative actions and submittals that must precede or coincide with submittal of the first Application for Payment** shall include the following:
   1. List of sub-CONTRACTORs
   2. Schedule of Values
   3. CONTRACTOR'S Construction Schedule
   4. Products List
   5. Schedule of unit prices
   6. Submittal Schedule
   7. List of CONTRACTOR'S staff assignments
   8. List of CONTRACTOR'S principal consultants
   9. Copies of building permits
   10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
   11. Initial progress report
   12. Report of preconstruction conference

13. Certificates of insurance and insurance policies
14. Performance and payment bonds
15. Date needed to acquire OWNER'S insurance
16. Initial settlement survey and damage report if applicable

J. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing one hundred (100%) percent completion for the portion of the Work claimed as substantially complete.
   1. Include documentation supporting the claim that the Work is substantially complete and a statement showing an accounting of changes in the Contract Sum.
   2. This application shall reflect Certificates of Partial Substantial Completion issued previously for OWNER occupancy of designated portions of the Work.

K. Final Application for Payment: Submit the Final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited to the following:
   1. Evidence of completion of Project Closeout requirements.
   2. Insurance certificates for products and completed operations where required and proof that taxes, fees and similar obligations were paid.
   3. Updated final statement, accounting for final changes to the Contract Sum.
   4. AIA Document G706 "CONTRACTOR'S Affidavit of Payment of Debts and Claims".
   5. AIA Document G706A, "CONTRACTOR'S Affidavit of Release of Liens".
   6. AIA Document G707, "Consent of Surety to Final Payment".
   7. Evidence that any claims have been settled.
   8. Final meter readings for utilities, a measured record of stored fuel and similar data as a date of Substantial Completion, or when the OWNER takes possession of and assumes responsibility for corresponding elements of Work.
   9. Final, liquidated damages settlement statement.

END OF SECTION

SECTION 01 31 00

PROJECT MEETINGS, MANAGEMENT AND COORDINATION

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes administrative provisions for coordinating construction operations related to the Project including, but not limited to, the following:
   1. General project coordination procedures.
   2. Submittals.
   3. Administrative and supervisory personnel.
   4. Project meetings.
   5. Requests for Information (RFI's).

B. Each CONTRACTOR shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific CONTRACTOR.

1.02 DEFINITIONS

A. Request for Information (RFI): Request from OWNER or CONTRACTOR seeking interpretation or clarification of the Contract Documents.

1.03 COORDINATION

A. Coordination: Coordinate construction operations included in different section of the Specifications to ensure efficient and orderly installations of each part of the Work. Coordinate construction operations, included in different sections of the Specifications that depend on each other for proper installation, connection and operation.
   1. Schedule construction operations in the sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after installation.
   2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service and repair.
   3. Make adequate provisions to accommodate items scheduled for later installation.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports and list of attendees at meetings.
   1. Prepare similar memoranda for the OWNER and separate CONTRACTORs if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other CONTRACTORs to avoid conflicts and to ensure orderly progress of Work. Such administrative activities include, but are not limited to, the following:
   1. Preparation of CONTRACTOR'S construction schedule.
   2. Preparation of the Schedule of Values.
   3. Installation and removal of temporary facilities and controls.
   4. Delivery and processing of submittals.
   5. Progress meetings.
   6. Pre-installation conferences.
   7. Start-up and adjustment of systems.
   8. Project closeout activities.

D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water and materials. Coordinate use of temporary utilities to minimize waste.
   1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. Refer to other sections of the Specifications for disposition of salvaged materials that are designated as the OWNER'S property.

E. Critical Observations: The CONTRACTOR is required to notify the Landscape Architect and the OWNER a minimum of forty-eight (48) hours prior to the time for critical observations.

1.04 SUBMITTALS

A. Refer to Section 01 33 00 – Submittal Procedures.

B. Key Personnel Names: Within ten (10) working days of starting construction operations, the CONTRACTOR shall submit a list of key personnel including superintendent and other personnel in attendance at the Project site. Identify individuals and their duties and responsibilities, list telephone numbers including office and cellular and email address.
   1. Post copies of the personnel list in the temporary field office. Keep list current at all times.

1.05 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

A. General: In addition to the Project Superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work.
   1. Include special personnel required for coordination of operations with other CONTRACTORs.

1.06 PROJECT MEETINGS

A. General: Landscape Architect will schedule and conduct meetings and conferences at the Project site.
   1. Attendees: Landscape Architect will inform participants and others involved and individuals whose presence is required, of the date and time of each meeting.
   2. Agenda: Landscape Architect will prepare the meeting agenda and will distribute it to all invited attendees.

B. Pre-construction Conference: OWNER and Landscape Architect will schedule and conduct a pre-construction conference before starting construction but not later than ten (10) days after execution of the construction contract. The conference will take place at a location determined by the OWNER. The conference is to review responsibilities and personnel assignments.
   1. Attendees: Authorized representatives of the OWNER, Landscape Architect and their consultants, CONTRACTOR and its superintendent, major sub-CONTRACTORs, suppliers and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
   2. Agenda: The Landscape Architect will prepare an agenda that will highlight items of significance related to Project construction, including the following:
      a. Tentative project schedule.
      b. Phasing.
      c. Critical work sequencing and long-term lead items.
      d. Designation of key personnel and their duties.
      e. Lines of communication.
      f. Procedures for processing field decisions and Change Orders.
      g. Procedures for RFI's.
      h. Procedures for testing and inspecting.
      i. Procedures for processing Applications for Payment.
      j. Distribution of Contract Documents.
      k. Submittal procedures.
      l. Preparation of Record Documents.
      m. Use of existing on-site utilities and facilities.
      n. Work restrictions.
      o. Work hours.
      p. OWNER'S occupancy requirements.
      q. Responsibility for temporary facilities.
      r. Construction waste management.
      s. Parking availability and location.
      t. Office, work and storage areas.
      u. Equipment deliveries.
      v. Security.
      w. Progress cleaning.
      x. Tracking of weather or other days of construction delay.
   3. Minutes: The Landscape Architect will record and distribute meeting minutes.

C. Pre-installation Conferences: Conduct pre-installation conferences at the Project site before each construction activity that requires coordination with other construction.
   1. Attendees: Installer and representatives of the manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and other installations that have preceded or will follow shall attend. The Landscape Architect and CONTRACTOR will coordinate these conferences.
   2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including the following requirements:
      a. Contract Documents.
      b. Options.

c. Related RFI's.
d. Related Change Orders.
e. Purchases.
f. Deliveries.
g. Submittals.
h. Review of mockups.
i. Possible conflicts.
j. Potential compatibility problems.
k. Time schedules.
l. Weather limitations.
m. Manufacturer's written recommendations.
n. Warranty requirements.
o. Material compatibility.
p. Acceptability of substrates.
q. Temporary facilities and controls.
r. Space and access requirements.
s. Regulations of authorities having jurisdiction.
t. Testing and inspection requirements.
u. Installation procedures.
v. Coordination with other Work.
w. Required performance results.
x. Protection of adjacent work.
y. Construction safety.

3. Landscape Architect will record conference discussions, agreements, disagreements and decisions made, including required corrective measures and actions if required.
4. Reporting: Landscape Architect will distribute minutes of the conference to each party present.
5. Do not proceed with installation if the conference does not conclude successfully. Initiate whatever actions are necessary to resolve impediments to progress of the Work and reconvene the conference at the earliest feasible date.

D. Progress Meetings: Landscape Architect will conduct progress meetings at monthly intervals unless there is a need for more meetings.
1. Landscape Architect will coordinate dates of meetings with preparation of pay applications.
2. Attendees: In addition to representatives of the OWNER and Landscape Architect, each CONTRACTOR, sub-CONTRACTOR, supplier and other entity concerned with construction progress or involved in planning, coordination or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with the Project and authorized to conclude matters relating to the Work.
3. Agenda: Review minutes of the previous meeting or other items of significance that could impact construction progress. Include topics for discussion as appropriate to the status of the Project.
a. CONTRACTOR'S Construction Schedule: Review construction progress since the previous meeting. Determine whether each activity is on time, ahead of schedule or behind schedule in relation to the CONTRACTOR'S construction schedule. Determine how construction activities that are behind schedule can be expedited by securing commitments from the parties involved. Discuss whether schedule revisions are

required to ensure that current and subsequent activities will be completed with the Contract Time.
1) Review next month's schedule.

b. Review present and future needs of each entity present, include the following:
1) Status of submittals
2) Deliveries
3) Off-site fabrication
4) Access
5) Site utilization
6) Temporary facilities
7) Progress cleaning
8) Quality and work standards
9) Status of correction of deficient items
10) Field observations
11) Status of RFI's
12) Status of proposal requests
13) Pending changes
14) Status of change orders
15) Pending claims and disputes
16) Documentation of information for payment application
17) Record drawings
18) Work hours and construction delays

4. Minutes: Landscape Architect will record and distribute the meeting minutes to each party present.
a. Schedule Update: CONTRACTOR to revise the construction schedule after each progress meeting where revisions to the schedule were discussed and agreed upon. A revised schedule should be issued no later than one (1) week after the progress meeting.

1.07 REQUESTS FOR INFORMATION (RFI's)

A. General: Immediately upon discovery or the need for additional information or interpretation of the Contract Documents, the CONTRACTOR shall prepare and submit an RFI in the form specified.
1. Landscape Architect will return RFI's with no response any RFI that is submitted by any other entity other than the CONTRACTOR.
2. CONTRACTOR shall coordinate and submit RFI's in a prompt manner so as to avoid delays in Work.

B. RFI content: The CONTRACTOR shall include a detailed and legible description of the item needing information or interpretation and shall include the following:
1. Project name.
2. Project number.
3. Date.
4. CONTRACTOR'S name.
5. Landscape Architect's name.
6. RFI number (numbered sequentially).
7. Subject of RFI.

8. Specification section number and title and related paragraph, as appropriate.
9. Drawing number and detail reference, as appropriate.
10. Field dimensions and conditions, as appropriate.
11. CONTRACTOR'S suggestion resolution. If the CONTRACTOR'S solution(s) impacts the Contract Time or the Contract Sum, CONTRACTOR shall state impact in the RFI.
12. CONTRACTOR'S signature.
13. Attachments: Include sketches, descriptions, measurements, photos, Product data, Shop Drawings, coordination drawings and other information necessary to fully describe items needing attention.
    a. Include dimensions, thickness, structural grid references and details of impacted materials, assemblies and attachments or attached sketches.

C. RFI Forms: AIA Form or software generated form with substantially the same content as indicated above, acceptable to the Landscape Architect.
   1. Attachments shall be electronic files in Adobe Acrobat PDF format.

D. Landscape Architect Action: Landscape Architect will review each RFI, determine the necessary action and respond. Allow the below specified working days for Landscape Architect response to each RFI. RFI's received by the Landscape Architect after 1:00 PM will be considered as received the following working day.
   1. There are three (3) categories or RFI's:
      a. Category 1 – Emergency RFI: Requires a response within twenty-four (24) to forty-eight (48) hours.
      b. Category 2 – Normal RFI: Requires a response within five (5) working days.
      c. Category 3 – Low Priority RFI: Requires a response within ten (10) to twenty (20) working days.
      d. The Contactor and Landscape Architect will mutually agree on the category assignment for each RFI. If there is an unusually high number of Category 1 RFI's and claims for frivolous RFI's the Landscape Architect and OWNER will discuss this with the CONTRACTOR at the following progress meeting.
   2. The following RFI's will be returned without action if the following occurs:
      a. Requests for approval of submittals.
      b. Requests for approval of substitutions.
      c. Requests for coordination information already indicated in the Contract Documents.
      d. Requests for adjustments for Contract Time or Contract Sum.
      e. Requests for interpretation of Landscape Architect's actions on submittals.
      f. Incomplete RFIs or inaccurately prepared RFIs.
   3. Landscape Architect's action may include a request for additional information, in which case the Landscape Architect's time for response will date from the time of receipt of additional information.
   4. Landscape Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for CONTRACTOR to submit Change Proposal according to Specification section 01 25 00 Contract Modification Procedures.
      a. If the CONTRACTOR believes the RFI response warrants change in the Contract Time or the Contract Sum, notify the Landscape Architect in writing within six (6) working days of receipt of the RFI response.

E. On receipt of the Landscape Architect's action, the CONTRACTOR shall update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify the Landscape Architect within five (5) working days if the CONTRACTOR disagrees with the response.

F. RFI Log: The CONTRACTOR shall prepare, maintain and submit a tabular log of RFIs organized by the RFI number. The RFI log shall be submitted and reviewed at the progress review meeting. RFI log shall include the following information:
   1. Project name.
   2. Name and address of the CONTRACTOR.
   3. Name and address of the Landscape Architect.
   4. RFI number including RFIs that were dropped and not submitted.
   5. RFI description.
   6. Date the RFI was submitted.
   7. Date the Landscape Architect's response was received.
   8. Identification of related Field Order, Work Change Directive and Proposal Request, as appropriate

END OF SECTION

SECTION 01 32 33

PHOTOGRAPHIC DOCUMENTATION

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for the following.
   1. Preconstruction photographs.
   2. Periodic construction photographs.
   3. Final completion construction photographs.

1.02 SUBMITTALS

A. Qualification Data: For the photographer.

B. Key Plan: Submit a key plan for the Project site with notation of vantage points marked for location and direction of each photograph. Include some label information for the corresponding set of photographs.

C. Construction Photographs: Submit two (2) prints of each photographic view within seven (7) days of taking photographs.
   1. Format: eight (8”) by ten (10”) inch smooth surface matte prints on single weight commercial grade photographic paper, enclosed back to back in clear plastic sleeves that are punched for a standard three (3) ring binder.
   2 Identification: On the back of each print, provide an applied label or rubber stamped impression with the following information:
      a. Name of Project.
      b. Name and address of the photographer.
      c. Name of the Landscape Architect
      d. Name of the CONTRACTOR
      e. Date photograph was taken if not time stamped by the camera.
      f. Description of vantage point, indicating location and direction.
      g. Unique sequential identifier.
   3. Digital images: Submit a complete set of digital image electronic files with each submittal of prints as a Project Record Document on a CD-ROM. Identify electronic media with date photographs were taken. Submit images that have the same aspect ratio as the sensor and uncropped.
   4. Transcript: Prepare on an eight and one half (8 ½”) inch by eleven (11”) inch paper, punched and bound in the three (3) ring binder. Mark appropriate identification on the front and spine of each binder.

1.03 QUALITY ASSURANCE

A. Photographer Qualifications: An individual who has been regularly engaged as a professional photographer of construction projects for not less than three (3) years.

1.04 COORDINATION

A. Auxiliary Services: Cooperate with photographer and provide auxiliary services requested, including access to the Project site and use of temporary facilities, including temporary lighting required to produce clear, well lit photographs without obscuring shadows.

1.05 USAGE RIGHTS

A. Obtain and transfer copyright usage rights from the photographer to OWNER for unlimited reproduction of photographic documentation.

PART 2 – PRODUCTS

2.01 PHOTOGRAPHIC MEDIA

A. Digital Images: Provide images in uncompressed TIFF format, produced by a digital camera with a minimum sensor size of four (4.0) megapixels and at an image resolution of not less than one thousand six hundred (1600) by two thousand (2000) pixels.

PART 3 – EXECUTION

3.01 CONSTRUCTION PHOTOGRPAHS

A. General: Take Photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out of focus areas will not be accepted.
   1. Maintain a key plan with each set of construction photographs that identifies each photographic location.

B. Film Images:
   1. Date Stamp: Unless otherwise indicated, date and time stamp each photograph as it is being taken so stamp is integral to each photograph.
   2. Field Office Prints: Retain one set of prints of progress photographs in the field office at the Project site, available at all times for reference. Identify photographs same as for those submitted to the Landscape Architect.

C. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing or modifications using image editing software.
   1. Date and Time: Include date and time in the file name for each image.
   2. Field Office Images: Maintain one set of images on a CD-ROM in the field office at the

Project site, available at all times for reference. Identify images same as for those submitted to the Landscape Architect.

D. Preconstruction Photographs: Before starting construction, take color digital photographs of the Project site, and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by the Landscape Architect.
   1. Take photographs to show existing conditions before starting construction.
   2. Take photographs of existing structures and improvements on or adjacent to the construction site to accurately record physical condition.
   3. Take photographs as required to record settlement, cracking of adjacent structures, paving and improvements.

E. Periodic Construction Photographs: Take color digital photographs on a monthly basis coinciding with the submittal date associated with each Application for Payment. Select vantage points to show status of construction and progress since the previous photographs were taken.

F. Final Completion Construction Photographs: take color digital photographs after the Date of Substantial Completion for submission as a Project Record Document. Landscape Architect will direct the photographer for desired vantage points.
   1. Do not include the time and date stamp.

END OF SECTION

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 – GENERAL

1.01 SUMMARY

A. This section specifies administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples and other submittals.

1.02 DEFINITIONS

A. Action Submittals: Written and graphic information that requires Landscape Architect responsive action.

B. Informational Submittals: Written information that does not require Landscape Architect's responsive action. Submittals may be rejected for not complying with requirements.

1.03 SUBMITTAL PROCESURES:

A. Submission Period: Submit shop drawings and product data as soon as practicable after contract award, but not later than thirty (30) days before dates reviewed submittals will be needed. **Shop drawings and product data shall be submitted no later than sixty (60) days after contract award.** This is in order to facilitate color selections and coordinate the various materials. Final color selections and release of shop drawings/product data, contingent upon color selection, will not be made until all samples have been submitted, coordinated and approved.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
   1. Coordinate each submittal with fabrication, purchasing testing, delivery, other submittals and related activities that require sequential activity.
   2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
      a. Landscape Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Processing Time: Allow enough time for submittal review, including time for re-submittals, as follows. Time for review shall commence on Landscape Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including re-submittals.
   1. Initial Review: Allow fifteen (15) working days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Landscape Architect will advise the CONTRACTOR when a submittal being processed must be delayed for coordination.

2. Intermediate Review: If an intermediate submittal is necessary, process it in the same manner as the initial submittal.
3. Re-Submittal Review: Allow fifteen (15) working days for review of each re-submittal.
4. Sequential Review: Where sequential review of submittals by Landscape Architect, Sub-consultant, OWNER or other parties is indicated, allow twenty (20) working days for initial review of each submittal.

D. Identification: Place a permanent label of or title block on each submittal for identification.
   1. Indicate name of firm or entity that prepared each submittal on the label or title block.
   2. Provide a space approximately four (4") inches by eight (8") inches, on label or beside the title block to record the CONTRACTOR'S review and approval markings and action taken by the Landscape Architect.
   3. Include the following information on the label for processing and recording action taken:
      a. Project title and number.
      b. Date (and revision dates, if necessary).
      c. Name and address of the Landscape Architect.
      d. Name and address of the CONTRACTOR.
      e. Name and address of the Sub-CONTRACTOR.
      f. Name and address of the Supplier.
      g. Name of the Manufacturer.
      h. Submittal number or unique identifier, including revision identifier.
      i. Number and title of the appropriate Specification section.
      j. Drawing number and detail references, as appropriate>
      k. Location(s) where product is to be installed, as appropriate.
      l. CONTRACTOR'S stamp, initialed and signed, certifying general conformance review of submittal.
      o. Other necessary identification.

E. Deviations: Highlight/Encircle or otherwise specifically identify deviations from the Contract Documents on each submittal if necessary.

F. Additional Copies: Unless additional copies are required for final submittal and unless the Landscape Architect observes noncompliance with provisions in the Contract Documents the initial submittal will serve as the final submittal.

G. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Landscape Architect will return submittals without review, when received from sources other than the CONTRACTOR.

H. Re-Submittals: Make re-submittals in the same form and number of copies as the initial submittal.
   1. Note date and content of previous submittal.
   2. Note date and content of revision in the label or title block and clearly indicate extent of revisions.
   3. Resubmit submittals until they are marked "Approved" of "Approved as Noted".

I. Distribution: Furnish copies of final submittals to manufacturers, sub-CONTRACTORs, suppliers, fabricators, installers, authorities having jurisdiction and others as necessary for performance of construction activities. Show distribution on the transmittal form.

J. Use for Construction: Use only final submittals with the Landscape Architect's mark indicating "Approved" or "Approved as Noted".

1.05 CONTRACTOR'S USE OF LANDSCAPE ARCHITECT'S CAD FILES

A. General: At CONTRACTOR'S written request, copies of the Landscape Architect's CAD files will be provided to the CONTRACTOR for the CONTRACTOR'S use in connection with the Project, subject to the following conditions:
   1. Return the signed and dated "Agreement with Regard to Release of Electronic (CAD) Files" to the Landscape Architect.

PART 2 – PRODUCTS

2.01 ACTION SUBMITTALS

A. General: Prepare and submit Action Submittals required by individual Specifications sections.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
   1. If information must be specifically prepared for submittal because standard printed data is not suitable for use, submit as a Shop Drawings and not as Product Data.
   2. Mark each copy of each submittal to show which products and options are applicable.
   3. Include the following information, as applicable:
      a. Manufacturer's written recommendations.
      b. Manufacturer's product specifications.
      c. Manufacturer's installation instructions.
      d. Standard color charts.
      e. Manufacturer's catalog cut sheets.
      f. Wiring diagrams and controls showing factory –installed wiring.
      g. Printed performance curves.
      h. Operational range diagrams.
      i. Mill reports.
      j. Standard product operation and maintenance manuals.
      k. Compliance with specified referenced standards.
      l. Testing by recognized testing agency.
      m. Application of testing agency labels and seals.
      n. Notation of coordination requirements.
   4. Submit Product Data before or concurrent with Samples.
   5. Number of Copies: Submit five (5) copies of Product data, unless otherwise indicated. Landscape Architect will retain three (3) copies: one (1) for their files, one for their sub-consultants and one (1) for the OWNER. Distribute the reviewed submittals that contain the Landscape Architect's stamp as follows:
      a. Job-site file.

b. Record document file.
c. Other affected CONTRACTORs.
d. Sub-CONTRACTORs.
e. Suppliers and/or fabricators.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data unless submittal of Landscape Architect's CAD Drawings was otherwise permitted.
   1. Preparation: Fully illustrate requirements in the Contr5act Documents. Indicate the following information, as applicable:
      a. Dimensions.
      b. Identification of products.
      c. Fabrication and installation drawings.
      d. Rough-in and setting diagrams.
      e. Wiring diagrams showing field-installed wiring, including power, signal and control wiring.
      f. Shop work manufacturing instructions.
      g. Templates and patterns.
      h. Schedules.
      i. Design calculations.
      j. Compliance with specified requirements.
      k. Notation of dimensions established field measurements.
      l. Notation of coordination requirements.
      m. Relationship to adjoin construction clearly indicated.
      n. Seal and signature of professional engineer if required.
      o. Wiring diagrams: differentiate between manufacturer-installed and field-installed wiring.
      p. Identify details by reference to sheet and detail numbers.
   2. Sheet Size: Except for templates, patterns and similar full-size drawings submit Shop Drawings on sheets at least eight one-half (8 ½") inches by eleven (11") inches but not larger than thirty (30") inches by forty-two (42") inches.
   3. Number of Copies: Submit five (5) opaque copies of each submittal unless copies are required for operation and maintenance manuals. Landscape Architect will retain three (3) copies and the remainder will be returned.
   4. Shop Drawings shall be submitted ONLY to clarify, amplify or revise information shown or identified in the Construction Documents.

D. Samples: Submit Samples for review of kind, color, pattern and texture for a check of these characteristics with other elements and for comparison of these characteristics between submittals and actual component as delivered and installed.
   1. Transmit Samples that contain multiple related components such as accessories together in one submittal package.
   2. Identification: Attach label on unexposed side of Samples that includes the following:
      a. Generic description of Sample.
      b. Product name and name of Manufacturer.
      c. Sample source.
      d. Number and title of appropriate Specification section.

3. Disposition: Maintain sets of approved Samples at the Project site, available for quality control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
    a. Samples that may be incorporated into the Work are indicated in individual Specification sections. Such Samples must be in undamaged condition at the time of use.
    b. Samples not incorporated into the Work, or otherwise designated as the OWNER'S property, are the property of the CONTRACTOR.
4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures and patterns available.
    a. Number of Samples: Submit two (2) full set(s) of available choices where color, pattern, texture or similar characteristics are required to be selected from the manufacturer's product line. Landscape Architect will return submittal with options selected.
5. Samples for Verification: Submit full-size units or Samples of the size indicated; prepared from the same material to be used for the Work; cured and finished in the manner specified and physically identical with the material or product proposed for use; and that shows the full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers or materials; complete units of repetitively used materials; swatches showing color, texture and pattern; color range sets; and components used or independent testing and inspection.
    a. Number of Samples: Submit three (3) sets of Samples. Landscape Architect will retain two (2) Sample sets and the remainder will be returned.
        i. Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation and other similar characteristics are to be demonstrated.
        ii. If variation in color, pattern, texture or other characteristic is inherent in material or product represented by a Sample, submit at least three (3) sets of paired units that show approximate limits or variations.
6. Field Samples and Mock-ups shall be erected at the Project site at an acceptable location. Construct each sample / mock-up completely, including work of all trades required to finish work.

E. Product Schedule or List: As required in individual Specification sections, prepare a written summary indicating types of products required for Work and their intended location. Include the following information in tabular form:
    1. Type of product, Include unique identifier for each product.
    2. Number of name of room or space.
    3. Location of room or space.
    4. Number of copies: Submit three (3) copies of product schedule or list, unless otherwise indicated. Landscape Architect will return two (2) copies.
        a. Mark-up and retain one (1) returned copy as a Project Record Document.

F. Application for Payment: Comply with requirements specified in Section 01 29 00 Payment Procedures.

G. Schedule of Values: Comply with requirements specified in Section 01 29 00 Payment Procedures.

H. Sub-contract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following tabular form:
   1. Name, address and telephone number of the entity performing sub-contract or supplying products.
   2. Number and title of related Specifications section(s) covered by the sub-contract.
   3. Drawing number and detailed referenced, as appropriate, covered by the sub-contract.
   4. Number of Copies: Submit five (5) copies of the sub-contract list, unless otherwise indicated. Landscape Architect will return two (2) copies.
      a. Mark-up and retain one (1) returned copy as a Project Record Document.

2.02 INFORMATIONAL SUBMITTALS

A. General: Prepare and submit Informational Submittals required by other Specification sections.
   1. Number of Copies: Submit three (3) copies of each submittal, unless otherwise indicated. Landscape Architect will not return any copies.
   2. Certificates and Certifications: Provide a notarized statement that includes signature of the entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
   3. Test and Inspection Reports: Comply with requirements specified in Section 01 41 00 Testing Laboratory Services.

B. Coordination Drawings: Comply with requirements specified in Section 01 31 00 Project Meetings, Management and Coordination.

C. Qualification Data: Prepare written information that demonstrated capabilities and experience of the firm or person. Include lists of completed projects with project names and addresses, names of addresses of Landscape Architects and OWNERs and other information specified.

D. Welding Certificates: Prepare written certifications that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.

E. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that the manufacturer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific project.

F. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that the manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

G. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that the product complies with requirements in the Contract Documents.

H. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

I. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency standard form, indicating and interpreting test results of material for compliance with requirements of the Contract Documents.

J. Product Test Reports: Prepare written test reports indicating current product produced by manufacturer complies with the requirements in the Contract Documents. Base report on the evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

K. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for the Project. Include the following information:
   1. Name of evaluation organization.
   2. Date of evaluation.
   3. Time period when report is in effect.
   4. Product and manufacturer's names.
   5. Description of product.
   6. Test procedures and results.
   7. Limitations of use.

L. Schedule of Tests and Inspections: Comply with the requirements specified in Section 01 41 00 Testing Laboratory Services.

M. Preconstruction Test Reports: Prepare written reports by a qualified testing agency, on agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

N. Compatibility Test Reports: Prepare written reports by a qualified testing agency, on agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

O. Field Test Reports: Prepare written reports by a qualified testing agency, on agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

P. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance or products and equipment.

Q. Design Data: Prepare written and graphic information including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculation. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide names and versions of software, if any, used for calculations.

R. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines and procedures for installing or operating a product or equipment, Include names of product and name, address and telephone number of manufacturer. Include the following, as applicable:
   1. Preparation of substrates.
   2. Required substrate tolerances.
   3. Sequence of installation or erection.
   4. Required installation tolerances.
   5. Required adjustments.
   6. Recommendations for cleaning and protection.

S. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following information:
   1. Name, address and telephone number of factory-authorized service representative making report.
   2. Statement on condition of substrates and their acceptability for installation of product.
   3. Statement that products at the Project Site comply with requirements.
   4. Summary if installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
   5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
   6. Statement that notes whether conditions, products and installation will affect the warranty.
   7. Other required items indicated in individual Specification sections.

T. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and terms of the coverage.

U. Construction Photographs: Comply with requirements specified in 01 32 33 Photographic Documentation.

V. Receipt of Material Safety Data Sheet (MSDS) information by Landscape Architect may result in unwanted liability for product safety. Many Landscape Architect return submittals that contain MSDSs with transmittals that indicates that MSDSs are not required by the Contract Documents and that they were not reviewed.

W. Material Safety Data Sheets (MSDSs): Submit information directly to the OWNER, do not submit to the Landscape Architect>
   1. Landscape Architect will not review submittals that include MSDSs and will return the entire submittal for re-submittal.

2.03 DELEGATED DESIGN

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of the CONTRACTOR by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
   1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to the Landscape Architect.

B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data and other required submittals, submit three (3) copies of a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to the CONTRACTOR to be designed or certified by a design professional.
   1. Indicate that products and systems comply with performance and design criteria in the Contract Documents, include list of codes, loads and other factors used in performing these services.

PART 3 – EXECUTION

3.01 CONTRACTOR'S REVIEW

A. Review each submittal and check for coordination with other Work of the Contact and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with an approval stamp before submitting to the Landscape Architect.

B. Approval Stamp: Stamp each submittal with a uniform approval stamp. Include Project name and location, submittal number, Specification section title and number, name of reviewer, date of CONTRACTOR'S approval and a statement certifying that the submittal has been reviewed, checked and approved for compliance with the Contract Documents.

3.02 LANDSCAPE ARCHITECT'S ACTION

A. General: Landscape Architect will not review submittals that do not bear the CONTRACTOR'S approval stamp and will return the submittal without any action.

B. Action Submittals: Landscape Architect will review each submittal, make marks to indicate corrections or modifications required and return it. Landscape Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken,

C. Informational Submittals: Landscape Architect will review each submittal and will not return it, unless it does not comply with requirements. If the submittal does not comply, then it will be forwarded to the appropriate party.

D. Partial submittals are not acceptable, will be considered non-responsive and will be returned without review.

E. Submittals are not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION

SECTION 01 41 00

TESTING LABORATORY SERVICES

PART 1 – GENERAL

1.01 REQUIREMENTS INCLUDED

A. The OWNER shall employ and pay for the services of an Independent Testing Laboratory to perform specified testing of Work and materials at the Project Site.
   1. CONTRACTOR shall cooperate with the laboratory to facilitate the execution of its required services.
   2. Employment of the laboratory shall in no way relieve the CONTRACTOR'S obligations to perform the Work of the Contract.

1.02 QUALIFICATIONS OF THE OWNER'S LABORATORY

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

B. Meet basic requirements of ASTM E329, "Standards of Recommended Practice for Inspection and Testing Agencies for Concrete and Steel Used in Construction".

C. Authorized to operate in the State of Texas.

D. Submit a copy of the inspection report of facilities made by Materials Reference Laboratory of National Bureau of Standards during the most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.

E. Testing Equipment:
   1. Calibrate at reasonable intervals by devices of accuracy traceable to either:
      a. National Bureau of Standards.
      b. Accepted values of natural physical constants.

1.03 LABORATORY DUTIES

A. Cooperate with the Landscape Architect and CONTRACTOR; provide qualified personnel after due notice from the CONTRACTOR.

B. Perform specified inspections, sampling and testing of materials and methods of construction:
   1. Comply with specified standards.
   2. Ascertain compliance of materials with requirements of the Contract Documents.

C. Promptly notify Landscape Architect and CONTRACTOR of observed irregularities or deficiencies of Work or Products.

D. Promptly submit written reports of each test and inspection; one copy each for the Landscape Architect, OWNER, CONTRACTOR and one copy to the Record Documents File. Each report shall include the following:
   1. Date issued.
   2. Project title and number.
   3. Testing laboratory name, address and telephone number.
   4. Name and signature of the laboratory inspector.
   5. Date and time of sampling or inspection.
   6. Record of temperature and weather condition.
   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 the Contract Documents.
   12. Interpretation of test results, when requested by the Landscape Architect.

E. Perform additional tests as required by the Landscape Architect or the OWNER.

1.04 LIMITATIONS OF AUTHORITY OF THE TESTING LABORATORY

A. Laboratory is not authorized to do the following:
   1. Release, revoke, alter or increase requirements of the Contract Documents.
   2. Approve or accept any portion of the Work.
   3. Perform any duties of the CONTRACTOR.
   4. Stop the Work.

1.05 CONTRACTOR'S RESPONSIBILITIES

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

B. Furnish copies of the Products test reports as required.

C. Furnish incidental labor and facilities:
   1. To provide access to Work to be tested.
   2. To obtain and handle samples at the Project site or at the source of the Product to be tested.
   3. To facilitate inspections or tests.
   4. For storage and curing of test samples.

D. Notify laboratory sufficiently in advance of operations to allow for laboratory assignments of personnel and scheduling of tests.
   1. When tests or inspections cannot be performed after such notice, reimburse OWNER for laboratory personnel and travel expenses incurred due to CONTRACTOR'S negligence.

1.06 PAYMENT FOR TESTING

A. Initial Testing: The OWNER shall pay for all initial services of the testing laboratory for initial testing as required by the Contract Documents and testing as the OWNER deems necessary.

B. Retesting: When initial testing indicates non-compliance with the Contact Documents, subsequent retesting occasioned by the non-compliance shall be performed by the same testing agency, and costs will be paid by the CONTRACTOR.

C. Code Compliance Testing: Inspections and tests required by codes and ordinances, or by plan authority, and made by legally constituted authority, shall be the responsibility of, and shall be paid for, by the OWNER.

D. CONTRACTOR'S Convenience Testing: Inspection or testing performed exclusively or the CONTRACTOR'S convenience shall be the sole responsibility of the CONTRACTOR.

END OF SECTION

SECTION 01 51 00

TEMPORARY UTILITIES AND FACILITIES

PART 1 – GENERAL

1.01 REQUIREMENT INCLUDED

A. Furnish, install and maintain temporary utilities and facilities required for construction and remove on completion of Work.

1.02 REQUIREMENTS OF REGULATORY AGENCIES

A. Comply with National Electric Code.

B. Comply with federal, state and local codes and regulations and with utility company requirements.

PART 2 – PRODUCTS

2.01 FIELD OFFICE

A. The CONTRACTOR has the option of furnishing a weather tight job office with operative windows, provided with light and electric heat and air conditioning when necessary, with smooth tables for displaying Construction Documents and with means for filing same. CONTRACTOR shall pay for energy used by the field office. Upon completion of the Work, the office shall be removed from the premises. The CONTRACTOR shall examine the site plan before locating the field office and shall not place it within five (5') feet of any underground utilities. OWNER shall approve the location of the field office.

2.02 CONSTRUCTION DOCUMENTS

A. A complete set of Construction Documents shall be kept on the job site at all times. CONTRACTOR shall record notes on this set of Construction Documents such that accurate Record Drawings can be prepared at the end of construction. These documents must be presented at each monthly progress review meeting.

2.03 TELEPHONE

A. The field office or the superintendent must have a telephone at all times during the course of construction. The field office may be equipped with a land line but the superintendent must have a cellular phone in their possession at all times during construction.

2.04 STORAGE SHEDS

A. The CONTRACTOR may provide on the premises at convenient locations with respect to Construction a suitable watertight storage shed(s) for storage of materials, equipment and tools which might be damaged by exposure to the weather. Storage shed(s) shall be maintained in good condition and shall be removed from the site when they are no longer needed.

2.05 FENCING

A. The CONTRACTOR may provide storage or security fending a minimum of six (6') feet in height with four by four (4"x4") inch posts or two and one-half (2 1/2") inch galvanized steel posts spaced on eight (8') foot centers, well braced and having hog wire or two (2") inch diamond mesh chain link fabric. The fence will be complete with sliding or swinging gates with necessary hardware and a padlock. Provide two (2) keys for the OWNER'S use. Remove fending and fill post holes upon completion of Work.

2.06 CONSTRUCTION SIGN

A. The CONTRACTOR shall erect a temporary construction sign for the duration of construction per the detail on the plans.

2.07 TEMPORARY POWER

A. The CONTRACTOR shall obtain and have installed a temporary power service line to a point convenient for an available to all trades. The cost for all electrical service shall be paid for by the CONTRACTOR.

2.08 SANITARY FACILITIES

A. The CONTRACTOR shall provide adequate toilet facilities for use of all persons employed on the project site. They shall post notices, take such precautions as may be necessary and maintain the premises around the sanitary facility. Park restrooms are off limits to construction personnel.

2.09 WATER

A. The CONTRACTOR shall be responsible for obtaining temporary water from the local utility authority or the OWNER. All costs for temporary water connections and water usage fees shall be paid for by the CONTRACTOR.

B. Irrigation water for turf grow-in will be provided by the OWNER at no cost as long as it is not used in a wasteful manner. CONTRACTOR must coordinate use of this irrigation water with the OWNER as it related to water rationing.

2.10 EXCAVATED DIRT

A. All dirt excavated during construction shall be removed from the site and legally disposed of.

2.11 TRAFFIC CONTROL AND SAFETY

A. The CONTRACTOR shall be responsible for traffic control and safety during construction. The CONTRACTOR shall meet all City requirements for public safety, barriers and traffic control.

2.12 REMOVAL OF TEMPORARY FACILITIES

A. When any temporary facility is no longer needed, the CONTRACTOR shall completely remove it from the project site and shall repair or replace and material, equipment or finish damaged by the removal.

2.13 TEMPORARY FIRE PROTECTION

A. Provide and maintain temporary fire protection during construction in accordance with requirements of the local Fire Protection Code.

2.14 PARKING

A. Restrict parking of construction personnel vehicles to areas designated by the OWNER/ Landscape Architect in the pre-construction conference.

END OF SECTION

SECTION 01 57 13

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL

PART 1 – GENERAL

1.01 SUMMARY

A. This item shall consist of temporary soil erosion sediment and water pollution control measures deemed necessary by the Architect/Engineer for duration of the contract. The temporary measures shall include dikes, dams, berms, sediment basins, fiber mats, jute netting, temporary seeding, straw mulch, asphalt mulch, plastic liners, rubble liners, baled-hay retards, dikes, slope drains and other devices typically used to prevent erosion.

B. Related Sections:
   1. Section 01 57 23 - Storm Water Pollution Prevention Plan.
   2. Section 31 20 00 - Earthwork.

1.02 CONSTRUCTION REQUIREMENTS

A. The Architect/Engineer has the authority to define erodible earth and the authority to limit the surface area of erodible-earth material. The CONTRACTOR will be required to incorporate temporary pollution control measures to prevent or correct erosion that may develop during construction. The CONTRACTOR shall maintain erosion control measures until full vegetative coverage of all disturbed areas is achieved. CONTRACTOR shall be responsible for the removal of all temporary erosion control measures once the vegetative requirements have been met. All labor, tools, equipment and incidentals to complete the work will not be paid for directly but shall be considered subsidiary work to the various items included in the contract.

B. Waste or disposal areas and construction roads shall be located and constructed in a manner that will minimize the amount of sediment entering public streets, storm sewer systems and streams.

C. All streets shall be cleared as soon as practicable of mud, debris or other obstruction placed during construction operations that are not a part of the finished work.

D. The CONTRACTOR shall take sufficient precautions to prevent pollution with fuels, oils, bitumens, calcium chloride or other harmful materials. The CONTRACTOR shall conduct and schedule their operations so as to avoid or minimize siltation of streams, storm sewer lines, and adjacent streets.

1.03 The CONTRACTOR shall use NCTCOG STORM WATER QUALITY - Best Management Practices for Construction Activities for acceptable erosion control practices.

1.04 Construction of perimeter swales and straw bale check dams are a temporary measure to prevent sediment and debris from leaving the site. The CONTRACTOR is responsible for achieving the proposed grades as shown on the grading plan. Location of high points, center lines of perimeter swales and outfalls are approximate. During construction, swales shall be adjusted in the field as necessary to allow positive drainage in the swale and prevent sediment and debris from leaving the construction site.

END OF SECTION

SECTION 01 57 23

STORM WATER POLLUTION PREVENTION PLAN

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes: Storm Water Pollution Prevention and Pollution Control Plan as required by the Texas Commission on Environmental Quality (TCEQ), effective March 2013.

B. Related Sections:
   1. Section 01 57 13 - Temporary Erosion and Sediment Control.
   2. Section 31 20 00 - Earthwork

1.02 QUALITY ASSURANCE

A. State Standards: Execution of the Pollution Prevention and the Pollution Control Plan shall meet all requirements set forth by TCEQ under the Texas Pollution Discharge Elimination System (TPDES) regulations.

PART 2 – PRODUCTS

NOT APPLICABLE.

PART 3 – EXECUTION

3.01 PERMIT

A. As defined by Texas Commission on Environmental Quality (TCEQ) regulations, a Texas Pollutant Discharge Elimination System (TPDES) General Construction Permit is required for all construction activities that result in the disturbance of one to five acres (Small Construction Activity) or five or more acres of total land (Large Construction Activity). The CONTRACTOR is defined as an "operator" by state regulations and is required to obtain a permit. Information concerning the permit can be obtained through the Internet at:

   www.tnrcc.state.tx.us/permitting/waterperm/wwperm/construct.html

   Soil stabilization and structural practices have been selected and designed in accordance with North Central Texas Council of Governments Best Management Practices and Erosion Control Manual for Construction Activities (BMP Manual). This manual can be obtained through the internet at:

   www.dfwstormwater.com/runoff.html

Not all of the structural controls discussed in the BMP Manual will necessarily apply to this project. Best Management Practices are construction management techniques that, if properly utilized, can minimize the need for physical controls and possibly reduce costs. The methods of control shall result in minimum sediment retention of not less than seventy (70%) percent.

3.02 NOTICE OF INTENT (NOI)

A. If the project will result in a total land disturbance equal to or greater than five (5) acres, the CONTRACTOR shall sign a TCEQ Notice of Intent (NOI) form. It will serve as a notification to the TCEQ of construction activity as well as a commitment that the CONTRACTOR understands the requirements of the permit for storm water discharges from construction activities and that measures will be taken to implement and maintain storm water pollution prevention at the site. The NOI shall be submitted to the TCEQ at least forty-eight (48) hours prior to the CONTRACTOR moving on site and shall include the required one hundred ($100) dollars application fee.

The NOI shall be mailed to:
Texas Commission on Environmental Quality
Storm Water & General Permits Team; MC-228
P.O. Box 13087
Austin, TX78711-3087

3.03 NOTICE OF TERMINATION (NOT)

A. For all sites that qualify as Large Construction Activity, the CONTRACTOR shall sign, prior to final payment, a TCEQ Notice of Termination (NOT) form prepared by the CONTRACTOR.

The NOT shall be mailed to:
Texas Commission on Environmental Quality
Storm Water & General Permits Team; MC-228
P.O. Box 13087
Austin, TX78711-3087

3.04 STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

A. A document consisting of an erosion control and toxic waste management plan and a narrative defining site parameters and techniques to be employed to reduce the release of sediment and pollution from the construction site. The CONTRACTOR will be responsible for preparing and implementing the Storm Water Pollution Prevention Plan (SWPPP) and payment shall be considered subsidiary to the various items included in this contract. The CONTRACTOR will be required to have a copy of the SWPPP on site, along with all other documents submitted to the Texas Commission on Environmental Quality.

3.05 LARGE CONSTRUCTION ACTIVITY - DISTURBED AREA EQUAL TO OR GREATER THAN FIVE (5) ACRES

A. A Notice of Intent (NOI) form shall be completed and submitted to the TCEQ including payment of the TCEQ required fee. A SWPPP that meets all TCEQ requirements shall be prepared and implemented at least forty-eight (48) hours before the commencement of construction activities. The SWPPP shall be incorporated into in the contract documents. The CONTRACTOR shall submit a schedule for implementation of the SWPPP. Deviations from the plan must be submitted to the Architect/Engineer for approval. The SWPPP is not warranted to meet all the conditions of the permit since the actual construction activities may vary from those anticipated during the preparation of the SWPPP. Modifications may be required to fully conform to the requirements of the Permit. The CONTRACTOR must keep a copy of the most current SWPPP at the construction site. A Notice of Termination (NOT) form shall be submitted within thirty (30) days after final stabilization has been achieved on all portions of the site that is the responsibility of the permittee, or, when another permitted operator assumes control over all areas of the site that have not been finally stabilized.

END OF SECTION

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in the Project; product delivery, storage and handling; manufacturer's standard warranties for products; special warranties and comparable products.

1.02 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material", "equipment", "system" and terms of similar intent.
   1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in the manufacturer's published product literature that is current as of the date of the Contract Documents.
   2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
   3. Comparable Products: Product that is demonstrated and approved through the submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance and other characteristics that equal or exceed those of the specified product.

B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product", including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance and other characteristics for the purpose of evaluating comparable products of additional manufacturers named in the specifications.

1.03 ACTION SUBMITTALS

A. Comparable Product Requests: Submit requests for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification section number and title and Drawing number and title.
   1. Include data to indicate compliance with the requirements specified in the "Comparable Products" article.

   2. Landscape Architect's Action: If necessary, the Landscape Architect will request additional information or documentation for evaluation within one (1) week of receipt of a comparable product request. The Landscape Architect will notify the CONTRACTOR of

approval or rejection of the proposed comparable product request within fifteen (15) days of receipt of request, or seven (7) days of receipt of additional information or documentation, whichever is later.

a. Form of Approval: as defined in Section 01 33 00 Submittal Procedure.
b. Use product specified if the Landscape Architect does not issue a decision on the use of a comparable product request with the time allocated.

B. Basis-of-Design Product Specification Submittal: Comply with the requirements of Section 01 33 00 Submittal Procedure. Show compliance with these requirements.

1.04 QUALITY ASSURANCE

A. Comparability of Options: If the CONTRACTOR is given the option of selecting between two (2) or more products for use on the Project, select a product that is compatible with products previously selected, even if previously selected products were also options.
   1. Each CONTRACTOR is responsible for providing products and construction methods compatible with products and construction methods of other CONTRACTORs.
   2. If a dispute arises between CONTRACTORs over previously selected but incompatible products the Landscape Architect will determine which product shall be used.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle products using methods and means that will prevent damage, deterioration and loss including theft or vandalism. Comply with manufacturer's written instructions.
B. Delivery and Handling:
   1. Schedule delivery to minimize long-term storage at the Project site and to prevent overcrowding of construction storage space.
   2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.
   3. Deliver products to the Project site in an undamaged condition in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storage, unpacking, protecting and installing.
   4. Inspect products upon delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.
C. Storage:
   1. Store products to allow for inspection and measurement of quantity or counting of units.
   2. Store materials in a manner that will not endanger the Project structure.
   3. Store products that are subject to damage by the elements, under cover in a weather tight enclosure above ground and with ventilation adequate to prevent condensation.
   4. Store foam plastic from exposure to sunlight, except to the extent necessary for the period installation and concealment.
   5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation and weather protection requirements for storage.
   6. Protect stored products from damage and liquids from freezing.

7. Provide a secure location and enclosure at the Project site for storage of materials and equipment used by the OWNER'S construction forces. Coordinate location with the OWNER.

1.06 PRODUCT WARRANTIES

A. Warranties specified in other Specification sections shall be in addition to, and/or concurrent with other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relive the CONTRACTOR of obligations under the requirements of the Contract Documents.
   1. Manufacturer's Warranty: Written warranty furnished by an individual manufacturer for a particular product and specifically endorsed by the manufacturer to the OWNER.
   2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights to the OWNER.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
   1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
   2. Specified Form: When specified forms are included with the Specifications, prepare a written document using the indicated form.
   3. Refer to Specification sections for content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Section 01 77 00 Closeout Procedures.

PART 2 – PRODUCTS

A. General Product Requirements: provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at the time of installation.
   1. Provide products complete with accessories, trim, finish, fasteners and other items needed for a complete installation and indicated use and effect.
   2. Standard Products: If available, and unless custom products or non-standard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
   3. OWNER reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
   4. Where products are accompanied by the term "as selected" the Landscape Architect will make the selection.
   5. Descriptive, performance and reference standard requirements in the Specifications establish salient characteristics of products.
   6. Or Equal: For products specified by name and accompanied by the term "or equal" or "or approved equal", or "or approved" comply with the requirements in the "Comparable Products" article to obtain approval for use of an unnamed product.

B. Product Selection Procedures:
   1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with the requirements. Comparable products or substitutions for the CONTRACTOR'S convenience will not be considered.
   2. Manufacturer / Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with the requirements. Comparable products or substitutions for the CONTRACTOR'S convenience will not be considered.
   3. Products:
      a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with the requirements. Comparable products or substitutions for CONTRACTOR'S convenience will not be considered, unless otherwise indicated.
      b. Nonrestricted List: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed, or an unnamed product that complies with the requirements. Comply with requirements in "Comparable Products" article for consideration of unnamed product.
   4. Manufacturers:
      a. Restricted List: Where Specifications include a list of manufacturer's names. Provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for the CONTRACTOR'S convenience **will not** be considered, unless otherwise indicated.
      b. Nonrestricted List: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, that complies with requirements. Comply with requirements in "Comparable Products" article for consideration of unnamed product.
   5. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on the Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" article for consideration of unnamed product by one of the other named manufacturers.

C. Visual Matching Specification: Where Specifications require "match Landscape Architect's Sample" provide a product that complies with requirements and matches the Landscape Architect's sample. Landscape Architect's decision will be final on whether a proposed product matches.
   1. If no product available within the specified category matches and complies with other specified requirements, comply with requirements in Section 01 25 00 Substitution Procedures.

D. Visual Selection Specification: Where Specifications include the phrase "as selected by the Landscape Architect from the manufacturer's full range" or similar phrase; select a product that complies with requirements. Landscape Architect will select color, gloss, pattern, density or texture from the manufacturer's product line that includes both standard and premium items.

2.02 COMPARABLE PRODUCTS

A. Conditions for Consideration: Landscape Architect will consider CONTRACTOR'S request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, the Landscape Architect may return requests without action, except to record non-compliance with these requirements:
   1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that is compatible with other portions of the Work.
   2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect and specific features and requirements indicated.
   3. Evidence that the proposed product provides the specified warranty.
   4. List or similar installations for completed projects with names and addresses and manes of addresses of design consultants and OWNERs, if requested.
   5. Samples, if requested.

PART 3 – EXECUTION (not used)

END OF SECTION

SECTION 01 63 00

SUBSTITUTIONS AND PRODUCT OPTIONS

PART 1 – GENERAL

1.01 REQUIREMENT INCLUDED

A. Furnish and install Products specified, under conditions for options and substitutions stated in this Section.

1.02 PRODUCTS LIST

A. Within thirty (30) days after award of Contract, submit to the Landscape Architect five (5) copies of the complete list of major Products which are proposed for installation.

B. Tabulate Products by Specification section, number and title.

C. For Products specified only be reference standards, list each such Product:
   1. Name and address of the manufacturer.
   2. Trade name.
   3. Model or catalogue designation.
   4. Manufacturer's data:
      a. Reference standards.
      b. Performance test data.

1.03 CONTRACTOR'S OPTIONS

A. For Products specified only by reference standards, select Products meeting that standard, by any manufacturer.

B. For Products specified by naming several Products or manufacturers, select any one of the Products and manufacturers named which complies with the Specifications.

C. For Products specified by naming only on Product and manufacturer, there is no option and no substitution will be allowed (unless substitution is approved prior to the Bid Opening).

1.04 SUBSTITUTION PROCEDURE

A. Prior to the Bid Date: Landscape Architect will consider substitutions as specified in the instructions to Bidders.

B. After the Bid Date: Landscape Architect will consider formal written requests from the CONTRACTOR for substitution of products in place of those specified only when submitted in accordance with the requirements of this Section. Substitution requests must be presented

in writing no later than thirty (30) days after Notice to Proceed. One or more of the following conditions must be documented:

1. The Substitution must be required for compliance with final interpretation of code requirements or insurance requirements.
2. The substitution must be due to the unavailability of the specified Products, through no fault of the CONTRACTOR. Long delivery period will not qualify as unavailability.
3. The substitution may be requested when subsequent information discloses the inability of the specified Products to perform properly or to fit in the designated space.
4. The substitution may be due to the manufacturer's of fabricator's refusal to certify or guarantee performance of the specified Product as required.
5. The substitution may be requested when it is clearly seen, in the judgment of the Landscape Architect that a substitution would be substantially to the OWNER'S best interest in terms of cost, time or other considerations.

C. Submit a separate request for each substitution on a copy of the requested form attached to this Specification section. Support each request with the following:
   1. Complete data substantiating compliance of the proposed substitution with requirements stated in the Contract Documents including:
      a. Product identification, including manufacturer's name and address.
      b. Manufacturer's literature.
      c. Samples, as applicable.
      d. Name and address of similar projects on which the Product has been used, and the date of installation.
   2. Itemized comparison of the proposed substitution with the Product specified; list significant variations.
   3. Date relating to changes in construction schedule.
   4. Any effect of substitution on separate contracts.
   5. List of changes required in other Work or Products.
   6. Accurate cost data comparing proposed substitution with the Product specified.
      a. Amount of any net change in the Contract Sum.
   7. Designation of required license fees or royalties.
   8. Designation of availability of maintenance services, sources or replacement materials.

D. Substitutions will not be considered for acceptance when the following occur:
   1. Substitution's are indicated or implied on Shop Drawings or Product data submittals without a formal request from the CONTRACTOR.
   2. Substitution's are requested directly by a sub-CONTRACTOR or supplier.
   3. Acceptance will require substantial revisions of the Contract Documents.

E. Substitute Products shall not be ordered or installed without written acceptance from the Landscape Architect or OWNER.

F. Landscape Architect and OWNER will determine acceptability of the proposed substitution.

1.05 CONTRACTOR'S REPRESENTATION

A. In making a formal request for a substitution the CONTRACTOR represents the following:
   1. They have investigated the proposed Product and have determined that is equal to or superior in all respects to the specified Product.
   2. They will provide same warranties or bonds for the substitution as for the specified Product.
   3. They will coordinate installation of the accepted substitution into the Work, and will make such changes as may be required for the Work to complete in all respects.
   4. They wave claims for additional costs caused by the substitution which may subsequently become apparent.
   5. Cost data is complete and includes related costs under this Contract, but not the following:
      a. Cost under separate contracts.
      b. Landscape Architect costs for redesign or revisions of the Contract Documents.
   6. They will reimburse the OWNER separately for fees paid to the Landscape Architect for redesign, revisions of the Contract Documents and review of each substitution request.

1.07 LANDSCAPE ARCHITECT'S DUTIES

A. Review CONTRACTOR'S request for substitutions with reasonable promptness.

B. Notify CONTRACTOR, in writing, of decision to accept or reject the requested substitution.

END OF SECTION

SECTION 01 73 00

EXECUTION

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes general procedural requirements governing execution of the Work including, but not limited, to the following:
   1. Construction layout.
   2. Field engineering and surveying.
   3. General installation of Products.
   4. Coordination of OWNER-installed Products.
   5. Progress cleaning.
   6. Starting and adjusting.
   7. Protection of installed construction.
   8. Correction of the Work.

1.02 SUBMITTALS

A. Qualification Data: For land surveyor.

B. Certificates: Submit certificates signed by the land surveyor certifying that location and elevation of the improvements comply with requirements.

C. Landfill Receipts: Submit copies of all receipts issued by a landfill facility for dumping of construction materials.

1.03 QUALITY ASSURANCE

A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in the jurisdiction where the Project is located and who is experienced in providing land surveying services of the kind required for this Project.

PART 2 – PRODUCTS (not used)

PART 3 – EXECUTION

3.01 EXAMINATION

A. Existing Conditions: The existence and location of site improvements and other construction indicated as existing are not guaranteed. Before beginning Work, investigate and verify the existence and location of site improvements and other construction impacting Work.

B. Existing Utilities: The existence and location of underground and other utilities indicated as existing are not guaranteed. Before beginning Work, investigate and verify the existence and location of underground utilities and other construction impacting Work.
   1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, water service piping, irrigation piping and underground electrical service.
   2. Furnish location data for Work related to the Project that must be performed by public utility companies serving the Project site.

C. Acceptance of Conditions: Examine substrates, areas and conditions of the Site for compliance with requirements for installation tolerances and other conditions that may impact performance. Record observations.
   1. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Specification sections, include the following:
      a. Description of the Work.
      b. List of detrimental conditions, including substrates.
      c. List of unacceptable installation tolerances.
      d. Recommended corrections.
   2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes.
   3. Examine rough-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
   4. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with Work indicates acceptance of surfaces and conditions

3.02 PREPARATION

A. Existing Utility Information: Furnish information to local Utilities and the OWNER that is necessary to adjust, move or relocate existing utility structures, utility poles, lines, services or other utility appurtenances located in or impacted by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each Product. Where portions of the Work are indicated to fit other construction, verify dimensions or other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on the Drawings.

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a Request for Information (RFI) to the Landscape Architect. Include a detailed description of the problem encountered, together with recommendations for changing the Contract Documents.

3.03 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to the layout the Work, verify layout information shown on the Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify the Landscape Architect promptly.

B. General: Engage a land surveyor to layout the Work using acceptable surveying practices.
   1. Establish benchmarks and control points to set lines and levels as necessary to locate each element of the Project.
   2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain the required dimensions.
   3. Inform installers of lines and levels to which they must comply.
   4. Check location, level and plumb of every major element as the Work progresses.
   5. Notify the Landscape Architect when deviations from the required lines and levels exceed allowable tolerances.
   6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

C. Site Improvements: Locate and layout site improvements including pavement, grading, fill and topsoil placement, utility slopes and invert elevations.

D. Building Lines and Levels: Locate and layout control lines and levels for structures, building foundations, column grids and floor levels including those required for mechanical and electrical Work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two (2) or more locations.

E. Record Log: Maintain a log of layout control Work. Record deviations from the required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member and types of instruments used. Make the log available for reference by the Landscape Architect.

3.04 FIELD ENGINEERING

A. Identification: OWNER will identify existing benchmarks, control points and property corners.

B. Reference Points: Locate existing permanent benchmarks or control points and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
   1. Do not change or relocate existing benchmarks or control points without prior written approval of the Landscape Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to the Landscape Architect before proceeding.
   2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

C. Benchmarks: Establish and maintain a minimum of two (2) permanent benchmarks on the Project site, referenced to data established by the survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
   1. Record benchmark locations with horizontal and vertical data, on Project Record Documents.
   2. Where the actual location or elevation of the layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
   3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

D. Certified Survey: On completion of foundation walls, major site improvements and other Work requiring field engineering services prepare a certified survey showing dimensions, locations, angles and elevations of construction and site work.

3.05 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated:
   1. Make vertical Work plumb and make horizontal Work level.
   2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
   3. Conceal pipes, ducts and wiring in finished areas, unless otherwise indicated.
   4. Maintain minimum headroom clearance of eight (8') feet in spaces with suspended ceilings.

B. Comply with manufacturer's written instructions and recommendations for installing Products in applications indicated.

C. Install Products at the time and under conditions that will ensure the best results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
F. Templates: Obtain and distribute to the parties involved with templates for Work specified to be factory prepared and field installed. Check Shop Drawings of other Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

G. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other provisions of the Work.
   1. Mounting Heights: where mounting heights are not indicated, mount components at heights directed by the Landscape Architect.
   2. Allow for building movement, including thermal expansion and contraction.
   3. Coordinate installation of anchorages, furnish setting drawings, templates and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts and items with

integral anchors that are to be imbedded in concrete or masonry. Deliver such items to the Project site in time for installation.

H. Hazardous Materials: Use products, cleaners and installation materials that are not considered hazardous.

3.06 PROGRESS CLEANING

A. General: Clean Project site and Work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.
   1. Comply with requirements in NFPA 241 or removal of combustible materials and debris.
   2. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean Work areas where Work is in progress to the level of cleanliness necessary for proper execution of Work.
   1. Promptly remove liquid spills.
   2. Where dust might impair proper execution of the Work, broom clean the entire area of Work, as appropriate.

D. Installed Work: Keep installed Work clean. Clean installed surfaces according to written instruction of the manufacturer or fabricator of Product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous top health or property and that will not damage exposed surfaces.

E. Waste Disposal: Burying or burning of waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

F. During handling and installation, clean and protect construction in progress and adjoin materials already in place. Apply protective covering where required to ensure protection from damage or deterioration.

G. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

H. Limiting Exposure: Supervise construction operations to assure that no part of the construction completed or in progress, is subject to harmful, dangerous, damaging or otherwise deleterious exposure during the construction period.

3.07 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration until the time of Substantial Completion.

3.08 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Section 01 73 29 Cutting and Patching.

B. Restore permanent facilities used during construction to the specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

END OF SECTION

SECTION 01 74 00

CLEANING

PART 1 – GENERAL

1.01 WORK INCLUDED

A. Execute cleaning, during the progress of the Work, and at completion of the Work.

PART 3 – EXECUTION

3.01 DURING CONSTRUCTION

A. Execute periodic cleaning to keep the Work, site and adjacent properties free from accumulations of waste materials, rubbish and debris resulting from construction operations.

B. All waster materials must be legally disposed of off-site.

C. Provide on-site containers for collection of waste materials. These waste containers must be emptied periodically throughout the construction period.

D. Do not allow waste materials, rubbish and debris to accumulate on-site and become an unsightly or hazardous condition.

E. CONTRACTOR will be allowed to wash out concrete trucks on-site in a controlled area that can be easily removed from the site at the end of concrete operations.

3.02 DUST CONTROL

A. Sprinkle exposed dirt areas with water on a frequent basis to control blowing dust.

B. Schedule operations that may generate dust and other blowing contaminants so that this dust and debris does not fall on newly painted surfaces.

3.03 FINAL CLEANING

A. Employ skilled workmen for final cleaning.

B. Remove grease, mastic, adhesives, dust, dirt, stains, labels, fingerprints and other foreign material from exposed surfaces.

C. Repair, patch and touch up any marred surfaces to match adjacent finishes.

D. Broom clean paved surfaces and rake clean all natural surfaces.

E. Polish any glossy surfaces.

F. Prior to final observation, conduct a thorough inspection of the work area to verify that the entire work area is clean.

END OF SECTION

SECTION 01 77 00

CLOSEOUT PROCEDURES

PART 1 – GENERAL

1.01 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
   1. Observation procedures.
   2. Warranties.
   3. Final cleaning.

1.02 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining the date of Substantial Completion, the CONTRACTOR shall complete the following:
   1. Prepare a list of items to be completed and corrected (a punch list), the value of the items on the list and reasons why the Work is not complete.
   2. Advise the OWNER of pending insurance changeover requirements.
   3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications and similar documents.
   4. Obtain and submit releases permitting the OWNER unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates and similar releases.
   5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs, damage or settlement surveys, property surveys and similar final record documentation.
   6. Deliver tools, spare parts, extra materials and similar items to the location designated by the OWNER. Label with the manufacturer's name and model number where applicable.
   7. Make final changeover of permanent locks and deliver keys to the OWNER. Advise OWNER'S personnel of changeover in security procedures.
   8. Complete startup testing of systems.
   9. Submit testing/adjust/balance records.
   10. Terminate and remove temporary facilities from the Project Site, along with mockups, construction tools and similar elements.
   11. Advise the OWNER of changeover of utilities.
   12. Submit changeover information related to the OWNER'S occupancy, use, operation and maintenance.
   13. Complete final cleaning requirements, including touchup painting.
   14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Observation: Submit a written request for observation for Substantial Completion. Upon receipt of the request, the Landscape Architect will either proceed with the observation or

will notify the CONTRACTOR of unfulfilled requirements. The Landscape Architect will prepare the Certificate of Substantial Completion after the observation or will notify the CONTRACTOR of items, either on the CONTRACTOR'S list or other items identified by the Landscape Architect, during their observation that must be completed or corrected (a punch list) before the certificate will be issued.

1. Re-observation: Request re-observation when the Work identified in previous punch lists is completed or corrected.
2. Results of completed observation will form the basis for the Final Completion.

1.03 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final observation for determining the date of Final Completion, the CONTRACTOR must complete the following:
   1. Submit the Final Application for Payment, according to Section 01 29 00 Payment Procedures.
   2. Submit a certified copy of the Landscape Architect's Substantial Completion observation punch list of items to be completed or corrected, endorsed and dated by the Landscape Architect. The certified copy of the punch list shall state that each item has been completed or otherwise resolved for acceptance.
   3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
   4. Submit pest control final inspection report and warranty.
   5. Instruct the OWNER'S personnel on the operation, adjustment and maintenance of products, equipment and systems.

B. Observation: Submit a written request for Final Observation for Acceptance. Upon receipt of the request, the Landscape Architect will either proceed with the observation or will notify the CONTRACTOR of unfulfilled requirements. The Landscape Architect will prepare a Final Certificate for Payment after the observation or will notify the CONTRACTOR of items identified by the Landscape Architect, during their observation that must be completed or corrected (a punch list) before the certificate will be issued.
   1. Re-observation: Request re-observation when the Work identified in previous punch lists is completed or corrected.

1.04 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit three (3) copies of the punch list. Include the name and identification of each area of construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by the CONTRACTOR that are outside the limits of construction.
   1. Organize list of areas.
   2. For each area organize by major elements or construction system.

   3. Include the following as the header for each page of the punch list:
      a. Project name.
      b. Date.
      c. Name of the Landscape Architect.

d. Name of the CONTRACTOR.
e. Page number.

1.05 WARRANTIES

A. Submittal Time: Submit written warranties upon request from the Landscape Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

B. Partial Occupancy: Submit properly executed warranties within fifteen (15) days of completion of designated portions of the Work that are completed and occupied or used by the OWNER during the construction period by separate agreement with the CONTRACTOR.

C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual:
   1. Bind warranties and bonds in a heavy-duty, three (3) ring, vinyl covered, loose leaf binder with a thickness necessary to accommodate the contents and sized to receive eight and one-half (8 ½") inch by eleven (11") inch paper.
   2. Provide heavy duty card stock binders with plastic coated tabs for each separate warranty. Mark tabs to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address and telephone number of the installer.
   3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES", Project name and the name of the CONTRACTOR.

D. Provide additional copies of each warranty to include in the operation and maintenance manuals.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by the manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to the health or property or might damage the finished surface.

PART 3 – EXECUTION

3.01 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and anti-pollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to a condition expected in an average commercial building cleaning and maintenance program. Comply with the manufacturer's written instructions.
   1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for the entire Project or for a portion of the Project:
      a. Clean the project site, yard and grounds in areas disturbed by construction activities including landscaped areas of rubbish, waste materials, litter and other foreign substances.
      b. Sweep paved areas broom clean. Remove petrochemicals spills, stains and other foreign deposits.
      c. Rake grounds that are not planted or paved to a smooth, even-textured surface.
      d. Remove tools, construction equipment, machinery and surplus materials from the Project site.
      e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition free of stains, films and foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
      f. Remove debris and surface dust from limited access spaces.
      g. Remove labels that are not permanent
      h. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already shows evidence of repair or restoration.
      i. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and other foreign substances.
      j. Clean light fixtures, lamps, globes and reflectors to function with full efficiency. Replace burned out bulbs and those noticeably dimmed by hours or use.
      k. Leave the Project site clean and ready for occupancy.

C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Project site. Do not discharge volatile, harmful or dangerous materials into the drainage system. Remove waste materials from the Project site and dispose in a certified landfill operation, in accordance with Federal, State and Local regulations.

END OF SECTION

SECTION 04 54 00
BRICK MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Brick units.

B. Reinforcement.

1.02 REFERENCES

A. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

B. ASTM C 216 - Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale).

1.03 SUBMITTALS

A. Submit under provisions of Section 01 33 00 – Submittal Procedures.

B. Selection Samples: For each product specified, two complete samples of brick to reflect the full range of color, shades and surface texture of brick specified.

C. Verification Samples: For each product specified, two samples of four brick each, representing actual product, color, and texture.

D. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

1.04 MOCKUP

A. As soon as the brick samples have been approved, deliver enough brick to the job site to construct a two (2’-0”) foot by two (2’-0”) foot mockup wall panel.

B. Construct the mockup panel using the brick, mortar, reinforcing, tooling, and cleaning as specified, with appropriate backup walls as shown on the Drawing.

C. The approved sample panel shall be a standard of workmanship for the Work.

D. Mockup panel shall not be removed until masonry work required by this Section has been completed and accepted.

1.05 DELIVERY, STORAGE, AND HANDLING

A Deliver, store, and handle materials to prevent inclusion of foreign materials and damage by water or weather. Store packaged materials in their original packages. Remove damaged or deteriorated materials from the premises.

1.06 PROJECT CONDITIONS

A. Follow hot weather and cold weather requirements in the masonry code and specifications, TMS 402 and TMS 602.

PART 2 PRODUCTS

2.01 BRICK UNITS

A. Face Brick: Brick shall be Type FBS or HBS, modular in size, 2-1/4 by 3-5/8 by 7-5/8 inches, and conform to the requirements of ASTM C 216, Grade SW.

B. Color: Match the color of the brick on the new Veteran's Memorial in the park.

2.02 REINFORCEMENT AND TIES

A. Masonry Joint Reinforcement: Either galvanized ladder or truss type reinforcing with side rods.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until backup substrates have been properly prepared.

B. Verify field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Furnish temporary bracing during installation of masonry work. Maintain in place until structure provides permanent support.

3.03 INSTALLATION

A. Pre-wet all brick having initial rate of absorption greater than thirty (30) before laying.

B. Heat water and sand in cold weather. Do not lay brick in temperature below freezing unless such heating of materials and protection of work is properly provided for.

C. Lay brickwork true to dimensions, plumb, square, and in bond. All courses shall be level with joints of uniform width and height.

D. Vertical joints in facing bond work shall be spaced so as to line up plumb and true, and all joints shall be as uniform as the type of brick will allow.

E. Lay facing brick in full mortar bed with shoved head joints. Completely fill joints with mortar. Do not deep furrow bed joints.

F. Bond for facing brick shall be running bond unless otherwise indicated on the Drawings.

G. Anchor facing brick to metal studs or masonry backup at sixteen (16”) inches o.c. vertically and sixteen (16”) inches o.c. horizontally with galvanized, corrugated strap anchors and ties.

H. Joint thickness shall be such as to provide coursing pattern to match existing brickwork. When the joints have become thumbprint hard, all exposed joints shall be tooled with a sled-jointing tool. The jointer shall be larger than the width of the joints so that a complete contact is made along the edges of the units, compressing and sealing the surface of the joint. Joints shall be pointed as the tool proceeds.

I. Where fresh masonry joins masonry that is partially set or totally set, the exposed surface of the set masonry shall be cleaned and lightly wetted so as to obtain the best possible bond with the new work. All loose brick and mortar shall be removed.

3.04 CLEANING

A. After tooling and pointing is done, clean face brick surface with dry brush.

B. After three (3) days clean with water and mild detergent or cleaners recommended by brick manufacturer. Do not use muriatic acid.

1. Wet brick surfaces thoroughly before applying cleaning solution.
2. Apply cleaning solution with bucket and brush or LOW PRESSURE spray.
3. Remove all stains and mortar streaks using stiff fiber bristle brush.
4. Rinse THOROUGHLY with water.
5. Protect landscaping and surrounding paved surfaces from cleaning solution and rinse water.

END OF SECTION

SECTION 04 72 00
CAST STONE

PART 1 – GENERAL

1.01 DESCRIPTION

A. Work included: Provide cast stone where indicated on the Drawings, as specified herein, and as needed for a complete and proper installation.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Section 04 54 00: Brick Masonry.

1.02 SUBMITTALS

A. Comply with pertinent provisions of Section 01340.

B. At least twenty (20) calendar days prior to beginning work described by this Section, prepare a sample of the work of this Section and install into mock-up panel.

1. Make necessary adjustments in the mock-up panels and secure the Landscape Architect's approval.

C. The mock-up panel, when approved by the Landscape Architect, will be used as datum points for comparison with the remainder of the installation of the work of this Section for the purpose of acceptance or rejection.

1.03 PRODUCT HANDLING

A. Store the materials of this section off ground, and cover to protect from elements and adulterants.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Fabricate cast stone from three thousand (3000 lb) pound type I Portland cement concrete to the shapes and profiles shown on the Drawings.

B. Reinforcement:
1. Truss type masonry wall reinforcing, nine (9 ga,) gauge mill galvanized.

2.02 FABRICATION

A. Fabricate cast stone under conditions, which will allow uniformly formed surfaces in the finished product.

B. Finish: natural/gray

C. Use pre-shaped metal or HDO plywood forms.

D. Size of units:
   1. Not greater than thirty-two (32") inches in any dimension.
   2. Not greater than seventy (70 lbs.) pounds in weight.

E. Seal finished surfaces which will be exposed to weather in the finished work.

PART 3 – EXECUTION

3.01 DELIVERY AND STORAGE

A. Deliver precast units to jobsite and store with face brick.

B. Store units above ground and adequately protected from mechanical injury or staining.

3.02 ERECTION

A. Lay-up pre-cast stone with brick veneer.

   1. Full shoved head and bed joints to match brick coursing.
   2. Tool joints concave.

B. Clean stone with brick veneer.

END OF SECTION

SECTION 07 92 00

JOINT SEALANTS

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes: Provide sealant required to close joints that would allow moisture or air to enter structure between fixed materials, as shown on the drawings and as herein specified, including but not limited to:
   1. Sealing at paving joints.

B. Related Sections include the following:
   1. SECTOIN 32 13 13 Concrete Construction

1.02 JOB CONDITIONS

A. Environmental Conditions: Sealant work not permitted when air temperature is below forty (40^0F) degrees Farhenheit.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's product specifications, color range, handling/installation/curing instructions, and performance tested data sheets for each elastomeric product or joint backing material.

B. Samples: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

C. Submit samples of joint backing material.

1.04 WARRANTY

A. The CONTRACTOR shall submit, in writing, a warranty that all sealant work executed under this Section shall be free from defects in materials and workmanship for a period of two (2) years from date of acceptance of the Project, and they shall remedy any defects in the sealant work during the warranty period.

PART 2 – PRODUCTS

2.01 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience. Confirm compatibility with adjacent existing sealants to remain. Inform Landscape Architect of any conflicts either before or to be included with submittal, and not recommended substitutions for chemical compatibility.

2.02 MATERIALS

A. Chemical Compatibility, General: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. Primers: Non-staining type as recommended by sealant manufacturer for each working surface. Material shall not leave residue or stain on adjacent surfaces. Each joint must be primed prior to sealing according to Manufacturer's recommendations.

C. Sealant for Exterior Concrete Paving and Sidewalk Joints: One component urethane (self leveling) sealant equal to "MasterSeal SL-1" by BASF Chemical Co., "Urexpan NR-200" by Pecora, or "THC-901" Tremco. Provide non-sag product at joints in vertical curbs, equal to "MasterSeal NP-2" by BASF.

D. Sealant for Vertical Surfaces: Two part, non sag, polyurethane, rubber sealant complying with ASTM C-920 equal to Pecora Dynatrol II or approved equal.

E. Joint Backing: Non-staining closed cell polyethylene foam rod oversized thirty (30%) degrees to fifty (50%) degrees, equal to "MasterSeal 920" by BASF.

F. Solvents and Cleaning Agents: Of a type specifically recommended by sealant manufacturer.

PART 3 – EXECUTION

3.01 INSPECTION

A. Applicator shall examine surfaces receiving sealant or caulking for any defects or joint sizes which would not structurally perform or for any unusual conditions which would interfere with proper installation of sealant or caulking.

3.02 PREPARATION

A. Thoroughly clean all joints removing all foreign matter such as dust, oil, grease, dirt or other loose particles. Provide and apply non-staining primer as required by conditions and sealant manufacturer.

B. When primer is dry, compress backup and insert into joint leaving one-fourth (1/4") inch to surface open for joint sealing or leave open one-half (1/2) of joint width, but not less that one-fourth (1/4") inch.

3.03 APPLICATION

A. It is the intent and purpose and interpretation of this specification that in all areas, joints sealed shall be rendered structurally sound and impervious to the passage of water, moisture and dust.

B. Follow sealant manufacturer's instructions regarding mixing, surface application, priming and application procedure.

C. Sealant shall be applied under pressure with a hand or power activated gun having a nozzle of proper size to entirely fill joint void and shall be forced into joints with sufficient pressure to expel air and fill the joints solidly. All joint surfaces shall be neatly tooled to a smooth surface, free of wrinkles and result in a flush joint when dry.

D. Apply sealants when the ambient temperature is between forty (40°) degrees and one hundred (100° F) degress Fahrenheit.

E. Joint backing shall be used in all joints, product to be constructed of closed cell foam, or appropriate resilient material for sealant. Backing shall be sized to require twenty (20%) percent to fifty (50%) percent compression upon insertion and shall be placed so that sealant depth is approximately one-half (1/2) of the joint width. In joints of insufficient depth to allow backing install bond breaking tape at joint.

3.04 CLEANING

A. Clean adjacent surfaces free of sealant or soiling resulting from this work as work progresses. Use solvent or cleaning agent as recommended by sealant manufacturer. All finished work shall be left in a neat, clean condition.

END OF SECTION

SECTION 13 34 23

PRE-ENGINEERED STEEL SHADE STRUCTURES

PART 1 – GENERAL

1.01 SCOPE

A. Pre-engineered steel shade structure components for the dugout covers shall be included in Alternate Bid No. 2.

1.02 SUMMARY

A. All structures shall be designed and fabricated to the IBC (Latest Edition) or current local building code with standard load designs of the greater value of twenty (20 lbs.) pounds per square feet minimum live load and one hundred (100) mph sustained wind load or site specific conditions and the applicable zone for seismic loads.

B. All members shall be designed according to the American Institute of Steel Construction (AISC) specifications and the American Iron and Steel Institute (AISC) specifications for cold-formed members.

C. All fabrication welds shall be in strict accordance with the structural welding code of the American Welding Society (AWS) specifications. All structural welds shall be in compliance with the requirements of "Pre-qualified" welded joints. All welding shall conform to ASTM A-233 series E-70XX electrodes – low hydrogen.

1.03 SUBMITTALS

A. Engineered shop drawings, including foundation design, shall be prepared by a professional engineer licensed in the state of Texas.

B. When required, after award of bid, the shade structure manufacturer shall submit structural calculations, sealed by a registered engineer in the state of Texas for review and approval.

C. Provide paint samples for roof color and steel member powder coat color selection.

1.04 QUALIFICATIONS

A. Manufacturers shall have a minimum of twenty (20) years' experience in the fabrication of tubular steel shade structures. Shade structure fabrication shall be the manufacturer's primary business. Manufacturer shall have fabricated similar structures to that which is specified.

PART 2 – MATERIALS

2.01 COLUMNS

A. Columns shall be seven (7”) inch be seven (7”) inch steel tubing with a minimum wall thickness of 0.188” ASTM 500 grade B.

2.02 FRAME MEMBERS AND COMPRESSION RING

A. Ninety (90%) percent of all steel shall be American (domestic) made. Mill certification shall be made available upon request. All frame members shall be one piece structural steel tube with a minimum one-eighth (1/8”) inch wall thickness. All frame members shall be bolted together with bolts totally concealed. All tubing for frame members shall be ASTM 500 grade B. Beam end plates shall be ASTM A36 fy = 36,000 psi UNO. Bolts shall be A307’s, or 325’s unless noted otherwise.

2.03 ROOFING

A. All roofing shall be twenty-four (24) gauge Zincalume/Galvalume coated steel panels. R-panels shall be Design Span by AEP Span with one and three-fourth (1 3/4”) inch high ribs by eighteen (18”) inches. All roofing shall be prefinished with a Duratech 5000 or equal, thirty (30) year paint finish. All roof panels shall be pre-cut with ribs running with the slope of the roof.

B. Fascia shall be tube steel.

C. Trim shall be twenty-four (24) gauge Zincalume/Galvalume coated pre-finished to match the roof color.

D. Screws and rivets shall match roof color.

E. Roof color shall be as selected by the Owner.

2.04 PAINT

A. All frame members shall be media blasted to a white finish removing all rust, scale, oil and grease. Powder coating for all frame members shall be provisionally warranted for five (5) years with **TRUZINC** 7520-70138 primer with a Dry Film Thickness of (2.0 – 6.0 mils) and hardness of 2H – 3H with a Salt Spray Resistance of **six thousand (6,000) hours** and **Super Durable Gloss Polyester 9000** series finish paint (2.5 – 3.5 mils) with a hardness of H – H2 and has **one thousand (1,000) hour** salt spray resistance. Total of primer and finish paint shall be 4.5 – 9.5 mils of paint. Finish shall be a smooth uniform surface with no pits, runs or sags. For additional information, please visit http://www.tcipowder.com/ for a complete list of specifications.

B. Color on the support posts shall be as selected by the Owner.

2.05 SHADE SHELTER

A. The shade shelter shall be a twenty-five (25') foot by eight (8') foot Marana model as manufactured by Classic Recreation Systems. The local representative for Classic Recreation Systems is Site Source; 972.538.4024.

PART 3 – EXECUTION

3.01 ERECTION

A. Manufacturer shall supply complete layout and detail plans with installation instructions for the structure. The structure shall be erected in a work-man-like manner with framing, roofing and trim installed according to the manufacturer's installation instructions. Care shall be taken to avoid damaging the structure during installation. Touch up powder coat paint with paint provided to prevent rusting. Components of the structure shall be covered and kept dry prior to erection.

3.02 WARRANTY

A. Manufacturer shall warranty the structure to be free from defects in material and workmanship for a period of ten (10) years from date of acceptance by OWNER. Warranty does not include damage from theft, fire, vandalism or acts of God. Manufacturer shall repair or replace structure components of like kind at their option, to match existing material and workmanship. Steel roof finish shall be warranted for thirty (30) years under a separate roof manufacturer's warranty. Powder coat paint shall be warranted for five (5) years after acceptance from OWNER against peeling, flaking and rusting. Warranty does not cover damage caused from shipping, erection of structure, lack of touchup and maintenance, overspray from lawn sprinklers or vandalism. Bolt threads are not powder coated and therefore are not covered under the powder coat warranty.

END OF SECTION

SECTION 26 05 00

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.
   4. Common electrical installation requirements.

1.3 DEFINITIONS

A. EPDM: Ethylene-propylene-diene terpolymer rubber.

B. NBR: Acrylonitrile-butadiene rubber.

1.4 SUBMITTALS

A. Product Data: For sleeve seals.

1.5 COORDINATION

A. Coordinate arrangement, mounting, and support of electrical equipment:
   1. To provide for ease of disconnecting the equipment with minimum interference to other installations.
   2. So connecting raceways 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.

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.

2.2 SLEEVE SEALS

A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.
   1. Subject to compliance with requirements, provide product by one of the following:
      a. Advance Products & Systems, Inc.
      b. Calpico, Inc.
      c. Metraflex Co.
      d. Pipeline Seal and Insulator, Inc.
   2. Sealing Elements: EPDM or NBR 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.

PART 3 - EXECUTION

3.1 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

A. 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.

END OF SECTION

SECTION 26 05 10

GENERAL REQUIREMENTS FOR ELECTRICAL WORK

PART 1 - GENERAL

1.1 BASIC REQUIREMENTS

A. In accordance with the Conditions of the Contract, each Electrical Contractor is acting in the capacity of a sub-contractor. However, the electrical sub-contractor is hereinafter referred to as the Contractor.

B. The Contractor is duly bound to all applicable requirements of the prime Contractor as stipulated in the Conditions of the Contract.

C. The Contractor shall execute all work hereinafter specified or indicated on accompanying drawings, and provide equipment and labor as required in connection with his work and systems.

1.2 GENERAL REQUIREMENTS

A. Unless otherwise specified, materials are to be new and of current U.S. manufacturer, free from defects and of the best quality of their respective kinds.

B. Equipment and/or materials damaged in shipment or handling, or otherwise damaged before installation, shall be replaced with new equipment and/or materials. Damaged equipment and/or materials shall not be repaired at the jobsite.

C. Furnishing of the proper equipment and/or materials and to see that it is installed as recommended by the manufacturer is entirely the responsibility of the Contractor. If required for proper installation, the Contractor shall obtain advice and supervisory assistance from a representative of the specific manufacturer of the equipment being installed.

D. Materials and adhesives to conform to Federal Standard Flame-Spread Properties, Inc., with composite fire and smoke hazard ratings, maximum 25 for flame spread and 50 for smoke developed. Adhesives to be waterproof.

E. The Contractor shall promptly notify the Architect/Engineer in writing of conflicts between the requirements of the Contract Documents and the manufacturer's directions and shall obtain the Architect/Engineer's instructions before proceeding with the work. Should the Contractor perform such work that does not comply with the manufacturer's directions or such instructions from the Architect/Engineer, he shall bear all costs arising in connection with the deficiencies.

1.3 CONSTRUCTION REQUIREMENTS

A. It is the intent of the Contract Documents to provide an installation complete in every respect. If additional work is required for Work indicated or specified, it shall be the responsibility of the Contractor to provide same as well as to provide material and equipment usually furnished with such systems or as required to complete the installation.

B. The Contractor shall be responsible for placing his material and equipment into the site and structure, and shall carefully lay out his work in the project to conform to the structural conditions, to avoid all obstructions, to conform to the details of the installation supplied by the manufacturer of the equipment to be installed and thereby provide an integrated, satisfactorily operating installation.

C. Investigate structural and finish conditions and coordinate all work with the various trades to avoid interferences between the different phases of Work. Harmonize work so that it may be installed in the most direct and workmanlike manner without hindering or handicapping each other.

D. Unless specifically noted to be exposed, lay out work in finish portions of the site and structures so that it will be concealed.

E. Lay out work as required to avoid crippling of structural members. Provide and properly lay out sleeves in concrete for penetrating conduits.

F. Lay out and install equipment as required to provide convenient and safe maintenance and access for future replacement as well as providing easy access to removable access panels and junction boxes.

1.4 SITE INSPECTION

A. Contractor shall visit the site and verify the following:
   1. Existing structures, trees, utilities, obstructions, etc.
   2. Work conditions.
   3. Hazards.
   4. Soil grades and conditions.

B. Acceptance of a contract shall be deemed as evidence that the site visit has been made and that the Contractor has familiarized himself with the conditions noted above.

1.5 PERMITS, UTILITY CONNECTIONS AND INSPECTIONS

A. Fees related to permits and utilities shall be paid by the Contractor and shall be included in the Bid.

B. Power Company charges, if any, will be paid by Owner.

1.6 CONTRACT DOCUMENTS

A. The specifications and accompanying drawings indicate plans and details showing installations and locations of equipment, conduit, outlets, poles, fixtures, etc., based on a product or a group of products, from an identified manufacture or manufacturers. The layout of the equipment and the installation drawing are based on the identified equipment, materials, etc.

B. Installation drawings of the systems are based on the identified vendors and products, and these items are used for dimensions, utility connections, service clearances, etc. These drawings, even when dimensioned, are schematic in nature and are subject to field coordination to reflect actual conditions, final equipment shop drawings, construction means and methods, as well as coordination between trades.

C. Due to the intricacies of construction it is impractical to specify or indicate every detail; in such cases the current rules of good construction practices and applicable specifications shall govern. If departures from the drawings are deemed necessary by the Contractor, details of such proposed departures shall be made to the Architect/Engineer in writing. Each request shall state reasons and recommended correction for proposed departure. No departure shall be made without prior written approval of the Architect/Engineer.

D. The Contractor shall familiarize himself with all drawings and specifications and properly use information found on the Architectural, Civil, Landscape, Irrigation, Electrical, and any other drawings and specifications affecting his work.

E. The electrical power circuits shown on the drawings to items of equipment may or may not be the correct size to serve new and existing equipment. The Electrical Contractor shall obtain from other Contractors and Owner the exact power requirements for each item of mechanical and existing equipment before all circuit breakers, disconnects, power wiring, conduit, etc., have been purchased or installed. Correct power wiring to serve the new and existing equipment items shall be provided at no additional cost to the Owner.

F. Dimensional information pertaining to existing conditions shall be made by the Contractor on the site.

G. Should the drawings or specifications disagree within themselves, or with each other, the better quality or greater quantity of work or materials shall be performed or furnished at no additional cost to the Owner.

H. Interrelation of the specifications and drawings and schedules is as follows:
   1. Specifications determine type and installation of material.
   2. Drawings establish location, quantities, dimensions and details.
   3. Schedules establish performance characteristics of equipment.

I. Dimensions indicated on drawings govern scaled measurements. Large scale details govern small scale drawings.

1.7 SPACE AND EQUIPMENT

A. The size of electrical equipment indicated on the drawings is based on the dimensions of the equipment by the manufacturer indicated on the drawings or specifications. Other manufacturers may be acceptable in some cases if equal in design and function. Other manufacturers are specifically noted in each section.

B. It is the responsibility of the Contractor to determine if equipment proposed to be furnished will fit in the allotted space.

C. Contractor shall prepare and furnish detailed installation drawings indicating arrangement and installation of proposed equipment, and submit to Architect/Engineer for approval. Approval, in writing, shall be obtained before ordering equipment.

1.8 SUPERINTENDENT

A. It shall be the responsibility of each superintendent to study all Contract Documents and familiarize himself with the work to be done by other trades. The superintendent shall coordinate his work with other trades and before material is fabricated or installed, make sure that his work will not cause interference that cannot be resolved without major changes to the Contract Documents.

1.9 PROJECT OBSERVATION

A. Project observation by the Architect/Engineer is for the express purpose of verifying compliance by the Contractor with the Contract Documents, and shall not be construed as construction supervision nor indication of approval of the manner in which the work is being performed.

1.10 LOCATION OF OUTLETS AND EQUIPMENT

A. The drawings show the locations of the various outlets and equipment. Exact locations and mounting heights of these outlets and equipment shall be determined by reference to the general construction plans and to all detail drawings, equipment drawings, roughing-in drawings, etc., by measurements at the site, and in cooperation with the other trades. Receptacle, switch, etc. locations shall comply with ADA and TAS.

B. At the Owner's option, poles, devices and outlets as listed below may be relocated at no additional cost to the Owner.
   1. Lighting poles, lighting fixtures, enclosure, and convenience outlets may, at the Owner's option, be relocated to a point within 10 feet of the location indicated on the drawings, at no additional cost to the Owner, provided the Contractor is advised of this relocation before roughing-in begins.

C. The Contractor shall install his work complete and in good working order. If the requirements of the drawings and specifications are impossible to perform, or if the installation when made in accordance with such requirements will not perform satisfactorily, he shall report same to the Architect/Engineer for correction.

D. No extra compensation will be allowed for extra work or change caused by failure to comply with the above requirements.

1.11 EXCAVATION, BACKFILL AND COMPACTION

A. All safety systems shall meet Occupational Safety and Health Administration Standards.

B. A pay item for these same safety systems shall be included as part of the Contractor's bid and included in the Schedule of Values.

C. Submit trenching/shoring shop drawings where applicable.

D. Trenching shall be in accordance with Occupational Safety and Health Document, Part 1926 - Safety and Health Regulations for Construction; 1926-652 - General Trenching Requirements.
   1. Banks more than 5 feet high shall be shored, laid back to a stable slope, or some other equivalent means of protection shall be provided where employees may be exposed to moving ground or cave-ins. Refer to drawings for standard trenching details.
   2. The Contractor may also have supporting systems, pilings, cribbing, shoring, etc., designed by a Registered Professional Structural Engineer and submitted to the Architect/Engineer as a shop drawing submittal before trenching work is done. Submittal drawings shall be sealed by the Engineer.

E. Excavate to the depths indicated or as otherwise specified.

F. Pile materials suitable for backfilling in an orderly manner a sufficient distance from the banks of the trench to avoid overloading and to prevent slide or cave-ins.

G. Remove excavated materials not required or suitable for backfill.

H. Prevent surface water from flowing into trenches or other excavations, and remove all water accumulating therein.

I. Sheeting and shoring shall be done as may be necessary.

J. Unless otherwise indicated, excavation shall be by open cut except that short sections of a trench may be tunneled if the conduit, cable, or duct can be safely and properly installed and backfill can be properly tamped in such tunnel sections.

K. Excavate all materials encountered including rock and filled-in material.

L. Trench Excavation:
   1. Sides and Bottom: Trenches shall be of the necessary width for proper laying of conduit, cables, or ducts. The banks of conduit trenches shall be as nearly vertical as

practicable. Do not over-excavate. Grade bottom of the trenches to provide uniform bearing and support for each section of the conduit on undisturbed soil at every point along its entire length.

2. Stones: Remove stones necessary to avoid point bearing. Where rock excavation is required in trenches for conduit, excavate rock to a minimum over-depth of 6 inches below the trench depths indicated or specified. Except as hereinafter specified for wet or otherwise unstable material, over-depths shall be backfilled as and with materials specified for backfilling the lower portion of trenches.
3. Unstable Material: Remove wet or otherwise unstable material encountered beyond the depths indicated on the drawings or specified herein and replace with satisfactory material.

M. Removal of Utility Lines: When utility lines that are to be removed are encountered within the area of operations, notify representatives of the Utility, the Owner, and others in ample time for the necessary measures to be taken to prevent interruption of the service.

N. Backfilling:
1. General: The trenches shall not be backfilled until the utilities systems as installed conform to the requirements specified in the several sections covering the installation of the various utilities. Where damage is likely to result from withdrawing sheeting, leave the sheeting in place. Except as otherwise specified for special conditions of over-depths, backfill the trenches to the ground surface with selected material that is suitable for the specified compaction and as hereinafter specified. Reopen improperly backfilled trenches, and trenches that show sinking within 12 months after Substantial Completion to the depth required for proper compaction, then refill and compact as specified. The meaning of "density of the adjacent soil" when the adjacent formation is rock shall be interpreted as maximum density. The surface shall be restored to its original condition as near as practicable and as hereinafter specified. Replace sidewalks, curbs, gravel, pavement, base course, and compacted subgrade disturbed by trenching operations.
2. Lower Portion of Trench: Deposit backfill material in 6-inch-maximum-thickness layers and compact with suitable tampers to the density of the adjacent soil or grade as hereinafter specified until there is a cover of not less than 2 feet over sewers and 1 foot over other utility lines. The backfill material in this portion of the trench shall consist of a selected material at a moisture content that will facilitate compaction, free from stones larger than 3 inches in dimension and hard clods and frozen conglomerates larger than 6 inches in dimension, except that where the pipe is coated or wrapped for protection against corrosion the backfill material shall be free from stones larger than 1 inch in dimension. If a portion of the cover in the lower portion of the trench is in the depth of special compaction and materials requirements under pavement, the special requirements shall control.
3. Remainder of Trench: Except for special materials for pavements, the remainder of the trench shall be backfilled with material that is free of stones larger than 6 inches or 1/2 the layered thickness, whichever is smaller, in dimension. Backfill material shall be deposited in layers not exceeding the thickness specified, and each layer shall be compacted to the minimum density specified as applicable to the particular area except that in areas other than under roadways, parking areas, shoulders of roadways and

parking areas, and other paved areas subject to vehicular movement, settling of granular, non-cohesive material with water will be permitted.

a. Under Pavements: Six-inch layers, 90 percent CE 55 maximum density for cohesive soils and 95 percent CE 55 maximum density for cohesionless soils up to the elevation at which the requirements for pavement subgrade material and compaction control or up to the bottom of the concrete backfill.
b. Under Turfed or Seeded Lawn Areas and Sidewalks: Twelve-inch layers, 85 percent CE 55 maximum density for cohesive soils and 90 percent CE 55 maximum density for cohesionless soils. This requirement also applies to areas designated to be turfed or seeded.
c. Under Other Areas: Two-foot layers, density equal to the adjacent soil.

4. Public Streets, Sidewalks and Other Public Rights-of-Way: Repair in compliance with the requirements of the City of Mesquite, Texas.

O. Landscape:
1. Routing:
a. Stake the route jointly with the Owner.
b. Mark trees, shrubbery and other landscaping to be saved, jointly with the Owner.
c. Avoid the dripline of other trees and large shrubbery.
2. Repair: Place topsoil in top 6 inches of trench in areas of existing cultivated ground cover.
3. Sod: Plant sod in areas of existing sod.
4. Seeding and Hydromulch: Seed or hydromulch as directed by Owner for all other disturbed areas.
5. Mat all areas as required to prevent damage and rutting.

1.12 CONCRETE

A. The work of this article is defined to include whatever concrete work is necessary or shown specifically to install the electrical work. Coordinate the work with other work, particularly other concrete work and accessories.
1. Comply with applicable provisions for electrical-work concrete, including formwork, reinforcement, mix design, materials, admixtures, accessories (including waterstops), placing of wet concrete, finishing, curing, protecting, testing, submittals, and other requirements of the concrete work. Refer instances of uncertain applicability to the Architect/Engineer for resolution before proceeding.

B. Provide strength classes as follows, for the indicated applications and similar required applications:
1. Provide 4000 PSI Class for vaults, beam-type foundations and similar structures.
2. Provide 3000 PSI Class for miscellaneous underground structural concrete, reinforced encasement, block-type foundations (with smallest dimension at least 0.2 x largest dimension), curbs, pads, and similar structural support work.
3. Provide 2500 PSI Class for plain encasement, filling steel-framed units, and similar work.
4. Refer to Musco structural footing/embedment drawings for additional requirements.

1.13 HOUSEKEEPING PADS

A. Refer to detail on drawings.

B. Trowel finish and chamfer edges 1/2".

1.14 LOCKING OF ELECTRICAL FACILITIES

A. Provide padlocks or lockable latches for electrical facilities subject to unauthorized entry, such as panelboards, disconnects, etc.

B. Furnish locks to match existing locking system. Key all locks alike.

C. Furnish Owner with two keys per lock up to a quantity of ten keys.

D. Install locks immediately upon installation of electrical facility.

1.15 ELECTRIC UTILITY

A. Verify all standard practices of the electric utility company and requirements for electric metering and provide metering to conform to the requirements.

B. Furnish necessary labor to install all equipment supplied by the electric utility company and furnish and install other materials and equipment as required.

1.16 ELECTRIC SERVICE FOR TESTING

A. Notify the electric utility company at least 90 working days before job completion deadline of the need for the service. If the power company indicates that service will not be available when needed, notify the Architect/Engineer in writing.

1.17 CLEANING AND PREPARATION OF ITEMS FOR PAINTING

A. Refer to architectural specifications for painting requirements.

B. Thoroughly clean all parts of materials and equipment of cement, plaster, and other materials. All oil and grease spots shall be removed.

C. Thoroughly clean the finish on all parts of the materials and equipment with factory applied finishes. If the factory finish or job applied painted finished surface has been damaged, the surfaces shall be repainted by this Contractor to the satisfaction of the Owner's Designated Representative.

D. No nameplates on equipment shall be painted, and suitable protection shall be afforded to the plates to prevent their being rendered illegible during the painting operation.

1.18 FINAL CLEANING

A. Employ experienced workmen, or professional cleaners for final cleaning.

B. In preparation for substantial completion or occupancy, conduct final inspection of sight-exposed interior and exterior surfaces, and of concealed spaces, and clean as follows:
   1. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from sight-exposed interior and exterior surfaces; polish surfaces so designated to shine finish.
   2. Repair, patch and touch-up marred surfaces to specified finish, to match adjacent surfaces.

1.19 DISRUPTION OF EXISTING FUNCTIONS

A. Access to and use of the existing site except as otherwise indicated will be restricted, and will be under the direction and control of the Owner.

B. Maintain existing electric service, except for scheduled disruptions.

C. Obtain approval three weeks in advance of schedule for date, time and duration of required disruptions.

D. Other disruptions:
   1. Make request immediately on knowledge of the requirement.
   2. Perform Work to cause minimum disruption.

E. Notify the Architect/Engineer and the Owner immediately by telephone and then in writing as changes and additions to the scheduled disruption requirements become known.

F. Duration:
   1. Complete as large a portion of the Work as possible before the disruption.
   2. Maintain on hand adequate supplies, materials, equipment, workers, and other items during the disruption.
   3. Duration of disruption shall be kept to a minimum.
   4. During disruption, perform only the amount of Work that requires the disruption.

1.20 SALVAGE, DEMOLITION AND RELOCATION

A. General:
   1. Modify, remove, or relocate materials and items indicated on the Drawings or required by the installation of new facilities.
   2. Remove all existing equipment, wiring, conduit, devices, etc., not in use. The extent of the existing materials to be removed may or may not be indicated on the drawings. The intent is for the Contractor to verify the scope of demolition and removal on the jobsite and to include the cost of such work in the bid amount.
   3. All salvage equipment and material shall become the property of the Contractor and removed from the site.

B. Relocations:
   1. Materials and items scheduled for relocation and which are damaged during dismantling or reassembly operations shall be repaired and restored to good operational and functional condition.
   2. If materials are damaged and cannot be repaired, new materials and items of like design and quality shall be substituted upon approval of Shop Drawings, Product Data, and Samples.
   3. Remove carefully, in reverse to original assembly or placement, items which are to be relocated.
   4. Store and protect items until relocation is complete.
   5. Clean, repair and/or provide new materials, fittings, and appurtenances as required to complete the relocations and to restore to good operative order.
   6. Perform the relocation work in accordance with pertinent sections of the specifications, utilizing skilled workers.

C. Before work has been started on dismantling, report to Architect/Engineer items which are scheduled for relocation, reinstallation or reuse and are found to be in damaged condition.

1.21 EQUIPMENT SERVICE

A. All equipment installed on this project shall have representation, factory authorized service, and a stock of repair parts within a 200 mile radius.

1.22 CODES, ASSOCIATIONS AND STANDARDS

A. Local governing codes and authorities, trade association standards and publications are an extension of the contract documents, and are hereby imposed as applicable to the work in each instance. In general, each manufacturer, fabricator, supplier, and installer of electrical work is recognized as an expert to be completely familiar with the standards and publications applicable to his portion of the work. Therefore, copies have not been bound with these specifications.
   1. Where local codes, ordinances, rules or authorities conflict with associations and standards listed hereinafter, the local ordinances, codes, rules or authorities take precedence.
   2. Obtain copies of trade association standards and publications, wherever needed for proper execution of the work.
   3. Comply with the issue of applicable standard or publication which is in effect at the date shown on these contract documents.
   4. Where application of a trade association standard or publication appears to be in conflict with the requirements of the contract documents, the Architect/Engineer will determine which must be complied with, and in general the more stringent will be required for the performance of the electrical work.

1.23 LISTING OF ASSOCIATIONS AND STANDARDS

A. AASHTO: American Association of State Highway and Transportation Officials, 444 N. Capitol; Washington, DC 20001

B. AISC: American Institute of Steel Construction, One East Wacker Drive, Suite 3100; Chicago, IL 60601

C. AISI: American Iron and Steel Institute, 1101 17th Street N.W., Suite 1300; Washington, DC 20036

D. ANSI: American National Standards Institute (Successor to USASI and ASA), 11 West 42nd Street; New York, NY 10036

E. ASTM: American Society for Testing and Materials, 100 Barr Harbor Drive; West Conshohocken, PA 19428

F. AWS: American Welding Society, 550 N.W. LeJeune Road; Miami, FL 33126

G. BOCA: Building Officials and Code Administrators

H. CBM: Certified Ballast Manufacturers Association, 355 Lexington Avenue, 17th Floor; New York, NY 10017-6603

I. ETL: Electrical Testing Laboratories

J. FM: Factory Mutual System, 1151 Boston-Providence Turnpike; Norwood, MA 02062-9102

K. ICEA: Insulated Cable Engineers Association, P. O. Box 440; South Yarmouth, MA 02664

L. IECC: International Energy Conservation Code, International Code Council, 5203 Leesburg Pike, Suite 600, Falls Church, VA 22041-3401

M. IEEE: Institute of Electrical & Electronics Engineers, 445 Hoes Lane, P. O. Box 1331; Piscataway, NJ 08855-1331

N. NEC: National Electrical Code, (NFPA No. 70), 1 Batterymarch Park, P. O. Box 9101; Quincy, MA 02269-9101

O. NECA: National Electrical Contractors Association, Inc., 3 Bethesda Metro Center, Suite 1100; Bethesda, MD 20814

P. NEMA: National Electrical Manufacturers Association, 1300 North 17th Street, Suite 1847; Rosslyn, VA 22209

Q. NESC: National Electrical Safety Code (ANSI C2)

R. NFPA: National Fire Protection Association, 1 Batterymarch Park, P. O. Box 9101; Quincy, MA 02269-9101

S. OSHA: Occupational Safety & Health Administration (U.S. Dept. of Labor), Government Printing Office; Washington, DC 20402

T. SBCCI: Southern Building Code Congress International, 900 Monteclair Road; Birmingham, AL 35213-1206

U. UBC: Uniform Building Code, 900 Monteclair Road; Birmingham, AL 35213-1206

V. UL: Underwriters' Laboratories, Inc., 333 Pfingsten Rd.; Northbrook, IL 60062

W. City of Mesquite, Texas Code

1.24 ELECTRICAL SYMBOLS

A. The electrical contract drawings, and the Architect/Engineer's detail sheets are diagrammatic and show requirements by the use of graphic symbols. In general, these are the recognized symbols of the industry and of the engineering profession. Questions of meaning or intent will be decided by the Architect/Engineer, and shall be consistent with system of symbols indicated or, if none is indicated, with recognized conventions.

B. Listing of Symbols: The listing of (or key to) specific graphic symbols used to show the electrical work on the contract documents is shown on the drawings.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 26 05 18

ELECTRICAL CONNECTIONS TO EQUIPMENT

PART 1 - GENERAL

1.1 WORK INCLUDED

A. The extent of electrical connections to equipment is indicated on the drawings and in schedules, in other Divisions of the specifications, and by the requirements of this section, and is hereby defined to include (but not necessarily limited to) connections for providing electrical power to equipment.

B. The types of electrical connections specified in this section include, but are not necessarily limited to, the following:
   1. To motors
   2. To motor starters
   3. From motor starters to motors
   4. Miscellaneous equipment

1.2 SUBMITTALS

A. Submit manufacturer's product data on materials to be used on project.

PART 2 - PRODUCTS

2.1 MATERIALS AND COMPONENTS

A. For each electrical connection indicated, provide a complete assembly of materials, including but not necessarily limited to the following:
   1. Pressure connectors
   2. Terminals (lugs)
   3. Electrical insulating tape
   4. Heat shrinkable tubing
   5. Cable ties
   6. Solderless wire nuts
   7. Conductors

B. Furnish materials and components in compliance with equipment manufacturer's recommendations for the intended application.

PART 3 - EXECUTION

3.1 INSTALLATION OF ELECTRICAL CONNECTIONS

A. Install electrical connections as indicated, in accordance with recognized industry practices to ensure that products serve the intended functions.

B. Connect electrical power supply conductors to equipment conductors in accordance with other sections of the specifications and in accordance with equipment manufacturer's written instructions and wiring diagrams. Wherever possible, match conductors of the electrical connection for proper interface between the electrical supply and the installed equipment.
   1. Cover splices with electrical insulation equivalent to, or of a higher rating, than insulation on the conductors being spliced.
   2. Prepare cables and wires, by cutting and stripping covering armor, jacket, and insulation properly to ensure a uniform and neat appearance where cables and wires are terminated.
   3. Trim cables and wires to be as short as practicable and arrange routing to facilitate inspection, testing and maintenance.

C. Provide conduit for connections in accordance with other sections of the specifications.

D. Coordinate installation of electrical connections to the equipment with equipment installation work and as follows:
   1. Make electrical connections to equipment furnished under other sections of the Contract Documents.
   2. Furnish wiring, conduit, outlet boxes, disconnect switches, etc., as required for same throughout the project.
   3. Check the General Construction, Civil, Landscape, Irrigation plans and specifications and determine the amount of required wiring for final connections.
   4. Verify locations, horsepower, voltages, etc., of all such equipment as the work progresses.
   5. Advise the Architect/Engineer immediately, for clarification, if an apparent conflict arises in control wiring, power wiring, etc.

E. Due to manufacturer's changes or substitutions, equipment furnished under other sections of the specifications may require different rough-in and power requirements than indicated on the plans. Secure detailed drawings from the Contractor furnishing the equipment, to determine actual rough-in locations, and conduit and conductor requirements to assure a proper and workmanlike installation.

3.2 FINAL CONNECTIONS FROM MOTOR STARTERS TO MOTORS

A. Furnish and install conduit, wiring, disconnects, etc., as required to install final connections from motor starters to motors. Verify number and size of conductors, and disconnecting means requirements.

3.3 FINAL CONNECTIONS FOR EQUIPMENT FURNISHED BY OWNER OR UNDER OTHER SECTIONS OF THE CONTRACT DOCUMENTS

A. OTHER EQUIPMENT AND SYSTEMS: It is the Contractor's responsibility to obtain the submittal data for other equipment and systems, check the data, and provide required electrical, including conduit and conductors, circuit breakers, fuses, disconnects, etc., to accommodate changes or variations in the drawings and/or specifications.

END OF SECTION

SECTION 26 05 19

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.
   3. Sleeves and sleeve seals for cables.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Qualification Data: For testing agency.

C. Field quality-control test reports.

1.4 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.

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.
   2. American Insulated Wire Corp.; a Leviton Company.
   3. General Cable Corporation.
   4. Senator Wire & Cable Company.
   5. Southwire Company.

2.2 CONNECTORS AND SPLICES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. AFC Cable Systems, Inc.
   2. Hubbell Power Systems, Inc.
   3. O-Z/Gedney; EGS Electrical Group LLC.
   4. 3M; Electrical Products Division.
   5. Tyco Electronics Corp.

B. Provide factory-fabricated, metal connectors of the size, rating, material, type and class as indicated for each service. Where not indicated, provide proper selection as required to comply with installation requirements and with NEC standards. Select from only following types, classes, kinds and styles.

   1. Type:
      a. Solderless pressure connectors.
      b. Crimp.
      c. Threaded.
      d. Insulated spring wire connectors with plastic caps for 10 AWG and smaller.
   2. Class:
      a. Insulated.
   3. Material:
      a. Copper (for CU to CU connection).
   4. Style: Pigtail connector.
      a. Parallel and tee connectors equal to ILSCO and GTA and GTT with ILSCO insulating cover. Parallel and tee connections shall be used only where specifically detailed. (Split bolt type connectors are not permitted.)

         Note: Connectors in outdoor lighting poles shall be insulated compression type (Scotchlok type shall not be used).

2.3 GENERAL REQUIREMENTS

A. Generally, cable, wire and connectors shall be of manufacturer's standard materials, as indicated by published product information.

B. Provide factory-fabricated wire of the size, rating, material and type as indicated for each service. Where not indicated, provide proper selection as required to comply with installation requirements and with NEC standards. The minimum size wire to be used for power or lighting circuits shall be #12 copper with insulation as noted below. Minimum size for control shall be #14 copper.

C. If more than three phase conductors are installed in a single raceway, the conductors shall be derated in accordance with the National Electrical Code. Increase wire size so that resulting ampacity, after derating factor is applied, is equal to or greater than ampacity of conductor specified.

D. The conductors of wires and cables shall be of copper (tinned where specified), and have conductivity in accordance with the standardization rules of the IEEE. The conductor and each strand shall be round and free of kinks and defects.

E. Grounding conductors, where insulated, shall be colored solid green or identified with green color as required by the NEC. Conductors intended as a neutral shall be colored solid white, or identified as required by the NEC. All motor or equipment power wiring shall be colored according to Section 260553, Electrical Identification.

F. Use compression lugs for all wiring termination's, except on breakers or terminal strips in panel boards.

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: Type THHN-THWN, single conductors in raceway.

C. Service Entrance, Feeders and Branch Circuits Below Grade: Type XHHW, single conductors in raceway.

D. Branch Circuits: Type THHN-THWN, single conductors in raceway.

E. Nonmetallic sheathed cable, armored cable, metal-clad cable, etc. shall not be used.

F. 600 Volt Insulation Control Cable for Class 1 Remote Control and Signal Circuits, Type TC:
   1. Individual Conductors: 14 AWG, stranded copper, XHHW insulation. Rated 90 degrees C dry, 75 degrees C wet, color-coded per ICEA Method 1 plus one green equipment grounding conductor.
   2. Assembly: Bundle wrapped with cable tape and covered with an overall PVC jacket. Cable shall pass IEEE-1202 vertical tray ribbon-burner flame test (210,000 BTU) VW-1.

G. Instrumentation Cable
   1. 300 Volt Instrumentation Cable, Multiple Pairs, Overall Shield, Type PLTC:
      a. Individual Conductors: 18 AWG, stranded, tinned copper, flame retardant polyethylene or PVC insulated, rated 105 degrees C, black and white numerically printed and coded pairs.

b. Assembly: Individual twisted pairs having a 100 percent coverage aluminum-polyester shield and 20 AWG stranded tinned copper drain wire. Conductor bundle shall be shielded with 100 percent coverage overall aluminum-polyester shield complete with 20 AWG drain wire. All group shields completely isolated from each other. Bundle wrapped with cable tape and covered with an overall flame retardant PVC jacket. Cable shall pass IEEE-383 vertical tray flame test (70,000 BTU) UL1581.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

A. 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.

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

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

D. Install electrical cable, wire and connectors as indicated, in accordance with the manufacturer's written instructions, the applicable requirements of NEC and the National Electrical Contractors Association's "Standard of Installation", and as required to ensure that products serve the intended functions.

E. Coordinate cable and wire installation work with electrical raceway and equipment installation work, as necessary for proper interface. Do not install the conductors until raceway system is complete and properly cleaned.

F. No conductor smaller than #12 AWG shall be used for lighting and power purposes.
   1. Conductor sizes shown on drawings are minimum and shall be increased as necessary to comply with voltage drop restrictions specified herein. The sizing of all wire except remote control wire shall be accomplished in the case of both feeder and branch circuits by conforming to the following provisions.
      a. 480 Volt Branch Circuits: The voltage drop in the case of 277/480 volt circuits shall not exceed 1.0% at maximum load and 70.0% power factor.
      b. 120/240 Volt Branch Circuits: The voltage drop in the case of 120/208 volt circuits shall not exceed 2.0% at maximum load and 70.0% power factor.
   2. To accommodate circuits increased in size to offset voltage drop, provide pigtails as required to make terminations at source and load. Pigtail splices at source shall be in separate j-box (not inside panelboard). Increase size of load side termination box as required.

G. Separate neutral conductors shall be provided for each phase of the same size for 120V and 277V single-phase circuits.

H. Remote control wires shall be no smaller than No. 14 conductors. Control wires shall be run in separate conduits.

I. Exposed wire and cable is not permitted. All wire and cable shall be installed in conduit.

J. Wiring within Panel or Enclosed Breaker: Contractor shall bundle ac and dc wiring separately within an enclosure. The Contractor shall utilize panel wireways when they are provided. Where wireways are not provided the Contractor shall neatly tag, bundle wires and secure to sub-panel at a minimum of every three inches with T&B Type TC5355 heavy duty mounting bases.

K. Do not bend any conductor either permanently or temporarily during installation to radii less than four times the outer diameter of 600-volt insulated conductors.

L. Torque test conductor connections and terminations to manufacturer's recommended values.

M. Perform continuity test on all power and equipment branch circuit conductors. Verify proper phasing connections.

N. Conductors in poles, vertical conduits or raceways shall be supported in the manner set forth in the appropriate section of the latest revision of the National Electrical Code. Lighting fixtures shall not be used for raceways for circuits other than parallel wiring of fixtures.

O. Conductors may be run in parallel as shown on drawings, provided all paralleled conductors are the same size, length, and type of insulation. They shall be so arranged and terminated as to ensure equal division of the total current between all conductors involved.

P. Feeder or Branch Circuit Size Omission: In the event that an electrical feeder or branch circuit size is omitted, the Contractor shall report the same to the Engineers in time to issue an Addendum prior to bid date. If the omission is not discovered in time to issue an Addendum, the Contractor shall base his bid on installation of Conductors sized in accordance with the National Electrical Code, and protected by an overcurrent device sized per the N.E.C. (maximum of 3% voltage drop). Conduit for these conductors shall be sized in accordance with the National Electrical Code. Contractor shall confirm the conduit and conductor sizes with the Architect/Engineer before purchasing or installing same.

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. Keep conductor splices and taps accessible and to a minimum, and in junction boxes only. Control circuit conductors shall terminate at terminal blocks only. Do not splice below grade or in outdoor pull boxes.

D. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

3.5 FIELD QUALITY CONTROL

A. Before final acceptance, the Contractor shall make voltage, insulation, and load tests, necessary to demonstrate to the Owner's representative the satisfactory installation and proper performance of all circuits.

B. Test conductors clear of faults. Insulation-resistance test shall be conducted per NETA – Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems. Test results below 50 megohms shall be cause for rejection of the wiring installation. Replace and retest all such rejected conductor.

C. Perform tests and inspections and prepare test reports.

D. Tests and Inspections:
   1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance, feeder, and branch circuit conductors for compliance with requirements.
   2. Perform visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.

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

END OF SECTION

SECTION 26 05 26

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, plus the following special applications:
   1. Ground bonding common with lightning protection system.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. 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. Grounding arrangements and connections for separately derived systems.

C. Qualification Data: For qualified testing agency and testing agency's field supervisor.

D. Field quality-control reports.

1.4 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 or tinned-copper wire or cable insulated for 600 V.

B. Bare Copper Conductors:
   1. Bonding jumpers
   2. As noted herein, and per NEC.

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

C. 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 diameter by 10 feet.

B. Ufer Ground.

PART 3 - EXECUTION

3.1 APPLICATIONS

A. Conductors: Install solid conductor for No. 10 AWG and smaller, and stranded conductors for No. 8 AWG and larger unless otherwise indicated.

B. Ufer Ground: Install bare copper conductor, No. 3/0 AWG minimum.
   1. Bury at least 24 inches below grade, minimum 2” concrete encasement all around.

C. Grounding Bus: Install in pad mounted electrical equipment enclosure.
   1. Install bus on insulated spacers 2 inches minimum, 6 inches above pad unless otherwise indicated.
   2. Interconnect with minimum 3/0 copper.

D. Conductor Terminations and Connections:
   1. Equipment Grounding Conductor Terminations: Bolted connectors.
   2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
   3. Connections to Ground Rods: Welded connectors (bolted if test wells).
   4. Connections to Structural Steel: Welded connectors.

3.2 GROUNDING UNDERGROUND DISTRIBUTION SYSTEM COMPONENTS

A. Comply with IEEE C2 grounding requirements.

3.3 EQUIPMENT GROUNDING

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

B. Use of metallic conduit as a ground path is not permitted.

3.4 GROUNDING ELECTRODE SYSTEM

A. The following grounding electrodes that are present shall be bonded together to form the grounding electrode system.
   1. Metal frame of pad mounted electrical equipment enclosure.

B. In addition to above, provide the following and bond together with other electrodes to form the grounding electrode system:
   1. Concrete encased electrode (Ufer ground), 30” deep.
   2. (3) Ground rods shall be installed as detailed on drawings and as specified herein. Bond together with other electrodes to form the grounding electrode system. 4” from top of ground rod to finished grade.

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 Rods: Drive rods until tops are 2 inches below 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.

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

D. Separately derived system such as dry type transformers shall be grounded and bonded per NEC.

3.6 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Perform tests and inspections.

C. 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.

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

E. Prepare test and inspection reports.

F. Report measured ground resistances shall not exceed 2 ohms.

G. Excessive Ground Resistance: If resistance to ground exceeds specified values, install additional grounding system components as necessary to reduce ground resistance.

END OF SECTION

SECTION 26 05 29

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.

1.3 PERFORMANCE REQUIREMENTS

A. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

1.4 SUBMITTALS

A. Product Data: For the following:
   1. Steel slotted support systems within electrical equipment enclosure.

B. Shop Drawings: Show fabrication and installation details and include calculations for the following:
   1. Steel slotted channel systems. Include Product Data for components.
   2. Equipment supports.

1.5 COORDINATION

A. Coordinate installation of equipment supports and penetrations.

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.

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.

G. Do not use wood blocking to support electrical equipment and materials.

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. Spring-steel clamps are not permitted.

3.2 SUPPORT INSTALLATION

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

B. 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 (90 kg).

C. 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 thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick.
6. To Steel: Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69.
7. To Light Steel: Sheet metal screws.
8. Items Within Pad Mounted Electrical Equipment Enclosure: Mount cabinets, panelboards, breakers, control enclosures, and other devices on slotted-channel racks attached to enclosure.

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

E. Fasten hanger rods, conduit clamps, and outlet and junction boxes to building structure using precast insert system, expansion anchors, or beam clamps. Do not use spring steel clips and clamps. Provide necessary calculations to select proper support materials for electrical equipment, raceway supports.

F. Do not use powder actuated anchors without written permission from the Engineer.

G. Do not drill structural steel members without written permission from the Structural Engineer.

H. Fabricate supports from structural steel or steel channel, rigidly welded or bolted to present a neat appearance. Use hexagon head bolts with spring lock washers under all nuts.

3.3 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

SECTION 26 05 33

RACEWAY 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. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

1.3 DEFINITIONS

A. IMC: Intermediate metal conduit.

B. LFMC: Liquidtight flexible metal conduit.

C. RNC: Rigid nonmetallic conduit.

1.4 SUBMITTALS

A. Product Data: For wireways and fittings, hinged-cover enclosures, and cabinets.

B. Shop Drawings: For the following raceway components. Include plans, elevations, sections, details, and attachments to other work.
   1. Custom enclosures and cabinets.
   2. For handholes and boxes for underground wiring, including the following:
      a. Duct entry provisions, including locations and duct sizes.
      b. Frame and cover design.
      c. Grounding details.
      d. Joint details.

C. Submit cable pulling tension and sidewall pressure for all service, feeder and site conduits.

PART 2 - PRODUCTS

2.1 METAL CONDUIT AND TUBING

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

1. Allied Tube & Conduit; a Tyco International Ltd. Co.
2. Manhattan/CDT/Cole-Flex.
3. O-Z Gedney; a unit of General Signal.
4. Wheatland Tube Company.

B. Rigid Steel Conduit: ANSI C80.1.

C. IMC: ANSI C80.6.

D. LFMC: Flexible steel conduit with PVC jacket.

E. Fittings for Conduit (Including all Types and Liquidtight): NEMA FB 1; listed for type and size raceway with which used, and for application and environment in which installed.

F. Joint Compound for Rigid Steel Conduit or IMC: Listed for use in cable connector assemblies, and compounded for use to lubricate and protect threaded raceway joints from corrosion and enhance their conductivity.

2.2 NONMETALLIC CONDUIT

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. CANTEX Inc.
2. CertainTeed Corp.; Pipe & Plastics Group.
3. Lamson & Sessions; Carlon Electrical Products.
4. Manhattan/CDT/Cole-Flex.
5. RACO; a Hubbell Company.
6. Thomas & Betts Corporation.

B. RNC: NEMA TC 2, Type EPC-40-PVC, unless otherwise indicated.

C. Fittings for RNC: NEMA TC 3; match to conduit or tubing type and material.

2.3 METAL WIREWAYS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Cooper B-Line, Inc.
2. Hoffman.
3. Square D; Schneider Electric.

B. Description: Sheet metal sized and shaped as indicated, NEMA 250, Type 3R within electrical equipment enclosure.

C. Fittings and Accessories: Include 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.

E. Finish: Manufacturer's standard enamel finish.

F. Wireways shall only be used where shown on drawings or where approved by engineer.

2.4 BOXES, ENCLOSURES, AND CABINETS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Cooper Crouse-Hinds; Div. of Cooper Industries, Inc.
   2. EGS/Appleton Electric.
   3. Hoffman.
   4. Hubbell Incorporated; Killark Electric Manufacturing Co. Division.
   5. O-Z/Gedney; a unit of General Signal.
   6. Robroy Industries, Inc.; Enclosure Division.
   7. Spring City Electrical Manufacturing Company.
   8. Thomas & Betts Corporation.

B. Sheet Metal Outlet and Device Boxes: NEMA OS 1.

C. Cast-Metal Outlet and Device Boxes: NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.

D. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

E. Cast-Metal Access, Pull, and Junction Boxes: NEMA FB 1, cast aluminum with gasketed cover.

F. Hinged-Cover Enclosures: 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.

G. 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.

H. All boxes and cabinets shall be steel and cast-metal as noted above. Do not use plastic or non-metallic.

I. Pad mounted electrical equipment enclosures shall be as detailed on drawings.

J. Outlet boxes shall be 2-1/8” deep.

2.5 PULL BOXES FOR EXTERIOR UNDERGROUND WIRING

A. Description: Comply with SCTE 77.
   1. Color of Frame and Cover: Gray.
   2. Configuration: Units shall be designed for flush burial and have open 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, "ELECTRIC" or as indicated for each service.
   6. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
   7. Pull boxes shall be traffic grade with tamperproof cover.

B. Polymer-Concrete Handholes and Boxes with Polymer-Concrete Cover: Molded of sand and aggregate, bound together with polymer resin, and reinforced with steel or fiberglass or a combination of the two.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Armorcast Products Company.
      b. Carson Industries LLC.
      c. CDR Systems Corporation.
      d. NewBasis.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Outdoors: Apply raceway products as specified below, unless otherwise indicated:
   1. Concealed Conduit, Above Ground, and within pad mounted equipment enclosure: Galvanized RMC or IMC.
   2. Underground Branch Circuit Conduit: Schedule 40 PVC, direct buried.
   3. Underground Feeder Conduit: Schedule 40 PVC direct buried.
   4. Underground Service Entrance Conduit: Schedule 40 PVC, direct buried.
   5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
   6. Boxes and Enclosures, Above Ground: NEMA 250, Type 3R or 4 as noted.
   7. Application of Handholes and Boxes for Underground Wiring:
      a. All handholes and boxes shall be traffic grade, regardless of location.

B. Minimum Raceway Size:
   1. 1/2-inch for power and controls within pad mounted electrical equipment enclosure.
   2. Other conduit minimums as noted on drawings.

C. Raceway Fittings: Compatible with raceways and suitable for use and location.
   1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.

D. Do not install aluminum, EMT, flexible metal, and other conduit types. Use only conduit types listed in above.

3.2 INSTALLATION

A. Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements on Drawings or in this Article are stricter.

B. Complete raceway installation before starting conductor installation.

C. Support raceways as specified in Division 26 Section "Hangers and Supports for Electrical Systems."

D. Install no more than the equivalent of three 90-degree bends in any conduit run.

E. Conceal conduit within pad mounted electrical equipment enclosure, below grade, inside poles, and within structures such as screen wall.

F. Exposed conduits are only acceptable at stub-up to meter at enclosure, receptacle mounted to backstop structure, and at scoreboard. There shall be no other exposed conduits.

G. 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.

H. Raceway Terminations: Use insulating bushings or throats to protect conductors.

I. 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.

J. 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.

3.3 INSTALLATION OF UNDERGROUND CONDUIT

A. Direct-Buried Conduit:
   1. Excavate trench bottom to provide firm and uniform support for conduit.
   2. 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."

3. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at pad mounted electrical equipment enclosure entrances through the pad.
   a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete.
4. Warning Tape: Refer to Section 26 05 53.
5. Conduits shall be minimum of 30” below grade, additional depth as required by utility companies and as necessary to obtain clearances from other utilities and obstructions.

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 and boxes with bottom below the frost line.

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 PROTECTION

A. Provide final protection and maintain conditions that ensure coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.
   1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
   2. Repair damage to paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION

SECTION 26 05 53

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 of power and control cables.
2. Identification for conductors.
3. Underground-line warning tape.
4. Warning labels and signs.
5. Instruction signs.
6. Equipment identification labels.
7. Miscellaneous identification products.

1.3 SUBMITTALS

A. Product Data: For each electrical identification product indicated.

1.4 QUALITY ASSURANCE

A. Comply with ANSI A13.1 and IEEE C2

B. Comply with NFPA 70.

C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.

D. Comply with ANSI Z535.4 for safety signs and labels.

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 wiring diagrams, and the Operation and Maintenance Manual; and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.

B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

PART 2 - PRODUCTS

2.1 CONTROL CABLE IDENTIFICATION MATERIALS

A. 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.

2.2 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.

2.3 UNDERGROUND-LINE WARNING TAPE

A. Tape:
1. Magnetic type 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.

B. Color and Printing:
1. Comply with ANSI Z535.1 through ANSI Z535.5.
2. Inscriptions for Red-Colored Tapes: ELECTRICAL CONDUIT

C. Tag: Type IID:
1. Reinforced, detectable three-layer laminate, consisting of a printed pigmented woven scrim, a solid aluminum-foil core, and a clear protective film that allows inspection of the continuity of the conductive core, bright-colored, continuous-printed on one side with the inscription of the utility, compounded for direct-burial service.
2. Overall Thickness: 8 mils.
3. Foil Core Thickness: 0.35 mil.
4. Weight: 34 lb/1000 sq. ft.
5. 3-Inch Tensile According to ASTM D 882: 300 lbf, and 12,500 psi.

2.4 WARNING LABELS AND SIGNS

A. Comply with NFPA 70 and 29 CFR 1910.145.

B. Baked-Enamel Warning Signs:
1. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.

2. 1/4-inch grommets in corners for mounting.
3. Nominal size, 7 by 10 inches.

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."

2.5 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.

2.6 EQUIPMENT IDENTIFICATION LABELS

A. Engraved Laminated Acrylic Label: Punched or drilled for screw mounting. White letters on a dark-gray background. Minimum letter height shall be 3/8-inch.

B. Label shall be 1/16-inch thick up to 20 square inches and 1/8-inch for larger size.

2.7 RECEPTACLE LABELS

A. All receptacles shall have panel and circuit number engraved on outside of the cover plate. Black letters on gray background for stainless cover plates. Letter height shall be 1/8-inch.

2.8 CABLE TIES

A. General-Purpose Cable Ties: Fungus inert, self extinguishing, one piece, self locking, Type 6/6 nylon.
1. Minimum Width: 3/16-inch.
2. Tensile Strength at 73 degrees F, According to ASTM D 638: 12,000 psi.
3. Temperature Range: Minus 40 to plus 185 degrees F.
4. Color: Black.

B. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self extinguishing, one piece, self locking, Type 6/6 nylon.
1. Minimum Width: 3/16-inch.
2. Tensile Strength at 73 degrees F, According to ASTM D 638: 12,000 psi.
3. Temperature Range: Minus 40 to plus 185 degrees F.
4. Color: Black.

2.9 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. Attach signs and plastic labels with mechanical fasteners appropriate to the location and substrate.

E. Cable Ties: For attaching tags. Use general-purpose type, except as listed below:
   1. Outdoors: UV-stabilized nylon.

F. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above conduit 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. Install warning tape for all underground conduits.

3.2 IDENTIFICATION SCHEDULE

A. Power-Circuit Conductor Identification, 600 V or Less: For conductors in panelboards, device boxes, pull and junction boxes and handholes, use color-coding conductor tape to identify the phase.
   1. Color-Coding for Phase Identification, 600 V or Less: Use colors listed below for ungrounded 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 240/120-V Circuits:
         Phase A: Black.
         Phase B: Red.
         Phase C: Blue.
         Neutral: White
         Equipment Ground: Green

c. Colors for 480/240-V Circuits:
Phase A: Brown.
Phase B: Yellow.
Neutral: Grey
Equipment Ground: Green

d. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.

B. Conductors to Be Extended in the Future: Attach marker tape to conductors and list source.

C. 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.

D. 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.

E. 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.

1. Labeling Instructions:
   a. Indoor and Outdoor Equipment: Engraved laminated acrylic 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. Fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.
2. Equipment to be labeled with equipment identification/name, voltage, amperage, served from “include panel and circuit number of source”:
   a. Panelboards and Mini Power Zones (Also provide typewritten directory of circuits in the location provided by panelboard manufacturer).
   b. Distribution Panels (also label each individual feeder breaker with load served).
3. Equipment to be labeled with equipment identification/name, served from “include panel and circuit number of source”:
   a. Enclosed switches.
   b. Enclosed circuit breakers.
4. Equipment to be labeled with equipment identification/name:
   a. Musco Contactors.

END OF SECTION

SECTION 26 05 73

ARC FLASH STUDY

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 computer-based arc-flash study.

1.3 QUALITY ASSURANCE

A. Study shall be conducted by electrical switchgear manufacturer supplying equipment on project.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 ARC-FLASH STUDY

A. Provide arc-flash study and label equipment with required personal protective equipment (PPE).

END OF SECTION

SECTION 26 22 00

MINI POWER ZONES

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.

B. Refer to Section 262416 Panelboards for additional information related to panelboard component.

1.2 SUMMARY

A. This Section includes combination dry type transformer and panel board in single enclosure.

1.3 SUBMITTALS

A. Product Data: Include rated nameplate data, capacities, weights, dimensions, minimum clearances, installed devices and features, and performance for each type and size of transformer indicated.

B. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
   1. Wiring Diagrams: Power, signal, and control wiring.

C. Manufacturer's data on vibration isolators and accessories.

D. Operation and Maintenance Data: For transformers to include in emergency, operation, and maintenance manuals.

E. Provide 1/4" scale layout of mini power zones within electrical equipment enclosure to demonstrate all code clearances are obtained. Submit with equipment submittals. Submittals without 1/4" scale layout will be rejected.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

2. Siemens.
3. Square D.
4. Eaton Cutler Hammer.

2.2 GENERAL TRANSFORMER REQUIREMENTS

A. Description: Factory-assembled and -tested, air-cooled units for 60-Hz service.

B. Cores: Grain-oriented, non-aging silicon steel.

C. Coils: Continuous windings without splices except for taps.
1. Internal Coil Connections: Brazed or pressure type.
2. Coil Material: Copper.

2.3 TRANSFORMERS

A. Comply with NEMA ST 20, and list and label as complying with UL 1561.

B. Cores: One leg per phase.

C. Enclosure: Ventilated or totally enclosed, nonventilated, NEMA 250, Type 2.
1. Core and coil shall be encapsulated within resin compound, sealing out moisture and air.
2. Self cooled

D. Taps for Transformers: Two 2.5 percent taps above and two 2.5 percent taps below normal full capacity.

E. Insulation Class: Insulation class shall be 155 degrees or higher, UL-component-recognized insulation system with a maximum of 115 degrees C rise above 40 degrees C ambient temperature.

F. Energy Efficiency for Transformers:
1. 2016 Energy Act. Comply with all Rules from Department of Energy, DOE 10 CFR 431.192, April 2013.

G. Low-Sound-Level Requirements: Minimum of 3 dBA less than NEMA ST 20 standard sound levels when factory tested according to IEEE C57.12.91.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Mount to unistrut supports within electrical equipment enclosure. Provide vibration isolation at each mounting point.

3.2 FIELD QUALITY CONTROL

A. Tests and Inspections:
   1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.

B. Remove and replace units that do not pass tests or inspections and retest as specified above.

3.3 ADJUSTING

A. Record transformer secondary voltage at each unit. Adjust transformer taps to provide optimum voltage conditions at secondary terminals. Optimum is defined as not exceeding nameplate voltage plus 10 percent and not being lower than nameplate voltage minus 3 percent at maximum load conditions. Submit recording and tap settings as test results.

B. Output Settings Report: Prepare a written report recording output voltages and tap settings.

3.4 CLEANING

A. Vacuum dirt and debris; do not use compressed air to assist in cleaning.

END OF SECTION

SECTION 26 24 16

PANELBOARDS

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. Distribution panelboards.
   2. Lighting and appliance branch-circuit panelboards.
   3. Panelboard section of Mini Power Zones.

1.3 SUBMITTALS

A. Product Data: For each type of panelboard, switching and overcurrent protective device, transient voltage suppression device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

B. Shop Drawings: For each panelboard and related equipment.
   1. Include dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings.
   2. Detail enclosure types and details for types other than NEMA 250, Type 1.
   3. Detail bus configuration, current, and voltage ratings.
   4. Short-circuit current rating of panelboards and overcurrent protective devices.
   5. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
   6. Include wiring diagrams for power, signal, and control wiring.

C. Qualification Data: For qualified testing agency.

D. Operation and Maintenance Data: For panelboards and components 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. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
   2. Time-current curves, including selectable ranges for each type of overcurrent protective device that allows adjustments.

E. Provide 1/4” scale layout of panels within electrical equipment enclosure to demonstrate all code clearances are obtained. Submit with equipment submittals. Submittals without 1/4” scale equipment enclosure layout will be rejected.

1.4 PROJECT CONDITIONS

A. Interruption of Existing Electric Service:
   1. Notify Owner no fewer than 21 days in advance of proposed interruption of electric service.
   2. Do not proceed with interruption of electric service without Owner's written permission.

1.5 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Keys: Two spares for each type of panelboard cabinet lock.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR PANELBOARDS

A. Enclosures: Surface-mounted cabinets.
   1. Rated for environmental conditions at installed location.
      a. Within Electrical Equipment Enclosure: NEMA 250, Type 1.
   2. Hinged Front Cover: Entire front trim hinged to box and with standard door in door cover.
   3. Gutter Extension and Barrier: Same gage and finish as panelboard enclosure; integral with enclosure body. Arrange to isolate individual panel sections.
   4. Finishes:
      a. Panels and Trim: Factory finished immediately after cleaning and pretreating with manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat.
      b. Back Boxes: Same finish as panels and trim.
   5. Directory Card: Inside panelboard door, mounted in metal frame with transparent protective cover.
   6. Load centers are not acceptable.
   7. Plug-in circuit breakers are not acceptable except for Mini Power Zones.

B. Phase, Neutral, and Ground Buses:
   1. Material: Hard-drawn copper, 98 percent conductivity.
   2. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment grounding conductors; bonded to box.

C. Conductor Connectors: Suitable for use with conductor material and sizes.
   1. Material: Hard-drawn copper, 98 percent conductivity.

2. Main and Neutral Lugs: Mechanical type.
3. Ground Lugs and Bus-Configured Terminators: Mechanical type.

D. Future Devices:
1. Mounting brackets, bus connections, filler plates, and necessary appurtenances required for future installation of devices.

E. Panelboard Short-Circuit Current Rating: Fully rated to interrupt symmetrical short-circuit current available at terminals.

2.2 DISTRIBUTION PANELBOARDS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. General Electric Company.
2. Siemens.
3. Square D.
4. Eaton Cutler Hammer

B. Panelboards: NEMA PB 1, power and feeder distribution type.

C. Doors: Secured with vault-type latch with tumbler lock; keyed alike.
1. For doors more than 36 inches high, provide two latches, keyed alike.
2. Door-in-door construction.

D. Mains: Circuit breaker or lugs only as specified.

E. Branch Overcurrent Protective Devices: Bolt-on circuit breakers.

2.3 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. General Electric Company.
2. Siemens.
3. Square D.
4. Eaton Cutler Hammer

B. Panelboards: NEMA PB 1, lighting and appliance branch-circuit type.

C. Doors: Secured with vault-type latch with tumbler lock; keyed alike.
1. For doors more than 36 inches high, provide two latches, keyed alike.
2. Door-in-door construction

D. Mains: Circuit breaker or lugs only as scheduled.

E. Branch Overcurrent Protective Devices: Bolt-on circuit breakers.

2.4 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. General Electric Company
   2. Siemens
   3. Square D
   4. Eaton Cutler Hammer

B. Molded-Case Circuit Breaker (MCCB): Comply with UL 489, with interrupting capacity to meet available fault currents.
   1. Thermal-Magnetic Circuit Breakers: For frame sizes 250 amp and below, inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits, and adjustable magnetic trip setting.
   2. Electronic trip circuit breakers with rms sensing; field-replaceable rating plug or field-replicable electronic trip; and the following field-adjustable settings:
      a. 400A frame and above.
      b. Instantaneous trip.
      c. Long- and short-time pickup levels.
      d. Long- and short-time time adjustments.
      e. Ground-fault pickup level, time delay, and I2t response (service entrance main).
   3. Current-Limiting Circuit Breakers: Frame sizes 600 amp and below.
   4. GFCI Circuit Breakers: Single- and two-pole configurations with Class A ground-fault protection (5-mA trip).
   5. Ground-Fault Equipment Protection (GFEP) Circuit Breakers: Class B ground-fault protection (30-mA trip).
   6. Molded-Case Circuit-Breaker (MCCB) Features and Accessories:
      a. Standard frame sizes, trip ratings, and number of poles.
      b. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor materials.
      c. Ground-Fault Protection: Integrally mounted or remote-mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.
      d. Multipole units enclosed in a single housing or factory assembled to operate as a single unit.
      e. Handle Padlocking Device: Fixed attachment, for locking circuit-breaker handle in on or off position.
      f. Handle Clamp: Loose attachment, for holding circuit-breaker handle in on position.

2.5 SURGE PROTECTION DEVICES

A. Main panelboard shall be equipped with stand-alone SPD (surge protective device).

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

2. General Electric Company
3. Siemens
4. Square D
5. Eaton Cutler Hammer

C. Surge Protection Device: IEEE C62.41-compliant, mounted adjacent to main panel, solid-state, parallel-connected, modular (with field-replaceable modules) type, with sine-wave tracking suppression and filtering modules, UL 1449, second edition, short-circuit current rating matching or exceeding the panelboard short-circuit rating, and with the following features and accessories:
1. Fabrication using bolted compression lugs for internal wiring.
2. Integral disconnect switch.
3. Redundant suppression circuits.
4. Redundant replaceable modules.
5. Arrangement with wire connections to phase buses, neutral bus, and ground bus.
6. LED indicator lights for power and protection status.
7. Audible alarm, with silencing switch, to indicate when protection has failed.
8. Form-C contacts rated at 5 A and 250-V ac, one normally open and one normally closed, for remote monitoring of system operation. Contacts shall reverse position on failure of any surge diversion module or on opening of any current-limiting device. Coordinate with building power monitoring and control system.
9. Six-digit, transient-event counter set to totalize transient surges.

D. Minimum Surge Current Capability (single pulse rated) per phase:
1. Panelboards: 200 kA

E. SPD shall be UL labeled as Type 1 (verifiable at UL.com), intended for use without need for external or supplemental overcurrent controls. Every suppression component of every mode, including N-G, shall be protected by internal overcurrent and thermal overtemperature controls.

F. SPD shall provide surge current paths for all modes of protection: L-N, L-G, and N-G for Wye systems; L-L, L-G in single phase systems.

G. UL 1449 Third Edition Listed Voltage Protection Ratings (VPRs) shall not exceed the following:

System Voltage	L-N	L-G	L-L	N-G
480/240	1200V	1200V	2000V	1200V

H. UL 1449 Third Edition Listed Maximum Continuous Operating Voltage (MCOV):

System Voltage	Allowable System Voltage Fluctuation (%)	MCOV
480/240	15%	320V

I. Provide breaker in main panel sized as recommended by SPD manufacturer. Provide branch circuit conductors from main panel to SPD in conduit, conductors sized as recommended by SPD manufacturer. This breaker and feeder shall be provided although may not be shown on drawings.

2.6 ACCESSORY COMPONENTS AND FEATURES

A. Portable Test Set: For testing functions of solid-state trip devices without removing from panelboard.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install panelboards and accessories according to NECA 407.

B. Equipment Mounting:
   1. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
   2. Install anchor bolts to elevations required for proper attachment to panelboards.
   3. Attach panelboard to the vertical finished or structural surface behind the panelboard.

C. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from panelboards.

D. Mount panelboard cabinet plumb and rigid without distortion of box.

E. Install overcurrent protective devices and controllers not already factory installed.
   1. Set field-adjustable, circuit-breaker trip ranges.

F. Install filler plates in unused spaces.

G. Arrange conductors in gutters into groups and bundle and wrap with wire ties after completing load balancing.

3.2 IDENTIFICATION

A. Refer to Section 260553.

3.3 FIELD QUALITY CONTROL

A. Tests and Inspections:
   1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
   2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

B. Panelboards will be considered defective if they do not pass tests and inspections.

3.4 ADJUSTING

A. Adjust moving parts and operable component to function smoothly, and lubricate as recommended by manufacturer.

B. Set field-adjustable circuit-breaker trip ranges as recommended by switchgear manufacturer.

3.5 PROTECTION

A. Temporary Heating: Apply temporary heat to maintain temperature according to manufacturer's written instructions.

END OF SECTION

SECTION 26 27 26

WIRING DEVICES

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. Receptacles, receptacles with integral GFCI, and associated device plates.
   2. Snap switches.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of wiring device and associated wall plate through one source from a single manufacturer. Insofar as they are available, obtain all wiring devices and associated wall plates from a single manufacturer and one source.

1.5 COORDINATION

A. Receptacles for Owner-Furnished Equipment: Match plug configurations.
   1. Cord and Plug Sets: Match equipment requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable manufacturers:
   1. Cooper Wiring Devices; a division of Cooper Industries, Inc. (Cooper).
   2. Hubbell Incorporated; Wiring Device-Kellems (Hubbell).
   3. Leviton Mfg. Company Inc. (Leviton).
   4. Pass & Seymour/Legrand; Wiring Devices & Accessories (Pass & Seymour).

2.2 STRAIGHT BLADE RECEPTACLES

A. Tamper-Resistant Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 configuration 5-20R, and UL 498.
   1. Acceptable products:
      a. Cooper; TR8300 Series (tamper resistant).
      b. Hubbell; HBL8300SG Series (tamper resistant).
      c. Leviton; 8300-SGG Series (tamper resistant).
      d. Pass & Seymour; 63H Series (tamper resistant).

B. Devices shall be tamper-resistant as noted and as required by code.

2.3 GFCI RECEPTACLES

A. General Description: Straight blade, non-feed-through type. Comply with NEMA WD 1, NEMA WD 6, UL 498, and UL 943, Class A, and include indicator light that is lighted when device is tripped.

B. Tamper Resistant Duplex GFCI Convenience Receptacles, 125 V, 20 A:
   1. Acceptable products:
      a. Cooper; GF20 Series (tamper resistant).
      b. Pass & Seymour; 2084 Series (tamper resistant).

C. Devices shall be tamper-resistant as noted and as required by code.

2.4 HAZARDOUS (CLASSIFIED) LOCATION RECEPTACLES

A. Wiring Devices for Hazardous (Classified) Locations: Comply with NEMA FB 11 and UL 1010.

2.5 SNAP SWITCHES

A. Comply with NEMA WD 1 and UL 20.

B. Switches, 120/277 V, 20 A, quite type:
   1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
      a. Cooper; 2221 (single pole).
      b. Hubbell; CS1221 (single pole).
      c. Leviton; 1221-2 (single pole).
      d. Pass & Seymour; 20AC1 (single pole).
   2. Weatherproof where noted.

2.6 WALL PLATES

A. Single and combination types to match corresponding wiring devices.
   1. Plate-Securing Screws: Metal with head color to match plate finish.
   2. Material: 0.035-inch thick satin-finished stainless steel.

B. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with type 3R weather-resistant, die-cast aluminum with gasketed aluminum spring hinged lockable cover.

C. Provide die cast aluminum “in-use” lockable covers where “in-use” covers are required by NEC and local AHJ. Locate exterior receptacles in locations that do not require “in-use” cover where possible.

2.7 FINISHES

A. Color: Wiring device catalog numbers in Section Text do not designate device color.
   1. Wiring Devices and Cover Plates: Stainless Steel cover plate and gray device.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1, mounting heights shall comply with ADA and TAS.

B. Coordination with Other Trades:
   1. Take steps to ensure that devices and their boxes are protected.

C. Conductors:
   1. Do not strip insulation from conductors until just before they are spliced or terminated on devices.
   2. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.

D. Device Installation:
   1. Replace all devices that have been in temporary use during construction or that show signs that they were installed before building finishing operations were complete.
   2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
   3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
   4. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.
   5. Use side wiring with binding-head screw terminals.
   6. Use a torque screwdriver when a torque is recommended or required by the manufacturer.
   7. When conductors larger than No. 12 AWG are installed on 20-A circuits, splice No. 12 AWG pigtails for device connections.
   8. Tighten unused terminal screws on the device.
   9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device mounting screws in yokes, allowing metal-to-metal contact.
   10. Conductors terminating at devices shall be screwed to the devices. Wire nuts and push-in connections are not permitted.

E. Device Mounting Heights
   1. Receptacles shall be 18” AFF (measured from center of faceplate).

F. Receptacle Orientation:
   1. All 120 volt receptacles shall be installed with ground port at the bottom.

G. Device Plates: Do not use oversized plates.

3.2 FIELD QUALITY CONTROL

A. Tests for Convenience Receptacles:
   1. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.

END OF SECTION

SECTION 26 28 13

FUSES

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. Cartridge fuses rated 600-V ac and less for use in enclosed switches.

1.3 SUBMITTALS

A. Product Data:
   1. Dimensions and manufacturer's technical data on features, performance, electrical characteristics, and ratings.

1.4 COORDINATION

A. Coordinate fuse ratings with utilization equipment nameplate limitations of maximum fuse size and with system short-circuit current levels.

1.5 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than two of each size and type.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Cooper Bussmann, Inc.
   2. Ferraz Shawmut, Inc.
   3. Littelfuse, Inc.

2.2 CARTRIDGE FUSES

A. Characteristics: NEMA FU 1, nonrenewable cartridge fuses with voltage ratings consistent with circuit voltages.

PART 3 - EXECUTION

3.1 FUSE APPLICATIONS

A. Cartridge Fuses:
   1. Motor Branch Circuits: Class RK1 or Class RK5, time delay.
   2. Control Circuits: Class CC, fast acting or time delay as required.

3.2 INSTALLATION

A. Install fuses in fusible devices. Arrange fuses so rating information is readable without removing fuse.

3.3 IDENTIFICATION

A. Install labels complying with requirements for identification specified in Division 26 Section "Identification for Electrical Systems" and indicating fuse replacement information on inside door of each fused switch and adjacent to each fuse block, socket, and holder.

END OF SECTION

SECTION 26 28 16

ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Stand-alone main circuit breakers may be used in lieu of MCB in panel if necessary to comply with maximum electrical equipment enclosure height.

B. Section Includes:
   1. Fusible switches.
   2. Nonfusible switches.
   3. Molded-case circuit breakers (MCCBs).
   4. Enclosures.

1.3 DEFINITIONS

A. NC: Normally closed.

B. NO: Normally open.

C. SPDT: Single pole, double throw.

1.4 SUBMITTALS

A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.
   1. Enclosure types and details for types other than NEMA 250, Type 1.
   2. Current and voltage ratings.
   3. Short-circuit current ratings (interrupting and withstand, as appropriate).
   4. Include evidence of NRTL listing for series rating of installed devices.
   5. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices, accessories, and auxiliary components.
   6. Include time-current coordination curves (average melt) for each type and rating of overcurrent protective device; include selectable ranges for each type of overcurrent protective device.

B. Field quality-control reports.
   1. Test procedures used.
   2. Test results that comply with requirements.
   3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

1.5 COORDINATION

A. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

1.6 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than three of each size and type.
   2. Fuse Pullers: Two for each size and type.

PART 2 - PRODUCTS

2.1 FUSIBLE AND NON-FUSIBLE SWITCHES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. General Electric
   2. Siemens
   3. Square D
   4. Eaton Cutler Hammer

B. Type HD, Heavy Duty, Single Throw, 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate fuses, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

C. Accessories:
   1. Equipment Ground Kit: Internally mounted and labeled for copper conductors.
   2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper conductors.
   3. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
   4. Hookstick Handle: Allows use of a hookstick to operate the handle.
   5. Lugs: Mechanical type, suitable for number, size, and conductor material.
   6. Service-Rated Switches: Labeled for use as service equipment.
   7. Accessory Control Power Voltage: As required.

2.2 MOLDED-CASE CIRCUIT BREAKERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. General Electric Company.
   2. Siemens.
   3. Square D.
   4. Eaton Cutler Hammer.

B. General Requirements: Comply with UL 489, NEMA AB 1, and NEMA AB 3, with interrupting capacity to comply with available fault currents.

C. Thermal-Magnetic Circuit Breakers: For frame sizes 250 amp and below, inverse time-current element for low-level overloads and instantaneous magnetic trip element for short circuits and adjustable magnetic trip setting.

D. Electronic Trip Circuit Breakers: Field-replaceable rating plug, rms sensing, with the following field-adjustable settings:
   1. 400 amp frame and above.
   2. Instantaneous trip.
   3. Long- and short-time pickup levels.
   4. Long- and short-time time adjustments.

E. Current-Limiting Circuit Breakers: Frame sizes 600 amp and below.

F. Features and Accessories:
   1. Standard frame sizes, trip ratings, and number of poles.
   2. Lugs: Mechanical type, suitable for number, size, trip ratings, and conductor material.
   3. Main breaker shall be service entrance rated.
   4. Main breaker shall be rated 65,000 AIC.

2.3 ENCLOSURES

A. Enclosed Switches and Circuit Breakers: NEMA AB 1, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.
   1. Within electrical equipment enclosure: NEMA 250, Type 1.
   2. Outdoor Locations: NEMA 250, Type 3R.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.

3.2 FIELD QUALITY CONTROL

A. Acceptance Testing Preparation:
   1. Test insulation resistance for each enclosed switch and circuit breaker, component, connecting supply, feeder, and control circuit.
   2. Test continuity of each circuit.

B. Tests and Inspections:
   1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
   2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
   3. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.

C. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.

D. Prepare test and inspection reports, including a certified report that identifies enclosed switches and circuit breakers and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.3 ADJUSTING

A. Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.

B. Set field-adjustable circuit-breaker trip ranges as recommended by switchgear manufacturer.

END OF SECTION

SECTION 26 56 68

EXTERIOR ATHLETIC 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 lighting for the following outdoor sports venues:
   1. Baseball field.

B. The extent of sports lighting pole work is indicated by drawings and by schedules, and the requirements of this section.

1.3 DEFINITIONS

A. CV: Coefficient of variation; a statistical measure of the weighted average of all relevant illumination values for the playing area, expressed as the ratio of the standard deviation for all illuminance values to the mean illuminance value.

B. Illuminance: The metric most commonly used to evaluate lighting systems. It is the density of luminous flux, or flow of light, reaching a surface divided by the area of that surface.
   1. Horizontal Illuminance: Measurement in foot-candles (lux), on a horizontal surface 36 inches above ground unless otherwise indicated.
   2. Target Illuminance: Average maintained illuminance level, calculated by multiplying initial illuminance by LLF.
   3. Vertical Illuminance: Measurement in foot-candles (lux), in four directions on a vertical surface, at an elevation coinciding with plane height of horizontal measurements.

C. LC: Lighting Certified.

D. Light Trespass: Light spill into areas and properties outside the playing areas, which is either annoying or unwanted.

E. LLD: Lamp lumen depreciation, which is the decrease in LED output as the LED ages.

F. LLF: Light loss factor, which is the product of all factors that contribute to light loss in the system.

G. Luminaire: Complete lighting fixture.

H. UG: Uniformity gradient; the rate of change of illuminance on the playing field, expressed as a ratio between the illuminances of adjacent measuring points on a uniform grid.

1.4 PERFORMANCE REQUIREMENTS

A. Illumination Calculations: Computer-analyzed point method complying with IESNA RP-6 to optimize selection, location, and aiming of luminaires.
   1. Grid Pattern Dimensions: 10’ x 10’ including fence line.
   2. Spill-Light Control: Minimize spill light for playing area on adjacent and nearby areas.
   3. Glare Control: Design illumination for each playing area to minimize direct glare in adjacent and nearby areas.
   4. Light loss factor.
      a. LLF does not apply to Musco metal halide field lighting since maintained output system is specified.
      b. LLF for Musco LED shall include 0.95 dirt depreciation factor.
   5. Luminaire Mounting Height: As shown on Drawings.
   6. Luminaire Placement: Maximum of (6) fixtures per row.

B. Sports Lighting Calculations:
   1. Submit point-by-point horizontal illuminance levels on 10 foot centers for field.
   2. Submit illuminance values for the field boundary lines (fence).
   3. Submit aiming diagrams for approval. Based on footcandle levels, uniformity ratios and spill light, manufacturer shall recalculate aiming if requested by Architect/Engineer.

C. Lighting Control:
   1. Musco control cabinets shall be Nema 1
   2. Pole mounted driver enclosures shall be Nema 3R.
   3. Field, parking and security lighting shall be controlled via Musco lighting control system.
      a. Provide contactors for future flag lighting.

1.5 SUBMITTALS

A. Submit manufacturer's data on poles, including certified dimension drawings for fabricated poles, including mast arms, brackets, caps, conductor hooks, handholes, grounding connections and other appurtenances which are a part of or attachment to the pole.

B. Individual drawings shall be submitted for each pole. Fixture arrangement shall be included.

C. Drawings shall include design parameters including, but not limited to:
   1. Effective projected area of pole, brackets, appurtenances, and fixtures.
   2. Weight of pole, brackets, appurtenances, and fixtures.
   3. Wind Loading: Sustained and gust factor.

D. Product Data: For each type of lighting product indicated. Include the following:
   1. LED life, output, and energy-efficiency data. LED data certified by NVLAP or NRTL; comply with IESNA LM-47.

2. Photometric data based on laboratory tests of each luminaire type, complete with LEDs, drivers, and accessories; comply with IESNA LM-5.
    a. Photometric data shall be certified by a qualified independent testing agency.
    b. Photometric data shall be certified by manufacturer's laboratory with a current accreditation under the NVLAP for Energy Efficient Lighting Products.
3. Structural analysis data and calculations used for pole selection.
    a. Manufacturer Wind-Load Strength Certification: Submit certification that selected total support system, including poles, complies with AASHTO LTS-4-M for location of Project.

E. Manufacturer Certificates: For support structures, including brackets, arms, appurtenances, bases, anchorages, and foundations, from manufacturer.

F. Welding certificates.

G. Field quality-control reports.

H. Operation and Maintenance Data: For sports lighting system components to include in emergency, operation, and maintenance manuals.

I. Warranty: Sample of special warranty.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Luminaire Photometric Data Testing Laboratory: By manufacturers' laboratories that are accredited under the National Volunteer Laboratory Accreditation Program for Energy Efficient Lighting Products.

C. Luminaire Photometric Data Testing Laboratory: By an independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL.

D. Field Testing Agency Qualifications: An independent testing agency that is accredited under the National Volunteer Laboratory Accreditation Program for Energy Efficient Lighting Products, or an NRTL as defined in 29 CFR 1910, with the experience and capability to conduct field testing according to IESNA LM-5.

E. 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.

1.7 WARRANTY

A. Provide extended warranty, preventative maintenance, etc.:
    1. Fixture/pole manufacturer, provide 25 year warranty, 25 year preventative/spot maintenance, 25 year guarantee constant light levels, remote monitoring, remote

lighting control, and remote management tools. Light levels shall be guaranteed and held constant for 25 years.

a. Preventative and Spot Maintenance: Manufacturer shall provide all preventative and spot maintenance including parts and labor for 25 years from the date of equipment shipment. Individual fixture outages shall be repaired when the usage of field is materially impacted.

b. Remote Monitoring System: System shall monitor lighting performance and notify manufacturer if individual luminaire outage is detected so that appropriate maintenance can be scheduled. The manufacturer shall notify the Owner of outages within 24 hours, or the next business day. The controller shall determine switch position (Manual or Auto) and contactor status (open or closed).

c. Remote Lighting Control System:

1) System shall allow Owner and users with a security code to schedule on/off system operation via a website, phone, fax or email up to ten years in advance. Manufacturer shall provide and maintain a two-way TCP/IP communication link. Trained staff shall be available 24/7 to provide scheduling support and assist with report needs.

2) The Owner may assign various security levels to schedulers by function and/or field. This function must be flexible to allow a range of privileges such as full scheduling capabilities for field, to only having permission to execute “early off” commands by phone.

3) Controller shall accept and store 7-day schedules, be protected against memory loss during power outages, and shall reboot once power is regained and execute any commands that would have occurred during outage.

d. Management Tools: Manufacturer shall provide a web-based database of actual field usage and provide reports by facility and user group.

2. Communication Costs: Manufacturer shall include communication costs for operating the controls and monitoring system.

3. Furnish spare parts in accordance with extended warranty and preventative maintenance agreement.

PART 2 - PRODUCTS

2.1 LUMINAIRES, LEDS, AND DRIVERS

A. Luminaires: Listed and labeled, by an NRTL acceptable to authorities having jurisdiction, for compliance with UL 1598 for installation in wet locations.

1. Frames, and Other Internal Access: Free from light leakage under operating conditions.
2. Exposed Hardware: Stainless-steel latches, fasteners, and hinges.
3. Spill-Light Control Devices: External visor furnished by manufacturer and designed for secure attachment to specific luminaire.

B. Driver Mounting:

1. Grouped in cabinets, pole mounted, facing away from field.

2.2 SUPPORT STRUCTURES

A. Support-Structure Wind-Load Strength: Poles and other support structures, brackets, arms, appurtenances, bases, anchorages, and foundations shall comply with AASHTO LTS-4-M, 2012 International Building Code, and shall be certified for wind speed of 115MPH. Luminaires, visors, brackets, and crossarms shall withstand 150 mph winds and maintain luminaire aiming alignment.

B. Design: Poles and appurtenances shall be designed to withstand stresses produced by wind and dead loading.

C. Mountings, Fasteners, and Appurtenances:
   1. Corrosion resistant, compatible with support components, and which shall not cause galvanic action at contact points.
      a. Steel Components: Hot-dip galvanized after fabrication, complying with ASTM A 123/A 123M.
      b. Mounting Hardware Fasteners: Hot-dip galvanized, complying with ASTM A 153/A 153M, or minimum 18-8 grade stainless steel.
   2. Accommodate attachments and wiring of other indicated systems.

D. Concrete for Pole Foundations: 3000-psi, 28-day minimum compressive strength. Concrete, reinforcement, and formwork are specified in Division 03 Section "Cast-in-Place Concrete." Refer to Musco pole embedment structural design for additional information.

E. Direct-buried steel structures or poles shall not be used.

2.3 SPORTS LIGHTING

A. Contractor shall aim fixtures in accordance with approved aiming diagram supplied by fixture manufacturer.

B. Measure voltage on each pole at fixtures and record simultaneously with readings at transformer. Adjust transformer taps so that voltage at farthest point is 480 volts.

C. Contractor shall be present with Architect/Engineer at minimum of three observations after erection of poles and fixtures.
   1. Daylight observation to determine all deficiencies in installation methods or quality.
   2. Night observation to record footcandle values 36" above grade. Contractor shall make adjustments to fixture aiming during this observation if Engineer determines minimum amount of adjustment. If major adjustments are required, they shall be made prior to second night observation.
   3. Second night observation to record footcandle values 36" above grade. Contractor shall make adjustments to fixture aiming as recommended by Engineer.

D. Field measured values shall meet or exceed the manufacturer's computed values.

E. Contractor shall furnish and install additional fixtures, wiring, breakers, contactors, etc., at no cost to Owner if installed fixtures do not meet or exceed submitted and approved values and uniformity.

F. Sports Lighting Fixtures:
   1. Approved Product:
      a. Musco LED TLC Series, 4000K color temperature.
   2. Sports lighting fixtures shall have die-cast aluminum housing, sealed optical chamber, hinged lens (shock-impact resistant tempered glass).
      a. Fixtures shall have horizontal and vertical degree aiming scales.
   3. Fixture quantities shown on drawings are minimum quantities to be provided. Provide additional fixtures if necessary to provide the following:
      a. Baseball:
         1) 50 footcandles infield (maintained constant average)
         2) 30 footcandles outfield (maintained constant average)
         3) Horizontal uniformity infield (max:min): 1.7.
         4) Horizontal uniformity outfield (max:min): 2.0.
         5) 30 footcandles warm-up area (maintained constant average)
         6) Horizontal uniformity warm-up area: 3.0
      b. Illuminance values specified apply to entire field area, within playing area boundaries, and shall be considered the primary playing area.
      c. Parking:
         1) 1.0 footcandles minimum

G. Sports Lighting Poles:
   1. Acceptable Manufacturer: Musco
   2. Poles:
      a. Pole manufacturer shall obtain complete set of drawings and specifications for additional information pertaining to poles. Provide written confirmation with submittal data that all drawings were obtained and thoroughly reviewed.
      b. Provide tapered steel shafts, with appurtenances as described and scheduled.
      c. Steel Shafts:
         1) The shaft shall have a symmetrical round cross section and shall have a smooth continuous taper that will be aesthetically pleasing and will meet the design loading requirements.
            a) Shafts shall be fabricated from structural quality steel ASTM A572, with minimum yield strengths of 50,000 to 65,000 psi as required.
            b) Shafts shall have no intermediate horizontal welds and only one longitudinal weld. Seam shall be welded by automatic, electric, submerged arc weld process.
            c) Shafts may be sectional to permit shipping. Multi-piece shafts shall be joined together in the field by telescoping upper sections over lower sections. Field telescoping instruction and/or apparatus shall be as furnished and/or specified by the manufacturer. Non-manufacturer-approved procedures will not be acceptable. Field assembly instructions shall accompany shop drawings.

2) Pole top shall be equipped with crossarms with integral fixture mounting brackets, tenons, bracket mounting plates, and other appurtenances required to mount the fixtures. The pole shall be equipped with a cap, with bolts or set screws to securely lock into place. Cap shall prevent rain from entering pole.
3) Base shall be Musco concrete embedded type.
4) Handholes shall be custom tamperproof type to prevent conductor theft and shall be placed at the base and at the top of each pole, and at intervals not to exceed thirty feet along the shaft. Handholes shall be factory installed, reinforced, 4 x 6-1/2 minimum size, with removable bolt on covers. Additional handholes shall be placed at conductor J-hooks, bracket mounting plate, crossarms, and at other locations which may be required to facilitate access to wiring within the pole. Field installed handholes shall not be permitted.
5) J-hooks shall be installed at the top of each pole, within five feet of all openings or mounting plates, and at thirty foot intervals inside the shaft.
6) Grounding bar, 1" x 1" x 5/16" thick, drilled and tapped 1/2 - 13 UNC-2B, shall be welded inside each shaft adjacent to the lowest handhole, and rendered visible through this handhole.
7) Poles, crossarms, mounting brackets, etc., shall be hot dip galvanized after fabrication, inside and out, in accordance with ASTM Specification A123.
8) All welding shall have a neat workmanlike appearance and shall be in accordance with the American Welding Society Specification AWS D1.1, latest revision.
9) The shaft shall be die formed and longitudinally welded by an automatic, electric, submerged arc, weld process. In addition to AWS D1.1, longitudinal welds in the telescoping joint area shall conform to the following:
    a) 100% penetration and fusion between plates of all thicknesses.
    b) Welds shall be free of all cracks, surface or subsurface.
    c) There shall be no undercutting at either surface in excess of 1/32 inch depth.
    d) The height of the weld shall be even with or above the plate.
    e) Arc strikes will not be permitted.
    f) The sum of diameters of piping porosity shall not exceed 3/8 inch in 12 inch length of weld.
10) Longitudinal welds other than in the telescoping joint area shall conform to the following:
    a) 80% minimum penetration between plates of all thicknesses.
    b) There shall be no cracks in or near the weld.
    c) There shall be no undercutting at the external surface in excess of 1/32 inch depth.
    d) The height of the weld shall be even with or above the plate.
    e) The sum of diameters of piping porosity shall not exceed 3/8 inch in linear inch of weld and shall not exceed 3/4 inch in 12 inch length of weld.
    f) Arc strikes will not be permitted.

11) Fillet welds for fixture brackets and crossarms, and miscellaneous attachments shall be full fusion welds free of visible defects.

d. Mounting Bracket and Crossarms: Fixture mounting bracket shall be fabricated and furnished by the pole manufacturer. Brackets shall meet the following criteria:
   1) Bracket shall not be smaller than 2" (2-3/8" OD) tubular steel, with welded attachment brackets. The bracket shall be constructed in such a manner to permit completely concealed wiring for conductors. Removable caps shall be provided where necessary.
      a) Fixture mounting points shall be set vertically and spaced not less than 30 inches horizontally, and 36 inches vertically.
      b) Conductor wireway shall be continuous, without gaps from fixture to pole interior.
      c) Maximum of (6) fixtures per crossarm.

e. Lightning Protection for individual poles as follows:
   1) Manufacturer shall provide integrated lightning protection and grounding via concrete encased electrode grounding system as defined by NFPA 780 and be UL Listed per UL 96 and UL 96A. If grounding is not integrated into the structure, the manufacturer shall supply grounding electrodes, copper down conductors, and exothermic weld kits. Electrodes and conductors shall be sized as required by NFPA 780. The grounding electrode shall be minimum size of 3/4 inch diameter and 10 feet long, with a minimum of 12 feet embedment. Grounding electrode shall be connected to the structure by a grounding electrode conductor with a minimum size of 2/0 AWG.

f. Wiring shall be totally concealed within pole, mounting brackets, and crossarms. Exposed wiring is not acceptable.

g. Hardware: All bolts, nuts, washers and other fasteners must be either stainless steel or hot-dip galvanized per ASTM A153.

h. Structural Design:
   1) Wind Loads: Wind loads shall be based on the 2012 International Building Code, 115 mph.
   2) Foundation Design: The foundation design shall be based on soil parameters as outlined in the geotechnical report.

i. Service Platforms and Steps: Musco shall review civil and landscape drawings and guarantee that all fixtures can be serviced without service platforms, steps, etc. If service platforms, steps, etc. are required to service poles, they shall be provided on those poles and included in bid.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Use web fabric slings (not chain or cable) to raise and set structural members. Protect equipment during installation to prevent corrosion.

B. Install poles and other structural units level, plumb, and square.

C. Install Musco driver enclosures on pole at 10 feet above finished grade. Enclosures shall face away from field.

3.2 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests, inspections, and analysis.

B. Tests and Inspections:
1. After installing sports lighting system and after electrical circuits have been energized, perform proof-of-performance field measurements and analysis for compliance with requirements.
2. Playing and Other Designated Areas: Make field measurements at intersections of grids, dimensioned and located as specified and described below:
   a. Measure all grid points of the fields, including field boundary.
   b. Area between fields and fence, and between fields: Measure all grid points.
3. Make field measurements at established test points in areas of concern for spill light and glare.
4. Perform analysis to demonstrate correlation of field measurements with specified illumination quality and quantity values and corresponding computer-generated values that were submitted with submittal documents. Submit a report of the analysis.

C. Correction of Illumination Deficiencies for Playing Areas: Make corrections to illumination quality or quantity, measured in field quality-control tests, that varies from specified illumination criteria by plus or minus 10 percent.
1. Add or replace luminaires or revise aiming.
2. If luminaires are added, revise aiming and recalculate and modify or replace support structures if indicated.
3. Do not replace luminaires with units of higher or lower wattage.

D. Sports lighting will be considered defective if it does not pass tests and inspections. Prepare test and inspection reports.

3.3 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain exterior athletic lighting.

END OF SECTION

SECTION 31 10 00

SITE PREPARATION

PART 1 – GENERAL

1.01 SCOPE

A. Work in this section includes furnishing all labor, materials, equipment, and services required for clearing and grubbing, demolition, removal and disposal of items as specified herein and on the plans.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 31 20 00 – Earthwork.

PART 2 – PRODUCTS

2.01 No products are required to execute this work, except as the CONTRACTOR may deem necessary.

PART 3 – EXECUTION

3.01 CLEARING

A. Clearing shall consist of removing all natural and artificial objectionable materials from the project site or from limited areas of construction specified within the site.

B. In general, clearing shall be performed in advance of grading and earthwork operations and shall be performed over the entire area of earthwork.

3.02 PAVEMENT REMOVAL

A. Concrete pavements shall be removed to neatly sawed edges. Saw cuts shall be made to a minimum depth of one and one-half (1 1/2") inches. If a saw cut in concrete pavement falls within three (3') feet of an existing score joint, construction joint, saw joint, cold joint, expansion joint, or edge, the concrete shall be removed to that joint or edge. All saw cuts shall be parallel and/or perpendicular to the line of existing pavement. If an edge of a cut is damaged subsequent to saw cutting, the concrete shall again be sawed to a neat, straight line for the purpose of removing the damaged area.

3.03 MINOR DEMOLITION

A. There may be certain undetermined structures and improvements that require removal prior to the commencement of construction. Unless otherwise specified, such items become the property of the CONTRACTOR for subsequent disposal.

3.04 USE OF EXPLOSIVES

A. The use of explosives will not be permitted in site preparation operations.

3.05 BACKFILLING

A. All holes, cavities, and depressions in the ground caused by site preparation operations will be backfilled and tamped to normal compaction and graded to prevent ponding of water and to promote drainage. In areas that are to be immediately excavated, the Architect/Engineer may permit holes, to remain open.

3.06 DISPOSAL OF WASTE MATERIALS

A. Unless otherwise stated, materials generated by clearing, grubbing, removal, and demolition shall be known as "waste" or "spoils" and shall be removed from the site and legally disposed of by the CONTRACTOR. Similar materials may be unearthed or generated by earthwork operations. Unless otherwise specified any merchantable items become the property of the CONTRACTOR.

3.07 PROTECTION OF EXISTING IMPROVEMENTS AND UTILITIES

A. During construction, the CONTRACTOR shall use extreme caution to protect existing improvements and utilities.

B. Prior to the start of construction the CONTRACTOR shall coordinate and verify with the OWNER and local utility companies the location of all existing utilities to remain.

C. Also prior to construction, the CONTRACTOR shall visually inventory all damage to existing surrounding improvements and shall make a written or video record of this damage and present it to the OWNER.

D. If existing utilities or improvements are damaged during construction the CONTRACTOR shall repair the damaged improvements or utilities at no cost to the OWNER. All repairs shall, to the OWNER'S satisfaction, equal or exceed the condition of the improvements or utilities prior to the damage.

3.08 TREE PROTECTION

A. As noted on the plans, tree protection fencing must be installed to protect existing trees. Tree protection fencing shall be installed per detail on the plans.

END OF SECTION

SECTION 31 20 00

EARTHWORK

PART 1 – GENERAL

1.01 SCOPE

A. Work in this section includes furnishing all labor, materials, equipment, and services required to construct, shape, and finish earthwork to the required lines, grades, and cross sections as specified herein and on the plans.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 31 10 00 - Site Preparation.
B. Section 31 21 00 – Fine Grading.

1.03 TEST REPORTS

A. The OWNER will bear the cost of all testing requirements and will submit test reports from a commercial testing laboratory as specified herein and in the Conditions of the Contract.

PART 2 – PRODUCTS

2.01 UNCLASSIFIED EXCAVATION

A. Unclassified excavation shall consist of all excavation, unless separately designated, within the limits of the work. Unclassified excavation includes all material encountered regardless of its nature or the manner in which it is to be excavated.

2.02 UNCLASSIFIED FILL

A. Unclassified fill shall consist of all fill within the limits of the work. All suitable native materials removed in unclassified excavation, or similar imported materials, shall be used insofar as practicable as unclassified fill. Properly deposited, conditioned, and compacted fill is hereinafter referred to as "earth embankment."

B. Rock: Minor quantities of rock not greater than four (4") inches in greatest dimension are permissible in fill materials used to construct earth embankment. Minor quantities of rock of greater dimensions may be placed in the deeper fills in accordance with the State Department of Highways and Public Transportation requirements for construction of rock embankments, provided such placement of rock is not immediately adjacent to structures or piers. Also, rock may be placed in the portions of embankments outside the limits of the completed graded width where the size of the rock prohibits their incorporation in the normal embankment layers.

2.03 UNSUITABLE MATERIALS

A. Unclassified fill will be declared as "unsuitable" by the OWNER if, in his opinion, any of the following conditions or matter and particles are present to a degree that is judged detrimental to the proposed use of the material.
   1. Moisture.
   2. Decayed or undecayed vegetation.
   3. Hardpan clay, heavy clay, or clay balls.
   4. Rubbish.
   5. Construction rubble.
   6. Sand or gravel.
   7. Rocks, cobbles, or boulders.
   8. Cementious matter.
   9. Foreign matter of any kind.

B. Unsuitable materials will be disposed of as “waste” as specified in Section 31 10 00.

C. Wet Material: If fill material is unsatisfactory for use as embankment solely because of high moisture content, the Architect/Engineer may grant the CONTRACTOR permission to process the material to reduce the moisture content to a usable optimum condition.

2.04 INFIELD SURPACING

A. Reuse existing infield surfacing.

2.05 TOPSOIL

A. Contractor shall remove six (6”) inches of exiting topsoil from non-paved areas scheduled for grading operations. Topsoil shall be stockpiled for installation in non-paved areas prior to planting.

B. If “on-site” is not of sufficient quantity then topsoil of equal or better quality of the existing topsoil shall be imported from off-site. Provide a one (1) gallon sample of imported topsoil for review and approval by the Landscape Architect.

2.06 OUTFIELD TOP DRESSING MATERIAL

A. Outfield topdressing material shall be a sandy loam material passed through a one half (1/2”) inch screened. Provide a one gallon sample of the top dressing soil for approval.

PART 3 – EXECUTION

3.01 SITE PREPARATION

A. In general, "site preparation," as specified in Section 31 10 00, shall be performed in advance of grading and earthwork operations and shall be completed over the entire area of earthwork operations.

3.02 UNCLASSIFIED EXCAVATION

A. All excavated areas shall be maintained in a condition to assure proper drainage at all times, and ditches and sumps shall be constructed and maintained to avoid damage to the areas under construction. Erosion control measures shall be installed and maintained during

construction operations.

B. Surplus Material: Surplus excavation is that quantity of material that may be left over after the grading plan is executed, and all earthwork operations, including excavation, embankment construction, topsoil replacement, and final grading, are completed. Unless otherwise specified, the CONTRACTOR must legally dispose of surplus material off-site.

C. Excavation in Rock: The use of explosives will not be permitted unless specifically permitted in writing by the OWNER. Unless otherwise indicated, excavation in solid rock shall extend six (6") inches below required subgrade elevation for the entire width of the area under construction and shall be backfilled with suitable materials as indicated on the plans.

3.03 EARTH EMBANKMENT

A. Earth embankment is defined as embankment composed of suitable materials removed in unclassified excavation. The construction of embankment includes preparing the area on which fill is to be placed and the depositing, conditioning, and compaction of fill material.

B. General: Except as otherwise required by the plans, all embankment shall be constructed in layers approximately parallel to the finished grade of the graded area, and each layer shall be so constructed as to provide a uniform slope as shown on the grading plan. Embankments shall be constructed to correspond to the general shape of the typical sections shown on the plans, and each section of the embankment shall correspond to the detailed section or slopes established by the drawings. After completion of the graded area, embankment shall be continuously maintained to its finished section and grade until the project is accepted.

C. Preparation: Prior to placing any embankment, all preparatory operations must be completed in areas over which the embankment is to be placed. Any small excavations in the limits of the embankments shall be backfilled with suitable material and thoroughly tamped by approved methods before commencing embankment construction. The surface of the ground, including plowed, loosened ground, or surfaces roughened by small washes or otherwise, shall be restored to approximately its original slope by blading or other methods. The subgrade shall be firm and able to support construction equipment without displacement. Subgrade shall be proof rolled with a heavy pneumatic roller, loaded dump truck or similar piece of construction equipment weighing approximately twenty (20) tons. Soft or yielding subgrade shall be corrected and made stable before construction proceeds.

D. Scarification: The surface of all areas and slopes over which fill is to be placed, other than rock, shall be scarified to a depth of six (6") inches to provide a bond between the existing surface and the proposed embankment. Scarification shall be accomplished by plowing, discing, or other approved means. The material that has been loosened shall be recompacted with the new embankment.

E. Benching: Scarification is normally adequate for sloping surfaces. However, in certain cases where fill is to be placed against hillsides or existing embankment with slopes greater than six to one (6:1), the Architect/Engineer may direct the CONTRACTOR to key the fill material to the existing slopes by benching. A minimum bench of five (5') feet normal to the slope shall be removed and recompacted to insure that the new work is constructed on a firm foundation free of loose or disturbed material.

F. Depositing: Fill material shall be placed in horizontal layers or lifts, evenly spread, not to exceed eight (8") inches in loose depth before compaction. Unless otherwise permitted, each layer of fill material shall cover the length and width of the area to be filled and shall be compacted

before the next higher layer of fill is placed. The fill material shall be uniform with respect to material type and moisture content. Clods and chunks of material shall be broken down so that the largest particle size does not exceed six (6") inches and the fill materials mixed by discing or plowing as necessary so that a material of uniform moisture and density is obtained for each. Adequate drainage shall be maintained at all times.

G. Watering: At the time of compaction, the moisture content of fill material shall be such that the specified compaction will be obtained, and the fill will be firm, hard, and unyielding. Fill material which contains excessive moisture shall not be compacted until it is dry enough to obtain the specified compaction. Water required for sprinkling to bring the fill material to the proper moisture content shall be applied evenly throughout each layer.

H. Compacting: Each layer of earth fill shall be compacted by approved tamping or sheeps foot rollers, pneumatic tire rollers, or other mechanical means. Hand-directed compaction equipment shall be used in areas inaccessible to vehicular compactors. Each layer shall be compacted to ninety-five (95%) percent of the maximum density as determined by ASTM D 698 (Standard Proctor) at or above the optimum moisture content.

I. Grading:
   1. Embankments shall be constructed in proper sequence and at proper densities for their respective functions. All embankment serves in one capacity or another as subgrade (e.g., under topsoil, or under concrete pavement). Accordingly, the upper layer of embankment shall be graded to within plus or minus one-tenth (0.10') foot of proper subgrade elevation prior to the construction of pavements, or installation of topsoil.
   2. Non-paved areas shall be covered with six (6") inches of topsoil. Finish grading of topsoil areas are satisfactory if they are true to grade, true in plane, even in gradient, uniform in surface texture and of normal compaction. Areas of loose granular pockets or over compacted topsoil are not acceptable and will be reworked. Finish areas will promote surface drainage and will be ready for planting.

3.04 DENSITY CONTROL

A. Earth Embankment in General: Earth embankment shall be scarified to a depth of six (6") inches and should be compacted to a dry density that does not exceed ninety- three (93%) of Standard Proctor maximum dry density (ASTM D698). The moisture content should be at or above the optimum moisture content.

B. Earth Embankment Under Concrete Paving: Earth embankment under concrete paving, structures and synthetic turf base shall be compacted to at least ninety-five (95%) percent of standard proctor density (ASTM D698) and the moisture content should be at or above the optimum moisture content.

3.05 MOISTURE MAINTENANCE

A. The specified moisture content shall be maintained in all embankments that are to function as subgrade for areas of pavement. After completion of the embankment, the CONTRACTOR shall prevent excessive loss of moisture in the embankment by sprinkling as required. Loss of moisture in excess of one (1%) percent below optimum in the top twelve (12") inches of the fill will require that the top twelve (12") inches of the embankment be scarified, wetted, and

recompacted prior to placement of the pavement.

3.06 PROOF ROLLING

A. Prior to placement of pavement the subgrade shall be rolled with a loaded dump truck or roller that exceeds two thousand (2000) pounds in weight. If the subgrade pumps after compaction has been completed the subgrade shall be scarified to a depth of eight (8") inches, moisture added, if tests identify the moisture content, is insufficient and re-compacted.

3.07 INFIELD SURFACING

A. Existing infield surfacing material shall be spread to a depth of six (6") inches in all areas of the infield disturbed by construction.

B. Infield surfacing shall be compacted by a small steel wheel roller or plate compactor.

C. Finish grade of the infield surfacing shall be true in slope and firm to walk on.

3.08 TOPDRESSING

A. The outfield grass shall be covered with a finely screened sandy loam topsoil. The topsoil shall be evenly spread over the outfield grass with a tow behind spreader capable of spreading the topsoil to a depth not to exceed one quarter (1/4") inch.

B. After spreading the topsoil, the field shall be leveled with a drag to evenly spread the topsoil and to work it into the existing turfgrass.

C. If necessary, it may take multiple passes to fill all the low spots in the outfield.

3.09 TESTING

A. Observation by geotechnical engineer shall take place at fill placement, compaction and concrete placement. Spot field tests of embankment densities shall be required of the CONTRACTOR by the OWNER at the OWNER'S expense at the place and time of their choosing. Any area not meeting density control requirements shall be immediately excavated, reconstructed, and retested, at the expense of the CONTRACTOR, until satisfactory results are obtained.

3.10 STORM WATER MANAGEMENT

A. The CONTRACTOR shall perform his construction operations in accordance with best management practices to control pollutants in storm water discharges during construction. The CONTRACTOR shall conform to local, state and federal regulations regarding control of storm water pollutants, silt and sediments leaving the site.

END OF SECTION

SECTION 31 21 00

FINE GRADING

PART 1 – GENERAL

1.01 SCOPE

A. The work in this section includes furnishing all labor, materials, equipment and services required to construct, shape and finish earthwork to the required lines grades and cross sections as specified herein. Earthwork will be required as subgrade for concrete pavement, synthetic turf subgrade and turfgrass.

1.02 GENERAL IMPORTANCE

A. Properly placed and finished earthwork accomplished by finish grading is essential to the success of this project. The CONTRACTOR will be required to prove the competence and experience of their workers and subcontractors with respect to their ability to execute the fine grading required on this project.

PART 2 – PRODUCTS

2.01 TOPSOIL AND UNCLASSIFIED FILL

A. On-site topsoil will be used in the construction of the fine graded areas to be planted with turfgrass. If necessary, and with OWNER approval, a fine graded topsoil may be imported from off-site, at no additional cost to the OWNER, if on-site topsoil is not of sufficient quantity to complete the project.

PART 3 – EXECUTION

3.01 GENERAL

A. All fine grading shall be performed as specified herein and the completed work shall conform to the required lines, grades and cross sections shown on the plans. Where topsoil has been lost to erosion or construction operations, it shall be replaced.

3.02 ALLOWABLE DEVIATION

A. The maximum allowable deviation from the required finished grade when tested with an eight (8’) foot straight edge shall not exceed one-half (1/2”) inch above or below the midpoint of the straight edge. Any deviations that exceed this standard will be immediately corrected

3.03 LIMITS OF WORK

A. The limits of areas to be fine graded shall generally correspond to the area of pavement, and areas of turfgrass planting.

3.04 SEQUENCE OF WORK

A. Fine grading will not begin until all underground installations are complete and all surrounding construction is in place. Fine grading will not be attempted until construction which involves heavy vehicles is complete.

B. After fine grading is accomplished; it shall be the CONTRACTOR'S responsibility to protect all fine graded areas from construction traffic or disruptive activities. Damage to fine graded surfaces will be restored to a satisfactory condition as prescribed herein until the project is finished and accepted.

3.05 FINE GRADING OPERATIONS

A. Fine grading shall be executed with any or all of the following or other appropriate machinery; tractor box blade, disc, weighted spike harrow and weighted drags. Bull dozer blades or front end loaders buckets are not acceptable pieces of equipment for fine grading operations.

B. In is anticipated that some areas of topsoil may become over compacted and resistant to proper grading. Such areas will be loosened and pulverized with a disc and will then be regraded and compacted to normal density before fine grading. It may be necessary to apply water to these over compacted areas.

3.06 ACCEPTIBILITY

A. Satisfactorily fine graded areas shall be true in plane, even in gradient (slope), uniform in surface texture and of normal compaction. Areas of loose granular soil pockets interspersed with over compacted soils are not acceptable.

B. Fine graded areas will promote positive surface drainage and will be ready for turfgrass planting, or concrete placement.

C. The OWNER'S REPRESENTATIVE will be the judge of whether fine graded areas are acceptable.

3.07 DENSITIES

A. Topsoil: Densities of fine graded topsoil areas shall be a minimum ninety-three (93 %) percent of Standard ASTM D698 Densities with minus one (1) to plus four (4) percentages points above optimum moisture content.

B. Other Subgrades in General: Earth embankment for concrete pavement shall be compacted in maximum eight (8") inch lifts at a minimum ninety-five (95%) percent of Standard AASHTO Density between optimum moisture content and plus four (4) percentage points above optimum.

END OF SECTION

SECTION 32 13 13

CONCRETE CONSTRUCTION

PART 1 – GENERAL

1.01 SUMMARY

A. This Section includes exterior concrete construction for walkways, areas of pedestrian paving, edging, retaining walls, steps, ramps, floor slabs, footings, etc.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. SECTION 07 92 99 JOINT SEALANTS

B. SECTION 32 13 60 SPECIALITY CONCRETE PAVING

1.03 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, and ground granulated blast-furnace slag.

1.04 SUBMITTALS

A. Product Data: Submit manufacturer's data showing compliance with the specifications for the following products:
   1. Curing Compound
   2. Admixtures

B. Design Mixtures: For each concrete pavement mixture. Include alternate mixture designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.

C. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated, based on comprehensive testing of current materials:

D. Material Certificates: Signed by manufacturers certifying that each of the following materials complies with requirements:
   1. Cementitious materials.
   2. Steel reinforcement and reinforcement accessories.
   3. Admixtures.
   4. Curing compounds.
   5. Applied finish materials.
   6. Bonding agent or epoxy adhesive.
   7. Joint fillers.

E. Field quality-control test reports.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products who complies with ASTM C 94/C 94M requirements for production facilities and equipment.

B. Testing Agency Qualifications: An independent agency qualified according to ASTM C 1077 and ASTM E 329 for testing indicated, as documented according to ASTM E 548.
   1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-01 or an equivalent certification program.

C. ACI Publications: Comply with ACI 301, "Specification for Structural Concrete," unless modified by requirements in the Contract Documents.

PART 2 – PRODUCTS

2.01 FORMS

A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

2.02 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60; deformed.

B. Joint Dowel Bars: Plain steel bars, ASTM A 615/A 615M, Grade 60. Cut bars true to length with ends square and free of burrs.

C. Tie Bars: ASTM A 615/A 615M, Grade 60, deformed.

D. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or pre-cast concrete of greater compressive strength than concrete, and as follows:
   1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.

2.03 CONCRETE MATERIALS

A. Cementitious Material: Use one of the following cementitious materials, of the same type, brand, and source throughout the Project:
   1. Portland Cement: ASTM C 150, Type I/II gray.

B. Normal-Weight Aggregates: ASTM C 33, Class 4M coarse aggregate, uniformly graded. Provide aggregates from a single source.

1. Maximum Coarse-Aggregate Size: three-fourth (3/4 “) inch nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Water: ASTM C 94/C 94M.

D. Air-Entraining Admixture: ASTM C 260.

E. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than one-tenth (0.1%) percent water-soluble chloride ions by mass of cementitious material.
1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C 494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.04 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately nine (9 oz. /sq. yd.) ounces per square yard dry.

B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

D. Evaporation Retarder: Waterborne, monomolecular film forming; manufactured for application to fresh concrete.
1. Available Products:
a. Axim Concrete Technologies; Cimfilm.
b. Burke by Edeco; BurkeFilm.
c. ChemMasters; Spray-Film.
d. Conspec Marketing & Manufacturing Co., Inc.; Aquafilm.
e. Dayton Superior Corporation; Sure Film.
f. Euclid Chemical Company (The); Eucobar.
g. Kaufman Products, Inc.; Vapor Aid.
h. Lambert Corporation; Lambco Skin.
i. L&M Construction Chemicals, Inc.; E-Con.
j. MBT Protection and Repair, ChemRex Inc.; Confilm.
k. Meadows, W. R., Inc.; Sealtight Evapre.
l. Metalcrete Industries; Waterhold.
m. Nox-Crete Products Group, Kinsman Corporation; Monofilm.
n. Sika Corporation, Inc.; SikaFilm.
o. Symons Corporation; Finishing Aid.
p. Vexcon Chemicals, Inc.; Certi-Vex EnvioAssist.

E. Clear Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.
1. Available Products:
a. Anti-Hydro International, Inc.; AH Curing Compound #2 DR WB.

b. Burke by Edoko; Aqua Resin Cure.
c. ChemMasters; Safe-Cure Clear.
d. Conspec Marketing & Manufacturing Co., Inc.; W.B. Resin Cure.
e. Dayton Superior Corporation; Day Chem Rez Cure (J-11-W).
f. Euclid Chemical Company (The); Kurez DR VOX.
g. Kaufman Products, Inc.; Thinfilm 420.
h. Lambert Corporation; Aqua Kure-Clear.
i. L&M Construction Chemicals, Inc.; L&M Cure R.
j. Meadows, W. R., Inc.; 1100 Clear.
k. Nox-Crete Products Group, Kinsman Corporation; Resin Cure E.
l. Symons Corporation; Resi-Chem Clear.
m. Tamms Industries Inc.; Horncure WB 30.
n. Unitex; Hydro Cure 309.
o. Vexcon Chemicals, Inc.; Certi-Vex Enviocure 100.

2.05 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.

B. Bonding Agent: ASTM C 1059, Type II, non-dispersible, acrylic emulsion or styrene butadiene.

2.06 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301, for each type and strength of normal-weight concrete determined by either laboratory trial mixes or field experience.

B. Use a qualified independent testing agency for preparing and reporting proposed concrete mixture designs for the trial batch method.

C. Proportion mixtures to provide normal-weight concrete with the following properties:
1. Compressive Strength twenty-eight (28) Days: 3,000 psi.
2. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.45.
3. Slump Limit: five (5”) inches, plus or minus one (1”) inch.
4. Maximum Water Content: six (6) gallons per sack of cement
5. Maximum Cement Content: five (5) sacks per square yard

D. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:
1. Air Content: five (5%) percent plus or minus one and one-half (1.5%) percent for three-fourth (3/4”) inch nominal maximum aggregate size

E. Limit water-soluble, chloride-ion content in hardened concrete to three-tenths (0.30%) percent by weight of cement.

F. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.
1. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

2.07 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Furnish batch certificates for each batch discharged and used in the Work.
   1. When air temperature is between eighty-five (85^0F) degrees Fahrenheit and ninety (90^0F) degrees Fahrenheit, reduce mixing and delivery time from one and one-half (1 1/2) hours to seventy-five (75) minutes; when air temperature is above ninety (90^0F) degrees Fahrenheit, reduce mixing and delivery time to sixty (60) minutes.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Examine exposed sub-grades and subgrade surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

B. Proceed with concrete construction operations only after non-conforming conditions have been corrected and sub-grade is ready to receive pavement.

3.02 PREPARATION

A. Remove loose material from compacted sub-base surface immediately before placing concrete.

3.03 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for concrete construction to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least twenty-four (24) hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.04 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

3.05 JOINTS

A. General: Form construction, control, and expansion joints and tool edgings true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.
   1. When joining existing pavement, place transverse joints to align with previously placed joints, unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour unless pavement terminates at isolation joints.
   1. Continue steel reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of pavement strips, unless otherwise indicated.
   2. Provide tie bars at sides of pavement strips where indicated.
   3. Butt Joints: Use bonding agent at joint locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Expansion Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.
   1. Locate expansion joints at intervals as shown on plans.
   2. Terminate joint filler not less than one-half (1/2”) inch or more than one (1”) inch below finished surface if joint sealant is indicated.
   3. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
   4. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt-coat one-half of dowel length to prevent concrete bonding to one side of joint.
   5. Protect top edge of joint filler during concrete placement with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.

D. Control Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct control joints for a depth equal to at least one-fourth of the concrete thickness, as follows:
   1. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut one-eighth (1/8”) inch wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.

E. Edging: Tool edges of pavement and joints in concrete after initial floating with an edging tool to a one-half (1/2”) inch radius. Repeat tooling of edges after applying surface finishes. Eliminate tool marks on concrete surfaces.

3.06 CONCRETE PRODUCTION

A. Concrete shall not be mixed until the mix design and corresponding strength tests for each mix design have been approved by the Landscape Architect.

B. Concrete shall not be used if forty-five (45) minutes has elapsed since water was introduced to the mixture.

C. Batch plant shall sufficient capacity and adequate transport vehicles to assure continuous delivery of concrete. The delivery frequency shall provide for placing the concrete in one continuous pour.

3.07 CONCRETE PLACEMENT

A. Inspection: Before placing concrete, inspect and complete formwork installation, steel reinforcement, and items to be embedded or cast in. Notify other trades to permit installation of their work.

B. Remove snow, ice, or frost from subgrade surface and reinforcement before placing concrete. Do not place concrete on frozen surfaces.

C. Moisten subgrade and forms to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

D. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.

E. Do not add water to concrete during delivery or at Project site.

F. Do not add water to fresh concrete after testing.

G. Convey concrete from the mixer to the place of final deposit by methods that will prevent the separation or loss of ingredients.

H. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place. Place concrete in a uniform layer not more than twelve (12”) inches deep exercising care to avoid vertical joints and separate planes. Do not place concrete on previously placed concrete which has hardened sufficiently to cause of plane or separation between pours.

I. Do not allow concrete to drop more than three (3’) feet without a chute or tremie to avoid separation of materials.

J. Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping.
   1. Consolidate concrete along face of forms and adjacent to transverse joints with an mechanical vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels, and joint devices.
   2. Do not use a vibrator to transport concrete.

K. Screed pavement surfaces with a straightedge and strike off.

L. Commence initial floating using bull floats or darbies to impart an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations.

M. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
   1. When air temperature has fallen to or is expected to fall below forty (40^0F) degrees Fahrenheit, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than fifty (50^0F) degrees Fahrenheit and not more than eighty (80^0F) degrees Fahrenheit at point of placement.
   2. Do not use frozen materials or materials containing ice or snow.
   3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mix designs.

N. Hot-Weather Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:
   1. Cool ingredients before mixing to maintain concrete temperature below ninety (90^0F) degrees Fahrenheit at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is CONTRACTOR'S option.
   2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
   3. Fog-spray forms, steel reinforcement, and sub-grade just before placing concrete. Keep sub-grade moisture uniform without standing water, soft spots, or dry areas.

3.08 FLOAT FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats, or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Re-float surface immediately to uniform granular texture.

C. Broom Finish: Unless otherwise shown, all pavements shall have a medium textured broom finish. Draw a soft bristle broom across float-finished concrete surface, perpendicular to the line of foot traffic, to provide a uniform, medium texture.

3.09 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying, excessive cold or hot temperatures and rain.

B. Comply with ACI 306.1 for cold-weather protection.

C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching two-tenths (0.2 lb/sq. ft. x h) pound per square feet by height before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

E. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound or a combination of these as follows:
   1. Moist Curing: Keep surfaces continuously moist for not less than seven (7) days with the following materials:
      a. Water.
      b. Continuous water-fog spray.
      c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with twelve (12”) inch lap over adjacent absorptive covers.
   2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least twelve (12”) inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
   3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three (3) hours of the initial application. Maintain continuity of coating and repair damage during curing period.

3.10 PAVEMENT TOLERANCES

A. Comply with tolerances of ACI 117 and as follows:
   1. Elevation: one-fourth (1/4”) inch.
   2. Thickness: Plus three-eighths (3/8”) inch, minus one-fourth (1/4”) inch.
   3. Surface: Gap below ten (10’) foot long, unleveled straightedge not to exceed one-fourth (1/4”) inch.
   4. Lateral Alignment and Spacing of Tie Bars and Dowels: one (1”) inch.
   5. Vertical Alignment of Tie Bars and Dowels: one-fourth (1/4”) inch.
   6. Alignment of Tie-Bar End Relative to Line Perpendicular to Pavement Edge: one-half (1/2”) inch.
   7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Pavement Edge: Length of dowel one-fourth (1/4”) inch per twelve (12”) inches.
   8. Joint Spacing: one (1”) inch.
   9. Control Joint Depth: Plus one-fourth (1/4”) inch, no minus.
   10. Joint Width: Plus one-eighth (1/8”) inch, no minus.

3.10 FIELD QUALITY CONTROL

A. Testing Agency: OWNER will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
   1. Testing Frequency: Obtain at least one (1) composite sample for each concrete mix placed each day.
   2. Slump: ASTM C 143/C 143M; one (1) test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.
   3. Air Content: ASTM C 231, pressure method; one (1) test for each day's pour of each concrete mix.

4. Concrete Temperature: ASTM C 1064; one (1) test hourly when air temperature is forty (40^0F) degrees Fahrenheit and below and when eighty (80^0F) degrees Fahrenheit and above, and one (1) test for each composite sample.
5. Compressive-Strength Tests: ASTM C 39/C 39M; test one (1) specimen at seven (7) days and two (2) specimens at twenty-eight (28) days.
    a. A compressive-strength test shall be the average compressive strength from two (2) specimens obtained from same composite sample and tested at twenty-eight (28) days.

C. Strength of each concrete mix will be satisfactory if average of any three (3) consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

D. Test results shall be reported in writing to OWNER'S Representative, concrete manufacturer, and CONTRACTOR within forty-eight (48) hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at twenty-eight (28) days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both seven (7) and twenty-eight (28) day tests.

E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by the OWNER'S Representative but will not be used as sole basis for approval or rejection of concrete.

F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by the OWNER'S Representative.

G. Remove and replace concrete construction where test results indicate that it does not comply with specified requirements.

H. Additional testing and inspecting, at CONTRACTOR'S expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.11 REPAIRS AND PROTECTION

A. Remove and replace concrete construction that is broken, damaged, or defective or that does not comply with requirements in this Section.

B. Drill test cores, where directed by the OWNER'S Representative, when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with Portland cement concrete bonded to pavement with epoxy adhesive.

C. Protect concrete from damage. Exclude traffic across concrete construction for at least fourteen (14) days after placement. When construction traffic is permitted, maintain concrete construction as clean as possible by removing surface stains and spillage of materials as they occur.

D. Maintain concrete construction free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION

SECTION 32 13 60
SPECIALTY CONCRETE PAVING

PART 1 – GENERAL

1.01 SCOPE

A. Specialty concrete paving includes furnishing all labor, materials and equipment necessary for, and pertinent to, the work to be done. Work will be accomplished in a thorough and workmanlike manner. The specified products will be prepared and applied in strict accordance with the manufacturer's recommendation.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. SECTION 32 13 13 CONCRETE CONSTRUCTION

1.03 SUBMITTALS

A. The CONTRACTOR will prepare a submittal package of current specifications and product literature, including color charts, supplied by the manufacturer of the specified products. All proposed materials and methods of application are subject to review by the OWNER.

B. The CONTRACTOR will provide the OWNER with qualifications as described below.

1.04 LIMITS OF WORK

A. The extent of specialty concrete paving shall be as indicated on the construction drawings.

1.05 TEST PANEL

A. The CONTRACTOR shall prepare sixteen (16") inch square test panels for each color and surface type. The test panels shall contain the concrete stain and surface treatment as described in the construction drawings and as specified in these specifications. The OWNER must approve the test panels before concrete surfacing and staining can begin. If the test panels are rejected additional test panels must be prepared until the test panels are approved by the OWNER. The approved test panels will be the standard by which the finished product will be judged.

1.06 QUALIFICATIONS

A. The concrete surfacing and staining CONTRACTOR shall submit a list of completed projects in which concrete surfacing and chemical staining was done. This list shall include the names of clients, location, completion date and telephone number/ e-mail address of the Client or General CONTRACTOR. The concrete surfacing and staining CONTRACTOR shall have completed at least ten (10) similar projects in the last two (2) years.

PART 2- PRODUCTS

2.01 CHEMICAL STAIN

A. Chemical stain for coloring concrete shall be LITHOCHROME TINTURA STAIN, a high performance self-priming reactive polymer stain manufactured by L.M. Scofield Company, or approved equal.

B. Color shall be selected by the OWNER.

2.02 SANDBLAST TEXTURE

A. Light sandblast finish identified on the construction drawings shall be achieved using surface retarder, a water based reactive compound designed to retard the set of fresh concrete at the surface. Surface retarder shall be LITHOCAST Surface Retarder as manufactured by L. M. Scofield or approved equal.

2.03 SEALER

A. Sealer shall be SELECTSEAL PLUS, a high-solids urethane fortified acrylic concrete sealer with a high-gloss finish manufactured by L.M. Scofield or approved equal.

2.04 MATERIAL LABELS AND CONTAINERS

A. Materials specified for application shall be delivered to the site in sealed containers, properly labeled with the manufacturer's labels and stenciled with the proper batch code identification. Products packaged or labeled in any other manner will not be accepted.

PART 3 – EXECUTION

3.01 ADVERSE CONDITIONS

A. No preparation materials or chemical staining materials will be applied when adverse conditions exist or appear to be eminent. Adverse conditions include high wind, excessive humidity, precipitation of all kinds, high or low temperature, adverse concrete surface conditions, adjacent construction activity and any other conditions and limitations specified by the product manufacturer that would be detrimental to the product's performance and the desired results as specified herein.

B. All materials and containers stored on the site will be protected from extremes of heat and cold which would adversely affect their performance.

3.02 PROTECTION OF EXISTING IMPROVEMENTS

A. The CONTRACTOR shall be responsible for protecting existing or proposed improvements (such as turf areas, paving, walls, etc.) from damage, coloration or application of staining or

surfacing materials. Such areas shall be masked or otherwise protected. Any existing improvements that are damaged or detrimentally affected by staining and surfacing operations will be cleaned, repaired and restored to its original condition by the CONTRACTOR at their expense.

3.03 SAFETY PRECAUTIONS

A. Since the chemical stain and surfacing has corrosive and caustic properties, the CONTRACTOR shall exercise extreme caution during application to avoid contaminating people, animals and plant material. The CONTRACTOR will take the necessary measures to keep people away from the area to be stained.

3.04 SURFACE RETARDER

A. Mix the material for three (3) to five (5) minutes with a power drill at low speed until the material is a uniform light blue color.

B. Apply an even coat of the surface retarder with power spray equipment set at the lowest pressure setting to create a fan pattern.

C. Cover the entire area planned for treatment with even coat and allow to dry for one (1) to two (2) hours.

D. Within six (6) hours after installation use a garden hose and push broom or a pressure washer to remove the concrete surface.

E. Allow the exposed concrete to dry for at least twelve (12) hours before applying stain.

3.05 PREPARATION OF THE SURFACE FOR STAINING

A. Concrete surfaces to be stained will be prepared per the stain manufacturer's recommendations. In general, the concrete shall have cured for at least twenty one (21) days, should be dry, clean and free of curing compound, excess dust, paint, mortar, oils, waxes and any other foreign materials that would adversely affect the penetration and subsequent reaction of the stain solution with the concrete to be stained. The OWNER shall approve the concrete surface before staining can begin.

3.06 STAIN APPLICATION

A. Stain shall be applied per the manufacturer's instructions using either a broom-type medium stiff bristle brush or spray equipment, as appropriate.

B. One (1) gallon of stain will cover approximately three hundred (300 SF) square feet depending on surface texture and porosity of the concrete paving. Apply a minimum of two (2) coats of stain.

C. Drying time shall be a minimum of twelve (12) hours between coats.

D. Sealer shall be applied after the stain has fully cured. Sealer shall be applied at a rate of one (1) gallon per four hundred (400 SF) square feet with a broom-type medium bristle brush or spray equipment.

3.07 COLOR RESULTS

A. Because of differing characteristics in the concrete, some variation in appearance and variegation of the color is expected. This is desirable, to a degree. However, color variations will not be extreme and will not vary significantly from the color on the test panel.

B. The OWNER will determine the number of stain coats to be applied. If the surface color variation after application is judged to be unacceptable by the OWNER, the CONTRACTOR shall apply more stain as necessary to correct the problem.

3.08 CLEAN UP

A. The CONTRACTOR is responsible for removing and disposing of all containers, surplus materials, rubbish, trash, debris or other foreign material resulting from staining operations.

3.09 CURING COMPOUND

A. Concrete surfaces designated to receive chemical stain must be free of curing compound. Therefore, finished concrete shall be moisture cured.

END OF SECTION

SECTION 32 30 00

MISCELLANEOUS ATHLETIC IMPROVEMENTS

PART 1 – GENERAL

1.01 SCOPE

A. The work to be performed under this section of the specifications consists of furnishing and installing various athletic improvements.

1.02 SUBMITTALS

A. Submit shop drawings and product data for each of the items noted in this section of the specifications.

PART 2 – PRODUCTS

2.01 FOUL POLE

A. Foul pole shall be constructed with a six (6”) inch diameter by .188” wall reinforced aluminum support post, a 1.9” by .126” wall reinforced aluminum extruded tube wing frame and 1 ½” by 3/16” thick lock crimp mesh. The foul pole shall be powder coated with an optic yellow color.

B. Foul pole is available from Aluminum Athletic Equipment Co.; info@myAAEworld.com.

2.02 OUTFIELD WALL

A. The vinyl panel outfield wall shall be the Champion Wall manufactured by Crane Materials International. The outfield wall panels shall meet or exceed the following characteristics:
   1. Material: Rigid, high impact UV- inhibited, weatherable vinyl compound. All interior exposed surfaces of the vinyl wall panels shall be UV resistant and compromised of virgin material with a minimum ASTM D4216 Cell Classification of 1-42443-33 to ensure reliable performance and color consistency.
   2. Section Modulus: The minimum section modulus of the wall panels shall be not less than forty 9.3 in3 per lineal foot of wall.
   3. Moment of Inertia: The moment of inertia shall not be less than 45 in4 per lineal foot of wall.
   4. Thickness: The wall panels must have a minimum thickness of 0.250 in.
   5. Depth: The wall panels must have a maximum section depth of 7”.
   6. Coverage and Interlocks: The wall panels must have a minimum width of 24”.
   7. Locking system: Male interlocks must incorporate I-Beam Lock reinforcement to resist lock separation.
   8. Surface Finish: The surface color shall be Challenger Green.

B. Outfield wall shall include a home run line cap that adheres to the following physical characteristics:
   1. Material: Rigid, high impact UV-inhibited weatherable, virgin, HMW polyethylene compound.

2. Section Height: Cap shall have an interior height of 6”.
3. Geometry: Cap shall be designed to minimize sharp corners/edges at the bottom lip.
4. Thickness: Cap shall have a minimum thickness of 0.15”.
5. Surface Finish: Home run line cap shall be Pantone 116 yellow and textured to minimize glare.

C. Vinyl striping shall be attached to the vertical face of the wall at third and first base lines to denote the foul line. Striping shall be Pantone 116 yellow.

D. Vinyl distance numbering shall be attached to the wall as indicated on the plans at left, right and centerfield. Numbering shall be Pantone 116 yellow.

2.03 SCOREBOARD

A. Scoreboard shall be 20’-0” by 6’-6” digital LED lit numbering with sport console inserts, adjustable brightness, changeable game captions, 5-year limited warranty, water resistant aluminum with non-illuminated sponsorship signage, custom field signage, truss and decorative steel support system with lightning protection. Electrical requirements shall be 120 VAC, 60 Hertz, 390 watts, 4 amps, phase 1, 2-wire, 1 circuit with ETL/CETL safety listing. Owner will provide custom logo and lettering, as well as sponsorship graphics. Steel color to be black – RAL #9005. Scoreboard color to be selected by the Owner. Scoreboard shall be model no. BA-7220-2 available from Fair-Play.; www.fair-play.com.

2.04 FLAGPOLES

A. Flagpoles shall be Sentry series - ISC internal halyard aluminum flagpole manufactured by Concord American Flagpole or approved equal. Flagpoles shall have a clear anodized finish and a wall thickness of 0.188”. Two of the flagpoles shall be 20’ tall and one flagpole shall be 25’ tall.

2.05 PRECAST CONCRETE BASEBALLS (ALTERNATE BID NO. 3)

A. The precast concrete baseballs that sit on top of the Honor Wall shall be twenty-four (24”) inches in diameter with three (3) three eights (3/8”) inch threaded inserts for mounting. The surface of the baseballs shall have a smooth finish painted white with red paint the threads. The baseballs are available from Wausau Tile; wtile@wausautile.com or approved equal.

PART 3 – EXECUTION

3.01 INSTALLATION

A. All miscellaneous athletic improvements shall be installed per the manufacturer’s recommendations or as detailed and as located in the construction drawings.

3.02 FOUL POLE

A. The foul poles shall be fabricated off site and powder coated as an entire unit.

3.03 OUTFIELD WALL

A. Contractor to provide shop drawings of wall design for approval prior to installation.

B. The outfield wall shall be installed per the detail on the plans.

3.04 SCOREBOARD

A. Contractor to provide shop drawings of wall design for approval prior to installation.

B. Install scoreboard per the manufacturer's recommendations.

3.05 CLEAN UP

A. Upon completion of athletic and site improvements installation the construction site must be cleaned of all debris created by the installation of these improvements.

END OF SECTION

SECTION 32 31 13

CHAIN LINK FENCES AND GATES

PART 1 – GENERAL

1.01 SCOPE

A. This section covers the furnishing of all labor and materials necessary to install chain link fences and gates as shown on the plans.

1.02 SUBMITTALS

A. Shop drawings shall be furnished on all fences and gates to be installed, and the CONTRACTOR shall submit samples of each component part of the fencing.

PART 2 – PRODUCTS

2.01 FABRIC

A. All chain link fabric shall be zinc or aluminum coated steel wire with a minimum tensile strength of 75,000 psi.

1. Zinc-coated: Minimum 1.2 ounces of zinc coating per square foot of coated surface area (ASTM A392).

B. Fabric shall be helically wound and interwoven into a diamond mesh in the following gauges and mesh sizes determined by measuring the clear distance between parallel sides of the mesh.

1. No. 9 gauge - 0.148" dia. 2” mesh

C. All fabric shall have knuckled top and bottom selvage.

D. The CONTRACTOR shall submit a manufacturer's certified test result that the zinc and aluminum coatings meet specified standards.

2.02 POSTS

A. All line and terminal fence posts shall be Schedule 40 galvanized steel pipe.

B. Terminal posts shall be defined as end, pull, corner and gate posts, and line posts defined as the vertical posts installed between terminal posts.

C. All posts shall be hot-dip zinc coated on all surfaces after fabrication with a minimum of 1.8 ounces of zinc per square foot of coated surface area, conforming to ASTM A120.

D. All posts shall conform to the following sizes as called for on the plans:

2 3/8” o.d.	3.65 lbs. per foot
2 7/8” o.d.	5.79 lbs. per foot
4" o.d.	9.10 lbs. per foot
6 5/8" o.d.	18.97 lbs. per foot

E. Spacing for line posts shall be as shown on the plans.

F. All exposed ends of fence posts shall be fitted with a formed steel, malleable iron, or aluminum hot-dip galvanized alloy cap. All line posts shall be fitted with a cap suitable for passage of the continuous top rail. All terminal posts shall be capped with a domed terminal top.

2.03 RAILS

A. All chain link fencing shall have a 1-5/8" o.d. (2.27 lbs. per foot) continuous top rail. Outside sleeve-type couplings 7" long, spaced at 20' maximum intervals, of the same material as the rail, shall be used to allow for expansion and contraction. Every fifth coupling shall have a spring to take up rail expansion or contraction.

B. All rails shall be Schedule 40 steel pipe hot-dip zinc coated after fabrication with a minimum of 1.8 ounces of zinc per square foot of coated surface area.

2.04 WIRE TIES

A. Wire ties shall be used to attach fence fabric to rails and line posts. Wire tie gauge size shall not be less than gauge of the fence fabric. Spacing for wire ties along rails shall not be greater than 24" and shall not exceed 15” when attaching to line posts. Ties shall be aluminum or zinc coated steel.

2.05 GATES

A. Gate frames shall be constructed of one and seven-eighths (1 7/8”) inch o.d. Schedule 40 steel pipe secured at corners with malleable iron or pressed steel ells, riveted with four rivets per ell. Frame shall be hot-dip zinc coated after fabrication.

B. Internal bracing shall be galvanized truss rods.

C. Hinges shall be pressed steel or malleable iron and shall provide for a full one hundred eighty (180) degree swing.

D. Single gates shall be equipped with a fork-type industrial grade steel latch with lock keeper and lock keeper guide. All double gates shall be equipped with a fork-type industrial grade steel latch with lock keeper, lock keeper guide, plunger rod with lockable cap and plunger rod catch. **Cast iron latches will not be accepted.**

E. Gate fabric shall match adjacent fence fabric and shall attach to horizontal gate frame members with tie wires spaced at twelve (12”) inch intervals and attached to vertical gate frame members with tension bar and bands.

2.06 FITTINGS

A. Tension and Brace Bands shall be galvanized pressed steel complying with ASTM F626. The bands shall have minimum steel thickness of twelve (12 ga) gauge and a minimum width of three-quarter (3/4”) inches. The bands shall have a minimum zinc coating of 1.20 oz/ sq ft. Secure bands with five-sixteenths (5/16”) inch galvanized steel carriage bolts.

B. Truss Road Assembly shall be in compliance with ASTM F626 and shall consist of a three-eighths (3/8”) inch diameter steel truss rod and a pressed steel tightner. The bands shall have a minimum zinc coating of 1.20 oz/ sq ft.

C. Stretcher Bars shall be in compliance with ASTM F626. Stretcher bar shall be galvanized pressed steel two (2”) inches shorter than the fence fabric and shall have a minimum steel thickness of three-sixteenths (3/16”) inches and minimum width of three-quarter (3/4”) inches. The bars shall have a minimum zinc coating of 1.20 oz/ sq ft.

D. All fittings to be hot-dip zinc coated malleable cast iron or pressed steel conforming to ASTM A153. Hot-dip zinc coating shall be 1.2 ounces of zinc per square foot of coated area.

2.07 CONCRETE POST FOOTINGS

A. All concrete used shall be 3,000 psi at twenty-eight (28) days using five (5) sacks of cement per cubic yard of mix with a maximum of seven (7) gallons of water per sack. Concrete work shall conform to Section 321313, "Concrete Construction”.

PART 3 – EXECUTION

3.01 ERECTION

A. All fencing shall be installed by skilled and experienced fence erectors to the lines and grades shown on the drawings.

3.02 COORDINATION

A. Fence erectors shall coordinate work with the concrete subcontractor for the placement and location of fence post footings. Fence post erectors shall coordinate with the OWNER and CONTRATOR in locating all existing underground utilities prior to drilling holes for fence post footings.

3.03 CHAIN LINK FRAMEWORK INSTALLATION

A. Install chain link fence system in accordance with ASTM F567 and manufacturer’s instructions.

B. Locate terminal post at each fence termination, at each gate opening and each change in direction of thirty (30°) degrees or more.

C. Space line posts uniformly at a maximum distance of eight (8’) feet on center.

D. Check each post for vertical and top alignment, and maintain in position during placement.

E. Top rail: Install in lengths of twenty-one (21’) feet. Connect ends with sleeves forming a rigid connection, allow for expansion and contraction.

3.04 CHAIN LINK FABRIC INSTALLATION

A. Fabric: Install fabric on the inside of the field; pull fabric taut; thread the stretcher bar through fabric and attach to terminal posts with tension bands spaced at a maximum of fifteen (15”) inches on center and attach so that fabric remains in tension after pulling force is released.

B. Secure fabric to line posts using wire ties set at fifteen (15”) inches on center and to rails at twenty-four (24”) inches on center. Tie wires shall be secured to the fabric by wrapping two (2), three hundred sixty (360 deg.) degree turns around the chain link fabric. Cut off excess wire and bend back so as not to protrude and to avoid injury if a pedestrian may come in contact with the fence.

C. All fence fabric shall have a one (1") inch clearance from the bottom of the fence fabric to the finish grade. Fence fabric shall extend above the top of the top rail no more than one and one-half (1-1/2") inches.

3.05 CHAIN LINK GATE INSTALLATION

A. Installation of swing gates and gate posts shall be per ASTM F567. Direction of swing shall be as shown on drawings. Gates shall be hung plumb in the closed position with a one (1”) inch gap from concrete edging or finish grade to the bottom of the gate frame.

3.06 SITE CLEAN UP

A. Upon completion of the fence installation, any splattered concrete shall be removed from fence posts and fabric, all wire ties and fence hardware shall be picked up, and all excess fence fabric and equipment removed from the construction site.

END OF SECTION

SECTION 32 92 00

TURFGRASS PLANTING

PART 1 – GENERAL

1.01 SCOPE

A. The work in this section includes all soil preparation, fertilization, planting and other requirements associated with turfgrass planting. Furnish all labor, materials, equipment and services required as herein specified and as indicated on the drawings.

1.02 SUBMITTALS

A. All delivery receipts and copies of invoices for materials used for this work shall be subject to checking by the OWNER'S Representative.

B. Various samples, certificates and specifications for fertilizer and other materials shall be submitted for approval by the OWNER as required by subsequent sections of this specification.

PART 2 – PRODUCTS

2.01 TURFGRASS

A. Bermuda Grass Sod: Turfgrass sod shall be "Cynodon dactylon" Tifway 419 Bermuda Grass. Sod shall consist of stolons, leaf blades, rhizomes and roots with healthy, virile system of dense, thickly matted roots throughout the soil of the sod. The sod pad shall be not less than three-fourth (3/4") inches thick. Sod shall be alive, healthy, vigorous, free of insects, disease, stones and undesirable foreign materials and grasses. The grass shall have been mowed prior to sod cutting so that the height of the grass shall not exceed two (2") inches. Sod shall not be harvested or planted when the moisture condition of the sod is so excessively wet or dry that its survival will be affected. All sod shall be harvested, delivered and planted within a thirty-six (36) hour period. Sod shall be protected from exposure to wind, sun and freezing. If sod is stacked, it shall be kept moist and shall be stacked roots-to-roots and grass-to-grass.
   1. Prior to planting, provide the OWNER'S Representative with the State Certificate stating the analysis of the sod.
   2. All sod shall be the same thickness. Sod sections shall be rectangular and may vary in length but the width of all sod sections must be equal. Broken or torn sod pads will be unacceptable.

2.02 FERTILIZER

A. Fertilizer shall be a commercial product, uniform in composition, free flowing and suitable for application with approved equipment. Fertilizer shall be delivered to the site in fully labeled original containers. Fertilizer that has been exposed to high humidity and moisture or has been damaged making it unsuitable for use will not be acceptable.

B. Fertilizer for the initial planting application shall have an N-P-K ratio of 4-5-1 (19-26-5). The phosphorus content must be derived from monoammonium phosphate to stimulate vigorous development of new roots, stolons and rhizomes.
   1. Submit a sample label or specification of the fertilizer for the OWNER'S approval.

C. Fertilizer for the post planting application will be a complete fertilizer of a chemical base containing by weight the following percentages of nutrients: 27-3-4 +2% Fe (N-P-K) from a methylene urea or the nitrogen equivalent of 33-3-10.
   1. Submit a sample label or specification of the fertilizer for the OWNER'S approval.

PART 3 – EXECUTION

3.01 GENERAL

A. All turf planting shall be executed across the slope parallel to the finish grade contours.

3.02 SCHEDULE

A. Any turf areas not established by September 15 shall be planted with Bermuda sod that has been over seeded Rye Grass at the turf farm prior to delivery to the site. The CONTRACTOR will still be responsible for producing an acceptable coverage of Bermuda Grass as specified.

B. Grass planting can only proceed upon approval of the fine grading by the OWNER'S Representative.

3.03 SOIL PREPERATION

A. Soil shall be tilled to loosen the soil, destroy any existing vegetation and to prepare an acceptable planting bed. All turf areas shall be tilled to a depth of five (5") inches.

B. Soil shall be cleaned of all debris, building materials, rubbish, weeds and stones larger than three-fourth (3/4") inches in diameter. All collected materials shall be removed off-site.

C. After tilling and cleaning the areas to be planted shall be leveled, fine graded and drug with a float drag or a weighted spike harrow. The end result shall be a planted area free of ruts, depressions, humps and any soil clods.

3.04 FERTILIZATION

A. The initial planting fertilizer application shall be applied at a rate of nine (9 lbs.) pounds per one thousand (1,000 sq. ft.) square feet or four hundred (400 lbs.) pounds per acre.
   1. Fertilizer shall be applied over sodded areas after planting, but not more than two (2) days later.

B. The post planting fertilizer application shall be applied thirty (30) days after planting and shall be applied at a rate of one (1) pound of nitrogen per one thousand (1,000 sq. ft.) square feet or forty-four (44 lbs.) pounds per acre.
   1. The OWNER'S Representative will determine if it is too late in the growing season for the post planting application. In this event the application shall be made in the spring of the following year or the OWNER shall be credited the cost of this fertilization.
   2. Areas of turf grass that have not obtained uniform coverage within thirty (30) days will receive subsequent applications of fertilizer every thirty (30) days until uniform coverage is obtained.

3.05 PLANTING

A. Prior to laying the sod, the planting bed shall be raked smooth and moistened to a depth of four (4") inches, but not to the extent of causing puddling.

B. Sod shall be laid smoothly and butted end to end with staggered joints.

C. The sod shall be pressed firmly into contact with the subgrade by rolling in order to eliminate all air pockets, to provide a true and even surface and to ensure rooting without displacement of the sod or deformation of the surfaces of the sodded area.

D. Following rolling, fine screened soil of good quality shall be used to fill any cracks between sod sections. Excess soil shall be worked into the grass with suitable equipment and shall be well watered. The texture of the fill soil shall be such that it will not smother the grass.

3.06 PROTECTION

A. No heavy equipment shall be moved over the planted turf areas. Any areas disturbed prior to acceptance shall be tilled, regraded, leveled and replanted.

B. It will be the CONTRACTOR'S responsibility to protect all paved surfaces, utilities, plant material and any other improvements from damage during grassing operations. Any damage will be repaired at no cost to the OWNER.

C. The CONTRACTOR will be responsible for locating and protecting all irrigation equipment during grassing operations.

3.07 IRRIGATION SYSTEM

A. The proposed irrigation system must be completely operational before grassing operations may begin. After planting, any breakdowns or malfunctions of the irrigation system must be immediately repaired by the CONTRACTOR. Otherwise, the cost of replacing lost turf caused by CONTRACTOR'S failure to promptly repair the irrigation system will be borne by the CONTRACTOR.

B. Areas not covered by the proposed irrigation system shall be watered with a temporary irrigation system. Temporary irrigation must be approved by the OWNER prior to installation. Once the non-irrigated turfgrass has achieved an acceptable stand of grass the temporary irrigation system must be removed.

3.08 ESTABLISHMENT AND ACCEPTANCE

A. Regardless of unseasonable climatic conditions or any other adverse conditions affecting grassing operations, the germination and growth of turf grass, it shall be the sole responsibility of the CONTRACTOR to produce uniform coverage.

B. Uniform coverage shall be defined as no visible joints showing or felt between sod sections and all sod sections must be firmly rooted to the subgrade.

3.09 POST PLANTING MAINTENANCE

A. Maintenance shall begin immediately after grass is planted. All planted areas will be protected and maintained by watering, weeding and replanting as necessary for at least thirty (30) days after planting and for as long as necessary to establish uniform coverage of the specified grass. All areas which do not achieve uniform coverage at the end of thirty (30) days will continue to be replanted and maintained by the CONTRACTOR until the turfgrass is completely covered and accepted.

B. Apply at least one-half (1/2 ") inch of water over the entire planted area every three (3) days until grass is established. CONTRACTOR shall water thoroughly and infrequently once grass is established to encourage deep root growth. Water will be paid for by the OWNER as long as it is not used in a wasteful manner.

C. Once grass is established the turf areas must be mowed at least once a week at a height of two (2") inches until the end of the growing season or until the project is completed. The CONTRACTOR shall anticipate at least four (4) mowing as a part of this contract.

D. No sooner than forty-five (45) days after grass has been planted any weed growth shall be eradicated by applying MSMA broadcasted over the entire planted area. Additional spot applications of MSMA may be required to eliminate any weeds that continue to grow after the initial application. MSMA may only be used during the growing season. All weed growth during the dormant season will be controlled with spot applications of "Round-Up".

E. All turf areas adjacent to pavement shall be edged as required to maintain a neat appearance.

3.10 EROSION CONTROL

A. Throughout the grow-in and maintenance period it is the CONTRACTOR'S responsibility to maintain the topsoil in place at the finish grade. Any topsoil or turfgrass losses due to erosion will be replaced by the CONTRACTOR until establishment and acceptance is achieved.

3.11 CLEAN UP

A. The CONTRACTOR shall remove any excess material or debris brought to the site or uncovered during grassing operations.

3.12 GUARANTEE

A. The CONTRACTOR shall guarantee that all materials used for grassing operations are the type, quality and quantity specified.

END OF SECTION

SECTION 32 93 43

TREE PLANTING

PART 1 – GENERAL

1.01 SCOPE

A. The extent of tree planting is indicated on the drawings. Types of work required includes: furnishing trees, preparation of planting pits and planting area soil preparation including excavation, backfilling, and disposal of surplus and unsuitable excavated material. Planting of trees including mulching, trimming, and staking.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. SECTION 32 94 00 – Irrigation System

B. SECTION 32 92 00 – Turfgrass Planting

1.03 QUALITY ASSURANCE

A. General: Comply with all applicable federal, state, county and local regulations governing landscape materials and work.

B. Employ only experienced personnel familiar with required work. Provide adequate supervision by qualified foremen.

C. Provide quantity, size, genus, species, and variety of trees indicated and scheduled for landscape work and complying with applicable requirements of ANSI Z60.1, “American Standard for Nursery Stock”.

D. Measurements: Measure trees with branches and trunks or canes in their normal position. Do not prune to obtain required sizes. Take caliper measurements six inches above ground for trees up to and including four (4”) caliper size, and twelve inches above ground for larger sizes. Measure main body of all plant material of height and spread dimensions, do not measure from branch or root tip-to-tip.

1.04 DELIVERY, HANDLING AND STORAGE

A. Do not prune trees prior to delivery unless approved by the OWNER’S Representative. Provide adequate protection of the root systems and foliage from drying wind and sun. Do not bend or bind trees in such a manner that would damage the bark, break branches or destroy the trees natural shape. Provide protective coverings during delivery. Any tree in full leaf will be sprayed with an anti-desiccant prior to delivery. Do not drop balled and burlapped stock during delivery.

B. Deliver trees after preparations for planting have been completed and then plant immediately. If tree planting is delayed for more than six (6) hours after delivery set the trees

in the shade, protect them from the weather and construction damage and keep the roots moist.

C. Set balled stock on ground and cover with soil, peat moss, saw dust or other acceptable material.

D. Do not remove trees from their containers until they are ready to be planted.

E. While waiting to be planted trees shall not be stored on pavement or any surfaces which reflect a large amount of heat during storage.

F. Periodically water root system of trees stored on site using a fine mist spray. Water as often as necessary to maintain root systems in a moist condition.

G. All trees shall be handled carefully so that the roots are adequately protected from drying out and from injury. The balls of balled and burlapped trees which cannot be planted immediately upon delivery shall be "heeled in" for protection with soil, mulch or other acceptable material.

1.05 JOB SITE CONDITIONS

A. Timing: Plant trees during normal seasons for such work in location of project. Plant flowering trees during the spring planting season, except as otherwise acceptable to OWNER'S Representative.

B. Coordination with Turf: Protect existing turf areas to the greatest extent practical during construction. Seed or sod all areas disturbed during construction with approved seasonal grass.

C. Coordination with Irrigation System: The irrigation system must be fully operational prior to commencement of landscape and tree planting operations. Report potential conflicts with the irrigation system to the OWNER'S Representative.

PART 2 – PRODUCTS

2.01 PLANT MATERIAL

A. General: Provide plant material grown in accordance with good horticultural practice, with healthy root systems developed by transplanting or root pruning. Provide only healthy stock free of disease, insects, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, or disfigurement. Trunks will be centered in root ball. Fresh pruning cuts larger than one-half (1/2") inch can be cause for rejection of plant material.

B. Size: Provide plant material of the sizes indicated in the plant list and in accordance with dimensional relationship requirements of ANSI Z60.1 for kind and type of plant material required. Plant material of larger size than specified may be used if acceptable to OWNER'S Representative; in which case, increase size of root balls proportionately and at no additional cost to OWNER. It is the CONTRACTOR'S responsibility to verify plant quantities where formal arrangements of consecutive order of trees are shown, select stock for uniform height and spread.

C. Provide trees of height and caliper indicated on the construction drawings, provide single stem trees with straight trunk and intact leader, branched or pruned naturally according to species and type, and with relationship of caliper and branching recommended by ANSI Z60.1, unless otherwise indicated.

2.02 REQUIREMENTS FOR B&B STOCK

A. General: Where indicated to be balled and burlapped, provide trees dug with firm, natural ball of earth in which they are grown. Provide freshly dug trees to the greatest extent possible.

B. Provide ball size of not less than diameter and depth recommended by ANSI Z60.1 for type and size of tree required. Increase ball size or modify ratio of depth to diameter as required to encompass fibrous and feeding root system necessary for full recovery of trees subject to unusual or non-typical conditions of growth, soil conditions or horticultural practice.

C. Wrap and tie earth ball as recommended by ANSI Z60.1 for size of balls required. Drum-lace balls with a diameter of thirty (30") inches or greater.

2.03 REQUIREMENTS FOR CONTAINER GROWN STOCK

A. General: Provide healthy, vigorous, well-rooted plant materials established in container in which they are sold. Provide balled and burlapped stock, when required trees exceed maximum size recommended by ANSI Z60.1 for container grown stock.

B. Established container stock is defined as a tree grown in or transplanted into a container and grown in the container for a length of time sufficient to develop new fibrous roots, so that root mass will retain its shape and hold together when removed from container.

C. Containers: Use rigid containers that will hold ball shape and protect root mass during shipping. Provide trees established in containers of not less than minimum sizes recommended by ANSI X60.1 for kind, type, and size of trees required.

2.04 MISCELLANEOUS MATERIALS

A. Mulch: Provide shredded hardwood bark mulch to a depth of at least three (3") inches in the planting basin to cover root ball. Do not place mulch directly against the trunk of the tree.

B. Root-ball Stabilization*:* Trees shall be stabilized by means of an at-grade or sub-grade root stabilization system that does not employ the use of stakes, posts or guys. The recommended system is the Root Anchor™ Underground Tree Staking System by Tree Stake Solutions, LLC. Product shall be approved by the Landscape Architect prior to installation.

C. All other materials not specifically described but required for a complete and proper installation may be selected by the CONTRACTOR subject to the approval of the OWNER'S Representative.

D. Post Emergent Herbicide: "Round Up" or approved equal may be utilized in the planting basin to control weeds until final acceptance of the project. All chemicals must be applied by a Licensed Chemical Applicator.

E. Root Stimulator: Shall be Maxicrop or Garden Ville brand liquefied seaweed or approved equal.

F. Contractor shall supply the OWNER's REPRESENTATIVE with copies of all invoices or delivery tickets for soil amendments.

2.05 PLANTING MIXTURE - TREE PLANTING

A. Soil for use in back-filling tree pits shall be the excavated soil from the planting pit unless otherwise specified by OWNER'S Representative.

B. Existing topsoil shall be free of all rocks and rock chips over three-fourths (3/4) in diameter, as well as all trash, vegetation, and other debris.

PART 3 – EXECUTION

3.01 TREE PLANTING

A. Cooperate with other contractors and trades working in and adjacent to landscape work areas. Examine drawings that show development of entire site and become familiar with scope of other work required.

B. Layout individual tree locations and areas for multiple plantings. Stake locations and secure OWNER Representative's acceptance before start of planting work. Make minor adjustments as may be requested by OWNER'S Representative.

C. Excavation: Excavate pits according to drawings with vertical but "rough" sides. Leave soil in bottom of pit undisturbed. Avoid creating smooth or "glazed" sides of pit. Do not excavate tree pits until preliminary approval has been obtained from the OWNER'S Representative.

D. Immediately dispose of unsuitable subsoil removed from landscape excavations. Do not mix with planting soil or use as back-fill.

E. Utilities: Have existing utilities field located prior to excavating. Notify OWNER'S Representative of potential conflicts.

F. Obstructions: If rock, underground construction, or other obstructions are encountered in excavation for planting of trees, notify OWNER'S Representative. New locations may be selected by OWNER'S Representative, or change order may be issued to direct removal of obstructions to depth of not less than six (6") inches below required planting depth.

G. Drainage: Test all planting pits for adequate percolation. If subsoil conditions indicate retention of water in planting areas, or if seepage or other evidence indicating presence of underground water exists, notify OWNER'S Representative before backfilling. A change order may be issued to direct installation of drain tile or other measures beyond drainage requirement indicated.

3.02 INSTALLATION

A. Before backfilling, clean soil of roots, plants, sod, stones, clay lumps, any other extraneous materials harmful or toxic to plant growth, and dispose of off site. Use only existing soil from the site as back-fill.

B. Setting and Back-filling: Set tree ball on undisturbed soil, plumb and in center of pit with top of ball one (1") inch to two (2") inches above finished landscape grades. Remove burlap from top of root-ball but do not remove from sides or under root-ball. Completely remove any nylon, plastic, or wire materials from the top half of the root-ball. Remove pallets, if any, before setting. Do not use stock if ball is cracked or broken before or during planting operation. When set, place back-fill (existing native soil) around base and sides of ball, and work each layer to settle back-fill and eliminate voids and air pockets. When excavation is approximately two-thirds (2/3) full, water thoroughly before placing remainder of backfill. Repeat watering until no more is absorbed. Water again after placing final layer or back-fill.

C. Construct water retention basin as directed in plans, at least four (4") inches high and twice the diameter of the root-ball.

D. Provide at least a three (3") inch layer of mulch on top of the root-ball. Do not place mulch against trunk of tree and do not cover the tree's root flare.

E. Unless otherwise directed by OWNER'S Representative, do not cut tree leaders, and remove only injured or dead branches. Any pruning shall be in accordance with standard horticultural practices. Stake trees immediately after planting. If after pruning, the plant has become misshapen or changed in appearance, the plant will be rejected.

F. Stake trees of two (2") inches or greater caliper. Trees shall be staked in accordance with the tree planting and staking details show on the drawings.

3.03 CLEAN UP

A. After tree planting operations are complete remove all trash, excess soil, empty containers and construction debris.

B. Any damage to the surrounding area that may occur during tree planting shall be repaired to its original condition.

3.04 MAINTENANCE

A. Tree maintenance shall occur until final acceptance. Maintenance shall include watering, pruning, fertilization, weeding and application of appropriate herbicides as necessary.

B. If tree settles the tree shall be removed, re-set, re-staked and the mulch replaced.

END OF SECTION

SECTION 32 94 00

IRRIGATION SYSTEM

PART 1 – GENERAL

1.01 SUMMARY

A. Provide complete landscape irrigation system as shown on drawings as described herein.

1.02 RELATED SECTIONS

A. SECTION 32 92 00 Turfgrass Planting

B. SECTION 32 93 43 Tree Planting

1.03 QUALITY ASSURANCE

A. Installer:

1. An irrigator licensed in State of Texas with a minimum five (5) years continuous experience installing systems of this size and complexity must supervise system installation.
2. Complete thrust block and mainline installation with personnel that have successfully installed equipment and materials as specified on at least three other projects equal in scope.
3. If requested, submit a list of references including OWNER, OWNER'S REPRESENTATIVE (if applicable), date of installation and approximate installation cost.

B. Testing:

1. Perform required testing under observations of OWNER'S REPRESENTATIVE. Give forty-eight (48) hours' notice that such tests are to be conducted.

C. Assembly Procedures:

1. Do not alter design hydraulics by installing additional tees or elbows unless approved by Architect.

1.04 REFERENCES: The following ASTM (latest edition) designations apply:

A536 Ductile Iron Fittings
D2241 Poly (Vinyl Chloride) (PVC) Plastic Pipe (SDR-PR)
D2672 Bell-End Poly (Vinyl Chloride) (PVC) Pipe
D2464 Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Thread, Schedule 80
D2466 Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Socket Type, Schedule 40
D2467 Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Socket Type, Schedule 80
D2564 Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings

D2287 Flexible Poly Vinyl Chloride (PVC) Plastic Pipe
F656 Poly Vinyl Chloride (PVC) Solvent Weld Primer
C213 AWWA Dual Compression Gasket Seal Fittings
D2855 Making Solvent - Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings
F477 Ductile Iron Fitting Gaskets

1.05 SUBMITTALS

A. Procedure: Comply with Division 1 specification requirements.

B. Product Data: Submit copies of manufacturer's specifications and literature for all specified materials.

C. Project Record Documents:
1. Locate by written dimension, routing of mainline piping, remote control valves and quick coupling valves. Locate mainlines by single dimensions from permanent site features provided they run parallel to these elements. Locate valves and intermediate electrical connections by two dimensions at approximately seventy (70) degrees to each other, provided they are within fifty (50') feet of a permanent site feature. Valves, electrical connections and quick couplers beyond fifty (50') feet must be located by triangulation using three dimensions from building corners, walk intersections or similar junctures.
2. When dimensioning is complete, transpose work to the AutoCad file for the original drawings.
3. Submit two (2) completed blackline drawings prior to final acceptance. Mark tracings "Record Prints Showing Significant Changes". Date and sign drawings.
4. Provide three complete operation manuals and equipment brochures neatly bound in a hard back three-ring binder. Include product data on all installed materials. Include warranties and guarantees extended to the CONTRACTOR by the manufacturer of all equipment.

D. Water Pressure: Prior to starting construction, determine if static water pressure is forty-six (46) psi as stated on Drawings. Confirm findings to OWNER in writing. If static pressure varies from pressure stated on drawings, do not start work until notified to do so by OWNER'S REPRESENTATIVE.

1.06 COORDINATION

A. Complete sleeve installation (not otherwise provided) in coordination with paving and other concrete pours.

B. Coordinate system installation with work specified in other Sections and coordinate with landscape installer to ensure plant material is uniformly watered in accordance with intent shown on Drawings.

1.07 WARRANTY AND MAINTENANCE

A. Extend to the OWNER warranties and guarantees provided by the manufacturer of all equipment used.

B. Fully warrant materials and workmanship for a minimum of one year after final acceptance.

C. Include repair of backfill settlement, packing the earth firmly around the heads and valve boxes.

PART 2 - PRODUCTS

2.01 DEFINITIONS:

A. Mainline: Piping from water source to operating valves. Hydrant lines and quick coupling valves (QCV) are considered mainlines.

B. Lateral Piping: Piping from operating valves to sprinkler heads.

2.02 POLYVINYL CHLORIDE PIPE

A. Polyvinyl Chloride Pipe (PVC) Manufactured in accordance with the product standards as follows:

B. Mainline Piping-PS-22-70, SDR-21, Class 200.

1. Four (4”) inch - gasket type joints.
2. Less than four (4”) inch - solvent weld joints

C. Lateral Piping-PS-22-70, SDR-21, Class 200 - solvent weld joints

D. Marking and Identification: Permanently marked with the following information: manufacturer’s name, pipe size, type of pipe and material, SDR number, Commercial Standard Number, and NSF (National Sanitation Foundation) Seal.

2.03 PIPE FITTINGS

A. PVC Schedule 40, as manufactured by the Lasco Company, or approved equal.

B. All PVC fittings shall be of the same material as the PVC pipe specified and be compatible with the PVC pipe furnished.

C. Use only solvent recommended by the manufacturer of the PVC pipe and the manufacturer of the PVC fittings.

2.04 VALVE WIRING

A. Single conductor copper type UF wire with minimum 4/64 in. vinyl insulation U.L. approved for direct underground burial in thirty (30) volt AC or less service.

B. Valve wiring from electric valves to controllers: #14 UF red.

C. Ground wiring from electric valves to controllers: #12 UF white.

2.05 NIPPLES

A. For lawn and pop-up shrub heads: Flexible PVC manufactured from virgin PVC material and tested at two hundred (200) psi; static pressure for two (2) hours with a quick burst rating of four hundred (400) psi min. manufactured by Agrifim (NDS), Inc.

B. For rotary head swing joints: Schedule 80 PVC, Type 1, Grade 1, plus Lasco swing joint assemblies with 'O' Ring fittings.

2.06 VALVE BOXES

A. Electric Valves:

1. Twelve (12”) inches x seventeen (17”) inches x twelve (12”)inches deep plastic valve box with extensions as required.
2. Manufacturer: Highline

2.07 WIRE SPLICES

A. Valve Wiring - Waterproof-type connectors with plastic housing and non-settling sealant.

B. Manufacturer: King One Step wire connector or Type DBY by 3M.

2.08 MATERIALS LIST

A. Refer to drawings for additional material requirements.

PART 3 - EXECUTION

3.01 INSPECTION

A. Examine areas to be sprinkled and conditions under which irrigation sprinkler system is to be installed.

B. Verify that interfacing work specified elsewhere is complete.

C. Notify OWNER’S REPRESENTATIVE in writing of conditions detrimental to proper irrigation coverage and timely completion of Work.

D. Do not proceed until conditions are satisfactory.

3.02 INSTALLATION

A. General

1. Compliance: Complete installation in strict accordance with manufacturer's recommendation which shall be considered a part of these specifications.
2. Staking: Stake location of each sprinkler before proceeding. Do not exceed manufacturer's maximum spacing limits for the stated pressure.
3. Piping Layout: Piping layout is diagrammatic. Route piping around trees to avoid damage to plantings. Do not dig within balls of newly planted trees. Also, if applicable, do not trench within the drip line of existing trees. These trenches must be dug by hand.
4. Discrepancies
    a. Point out any discrepancy between the drawings and the field conditions that may affect uniform coverage. Do not proceed until any design change made necessary by such discrepancy is approved.
    b. Should such changes create extra cost, approval for extra compensation shall be obtained in writing before commencing work.
    c. Should such changes create a savings in cost, a written reduction in the contract price shall be approved in writing before commencing work.
    d. If Contractor fails to comply with a. above, and proceeds with the installation, then the Contractor assumes responsibility for cost of subsequent system modifications to assure that uniform water coverage is achieved.

B. Excavations: Excavations are unclassified and include earth, rock, or combinations, in wet or dry state. Backfill trenches with material removed except if rock is encountered, haul this material off site and backfill to ensure a minimum of 3 inches of rock free soil surrounding pipe.

3.03 PIPE INSTALLATION

A. General: Width of trenches to be approximately twice as large as the pipe diameter.
    1. Maintain a minimum horizontal distance of three (3’) feet between any valves that are installed side by side.
    2. Maintain a minimum eighteen (18”) inch distance between any fittings installed in the main line and lateral lines (except for reducer bushings). Crosses are not allowed.

B. Mainline and Lateral Piping: Install with twelve (12”) inches of soil cover over laterals, and eighteen (18”) inch coverage over mainline.

C. Trenching: Provide firm, uniform bearing for entire length of pipe to prevent uneven settlement. Wedging or blocking of pipe is not permitted. Remove foreign matter from inside of pipes before assembly. Keep inside of piping clean during and after layout of pipes.

D. Backfill: Water jet and compact to ninety (90%) percent standard proctor density to prevent after settling. Hand rake trenches and adjoining areas to leave grade in condition equal to before installation.

3.04 PVC PIPE AND FITTINGS ASSEMBLY

A. Solvent: Use solvent and procedures recommended by manufacturer to make solvent-welded joints. Thoroughly clean pipe and fittings before applying solvent.

B. PVC to Metal Connections: Use Teflon tape.

C. Threaded PVC Connections: Use threaded PVC adapters into which pipe may be welded. Use Teflon tape on threads.

3.05 REMOTE CONTROL

A. Provide valves in accordance with materials list and size according to Drawings.

B. Install valves in a level position in accordance with manufacturer's specifications.

C. Provide plastic valve box, centered over valve, flush with finish grade. Provide valve box extensions as required.

D. Install 0.5 cubic feet washed pea gravel in bottom of valve box.

3.06 SPRINKLERS

A. General: Provide in accordance with materials list and nozzling as shown on the Drawings. Change nozzle degree and trajectory if wind conditions affect coverage. Receive approval from the OWNER'S REPRESENTATIVE prior to any change. Install heads adjacent to walks and curbs three (3") inches clear of paving.

B. Spray Heads: Attach sprinklers to lateral piping with flexible PVC pipe. Firmly tamp soil around base plate and leave head plumb. Underside of flange shall be set flush to one (1") inch above finish grade in solid sodded areas.

C. Rotary Heads: Install as detailed on the Drawings on swing joints. Follow manufacturer's assembly and installation procedure. Set heads one quarter (¼") inch above finish grade.

3.07 WIRING

A. Sprinkler Controls to Valves:

1. Conduit is not required for U.F. wire unless otherwise noted on Drawings. Tuck wire under piping.
2. Make wire connections with waterproof connectors according to manufacturer's recommendations.
3. Provide a separate wire from controller to each electric valve. Provide a common neutral wire from each controller to valves served by a particular controller.
4. Provide a twenty-four (24") inch long wire coils at valves.
5. Provide an expansion coil every two hundred (200') feet, which consists of ten (10) wraps around a one (1") inch PVC pipe.

6. Bundle all valve wires from the same controller together at ten foot (10') intervals with plastic electrical tape.

3.08 TESTING

A. Notify OWNER'S REPRESENTATIVE to review work forty-eight (48) hours prior to testing pipe and fittings for leaks.

B. Test mains for a period of four (4) hours under static pressure. If leaks (or pressure drops) occur, correct defect and repeat test.

3.09 FINAL ADJUSTMENT

A. Make final adjustments of sprinkler system prior to OWNER'S REPRESENTATIVE final inspection.

B. Flush system by removing nozzles from heads on ends of lines and operating system.

C. Adjust sprinklers for proper operation and proper alignment for direction of throw.

D. Adjust each section for operating pressure and balance to other sections by use of flow adjustment on top of each valve. Correct operating pressure at last head of each section – fifty (50) psi for rotary heads and twenty (20) to twenty-five (25) psi for spray heads.

E. Adjust nozzling for proper coverage. Prevailing wind conditions or slopes may indicate that arc of angle or trajectory of spray should be other than as shown on Drawings. Change nozzles to provide correct coverage.

3.10 CLEANUP

A. Keep premises clean and neat.

END OF SECTION