CITY OF IDALOU

CONTRACT DOCUMENTS & SPECIFICATIONS

for

MULTI-PURPOSE COURT IMPROVEMENTS

AUGUST 2025

CITY COUNCIL MEMBERS

Russ Perkins – Mayor
Joe Sisk – Mayor Pro-Tem
Darrell Fuller Albert Bravo
Brendi Pierce Kyle Dubois
Suzette Williams – City Administrator

JACOB MARTIN

Firm #2448
Project #: 25285

3465 Curry Lane
Abilene, TX 79606
325.695.1070

908 S. Main Street, Suite 100
Boerne, TX 78006
325.695.1070

4920 S. Loop 289, Suite 106
Lubbock, TX 79414
806.368.6375

1925 Fort Worth Highway
Weatherford, TX 76086
817.594.9880

www.jacobmartin.com | info@jacobmartin.com | TBPE Firm #: 2448 | TBPELS Firm #: 10194493 | TBAE Firm #: BR 2261

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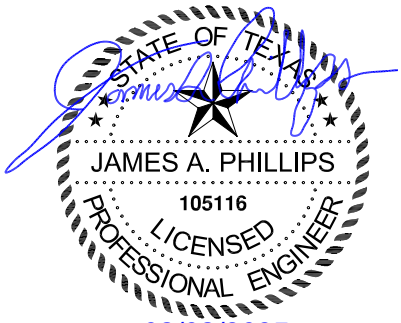

08/08/2025

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CITY OF IDALOU

MULTI-PURPOSE COURT IMPROVEMENTS

CONTRACT DOCUMENTS

ADVERTISEMENT FOR BIDS
CITY OF IDALOU, TEXAS
MULTI-PURPOSE COURT IMPROVEMENTS

Separate sealed bids for the **Multi-Purpose Court Improvements** project will be received by the **City of Idalou, Texas**, until **2:00 PM**, on **September 3, 2025**, at **Idalou City Hall, 301 Main St., Idalou, TX 79329**, and then at said location publicly opened and read aloud. This project involves the construction of a new multi-purpose court, enclosed by a 10-foot perimeter fence. The scope of work also includes improvements to ensure ADA accessibility, featuring the installation of a new ramp and sidewalk connecting the parking lot to the court.

The Contract Documents, consisting of Advertisement for Bids, Information for Bidders, Bid Proposal, Bid Bond, Agreement, Performance and Payment Bonds, General Conditions, Notice of Award, Notice to Proceed, Plans, and Specifications, may be examined at the following location:

Jacob & Martin, LLC
4920 S. Loop 289, Suite 106, Lubbock, Texas 79414

The Owner reserves the right to waive any informalities and to reject any or all bids. Bids may be held by the Owner for a period not to exceed 60 days from the date of bid opening for the purpose of reviewing the bids and investigating the qualifications of Bidders prior to awarding of the contract.

Copies of the CONTRACT DOCUMENTS must be ordered online at www.jacobmartin.com. Orders for CONTRACT DOCUMENTS may include hard copies for pick up, mail out or digital download via www.jacobmartin.com. Upon verification of online payment, hard copies may be picked up at Jacob & Martin, LLC, located at 3465 Curry Lane, Abilene, TX 79606. Cost for hard copies of the CONTRACT DOCUMENTS will be **$100.00** for 11x17 plans. Cost for digital download of CONTRACT DOCUMENTS will be **$0.00**. Contractors must purchase a set of CONTRACT DOCUMENTS to be considered a registered plan holder eligible to bid the project.

Bid Bond: A certified check or bank draft, payable to the order of the City of Idalou, negotiable U.S. Government bonds (at par value) or a satisfactory Bid Bond executed by the Bidder and an acceptable surety in an amount equal to five percent (5%) of the total bid shall be submitted with each bid.

City of Idalou Russ Perkins, Mayor August 8th and 15th, 2025

INFORMATION FOR BIDDERS

Bids will be received by the City of Idalou, Texas, herein called the "Owner", at Idalou City Hall, 301 Main St., Idalou, TX 79329, until 2:00 PM on September 3, 2025, and then at said location publicly opened and read aloud.

Each bid must be submitted in a sealed envelope addressed to Russ Perkins, Mayor. Each sealed envelope containing a bid must be plainly marked on the outside as "MULTI-PURPOSE COURT IMPROVEMENTS" and the envelope shall bear on the outside the Bidder's name and address. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope and addressed to Russ Perkins, Mayor, 301 Main St., Idalou, TX 79329.

All bids must be made on the required bid form. All blank spaces for bid prices must be filled in, in ink or typewritten, and the bid must be fully completed and executed when submitted. Only one (1) copy of the bid form is required. **Bids will not be received from contractors who are not registered plan holders. Bids shall be submitted on the provided documents. No faxed bids will be accepted.**

The Owner may waive any informalities or minor defects or reject any and all bids. Any bid may be withdrawn prior to the above scheduled time for the opening or authorized postponement thereof. Any bid received after the time and date specified will not be considered. No Bidder may withdraw a bid within 60 days after the actual date of opening thereof. Should there be reasons that the contract cannot be awarded within the specified period, the time may be extended by mutual Agreement between the Owner and the Bidder.

Bidders must satisfy themselves of the accuracy of the estimated quantities in the Bid Schedule by examination of the site and a review of the drawings and specifications including Addenda. The failure or omission of any Bidder to do any of the foregoing shall in no way relieve any Bidder from any obligation in respect to his Bid. After bids have been submitted, the Bidder shall not assert that there was a misunderstanding concerning the quantities of the work or of the nature of the work to be done. The Contract Documents contain the provisions required for the construction of the project. Information obtained from an officer, agent or employee of the Owner or any other person shall not affect the risks or obligations assumed by the Contractor or relieve him from fulfilling any of the conditions of the Contract.

Each bid must be accompanied by a Bid Bond, certified check, or cashier's check payable to the City of Idalou in the amount of five percent (5%) of the greatest amount bid. As soon as bid prices have been compared, the Owner will return the bonds of all except the three (3) lowest responsible bidders. When the Agreement is executed, the bonds of the two (2) remaining unsuccessful bidders will be returned. The Bid Bond of the successful Bidder will be retained until the Performance-Payment Bonds have been executed and approved, after which it will be returned.

Performance-Payment Bonds in the amount of 100% of the contract price, with a corporate surety approved by the Owner, will be required for the faithful performance of the contract. Attorneys-in-fact who sign Payment Bonds or Performance Bonds must file with each bond a certified and effective dated copy of their power of attorney. Bonding will not be required if Bid is less than

$25,000; however, no payment will be made until all work is completed and accepted by the Owner.

Award of the contract will be made as a whole to one Bidder. A conditional or qualified bid will not be accepted.

The party to whom the contract is awarded will be required to execute the Agreement and obtain the Performance-Payment Bonds within twenty-one (21) calendar days from the date the Notice of Award is delivered to the Bidder. The Notice of Award shall be accompanied by the necessary Agreement and Bond forms.

The Owner within twenty-one (21) days of receipt of approval of the Contract Documents shall return to the Contractor an executed duplicate of the Contract Documents. Should the Owner not return the executed Contract Documents within such period, The Bidder may, by written notice, withdraw his signed Agreement. Such notice of withdrawal shall be effective upon receipt of the notice by the Owner.

The Notice to Proceed shall be issued within ten (10) days of the approval of the Contract Documents by the Owner. Should there be reasons why the Notice to Proceed cannot be issued within such period, the time may be extended by mutual Agreement between the Owner and the Contractor. If the Notice to Proceed has not been issued within the ten (10) day period or within the period mutually agreed upon, the Contractor may terminate the Agreement without further liability on the part of either party.

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

The Engineer is JACOB & MARTIN, LLC; 4920 S. Loop 289, Suite 106, Lubbock, Texas 79414 (806-368-6375).

Supplemental Instructions to Bidders (Local Funding)

Title	Must be returned with your bid
Addendums (if applicable)	Yes – Signed and Dated
Cover Page	No
Table of Contents	No
Advertisement for Bids	No
Information for Bidders	No
Statement of Bidder's Qualifications	Yes – Completed and attachments added as applicable
Non-Collusion of Prime Bidders	Yes – Completed, signed, and notarized
Proposer Guarantees	Yes – Completed and signed
Conflict of Interest Questionnaire (Form CIQ)	Yes – Completed and signed
Certificate of Interested Parties (Form 1295)	Must file online as indicated (within 7 business days from notification of pending award)
Bid Proposal with Bid Schedule	Yes – Completed, signed and placed at the front of bid packet
Bid Bond	Yes – Completed and signed by Principal and Surety with additional Bond paperwork as needed
Notice of Award	No – (required after award)
Agreement	No – (required after award)
Payment & Performance Bonds	No – (required after award)
Notice to Proceed	No – (required after award)
General Conditions	No
Specifications and Plans	No

Note: Please do not use staples or bindings on submitted bids.

STATEMENT OF BIDDER'S QUALIFICATIONS

All questions must be answered, and the date given must be clear and comprehensive. If necessary, questions may be answered on separate attached sheets. The Bidder may submit any additional information as desired.

Name of Bidder: _____ Date Organized: _____
Physical Address: _____ Date Incorporated: _____
_____

Number of Years in contracting business under present name: _____

Contracts on hand:

Contract	Amount	Anticipated Completion Date

Type of work performed by your company: _____
Have you ever failed to complete any work awarded to you? _____
Have you ever defaulted on a contract? _____

List the more important projects recently completed by your firm (be sure to include projects of similar importance):

Project	Amount	Month/Year Completed

Major equipment available for this contract:

Attach resumes for the principal members of your organization, including the officers as well as the proposed superintendent for the project.

Credit Available: _____ Bank Reference: _____

The undersigned hereby authorizes and requests any person, firm, or corporation to furnish any information requested by the **City of Idalou** in verification of the recitals comprising this Statement of Bidder's Qualifications.

Executed this _____day of _____, 20_____.

By:_____

Name: _____

Title: _____

NON-COLLUSION AFFIDAVIT OF PRIME BIDDER

State of _____}

County of _____} ss.

_____, being first duly sworn,
(Name of Signer)

(1) He/She is _____ of _____, the
(Title of Signer) (Company Name)
Bidder that has submitted the attached Bid;

(2) He/She is fully informed respecting the preparation and contents of the attached Bid and of all pertinent circumstances respecting such Bid:

(3) Such Bid is genuine and is not a collusive or sham Bid;

(4) Neither the said Bidder nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant, has in any way colluded, conspired, connived or agreed, directly or indirectly with another Bidder, firm or person to submit a collusive or sham Bid in connection with the Contract for which the attached Bid has been submitted or to refrain from bidding in connection with such Contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Bidder, firm or person to fix the price or prices in the attached Bid or of any other Bidder, or to fix an overhead, profit or cost element of the Bid price or the Bid price of any other Bidder, or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against the **City of Idalou** or any person interested in the proposed Contract; and

(5) The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance, or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

Signed _____

Name _____

Title _____

Subscribed and sworn to me this _____ day of _____, _____.

By: _____
Notary Public
My Commission Expires:

PROPOSER GUARANTEES

State of _____

County of _____

_____, being first duly sworn disposed and says that:

(1) He/She is the (owner, partner, officer, representative or agent) of _____ _____, the proposer that has submitted the attached proposal.

(2) All responsible parties will comply with Chapter 176 Local Government Code and complete the Conflict of Interest Questionnaire (CIQ).

(3) Proposer will comply with Government Code 2252.908 and provide the **City of Idalou, Texas** with the Certificate of Interested Parties, Form 1295, within seven business days from notification of a pending award.

(4) In accordance with Chapter 2271 of the Texas Government Code, the proposer verifies that the company does not boycott Israel and will not boycott Israel during the term of any contract executed in response to this proposal.

(5) In compliance with Chapter 2252 of Texas Government Code, the **City of Idalou, Texas** will not enter in a contract with a company that does business with Iran, Sudan, or any known terrorist organization.

(6) The proposer verifies that in compliance with Senate Bill 13 of the Texas 87th Legislative Session it does not and will not during the contract term boycott energy companies. And further certifies that in accordance with Senate Bill 19 of the 87th Legislative Session it does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association and will not discriminate against such an entity or association during the contract term.

(7) The proposer and any subcontractor(s) shall comply with Title VI of the Civil Rights Act of 1964, which prohibits recipients of federal financial assistance from excluding from a program or activity, denying benefits of, or otherwise discriminating against a person on the basis of race, color, or national origin (42 U.S.C.§ 2000d et seq.), as implemented by the Department of the Treasury's Title VI regulations, 31 CFR Part 22, which are herein incorporated by reference and made a part of this contract (or agreement). Title VI also includes protection to persons with "Limited English Proficiency" in any program or activity receiving federal financial assistance, 42 U.S.C. § 2000d et seq., as implemented by the Department of the Treasury's Title VI regulations, 31 CFR Part 22, which are herein incorporated by reference and made a part of this contract or agreement.

SIGNATURE PRINTED NAME DATE

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

_____ _____ _____

Name of signatory Signature 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.

CERTIFICATE OF INTERESTED PARTIES

FORM 1295

Complete Nos. 1 - 4 and 6 if there are interested parties.
Complete Nos. 1, 2, 3, 5, and 6 if there are no interested parties.

OFFICE USE ONLY

1 Name of business entity filing form, and the city, state and country of the business entity's place of business.

2 Name of governmental entity or state agency that is a party to the contract for which the form is being filed.

3 Provide the identification number used by the governmental entity or state agency to track or identify the contract, and provide a description of the services, goods, or other property to be provided under the contract.

4 Name of Interested Party	City, State, Country (place of business)	Nature of Interest (check applicable)	
		Controlling	Intermediary

5 Check only if there is NO Interested Party. ☐

6 UNSWORN DECLARATION

My name is _____, and my date of birth is _____.

My address is _____, _____, _____, _____, _____.
(street) (city) (state) (zip code) (country)

I declare under penalty of perjury that the foregoing is true and correct.

Executed in _____ County, State of _____ , on the _____ day of _____, 20_____.
(month) (year)

_____
Signature of authorized agent of contracting business entity
(Declarant)

ADD ADDITIONAL PAGES AS NECESSARY

BID PROPOSAL

Date: _____

Proposal of _____ (hereinafter called "BIDDER"), organized and existing under the laws of the State of _____ doing business as a _____* to the City of Idalou, (hereinafter called "OWNER").

*Insert "a corporation", "a partnership", or "an individual" as applicable.

In compliance with your Advertisement for Bids, BIDDER hereby proposes to perform all WORK for the construction of the Multi-Purpose Court Improvements project in strict accordance with the CONTRACT DOCUMENTS, within the time set forth therein, and at the prices stated below.

By submission of this BID, each BIDDER certifies, and in the case of a joint BID each party thereto certifies as to its own organization, that this BID has been arrived at independently, without consultation, communication, or Agreement as to any matter relating to this BID with any other BIDDER or with any competitor.

BIDDER hereby agrees to commence WORK under this contract on or before a date to be specified in the NOTICE TO PROCEED and to fully complete the PROJECT within _____ consecutive calendar days thereafter, BIDDER further agrees to pay as liquidated damages, the sum of **$1,000.00** for each consecutive calendar day thereafter as provided in Section 15 of the General Conditions.

BIDDER acknowledges receipt of the following ADDENDUM:

_____

_____

_____

BIDDER agrees to perform all the work described in the CONTRACT DOCUMENTS for the following unit prices or lump sum prices.

Bidder certifies that it does not currently and will not employ undocumented workers. The Bidder further agrees, that if convicted of federal immigration violations under 8 U.S. Code Section 1324a(f), it shall repay the amount paid up to that date under this contract, including any interest paid by Owner to funding agency, if applicable. Such payment shall be made no later than the 120th day after receiving notice of violation from the Owner.

CITY OF IDALOU
MULTI-PURPOSE COURT IMPROVEMENTS
BASE BID SCHEDULE A

Show prices in numerals. Round off unit prices to two decimal places only.

These Bid Prices must include all labor, materials, equipment, insurance, overhead, superintendence, transportation, taxes, permits, profits & incidentals to cover the finished Work called for in the Contract Documents.

For all Labor, Materials, Equipment and Incidentals to Furnish and Install the Following:

Bid Item	Description	Est. Qty.	Unit	Unit Price	Extended Amount
1	Mobilization, Bonds, and Insurance	1	LS	$	$
2	Erosion Control	1	LS	$	$
3	Remove Existing Fencing	315	LF	$	$
4	Remove Existing Concrete Slab	7,223	SF	$	$
5	Remove Existing Concrete Sidewalk	597	SF	$	$
6	Remove Existing Curb and Gutter	75	LF	$	$
7	Remove Existing Asphalt	200	SF	$	$
8	Standard Concrete Slab on Grade (Multi Purpose Court)	5,920	SF	$	$
9	Portable Pickleball Net	1	EA	$	$
10	Basketball Goals	2	EA	$	$
11	Court Surfacing and Markings	4,700	SF	$	$
12	10' Perimeter Fencing w/ Pedestrian Gate	315	LF	$	$
13	Asphalt Repair	200	SF	$	$
14	Concrete Sidewalk	270	SF	$	$
15	Curb and Gutter	75	LF	$	$
16	ADA Ramp	90	SF	$	$
17	Parking Stall Striping, ADA Striping, ADA Signage and Wheel Stop	1	LS	$	$
TOTAL BASE BID A (Items 1 - 17)					**$**

PROPOSED NUMBER OF DAYS FOR COMPLETION*	**DAYS**

***Contractor must enter proposed number of days on Bid Proposal pages BP-1 & BP-4.**

CITY OF IDALOU
MULTI-PURPOSE COURT IMPROVEMENTS
ADDITIVE (A) or DEDUCTIBLE (D) ALTERNATE BID SCHEDULE

Show prices in numerals. Round off unit prices to two decimal places only.

These Bid Prices must include all labor, materials, equipment, insurance, overhead, superintendence, transportation, taxes, permits, profits & incidentals to cover the finished Work called for in the Contract Documents.

For all Labor, Materials, Equipment and Incidentals to Furnish and Install the Following:

Bid Item	Description	Est. Qty.	Unit	Unit Price	Extended Amount
D1	Remove Existing Concrete Slab	7,223	SF	$	$
D2	Remove Existing Fencing	315	LF	$	$
D3	Remove Existing Concrete Sidewalk	597	SF	$	$
D4	4' Concrete Buffer	1,220	SF	$	$
	TOTAL DEDUCTIBLE ALTERNATE BID (Items D1-D4)				**$**

ADDITIVE ALTERNATE BID

A1	Court Lighting with Panel	4	EA	$	$
A2	9' Tall Wind Screens for New Fence	315	LF	$	$
	TOTAL ADDITIVE ALTERNATE BID (Items A1-A2)				**$**

Note: Owner reserves the right to accept any combination of base bid and additive/deductible alternate bid items.

BID SCHEDULE CONTRACTOR COMPLIANCE TO TEXAS SALES TAX CODE

The contractor shall make available to the City of Idalou all tax advantages available to the City of Idalou pursuant to Chapter 151, Subchapter E of the Texas Tax Code.

I, _____, the undersigned, as authorized representative of _____, do hereby agree to complete the installation of material within _____ consecutive calendar days, which time allows for the normal delays associated with inclement weather, etc. as specified in the Specifications.

Respectfully Submitted,

By: _____
(Contractor Signature)

Name: _____

Title: _____

Physical Address: _____

_____

Email Address: _____

Telephone: _____

Employer Federal ID No. _____

ATTEST:

_____

_____

(Seal) if bid by Corporation

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we the undersigned, _____ as Principal, and _____ as Surety, are hereby and firmly bound unto the City of Idalou, as Owner in the penal sum of 5% for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors and assigns.

SIGNED, this _____ day of _____, 20___.

The condition of the above obligation is such that whereas the Principal has submitted to the City of Idalou, a certain bid, attached hereto, and hereby made a part hereof to enter into a contract in writing for the Multi-Purpose Court Improvements project.

NOW THEREFORE,

(a) If said bid shall be rejected, or in the alternate,

(b) If said bid shall be accepted and the Principal shall execute and deliver a contract in the form of contract attached hereto (properly completed in accordance with said bid,) and shall furnish a bond for this faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the Agreement created by the acceptance of said bid, then this obligation shall be void, otherwise the same shall remain in force and effect, it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that obligations of said Surety and its bond shall be in no way impaired or affected by any extension of time within which the Owner may accept such bid; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be affixed and these presents to be signed by their proper officers, the day and year first set forth above.

_____	_____
Principal	Surety
By: _____	By:_____

IMPORTANT: Surety companies executing bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the project is located.

NOTICE OF AWARD

To: _____ Project Description: Multi-Purpose Court Improvements

_____

_____

The Owner has considered the Bid submitted by you for the above-described work in response to the Advertisement for Bids dated August 8th and 15th, 2025, and the Information for Bidders.

You are hereby notified that your Bid has been accepted for items in the amount of $_____.

You are required by the Information for Bidders to execute the Agreement and furnish the required Contractor's Performance Bond, Payment Bond, and Certificate of Insurance within twenty-one (21) days from the date of this Notice to you.

If you fail to execute said Agreement and to furnish said bonds within twenty-one (21) days from the date of this Notice, the Owner will be entitled to consider all your rights arising out of the Owner's acceptance of your Bid as a forfeiture of your Bid Bond. The Owner will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this Notice of Award to the Owner.

Dated this ____ day of _____, 20___.

City of Idalou
(Owner)

By: _____
Name: Russ Perkins
Title: Mayor

ACCEPTANCE OF NOTICE

Receipt of the above Notice of Award
is hereby acknowledged by:

_____
(Contractor)

This _____ day of _____, 20___.

By: _____
Name: _____
Title: _____

AGREEMENT

THIS AGREEMENT, made this _____ day of _____, 20____, by and between City of Idalou, herein called "Owner", acting through its Mayor, and _____ _____ (a corporation) (a partnership) (an individual), County of _____, State of _____, hereinafter called "Contractor."

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

MULTI-PURPOSE COURT IMPROVEMENTS

hereinafter called the Project, for the sum of _____ Dollars ($_____) and all extra work in connection therewith, under the terms as stated in the General and Special Conditions of the Contract; and at his (it's or their) own proper cost and expense to furnish all materials, supplies, machinery, equipment, tools, superintendence, labor, insurance and other accessories and services necessary to complete the said project in accordance with the conditions and prices stated in the Proposal, the General Conditions, Supplemental General Conditions and Special Conditions of the Contract, the Plans, which include all maps, plats, blue prints and other drawings and printed or written explanatory matter thereof, the specifications and contract documents therefore as prepared by JACOB & MARTIN, LLC, herein entitled the Engineer, all of which are made a part hereof and collectively evidence and constitute the contract.

The Contractor hereby agrees to commence work under this contract on or before a date to be specified in a written "Notice to Proceed" of the Owner and to fully complete the project within ____ consecutive calendar days thereafter. The Contractor further agrees to pay as liquidated damages the sum of **$1,000.00** for each consecutive calendar day thereafter as hereinafter provided in Paragraph 15 of the General Conditions.

The Owner agrees to pay the Contractor in current funds for the performance of the contract, subject to additions and deductions, as provided in the General Conditions of the Contract, and to make payments on account thereof as provided in Paragraph 19 of the General Conditions.

IN WITNESS WHEREOF, the parties to these presents have executed this Agreement in three (3) counterparts, each of which shall be deemed an original, in the year and day first above mentioned.

City of Idalou
(Owner)

(SEAL)

ATTEST:

By: _____
Name: _____
Title: _____

By: _____
Name: Russ Perkins
Title: Mayor

_____
(Contractor)

(SEAL)

ATTEST:

By: _____
Name: _____
Title: _____

By: _____
Name: _____
Title: _____

Physical Address:

_____
_____

NOTE: The Secretary of the Owner should attest. If Contractor is a corporation, the corporate secretary should attest.

PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS: that

_____

(Name of Contractor)

_____

(Address of Contractor)

a _____ hereinafter called **PRINCIPAL** and
(Corporation, Partnership or Individual)

_____

(Name of Surety)

_____

(Mailing Address of Surety)

_____

(Physical Address of Surety)

_____

(Telephone Number, including area code, of Surety)

hereinafter called **SURETY**, as held, and firmly bound unto

City of Idalou

(Name of Owner)

301 Main St., Idalou, TX 79329

(Address of Owner)

hereinafter called **OWNER** in the total aggregate penal sum of: _____ Dollars ($_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the **PRINCIPAL** entered into a certain Contract with the **OWNER**, dated the _____ day of _____, 20____, a copy of which is hereto attached and made a part hereof for the construction of:

MULTI-PURPOSE COURT IMPROVEMENTS

_____

NOW, THEREFORE, if the **PRINCIPAL,** shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of said Contract during the original term thereof, and any extensions thereof which may be granted by the **OWNER** with or without notice to the **SURETY** and if the **PRINCIPAL** shall satisfy all claims and demands incurred under such Contract, and shall fully indemnify and save harmless the **OWNER,** from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the **OWNER** all outlay and expense which the **OWNER** may incur in making good any default, then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said **SURETY,** for value received hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Contract or to **WORK** to be performed thereunder or the **SPECIFICATIONS** 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 this contract or to the **WORK** or to the **SPECIFICATIONS**.

PROVIDED, FURTHER, that it is expressly agreed that the **BOND** shall be deemed amended automatically and immediately, without formal and separate amendments hereto, upon amendment to the Contract not increasing the contract price more than 25 percent, so as to bind the **PRINCIPAL** and the **SURETY** to the full and faithful performance of the **CONTRACT** as so amended. The term "Amendment", wherever used in this **BOND,** and whether referring to this **BOND**, the Contract or the Loan Documents shall include any alteration, addition, extension, or modification of any character whatsoever.

PROVIDED, FURTHER, that no final settlement between the **OWNER** and the **PRINCIPAL** shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied. The **OWNER** is the only beneficiary hereunder.

IN WITNESS WHEREOF, this instrument is executed in three (3) counterparts, each one of which shall be deemed an original, this _____ day of _____, 20____.

PRINCIPAL (Contractor):

Name: _____
Address: _____
_____

By: _____
ATTEST: Name: _____
Title: _____

_____ (SEAL)
Name: _____
Title: _____

SURETY:

Name: _____
Address: _____
_____

By: _____
ATTEST: Name: _____
Title: _____

_____ (SEAL)
Name: _____
Title: _____

OWNER APPROVAL:
The OWNER approves the form of this Performance Bond.

Date: _____

Name: City of Idalou
Address: 301 Main St.
Idalou, TX 79329

ATTEST: By: _____
Name: Russ Perkins
_____ Title: Mayor

(SEAL)

NOTES:

1. The date of the Bond must not be prior to the date of the Contract.

2. The amount of the Bond must not be less than the amount of the Contract.

3. If the contractor is a partnership, all partners should execute the Bond.

4. If the contractor is a corporation, the Bond must be executed by an authorized official of the corporation. Authorization should be evidenced by a corporate resolution.

5. The surety must:

    a) be a corporation which is authorized to conduct business in the State of Texas;

    b) be a corporation which is licensed by the State of Texas to execute bonds as a surety; and

    c) must appear on the Treasury Department's most current list (Circular 570 as amended). See the FMI.

6. The Bond must be executed by an authorized representative of the surety. Ordinarily, Bonds are signed by an attorney-in-fact or agent of the surety. The person signing the Bond for the surety should provide a copy of the power of attorney or other evidence of their authority to act on behalf of the surety.

7. (For Public Bodies Only) the Contractor may not be required to obtain a surety bond from any specific insurance or surety company.

PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS: that

_____
(Name of Contractor)

_____
(Address of Contractor)

a _____ hereinafter called **PRINCIPAL** and
(Corporation, Partnership or Individual)

_____
(Name of Surety)

_____
(Mailing Address of Surety)

_____
(Physical Address of Surety)

_____
(Telephone Number, including area code, of Surety)

hereinafter called **SURETY**, as held, and firmly bound unto

City of Idalou
(Name of Owner)

301 Main St., Idalou, TX 79329
(Address of Owner)

hereinafter called **OWNER** and unto all persons, firms, and corporations who or which may furnish labor, or who furnish materials to perform as described under the contract and to their successors and assigns in the total aggregate penal sum of: _____
Dollars ($_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the **PRINCIPAL** entered into a certain contract with the **OWNER**, dated the _____ day of _____, 20_____, a copy of which is hereto attached and made a part hereof for the construction of:

MULTI-PURPOSE COURT IMPROVEMENTS

_____

NOW, THEREFORE, if the **PRINCIPAL,** shall promptly make payment to all persons, firms, and corporations furnishing materials for or performing labor in the prosecution of the **WORK** provided for in such contract, and any authorized extensions or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such **WORK**, and for all labor cost incurred in such **WORK** including that by a **SUBCONTRACTOR,** and to any laborer, mechanic or materialman lienholder whether it acquires its lien by operation of State or Federal law; then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED, that beneficiaries or claimants hereunder shall be limited to the **SUBCONTRACTORS,** and persons, firms and corporations having a direct contract with the **PRINCIPAL** or its **SUBCONTRACTORS.**

PROVIDED, FURTHER, that the said **SURETY** for value received hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the contract or to the **WORK** to be performed thereunder of the **SPECIFICATIONS** 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 this contract or to the **WORK** or to the **SPECIFICATIONS**.

PROVIDED, **FURTHER**, that no suit or action shall be commenced hereunder by any claimant:

a) Unless claimant shall have given the notice or notices required by applicable state law, in the manner required by applicable state law and within the time limits prescribed by applicable state law; or

b) After the expiration of the minimum period of limitation permitted by applicable state law.

PROVIDED, FURTHER, that it is expressly agreed that this **BOND** shall be deemed amended automatically and immediately, without formal and separate amendments hereto, upon amendment to the Contract not increasing the contract price more than 25 percent, so as to bind the **PRINCIPAL** and the **SURETY** to the full and faithful performance of the Contract as so amended. The term "Amendment", wherever used in this **BOND** and whether referring to this **BOND,** the contract or the loan Documents shall include any alteration, addition, extension, or modification of any character whatsoever.

PROVIDED, FURTHER, that no final settlement between the **OWNER** and the **CONTRACTOR** shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in three (3) counterparts, each one of which shall be deemed an original, this ____ day of _____, 20___.

PRINCIPAL (Contractor):

Name: _____
Address: _____
_____

By: _____
ATTEST: Name: _____
Title: _____

_____ (SEAL)
Name: _____
Title: _____

SURETY:

Name: _____
Address: _____
_____

By: _____
ATTEST: Name: _____
Title: _____

_____ (SEAL)
Name: _____
Title: _____

OWNER APPROVAL:
The OWNER approves the form of this Payment Bond.

Date: _____

Name: City of Idalou
Address: 301 Main St.
Idalou, TX 79329

ATTEST: By: _____
Name: Russ Perkins
_____ Title: Mayor

(SEAL)

NOTICE TO PROCEED

To: _____ Project Description: Multi-Purpose Court Improvements

_____

_____

_____

You are hereby notified to commence work in accordance with the Agreement dated _____, _____, on or before _____, _____ and to complete the work within _____ consecutive calendar days thereafter.

The date of completion of all work is therefore, _____, _____.

City of Idalou
(Owner)

By: _____
Name: Russ Perkins
Title: Mayor

ACCEPTANCE OF NOTICE:

Receipt of the above Notice to Proceed
is hereby acknowledged by:

_____
(Contractor)

This ____ day of _____, 20____.

By: _____
Name: _____
Title: _____

GENERAL CONDITIONS

1. DEFINITIONS

1.1 Wherever used in the Contract Documents, the following terms shall have the meanings indicated which shall be applicable to both the singular and plural thereof:

1.2 ***ADDENDA***- Written or graphic instruments issued prior to the execution of the Agreement which modify or interpret the Contract Documents, Drawings and Specifications, by additions, deletions, clarifications, or corrections.

1.3 ***BID***- The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

1.4 ***BIDDER***- Any person, firm or corporation submitting a Bid for the Work.

1.5 ***BONDS***- Bid, Performance, and Payment Bonds and other instruments of security, furnished by the Contractor and his surety in accordance with the Contract Documents.

1.6 ***CHANGE ORDER***- A written order to the Contractor authorizing an addition, deletion or revision in the Work within the general scope of the Contract Documents, or authorizing an adjustment in the Contract Price or Contract Time.

1.7 ***CONTRACT DOCUMENTS***- The contract, including Advertisement for Bids, Information for Bidders, Bid, Bid Bond, Agreement, Payment Bond, Performance Bond, Notice of Award, Notice to Proceed, Change Order, Drawings, Specifications and Addenda.

1.8 ***CONTRACT PRICE***- The total monies payable to the Contractor under the terms and conditions of the Contract Documents.

1.9 ***CONTRACT TIME***- The number of calendar days stated in the Contract Documents for the completion of the Work.

1.10 ***CONTRACTOR***- The individual firm or corporation with whom the Owner has entered into the Agreement.

1.11 ***DEVELOPER***: The individual or entity with whom the Contractor has entered into the Agreement and for whom the Work is to be performed.

1.12 ***DRAWINGS***- That part of the Contract Documents prepared or approved by the Engineer which graphically shows the scope, extent, and character of the Work to be performed by the Contractor.

1.13 ***ENGINEER***- The person, firm or corporation named as such in the Contract Documents.

1.14 ***FIELD ORDER***- A written order issued by the Engineer to the Contractor during construction which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Time.

1.15 ***FINAL COMPLETION***- The time at which the Work in entirety is complete to the satisfaction of the Engineer and Owner, in accordance with the Contract Documents so that the Work can be utilized for the purposes for which it was intended. The terms finally complete(d), wholly complete(d), and entirely complete(d) as applied to all of the Work refer to final completion thereof.

1.16 ***NOTICE OF AWARD***- The written notice of the acceptance of the Bid from the Developer to the successful Bidder.

1.17 ***NOTICE TO PROCEED***- A written notice given by the Owner to the Contractor authorizing him to proceed with the Work and establishing the date of commencement of the Work.

1.18 ***OWNER***- The City of Gordon, whom the the bonds will performance and payment bonds will be issued and who will own the facilities once accepted.

1.19 ***PROJECT***- The total construction of Work to be performed under the Contract Documents.

1.20 ***RESIDENT PROJECT REPRESENTATIVE***- The authorized representative of the Engineer who is assigned to the Project Site or any part thereof.

1.21 ***SHOP DRAWINGS***- All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for the Contractor which illustrate how specific portions of the Work shall be fabricated or installed.

1.22 ***SPECIFICATIONS***- That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.

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

1.24 ***SUBSTANTIAL COMPLETION***- The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of the Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms substantially complete and substantially completed as applied to all or part of the Work refer to Substantial Completion thereof.

1.25 ***SUCCESSFUL BIDDER***- The Bidder submitting a responsive Bid to whom the Developer makes an award.

1.26 ***SUPPLIER***- A manufacturer, fabricator, supplier, distributor, material man, or vendor having a direct contract with the Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by the Contractor or Subcontractor, including that fabricated to a special design, but who does not perform labor at the site.

1.27 ***UNDERGROUND FACILITIES***- All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic, or other control systems.

1.28 ***UNIT PRICE WORK***- Work to be paid for on the basis of unit prices.

1.29 ***WORK***- The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

1.30 ***WRITTEN NOTICE***- Any notice to any party of the Agreement relative to any part of this Agreement in writing and considered delivered and the service thereof completed, when posted by certified or registered mail to the said party at his last given address, or delivered in person to said party or his authorized representative on the Work.

2. ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS

2.1 The Contractor may be furnished additional instructions and detail drawings, by the Engineer, as necessary to carry out the Work required by the Contract Documents.

2.2 The additional drawings and instruction thus supplied will become a part of the Contract Documents. The Contractor shall carry out the Work in accordance with the additional detail drawings and instructions.

3. SCHEDULES, REPORTS, AND RECORDS

3.1 The Contractor shall submit to the Owner such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records, and other data where applicable as are required by the Contract Documents for the Work to be performed.

3.2 Prior to the first partial payment estimate the Contractor shall submit construction progress schedules showing the order in which he proposes to carry on the Work, including dates at which he will start the various parts of the Work, estimated date of completion of each part and, as applicable:

3.2.1 The dates at which special detail drawings will be required; and

3.2.2 Respective dates for submission of Shop Drawings, the beginning of manufacture, the testing and the installation of materials, supplies and equipment

3.3 The Contractor shall also submit a schedule of payments that he anticipates he will earn during the course of the Work.

4. DRAWINGS AND SPECIFICATIONS

4.1 The intent of the Drawings and Specifications is that the Contractor shall furnish all labor, materials, tools, equipment, and transportation necessary for the proper execution of the Work in accordance with

the Contract Documents and all incidental Work necessary to complete the project in an acceptable manner, ready for use, occupancy, or operation by the Owner.

4.2 In case of conflict between the Drawings and Specifications, the Specifications shall govern. Figure dimensions on Drawings shall govern over scale dimensions, and detailed Drawings shall govern over general Drawings.

4.3 Any discrepancies found between the Drawings and Specifications and site conditions or any inconsistencies or ambiguities in the Drawings or Specifications shall be immediately reported to the Engineer, in writing, who shall promptly correct such inconsistencies or ambiguities in writing. Work done by the Contractor after his discovery of such discrepancies, inconsistencies or ambiguities shall be done at the Contractor's risk.

5. SHOP DRAWINGS

5.1 The Contractor shall provide Shop Drawings as may be necessary for the prosecution of the Work as required by the Contract Documents. The Engineer shall promptly review all Shop Drawings. The Engineer's approval of any Shop Drawings shall not release the Contractor from responsibility for deviations from the Contract Documents. The approval of any Shop Drawings which substantially deviates from the requirement of the Contract Documents shall be evidenced by a Change Order.

5.2 When submitted for the Engineer's review, Shop Drawings shall bear the Contractor's certification that he has reviewed, checked, and approved the Shop Drawings and that they are in conformance with the requirements of the Contract Documents.

5.3 Portions of the Work requiring a Shop Drawing or sample submission shall not begin until the Shop Drawing or submission has been approved by the Engineer. A copy of each approved Shop Drawing and each approved sample shall be kept in good order by the Contractor at the site and shall be available to the Engineer.

6. MATERIALS, SERVICES, AND FACILITIES

6.1 It is understood that, except as otherwise specifically stated in the Contract Documents, the Contractor shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, supervision, temporary construction of any nature, and all other services and facilities of any nature whatsoever necessary to execute, complete, and deliver the Work within the specified time.

6.2 Materials and equipment shall be so stored as to insure the preservation of their quality and fitness for the Work. Stored materials and equipment to be incorporated in the Work shall be located so as to facilitate prompt inspection.

6.3 Manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned as directed by the manufacturer.

6.4 Materials, supplies and equipment shall be in accordance with samples submitted by the Contractor and approved by the Engineer.

6.5 Materials, supplies or equipment to be incorporated into the Work shall not be purchased by the Contractor or the Subcontractor, subject to a chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller.

7. INSPECTION AND TESTING

7.1 All materials and equipment used in the construction of the Project shall be subject to adequate inspection and testing in accordance with generally accepted standards, as required and defined in the Contract Documents.

7.2 The Owner shall provide its own inspection services.

7.3 The Contractor shall provide at his expense the testing services required by the Contract Documents.

7.4 The Developer shall provide all testing services not required by the Contractor in the Contract Documents.

7.5 All retesting due to failure to meet minimum requirements shall be paid for by the Contractor.

7.6 The Engineer and his representatives will at all times have access to the Work. The Contractor will provide proper facilities for such access and observation of the Work and also for any inspection or testing thereof.

7.7 If any Work is covered contrary to the written instructions of the Engineer it must, if requested by the Engineer, be uncovered for his observation and replaced at the Contractor's expense.

7.8 If the Engineer considers it necessary or advisable that covered Work be inspected or tested by others, the Contractor, at the Engineer's request, will uncover, expose, or otherwise make available for observation, inspection or testing as the Engineer may require, that portion of the Work in question, furnishing all necessary labor, materials, tools, and equipment. If it is found that such Work is defective, the Contractor will bear all the expenses of such uncovering, exposure, observation, inspection, and

testing and of satisfactory reconstruction. If, however, such Work is not found to be defective, the Contractor will be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction and an appropriate Change Order shall be issued.

8. SUBSTITUTIONS

8.1 Whenever a material, article or piece of equipment is identified on the Drawings or Specifications by reference to brand name or catalogue number, it shall be understood that this is referenced for the purpose of defining the performance or other salient requirements and that other products of equal capacities, quality and function shall be considered. The Contractor may recommend the substitution of a material, article, or piece of equipment of equal substance and function for those referred to in the Contract Documents by reference to brand name or catalogue number, and if, in the opinion of the Engineer, such material, article, or piece of equipment is of equal substance and function to that specified, the Engineer may approve its substitution and use by the Contractor. Any cost differential shall be deductible from the Contract Price and the Contract Documents shall be appropriately modified by Change Order. The Contractor warrants that if substitutes are approved, no major changes in the function or general design of the Project will result. Incidental changes or extra component parts required to accommodate the substitute will be made by the Contractor without a change in the Contract Price or Contract Time.

9. PATENTS

9.1 The Contractor shall pay all applicable royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and save the Owner harmless from loss on account thereof, except that the Owner shall be responsible for any such loss when a particular process, design, or the product of a particular manufacturer or manufacturers is specified, however if the Contractor has reason to believe that the design, process or product specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the Engineer.

10. SURVEYS, PERMITS, REGULATIONS

10.1 The Developer shall furnish all boundary surveys and establish all base lines for locating the principal component parts of the Work together with a suitable number of benchmarks adjacent to the Work as shown in the Contract Documents. From the information provided by the Developer, unless otherwise specified in the Contract Documents, the Contractor shall develop and make all detail surveys needed for construction such as slope stakes, batter boards, stakes for pile locations and other working points, lines, elevations and cut sheets.

10.2 The Contractor shall carefully preserve benchmarks, reference points and stakes and, in case of willful or careless destruction, he shall be charged with the resulting expense and shall be responsible for any mistakes that may be caused by their unnecessary loss or disturbance.

10.3 Permits and licenses of a temporary nature necessary for the prosecution of the Work shall be secured and paid for by the Contractor. Permits, licenses and easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by the Developer, unless otherwise specified. The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the Work as drawn and specified. If the Contractor observes that the Contract Documents are at variance therewith, he shall promptly notify the Engineer in writing, and any necessary changes shall be adjusted as provided in Section 13, Changes in the Work.

11. PROTECTION OF WORK, PROPERTY, AND PERSONS

11.1 The Contractor will be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. He will take all necessary precautions for the safety of, and will provide the necessary protection to prevent damage, injury or loss to all employees on the Work and other persons who may be affected thereby, all the Work and all materials or equipment to be incorporated therein, whether in storage on or off the site, and other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation or replacement in the course of construction.

11.2 The Contractor will comply with all applicable laws, ordinances, rules, regulations, and orders of any public body having jurisdiction. He will erect and maintain, as required by the conditions and progress of the Work, all necessary safeguards for safety and protection. He will notify Engineers of adjacent utilities when prosecution of the Work may affect them. The Contractor will remedy all damage, injury or loss to any property caused, directly or indirectly, in whole or in part, by the Contractor, any Subcontractor or anyone directly or indirectly employed by any of them or anyone for whose acts any of them be liable, except damage or loss attributable to the fault of the Contract Documents or to the acts or omissions of the Developer or the Engineer or anyone employed by either of them or anyone for whose acts either of them may be liable,

and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of the Contractor.

11.3 In emergencies affecting the safety of persons or the Work or property at the site or adjacent thereto, the Contractor, without special instruction or authorization from the Engineer or Developer, shall act to prevent threatened damage, injury, or loss. He will give the Engineer prompt Written Notice of any significant changes in the Work or deviations from the Contract Documents caused thereby, and a Change Order shall thereupon be issued covering the changes and deviations involved.

12. SUPERVISION BY CONTRACTOR

12.1 The Contractor will supervise and direct the Work. He will be solely responsible for the means, methods, techniques, sequences, and procedures of construction. The Contractor will employ and maintain on the Work a qualified supervisor or superintendent who shall have been designated in writing by the Contractor as the Contractor's representative at the site. The supervisor shall have full authority to act on behalf of the Contractor and all communications given to the supervisor shall be as binding as if given to the Contractor. The supervisor shall be present on the site at all times as required to perform adequate supervision and coordination of the Work.

12.2 Labor; Working Hours

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

1. Regular working hours will be 8:00 AM to 5:00 PM. Owner, Developer,, Engineer and Contractor may agree to alternative regular working hours at the time of the pre-construction meeting but at no time will work be allowed prior to sunrise or after sunset.

2. Legal holidays are:
   a. January 1st, New Year's Day
   b. Last Monday in May, Memorial Day
   c. July 4th, Independence Day
   d. First Monday in September, Labor Day
   e. Fourth Thursday and Friday of November, Thanksgiving
   f. December 25th, Christmas

13. CHANGES IN THE WORK

13.1 The Owner may at any time, as the need arises, order changes within the scope of the Work without invalidating the Agreement. If such changes increase or decrease the amount due under the Contract Documents, or in the time required for performance of the Work, an equitable adjustment shall be authorized by Change Order.

13.2 The Engineer, also, may at any time, by issuing a Field Order, make changes in the details of the Work. The Contractor shall proceed with the performance of any changes in the Work so ordered by the Engineer unless the Contractor believes that such Field Order entitles him to a change in Contract Price or Time, or both, in which event he shall give the Engineer Written Notice thereof within seven (7) days after the receipt of the ordered change. Thereafter, the Contractor shall document the basis for the change in Contract Price or Time within thirty (30) days. The Contractor shall not execute such changes pending the receipt of an executed Change Order or further instruction from the Owner.

14. CHANGES IN CONTRACT PRICE

14.1 The Contract Price may be changed only by a Change Order. The value of any Work covered by a Change Order or of any claim for increase or decrease in the Contract Price shall be determined by one or more of the following methods in the order of precedence listed below:

(a) Unit prices previously approved.
(b) An agreed lump sum.
(c) The actual cost for labor, direct overhead, materials, supplies, equipment, and other services necessary to complete the Work. In addition, there shall be added an amount to be agreed upon but not to exceed fifteen (15)

percent of the actual cost of the Work to cover the cost of general overhead and profit.

15. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

15.1 The date of beginning and the time for completion of the Work are essential conditions of the Contract Documents and the Work embraced shall be commenced on a date specified in the Notice to Proceed.

15.2 The Contractor will proceed with the Work at such rate of progress to insure full completion within the Contract Time. It is expressly understood and agreed, by and between the Contractor and the Developer, that the Contract Time for completion of the Work described herein is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the Work.

15.3 If the Contractor shall fail to complete the Work within the Contract Time, or extension of time granted by the Developer, then the Contractor will pay to the Developer the amount for liquidated damages as specified in the Bid for each calendar day that the Contractor shall be in default after the time stipulated in the Contract Documents.

15.4 The Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the Work is due to the following, and the Contractor has promptly given Written Notice of such delay to the Developer or Engineer.

(a) To any preference, priority or allocation order duly issued by the Developer.

(b) To unforeseeable causes beyond the control and without the fault or negligence of the Contractor, including but not restricted to, acts of God, or of the public enemy, acts of the Developer, acts of another Contractor in the performance of a contract with the Developer, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and abnormal and unforeseeable weather; and

(c) To any delays of Subcontractors occasioned by any of the causes specified in paragraphs (a) and (b) of this article.

16. CORRECTION OF WORK

16.1 The Contractor shall promptly remove from the premises all Work rejected by the Engineer for failure to comply with the Contract Documents, whether incorporated in the construction or not, and the Contractor shall promptly replace and re-execute the Work in accordance with the Contract Documents and without expense to the Developer and shall bear the expense of making good all Work of other Contractors destroyed or damaged by such removal or replacement.

16.2 All removal and replacement Work shall be done at the Contractor's expense. If the Contractor does not take action to remove such rejected Work within ten (10) days after receipt of Written Notice, the Developer may remove such Work and store the materials at the expense of the Contractor.

17. SUBSURFACE CONDITIONS

17.1 The Contractor shall promptly, and before such conditions are disturbed, except in the event of an emergency, notify the Developer by Written Notice of:

(a) Subsurface or latent physical conditions at the site differing materially from those indicated in the Contract Documents; or

(b) Unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in Work of the character provided for in the Contract Documents.

17.2 The Developer shall promptly investigate the conditions, and if he finds that such conditions do so materially differ and cause an increase or decrease in the cost of, or in the time required for, performance of the Work, an equitable adjustment shall be made and the Contract Documents shall be modified by a Change Order. Any claim of the Contractor for adjustment hereunder shall not be allowed unless he has given the required Written Notice; provided that the Developer may, if he determines the facts so justify, consider, and adjust any such claims asserted before the date of final payment.

18. SUSPENSION OF WORK, TERMINATION, AND DELAY

18.1 The Developer may suspend the Work or any portion thereof for a period of not more than ninety days or such further time as agreed upon by the Contractor, by Written Notice to the Contractor and the Engineer which notice shall fix the date on which Work shall be resumed. The Contractor will resume that Work on the date so fixed. The Contractor will be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension.

18.2 If the Contractor is adjudged a bankrupt or insolvent, or if he makes a general assignment for the benefit of his creditors, or if a trustee or receiver is appointed for the Contractor or for any of his property, or if he files a petition to take advantage of any debtor's act, or to reorganize under the

bankruptcy or applicable laws, or if he repeatedly fails to supply sufficient skilled workmen or suitable materials or equipment, or if he repeatedly fails to make prompt payments to Subcontractors or for labor, materials or equipment or if he disregards laws, ordinances, rules, regulations or orders of any public body having jurisdiction of the Work or if he disregards the authority of the Engineer, or if he otherwise violates any provision of the Contract Documents, then the Developer may, without prejudice to any other right or remedy and after giving the Contractor and his surety a minimum of ten (10) days from delivery of a Written Notice, terminate the services of the Contractor and take possession of the Project and of all materials , equipment, tools, construction equipment and machinery thereon owned by the Contractor and finish the Work by whatever method he may deem expedient. In such case the Contractor shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds the direct and indirect costs of completing the Project, including compensation for additional professional services, such excess shall be paid to the Contractor. If such costs exceed such unpaid balance, the Contractor will pay the difference to the Developer. Such costs incurred by the Developer will be determined by the Engineer and incorporated in a Change Order.

18.3 Where the Contractor's services have been so terminated by the Developer, said termination shall not affect any right of the Developer against the Contractor then existing or which may thereafter accrue. Any retention or payment of monies by the Developer due the Contractor will not release the Contractor from compliance with the Contract Documents.

18.4 If, through no act or fault of the Contractor, the Work is suspended for a period of more than ninety (90) days by the Developer or under an order of court or other public authority, or the Engineer fails to act on any request for payment within thirty (30) days after it is submitted, or the Developer fails to pay the Contractor substantially the sum approved by the Engineer or awarded by arbitrators within thirty (30) days of its approval and presentation, then the Contractor may, after ten (10) days from delivery of a Written Notice to the Developer and the Engineer, terminate the Contract and recover from the Developer payment for all Work executed and all expenses sustained. In addition, and in lieu of terminating the Contract, if the Engineer has failed to act on a request for payment or if the Developer has failed to make any payment as aforesaid, the Contractor may upon ten (10) days Written Notice to the Developer and the Engineer stop the Work until he has been paid all amounts then due, in which event and upon resumption of the Work, Change Orders shall be issued for adjusting the Contract Price or extending the Contract Time, or both, to compensate for the costs and delays attributable to the stoppage of the Work.

18.5 If the performance of all or any portion of the Work is suspended, delayed, or interrupted as a result of a failure of the Developer or Engineer to act within the time specified in the Contract Documents, or if no time is specified, within a reasonable time, an adjustment in the Contract Price or an extension of the Contract Time, or both, shall be made by Change Order to compensate the Contractor for the costs and delays necessarily caused by the failure of the Developer or Engineer.

19. PAYMENTS TO CONTRACTOR

19.1 At least ten (10) days before each progress payment falls due (but not more often than once a month), the Contractor will submit to the Engineer a partial payment estimate filled out and signed by the Contractor covering the Work performed during the period covered by the partial payment estimate and supported by such data as the Engineer may reasonably require. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at or near the site, the partial payment estimate shall also be accompanied by such supporting data, satisfactory to the Owner, as will establish the Developer's title to the material and equipment and protect his interest therein, including applicable insurance. The Engineer will, within ten (10) days after receipt of each partial payment estimate, either indicate in writing his approval of payment and present the partial payment estimate to the Developer, or return the partial payment estimate to the Contractor, indicating in writing his reasons for refusing to approve payment. In the latter case, the Contractor may make the necessary corrections and resubmit the partial payment estimate. The Developer will, within ten (10) days of presentation to him of an approved partial payment estimate, pay the Contractor a progress payment on the basis of the approved partial payment estimate. The Developer shall retain ten (10) percent of the amount of each payment until final completion and acceptance of all Work covered by the Contract Documents. The Developer at any time however, after fifty (50) percent of the Work has been completed, if he finds that satisfactory progress is being made, shall reduce retainage to five (5) percent on the current and remaining estimates. When the Work is substantially complete (operational or beneficial occupancy), the retained amount may be further reduced below five (5) percent to only that amount necessary to assure completion. On completion and acceptance of a part of the Work on which the price is stated separately in the Contract Documents, payment may be made in full, including retained percentages, less authorized deductions.

19.2 The request for payment may also include an allowance for the cost of such major materials and equipment which are suitably stored either at or near the site.

19.3 Prior to Substantial Completion, the Owner, with the approval of the Engineer and with the concurrence of the Contractor, may use any completed or substantially completed portions of the Work. Such use shall not constitute an acceptance of such portions of the Work.

19.4 The Owner shall have the right to enter the premises for the purpose of doing work not covered by the Contract Documents. This provision shall not be construed as relieving the Contractor of the sole responsibility for the care and protection of the Work, or the restoration of any damaged Work except such as may be caused by agents or employees of the Owner.

19.5 Upon completion and acceptance of the Work, the Engineer shall issue a certificate attached to the final payment request that the Work has been accepted by him under the conditions of the Contract Documents. The entire balance found to be due the Contractor, including the retained percentages, but except such sums as may be lawfully retained by the Developer, shall be paid to the Contractor within thirty (30) days of completion and acceptance of the Work.

19.6 The Contractor will indemnify and save the Developer and the Owner or the their agents harmless from all claims growing out of the lawful demands of Subcontractors, laborers, workmen, mechanics, material men, and furnishers of machinery and parts thereof equipment, tools, and all supplies, incurred in the furtherance of the performance of the Work. The Contractor shall, at the Developer's request, furnish satisfactory evidence that all obligations of the nature designed above have been paid, discharged, or waived. If the Contractor fails to do so the Developer may, after having notified the Contractor, either pay unpaid bills or withhold from the Contractor's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to the Contractor shall be resumed, in accordance with the terms of the Contract Documents, but in no event shall the provisions of this sentence be construed to impose any obligations upon the Developer to either the Contractor, his Surety, or any third party. In paying any unpaid bills of the Contractor, any payment so made by the Developer shall be considered as a payment made under the Contract Documents by the Developer to the Contractor and the Developer shall not be liable to the Contractor for any such payments made in good faith.

19.7 If the Developer fails to make payment thirty (30) days after approval by the Engineer, in addition to other remedies available to the Contractor, there shall be added to each such payment interest at the maximum legal rate commencing on the first day after said payment is due and continuing until the payment is received by the Contractor.

20. ACCEPTANCE OF FINAL PAYMENT AS RELEASED

20.1 The acceptance by the Contractor of final payment shall be and shall operate as a release to the Developer of all claims and all liability to the Contractor other than claims in stated amounts as may be specifically excepted by the Contractor for all things done for furnished in connection with this Work and for every act and neglect of the Developer and others relating to or arising out of this Work. Any payment, however, final or otherwise, shall not release the Contractor or his sureties from any obligations under the Contract Documents or the Performance Bond and Payment Bond.

21. INSURANCE

21.1 The Contractor shall purchase and maintain such insurance as will protect him from claims set forth below which may arise out of or result from the Contractor's execution of the Work, whether such execution be by himself or by any Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

(a) Claims under workmen's compensation, disability benefit and other similar employee benefit acts;

(b) Claims for damages because of bodily injury, occupational sickness or disease, or death of his employees;

(c) Claims for damages because of bodily injury, sickness or disease, or death of any person other than his employees;

(d) Claims for damages insured by usual personal injury liability coverage which are sustained (1) by any person as a result of any offense directly or indirectly related to the employment of such person by the Contractor, or (2) by any other person, and;

(e) Claims for damages because of injury to or destruction of tangible property, including loss of use resulting therefrom.

21.2 Certificates of Insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work. These Certificates shall contain a

provision that coverages afforded under the policies will not be cancelled unless at least thirty (30) days prior Written Notice has been given to the Owner.

21.3 The Contractor shall procure and maintain, at his own expense, during the Contract Time, liability insurance as hereinafter specified:

(a) Contractor's General Public Liability and Property Damage Insurance including vehicle coverage issued to the Contractor and protecting him from all claims for personal injury, including death, and all claims for destruction of or damage to property, arising out of or in connection with any operations under the Contract Documents, whether such operations be by himself or by any Subcontractor under him or anyone directly or indirectly employed by the Contractor or by a Subcontractor under him. Insurance shall be written with a limit of liability of not less than $500,000 for all damages arising out of bodily injury, including death, at any time resulting therefrom, sustained by any one person in any one accident; and a limit of liability of not less than $500,000 aggregate for any such damages sustained by two or more persons in any one accident. Insurance shall be written with a limit of liability of not less than $200,000 for all property damage sustained by any one person in any one accident; and a limit of liability of not less than $200,000 aggregate for any such damage sustained by two or more persons in any one accident.

(b) The Contractor shall acquire and maintain, if applicable, Fire and Extended Coverage insurance upon the Project to the full insurable value thereof for the benefit of the Developer, Owner,, the Contractor, and Subcontractors as their interest may appear. This provision shall in no way release the Contractor or Contractor's surety from obligations under the Contract Documents to fully complete the Project.

21.4 The Contractor shall procure and maintain, at his own expense, during the Contract Time, in accordance with the provisions of the laws of the state in which the Work is performed, Workmen's Compensation Insurance, including occupational disease provisions for all of his employees at the site of the Project and in case any Work is sublet, the Contractor shall require such Subcontractor similarly to provide Workmen's Compensation Insurance, including occupational disease provisions for all of the latter's employees unless such employees are covered by the protection afforded by the Contractor. In case any class of employees engaged in hazardous Work under this contract at the site of the Project is not protected under Workmen's Compensation statue, the Contractor shall provide, and shall cause each Subcontractor to provide, adequate and suitable insurance for the protection of his employees not otherwise protected.

21.5 The Contractor shall secure, if applicable, "All Risk" type Builder's Risk Insurance for Work to be performed. Unless specifically authorized by the Owner, the amount of such insurance shall not be less than the Contract Price totaled in the Bid. The policy shall cover not less than the losses due to fire, explosion, hail, lightning, vandalism, malicious mischief, wind, collapse, riot, aircraft, and smoke during the Contract Time, and until the Work is accepted by the Owner. The policy shall name as the insured the Contractor, the Engineer, the Developer and the Owner.

22. CONTRACT SECURITY

22.1 The Contractor shall within ten (10) days after the receipt of the Notice of Award furnish the Owner with a Performance Bond and a Payment Bond in penal sums equal to the amount of the Contract Price, conditioned upon the performance by the Contractor of all undertakings, covenants, terms, conditions and agreements of the Contract Documents, and upon the prompt payment by the Contractor to all persons supplying labor and materials in the prosecution of the Work provided by the Contract Documents. Such Bonds shall be executed by the Contractor and a corporate bonding company licensed to transact such business in the state in which the Work is to be performed. The expense of these Bonds shall be borne by the Contractor. If at any time a surety on any such Bond is declared a bankrupt or loses its right to do business in the state in which the Work is to be performed, Contractor shall within ten (10) days after notice from the Owner to do so, substitute an acceptable Bond (or Bonds) in such form and sum and signed by such other surety or sureties as may be satisfactory to the Owner. The premiums on such Bond shall be paid by the Contractor. No further payments shall be deemed due nor shall be made until the new surety or sureties shall have furnished an acceptable BOND to the OWNER.

23. ASSIGNMENTS

23.1 Neither the Contractor nor the Developer shall sell, transfer, assign or otherwise dispose of the Contract or any portion thereof, or of his right, title or interest therein, or his obligations thereunder, without written consent of the other party.

24. INDEMNIFICATION

24.1 The Contractor will indemnify and hold harmless the Developer, the Owner, and the Engineer and their agents and employees from and against all

claims, damages, losses, and expenses including attorney's fees arising out of or resulting from the performance of the Work, provided that any such claims, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury or destruction of tangible property including the loss of use resulting therefrom; and is caused in whole or in part by any negligent or willful act or omission of the Contractor, and Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.

24.2 In any and all claims against the Developer, the Owner, or the Engineer, or any of their agents or employees, by any employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under workmen's compensation acts, disability benefit acts or other employees benefits acts.

24.3 The obligation of the Contractor under this paragraph shall not extend to the liability of the Engineer, his agents or employees arising out of the preparation or approval of maps, drawings, opinions, reports, surveys, Change Orders, designs, or Specifications.

25. SEPARATE CONTRACTS

25.1 The Developer and the Owner reserves the right to let other contracts in connection with this Project. The Contractor shall afford other Contractors reasonable opportunity for the introduction and storage of their materials and the execution of their Work, and shall properly connect and coordinate his Work with theirs. If the proper execution or results of any part of the Contractor's Work depends upon the Work of any other Contractor, the Contractor shall inspect and promptly report to the Engineer any defects in such Work that render it unsuitable for such proper execution and results.

25.2 The Owner may perform additional Work related to the Project by himself, or he may let other contracts containing provisions similar to these. The Contractor will afford the other Contractor's who are parties to such Contracts (or the Developer or the Owner, if he is performing the additional Work himself), reasonable opportunity for the introduction and storage of materials and equipment and the execution of Work, and shall properly connect and coordinate his Work with theirs.

25.3 If the performance of additional Work by other Contractors or the Developer or the Owner is not noted in the Contract Documents prior to the execution of the Contract, Written Notice thereof shall be given to the Contractor prior to starting any such additional Work. If the Contractor believes that the performance of such additional Work by the Developer or the Owner or others involves him in additional expense or entitles him to an extension of the Contract Time, he may make a claim thereof as provided in Sections 14 and 15.

26. SUBCONTRACTING

26.1 The Contractor may utilize the services of specialty Subcontractors on those parts of the Work which, under normal contracting practices, are performed by specialty Subcontractors.

26.2 The Contractor shall not award Work to Subcontractor (s), in excess of fifty (50) percent of the Contract Price, without prior written approval of the Developer and the Owner.

26.3 The Contractor shall be fully responsible to the Developer for the acts and omissions of his Subcontractors, and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him.

26.4 The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the Work to bind Subcontractors to the Contractor by the terms of the Contract Documents insofar as applicable to the Work of Subcontractors and to give the Contractor the same power as regards terminating any subcontract that the Developer or the Owner may exercise over the Contractor under any provision of the Contract Documents.

26.5 Nothing contained in this Contract shall create any contractual relation between any Subcontractor and the Developer or the Owner.

26.6 The Developer or the Owner may require copies of executed subcontracts.

27. ENGINEER'S AUTHORITY

27.1 The Engineer shall act as the Developer and the Owner's representative during the construction period. He shall decide questions which may arise as to quality and acceptability of materials furnished and Work performed. He shall interpret the intent of the Contract Documents in a fair and unbiased manner. The Engineer will make visits to the site and determine if the Work is proceeding in accordance with the Contract Documents.

27.2 The Contractor will be held strictly to the intent of the Contract Documents in regard to the quality of materials, workmanship, and execution of the Work. Inspections may be made at the factory or fabrication plant of the source of material supply.

27.3 The Engineer will not be responsible for the construction means, controls, techniques, sequences, procedures, or construction safety.

27.4 The Engineer shall promptly make decisions relative to interpretation of the Contract Documents.

28. LAND AND RIGHTS-OF-WAY

28.1 Prior to issuance of Notice to Proceed, the Owner shall obtain all land and rights-of-way necessary for carrying out and for the completion of the Work to be performed pursuant to the Contract Documents, unless otherwise mutually agreed.

28.2 The Owner shall provide to the Contractor information which delineates and describes the lands owned and rights-of-way acquired.

28.3 The Contractor shall provide at his own expense and without liability to the Owner any additional land and access thereto that the Contractor may desire for temporary construction facilities, or for storage of materials.

29. GUARANTY

29.1 The Contractor shall guarantee all materials and equipment furnished and Work performed for a period of one (1) year from the date of Final Completion. The Contractor warrants and guarantees for a period of one (1) year from the date of Final Completion of the system that the complete system is free from all defects due to faulty materials or workmanship and the Contractor shall promptly make such corrections as may be necessary by reason of such defects including the repairs of any damage to other parts of the system resulting from such defects. The Owner will give notice of observed defects with reasonable promptness. In the event that the Contractor should fail to make such repairs, adjustments, or other Work that may be made necessary by such defects, the Owner may do so and charge the Contractor the cost thereby incurred. The Performance Bond shall remain in full force and effect through the guarantee period.

30. ARBITRATION

30.1 All claims, disputes, and other matters in question arising out of, or relating to, the Contract Documents or the breach thereof, except for claims which have been waived by the making and acceptance of final payment as provided by Section 20, shall be decided by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association. This agreement to arbitrate shall be specifically enforceable under the prevailing arbitration law. The award rendered by the arbitrators shall be final, and judgment may be entered upon it in any court having jurisdiction thereof.

30.2 Notice of the demand for arbitration shall be filed in writing with the other party to the Contract Documents and with the American Arbitration Association, and a copy shall be filed with the Engineer. Demand for arbitration shall in no event be made on any claim, dispute or other matter in question which would be barred by the applicable statute of limitations.

30.3 The Contractor will carry on the Work and maintain the progress schedule during any arbitration proceedings, unless otherwise mutually agreed in writing.

31. TAXES

31.1 The Contractor will pay all sales, consumer, use and other similar taxes required by the law of the place where the Work is performed.

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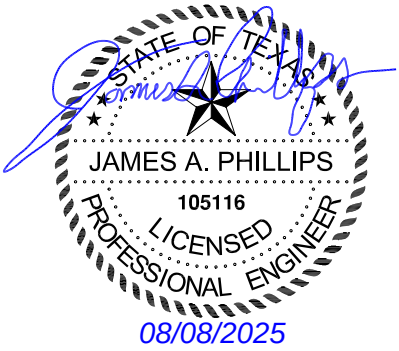

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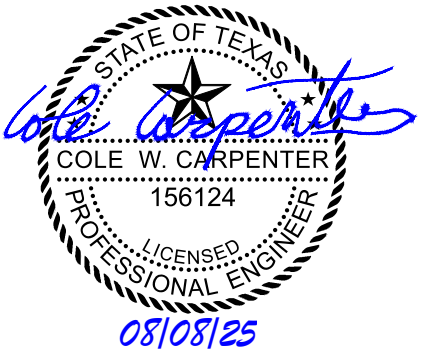

SECTION 01 00 01 - DEFINITIONS AND TERMINOLOGY

PART 1 GENERAL

1.1 ABBREVIATIONS

A. Whenever any of the following abbreviations appear in these Specifications and Contract Documents, their meanings shall be as follows:

1.	OWNER	City of Idalou
2.	ENGINEER	Jacob & Martin, LLC
3.	ASTM	American Society for Testing Materials
4.	AWWA	American Water Works Association
5.	AASHTO	American Association of State Highway and Transportation Officials
6.	A.C.	Asbestos Cement
7.	C.I.	Cast Iron
8.	C.S.	Commercial Standards
9.	D.I.	Ductile Iron
10.	EPA	Environmental Protection Agency
11.	GPM	Gallons Per Minute
12.	NSF	National Sanitation Foundation
13.	TDA	Texas Department of Agriculture
14.	OSHA	Occupational Safety and Health Administration
15.	PVC	Polyvinyl Chloride
16.	TCDP	Texas Community Development Program
17.	TCF	Texas Capital Fund
18.	TXDOT	Texas Department of Transportation
19.	TCEQ	Texas Commission on Environmental Quality
20.	TWDB	Texas Water Development Board
21.	USDA/RD	United States Department of Agriculture - Rural Development

*Latest Revision

1.2 DOCUMENT ORGANIZATION

A. Section GENERAL REQUIREMENTS govern the execution of all sections of the Specifications.

B. Organization of Contract Documents is not intended to control or to lessen the responsibility of the Contractor in dividing work among his subcontractors, or in establishing extent of work to be performed by any trade.

1.3 SPECIFICATION SENTENCE STRUCTURE

A. Specifications are written in modified brief style. Requirements indicated and specified apply to all work of same kind, class, and type even though word "all" is not stated.

B. Simple imperative mood of sentence structure is used in Specification sections which places verb as first word sentence. Where such words as "perform", "provide", "install", "erect", "furnish", "connect", "test", or words similar import are used, it shall be understood that such words include meanings of phrase "The CONTRACTOR shall..." before each word.

C. Standard paragraph titles and other identifications of subject matter in Specifications are intended as aid in locating and recognizing various requirements in the Specifications. Titles do not define, limit, or otherwise restrict Specification text. Capitalizing of words in text does not signify or mean that such words convey special or unique meanings that have precedence over other parts of the Contract Documents. Specification text shall govern over titling and shall be understood to be interpreted as a whole.

1.4 SPECIFICATION TERMINOLOGY

A. Terms such as "directed", "designated", "requested", "authorized", "approved", "selected", or words of similar value shall mean by the Engineer unless otherwise stated. Use of these terms does not extend the ENGINEERS's responsibility for construction supervision or responsibilities defined in the General conditions.

B. "Required" and words of similar value mean as required to complete the work, unless otherwise stated.

C. "Perform" shall mean CONTRACTOR, at his own expense, shall perform operations necessary to complete work.

D. "Provide" shall mean CONTRACTOR, at his own expense, shall furnish and install work complete in place and ready to use.

E. "Other acceptable manufacturer", "Approved equal", or words of similar meaning shall be understood to be followed by expression "in sole opinion of the ENGINEER" even though such words may not appear in print, unless otherwise stated.

F. "Acceptance", "acceptable", or words of similar meaning shall mean acceptable to ENGINEER or OWNER. OWNER shall have jurisdiction and may override decisions of others.

G. "At no extra cost to Owner", "With no extra compensation to CONTRACTOR", "At CONTRACTOR's own expense", or words of similar meaning shall be understood to mean the CONTRACTOR shall perform or provide specified operation of work at no increase to CONTRACTOR Sum in the executed Contract.

H. "Indicated" refers to graphic representations, notes, or schedules on drawings, or other paragraphs or schedules in specifications, and similar requirements in Contract Documents. Where terms such as "shown", "noted", "scheduled" and "specified" are used, it is to help locate the reference; no limitation on location is intended except as specifically noted.

I. "Accepted" where used in conjunction with ENGINEER's action on CONTRACTORS submittals, and requests, is limited to responsibilities and duties of ENGINEER. Such approval does not release CONTRACTOR from responsibility to fulfill Contract Document requirements.

J. "Regulation" includes Federal, State and Local Laws, statutes, ordinances, and lawful orders issued by authorities have jurisdiction, as well as, rules, conventions, and agreements within construction industry that control performance of work, whether they are lawfully imposed by authorities having jurisdiction or not.

K. "Furnish" is used to mean to supply and deliver to project site, ready for unloading, unpacking, assembly, installation, and similar operation.

L. "Install" is used to describe operations at project site including actual unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

M. "Installer" is an entity engaged by CONTRACTOR, either as an employee, subcontractor, or sub-subcontractor for performance of particular construction activity, including installation, erection, application, and similar operations. Installers are required to be experienced in the operations they are engaged to perform.

N. The term "experienced", when used with the term "installer", means having minimum five (5) previous projects similar in size and scope to this project, and familiar with precautions required, and has complied with requirements of authority having jurisdiction.

O. "Project site" is the space available to the CONTRACTOR for performance of work, either exclusively or in conjunction with others performing construction as part of the project.

P. "Testing Laboratory" is an independent entity engaged to perform specific inspections or test, either at the project site or elsewhere, and to report on, or to interpret results of those inspections or tests as required. Unless otherwise indicated, testing laboratories shall be hired by the CONTRACTOR at no additional cost to the OWNER.

Q. Equipment is "Listed" if of a kind mentioned in a list which:
   1. Is published by a nationally recognized laboratory which makes periodic inspection of production of such equipment.
   2. States that such equipment meets nationally recognized standards or has been tested and found safe for use in a specified manner.

R. Equipment is "Labeled" if:
   1. It embodies a valid label, symbol, or other identifying mark of a nationally recognized testing laboratory such as Underwriters Laboratories, Inc.
   2. Production is periodically inspected in accordance with nationally recognized standards or tests to determine safe use in a specified manner.

S. Equipment is "Certified" if:
   1. Equipment has been tested and found by a nationally recognized testing laboratory to meet nationally recognized standards or to be safe for use in a specified manner.
   2. Production is periodically inspected by a nationally recognized testing laboratory.
   3. It bears a label, tag, or other record of certification.

1.5 REFERENCE STANDARDS

A. Applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents regardless of lack of reference within the Contract Documents. Where Contract Documents include more stringent requirements than the reference standards, the Contract Documents shall apply.
   1. Standards referenced directly in the Contract documents take precedence over standards that are not referenced but recognized in the construction industry as applicable.
   2. Except as otherwise limited by the Contract Documents, enforce standards not referenced but recognized in industry as applicable for performance of the work. The ENGINEER shall decide whether code or standard is applicable, or which of several are applicable.

B. Consider a reference standard to be the latest edition with supplements or amendments when standard is referred to in an individual Specification Section but is not listed by the title and date.

C. Maintain copies of reference standards at project site throughout construction period. Make copies of reference standards available as requested by ENGINEER or OWNER.

D. Enforce the most stringent requirements where compliance with two (2) or more standards is specified, and they establish different or conflicting requirements for minimum quantities or quality levels, unless Contract Documents indicate otherwise.
   1. Quantity or quality level shown or indicated shall be minimum to be provided or performed in every instance.
   2. Actual installation may comply exactly with minimum quality indicated,or it may exceed that minimum within reasonable limits.
   3. In complying with these requirements, indicated numeric values are minimum or maximum values, as noted, or appropriate for context of requirements.
   4. Refer instances of uncertainty to the Engineer for decision before proceeding.

E. Trade association names and titles of general standards are frequently abbreviated. Where acronyms or abbreviations are used in specifications or other Contract Documents they mean recognized name of trade association, standards generating organization, authority having jurisdiction, or other entity applicable to context of text provision. Refer to "Encyclopedia of Associations", published by Gale Research Company.

PART 2 NOT USED

PART 3 NOT USED

-- END OF SECTION --

SECTION 01 01 01 - SUMMARY OF WORK

PART 1 GENERAL

1.1 WORK INCLUDED

A. Construct work as described in the Contract Documents.
   1. Provide materials, equipment, and incidentals required to make the project completely operable.
   2. Provide the labor, equipment, tools, and consumable supplies required for a complete project.
   3. Provide the civil, architectural, structural, mechanical, electrical, instrumentation and all other work required for a complete and operable project.
   4. Test and place the completed project in operation.
   5. Provide the special tools, spare parts, lubricants, supplies, or other materials as required for the operation and maintenance of the Project.
   6. Drawings and Specifications may not indicate or describe all of the work required to complete the project. Additional details required for the completion of the project are to be provide by the CONTRACTOR and coordinated with the ENGINEER.

1.2 REFERENCE STANDARDS

1.3 JOB CONDITIONS

A. The General Conditions, the Special Conditions, and Division One Specifications apply to each Specification section.
B. Comply with all applicable federal, state and local codes and regulations pertaining to the nature and character of the work being performed.

1.4 DESCRIPTION OF WORK

A. This project involves the construction of a new multi-purpose court, enclosed by a 10-foot perimeter fence. The scope of work also includes improvements to ensure ADA accessibility, featuring the installation of a new ramp and sidewalk connecting the parking lot to the court.

1.5 TIME OF COMPLETION

A. The time to be allowed under this Contract to complete all work is by CONTRACTOR. Work time established allows for the normal delays associated with bad weather, etc. and shall begin ten (10) days after the issuance of the Notice to Proceed by the OWNER. Requests for extension to time of completion shall be made by the CONTRACTOR to the ENGINEER, in writing, on a monthly basis corresponding with the submission of a partial payment requests. Requests for time extensions received more than 60 days following a requested date will not be considered.

1.6 SCHEDULE AND SEQUENCE OF CONSTRUCTION

A. Within 10 days prior to submission of the first partial payment request, the CONTRACTOR shall submit to the ENGINEER for approval six copies of the schedule under which the CONTRACTOR proposes to complete the project.
B. If, in the opinion of the ENGINEER, construction progress falls behind the schedule, the CONTRACTOR shall take such action as necessary to improve his progress, and the CONTRACTOR shall submit to the ENGINEER a revised schedule demonstrating his proposed plan to make up the lag in scheduled progress and complete the project within the contract time.

1.7 WORK UNDER OTHER CONTRACTS

A. The OWNER will release the construction contracts for the other project while this Contract is in progress (see list below). Cooperate with other Contractors as required with regard to scheduling, storage of materials, coordination, use of land, tie-ins, security, site restoration, and job site harmony. Report any potential conflicts between this work and other Contracts immediately to the OWNER. Other contracts for the Multi-Purpose Court Improvements project may include but are not limited to:
   1. LIST OF OTHER CONTRACTS
   2. LIST OF OTHER CONTRACTS
   3. LIST OF OTHER CONTRACTS

1.8 WORK BY OWNER

A. The OWNER may perform items of work which are not included in this Contract, but may impact construction scheduling. CONTRACTOR to coordinate construction activities through the ENGINEER.

1.9 CONSTRUCTION OF UTILITIES

A. Coordinate with Utility Companies or their contractors to provide all required utilities for this project. Construction of permanent utilities will be paid for by the OWNER.
B. Power and Electrical Services
   1. Pay for temporary construction power, including but not limited to construction cost, meter connection, fees and permits.

1.10 OCCUPANCY

A. As soon as any portion of the Project is ready to use, the OWNER shall have the right to operate the portion upon written notice to the CONTRACTOR.
B. Testing of Controls, including specified test periods, training, and start-up does not constitute acceptance for operation.
C. OWNER may accept the facility for continued use after start-up and testing at the option of the OWNER. If acceptance is delayed at option of the OWNER, shut down facilities per approved Operation and Maintenance procedures.
D. The execution of bonds is understood to indicate the consent of surety.
E. Conduct operations to insure the least inconvenience to the OWNER and general public.

PART 2 PRODUCTS

2.1 MATERIALS

A. Provide materials and products per the individual sections of the Specifications.

PART 3 EXECUTION

3.1 NOT USED

-- END OF SECTION --

SECTION 01 02 01 - SPECIAL TECHNICAL SPECIFICATIONS AND CONDITIONS

PART 1 GENERAL

1.1 PRIORITY OF INTERPRETATION

A. The Contract Documents are complementary, and what is called for by one document shall be binding as if called for by all. In case of conflict between any of the Contract Documents, priority of interpretation shall be in the following order:
   1. General Conditions
   2. Agreement
   3. Performance and Payment Bonds
   4. Special Bonds, if any
   5. Bid
   6. Special Technical Specifications and Conditions
   7. Plans
   8. Technical Specifications

1.2 REFERENCE STANDARDS

1.3 SALES TAX EXEMPTION

A. The OWNER qualifies as an exempt agency pursuant to the provisions of the Texas Limited Sales, Excise and Use Tax Act, and is not subject to any State or City sales tax on materials and labor used in the performance for this project. The CONTRACTOR shall issue a resale exemption certificate when purchasing said materials. Said exemption certificate complying with Section 151.155 (Exemption Certificate) and 151.309 (Government Entities) of Texas Limited Sales, Excise and Use Tax Act, as amended. Any sales taxes applicable to equipment purchases, rentals, leases, or consumable supplies or other taxable services not incorporated into the project shall be the responsibility of the CONTRACTOR.

1.4 MINIMUM WAGE SCALE

A. The minimum wage scale shall be according to local prevailing wage rates, if not already listed in the Contract Section.

1.5 METHODS OF OPERATION

A. The CONTRACTOR shall inform the ENGINEER in advance concerning his plans for carrying on each part of the work, but the CONTRACTOR alone shall be responsible for safety, adequacy, and efficiency of his plant, equipment, and methods.

B. The OWNER and ENGINEER will not be responsible for any act or omission of the CONTRACTOR, or any subcontractor, or any of the agents or employees, or any other persons performing any of the work. The OWNER and ENGINEER will not be responsible for any failure of the CONTRACTOR or his subcontractors or any other persons to perform the work in accordance with the requirements of the contract documents.

C. Review by the OWNER or ENGINEER of any plan or method of work proposed by the CONTRACTOR shall not relieve the CONTRACTOR of any responsibility therefore, and such review shall not be considered as an assumption of any risk or liability by the OWNER or ENGINEER, or any officer, agent, or employee thereof.

1.6 SUBCONTRACTORS

A. Subcontractors who may be used by the CONTRACTOR will not be approved by the ENGINEER prior to award of the contract. After award, if approval is given for a subcontractor to perform certain items of the work, the CONTRACTOR will remain completely and totally responsible for all work under this contract. If directed by the ENGINEER, the CONTRACTOR

will also be responsible for correcting any defects and/or removing any defective work completely from the site and satisfactorily replacing the work.

1.7 EVALUATION OF BIDS

A. The bid schedule lists the various divisions of construction contemplated in the Plans and Specifications, together with an estimate of the units of each. With these units as the basis, the Bidder will extend each item using the cost he sets in the unit price column. Any total cost found to be inconsistent with the net cost when the bids are evaluated will be deemed in error and corrected to agree with the unit cost, which shall be considered correct. The written unit price shall be used in case of conflict with the numerical unit price.

1.8 AWARD OF THE CONTRACT

A. The OWNER reserves the right to hold all bids for 60 days before making an award of the Contract.

1.9 WORKMANSHIP

A. These specifications contain detailed instructions and descriptions covering the major items of construction and workmanship necessary to construct the above mentioned project. The specifications are intended to be so written that only first class workmanship and finish of the best grade and quality will result. The fact that these specifications may fail to be so complete as to cover all details will not relieve the CONTRACTOR of full responsibility for providing a completed project of high quality, first class finish and appearance and satisfactory for operation, all within the apparent intent of the plans and specifications.

1.10 ESTIMATED QUANTITIES

A. The Contract Documents are intended to show clearly all work to be done and materials to be furnished. Where the estimated quantities are shown for the various classes of work to be done and material to be furnished under this contract, they are approximate and are to be used only as a basis for estimating the probable cost of the work and for comparing the proposals offered for the work. It shall be understood that the actual amount of work to be done and material to be furnished under this contract may differ from these estimates, and where the basis for payment under this contract is the unit price method, payment shall be for the actual amount of such work and material furnished.

B. Where payment is based on the unit price method, the CONTRACTOR agrees that he will make no claim for damages, anticipated profits or otherwise on account of any differences which may be found between the quantities of work actually done, the material actually furnished under this contract and the estimated quantities contemplated and contained in the proposal. However, in case the actual quantity of any major item becomes as much as 25% more than or 25% less than the estimated or contemplated quantity for such item, then either party to this Agreement, upon demand, shall be entitled to a revised consideration upon the portion of the work above or below 25% of the estimated quantity. The OWNER will not pay for increased material prices for any quantity increase within the 25% allowable. Therefore, the CONTRACTOR should endeavor to have his material quote cover up to 25% more than the bid quantity.

C. A "Major Item" shall be construed to be any individual bid item included in the proposal that has a total cost equal to or greater than10% of the total contract cost, computed on the basis of the proposal quantities and contract unit prices. Any revised consideration is to be determined by Agreement between the parties, otherwise by terms of the Agreement, as provided under Changes in Contract Price in the General Conditions.

1.11 FINAL QUANTITIES INSTALLED

A. Should there be a discrepancy between the CONTRACTOR'S claim for quantity of materials installed and the quantity measured by the ENGINEER, the discrepancy may be resolved as follows:
   1. The plans shall be thoroughly checked by the ENGINEER and CONTRACTOR to assure that all changes in work have been recorded and no errors exist in the material take-off.
   2. Should the quantity discrepancy not be resolved by means of plan sheet examination, then at the CONTRACTOR'S request, segments of lines may be re-measured: however, if the CONTRACTOR'S figures are not proven to be accurate by re-measurement, then the CONTRACTOR shall pay for cost of re-measurement.
   3. Any deviations in straight-line routing of pipeline not approved by the ENGINEER and/or OWNER shall be paid only for the footage of pipe which would have been required for a straight line installation.

1.12 PROTECTION OF LIVES AND PROPERTY

A. In order to protect the lives and health of his employees, the CONTRACTOR shall comply with all pertinent provisions of the "Manual of Accident Prevention in Construction" issued by the Associated General CONTRACTOR of America, Inc. The CONTRACTOR shall maintain an accurate record of all cases of death, occupational disease and injuries requiring medical attention or causing loss of time from work arising out of and in the course of work under this contract. The CONTRACTOR alone shall be responsible for the safety, efficiency and adequacy of his plant, appliances and methods and for any damage which may result from their failure, improper construction, maintenance or operation.

1.13 SANITARY FACILITIES

A. The CONTRACTOR shall provide adequate toilet facilities for use by workmen in accordance with O.S.H.A. provisions, and shall maintain such facilities throughout the construction period.

1.14 EXISTING UTILITIES

A. It shall be the entire responsibility of the CONTRACTOR to locate all existing underground utilities ahead of the work, whether or not shown on the Plans, and to protect and preserve such utilities from any damage from the proposed construction operations. In the event an underground water, oil, gas, telephone line, or other utility is damaged, the respective OWNER of said utility shall be notified immediately by the CONTRACTOR. It shall be the CONTRACTOR'S entire responsibility to see that said utilities are repaired to the satisfaction of the ENGINEER and utility OWNER. If the CONTRACTOR shows a complete disregard for existing utilities, the CONTRACTOR will pay the OWNER, $1,000 per occurrence in addition to paying all costs for repairing damage to existing utilities. Continued disregard for existing utilities may result in suspension or termination of the Construction Contract. Where overhead poles or anchors are encountered, or are necessary to be disturbed or moved, the CONTRACTOR shall contact the OWNER of the utility and arrange to have the necessary adjustments made, at no additional cost to the OWNER. When signs are disturbed or damaged, the CONTRACTOR shall restore them to the same or better condition that existed prior to construction.

1.15 SATURDAY AND SUNDAY WORK

A. Construction work on Saturdays or Sundays will not be permitted on the project except to maintain barricades, warning signs and flares. In the event the CONTRACTOR is prevented from working on the project for two or more days in any one calendar week, he may work the following Saturday if approval is given by the ENGINEER and OWNER.

1.16 TPDES GENERAL PERMIT

A. The CONTRACTOR shall fully comply with the Texas Pollutant Discharge Elimination System Permit TXR 150000. All construction activities shall fully comply with all aspects of this permit, and the CONTRACTOR shall certify to the OWNER said compliance before the certificate of construction completion is issued. The CONTRACTOR shall apply for and obtain the permit before construction. The CONTRACTOR shall be responsible for the permit fee and all other costs associated with the referenced permit.

B. At least three (3) days before commencement of construction, the CONTRACTOR shall file a Notice of Intent (NOI) with the TCEQ. The notice shall be sent to the TCEQ, Storm Water & Processing Center: MC-228, P.O. Box 13087, Austin, Texas 78711-3087. One copy of the NOI shall be sent to the ENGINEER and one copy shall be posted at the site. The NOI form and permit requirement may be obtained from the TCEQ or on their website www.tceq.state.tx.us The CONTRACTOR shall prepare a Stormwater Pollution Prevention Plan (SWPPP), obtain, and fully comply with the Texas Pollutant Discharge Elimination System Permit TXR 150000. Questions concerning this permit may be addressed to TCEQ at 512-239-3700.

1.17 CONSTRUCTION SURVEYING

A. The construction surveying described in Paragraph 1 below shall be provided by the OWNER. The surveying work contained in Paragraphs 2, 3, and 4 shall be considered subsidiary to the overall project and no separate payment shall be made for this work. Work contained in Paragraphs 2, 3, and 4 shall be accomplished by the CONTRACTOR.

1. The surveyor shall obtain copies of all private property easements, and public right of way permits. From these easements and permits, the surveyor shall set alignment lathes, stakes, and hubs as needed and benchmarks as needed, plus alignment stakes at every horizontal PI. Also, alignment lathes, stakes, and hubs shall be set at every property line or ROW line crossing. The CONTRACTOR shall notify the ENGINEER at least 24 hours before each segment is to be staked. Each segment to be staked shall be a minimum of 1000 feet in length. Staking will be provided one time only. Stakes that are lost or damaged shall be replaced by the CONTRACTOR at his own cost.
2. Locate and protect control points prior to starting the site work and preserve permanent reference points during construction. The CONTRACTOR shall not change or relocate points without prior approval of the ENGINEER. Notify ENGINEER when the reference point is lost, destroyed, or requires relocation. Replace project control points on the basis of the original survey.
3. Provide complete engineering layout of the work needed for construction.
    a. Provide competent personnel. Provide equipment including accurate surveying instruments, stakes, platforms, tools, and materials.
    b. Record data and measurements per standards.
4. Construction lines and grades, as well as base lines and bench marks provided by the CONTRACTOR, shall be subject to such checks and reviews as the ENGINEER may, from time to time, desire to make.

1.18 WATER USED DURING CONSTRUCTION PERIOD

A. The OWNER shall furnish water (at the nearest fire hydrant or flush valve) at no cost to the CONTRACTOR for testing, disinfection and flushing as required by these Specifications.

1.19 UTILITIES DURING CONSTRUCTION

A. The CONTRACTOR will be required to make arrangements for and pay for the electrical power and any other utilities required during construction.

1.20 STATE HISTORIC PRESERVATION

A. If cultural materials are encountered during construction, work must cease in the immediate area. Work can continue in the project area where no cultural materials are present. The Secretary of Interior (202-343-4101) must be contacted in accordance with 36 CFR 8007. Also, the State Historic Preservation Officer (512-463-6100) must be notified.

1.21 UNCLASSIFIED EXCAVATION

A. All excavation on this project will be considered to be unclassified, and no extra payment will be made for the removal of any rock, shale, roots and any other material or substance that may be encountered in the construction work as set out on the Drawings and in the Technical Specifications.

1.22 ROCK EXCAVATION

A. In all areas requiring rock excavation, the Contractor shall install the pipe and complete the "rock free" bedding so that the installation may be inspected prior to backfilling. The Owner's inspector shall be notified by the Contractor when the bedding is complete for each particular segment. Any rock excavation areas backfilled without the Owner's prior inspection will require uncovering and checking at the Contractor's expense.

1.23 LOCATION OF PIPELINES

A. In the event pipeline locations required by the Plans should intersect a septic tank drain field or animal pens where extreme pollution might occur, the CONTRACTOR shall notify the ENGINEER and OWNER, and proposed water pipeline shall be re-routed in order to avoid such areas of possible pollution. In the event additional lengths of pipeline are required, the additional lengths will be paid for at the unit price bid per linear foot as set out in the proposal. No unauthorized straight line deviations will be paid for. The CONTRACTOR shall fully comply with TCEQ chapter 290.44(3) and Chapter 317.13 Appendix E for location of water/sewer lines and separation distances. No extra payment will be made to the CONTRACTOR for compliance with TCEQ requirements.

1.24 LOCATION OF VALVES AND METERS

A. Valves, meters, meter boxes and vaults shall be installed at the locations shown on the Plans.
   1. Whenever possible, valves shall be located adjacent to existing fences or edge of the right-of-way especially in cultivated fields. Unless absolutely necessary, valves shall not be located in borrow ditches or wash-out areas. The CONTRACTOR shall install two 4" diameter steel pipes (7'), buried 3 feet with concrete and painted for all valves located in cultivated fields at no additional cost to the OWNER.
   2. The meters shall be centered in the boxes, vaults to allow for reading and ease of removal or maintenance. No boring or taps shall be made for meter installation unless the OWNER has previously designated the exact location for the meter.

1.25 TEXAS DEPARTMENT OF TRANSPORTATION RIGHT-OF-WAY

A. The OWNER has received, and will make available to the CONTRACTOR, permits authorizing construction work on the State Highway Department right-of-way. The CONTRACTOR shall perform all construction operations and clean up in accordance to the permit issued by the Texas State Department of Highways, and under the supervision of the representative of the Department of Highways, as well as in accordance with the Technical Specification of this contract as directed by the ENGINEER. All highway crossings or paralleling in highway right-of-way shall have right-of-way markers installed at the entrance and exit points and a detectable metal wire or tape shall be installed in the pipeline ditch while in the highway right-of-way.

B. It shall be the responsibility of the CONTRACTOR to notify the proper highway official 48 hours prior to any construction activity on highway right-of-way. The CONTRACTOR shall have a copy of the appropriate permits on site at all times.

1.26 CONSTRUCTION ON COUNTY OR CITY RIGHT-OF-WAY

A. The OWNER has received authorization from the County authorizing pipeline construction in County road right-of-way in the locations indicated on the Plans. It shall be the CONTRACTOR'S entire responsibility to notify the appropriate Precinct Commissioner 48 hours prior to any construction work on County right-of-way, and conduct construction operations in full cooperation with Precinct Commissioner.

B. Where necessary to cross a county road or install pipeline within the County road riding surface, all ditch backfilling shall be as noted or required per County Precinct Commissioner, base material replaced as directed by the Precinct Commissioner, and the road left in a condition equal to that prior to crossing. In areas where pavements exists or where new construction is being proposed, and the County Commissioner requires the crossing to be bored, the CONTRACTOR shall bore and encase the pipeline in the same manner required by the Texas Highway Department for highway crossings and payment will be made at the unit price bid for Bore and Encasement as set out in the Bid Schedule. All paved county roads shall be bored. No paved county road shall be open cut unless written approval is obtained from the appropriate Precinct Commissioner.

C. All County road crossings or paralleling in County right-of-way shall have right-of-way markers installed at the entrance and exit points and a detectable metal tape shall be installed in the pipeline ditch while in the County right-of-way.

D. **No extra payment shall be made for special backfill in county roads and no extra payment shall be made for any gravel or asphalt repair. All paved driveways and approaches shall be slick bored for no extra pay as noted on the Plans.**

1.27 TRENCH SETTLEMENT

A. The CONTRACTOR shall be responsible for all settlement of backfill, fills, and embankments which may occur within one (1) year after final completion of the contract under which the work was performed.

B. The CONTRACTOR shall make, or cause to be made, all repairs or replacements made necessary by settlement, within thirty (30) days after notice from the ENGINEER or OWNER.

1.28 RESTORATION OF SURFACES

A. The CONTRACTOR shall replace all surface material (including topsoil in original thickness), and shall restore gravel drives and roadways, fencing, sod and other surfaces disturbed, to a condition equal to that before the work began, furnishing all labor and material incidental thereto.

1.29 SURPLUS EARTH

A. Surplus excavated materials from all trenching, manholes, and structures shall be disposed of by the CONTRACTOR as approved by the OWNER and ENGINEER.

1.30 CONCRETE BLOCKING

A. All bends, tees, etc., 2" and larger shall be blocked with concrete per the Plans and Specifications with a minimum soil bearing surface of 1.0 square foot per inch diameter of pipe. The use of rocks, masonry blocks, etc. is not acceptable. Only "Sacrete" which has been thoroughly mixed or Class B concrete shall be used for blocking. No blocking shall be covered

up until it has been inspected and approved by the OWNER and/or ENGINEER. If covered prior to inspection, the CONTRACTOR shall uncover the blocking for inspection at his expense.

1.31 FENCES AND SIGNS

A. When necessary for the CONTRACTOR to take down signs, fences or other obstructions, this shall be done at his own expense and replaced in the original condition after construction operations. Fences which are taken loose by the Contactor shall be done in a manner to prevent slacking of the remainder of the wire. The CONTRACTOR, prior to taking down any fence shall have complete approval of the Project Representative as to the width of the fence gap to be made and the manner in which existing posts are to be placed. **No fences shall be cut without authorization in writing from OWNER or ENGINEER.**

1.32 BARRICADES, WARNING SIGNS AND PUBLIC CONVENIENCE

A. The convenience of access of the adjoining property OWNERS on the streets herein scheduled for improvements is of prime importance in the construction operations. In certain locations it may be necessary that property OWNERS use a portion of the roadway being improved to access their property. In such cases, the CONTRACTOR shall schedule his operations to provide such access to the property OWNERS in a safe and convenient manner. The CONTRACTOR shall provide courteous, English speaking and well informed flagmen for directing traffic. Flagmen shall wear a bright red coat and shall use a bright red flag to signal traffic.

B. At each section of street and each cross street intersecting the section of street under construction, the CONTRACTOR shall provide barricades and other warning signs as necessary. Detour signs shall be placed at all intersections where traffic is diverted from the section under construction and at other intersections of the detour to provide complete directions for detouring traffic around the section under construction. CONTRACTOR shall also provide any necessary special signs to signify any hazards or conditions. All barricades, detour and warning signs that remain in place at night shall be fully lighted by approved methods from sunset to sunrise. All signs shall be kept in a good state of repair and be plainly legible at all times. Upon completion of the project, all signs and evidence thereof shall be completely removed from the site of the work by the CONTRACTOR.

1.33 CLEARING AND CLEAN UP

A. All necessary clearing shall be done by the CONTRACTOR. All tree branches, limbs and roots shall be removed and disposed of by the CONTRACTOR in order that the right-of-way may be left in a neat and presentable condition. Any damage resulting to trees, grass and shrubbery must be paid for, by the CONTRACTOR, and damage claims, if any, settled by the CONTRACTOR.

B. Prior to final acceptance of the project, the CONTRACTOR shall clean and smooth up the site of the work and remove all rock, debris, material, etc., leaving the project site with a neat appearance to the satisfaction of the OWNER. Disposed of debris, rubbish, etc. shall be made in an area which shall meet the approval of the OWNER and ENGINEER. The CONTRACTOR shall comply fully with all applicable EPA and TCEQ regulations.

1.34 START UP AND OPERATION

A. Prior to presentation for final acceptance of the work under this contract, the CONTRACTOR shall have started and operated all units at each site for a sufficient duration of time, thirty (30) days to permit the OWNER and ENGINEER to observe overall performance of the respective units and equipment.

B. Such operation shall be properly coordinated with the OWNER'S operating personnel.

1.35 FEDERAL AND/OR STATE AGENCY'S APPROVAL AND INSPECTION

A. The written approval of the appropriate state agency having jurisdiction over the facility must be secured prior to payment of the final percentage retained under this contract.

B. The project site and premises as well as any records required shall be available at all reasonable times for inspection by authorized representatives of the State or Federal Agencies having jurisdiction over the project. The CONTRACTOR shall provide all necessary facilities for these inspections.

1.36 "RECORD DRAWING" INFORMATION

A. The CONTRACTOR shall be responsible for recording and providing all information concerning changes from the original plans as to valve, meter, and/or pipeline location for transfer to the "As-Built" or "Record Drawings" Plans. Final payment will not be released until "Record Drawings" are approved by the ENGINEER.

1.37 AFFIDAVIT OF BILLS PAID

A. Prior to final acceptance of the project by the OWNER, the CONTRACTOR shall execute a Release by Claimants and an affidavit which states all bills for labor, materials and incidentals incurred in the construction of the project have been paid in full and that there are no claims pending of which he has been notified.

1.38 LIQUIDATED DAMAGES

A. It is understood and agreed between the parties hereto that time is of the essence under this Contract, and that for each calendar day of delay beyond the stipulated number of calendar days awarded under this Contract, the CONTRACTOR shall pay the OWNER as liquidated damages the sum of $500.00 (five hundred dollars) per day. It is also understood between the parties hereto that such sum shall be treated as liquidated damages and not as a penalty, and the OWNER may withhold from the CONTRACTOR'S final payment such sum as liquidated damages.

1.39 WARRANTY

A. The CONTRACTOR shall guarantee the work performed under this contract against defective materials and workmanship of a period of one (1) year from the date of final acceptance of the work by the OWNER. The CONTRACTOR shall arrange to have his Performance Bond remain in effect for a period of one (1) year after the date of completion of construction work to cover his guarantee as stipulated under this item and in the General Conditions.

B. If defective materials and/or workmanship are discovered which require repairs made under this guarantee, all such repairs shall be done by the CONTRACTOR at his own expense within ten days after written notice of such defect. Should the CONTRACTOR fail to repair or correct such deficiency within ten days after notification, the OWNER may make the necessary repairs and charge the CONTRACTOR with the applicable costs of all labor and materials required to correct the deficiency.

PART 2 NOT USED

PART 3 NOT USED

-- END OF SECTION --

SECTION 01 03 01 - MEASUREMENT AND PAYMENT

PART 1 PAYMENT ITEMS

1.1 LUMP SUM PAYMENT ITEMS

A. Payment items for the work of this contract for which contract lump sum payments will be made are listed in the BIDDING SCHEDULE and described below. All costs for items of work, which are not specifically mentioned to be included in a particular lump sum or unit price payment item, shall be included in the listed lump sum item most closely associated with the work involved. The lump sum price and payment made for each item listed shall constitute full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for which separate payment is not otherwise provided.

1.2 REFERENCE STANDARDS

1.3 MOBILIZATION

A. PAYMENT
The mobilization, bonds and insurance items shall be measured and paid for according to the lump sum in the proposal. Payment shall constitue full reimbursement for all required site mobilization of personell and equipment as well as all required bonding and insurance for the project as required in the specifications.

B. Unit of measure: LUMP SUM

1.4 EROSION CONTROL

A. PAYMENT
The erosion control shall be measured and paid for according to the lump sum in the proposal. This will include any Storm Water Pollution Prevention Plan that will be required for this site. Payment shall constitute full reimbursement for furnishing and installing all materials, inspections, maintenance, silt fence, hay bales, sand bags, diversion swales, and any other measure and/or incidentals required for compliance with NPDES Permits. Payment shall not be made for partial storm water pollution prevention measures. No additional payments will be allowed where storm water pollution prevention is required because of work remedied due to not meeting the requirements of the plans and specifications.

B. Unit of measure: LUMP SUM

1.5 PARKING STALL STRIPING, ADA STRIPING, ADA SIGNAGE, AND WHEEL STOP

A. PAYMENT
The ADA striping and signage shall be measured and paid for according to the lump sum bid in the proposal. Payment shall constitute full reimbursement for all paint necessary for the ADA stymbol, aisle striping and wheel stop as well as the ADA sign necessary per the plan and specifications.This will also include payment for the additional striped stalls per the plan.

B. Unit of measurement: LUMP SUM

1.6 UNIT PRICE PAYMENT ITEMS

A. Payment items for the work of this contract on which the contract unit price payments will be made are listed in the BIDDING SCHEDULE and described below. The unit price and payment made for each item listed shall constitute full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control,

environmental protection, meeting safety requirements, tests and reports, and for performing all work required for each of the unit price items.

1.7 NEW BASKETBALL GOALS

A. PAYMENT
Payment will be made for costs associated with operations necessary to furnish and install two new basketball goals as specified and shown on the Plans.

B. Unit of measure: EACH

1.8 10' PERIMETER FENCING WITH PEDESTRIAN GATE

A. PAYMENT
Payment will be made for costs associated with operations necessary to furnish and install the 10 foot fencing around proposed concrete court as specified and shown on the Plans.

B. Unit of measure: LINEAR FOOT

1.9 STANDARD CONCRETE SLAB ON GRADE

A. PAYMENT
Payment will be made for costs associated with operations necessary to furnish and install the concrete slab on grade as specified and shown on Plans.

B. UNIT OF MEASURE: SQUARE FOOT

1.10 PORTABLE PICKLEBALL NET

A. PAYMENT
Payment will be made for costs associated with operations necessary to furnish the portable pickleball net as specified and shown on the Plans.

B. Unit of measure: EACH

1.11 COURT SURFACING AND MARKINGS

A. PAYMENT
Payment will be made for all costs associated with the operations required to furnish and complete the court surfacing and markings in accordance with the specifications and Plans.

B. Unit of measure: SQUARE FOOT

1.12 REMOVE EXISTING FENCING

A. PAYMENT
Payment will be made for costs associated with operations necessary to remove the existing fencing as specified and shown on the Plans.

B. Unit of measure: LINEAR FOOT

1.13 REMOVE EXISTING CONCRETE COURT

A. PAYMENT
Payment will be made for costs associated with operations necessary to remove the existing concrete slab as specified and shown on the Plans.

B. Unit of measure: SQUARE FOOT

1.14 REMOVE EXISTING CONCRETE SIDEWALK

A. PAYMENT
Payment will be made for costs associated with operations necessary to remove the existing concrete sidewalk as specified and shown on the Plans.

B. Unit of measure: SQUARE FOOT

1.15 REMOVE EXISTING CURB AND GUTTER

A. Payment will be made for costs associated with operations necessary to remove the existing curb and gutter as specified and shown on the Plans.
B. Unit of measure: LINEAR FOOT

1.16 REMOVE EXISTING ASPHALT PAVEMENT

A. Payment will be made for costs associated with operations necessary to remove the existing asphalt as specified and shown on the Plans.
B. Unit of measure: SQUARE FOOT

1.17 ASPHALT REPAIR

A. PAYMENT
Payment will be made for costs associated with operations necessary to furnish and install asphalt repair as specified and shown on the Plans.
B. Unit of measure: SQUARE FOOT

1.18 CONCRETE SIDEWALK

A. PAYMENT
Payment will be made for costs associated with operations necessary to furnish and install the concrete sidewalk as specified and shown on the Plans.
B. Unit of measure: SQUARE FOOT

1.19 CURB AND GUTTER

A. PAYMENT
Payment will be made for costs associated with operations necessary to furnish and install the curb and gutter as specified and shown on the Plans.
B. Unit of measure: LINEAR FOOT

1.20 ADA RAMP

A. PAYMENT
B. Payment will be made for costs associated with operations necessary to furnish and install the ADA ramp as specified and shown on the Plans.
C. Unit of measure: SQUARE FOOT

PART 2 NOT USED

PART 3 NOT USED

-- END OF SECTION --

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SECTION 01 04 01 - SUBMITTALS

PART 1 GENERAL

1.1 SUMMARY

The CONTRACTOR shall submit descriptive information to:

1. Allow the ENGINEER to advise the OWNER whether the materials and equipment proposed for the project are in general conformance with the design concepts and in conformance with the drawings and specifications.
2. Provide a record for the OWNER of the materials and equipment which have been incorporated into the project.
3. Provide a guide for operations and maintenance of equipment.
4. Provide information required for the administration of the Contract for construction of the project.
5. All submittals, shop drawing and other related documents include under this specification section shall be submitted electronically to the Engineer unless directed otherwise by the Engineer. The only exception being the Operation and Maintenance Manuals, which shall be submitted as directed under that item.

1.2 REFERENCE STANDARDS

PART 2 PROCEDURES

2.1 CONTRACTOR'S RESPONSIBILITIES

A. The CONTRACTOR shall be responsible for the accuracy and completeness of the information contained in each submittal and shall insure that the values, material, equipment, or method of work shall be as described in the submittal. All submittals must be stamped by the CONTRACTOR, indicating that they have been checked by the CONTRACTOR for compliance with the Contract Documents and approved by the CONTRACTOR, or contain certifications as required by the Contract Documents. Submittals that do not have the stamp applied or include the required certifications will be returned without processing to the CONTRACTOR.

B. The CONTRACTOR shall ensure that there is no conflict with other submittals and notify the ENGINEER of each case where the proposed change may affect the work of another CONTRACTOR or OWNER. The CONTRACTOR shall ensure coordination of submittals among the related crafts and Subcontractors. Submittals shall not be accepted from Subcontractors or suppliers.

2.2 MARKING OF SUBMITTALS

A. The CONTRACTOR shall assign a number to each submittal provided to the ENGINEER to allow each submittal to be tracked while processing through the review procedures.

B. Assignment of numbers shall be by means of a letter prefix, a sequence number, and letter suffix to indicate resubmittal's.

C. The sequence number shall be issued in chronological order for each submittal in a division. Resubmittal's shall be followed by a letter of the alphabet to indicate the number of times a submittal has been sent to the ENGINEER for processing, As an example, a submittal with the number SD-03-01 indicates that the submittal is the first in Division 3 submitted. Submittal number SD-11-04-AA indicates the submittal is the fourth shop drawing submitted in Division 11 and is being submitted for the second time. Operation and maintenance manuals submitted shall be identified with the same number as its corresponding equipment submittal. For example, OM-11-04 indicates that this is the operation and maintenance manual for the equipment submitted as SD-11-04.

D. Correct assignment of numbers is essential as different submittal types are processed in different ways. Some submittals received do not require that any response be given for the material. CONTRACTOR and ENGINEER shall both maintain a log of submissions to allow the processing of CONTRACTOR's submittals to be monitored. Logs will be reviewed periodically to determine that all submittals are received and processed.

E. Submittals shall be marked to show clearly the applicable sections of the specification and sheet number of drawings.

F. Submittals shall be accompanied by a Submittal Transmittal Form to be provided by the CONTRACTOR. A separate form shall be used for each specific item, class of material, equipment, and items specified in separate discrete sections, etc. for which a submittal is required. Submittals for various items shall be made with a single form when the items taken together constitute a manufacturer's package or are so functionally related that they should be checked as a unit.

2.3 CONTRACTOR MODIFICATION REQUEST/PROPOSED CONTRACT MODIFICATION

A. Any change in the contract documents that is requested will be initiated by the CONTRACTOR issuing a Contractor's Modification Request or by ENGINEER issuing a Proposed Contract Modification. Proposals will be considered and if found acceptable will be incorporated in a Field Order in accordance with the General Conditions or Change Order in accordance with the General Conditions.

2.4 SHOP DRAWINGS

A. DEFINITION

1. As defined in the General Conditions, shop drawings consist of all drawings, diagrams, illustrations, schedules and other data which are specifically prepared by or for the CONTRACTOR to illustrate some portion of the work and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams, and other information prepared by a supplier and submitted by CONTRACTOR to illustrate material or equipment for some portion of the Work.
2. Shop drawings shall indicate the kind, exact model, size, arrangement, and operation of component materials and devices; materials of construction, external connections, anchorages and supports required; performance characteristics; dimensions, weights, and other information required for installation and correlation with other materials and equipment.

B. SCHEDULE OF SUBMITTAL OF SHOP DRAWINGS

1. The CONTRACTOR shall submit, in accordance with the General Conditions, a schedule indicating the time and sequence in which Shop Drawings are to be submitted. This schedule shall consider the dates for incorporation of the materials or equipment into the project and take into consideration time for delivery and a reasonable time for review of shop drawings. Proposed order and delivery dates shall be incorporated in the Progress Schedule.
2. Shop drawings will generally be reviewed in the order in which they are received. Drawings marked "Priority" will be reviewed ahead of other shop drawing submittals not so marked which have already been received but are not yet being reviewed. CONTRACTOR shall be aware that checking of "Priority" shop drawings may delay the review of other drawings which have already been submitted by the CONTRACTOR and the use of this designation is to be used with discretion.

C. CONTRACTOR'S REVIEW AND CERTIFICATION

The CONTRACTOR shall verify that the material and equipment in each shop drawing conforms to the requirements of the Contract Documents. Shop drawings shall be in strict

compliance with the Contract Documents and shall bear an executed statement to that effect by the CONTRACTOR. Shop Drawings without this stamp applied will be returned without review.

D. DEVIATIONS FROM CONTRACT DOCUMENTS

Requests for deviation from the Contract Documents shall be by Contractor's Modification Request as outlined in Paragraph 2.03 of this section of the specifications. The CONTRACTOR'S Modification Request shall fully identify and describe the deviations and state the reason the change is requested. Any savings in cost related to the substitution is to be stated in the request for consideration.

E. REQUIREMENT FOR COMPLETE SHOP DRAWINGS

1. Material in shop drawings shall be in sufficient detail to demonstrate compliance with all requirements of the Contract Documents. Shop drawings shall address material and/or methods of construction, design criteria, performance characteristics, and special provisions of the Specifications.
2. Shop drawings for systems and related equipment shall include information for all components required for a complete and operational system, including electrical, mechanical, and any other information required to indicate how the various components of the system function, and shall be included in the same submittal.
3. Where statements of certification, written guarantees, extended service agreements or extended warranties as defined in Paragraph J are required, they will be provided with the shop drawing. The effective date of the guarantee and service agreements, however, shall not be until the date of acceptance for the project.
4. Shop drawings shall be clearly marked to show the applicable sections of the specifications and sheet in the drawings. Other identification may also be required on drawings such as layout drawings or schedules to allow the reviewer to determine where a particular item is to be used in the project.
5. One (1) electronic copy of each shop drawing shall be submitted to the ENGINEER and OWNER.
6. Shop drawings which do not have all of the information required for evaluation will be returned without benefit of review and comment.

F. CHECKING AND REVIEW OF SHOP DRAWINGS

1. The ENGINEER will review the data for general conformity to the Contract Documents. Comments will be made on items called to the attention of the ENGINEER for review and verification. Markings will be based on this examination and do not constitute a blanket review of the shop drawing. The ENGINEER's review does not relieve the CONTRACTOR from any responsibility for errors or deviations from the Contract requirements. Shop drawings which contain substantial error or omissions, or which are not clearly legible, will be returned without benefit of review.
2. Shop drawings will be marked in one of the three following ways:
    a. Approved: Shop drawings are acceptable without correction and may be distributed for construction and/or manufacture.
    b. Approved as Noted: Shop drawings are acceptable with minor corrections as marked and may be used with the corrections noted.
    c. Rejected: Material or equipment described is not acceptable.

G. APPROVAL OF EQUAL SUBSTITUTIONS

Where Contract Documents allow substitution of material or equipment as an approved equal to the specified product, shop drawings shall be provided. Shop drawings shall include supporting data to indicate specifically, on a point-by-point basis for each feature of the design, how the proposed product is equal to or better than the specified product. Deviations from the Contract Documents must be requested and approved as described in Paragraph D.

H. SHOP DRAWINGS REQUIRED

Shop drawings are required for only those items of equipment or materials where submittals are listed in the individual specification section and for the determination of substitutions for approval as described in Paragraph G of this section. Only these shop drawings will be reviewed. Shop drawings which are not required may be returned with the notation "NOT REQUIRED BY THIS CONTRACT."

I. OWNER SELECTED OPTIONS

Where selections are to be made by the OWNER for color, texture or finish and shop drawings are required for that product, shop drawings will be submitted for approval of the materials of construction, composition, etc., prior to the selection of finishes by the OWNER. Items requiring selection of finish for which shop drawings are not required shall be furnished as record data. Selection of finish for materials shall be determined as described in Paragraph 2.13.

J. CERTIFICATIONS, WARRANTIES AND OTHER REQUIREMENTS

Where indicated in the Contract Documents the following items as defined below are to be provided as part of the shop drawing:

1. Certified Test Report - A report prepared by an approved testing agency on the results of tests performed on materials to indicate their compliance with the specifications. Reports are to be numbered consecutively for reference. Retest required to verify compliance with Contract Documents shall be identified with the same number as the original test with a letter to indicate retest, similar to the numbering system used for Shop Drawings.
2. Certification of Local Field Service - A certified letter stating that field service is available from a factory or supplier approved service organization located within a 300-mile radius of the project site.
3. Extended Warranty - A guarantee of performance for the product or system beyond the one-year warranty described in the General Conditions. The Warranty Certificate is to be issued in the name of the OWNER.
4. Extended Service Agreement - A contract to provide operations and maintenance for equipment as specified beyond that required to fulfill requirements for warranty repairs; or to perform routine maintenance at some period beyond the warranty period. The Service Agreement is to be issued in the name of the OWNER.
5. Certification of Adequacy of Design - A certified letter from the manufacturer of the equipment stating that they have designed the equipment offered to account for structural stability to withstand all imposed loads without deformation, failure or adversely affecting the operational requirements of the unit; and operational capability, including mechanical and electrical equipment sizing to be fully operational in accordance with the conditions specified.
6. Certification of Applicator/Subcontractor Qualifications - A certified letter stating that the applicator/subcontractor proposed to perform a specified item of work is duly designated as factory-authorized and trained for the application or installation of the specified product.

2.5 RECORD DATA

A. Record data shall be submitted to provide information as to the general character, style and manufacturer of the equipment to allow the OWNER to adequately identify the materials or equipment incorporated into the project. Record data shall be provided for all equipment and materials of construction. Record data are not required for items for which Shop Drawings and/or operations and maintenance manuals are required.

B. Record data shall be complete to indicate where the material was incorporated into the project, provide schedules of materials and their use, colors, model numbers and other information which would allow this material to be replaced at some future date. Record data will be received by the ENGINEER and logged for transmittal to the OWNER. Record data will not be reviewed for comment and no response will be made to the CONTRACTOR.

2.6 OPERATIONS AND MAINTENANCE MANUALS

A. For each type of equipment to be furnished and installed under this contract, the CONTRACTOR shall prepare an operation and maintenance manual covering:
   1. Name, address, and telephone number of nearest competent service organization who can supply parts and service.
   2. Equipment function, normal operating characteristics, and limiting conditions, which reflect "as-built" conditions for the equipment furnished.
   3. Assembly, installation, alignment, adjustment, and checking instructions, including field modifications made during installation, startup and testing.
   4. Operating instructions for startup, routine and normal operation, regulation and control, shutdown, and emergency conditions.
   5. Lubrication and maintenance instructions, with lists of acceptable lubricants.
   6. Guide to "Troubleshooting".
   7. Parts lists, predicted life of parts subject to wear, list of recommended spare parts, and list of maintenance tools furnished with equipment.
   8. Outline, cross-section, and assembly drawings; engineering data; control schematics and point-to-point wiring diagrams, and reproductions of all equipment nameplates.
   9. A copy of the shop drawing submittal information, description of the equipment, specifications, test data, and performance curves, where applicable.
   10. Specified warranties and service agreements.
   11. A listing of the manufacturer's identification, including order number, model, and serial number and reproduction of equipment nameplate.

B. The above information, as applicable, shall be provided for the equipment as indicated in individual specification sections.

C. The operation and maintenance manuals shall be in addition to any instructions or parts lists packed with or attached to the equipment when delivered.

D. Manuals shall be furnished in Adobe PDF Format and printed on heavy, first quality paper, 8-1/2x 11-inch size with standard 3-hole punching. Drawings and diagrams shall be reduced to 8-1/2x 11 inches. Where reduction is not practicable, larger drawings shall be folded separately, and placed in envelopes which are bound into the manual. Each envelope shall bear suitable identification on the outside. Indicate applicable specification number and location within plant that equipment will be installed on cover of each manual. Provide "Table of Contents" and "Index Tabs" for each manual.

E. Two preliminary copies of each manual, temporarily bound in heavy paper covers bearing suitable identification, shall be submitted to the ENGINEER at the time of submittal of the shop drawings. CONTRACTOR shall organize all equipment O&Ms, and submit draft covers of all manuals required, in order of process treatment. All volumes shall be numbered sequentially. After review by the ENGINEER, CONTRACTOR shall prepare three (3) hard copies and two (2) electronic copies (on CD) of each operation and maintenance manual and deliver to the ENGINEER not later than 90 days prior to placing the equipment into operation.

2.7 PROJECT INFORMATION REQUEST

A. When it is necessary for the CONTRACTOR to request additional information, interpretation of the Contract Documents, or when the CONTRACTOR believes there is a conflict between the drawings and specifications, he shall identify the conflict and request clarification using the Project Information Request form. Use of this form will allow requests for information to be routed to OWNER, design engineers, design consultants or others through the ENGINEER and allow these requests to be monitored to determine that clarification is provided when needed. Sufficient information shall be attached to permit a written response without further information.

B. The ENGINEER will log each request and will review the request to determine that the information provided is adequate. If information is not adequate, the request will be returned for additional information. When adequate information is provided, the request will be reviewed and a response made. If a change is required, the ENGINEER will initiate a Proposed Contract Modification. If no change is required, the ENGINEER will provide additional information required to help the CONTRACTOR comply with the Contract Documents.

2.8 SCHEDULE OF VALUES AND PAYMENT ESTIMATES

A. For contracts based on lump sum amounts, the CONTRACTOR is to submit to the ENGINEER for approval, a breakdown of cost for the Project. The breakdown is to provide adequate detail to allow easy determination of the percentage of completion for periodic payment review by the ENGINEER. Specification sections and add or deduct items in the proposal are to be used as a guide for preparing the breakdown. This breakdown is to be incorporated onto a form for the submission of payment request provided by the ENGINEER or in a form approved by the ENGINEER.

B. The CONTRACTOR is to submit a schedule showing the anticipated schedule of payments for the CONTRACTOR to assist the OWNER in determining when funds are to be made available for payment of periodic payment requests.

2.9 PROGRESS SCHEDULES

A. As required in the General Conditions, within 10 days prior to the submission of the first periodical estimate for partial payment, the CONTRACTOR shall prepare and submit to the ENGINEER an electronic copy of the schedule in which the CONTRACTOR proposes to carry on the work. The schedule is to include the date on which work will be started on each major activity, including procurement of materials and equipment, and the anticipated date for the completion of each activity. The CONTRACTOR shall be responsible for developing the construction schedule and monitoring progress. The CONTRACTOR shall consider and include the schedules of all subcontractors, material and equipment suppliers to ensure that all necessary information is incorporated into the construction schedule.

1. Give early warning of delays in time for correction.
2. Require that detailed plans for the execution of the work be prepared in the form of future activities and events in sequential relationships.
3. Establish interrelationships of significant planned work activities and provide a logical sequence of interdependence of planned work activities.
4. Provide continuous current status information.
5. Allow analysis of the CONTRACTOR's program for the completion of the Project.
6. Permit preparation of new schedules when an existing schedule is not achievable.
7. Log the progress of the work as it actually occurs.

2.10 SUPPLIERS AND SUBCONTRACTORS

The Contractor is to provide a written list of subcontractors and suppliers prior to the preconstruction conference described in the General Conditions.

2.11 EQUIPMENT INSTALLATION REPORT

A. A written report shall be submitted by the equipment supplier performing the installation check for all major equipment. This report shall certify that 1) The equipment has been properly installed and lubricated, 2) is in accurate alignment, 3) is free from any undue stress imposed by connecting piping, equipment, or anchor bolts, and 4) has been operated under full load conditions and that it is operating satisfactorily.

2.12 NOTIFICATION BY CONTRACTOR

Written notification of the need for testing, observation work by ENGINEER, intent to work outside of regular working hours, or the request to shut down the facilities or make utility connections shall be given to the ENGINEER by issuance of a Notification By Contract or on a form provided by the ENGINEER.

2.13 SELECTION OF FINISH BY OWNER

Items that require that the OWNER select the finish, color, texture, fabric or make other choices related to the appearance of some material or equipment to be provided are to be determined as soon as possible to allow OWNER adequate time to consider available options for selection. Color chips, samples, etc., for all items are to be assembled and submitted to the OWNER through the ENGINEER for selection of finishes at the same time to allow all options to be considered and allow selections to be coordinated with other items of finish. The ENGINEER will meet with the OWNER who will determine the finish to be used within 2 weeks, unless additional samples are required for selection. Materials for which shop drawings are required are to be submitted for approval of material quality prior to selection of finish. CONTRACTOR's bid shall include costs to match existing colors and furnish non-standard colors at OWNER's selection.

PART 3 NOT USED

-- END OF SECTION --

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SECTION 01 08 01 - GENERAL DEMOLITION

PART 1 GENERAL

1.1 REFERENCE STANDARDS

29 CFR 1910 - Occupational Safety and Health Standards; current edition.

1.2 DEFINITIONS

A. Abandoned: Refers to items that are no longer in use and are to be taken out of service and left in place.
B. Removed: Refers to items that are to be disconnected and removed from project site.
C. Salvaged: Refers to items which are disconnected, taken out of service and turned over to OWNER.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Provide all materials necessary for work.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify field measurements and layouts as shown on drawings, or as existing.
B. Verify that abandoned piping, wiring, equipment, etc. serve only abandoned facilities.
C. Demolition drawings are based on field observations and existing record documents. Report discrepancies to OWNER's Representative before disturbing existing installation. Drawings are for CONTRACTOR's convenience, and accuracy or exactness is not guaranteed.
D. Beginning of demolition means installer accepts existing conditions.

3.2 PREPARATION

A. Coordinate utility service outages with utility company, OWNER's representative, and OWNER's Representative ten (10) days prior to outage.
B. Provide temporary piping, wiring, equipment, etc. as required to maintain existing system in service during construction. When CONTRACTOR elects to perform work on energized equipment or circuits, use personnel experienced in such operations.

3.3 DEMOLITION AND EXTENSION OF EXISTING ITEMS

A. All equipment shown on the Plans to be demolished shall be completely removed along with all associated devices.
B. The CONTRACTOR shall relocate all existing piping, circuitry (conduit and wiring), etc., which impedes the installation of new materials and equipment, unless otherwise specified and/or shown on the Plans.
C. Repair adjacent construction and finishes damaged during demolition and extension work.
D. Maintain access to existing installations which remain active. Modify installation or provide access as appropriate.
E. Remove with care all equipment to be relocated. Repair or replace damaged equipment as required.
F. Provide temporary barricades and other forms of protection as required for safety and security.
G. Provide barriers and appropriate signs meeting requirements of 29 CFR 1910 for size and color where necessary to restrict pedestrians from wandering into construction areas.

H. Completely backfill below-grade areas and voids resulting from demolition work, all backfill must be compacted and stabilized to earthwork specifications. Unless otherwise specified and /or shown on the Plans.
I. Use water as necessary to lay dust when chipping, coring, or sawing concrete, masonry, or similar materials.
J. Demolish and remove existing construction only to extent required, as indicated on the Plans.
K. CONTRACTOR is responsible for disposal of all materials generated as a result of demolition.

-- END OF SECTION --

SECTION 01 57 13 - TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Prevention of erosion due to construction activities.
B. Prevention of sedimentation of waterways, open drainage ways, and storm and sanitary sewers due to construction activities.
C. Restoration of areas eroded due to insufficient preventive measures.
D. Performance bond.
E. Compensation of OWNER for fines levied by authorities having jurisdiction due to non-compliance by Contractor.

1.2 RELATED REQUIREMENTS

A. Section 01 33 29 - Sustainable Design Reporting: Submittal procedures for sustainable design documentation.
B. Section 03 30 00 - Cast-in-Place Concrete: Concrete for temporary and permanent erosion control structures indicated on drawings.
C. Section 31 37 00 - Riprap: Temporary and permanent stabilization using riprap.

1.3 REFERENCE STANDARDS

A. ASTM D4355/D4355M - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc-Type Apparatus; 2021.
B. ASTM D4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity.; 1999a (Reapproved 2014).
C. ASTM D4533/D4533M - Standard Test Method for Trapezoid Tearing Strength of Geotextiles; 2015.
D. ASTM D4632/D4632M - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles; 2015a.
E. ASTM D4751 - Standard Test Methods for Determining Apparent Opening Size of a Geotextile; 2020b.
F. ASTM D4873/D4873M - Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples; 2017.
G. EPA (NPDES) - National Pollutant Discharge Elimination System (NPDES), Construction General Permit; Current Edition.
H. FHWA FLP-94-005 - Best Management Practices for Erosion and Sediment Control; 1995.
I. USDA TR-55 - Urban Hydrology for Small Watersheds; USDA Natural Resources Conservation Service; 2009.

1.4 PERFORMANCE REQUIREMENTS

A. Comply with requirements of EPA (NPDES) for erosion and sedimentation control, as specified by the NPDES, for Phases I and II, and in compliance with requirements of Construction General Permit (CGP), whether the project is required by law to comply or not.
B. Also comply with all more stringent requirements of State of _____ Erosion and Sedimentation Control Manual.
C. Comply with all requirements of _____ for erosion and sedimentation control , even though this project is not required by law to comply.
D. Best Management Practices Standard: FHWA FLP-94-005.
E. Runoff Calculation Standard for Urban Areas: USDA TR-55.

F. Develop and follow an Erosion and Sedimentation Prevention Plan and submit periodic inspection reports.
G. Do not begin clearing, grading, or other work involving disturbance of ground surface cover until applicable permits have been obtained; furnish all documentation required to obtain applicable permits.
    1. OWNER will obtain permits and pay for securities required by authority having jurisdiction.
    2. Obtain and pay for permits and provide security required by authority having jurisdiction.
    3. OWNER will withhold payment to Contractor equivalent to all fines resulting from non-compliance with applicable regulations.
H. Provide to OWNER a Performance Bond covering erosion and sedimentation preventive measures only, in an amount equal to 100 percent of the cost of erosion and sedimentation control work.
I. Timing: Put preventive measures in place as soon as possible after disturbance of surface cover and before precipitation occurs.
J. Storm Water Runoff: Control increased storm water runoff due to disturbance of surface cover due to construction activities for this project.
    1. Prevent runoff into storm and sanitary sewer systems, including open drainage channels, in excess of actual capacity or amount allowed by authorities having jurisdiction, whichever is less.
    2. Anticipate runoff volume due to the most extreme short term and 24-hour rainfall events that might occur in 25 years.
K. Erosion On Site: Minimize wind, water, and vehicular erosion of soil on project site due to construction activities for this project.
    1. Control movement of sediment and soil from temporary stockpiles of soil.
    2. Prevent development of ruts due to equipment and vehicular traffic.
    3. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to OWNER.
L. Erosion Off Site: Prevent erosion of soil and deposition of sediment on other properties caused by water leaving the project site due to construction activities for this project.
    1. Prevent windblown soil from leaving the project site.
    2. Prevent tracking of mud onto public roads outside site.
    3. Prevent mud and sediment from flowing onto sidewalks and pavements.
    4. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to OWNER.
M. Sedimentation of Waterways On Site: Prevent sedimentation of waterways on the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
    1. If sedimentation occurs, install or correct preventive measures immediately at no cost to OWNER; remove deposited sediments; comply with requirements of authorities having jurisdiction.
    2. If sediment basins are used as temporary preventive measures, pump dry and remove deposited sediment after each storm.
N. Sedimentation of Waterways Off Site: Prevent sedimentation of waterways off the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
    1. If sedimentation occurs, install or correct preventive measures immediately at no cost to OWNER; remove deposited sediments; comply with requirements of authorities having jurisdiction.
O. Open Water: Prevent standing water that could become stagnant.

P. Maintenance: Maintain temporary preventive measures until permanent measures have been established.

1.5 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Sustainable Design Documentation: Submit all submittals required in this section in accordance with procedures specified in Section 01 33 29.
C. Erosion and Sedimentation Control Plan:
   1. Submit within 2 weeks after Notice to Proceed.
   2. Submit not less than 30 days prior to anticipated start of clearing, grading, or other work involving disturbance of ground surface cover.
   3. Include:
      a. Site plan identifying soils and vegetation, existing erosion problems, and areas vulnerable to erosion due to topography, soils, vegetation, or drainage.
      b. Measurements of existing turbidity of waterways.
      c. Site plan showing grading; new improvements; temporary roads, traffic accesses, and other temporary construction; and proposed preventive measures.
      d. Where extensive areas of soil will be disturbed, include storm water flow and volume calculations, soil loss predictions, and proposed preventive measures.
      e. Schedule of temporary preventive measures, in relation to ground disturbing activities.
      f. Other information required by law.
      g. Format required by law is acceptable, provided any additional information specified is also included.
   4. Obtain the approval of the Plan by authorities having jurisdiction.
   5. Obtain the approval of the Plan by OWNER.
D. Certificate: Mill certificate for silt fence fabric attesting that fabric and factory seams comply with specified requirements, signed by legally authorized official of manufacturer; indicate actual minimum average roll values; identify fabric by roll identification numbers.
E. Inspection Reports: Submit report of each inspection; identify each preventive measure, indicate condition, and specify maintenance or repair required and accomplished.
F. Maintenance Instructions: Provide instructions covering inspection and maintenance for temporary measures that must remain after Substantial Completion.

PART 2 PRODUCTS

2.1 MATERIALS

A. Mulch: Use one of the following:
   1. Straw or hay.
   2. Wood waste, chips, or bark.
   3. Erosion control matting or netting.
   4. Cutback asphalt.
   5. Polyethylene film, where specifically indicated only.
B. Grass Seed For Temporary Cover: Select a species appropriate to climate, planting season, and intended purpose. If same area will later be planted with permanent vegetation, do not use species known to be excessively competitive or prone to volunteer in subsequent seasons.
C. Bales: Air dry, rectangular straw bales.
   1. Cross Section: 14 by 18 inches, minimum.
   2. Bindings: Wire or string, around long dimension.
D. Bale Stakes: One of the following, minimum 3 feet long:
   1. Steel U- or T-section, with minimum mass of 1.33 pound per linear foot.
   2. Wood, 2 by 2 inches in cross section.

E. Silt Fence Fabric: Polypropylene geotextile resistant to common soil chemicals, mildew, and insects; non-biodegradable; in longest lengths possible; fabric including seams with the following minimum average roll lengths:
   1. Average Opening Size: 30 U.S. Std. Sieve, maximum, when tested in accordance with ASTM D4751.
   2. Permittivity: 0.05 sec^-1, minimum, when tested in accordance with ASTM D4491.
   3. Ultraviolet Resistance: Retaining at least 70 percent of tensile strength, when tested in accordance with ASTM D4355/D4355M after 500 hours exposure.
   4. Tensile Strength: 100 pounds-force, minimum, in cross-machine direction; 124 pounds-force, minimum, in machine direction; when tested in accordance with ASTM D4632/D4632M.
   5. Elongation: 15 to 30 percent, when tested in accordance with ASTM D4632/D4632M.
   6. Tear Strength: 55 pounds-force, minimum, when tested in accordance with ASTM D4533/D4533M.
   7. Color: Manufacturer's standard, with embedment and fastener lines preprinted.
   8. Manufacturers:
      a. TenCate; _____: www.tencate.com/#sle.
      b. North American Green; _____: www.nagreen.com/#sle.
      c. Propex Geosynthetics; _____: www.geotextile.com/#sle.
      d. _____.
      e. _____.
      f. _____.
      g. Substitutions: See Section 01 60 00 - Product Requirements.

F. Silt Fence Posts: One of the following, minimum 5 feet long:
   1. Steel U- or T-section, with minimum mass of 1.33 pound per linear foot.
   2. Softwood, 4 by 4 inches in cross section.
   3. Hardwood, 2 by 2 inches in cross section.

G. Gravel: See Section 32 11 23 for aggregate.

H. Riprap: See Section 31 37 00.

I. Concrete: See Section 03 30 00.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine site and identify existing features that contribute to erosion resistance; maintain such existing features to greatest extent possible.

3.2 PREPARATION

A. Schedule work so that soil surfaces are left exposed for the minimum amount of time.

3.3 SCOPE OF PREVENTIVE MEASURES

A. In all cases, if permanent erosion resistant measures have been installed temporary preventive measures are not required.

B. Construction Entrances: Traffic-bearing aggregate surface.
   1. Width: As required; 20 feet, minimum.
   2. Length: 50 feet, minimum.
   3. Provide at each construction entrance from public right-of-way.
   4. Where necessary to prevent tracking of mud onto right-of-way, provide wheel washing area out of direct traffic lane, with drain into sediment trap or basin.

C. Linear Sediment Barriers: Made of silt fences.
   1. Provide linear sediment barriers:
      a. Along downhill perimeter edge of disturbed areas, including soil stockpiles.

b. Along the top of the slope or top bank of drainage channels and swales that traverse disturbed areas.
c. Along the toe of cut slopes and fill slopes.
d. Perpendicular to flow across the bottom of existing and new drainage channels and swales that traverse disturbed areas or carry runoff from disturbed areas; space at maximum of 200 feet apart.
e. Across the entrances to culverts that receive runoff from disturbed areas.

2. Space sediment barriers with the following maximum slope length upslope from barrier:
a. Slope of Less Than 2 Percent: 100 feet..
b. Slope Between 2 and 5 Percent: 75 feet.
c. Slope Between 5 and 10 Percent: 50 feet.
d. Slope Between 10 and 20 Percent: 25 feet.
e. Slope Over 20 Percent: 15 feet.

D. Storm Drain Curb Inlet Sediment Trap: Protect each curb inlet using one of the following measures:
1. Filter fabric wrapped around hollow concrete blocks blocking entire inlet face area; use one piece of fabric wrapped at least 1-1/2 times around concrete blocks and secured to prevent dislodging; orient cores of blocks so runoff passes into inlet.
2. Straw bale row blocking entire inlet face area; anchor into pavement.

E. Storm Drain Drop Inlet Sediment Traps: As detailed on drawings.

F. Temporary Splash Pads: Stone aggregate over filter fabric; size to suit application; provide at downspout outlets and storm water outlets.

G. Soil Stockpiles: Protect using one of the following measures:
1. Cover with polyethylene film, secured by placing soil on outer edges.
2. Cover with mulch at least 4 inches thickness of pine needles, sawdust, bark, wood chips, or shredded leaves, or 6 inches of straw or hay.

H. Mulching: Use only for areas that may be subjected to erosion for less than 6 months.
1. Wood Waste: Use only on slopes 3:1 or flatter; no anchoring required.
2. Asphalt: Use only where no traffic, either vehicular or pedestrian, is anticipated.

I. Temporary Seeding: Use where temporary vegetated cover is required.

3.4 INSTALLATION

A. Traffic-Bearing Aggregate Surface:
1. Excavate minimum of 6 inches.
2. Place geotextile fabric full width and length, with minimum 12 inch overlap at joints.
3. Place and compact at least 6 inches of 1 1/2 to 3 1/2 inch diameter stone.

B. Silt Fences:
1. Store and handle fabric in accordance with ASTM D4873/D4873M.
2. Where slope gradient is less than 3:1 or barriers will be in place less than 6 months, use nominal 16 inch high barriers with minimum 36 inch long posts spaced at 6 feet maximum, with fabric embedded at least 4 inches in ground.
3. Where slope gradient is steeper than 3:1 or barriers will be in place over 6 months, use nominal 28 inch high barriers, minimum 48 inch long posts spaced at 6 feet maximum, with fabric embedded at least 6 inches in ground.
4. Where slope gradient is steeper than 3:1 and vertical height of slope between barriers is more than 20 feet, use nominal 32 inch high barriers with woven wire reinforcement and steel posts spaced at 4 feet maximum, with fabric embedded at least 6 inches in ground.
5. Install with top of fabric at nominal height and embedment as specified.
6. Embed bottom of fabric in a trench on the upslope side of fence, with 2 inches of fabric laid flat on bottom of trench facing upslope; backfill trench and compact.
7. Do not splice fabric width; minimize splices in fabric length; splice at post only, overlapping at least 18 inches, with extra post.

8. Fasten fabric to wood posts using one of the following:
   a. Four nails per post with 3/4 inch diameter flat or button head, 1 inch long, and 14 gage, 0.083 inch shank diameter.
   b. Five staples per post with at least 17 gage, 0.0453 inch wire, 3/4 inch crown width and 1/2 inch long legs.
9. Fasten fabric to steel posts using wire, nylon cord, or integral pockets.
10. Wherever runoff will flow around end of barrier or over the top, provide temporary splash pad or other outlet protection; at such outlets in the run of the barrier, make barrier not more than 12 inches high with post spacing not more than 4 feet.

C. Straw Bale Rows:
1. Install bales in continuous rows with ends butting tightly, with one bale at each end of row turned uphill.
2. Install bales so that bindings are not in contact with the ground.
3. Embed bales at least 4 inches in the ground.
4. Anchor bales with at least two stakes per bale, driven at least 18 inches into the ground; drive first stake in each bale toward the previously placed bale to force bales together.
5. Fill gaps between ends of bales with loose straw wedged tightly.
6. Place soil excavated for trench against bales on the upslope side of the row, compacted.

D. Mulching Over Large Areas:
1. Dry Straw and Hay: Apply 2-1/2 tons per acre; anchor using dull disc harrow or emulsified asphalt applied using same spraying machine at 100 gallons of water per ton of mulch.
2. Wood Waste: Apply 6 to 9 tons per acre.
3. Asphalt: Apply at 1200 gallons per acre.
4. Erosion Control Matting: Comply with manufacturer's instructions.

E. Mulching Over Small and Medium Areas:
1. Dry Straw and Hay: Apply 4 to 6 inches depth.
2. Wood Waste: Apply 2 to 3inches depth.
3. Pine Needles: Apply 2 to 3 inches depth.
4. Asphalt: Apply 1/4 gallon per square yard.
5. Erosion Control Matting: Comply with manufacturer's instructions.

F. Temporary Seeding:
1. When hydraulic seeder is used, seedbed preparation is not required.
2. When surface soil has been sealed by rainfall or consists of smooth undisturbed cut slopes, and conventional or manual seeding is to be used, prepare seedbed by scarifying sufficiently to allow seed to lodge and germinate.
3. If temporary mulching was used on planting area but not removed, apply nitrogen fertilizer at 1 pound per 1000 sq ft.
4. On soils of very low fertility, apply 10-10-10 fertilizer at rate of 12 to 16 pounds per 1000 sq ft.
5. Incorporate fertilizer into soil before seeding.
6. Apply seed uniformly; if using drill or cultipacker seeders place seed 1/2 to 1 inch deep.
7. Irrigate as required to thoroughly wet soil to depth that will ensure germination, without causing runoff or erosion.
8. Repeat irrigation as required until grass is established.

3.5 MAINTENANCE

A. Inspect preventive measures weekly, within 24 hours after the end of any storm that produces 0.5 inches or more rainfall at the project site, and daily during prolonged rainfall.

B. Repair deficiencies immediately.

C. Silt Fences:
1. Promptly replace fabric that deteriorates unless need for fence has passed.
2. Remove silt deposits that exceed one-third of the height of the fence.

3. Repair fences that are undercut by runoff or otherwise damaged, whether by runoff or other causes.

D. Straw Bale Rows:
   1. Promptly replace bales that fall apart or otherwise deteriorate unless need has passed.
   2. Remove silt deposits that exceed one-half of the height of the bales.
   3. Repair bale rows that are undercut by runoff or otherwise damaged, whether by runoff or other causes.

E. Clean out temporary sediment control structures weekly and relocate soil on site.

F. Place sediment in appropriate locations on site; do not remove from site.

3.6 CLEAN UP

A. Remove temporary measures after permanent measures have been installed, unless permitted to remain by Architect.

B. Clean out temporary sediment control structures that are to remain as permanent measures.

C. Where removal of temporary measures would leave exposed soil, shape surface to an acceptable grade and finish to match adjacent ground surfaces.

END OF SECTION

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SECTION 02 01 01 - SITE CLEARING

PART 1 GENERAL

1.1 WORK INCLUDED

All paving and surface debris shall be removed, and the work area shall be cleared of plant life and grass. Trees and shrubs not in conflict with the proposed structure shall not be removed, except as designated by the OWNER.

1.2 REGULATORY REQUIREMENTS

CONTRACTOR shall conform to all applicable codes for the disposal of debris. Clearing work shall be coordinated with the appropriate utility companies.

1.3 REFERENCE STANDARDS

PART 2 PRODUCTS

2.1 NOT USED

PART 3 EXECUTION

3.1 PREPARATION

Verify that existing trees, plant life, and features designated to remain are tagged or identified. Provide written notification of intent to begin clearing operation. Document trees that are to be protected.

3.2 PROTECTION

CONTRACTOR shall protect existing trees, plant growth, fences and other features designated to remain during clearing procedures. All benchmarks and structures shall be protected from damage or displacement.

3.3 CLEARING

All areas required for access to the site and execution of the Work, except as indicated in paragraph 3.2, shall be cleared.

Trees and shrubs shall be removed within the limits of excavation required. Stumps, main root balls and the root system to a depth of twelve (12) inches below finished grade shall be removed. CONTRACTOR shall clear undergrowth and deadwood without disturbing the subsoil and shall apply herbicide to any remaining stumps to inhibit growth.

All debris, rocks larger than three inches, and extracted plant life shall be promptly removed from the site.

-- END OF SECTION --

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SECTION 02 41 00 - DEMOLITION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Building demolition excluding removal of hazardous materials and toxic substances.
B. Selective demolition of built site elements.
C. Selective demolition of building elements for alteration purposes.
D. Abandonment and removal of existing utilities and utility structures.

1.2 RELATED REQUIREMENTS

A. Section 01 10 00 - Summary: Limitations on Contractor's use of site and premises.
B. Section 01 10 00 - Summary: Sequencing and staging requirements.
C. Section 01 10 00 - Summary: Description of items to be salvaged or removed for re-use by Contractor.
D. Section 01 50 00 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.
E. Section 01 60 00 - Product Requirements: Handling and storage of items removed for salvage and relocation.
F. Section 01 70 00 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.
G. Section 02 65 00 - Underground Storage Tank Removal.

1.3 REFERENCE STANDARDS

A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.
B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2013.

1.4 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Site Plan: Showing:
   1. Vegetation to be protected.
   2. Areas for temporary construction and field offices.
   3. Areas for temporary and permanent placement of removed materials.
C. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
   1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences.
   2. Identify demolition firm and submit qualifications.
   3. Include a summary of safety procedures.
D. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.5 QUALITY ASSURANCE

A. Demolition Firm Qualifications: Company specializing in the type of work required.
   1. Minimum of ___ years of documented experience.

PART 2 PRODUCTS

2.1 MATERIALS

A. Fill Material: As specified in Section 31 23 23 - Fill.

PART 3 EXECUTION

3.1 SCOPE

A. Remove the entire building designated _____.
B. Remove portions of existing buildings in the following sequence:
   1. _____.
   2. _____.
   3. _____.
C. Remove paving and curbs as required to accomplish new work.
D. Remove all other paving and curbs within site boundaries.
E. Break up paving within site boundaries to permit natural moisture drainage; leave pieces not larger than 1 square yard.
F. Within area of new construction, remove foundation walls and footings to a minimum of 2 feet below finished grade.
G. Outside area of new construction, remove foundation walls and footings to a minimum of 2 feet below finished grade.
H. Remove concrete slabs on grade within site boundaries.
I. Break up concrete slabs on grade within site boundaries to permit natural moisture drainage; leave pieces not larger than 1 square yard.
J. Remove underground tanks.
K. Remove underground tanks that contain or once contained petroleum products; fill and bury other types of tanks.
L. Remove manholes and manhole covers, curb inlets and catch basins.
M. Remove fences and gates.
N. Remove creosote-treated wood utility poles.
O. _____.
P. Remove other items indicated, for salvage, relocation, recycling, and _____.
Q. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as specified in Section 31 22 00.

3.2 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with other requirements specified in Section 01 70 00.
B. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. Comply with applicable requirements of NFPA 241.
   3. Use of explosives is not permitted.
   4. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
   5. Provide, erect, and maintain temporary barriers and security devices.
   6. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
   7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
   8. Do not close or obstruct roadways or sidewalks without permit.
   9. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.

10. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.

C. Do not begin removal until receipt of notification to proceed from OWNER.
D. Do not begin removal until built elements to be salvaged or relocated have been removed.
E. Do not begin removal until vegetation to be relocated has been removed and specified measures have been taken to protect vegetation to remain.
F. Protect existing structures and other elements that are not to be removed.
   1. Provide bracing and shoring.
   2. Prevent movement or settlement of adjacent structures.
   3. Stop work immediately if adjacent structures appear to be in danger.
G. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
H. If hazardous materials are discovered during removal operations, stop work and notify Architect and OWNER; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.
I. Hazardous Materials: Comply with 29 CFR 1926 and state and local regulations.
J. Perform demolition in a manner that maximizes salvage and recycling of materials.
   1. Comply with requirements of Section 01 74 19 - Waste Management.
   2. Dismantle existing construction and separate materials.
   3. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.
K. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.
L. Underground Storage Tanks: Remove and dispose of as specified in Section 02 65 00.

3.3 EXISTING UTILITIES

A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.
B. Protect existing utilities to remain from damage.
C. Do not disrupt public utilities without permit from authority having jurisdiction.
D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to OWNER.
E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to OWNER.
F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.
G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.
H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.

3.4 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as indicated.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Separate areas in which demolition is being conducted from other areas that are still occupied.
   1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 50 00 in locations indicated on drawings.
   2. Provide sound retardant partitions of construction indicated on drawings in locations indicated on drawings.
C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
D. Remove existing work as indicated and as required to accomplish new work.
   1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
   2. Remove items indicated on drawings.
E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, Telecommunications, and _____): Remove existing systems and equipment as indicated.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.
   2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
   3. See Section 01 10 00 for other limitations on outages and required notifications.
   4. Verify that abandoned services serve only abandoned facilities before removal.
   5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.
F. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.
   4. Patch as specified for patching new work.

3.5 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.
B. Remove from site all materials not to be reused on site; comply with requirements of Section 01 74 19 - Waste Management.
C. Leave site in clean condition, ready for subsequent work.
D. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 03 02 01 - CONCRETE REINFORCEMENT

PART 1 GENERAL

1.1 REFERENCES STANDARDS

ACI 301 - Specifications for Structural Concrete; 2010 (Errata 2012).
ACI 318 - Building Code Requirements for Structural Concrete and Commentary; 2014 (Errata 2016).
ACI SP-66 - ACI Detailing Manual; 2004.
ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2015.
ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2016.
ASTM A706/A706M - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement; 2016.
ASTM A722/A722M - Standard Specification for High-Strength Steel Bars for Prestressed Concrete; 2015.
AWS D1.4/D1.4M - Structural Welding Code - Reinforcing Steel; 2011.
CRSI 10MSP - Manual of Standard Practice; (2009; 28TH Ed)
CRSI 63 - Recommended Practice for Placing Reinforcing Bars
CRSI 65 - Recommended Practice for Placing Bar Supports, Specifications and Nomenclature

1.2 WORK INCLUDED

The work included in this Section of the Specifications shall consist of furnishing and installing reinforcing steel bars, wire fabric and accessories for cast-in-place concrete.

1.3 RELATED WORK AND SPECIFICATIONS

A. Section 03 09 01 - General Concrete.
B. Section 03 01 01 - Concrete Formwork.

1.4 SUBMITTALS

A. Submittals shall meet the requirements of Section 01 04 01, CONTRACTOR's Submittals.
B. Record Data: Indicate bar sizes, spacings, locations, and quantities of reinforcing steel, bending and cutting schedules, supporting and spacing devices, and joint and splice locations.
C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
D. Comply with ACI SP-66.
E. Manufacture's specifications and installation instructions for all proprietary products, including sleeves for welded splices.
F. Shop Drawings are required. Provide to scale drawing showing the fabrication and placement requirements for all reinforcing. Include all details required to clearly show placement of bars. Shop Drawings to be sealed by a Texas Licensed P.E.

1.5 QUALITY ASSURANCE

Perform work in accordance with referenced standards. Submit certified copies of mill test report of reinforcement materials analysis.

1.6 COORDINATION

Coordinate work with other trades, placement of formwork, formed openings and other work.

PART 2 PRODUCTS

2.1 REINFORCEMENT

A. Reinforcing Bars: New, deformed billet steel conforming to ASTM A615/A615M, Grade 60 for nonweldable bars and ASTM A706/A706M, Grade 60 for weldable bars.
B. Welded Wire Fabric: ASTM A1064/A1064M for smooth wire andASTM A722/A722M for deformed wire.
C. High Strength Reinforcing Bar (DYWIDAG Thread Bar) Meeting ASTM A722/A722M for Anchoring in Rocks.

2.2 ACCESSORY MATERIALS

A. Tie Wire: Minimum 16-gage annealed type.
B. Supports for Reinforcement: Conform to CRSI STANDARDS.
C. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions including load bearing pad on bottom to prevent settling or vapor barrier puncture.
D. Special Chairs, Bolsters, Bar Supports, Spacers Adjacent to Weather Exposed Concrete Surfaces: Plastic coated steel or stainless steel type, size and shape as required.
E. Splices
    1. Mechanical Connections:
        a. Compression: Gateway Building Products "G-Loc" or approved equivalent.
        b. Tension: Lenton Anchor or approved equivalent. Connection device shall develop 125 percent of yield strength of bar.
    2. Welded Splices: "Cadweld," "Thermoweld" or approved equivalent. Size device to develop 125 percent of yield strength of bar.

2.3 FABRICATION

Fabricate concrete reinforcing in accordance with CRSI Manual of Practice. Locate reinforcing splices not indicated on Plans at point of minimum stress. Review location of splices with ENGINEER.

PART 3 EXECUTION

3.1 PLACEMENT

A. Place, support and secure reinforcement against displacement by means of accepted spacers, chairs or hangers. Do not deviate from required position.
B. Do not displace or damage vapor barrier.
C. Accommodate placement of formed openings.
D. Conform to ACI 318 code for concrete cover over reinforcement. Concrete surfaces in contact with liquids shall have 2-inch cover.
E. Clean reinforcement to remove loose rust, mill scale, oil, earth, ice, and other materials which might reduce or destroy bond with concrete.

3.2 FIELD QUALITY CONTROL

Concrete shall not be placed until reinforcing steel is inspected by OWNER'S Representative. All concrete placed in violation of this provision will be rejected. The CONTRACTOR shall give OWNER'S Representative a minimum of 24 hours notice after completion of reinforcement placement prior to placement of concrete.

-- END OF SECTION --

SECTION 03 09 01 - GENERAL CONCRETE

PART 1 GENERAL

1.1 REFERENCE STANDARDS

AASHTO M85 - Standard Specification for Portland Cement; Current Edition.
ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2015.
ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2016.
ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2004 (Reapproved 2013).
TxDot Item 423, (2004) Hydraulic Cement Concrete
THD Bulletin C-11, Construction Bulletin Procedures for the Design and Control of Portland Cement Concrete Mixtures

1.2 WORK INCLUDED

Concrete shall consist of Portland cement, aggregates, and water which shall conform to the requirements as hereinafter specified. All concrete placed under this contract shall be in conformity with this specification.

1.3 SUBMITTALS

A. Submit complete information for each concrete mix proposed. Include location for mix and proposed finishes.

PART 2 PRODUCTS

2.1 MATERIALS

A. Cement shall be a standard brand of Portland cement, Type I, in conformity with AASHTO M85. Only one brand of cement may be used in any one structure.
B. Coarse Aggregate shall comply fully with the minimum requirements of ASTM C33/C33M, for 1 ½ inch maximum size aggregate.
C. Fine Aggregate shall comply fully with the minimum requirements of ASTM C33/C33M.
D. Reinforcing Steel shall be new deformed reinforcing bars, ASTM A1064/A1064M, of sizes and shapes noted on the Plans.
E. Premolded Expansion Joint Material shall conform with the requirements of ASTM D1751.

2.2 CLASSIFICATIONS & PROPORTIONS

A. Concrete shall be proportioned using methods outlined in the THD Bulletin C-11 for design of a concrete batch to meet the requirements hereinafter set forth. It shall be the entire responsibility of the CONTRACTOR to procure the strength as set out below for the respective class of concrete. All concrete shall be Class C unless otherwise shown on Plans. The concrete shall be uniform and workable. The minimum cement content, maximum allowable water content, and maximum slump shall conform to the following:

Class of Concrete	Minimum Cement (Bags / Cu. Yd.)	Maximum Water (Net Gal / Bag)	Maximum Slump for Hand Tamping	Maximum Slump for Machine Vibration
A	5.00	7.0	4"	3-1/2"
B	4.50	7.5	4"	3-1/2"
C	5.25	6.5	4"	3-1/2"

B. The concrete mix will be designed with the intent of producing concrete which, when cured and tested as outlined in THD Bulletin C-11, will have strength equal to or greater than the following:

Class of Concrete	Compressive Strength (1lb per Sq. In.)		7-Day Flexural Strength (1 lbs psi)
	28 - Day	7 - Day	
A	3,000	2,250	500
B	2,500	1,875	470
C	3,500	2,600	650

C. If the strength required for the concrete being produced is not secured with the minimum cement content specified, additional cement shall be used or other aggregates provided at the CONTRACTOR's expense.

D. Air entrainment shall be used for all exterior concrete.

2.3 CONSTRUCTION JOINTS

Construction joints shall be made only where located on the Plans, unless otherwise approved by the ENGINEER.

2.4 FORMS

All forms shall be of wood or metal and shall be built mortar tight and of sufficient rigidity to prevent distortion due to the pressure of the concrete and other loads incident to the construction operations. Forms shall be constructed and maintained to prevent warping and opening of joints due to shrinkage of the lumber.

2.5 STEEL REINFORCEMENT

A. Reinforcing steel in the sizes, shapes and lengths as shown shall be placed in the positions as indicated on the Plans. Minimum cover of not less than 1" of concrete shall be provided over the surface of all reinforcing steel.

B. Stirrups and hoops shall pass around the main reinforcement members and shall be securely attached thereto. The reinforcing steel shall be spaced and secured in the forms by means of approved galvanized metal spacers or precast motor blocks. Steel shall be wired together at all intersections; and when completed, the reinforcement mat shall present practically a rigid cage of steel which will not be distorted or shifted from position in any way by workmen walking on the mat or by concrete placement operations. Reinforcing steel in horizontal slabs shall be supported by chairs to ensure accurate placement. Do not lift reinforcement during concrete placement.

C. Splicing of bars will be permitted only where shown on the Plans or with the specific approval of the ENGINEER. The bar splice, when so made, shall not be less than 36 bar diameters with the spliced bars securely tied.

D. Steel bars, when placed in the work, shall be completely free of dirt, grease, loose rust, scale or other foreign matter. After placement, care shall be exercised to keep the steel free of mud, dried concrete or other material. No concrete whatsoever shall be deposited in the forms until the ENGINEER has inspected the final placement and condition of the reinforcement and approved the work for placement of concrete.

PART 3 EXECUTION

3.1 MIXING CONCRETE

A. Mixing at Site: Concrete shall be thoroughly mixed in a batch mixer of an approved size and type which will insure a uniform distribution of the materials throughout the mass, equipped with adequate water storage and a device for accurately measuring and automatically controlling the amount of water used in each batch.

B. Truck Mixing: Truck mixers shall be of the revolving drum type, water tight, and so constructed that the concrete can be mixed to insure uniform distribution of materials throughout the mass.

C. Time of Hauling and Placing Mixed Concrete: Concrete transported in a truck mixer shall be placed in its final position in the forms within 1 ½ hours after the introduction of the mixing water to the cement and aggregate.

D. Delivery Rate of Concrete during concrete operations shall be such as to provide for the proper handling, placing and finishing of the concrete, and the interval between batches shall not exceed 20 minutes. Concrete which has partially hardened shall not be retempered or remixed.

3.2 HANDLING AND PLACING OF CONCRETE

A. During and immediately after depositing, concrete shall be thoroughly compacted by mechanical vibration with satisfactory equipment and in a manner and to the extent as may be approved by the ENGINEER. Concrete shall not be poured in weather below freezing.

B. In preparation for placement of concrete, all sawdust, chips or other construction debris and extraneous matter shall be completely removed from the interior of the forms. When placing concrete on previously placed construction joints, the surface shall be cleaned by compressed air or vacuum methods, if so directed, and the surface of the existing joint shall be completely free of dust, dirt, sawdust or other foreign material. Concrete shall not be placed in any form prior to specific inspection and approval by the ENGINEER.

C. Foundations and footings shall be placed on firm, undisturbed earthen subgrade which is free of mud or excessive moisture. If groundwater is encountered, prior to placement of concrete the area shall be dewatered sufficiently for the subgrade to be firm and stable with the last 6 inches of excavation being removed immediately ahead of the concrete placement. Concrete for footing and/or foundations will not be placed on unstable, soggy or otherwise unsatisfactory earthen subgrade.

D. Concrete shall be placed in a manner to avoid segregation of the materials and the displacement of reinforcement. All chutes, troughs, tremies and pipes shall be kept clean and free from coatings of hardened concrete. When placing operations involving dropping the concrete more than 5 feet, the concrete shall be deposited through approved pipes or tremies. In walls less than 11 feet in height and widths less than 12 inches, tremies will not be required.

E. During and immediately after depositing, the concrete shall be thoroughly compacted by mechanical vibrating equipment and in a manner and to the extent as may be approved by the ENGINEER. Where placed in sidewalks, pavement or driveways, satisfactory hand methods for compaction and consolidation may be used.

F. Concrete shall be placed in horizontal layers not more than 12" thick except as provided herein. When less than a complete layer is placed in one operation, it shall be terminated in a vertical bulk head. Each layer shall be placed and compacted before the preceding batch has taken initial set to avoid surfaces of separation between the batches and to avoid the formation of construction joint with a preceding layer and surfaces of separation between batches.

G. When placement of concrete is unavoidably temporarily discontinued, the concrete, after becoming firm enough to retain its form, shall be cleaned of laitance and other objectionable material to a sufficient depth to expose sound concrete, and the top surface of the concrete adjacent to the forms shall be smoothed with a trowel. Where a "feather" edge might be produced at a construction joint, an inset formwork shall be used to produce an edge thickness of not less than 6" in the succeeding layer. Work shall not be discontinued within 18" of the top of any face, unless provisions have been made for a coping less than 18" thick, in which case, and if permitted by the ENGINEER, the construction joint may be made at the underside of the coping.

H. CYLINDER OR BEAM TESTS: During work progress, the OWNER, at his discretion, shall have cylinders or beam tests performed as specified herein. The laboratory testing and services shall be provided by the OWNER. The OWNER does hereby reserve the right to collect all cylinder samples himself, if desired, and deliver same to the testing laboratory approved to perform the tests prior to the placement of concrete. The tests will be performed to maintain a check on the compressive or flexural strength of the concrete that is actually placed. The test shall be defined as the average of the breaking of two cylinders or two beams as the case may be. Test beam or cylinder specimens shall be required for each 167.5 cubic yards, or a portion thereof, placed each day. For smaller concrete placements, the OWNER's Representative may vary the test specimen to 25 cubic yard placement, over a several day period. Cylinders or beam specimens shall be field protected per THD Bulletin C-11 until transported to the testing laboratory. The test specimens shall be cured in accordance with THD Bulletin C-11

3.3 CURING & FINISHING

A. Concrete surfaces exposed to conditions causing premature drying shall be protected by covering as soon as possible with approved curing compound, burlap, sand, or other satisfactory material and kept moist. Curing shall continue for a period of not less than 7 days after placing the concrete.

B. Surface finishes shall be classified as follows:
   1. Class I - Ordinary Surface Finish
   2. Class II- Rubbed Finish
   3. Class III - Broom Finish
   4. Class IV - Steel Trowel Surface Finish
   5. Class V - Adhesive Grout Finish
   6. Class VI - Sidewalk Finish

   All concrete shall be given Class I, ordinary surface finish, and in addition, if further finishing is required, such other types of finish as specified. If not otherwise specified, the following surfaces shall be given Class II -Rubbed Finish: exposed faces of structures; outside faces of slabs, brackets, curbs, headwalls, railings. Slab surfaces shall be given Class III - Broom Finish and Class IV - Steel Trowel Surface Finish.

C. Inspector to approve all finishes for slabs prior to their installations. Contractor to acquire from Engineer written instruction of finishing slabs in each specific area of building and exterior slabs.
   1. Class I, Ordinary Surface Finish: Immediately following the removal of forms, all fins and irregular projections shall be removed from all surfaces except from those which are not to be exposed. On ALL surfaces, the cavities produced by form ties and other holes, honey comb spots, broken corners or edges and other defects shall be thoroughly cleaned, carefully pointed and cured with a mortar of cement and fine aggregate. The resulting surface shall be to the satisfaction of the ENGINEER.

2. Class II, Rubbed Finish: After removal of forms, the rubbing of concrete shall be started as soon as its condition will permit. Immediately before starting this work, the concrete shall be kept thoroughly saturated with water for a minimum period of three hours. Surfaces to be finished shall be rubbed with a medium carborundum stone, using a small amount of mortar on its face. The mortar shall be composed of cement and fine sand mixed in proportions used in the concrete being finished. Rubbing shall be continued until all form marks, projections and irregularities have been removed, all voids filled, and a uniform surface has been obtained. The final finish shall be obtained by rubbing with a fine carborundum stone and water. This rubbing shall be continued until the entire surface is of a smooth texture and uniform color.
3. Class III, Broom Finish: After the concrete is compacted, the surface shall be carefully rodded and struck off with a strike board to conform to the cross-section and grade shown on the Plans. After striking off and consolidating as specified above, the surfaces shall be made uniform by longitudinal or transverse floating, or both. When the concrete has hardened sufficiently, the surface shall be given a broom finish with a broom of an approved type. The strokes shall be square across the slab, from edge to edge with adjacent strokes slightly overlapped. The surface when finished shall be uniform, free of porous spots, irregularities, depressions and small pockets or rough spots.
4. Class IV, Steel Trowel Finish: The concrete surface shall be struck off and given a float finish as outlined for Class III finish above. After the surface has been tested with a straight edge and irregularities corrected, the entire system shall be finished with an acceptable steel bladed rotary type mechanical finishing machine to a smooth and uniformly finished condition. Hand troweling methods with a steel trowel will be used to finish corners or other areas inaccessible to the finishing machine and to remove all blade marks, burrs and other irregularities left by the machine, and the entire surface completed in a smooth and workmanlike manner, of uniform texture, and to the entire satisfaction of the ENGINEER.
5. Class 5, Adhesive Grout Finish: The surface of the concrete shall be given an Class 1 finish, chamfer lines lightly rubbed, irregularities corrected, and then covered with an adhesive grout textured coating a minimum of 1/16" thickness. Coating shall be composed of one part white cement, one part natural (gray) cement, two parts masonry and, one part (latex) emulsion and enough water to form a viscous slurry of a consistency that may be applied by spray gun, brush or roller with appreciable running or sagging. The proportions of white and gray cement may be varied slightly to obtain the desired color. Gradation of the masonry sand shall be as required to product a texture satisfactory to the ENGINEER. Prepackaged materials meeting these requirements and acceptable to the ENGINEER as to color, texture and appearance will be permitted. The adhesive grout coating shall be applied to the moistened concrete surface in a manner which will provide a uniform texture and color, in the thickness specified, and shall be completely protected from rain and/or freezing for a period of 24 hours minimum. The adhesive grout type coating shall meet the test requirements of TxDot Item 423 for Adhesive Grout Type Coatings. If requested, the CONTRACTOR shall furnish the ENGINEER a certificate from the manufacturer stating the product furnished complies with these specifications.
6. Class 6, sidewalk Finish: After the concrete has been deposited in place, it shall be compacted, the surface struck off by means of a strike board, and then finished with a steel trowel. An edging tool shall be used on all edges and at all expansion joints and dummy joints. The surface shall not vary more than 1/8" under a 10 foot straight edge. The surface shall then be given a granular or matted texture by light brushing with a wetted brush or broom to provide a non-skid surface when wet and meeting the entire approval of the ENGINEER.

D. Temperature of Concrete: When placing concrete at a temperature below 45 degrees F., the concrete shall have a temperature not lower than 50 degrees F. and not higher than 95 degrees

F. Suitable means shall be provided to maintain the concrete at a temperature not less than 50 degrees F. for the first five days after placement, or until it has hardened sufficiently, or until the first three days if high early strength concrete is used. The method of heating the materials at all times shall be subject to the ENGINEER's approval. No salt, chemical or other foreign matter shall be mixed with the concrete for the purpose of preventing freezing. If warm water is used, the cement shall be put in before other aggregates to prevent a flash set.
If concrete is placed when weather is such that the temperature of the concrete would exceed 95 degrees F., as determined by the ENGINEER, the CONTRACTOR shall employ effective means, such as placing early in the day, as necessary to maintain the temperature of the concrete as it is placed below 95 degrees F.

-- END OF SECTION --

SECTION 26 05 19 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Single conductor building wire.
B. Nonmetallic-sheathed cable.
C. Underground feeder and branch-circuit cable.
D. Service entrance cable.
E. Armored cable.
F. Metal-clad cable.
G. Power and control tray cable.
H. Variable-frequency drive cable.
I. Manufactured wiring systems.
J. Wiring connectors.
K. Electrical tape.
L. Heat shrink tubing.
M. Oxide inhibiting compound.
N. Wire pulling lubricant.
O. Cable ties.

1.2 RELATED REQUIREMENTS

A. Section 26 05 26 - Grounding and Bonding for Electrical Systems: Additional requirements for grounding conductors and grounding connectors.
B. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.
C. Section 26 21 00 - Low-Voltage Electrical Service Entrance: Additional requirements for electrical service conductors.

1.3 REFERENCE STANDARDS

A. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire; 2013 (Reapproved 2024).
B. ASTM B8 - Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft; 2023.
C. ASTM B33 - Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes; 2010, with Editorial Revision (2020).
D. ASTM B787/B787M - Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation; 2004 (Reapproved 2020).
E. ASTM B800 - Standard Specification for 8000 Series Aluminum Alloy Wire for Electrical Purposes - Annealed and Intermediate Tempers; 2005 (Reapproved 2021).
F. ASTM B801 - Standard Specification for Concentric-Lay-Stranded Conductors of 8000 Series Aluminum Alloy for Subsequent Covering or Insulation; 2018 (Reapproved 2023).
G. ASTM D3005 - Standard Specification for Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape; 2024.
H. ASTM D4388 - Standard Specification for Nonmetallic Semi-Conducting and Electrically Insulating Rubber Tapes; 2020.
I. FS A-A-59544 - Cable and Wire, Electrical (Power, Fixed Installation); 2008a (Validated 2019).
J. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
K. NECA 104 - Standard for Installing Aluminum Building Wire and Cable; 2012.

L. NECA 120 - Standard for Installing Armored Cable (AC) and Type Metal-Clad (MC) Cable; 2018.
M. NECA 121 - Standard for Installing Nonmetallic-Sheathed Cable (Type NM-B) and Underground Feeder and Branch-Circuit Cable (Type UF); 2024.
N. NEMA WC 70 - Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy; 2021.
O. NETA ATS - Standard for Acceptance Testing Specifications for Electrical Power Equipment And Systems; 2025.
P. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
Q. UL 4 - Armored Cable; Current Edition, Including All Revisions.
R. UL 44 - Thermoset-Insulated Wires and Cables; Current Edition, Including All Revisions.
S. UL 83 - Thermoplastic-Insulated Wires and Cables; Current Edition, Including All Revisions.
T. UL 183 - Manufactured Wiring Systems; Current Edition, Including All Revisions.
U. UL 486A-486B - Wire Connectors; Current Edition, Including All Revisions.
V. UL 486C - Splicing Wire Connectors; Current Edition, Including All Revisions.
W. UL 486D - Sealed Wire Connector Systems; Current Edition, Including All Revisions.
X. UL 493 - Thermoplastic-Insulated Underground Feeder and Branch-Circuit Cables; Current Edition, Including All Revisions.
Y. UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape; Current Edition, Including All Revisions.
Z. UL 719 - Nonmetallic-Sheathed Cables; Current Edition, Including All Revisions.
AA. UL 854 - Service-Entrance Cables; Current Edition, Including All Revisions.
BB. UL 1277 - Electrical Power and Control Tray Cables with Optional Optical-Fiber Members; Current Edition, Including All Revisions.
CC. UL 1569 - Metal-Clad Cables; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate sizes of raceways, boxes, and equipment enclosures installed under other sections with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
   2. Coordinate the installation of direct burial cable with other trades to avoid conflicts with piping or other potential conflicts.
   3. Coordinate with electrical equipment installed under other sections to provide terminations suitable for use with the conductors to be installed.
   4. Notify Architect/Engineer of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.5 SUBMITTALS

A. Product Data: Provide manufacturer's standard catalog pages and data sheets for conductors and cables, including detailed information on materials, construction, ratings, listings, and available sizes, configurations, and stranding.
B. Sustainable Design Documentation: Submit manufacturer's product data on conductor and cable showing compliance with specified lead content requirements.
C. Manufactured Wiring System Shop Drawings: Provide plan views indicating proposed system layout with components identified; indicate branch circuit connections.

D. Design Data: Indicate voltage drop and ampacity calculations for aluminum conductors substituted for copper conductors. Include proposed modifications to raceways, boxes, wiring gutters, enclosures, etc. to accommodate substituted conductors.
E. Field Quality Control Test Reports.
F. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
G. Project Record Documents: Record actual installed circuiting arrangements. Record actual routing for underground circuits.
H. Maintenance Materials: Furnish the following for OWNER's use in maintenance of project.
    1. Extra Manufactured Wiring Systems Cable Assemblies: One of each configuration, 6 feet length.

1.6 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.
B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
D. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store conductors and cables in accordance with manufacturer's instructions.

1.8 FIELD CONDITIONS

A. Do not install or otherwise handle thermoplastic-insulated conductors at temperatures lower than 14 degrees F, unless otherwise permitted by manufacturer's instructions. When installation below this temperature is unavoidable, notify Architect/Engineer and obtain direction before proceeding with work.

PART 2 PRODUCTS

2.1 CONDUCTOR AND CABLE APPLICATIONS

A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.
B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.
    1. Exceptions:
        a. Use manufactured wiring systems for branch circuits where concealed under raised floors.
            1) Exception: Provide single conductor building wire in raceway for circuit homerun from distribution box to panelboard.
        b. Use power and control tray cable or metal-clad cable for installation in cable tray.
C. Nonmetallic-sheathed cable is not permitted.
D. Underground feeder and branch-circuit cable is permitted only as follows:
    1. Where not otherwise restricted, may be used:
        a. For damp, wet, or corrosive locations as a substitute for NFPA 70, Type NMC nonmetallic-sheathed cable, when nonmetallic-sheathed cable is permitted.

2. In addition to other applicable restrictions, may not be used:
    a. Where exposed to view.
    b. Where exposed to damage.

E. Service entrance cable is permitted only as follows:
1. Where not otherwise restricted, may be used:
    a. For overhead service drop, installed in raceway to service head.
    b. For underground service entrance, installed in raceway.
2. In addition to other applicable restrictions, may not be used:
    a. Where exposed to damage.

F. Armored cable is permitted only as follows:
1. Where not otherwise restricted, may be used:
    a. Where concealed above accessible ceilings for final connections from junction boxes to luminaires.
        1) Maximum Length: 6 feet.
    b. Where concealed in hollow stud walls, above accessible ceilings, and under raised floors for branch circuits up to 20 A.
        1) Exception: Provide single conductor building wire in raceway for circuit homerun from first outlet to panelboard.
    c. For general purpose, non-essential electrical systems in non-hazardous patient care areas of health care facilities, when provided with additional insulated grounding conductor for redundant grounding.
2. In addition to other applicable restrictions, may not be used:
    a. Unless approved by OWNER.
    b. Where not approved for use by the authority having jurisdiction.
    c. Where exposed to damage.
    d. For damp, wet, or corrosive locations.
    e. For isolated ground circuits.

G. Metal-clad cable is permitted only as follows:
1. Where not otherwise restricted, may be used:
    a. Where concealed above accessible ceilings for final connections from junction boxes to luminaires.
        1) Maximum Length: 6 feet.
    b. Where concealed in hollow stud walls, above accessible ceilings, and under raised floors for branch circuits up to 20 A.
        1) Exception: Provide single conductor building wire in raceway for circuit homerun from first outlet to panelboard.
2. In addition to other applicable restrictions, may not be used:
    a. Unless approved by OWNER.
    b. Where not approved for use by the authority having jurisdiction.
    c. Where exposed to damage.
    d. For damp, wet, or corrosive locations, unless provided with a PVC jacket listed as suitable for those locations.
    e. For isolated ground circuits, unless provided with an additional isolated/insulated grounding conductor.
    f. For patient care areas of health care facilities requiring redundant grounding.

H. Manufactured wiring systems are permitted only as follows:
1. Where not otherwise restricted, may be used:
    a. For branch circuits where concealed under raised floors, where concealed above accessible ceilings for lighting, and in open ceiling areas for lighting.
        1) Exception: Provide single conductor building wire in raceway for circuit homerun from distribution box to panelboard.

b. For general purpose, non-essential electrical systems in non-hazardous patient care areas of health care facilities, when provided with additional insulated grounding conductor for redundant grounding.

2. In addition to other applicable restrictions, may not be used:
   a. Unless approved by OWNER.
   b. Where not approved for use by the authority having jurisdiction.
   c. Where exposed to view.
   d. Where exposed to damage.
   e. For damp, wet, or corrosive locations.
   f. For isolated ground circuits, unless provided with an additional isolated/insulated grounding conductor.

2.2 CONDUCTOR AND CABLE GENERAL REQUIREMENTS

A. Provide products that comply with requirements of NFPA 70.
B. Provide products listed, classified, and labeled as suitable for the purpose intended.
C. Provide new conductors and cables manufactured not more than one year prior to installation.
D. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.
E. Comply with NEMA WC 70.
F. Comply with FS A-A-59544 where applicable.
G. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.
H. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.
I. Conductors for Grounding and Bonding: Also comply with Section 26 05 26.
J. Conductors and Cables Installed in Cable Tray: Listed and labeled as suitable for cable tray use.
K. Conductors and Cables Installed Where Exposed to Direct Rays of Sun: Listed and labeled as sunlight resistant.
L. Conductors and Cables Installed Exposed in Spaces Used for Environmental Air (only where specifically permitted): Plenum rated, listed and labeled as suitable for use in return air plenums.
M. Conductor Material:
   1. Provide copper conductors only. Aluminum conductors are not acceptable for this project. Conductor sizes indicated are based on copper.
   2. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.
   3. Tinned Copper Conductors: Comply with ASTM B33.
N. Minimum Conductor Size:
   1. Branch Circuits: 12 AWG.
   2. Control Circuits: 14 AWG.
O. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
P. Conductor Color Coding:
   1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.
   2. Color Coding Method: Integrally colored insulation.
      a. Conductors size 4 AWG and larger may have black insulation color coded using vinyl color coding electrical tape.
   3. Color Code:
      a. 240/120 V, 1 Phase, 3 Wire System:

1) Phase A: Black.
2) Phase B: Red.
3) Neutral/Grounded: White.

b. Equipment Ground, All Systems: Green.
c. Isolated Ground, All Systems: Green with yellow stripe.
d. Travelers for 3-Way and 4-Way Switching: Pink.
e. For modifications or additions to existing wiring systems, comply with existing color code when existing code complies with NFPA 70 and is approved by the authority having jurisdiction.
f. For control circuits, comply with manufacturer's recommended color code.

2.3 SINGLE CONDUCTOR BUILDING WIRE

A. Manufacturers:
1. Copper Building Wire:
a. Cerro Wire LLC: www.cerrowire.com/#sle.
b. Encore Wire Corporation: www.encorewire.com/#sle.
c. General Cable Technologies Corporation: www.generalcable.com/#sle.
d. Southwire Company: www.southwire.com/#sle.
e. Substitutions: Submit Manufacture's Data Sheet for Approval.
2. Aluminum Building Wire (only where specifically indicated or permitted for substitution):
a. Encore Wire Corporation: www.encorewire.com/#sle.
b. Southwire Company: www.southwire.com/#sle.
c. Stabiloy, a brand of General Cable Technologies Corporation; _____: www.stabiloy.com/#sle.
d. Substitutions: Submit Manufacture's Data Sheet for Approval.

B. Description: Single conductor insulated wire.
C. Conductor Stranding:
1. Feeders and Branch Circuits:
a. Size 10 AWG and Smaller: Solid.
b. Size 8 AWG and Larger: Stranded.
2. Control Circuits: Stranded.

D. Insulation Voltage Rating: 600 V.
E. Insulation:
1. Copper Building Wire: Type THHN/THWN or THHN/THWN-2, except as indicated below.
a. Size 4 AWG and Larger: Type XHHW-2.
b. Installed Underground: Type XHHW-2.
c. Fixture Wiring Within Luminaires: Type TFFN/TFN for luminaires with labeled maximum temperature of 90 degrees C; Approved suitable type for luminaires with labeled maximum temperature greater than 90 degrees C.

2.4 NONMETALLIC-SHEATHED CABLE

A. Manufacturers:
1. Cerro Wire LLC: www.cerrowire.com/#sle.
2. Encore Wire Corporation: www.encorewire.com/#sle.
3. Southwire Company: www.southwire.com/#sle.
4. Substitutions: Submit Manufacture's Data Sheet for Approval.

B. Description: NFPA 70, Type NM multiple-conductor cable listed and labeled as complying with UL 719, Type NM-B.
C. Conductor Stranding:
1. Size 10 AWG and Smaller: Solid.
2. Size 8 AWG and Larger: Stranded.

D. Insulation Voltage Rating: 600 V.

2.5 UNDERGROUND FEEDER AND BRANCH-CIRCUIT CABLE

A. Manufacturers:
   1. Cerro Wire LLC: www.cerrowire.com/#sle.
   2. Encore Wire Corporation: www.encorewire.com/#sle.
   3. Southwire Company: www.southwire.com/#sle.
   4. Substitutions: Submit Manufacture's Data Sheet for Approval.
B. Description: NFPA 70, Type UF multiple-conductor cable listed and labeled as complying with UL 493, Type UF-B.
C. Provide equipment grounding conductor unless otherwise indicated.
D. Conductor Stranding:
   1. Size 10 AWG and Smaller: Solid.
   2. Size 8 AWG and Larger: Stranded.
E. Insulation Voltage Rating: 600 V.
F. Cable Jacket: Listed and labeled as sunlight resistant.

2.6 SERVICE ENTRANCE CABLE

A. Manufacturers:
   1. Copper Service Entrance Cable:
      a. Cerro Wire LLC: www.cerrowire.com/#sle.
      b. Encore Wire Corporation: www.encorewire.com/#sle.
      c. Southwire Company: www.southwire.com/#sle.
      d. Substitutions: Submit Manufacture's Data Sheet for Approval.
B. Service Entrance Cable for Above-Ground Use: NFPA 70, Type SE multiple-conductor cable listed and labeled as complying with UL 854, Style R.
C. Service Entrance Cable for Underground Use: NFPA 70, Type USE single-conductor cable listed and labeled as complying with UL 854, Type USE-2, and with UL 44 Type RHH/RHW-2.
D. Conductor Stranding: Stranded.
E. Insulation Voltage Rating: 600 V.

2.7 ARMORED CABLE

A. Manufacturers:
   1. AFC Cable Systems Inc: www.afcweb.com/#sle.
   2. Encore Wire Corporation: www.encorewire.com/#sle.
   3. Southwire Company: www.southwire.com/#sle.
   4. Substitutions: Submit Manufacture's Data Sheet for Approval.
B. Description: NFPA 70, Type AC cable listed and labeled as complying with UL 4, and listed for use in classified firestop systems to be used.
C. Conductor Stranding:
   1. Size 10 AWG and Smaller: Solid.
   2. Size 8 AWG and Larger: Stranded.
D. Insulation Voltage Rating: 600 V.
E. Insulation: Type THHN.
F. Grounding: Combination of interlocking armor and integral bonding wire.
   1. Provide additional full-size integral insulated equipment grounding conductor for redundant grounding, suitable for general purpose, non-essential electrical systems in non-hazardous patient care areas of health care facilities.
G. Armor: Steel, interlocked tape.

2.8 METAL-CLAD CABLE

A. Manufacturers:
   1. AFC Cable Systems Inc: www.afcweb.com/#sle.

2. Encore Wire Corporation: www.encorewire.com/#sle.
3. Southwire Company: www.southwire.com/#sle.
4. Substitutions: Submit Manufacture's Data Sheet for Approval.

B. Description: NFPA 70, Type MC cable listed and labeled as complying with UL 1569, and listed for use in classified firestop systems to be used.

C. Conductor Stranding:
1. Size 10 AWG and Smaller: Solid.
2. Size 8 AWG and Larger: Stranded.

D. Insulation Voltage Rating: 600 V.

E. Insulation: Type THHN, THHN/THWN, or THHN/THWN-2.

F. Provide oversized neutral conductors where indicated or required.

G. Provide dedicated neutral conductor for each phase conductor where indicated or required.

H. Grounding: Full-size integral equipment grounding conductor.
1. Provide additional isolated/insulated grounding conductor where indicated or required.

I. Armor: Steel, interlocked tape.

J. Provide PVC jacket applied over cable armor where indicated or required for environment of installed location.

2.9 POWER AND CONTROL TRAY CABLE

A. Manufacturers:
1. Encore Wire Corporation: www.encorewire.com/#sle.
2. General Cable Technologies Corporation: www.generalcable.com/#sle.
3. Okonite: www.okonite.com/#sle.
4. Southwire Company: www.southwire.com/#sle.
5. Substitutions: Submit Manufacture's Data Sheet for Approval.

B. Description: NFPA 70, Type TC cable listed and labeled as complying with UL 1277.

C. Where exposed run cable is indicated between cable tray and utilization equipment in qualifying industrial establishments as determined by authorities having jurisdiction, provide tray cable marked as Type TC-ER in accordance with NFPA 70.

D. Conductor Stranding: Stranded.

E. Insulation Voltage Rating: 600 V.

F. Insulation: Type XHHW or XHHW-2.

G. Grounding: Full-size integral equipment grounding conductor.

H. Jacket: PVC or Chlorinated Polyethylene (CPE).

2.10 MANUFACTURED WIRING SYSTEMS

A. Manufacturers:
1. AFC Cable Systems Inc: www.afcweb.com/#sle.
2. D&P Custom Lights & Wiring Systems, Inc: www.dandpcustomlights.com/#sle.
3. RELOC Wiring Solutions, a brand of Acuity Brands, Inc: www.relocwiring.com/#sle.
4. Wiremold, a brand of Legrand North America, Inc: www.legrand.us/#sle.
5. Substitutions: Submit Manufacture's Data Sheet for Approval.

B. Description: Manufactured wiring assemblies complying with NFPA 70 Article 604, and listed and labeled as complying with UL 183.

C. Provide components necessary to transition between manufactured wiring system and other wiring methods.

D. Branch Circuit Cables:
1. Conductor Stranding (Size 10 AWG and Smaller): Solid.
2. Insulation Voltage Rating: 600 V.
3. Insulation: Type THHN.

4. Provide dedicated neutral conductor for each phase conductor where indicated or required.
5. Grounding: Full-size integral equipment grounding conductor.
   a. Provide additional isolated/insulated grounding conductor where indicated or required.
   b. Provide redundant grounding, suitable for general purpose, non-essential electrical systems in non-hazardous patient care areas of health care facilities<> where indicated or required.
6. Armor: Steel, interlocked tape.

E. Connectors: Keyed and color-coded to prevent interconnection of different voltages.

F. Fixture Leads: Type TFN insulation.

G. Product(s):
   1. Substitutions: Submit Manufacture's Data Sheet for Approval.

2.11 WIRING CONNECTORS

A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.

B. Connectors for Grounding and Bonding: Comply with Section 26 05 26.

C. Wiring Connectors for Splices and Taps:
   1. Copper Conductors Size 8 AWG and Smaller: Use twist-on insulated spring connectors.
   2. Copper Conductors Size 6 AWG and Larger: Use mechanical connectors or compression connectors.

D. Wiring Connectors for Terminations:
   1. Provide terminal lugs for connecting conductors to equipment furnished with terminations designed for terminal lugs.
   2. Provide compression adapters for connecting conductors to equipment furnished with mechanical lugs when only compression connectors are specified.
   3. Where over-sized conductors are larger than the equipment terminations can accommodate, provide connectors suitable for reducing to appropriate size, but not less than required for the rating of the overcurrent protective device.
   4. Provide motor pigtail connectors for connecting motor leads in order to facilitate disconnection.
   5. Copper Conductors Size 8 AWG and Larger: Use mechanical connectors or compression connectors where connectors are required.
   6. Aluminum Conductors: Use compression connectors for all connections.
   7. Stranded Conductors Size 10 AWG and Smaller: Use crimped terminals for connections to terminal screws.
   8. Conductors for Control Circuits: Use crimped terminals for all connections.

E. Do not use insulation-piercing or insulation-displacement connectors designed for use with conductors without stripping insulation.

F. Do not use push-in wire connectors as a substitute for twist-on insulated spring connectors.

G. Twist-on Insulated Spring Connectors: Rated 600 V, 221 degrees F for standard applications and 302 degrees F for high temperature applications; pre-filled with sealant and listed as complying with UL 486D for damp and wet locations.
   1. Manufacturers:
      a. 3M: www.3m.com/#sle.
      b. Ideal Industries, Inc: www.idealindustries.com/#sle.
      c. NSI Industries LLC: www.nsiindustries.com/#sle.
      d. Substitutions: Submit Manufacture's Data Sheet for Approval.

H. Push-in Wire Connectors: Rated 600 V, 221 degrees F.

1. Manufacturers:
   a. Ideal Industries, Inc: www.idealindustries.com/#sle.
   b. NSI Industries LLC: www.nsiindustries.com/#sle.
   c. Wago Corporation: www.wago.us/#sle.
   d. Substitutions: Submit Manufacture's Data Sheet for Approval.

I. Mechanical Connectors: Provide bolted type or set-screw type.
   1. Manufacturers:
      a. Burndy LLC: www.burndy.com.
      b. Ilsco: www.ilsco.com/#sle.
      c. Thomas & Betts Corporation: www.tnb.com/#sle.
      d. Substitutions: Submit Manufacture's Data Sheet for Approval.

J. Compression Connectors: Provide circumferential type or hex type crimp configuration.
   1. Manufacturers:
      a. Burndy LLC: www.burndy.com.
      b. Ilsco: www.ilsco.com/#sle.
      c. Thomas & Betts Corporation: www.tnb.com/#sle.
      d. Substitutions: Submit Manufacture's Data Sheet for Approval.

K. Crimped Terminals: Nylon-insulated, with insulation grip and terminal configuration suitable for connection to be made.
   1. Manufacturers:
      a. Burndy LLC: www.burndy.com.
      b. Ilsco: www.ilsco.com/#sle.
      c. Thomas & Betts Corporation: www.tnb.com/#sle.
      d. Substitutions: Submit Manufacture's Data Sheet for Approval.

2.12 WIRING ACCESSORIES

A. Electrical Tape:
   1. Manufacturers:
      a. 3M: www.3m.com/#sle.
      b. Plymouth Rubber Europa: www.plymouthrubber.com/#sle.
      c. Substitutions: Submit Manufacture's Data Sheet for Approval.
   2. Vinyl Color Coding Electrical Tape: Integrally colored to match color code indicated; listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; suitable for continuous temperature environment up to 221 degrees F.
      a. Substitutions: Submit Manufacture's Data Sheet for Approval.
   3. Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; conformable for application down to 0 degrees F and suitable for continuous temperature environment up to 221 degrees F.
      a. Substitutions: Submit Manufacture's Data Sheet for Approval.
   4. Rubber Splicing Electrical Tape: Ethylene Propylene Rubber (EPR) tape, complying with ASTM D4388; minimum thickness of 30 mil; suitable for continuous temperature environment up to 194 degrees F and short-term 266 degrees F overload service.
      a. Substitutions: Submit Manufacture's Data Sheet for Approval.
   5. Electrical Filler Tape: Rubber-based insulating moldable putty, minimum thickness of 125 mil; suitable for continuous temperature environment up to 176 degrees F.
      a. Substitutions: Submit Manufacture's Data Sheet for Approval.
   6. Varnished Cambric Electrical Tape: Cotton cambric fabric tape, with or without adhesive, oil-primed and coated with high-grade insulating varnish; minimum thickness of 7 mil; suitable for continuous temperature environment up to 221 degrees F.
      a. Substitutions: Submit Manufacture's Data Sheet for Approval.
   7. Moisture Sealing Electrical Tape: Insulating mastic compound laminated to flexible, all-weather vinyl backing; minimum thickness of 90 mil.

a. Substitutions: Submit Manufacture's Data Sheet for Approval.

B. Heat Shrink Tubing: Heavy-wall, split-resistant, with factory-applied adhesive; rated 600 V; suitable for direct burial applications; listed as complying with UL 486D.
   1. Manufacturers:
      a. 3M: www.3m.com/#sle.
      b. Burndy LLC: www.burndy.com.
      c. Thomas & Betts Corporation: www.tnb.com/#sle.
      d. Substitutions: Submit Manufacture's Data Sheet for Approval.

C. Oxide Inhibiting Compound: Listed; suitable for use with the conductors or cables to be installed.
   1. Manufacturers:
      a. Burndy LLC: www.burndy.com.
      b. Ideal Industries, Inc: www.idealindustries.com/#sle.
      c. Ilsco: www.ilsco.com/#sle.
      d. Substitutions: Submit Manufacture's Data Sheet for Approval.

D. Wire Pulling Lubricant: Listed; suitable for use with the conductors or cables to be installed and suitable for use at the installation temperature.
   1. Manufacturers:
      a. 3M: www.3m.com/#sle.
      b. American Polywater Corporation: www.polywater.com/#sle.
      c. Ideal Industries, Inc: www.idealindustries.com/#sle.
      d. Substitutions: Submit Manufacture's Data Sheet for Approval.

E. Cable Ties: Material and tensile strength rating suitable for application.
   1. Manufacturers:
      a. Burndy LLC: www.burndy.com.
      b. Substitutions: Submit Manufacture's Data Sheet for Approval.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that interior of building has been protected from weather.

B. Verify that work likely to damage wire and cable has been completed.

C. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with NFPA 70.

D. Verify that field measurements are as indicated.

E. Verify that conditions are satisfactory for installation prior to starting work.

3.2 PREPARATION

A. Clean raceways thoroughly to remove foreign materials before installing conductors and cables.

3.3 INSTALLATION

A. Circuiting Requirements:
   1. Unless dimensioned, circuit routing indicated is diagrammatic.
   2. When circuit destination is indicated without specific routing, determine exact routing required.
   3. Arrange circuiting to minimize splices.
   4. Include circuit lengths required to install connected devices within 10 ft of location indicated.
   5. Maintain separation of Class 1, Class 2, and Class 3 remote-control, signaling, and power-limited circuits in accordance with NFPA 70.
   6. Maintain separation of wiring for emergency systems in accordance with NFPA 70.
   7. Circuiting Adjustments: Unless otherwise indicated, when branch circuits are indicated as separate, combining them together in a single raceway is not permitted.

8. Common Neutrals: Unless otherwise indicated, sharing of neutral/grounded conductors among up to three single phase branch circuits of different phases installed in the same raceway is not permitted. Provide dedicated neutral/grounded conductor for each individual branch circuit.

B. Install products in accordance with manufacturer's instructions.

C. Perform work in accordance with NECA 1 (general workmanship).

D. Install underground feeder and branch-circuit cable (Type UF-B) in accordance with NECA 121.

E. Install armored cable (Type AC) in accordance with NECA 120.

F. Install metal-clad cable (Type MC) in accordance with NECA 120.

G. Installation in Raceway:
   1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.
   2. Pull all conductors and cables together into raceway at same time.
   3. Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and sidewall pressure.
   4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.

H. Exposed Cable Installation (only where specifically permitted):
   1. Route cables parallel or perpendicular to building structural members and surfaces.
   2. Protect cables from physical damage.

I. Direct Burial Cable Installation:
   1. Install cable with minimum cover of 24 inches unless otherwise indicated or required.
   2. Protect cables from damage in accordance with NFPA 70.
   3. Provide underground warning tape in accordance with Section 26 05 53 along entire cable length.

J. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.

K. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.
   1. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conductors and cables to lay on ceiling tiles.
   2. Installation in Vertical Raceways: Provide supports where vertical rise exceeds permissible limits.

L. Terminate cables using suitable fittings.
   1. Armored Cable (Type AC):
      a. Use listed fittings and anti-short, insulating bushings.
      b. Cut cable armor only using specialized tools to prevent damaging conductors or insulation. Do not use hacksaw or wire cutters to cut armor.
   2. Metal-Clad Cable (Type MC):
      a. Use listed fittings.
      b. Cut cable armor only using specialized tools to prevent damaging conductors or insulation. Do not use hacksaw or wire cutters to cut armor.

M. Install conductors with a minimum of 12 inches of slack at each outlet.

N. Where conductors are installed in enclosures for future termination by others, provide a minimum of 5 feet of slack.

O. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.

P. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures in accordance with NFPA 70.
Q. Make wiring connections using specified wiring connectors.
    1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.
    2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.
    3. Do not remove conductor strands to facilitate insertion into connector.
    4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminates. Do not use wire brush on plated connector surfaces.
    5. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
    6. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.
R. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.
    1. Dry Locations: Use insulating covers specifically designed for the connectors, electrical tape, or heat shrink tubing.
        a. For taped connections, first apply adequate amount of rubber splicing electrical tape or electrical filler tape, followed by outer covering of vinyl insulating electrical tape.
        b. For taped connections likely to require re-entering, including motor leads, first apply varnished cambric electrical tape, followed by adequate amount of rubber splicing electrical tape, followed by outer covering of vinyl insulating electrical tape.
    2. Damp Locations: Use insulating covers specifically designed for the connectors, electrical tape, or heat shrink tubing.
        a. For connections with insulating covers, apply outer covering of moisture sealing electrical tape.
        b. For taped connections, follow same procedure as for dry locations but apply outer covering of moisture sealing electrical tape.
    3. Wet Locations: Use heat shrink tubing.
S. Insulate ends of spare conductors using vinyl insulating electrical tape.
T. Field-Applied Color Coding: Where vinyl color coding electrical tape is used in lieu of integrally colored insulation as permitted in Part 2 under "Color Coding", apply half overlapping turns of tape at each termination and at each location conductors are accessible.
U. Identify conductors and cables in accordance with Section 26 05 53.
V. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.

3.4 FIELD QUALITY CONTROL

A. Inspect and test in accordance with NETA ATS, except Section 4.
B. Perform inspections and tests listed in NETA ATS, Section 7.3.2. The insulation resistance test is required for all conductors. The resistance test for parallel conductors listed as optional is not required.
    1. Disconnect surge protective devices (SPDs) prior to performing any high potential testing. Replace SPDs damaged by performing high potential testing with SPDs connected.
C. Correct deficiencies and replace damaged or defective conductors and cables.

END OF SECTION

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SECTION 26 05 26 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Grounding and bonding requirements.
B. Conductors for grounding and bonding.
C. Connectors for grounding and bonding.
D. Ground bars.
E. Ground rod electrodes.
F. Chemically-enhanced ground electrodes.
G. Ground enhancement material.

1.2 RELATED REQUIREMENTS

A. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables: Additional requirements for conductors for grounding and bonding, including conductor color coding.
B. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.
C. Section 26 56 00 - Exterior Lighting: Additional grounding and bonding requirements for pole-mounted luminaires.

1.3 REFERENCE STANDARDS

A. IEEE 81 - IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Grounding System; 2012.
B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
C. NEMA GR 1 - Grounding Rod Electrodes and Grounding Rod Electrode Couplings; 2022.
D. NETA ATS - Standard for Acceptance Testing Specifications for Electrical Power Equipment And Systems; 2025.
E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
F. NFPA 780 - Standard for the Installation of Lightning Protection Systems; 2026.
G. UL 467 - Grounding and Bonding Equipment; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Verify exact locations of underground metal water service pipe entrances to building.
   2. Coordinate the work with other trades to provide steel reinforcement complying with specified requirements for concrete-encased electrode.
   3. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.
B. Sequencing:
   1. Do not install ground rod electrodes until final backfill and compaction is complete.

1.5 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittals procedures.
B. Product Data: Provide manufacturer's standard catalog pages and data sheets for grounding and bonding system components.
C. Field quality control test reports.

1.6 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 GROUNDING AND BONDING REQUIREMENTS

A. Do not use products for applications other than as permitted by NFPA 70 and product listing.
B. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.
C. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
D. Grounding System Resistance:
    1. Achieve specified grounding system resistance under normally dry conditions unless otherwise approved by Architect. Precipitation within the previous 48 hours does not constitute normally dry conditions.
    2. Grounding Electrode System: Not greater than 25 ohms to ground, when tested according to IEEE 81 using "fall-of-potential" method.
    3. Between Grounding Electrode System and Major Electrical Equipment Frames, System Neutral, and Derived Neutral Points: Not greater than 0.5 ohms, when tested using "point-to-point" methods.
E. Grounding Electrode System:
    1. Provide connection to required and supplemental grounding electrodes indicated to form grounding electrode system.
    2. Metal Underground Water Pipe(s):
        a. Provide connection to underground metal domestic and fire protection (where present) water service pipe(s) that are in direct contact with earth for at least 10 feet at an accessible location not more than 5 feet from the point of entrance to the building.
        b. Provide bonding jumper(s) around insulating joints/pipes as required to make pipe electrically continuous.
        c. Provide bonding jumper around water meter of sufficient length to permit removal of meter without disconnecting jumper.
    3. Provide additional ground electrode(s) as required to achieve specified grounding electrode system resistance.
F. Service-Supplied System Grounding:
    1. For each service disconnect, provide grounding electrode conductor to connect neutral (grounded) service conductor to grounding electrode system. Unless otherwise indicated, make connection at neutral (grounded) bus in service disconnect enclosure.
    2. For each service disconnect, provide main bonding jumper to connect neutral (grounded) bus to equipment ground bus where not factory-installed. Do not make any other connections between neutral (grounded) conductors and ground on load side of service disconnect.
G. Bonding and Equipment Grounding:
    1. Provide bonding for equipment grounding conductors, equipment ground busses, metallic equipment enclosures, metallic raceways and boxes, device grounding terminals, and other normally non-current-carrying conductive materials enclosing electrical conductors/equipment or likely to become energized as indicated and in accordance with NFPA 70.

2. Provide insulated equipment grounding conductor in each feeder and branch circuit raceway. Do not use raceways as sole equipment grounding conductor.
3. Where circuit conductor sizes are increased for voltage drop, increase size of equipment grounding conductor proportionally in accordance with NFPA 70.
4. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
5. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on neutral (grounded) or isolated/insulated ground bus.
6. Provide bonding jumper across expansion or expansion/deflection fittings provided to accommodate conduit movement.
7. Provide bonding for interior metal piping systems in accordance with NFPA 70. This includes, but is not limited to:
   a. Metal water piping where not already effectively bonded to metal underground water pipe used as grounding electrode.
8. Provide bonding for metal building frame.
9. Provide bonding for metal siding not effectively bonded through attachment to metal building frame.

H. Lightning Protection Systems, in Addition to Requirements of Section 26 41 13:
1. Do not use grounding electrode dedicated for lightning protection system for component of building grounding electrode system provided under this section.
2. Provide bonding of building grounding electrode system provided under this section and lightning protection grounding electrode system in accordance with NFPA 70 and NFPA 780.

2.2 GROUNDING AND BONDING COMPONENTS

A. General Requirements:
1. Provide products listed, classified, and labeled as suitable for the purpose intended.
2. Provide products listed and labeled as complying with UL 467 where applicable.

B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 26 05 26:
1. Use insulated copper conductors unless otherwise indicated.
   a. Exceptions:
      1) Use bare copper conductors where installed underground in direct contact with earth.
      2) Use bare copper conductors where directly encased in concrete (not in raceway).
2. Factory Pre-fabricated Bonding Jumpers: Furnished with factory-installed ferrules; size braided cables to provide equivalent gage of specified conductors.

C. Connectors for Grounding and Bonding:
1. Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.
2. Unless otherwise indicated, use exothermic welded connections for underground, concealed and other inaccessible connections.
3. Unless otherwise indicated, use mechanical connectors, compression connectors, or exothermic welded connections for accessible connections.

D. Ground Bars:
1. Description: Copper rectangular ground bars with mounting brackets and insulators.
2. Size: 5/8" diameter X 10' long copper clad ground rod unless otherwise indicated or required.
3. Holes for Connections: As indicated or as required for connections to be made.

E. Ground Rod Electrodes:
1. Comply with NEMA GR 1.
2. Material: Copper-bonded (copper-clad) steel.
3. Size: 5/8 inch diameter by 10 feet length, unless otherwise indicated.

4. Where rod lengths of greater than 10 feet are indicated or otherwise required, sectionalized ground rods may be used.

F. Chemically-Enhanced Ground Electrodes:
   1. Description: Copper tube factory-filled with electrolytic salts designed to provide a low-impedance ground in locations with high soil resistivity; straight (for vertical installations) or L-shaped (for horizontal installations) as indicated or as required.
   2. Length: 10 feet.
   3. Integral Pigtail: Factory-attached, sized not less than grounding electrode conductor to be attached.
   4. Backfill Material: Grounding enhancement material recommended by electrode manufacturer.
   5. Manufacturers:
      a. Advanced Lightning Technology (ALT): www.altfab.com.
      b. Erico International Corporation: www.erico.com.
      c. Harger Lightning & Grounding: www.harger.com.
      d. thermOweld®, subsidiary of Continental Industries; division of Burndy LLC: www.thermoweld.com.
      e. Substitutions: See Section 01 60 00 - Product Requirements.

G. Ground Enhancement Material:
   1. Description: Factory-mixed conductive material designed for permanent and maintenance-free improvement of grounding effectiveness by lowering resistivity.
   2. Resistivity: Not more than 20 ohm-cm in final installed form.
   3. Manufacturers:
      a. Erico International Corporation: www.erico.com.
      b. Harger Lightning & Grounding: www.harger.com.
      c. thermOweld®, subsidiary of Continental Industries; division of Burndy LLC: www.thermoweld.com.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that work likely to damage grounding and bonding system components has been completed.
B. Verify that field measurements are as indicated.
C. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

A. Install products in accordance with manufacturer's instructions.
B. Perform work in accordance with NECA 1 (general workmanship).
C. Ground Rod Electrodes: Unless otherwise indicated, install ground rod electrodes vertically. Where encountered rock prohibits vertical installation, install at 45 degree angle or bury horizontally in trench at least 30 inches (750 mm) deep in accordance with NFPA 70 or provide ground plates.
   1. Outdoor Installations: Unless otherwise indicated, install with top of rod 6 inches below finished grade.
   2. Indoor Installations: Unless otherwise indicated, install with 4 inches of top of rod exposed.
D. Make grounding and bonding connections using specified connectors.
   1. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors. Do not remove conductor strands to facilitate insertion into connector.

2. Remove nonconductive paint, enamel, or similar coating at threads, contact points, and contact surfaces.
3. Exothermic Welds: Make connections using molds and weld material suitable for the items to be connected in accordance with manufacturer's recommendations.
4. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
5. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.

E. Identify grounding and bonding system components in accordance with Section 26 05 53.

3.3 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.
B. Inspect and test in accordance with NETA ATS except Section 4.
C. Perform inspections and tests listed in NETA ATS, Section 7.13.
D. Perform ground electrode resistance tests under normally dry conditions. Precipitation within the previous 48 hours does not constitute normally dry conditions.
E. Investigate and correct deficiencies where measured ground resistances do not comply with specified requirements.
F. Submit detailed reports indicating inspection and testing results and corrective actions taken.

END OF SECTION

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SECTION 26 05 29 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Support and attachment components for equipment, conduit, cable, boxes, and other electrical work.

1.2 RELATED REQUIREMENTS

A. Section 26 05 33.13 - Conduit for Electrical Systems: Additional support and attachment requirements for conduits.
B. Section 26 05 33.16 - Boxes for Electrical Systems: Additional support and attachment requirements for boxes.
C. Section 26 51 00 - Interior Lighting: Additional support and attachment requirements for interior luminaires.
D. Section 26 56 00 - Exterior Lighting: Additional support and attachment requirements for exterior luminaires.

1.3 REFERENCE STANDARDS

A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.
B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
C. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2023.
D. MFMA-4 - Metal Framing Standards Publication; 2004.
E. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
F. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate sizes and arrangement of supports and bases with the actual equipment and components to be installed.
   2. Coordinate the work with other trades to provide additional framing and materials required for installation.
   3. Coordinate compatibility of support and attachment components with mounting surfaces at the installed locations.
   4. Coordinate the arrangement of supports with ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
   5. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.
B. Sequencing:
   1. Do not install products on or provide attachment to concrete surfaces until concrete has fully cured in accordance with Section 03 30 00.

1.5 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's standard catalog pages and data sheets for metal channel (strut) framing systems, non-penetrating rooftop supports, and post-installed concrete and masonry anchors.
C. Installer's Qualifications: Include evidence of compliance with specified requirements.

D. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.

1.6 QUALITY ASSURANCE

A. Comply with NFPA 70.
B. Comply with applicable building code.

PART 2 PRODUCTS

2.1 SUPPORT AND ATTACHMENT COMPONENTS

A. General Requirements:
   1. Provide all required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for the complete installation of electrical work.
   2. Provide products listed, classified, and labeled as suitable for the purpose intended, where applicable.
   3. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for the load to be supported. Include consideration for vibration, equipment operation, and shock loads where applicable.
   4. Do not use products for applications other than as permitted by NFPA 70 and product listing.
   5. Do not use wire, chain, perforated pipe strap, or wood for permanent supports unless specifically indicated or permitted.
   6. Steel Components: Use corrosion resistant materials suitable for the environment where installed.
      a. Indoor Dry Locations: Use zinc-plated steel or approved equivalent unless otherwise indicated.
      b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel, stainless steel, or approved equivalent unless otherwise indicated.
B. Conduit and Cable Supports: Straps, clamps, etc. suitable for the conduit or cable to be supported.
   1. Conduit Straps: One-hole or two-hole type; steel or malleable iron.
   2. Conduit Clamps: Bolted type unless otherwise indicated.
C. Outlet Box Supports: Hangers, brackets, etc. suitable for the boxes to be supported.
D. Metal Channel (Strut) Framing Systems: Factory-fabricated continuous-slot metal channel (strut) and associated fittings, accessories, and hardware required for field-assembly of supports.
   1. Channel Material:
      a. Indoor Dry Locations: Use painted steel, zinc-plated steel, or galvanized steel.
      b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel.
   2. Minimum Channel Thickness: Steel sheet, 12 gage, 0.1046 inch.
   3. Minimum Channel Dimensions: 1-5/8 inch width by 13/16 inch height.
E. Hanger Rods: Threaded zinc-plated steel unless otherwise indicated.
   1. Minimum Size, Unless Otherwise Indicated or Required:
      a. Equipment Supports: 1/2 inch diameter.
      b. Single Conduit up to 1 inch (27 mm) trade size: 1/4 inch diameter.
      c. Single Conduit larger than 1 inch (27 mm) trade size: 3/8 inch diameter.
      d. Trapeze Support for Multiple Conduits: 3/8 inch diameter.
      e. Outlet Boxes: 1/4 inch diameter.
      f. Luminaires: 1/4 inch diameter.
F. Anchors and Fasteners:

1. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.
2. Plastic and lead anchors are not permitted.
3. Hammer-driven anchors and fasteners are not permitted.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that field measurements are as indicated.
B. Verify that mounting surfaces are ready to receive support and attachment components.
C. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

A. Install products in accordance with manufacturer's instructions.
B. Perform work in accordance with NECA 1 (general workmanship).
C. Install anchors and fasteners in accordance with ICC Evaluation Services, LLC (ICC-ES) evaluation report conditions of use where applicable.
D. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
E. Unless specifically indicated or approved by Architect, do not provide support from suspended ceiling support system or ceiling grid.
F. Unless specifically indicated or approved by Architect, do not provide support from roof deck.
G. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.
H. Field-Welding (where approved by Architect): Comply with Section 05 50 00.
I. Equipment Support and Attachment:
   1. Use metal fabricated supports or supports assembled from metal channel (strut) to support equipment as required.
   2. Use metal channel (strut) secured to studs to support equipment surface-mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
   3. Use metal channel (strut) to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
J. Conduit Support and Attachment: Also comply with Section 26 05 33.13.
K. Box Support and Attachment: Also comply with Section 26 05 33.16.
L. Interior Luminaire Support and Attachment: Also comply with Section 26 51 00.
M. Exterior Luminaire Support and Attachment: Also comply with Section 26 56 00.
N. Secure fasteners according to manufacturer's recommended torque settings.
O. Remove temporary supports.

3.3 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.
B. Inspect support and attachment components for damage and defects.
C. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.
D. Correct deficiencies and replace damaged or defective support and attachment components.

END OF SECTION

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SECTION 26 05 33.13 - CONDUIT FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Galvanized steel rigid metal conduit (RMC).
B. Intermediate metal conduit (IMC).
C. Flexible metal conduit (FMC).
D. Liquidtight flexible metal conduit (LFMC).
E. Electrical metallic tubing (EMT).
F. Rigid polyvinyl chloride (PVC) conduit.
G. Electrical nonmetallic tubing (ENT).
H. Reinforced thermosetting resin conduit (RTRC).
I. Conduit fittings.
J. Accessories.

1.2 RELATED REQUIREMENTS

A. Section 07 84 00 - Firestopping.
B. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables: Metal clad cable (Type MC), armored cable (Type AC), and manufactured wiring systems, including uses permitted.
C. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
    1. Includes additional requirements for fittings for grounding and bonding.
D. Section 26 05 29 - Hangers and Supports for Electrical Systems.
E. Section 26 05 33.16 - Boxes for Electrical Systems.
F. Section 26 05 33.16 - Boxes for Electrical Systems.
G. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.
H. Section 26 21 00 - Low-Voltage Electrical Service Entrance: Additional requirements for electrical service conduits.

1.3 REFERENCE STANDARDS

A. ANSI C80.1 - American National Standard for Electrical Rigid Steel Conduit (ERSC); 2020.
B. ANSI C80.3 - American National Standard for Electrical Metallic Tubing -- Steel (EMT-S); 2020.
C. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
D. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT); 2020.
E. NECA 111 - Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC); 2017.
F. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2014.
G. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Conduit; 2020.
H. NEMA TC 3 - Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing; 2021.
I. NEMA BI 50058 - Electrical Nonmetallic Tubing (ENT); 2014 (Reaffirmed 2019).
J. NEMA TC 14 (SERIES) - Reinforced Thermosetting Resin Conduit and Fittings Series; 2015.
K. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
L. UL 1 - Flexible Metal Conduit; Current Edition, Including All Revisions.
M. UL 6 - Electrical Rigid Metal Conduit-Steel; Current Edition, Including All Revisions.
N. UL 360 - Liquid-Tight Flexible Metal Conduit; Current Edition, Including All Revisions.

O. UL 514B - Conduit, Tubing, and Cable Fittings; Current Edition, Including All Revisions.
P. UL 651 - Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings; Current Edition, Including All Revisions.
Q. UL 797 - Electrical Metallic Tubing-Steel; Current Edition, Including All Revisions.
R. UL 1203 - Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations; Current Edition, Including All Revisions.
S. UL 1242 - Electrical Intermediate Metal Conduit-Steel; Current Edition, Including All Revisions.
T. UL 1653 - Electrical Nonmetallic Tubing; Current Edition, Including All Revisions.
U. UL 1660 - Liquid-Tight Flexible Nonmetallic Conduit; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate minimum sizes of conduits with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
   2. Coordinate the arrangement of conduits with structural members, ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
   3. Verify exact conduit termination locations required for boxes, enclosures, and equipment installed under other sections or by others.
   4. Coordinate the work with other trades to provide roof penetrations that preserve the integrity of the roofing system and do not void the roof warranty.
   5. Notify Architect/Engineer of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.
B. Sequencing:
   1. Do not begin installation of conductors and cables until installation of conduit is complete between outlet, junction and splicing points.

1.5 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittals procedures.
B. Product Data: Provide manufacturer's standard catalog pages and data sheets for conduits and fittings.
C. Project Record Documents: Record actual routing for conduits installed underground, conduits embedded within concrete slabs, and conduits 2 inch (53 mm) trade size and larger.

1.6 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store conduit and fittings in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 CONDUIT APPLICATIONS

A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70 and product listing.
B. Unless otherwise indicated and where not otherwise restricted, use the conduit types indicated for the specified applications. Where more than one listed application applies, comply with the most restrictive requirements. Where conduit type for a particular application is not specified, use galvanized steel rigid metal conduit.
C. Underground:
   1. Under Slab on Grade: Use rigid PVC conduit.
   2. Exterior, Direct-Buried: Use rigid PVC conduit.

3. Exterior, Embedded Within Concrete: Use galvanized steel rigid metal conduit, intermediate metallic conduit (IMC), PVC-coated galvanized steel rigid metal conduit, rigid PVC conduit, or reinforced thermosetting resin conduit (RTRC).
4. Where rigid polyvinyl (PVC) conduit is provided, transition to galvanized steel rigid metal conduit where emerging from underground.
5. Where rigid polyvinyl (PVC) conduit larger than 2 inch (53 mm) trade size is provided, use galvanized steel rigid metal conduit elbows for bends.
6. Where steel conduit is installed in direct contact with earth where soil has a resistivity of less than 2000 ohm-centimeters or is characterized as severely corrosive based on soils report or local experience, use corrosion protection tape to provide supplementary corrosion protection or use PVC-coated galvanized steel rigid metal conduit.
7. Where steel conduit emerges from concrete into soil, use corrosion protection tape to provide supplementary corrosion protection for a minimum of 4 inches on either side of where conduit emerges or use PVC-coated galvanized steel rigid metal conduit.

D. Embedded Within Concrete:
1. Within Slab on Grade (within structural slabs only where approved by Structural Engineer): Use rigid PVC conduit.
2. Within Slab Above Ground (within structural slabs only where approved by Structural Engineer): Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), PVC-coated galvanized steel rigid metal conduit, rigid PVC conduit, or reinforced thermosetting resin conduit (RTRC).
3. Where rigid polyvinyl (PVC) conduit is provided, transition to galvanized steel rigid metal conduit where emerging from concrete.

E. Concealed Within Hollow Stud Walls: Use FMC or Nonmetallic sheathed cable. Where nonmetallic sheathed cables pass through factory or field punched holes in metal studs the cable shall be protedted with listed grobushings or grommets cover all metal edges and securley fastened in the opening..

F. Concealed Above Accessible Ceilings: Use FMC (Flexible Metal Conduit).

G. Interior, Damp or Wet Locations: Use galvanized steel rigid metal conduit.

H. Exposed, Interior, Not Subject to Physical Damage: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), or electrical metallic tubing (EMT).

I. Exposed, Interior, Subject to Physical Damage: Use galvanized steel rigid metal conduit or intermediate metal conduit (IMC).
1. Locations subject to physical damage include, but are not limited to:
a. Where exposed below 8 feet, except within electrical and communication rooms or closets.

J. Exposed, Exterior: Use galvanized steel rigid metal conduit or intermediate metal conduit (IMC).

K. Concealed, Exterior, Not Embedded in Concrete or in Contact With Earth: Use galvanized steel rigid metal conduit or intermediate metal conduit (IMC).

L. Corrosive Locations Above Ground: Use PVC-coated galvanized steel rigid metal conduit, aluminum rigid metal conduit, or reinforced thermosetting resin conduit (RTRC).

M. Hazardous (Classified) Locations: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), aluminum rigid metal conduit, or PVC-coated galvanized steel rigid metal conduit.

N. Connections to Luminaires Above Accessible Ceilings: Use flexible metal conduit.

O. Connections to Vibrating Equipment:
1. Dry Locations: Use flexible metal conduit.
2. Damp, Wet, or Corrosive Locations: Use liquidtight flexible metal conduit.
3. Maximum Length: 6 feet unless otherwise indicated.

4. Vibrating equipment includes, but is not limited to:
    a. Transformers.
    b. Motors.
    c. HVAC.

P. Fished in Existing Walls, Where Necessary: Use flexible metal conduit.

2.2 CONDUIT REQUIREMENTS

A. Existing Work: Where existing conduits are indicated to be reused, they may be reused only where they comply with specified requirements, are free from corrosion, and integrity is verified by pulling a mandrel through them.
B. Electrical Service Conduits: Also comply with Section 26 21 00.
C. Fittings for Grounding and Bonding: Also comply with Section 26 05 26.
D. Provide all conduit, fittings, supports, and accessories required for a complete raceway system.
E. Provide products listed, classified, and labeled as suitable for the purpose intended.
F. Minimum Conduit Size, Unless Otherwise Indicated:
    1. Branch Circuits: 1/2 inch (16 mm) trade size.
    2. Branch Circuit Homeruns: 3/4 inch (21 mm) trade size.
    3. Control Circuits: 1/2 inch (16 mm) trade size.
    4. Flexible Connections to Luminaires: 3/8 inch (12 mm) trade size.
    5. Underground, Interior: 3/4 inch (21 mm) trade size.
    6. Underground, Exterior: 1 inch (27 mm) trade size.
G. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

2.3 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

A. Manufacturers:
    1. Allied Tube & Conduit: www.alliedeg.com.
    2. Republic Conduit: www.republic-conduit.com/#sle.
    3. Wheatland Tube Company: www.wheatland.com/#sle.
    4. Substitutions: Submit Manufacture's Data Sheet for Approval..
B. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.
C. Fittings:
    1. Manufacturers:
        a. Bridgeport Fittings Inc: www.bptfittings.com/#sle.
        b. O-Z/Gedney, a brand of Emerson Industrial Automation: www.emersonindustrial.com/#sle.
        c. Thomas & Betts Corporation: www.tnb.com/#sle.
        d. Substitutions: Submit Manufacture's Data Sheet for Approval..
    2. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
    3. Hazardous (Classified) Locations: Use fittings listed and labeled as complying with UL 1203 for the classification of the installed location.
    4. Material: Use steel or malleable iron.
        a. Do not use die cast zinc fittings.
    5. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.4 INTERMEDIATE METAL CONDUIT (IMC)

A. Manufacturers:
    1. Allied Tube & Conduit: www.alliedeg.com/#sle.
    2. Republic Conduit: www.republic-conduit.com/#sle.

3. Wheatland Tube Company: www.wheatland.com/#sle.
4. Substitutions: Submit Manufacture's Data Sheet for Approval..

B. Description: NFPA 70, Type IMC galvanized steel intermediate metal conduit complying with ANSI C80.6 and listed and labeled as complying with UL 1242.

C. Fittings:
1. Manufacturers:
a. Bridgeport Fittings Inc: www.bptfittings.com/#sle.
b. O-Z/Gedney, a brand of Emerson Industrial Automation: www.emersonindustrial.com/#sle.
c. Thomas & Betts Corporation: www.tnb.com/#sle.
d. Substitutions: Not permitted.
e. Substitutions: Not permitted.
2. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
3. Hazardous (Classified) Locations: Use fittings listed and labeled as complying with UL 1203 for the classification of the installed location.
4. Material: Use steel or malleable iron.
a. Do not use die cast zinc fittings.
5. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.5 FLEXIBLE METAL CONDUIT (FMC)

A. Manufacturers:
1. AFC Cable Systems, Inc: www.afcweb.com.
2. Electri-Flex Company: www.electriflex.com.
3. International Metal Hose: www.metalhose.com.
4. Substitutions: Submit Manufacture's Data Sheet for Approval..

B. Description: NFPA 70, Type FMC standard wall steel flexible metal conduit listed and labeled as complying with UL 1, and listed for use in classified firestop systems to be used.

C. Fittings:
1. Manufacturers:
a. Bridgeport Fittings Inc: www.bptfittings.com/#sle.
b. O-Z/Gedney, a brand of Emerson Industrial Automation: www.emersonindustrial.com/#sle.
c. Thomas & Betts Corporation: www.tnb.com/#sle.
d. Substitutions: Submit Manufacture's Data Sheet for Approval..
2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
3. Material: Use steel or malleable iron.
a. Do not use die cast zinc fittings.

2.6 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)

A. Manufacturers:
1. AFC Cable Systems, Inc: www.afcweb.com.
2. Electri-Flex Company: www.electriflex.com.
3. International Metal Hose: www.metalhose.com.
4. Substitutions: Submit Manufacture's Data Sheet for Approval..

B. Description: NFPA 70, Type LFMC polyvinyl chloride (PVC) jacketed steel flexible metal conduit listed and labeled as complying with UL 360.

C. Fittings:
1. Manufacturers:
a. Bridgeport Fittings Inc: www.bptfittings.com/#sle.

b. O-Z/Gedney, a brand of Emerson Industrial Automation: www.emersonindustrial.com/#sle.
c. Thomas & Betts Corporation: www.tnb.com/#sle.
d. Substitutions: Submit Manufacture's Data Sheet for Approval..

2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
3. Material: Use steel or malleable iron.
   a. Do not use die cast zinc fittings.

2.7 ELECTRICAL METALLIC TUBING (EMT)

A. Manufacturers:
   1. Allied Tube & Conduit: www.alliedeg.com.
   2. Republic Conduit: www.republic-conduit.com/#sle.
   3. Wheatland Tube Company: www.wheatland.com.
   4. Substitutions: Submit Manufacture's Data Sheet for Approval..
B. Description: NFPA 70, Type EMT steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.
C. Fittings:
   1. Manufacturers:
      a. Bridgeport Fittings Inc: www.bptfittings.com/#sle.
      b. O-Z/Gedney, a brand of Emerson Industrial Automation: www.emersonindustrial.com/#sle.
      c. Thomas & Betts Corporation: www.tnb.com/#sle.
      d. Substitutions: Submit Manufacture's Data Sheet for Approval..
   2. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   3. Material: Use steel or malleable iron.
      a. Do not use die cast zinc fittings.
   4. Connectors and Couplings: Use compression (gland) or set-screw type.
      a. Do not use indenter type connectors and couplings.
   5. Damp or Wet Locations (where permitted): Use fittings listed for use in wet locations.
   6. Embedded Within Concrete (where permitted): Use fittings listed as concrete-tight. Fittings that require taping to be concrete-tight are acceptable.

2.8 RIGID POLYVINYL CHLORIDE (PVC) CONDUIT

A. Manufacturers:
   1. Cantex Inc: www.cantexinc.com/#sle.
   2. Carlon, a brand of Thomas & Betts Corporation: www.carlon.com/#sle.
   3. JM Eagle: www.jmeagle.com/#sle.
   4. Substitutions: Submit Manufacture's Data Sheet for Approval..
B. Description: NFPA 70, Type PVC rigid polyvinyl chloride conduit complying with NEMA TC 2 and listed and labeled as complying with UL 651; Schedule 40 unless otherwise indicated, Schedule 80 where subject to physical damage; rated for use with conductors rated 90 degrees C.
C. Fittings:
   1. Manufacturer: Same as manufacturer of conduit to be connected.
   2. Description: Fittings complying with NEMA TC 3 and listed and labeled as complying with UL 651; material to match conduit.

2.9 REINFORCED THERMOSETTING RESIN CONDUIT (RTRC)

A. Description: NFPA 70, Type RTRC reinforced thermosetting resin conduit complying with NEMA TC 14 (SERIES).
B. Supports: Per manufacturer's recommendations.

C. Fittings: Same type and manufacturer as conduit to be connected.

2.10 ACCESSORIES

A. Corrosion Protection Tape: PVC-based, minimum thickness of 20 mil.
   1. Substitutions: See Section 01 60 00 - Product Requirements.
B. Conduit Joint Compound: Corrosion-resistant, electrically conductive; suitable for use with the conduit to be installed.
   1. Substitutions: Submit Manufacture's Data Sheet for Approval..
C. Solvent Cement for PVC Conduit and Fittings: As recommended by manufacturer of conduit and fittings to be installed.
D. Epoxy Adhesive for RTRC Conduit and Fittings: As recommended by manufacturer of conduit and fittings to be installed.
E. Pull Strings: Use nylon cord with average breaking strength of not less than 200 pound-force.
F. Sealing Compound for Sealing Fittings: Listed for use with the particular fittings to be installed.
G. Modular Seals for Conduit Penetrations: Rated for minimum of 40 psig; Suitable for the conduits to be installed.
   1. Substitutions: Submit Manufacture's Data Sheet for Approval..

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that field measurements are as indicated.
B. Verify that mounting surfaces are ready to receive conduits.
C. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

A. Install products in accordance with manufacturer's instructions.
B. Perform work in accordance with NECA 1 (general workmanship).
C. Install galvanized steel rigid metal conduit (RMC) in accordance with NECA 101.
D. Install aluminum rigid metal conduit (RMC) in accordance with NECA 102.
E. Install intermediate metal conduit (IMC) in accordance with NECA 101.
F. Install rigid polyvinyl chloride (PVC) conduit in accordance with NECA 111.
G. Install electrical nonmetallic tubing (ENT) in accordance with NECA 111.
H. Conduit Routing:
   1. Unless dimensioned, conduit routing indicated is diagrammatic.
   2. When conduit destination is indicated without specific routing, determine exact routing required.
   3. Conceal all conduits unless specifically indicated to be exposed.
   4. Conduits in the following areas may be exposed, unless otherwise indicated:
      a. Electrical rooms.
      b. Mechanical equipment rooms.
      c. Within joists in areas with no ceiling.
   5. Unless otherwise approved, do not route conduits exposed:
      a. Across floors.
      b. Across roofs.
      c. Across top of parapet walls.
      d. Across building exterior surfaces.
   6. Conduits installed underground or embedded in concrete may be routed in the shortest possible manner unless otherwise indicated. Route all other conduits parallel or perpendicular to building structure and surfaces, following surface contours where practical.
   7. Arrange conduit to maintain adequate headroom, clearances, and access.

8. Arrange conduit to provide no more than the equivalent of four 90 degree bends between pull points.
9. Arrange conduit to provide no more than 150 feet between pull points.
10. Route conduits above water and drain piping where possible.
11. Arrange conduit to prevent moisture traps. Provide drain fittings at low points and at sealing fittings where moisture may collect.
12. Maintain minimum clearance of 6 inches between conduits and piping for other systems.
13. Maintain minimum clearance of 12 inches between conduits and hot surfaces. This includes, but is not limited to:
    a. Heaters.
    b. Hot water piping.
14. Group parallel conduits in the same area together on a common rack.

I. Conduit Support:
1. Secure and support conduits in accordance with NFPA 70 and Section 26 05 29 using suitable supports and methods approved by the authority having jurisdiction.
2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
3. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conduits to lay on ceiling tiles.
4. Use conduit strap to support single surface-mounted conduit.
    a. Use clamp back spacer with conduit strap for damp and wet locations to provide space between conduit and mounting surface.
5. Use metal channel (strut) with accessory conduit clamps to support multiple parallel surface-mounted conduits.
6. Use conduit clamp to support single conduit from beam clamp or threaded rod.
7. Use trapeze hangers assembled from threaded rods and metal channel (strut) with accessory conduit clamps to support multiple parallel suspended conduits.
8. Use of spring steel conduit clips for support of conduits is not permitted.
9. Where conduit support intervals specified in NFPA 70 and NECA standards differ, comply with the most stringent requirements.

J. Connections and Terminations:
1. Use approved zinc-rich paint or conduit joint compound on field-cut threads of galvanized steel conduits prior to making connections.
2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.
3. Use suitable adapters where required to transition from one type of conduit to another.
4. Provide drip loops for liquidtight flexible conduit connections to prevent drainage of liquid into connectors.
5. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.
6. Where spare conduits stub up through concrete floors and are not terminated in a box or enclosure, provide threaded couplings equipped with threaded plugs set flush with finished floor.
7. Provide insulating bushings or insulated throats at all conduit terminations to protect conductors.
8. Secure joints and connections to provide maximum mechanical strength and electrical continuity.

K. Penetrations:
1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.
2. Make penetrations perpendicular to surfaces unless otherwise indicated.
3. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.

4. Conceal bends for conduit risers emerging above ground.
5. Seal interior of conduits entering the building from underground at first accessible point to prevent entry of moisture and gases.
6. Provide suitable modular seal where conduits penetrate exterior wall below grade.
7. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.
8. Provide metal escutcheon plates for conduit penetrations exposed to public view.
9. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 84 00.

L. Underground Installation:
   1. Minimum Cover, Unless Otherwise Indicated or Required:
      a. Underground, Exterior: 24 inches.
      b. Under Slab on Grade: 12 inches to bottom of slab.
   2. Provide underground warning tape in accordance with Section 26 05 53 along entire conduit length for service entrance where not concrete-encased.

M. Conduit Movement Provisions: Where conduits are subject to movement, provide expansion and expansion/deflection fittings to prevent damage to enclosed conductors or connected equipment. This includes, but is not limited to:
   1. Where conduits cross structural joints intended for expansion, contraction, or deflection.
   2. Where calculated in accordance with NFPA 70 for rigid polyvinyl chloride (PVC) conduit installed above ground to compensate for thermal expansion and contraction.
   3. Where calculated in accordance with NFPA 70 for reinforced thermosetting resin conduit (RTRC) conduit installed above ground to compensate for thermal expansion and contraction.
   4. Where conduits are subject to earth movement by settlement or frost.

N. Provide pull string in all empty conduits and in conduits where conductors and cables are to be installed by others. Leave minimum slack of 12 inches at each end.

O. Provide grounding and bonding in accordance with Section 26 05 26.

3.3 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.

B. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.

C. Where coating of PVC-coated galvanized steel rigid metal conduit (RMC) contains cuts or abrasions, repair in accordance with manufacturer's instructions.

D. Correct deficiencies and replace damaged or defective conduits.

3.4 CLEANING

A. Clean interior of conduits to remove moisture and foreign matter.

3.5 PROTECTION

A. Immediately after installation of conduit, use suitable manufactured plugs to provide protection from entry of moisture and foreign material and do not remove until ready for installation of conductors.

END OF SECTION

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SECTION 26 05 33.16 - BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Outlet and device boxes up to 100 cubic inches, including those used as junction and pull boxes.
B. Cabinets and enclosures, including junction and pull boxes larger than 100 cubic inches.
C. Boxes for hazardous (classified) locations.
D. Floor boxes.
E. Underground boxes/enclosures.

1.2 RELATED REQUIREMENTS

A. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
B. Section 26 05 29 - Hangers and Supports for Electrical Systems.
C. Section 26 05 33.13 - Conduit for Electrical Systems:
    1. Conduit bodies and other fittings.
    2. Additional requirements for locating boxes to limit conduit length and/or number of bends between pulling points.
D. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.
E. Section 26 27 26 - Wiring Devices:
    1. Wall plates.
    2. Floor box service fittings.
    3. Poke-through assemblies.
    4. Access floor boxes.
    5. Additional requirements for locating boxes for wiring devices.

1.3 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
B. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2016.
C. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2014.
D. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports; 2013 (Reaffirmed 2020).
E. NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports; 2013 (Reaffirmed 2020).
F. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.
G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
H. SCTE 77 - Specifications for Underground Enclosure Integrity; 2023.
I. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.
J. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.
K. UL 514A - Metallic Outlet Boxes; Current Edition, Including All Revisions.
L. UL 514C - Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers; Current Edition, Including All Revisions.
M. UL 1203 - Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.
   2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
   3. Coordinate minimum sizes of boxes with the actual installed arrangement of conductors, clamps, support fittings, and devices, calculated according to NFPA 70.
   4. Coordinate minimum sizes of pull boxes with the actual installed arrangement of connected conduits, calculated according to NFPA 70.
   5. Coordinate the placement of boxes with millwork, furniture, devices, equipment, etc. installed under other sections or by others.
   6. Coordinate the work with other trades to preserve insulation integrity.
   7. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted boxes where indicated.
   8. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.5 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. All boxes and cabinets shall be steel. Do not use plastic boxes.
C. Maintenance Materials: Furnish the following for OWNER's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Keys for Lockable Enclosures: Two of each different key.

1.6 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 BOXES

A. General Requirements:
   1. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.
   2. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.
   3. Provide products listed, classified, and labeled as suitable for the purpose intended.
   4. Where box size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
   5. Provide grounding terminals within boxes where equipment grounding conductors terminate.
B. Outlet and Device Boxes Up to 100 cubic inches, Including Those Used as Junction and Pull Boxes:
   1. Use sheet-steel boxes for dry locations unless otherwise indicated or required.
   2. Use cast iron boxes or cast aluminum boxes for damp or wet locations unless otherwise indicated or required; furnish with compatible weatherproof gasketed covers.
   3. Use cast iron boxes or cast aluminum boxes where exposed galvanized steel rigid metal conduit or exposed intermediate metal conduit (IMC) is used.
   4. Use cast aluminum boxes where aluminum rigid metal conduit is used.
   5. Use suitable concrete type boxes where flush-mounted in concrete.

6. Use suitable masonry type boxes where flush-mounted in masonry walls.
7. Use raised covers suitable for the type of wall construction and device configuration where required.
8. Use shallow boxes where required by the type of wall construction.
9. Do not use "through-wall" boxes designed for access from both sides of wall.
10. Sheet-Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL 514A.
11. Cast Metal Boxes: Comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs.
12. Boxes for Supporting Luminaires and Ceiling Fans: Listed as suitable for the type and weight of load to be supported; furnished with fixture stud to accommodate mounting of luminaire where required.
13. Boxes for Ganged Devices: Use multigang boxes of single-piece construction. Do not use field-connected gangable boxes.
14. Minimum Box Size, Unless Otherwise Indicated:
    a. Wiring Devices (Other Than Communications Systems Outlets): 4 inch square by 1-1/2 inch deep (100 by 38 mm) trade size.
    b. Communications Systems Outlets: Comply with Section 27 10 00.
    c. Ceiling Outlets: 4 inch octagonal or square by 1-1/2 inch deep (100 by 38 mm) trade size.
15. Wall Plates: Comply with Section 26 27 26.
16. Manufacturers:
    a. Cooper Crouse-Hinds, a division of Eaton Corporation: www.cooperindustries.com.
    b. Hubbell Incorporated; Bell Products: www.hubbell-rtb.com.
    c. Hubbell Incorporated; RACO Products: www.hubbell-rtb.com.
    d. O-Z/Gedney, a brand of Emerson Industrial Automation: www.emersonindustrial.com.
    e. Thomas & Betts Corporation: www.tnb.com.
    f. Substitutions: See Section 01 60 00 - Product Requirements.

C. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches:
1. Comply with NEMA EN 10250, and list and label as complying with UL 50 and UL 50E, or UL 508A.
2. NEMA EN 10250 Environment Type, Unless Otherwise Indicated:
    a. Indoor Clean, Dry Locations: Type 1, painted steel.
    b. Outdoor Locations: Type 3R, painted steel.
3. Junction and Pull Boxes Larger Than 100 cubic inches:
    a. Provide screw-cover or hinged-cover enclosures unless otherwise indicated.
4. Cabinets and Hinged-Cover Enclosures, Other Than Junction and Pull Boxes:
    a. Provide lockable hinged covers, all locks keyed alike unless otherwise indicated.
    b. Back Panels: Painted steel, removable.
    c. Terminal Blocks: Provide voltage/current ratings and terminal quantity suitable for purpose indicated, with 25 percent spare terminal capacity.
5. Finish for Painted Steel Enclosures: Manufacturer's standard grey unless otherwise indicated.
6. Manufacturers:
    a. Cooper B-Line, a division of Eaton Corporation: www.cooperindustries.com.
    b. Hoffman, a brand of Pentair Technical Products: www.hoffmanonline.com.
    c. Hubbell Incorporated; Wiegmann Products: www.hubbell-wiegmann.com.
    d. Substitutions: See Section 01 60 00 - Product Requirements.

D. Boxes for Hazardous (Classified) Locations: Listed and labeled as complying with UL 1203 for the classification of the installed location.
1. Manufacturers:
    a. Appleton, a brand of Emerson Industrial Automation: www.emersonindustrial.com.

b. Cooper Crouse-Hinds, a division of Eaton Corporation: www.cooperindustries.com.
c. Hubbell Incorporated; Killark Products: www.hubbell-killark.com.
d. Substitutions: See Section 01 60 00 - Product Requirements.

E. Floor Boxes:
1. Description: Floor boxes compatible with floor box service fittings provided in accordance with Section 26 27 26; with partitions to separate multiple services; furnished with all components, adapters, and trims required for complete installation.
2. Use cast iron floor boxes within slab on grade.
3. Use sheet-steel or cast iron floor boxes within slab above grade.
4. Metallic Floor Boxes: Fully adjustable (with integral means for leveling adjustment prior to and after concrete pour).
5. Manufacturer: Same as manufacturer of floor box service fittings.

F. Underground Boxes/Enclosures:
1. Description: In-ground, open bottom boxes furnished with flush, non-skid covers with legend indicating type of service and stainless steel tamper resistant cover bolts.
2. Size: As indicated on drawings.
3. Depth: As required to extend below frost line to prevent frost upheaval, but not less than 12 inches.
4. Provide logo on cover to indicate type of service.
5. Applications:
a. Sidewalks and Landscaped Areas Subject Only to Occasional Nondeliberate Vehicular Traffic: Use polymer concrete enclosures, with minimum SCTE 77 Tier 8 load rating.
b. Parking Lots, in Areas Subject Only To Occasional Nondeliberate Vehicular Traffic: Use polymer concrete enclosures, with minimum SCTE 77 Tier 15 load rating.
c. Do not use polymer concrete enclosures in areas subject to deliberate vehicular traffic.
6. Polymer Concrete Underground Boxes/Enclosures: Comply with SCTE 77.
a. Manufacturers:
1) Highline Products, a subsidiary of MacLean Power Systems: www.highlineproducts.com.
2) Hubbell Incorporated; Quazite Products: www.hubbellpowersystems.com.
3) Oldcastle Precast, Inc: www.oldcastleprecast.com.
4) Substitutions: See Section 01 60 00 - Product Requirements.
b. Combination fiberglass/polymer concrete boxes/enclosures are acceptable.
c. Product(s):
1) MacLean Highline PHA Series: Straight wall, all-polymer concrete splice box/pull box; available Tier 8, Tier 15, and Tier 22 load ratings.
2) MacLean Highline CHA Series: Fiberglass/polymer concrete splice box/pull box; available Tier 8 and Tier 15 load ratings.
3) MacLean Highline CVA Series: Fiberglass/polymer concrete splice vault; available Tier 8, Tier 15, and Tier 22 load ratings.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that field measurements are as indicated.
B. Verify that mounting surfaces are ready to receive boxes.
C. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install boxes in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards where mounting heights are not indicated.
C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
D. Provide separate boxes for emergency power and normal power systems.
E. Unless otherwise indicated, provide separate boxes for line voltage and low voltage systems.
F. Flush-mount boxes in finished areas unless specifically indicated to be surface-mounted.
G. Unless otherwise indicated, boxes may be surface-mounted where exposed conduits are indicated or permitted.
H. Box Locations:
    1. Locate boxes to be accessible. Provide access panels in accordance with Section 08 31 00 as required where approved by the Architect.
    2. Unless dimensioned, box locations indicated are approximate.
    3. Locate boxes as required for devices installed under other sections or by others.
        a. Switches, Receptacles, and Other Wiring Devices: Comply with Section 26 27 26.
        b. Communications Systems Outlets: Comply with Section 27 10 00.
    4. Locate boxes so that wall plates do not span different building finishes.
    5. Locate boxes so that wall plates do not cross masonry joints.
    6. Unless otherwise indicated, where multiple outlet boxes are installed at the same location at different mounting heights, install along a common vertical center line.
    7. Do not install flush-mounted boxes on opposite sides of walls back-to-back. Provide minimum 6 inches horizontal separation unless otherwise indicated.
    8. Acoustic-Rated Walls: Do not install flush-mounted boxes on opposite sides of walls back-to-back; provide minimum 24 inches horizontal separation.
    9. Fire Resistance Rated Walls: Install flush-mounted boxes such that the required fire resistance will not be reduced.
        a. Do not install flush-mounted boxes on opposite sides of walls back-to-back; provide minimum 24 inches separation where wall is constructed with individual noncommunicating stud cavities or protect both boxes with listed putty pads.
        b. Do not install flush-mounted boxes with area larger than 16 square inches or such that the total aggregate area of openings exceeds 100 square inches for any 100 square feet of wall area.
    10. Locate junction and pull boxes as indicated, as required to facilitate installation of conductors, and to limit conduit length and/or number of bends between pulling points in accordance with Section 26 05 33.13.
    11. Locate junction and pull boxes in the following areas, unless otherwise indicated or approved by the Architect:
        a. Concealed above accessible suspended ceilings.
        b. Within joists in areas with no ceiling.
        c. Electrical rooms.
        d. Mechanical equipment rooms.
I. Box Supports:
    1. Secure and support boxes in accordance with NFPA 70 and Section 26 05 29 using suitable supports and methods approved by the authority having jurisdiction.
    2. Provide independent support from building structure except for cast metal boxes (other than boxes used for fixture support) supported by threaded conduit connections in accordance with NFPA 70. Do not provide support from piping, ductwork, or other systems.
    3. Installation Above Suspended Ceilings: Do not provide support from ceiling grid or ceiling support system.

4. Use far-side support to secure flush-mounted boxes supported from single stud in hollow stud walls. Repair or replace supports for boxes that permit excessive movement.

J. Install boxes plumb and level.

K. Flush-Mounted Boxes:
1. Install boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that front edge of box or associated raised cover is not set back from finished surface more than 1/4 inch or does not project beyond finished surface.
2. Install boxes in combustible materials such as wood so that front edge of box or associated raised cover is flush with finished surface.
3. Repair rough openings around boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that there are no gaps or open spaces greater than 1/8 inch at the edge of the box.

L. Floor-Mounted Cabinets: Mount on properly sized 3 inch high concrete pad constructed in accordance with Section 03 30 00.

M. Install boxes as required to preserve insulation integrity.

N. Metallic Floor Boxes: Install box level at the proper elevation to be flush with finished floor.

O. Nonmetallic Floor Boxes: Cut box flush with finished floor after concrete pour.

P. Underground Boxes/Enclosures:
1. Install enclosure on gravel base, minimum 6 inches deep.
2. Flush-mount enclosures located in concrete or paved areas.
3. Mount enclosures located in landscaped areas with top at 1 inch above finished grade.
4. Provide cast-in-place concrete collar constructed in accordance with Section 03 30 00, minimum 10 inches wide by 12 inches deep, around enclosures that are not located in concrete areas.
5. Install additional bracing inside enclosures in accordance with manufacturer's instructions to minimize box sidewall deflections during backfilling. Backfill with cover bolted in place.

Q. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.

R. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 84 00.

S. Close unused box openings.

T. Install blank wall plates on junction boxes and on outlet boxes with no devices or equipment installed or designated for future use.

U. Provide grounding and bonding in accordance with Section 26 05 26.

3.3 CLEANING

A. Clean interior of boxes to remove dirt, debris, plaster and other foreign material.

3.4 PROTECTION

A. Immediately after installation, protect boxes from entry of moisture and foreign material until ready for installation of conductors.

END OF SECTION

SECTION 26 05 53 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Electrical identification requirements.
B. Identification nameplates and labels.
C. Wire and cable markers.
D. Voltage markers.
E. Underground warning tape.
F. Warning signs and labels.

1.2 RELATED REQUIREMENTS

A. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables: Color coding for power conductors and cables 600 V and less; vinyl color coding electrical tape.
B. Section 27 10 00 - Structured Cabling: Identification for communications cabling and devices.

1.3 REFERENCE STANDARDS

A. ANSI Z535.2 - American National Standard for Environmental and Facility Safety Signs; 2023.
B. ANSI Z535.4 - American National Standard for Product Safety Signs and Labels; 2011.
C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
D. UL 969 - Marking and Labeling Systems; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
    1. Verify final designations for equipment, systems, and components to be identified prior to fabrication of identification products.
B. Sequencing:
    1. Do not conceal items to be identified, in locations such as above suspended ceilings, until identification products have been installed.
    2. Do not install identification products until final surface finishes and painting are complete.

1.5 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittals procedures.

1.6 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

1.7 FIELD CONDITIONS

A. Do not install adhesive products when ambient temperature is lower than recommended by manufacturer.

PART 2 PRODUCTS

2.1 IDENTIFICATION REQUIREMENTS

A. Identification for Equipment:
    1. Use identification nameplate to identify each piece of electrical distribution and control equipment and associated sections, compartments, and components.
        a. Panelboards:
            1) Identify ampere rating.
            2) Identify voltage and phase.
            3) Identify power source and circuit number. Include location when not within sight of equipment.

4) Identify main overcurrent protective device. Use identification label for panelboards with a door. For power distribution panelboards without a door, use identification nameplate.
5) Use typewritten circuit directory to identify load(s) served for panelboards with a door. Identify spares and spaces using pencil.
6) For power panelboards without a door, use identification nameplate to identify load(s) served for each branch device. Do not identify spares and spaces.

b. Enclosed switches, circuit breakers, and motor controllers:
1) Identify voltage and phase.
2) Identify power source and circuit number. Include location when not within sight of equipment.
3) Identify load(s) served. Include location when not within sight of equipment.

2. Service Equipment:
a. Use identification nameplate to identify each service disconnecting means.
b. For buildings or structures supplied by more than one service, or any combination of branch circuits, feeders, and services, use identification nameplate or means of identification acceptable to authority having jurisdiction at each service disconnecting means to identify all other services, feeders, and branch circuits supplying that building or structure. Verify format and descriptions with authority having jurisdiction.

3. Emergency System Equipment:
a. Use identification nameplate or voltage marker to identify emergency system equipment in accordance with NFPA 70.
b. Use identification nameplate at each piece of service equipment to identify type and location of on-site emergency power sources.

4. Available Fault Current Documentation: Use identification label to identify the available fault current and date calculations were performed at locations requiring documentation by NFPA 70 including but not limited to the following.
a. Service equipment.
b. Industrial control panels.
c. Motor control centers.
d. Elevator control panels.
e. Industrial machinery.

B. Identification for Conductors and Cables:
1. Color Coding for Power Conductors 600 V and Less: Comply with Section 26 05 19.
2. Identification for Communications Conductors and Cables: Comply with Section 27 10 00.
3. Use identification nameplate or identification label to identify color code for ungrounded and grounded power conductors inside door or enclosure at each piece of feeder or branch-circuit distribution equipment when premises has feeders or branch circuits served by more than one nominal voltage system.
4. Use wire and cable markers to identify circuit number or other designation indicated for power, control, and instrumentation conductors and cables at the following locations:
a. At each source and load connection.
b. Within boxes when more than one circuit is present.
c. Within equipment enclosures when conductors and cables enter or leave the enclosure.
5. Use wire and cable markers to identify connected grounding electrode system components for grounding electrode conductors.
6. Use underground warning tape to identify direct buried cables.

C. Identification for Raceways:
1. Use voltage markers to identify highest voltage present for accessible conduits at maximum intervals of 20 feet.

D. Identification for Devices:

1. Use identification label to identify receptacles protected by upstream GFI protection, where permitted.

2.2 IDENTIFICATION NAMEPLATES AND LABELS

A. Identification Nameplates:
   1. Manufacturers:
      a. Brimar Industries, Inc: www.brimar.com/#sle.
      b. Kolbi Pipe Marker Co: www.kolbipipemarkers.com.
      c. Seton Identification Products: www.seton.com.
      d. Substitutions: Submit Manufacture's Data Sheet for Approval.
   2. Materials:
      a. Indoor Clean, Dry Locations: Use plastic nameplates.
      b. Outdoor Locations: Use plastic, stainless steel, or aluminum nameplates suitable for exterior use.
   3. Plastic Nameplates: Two-layer or three-layer laminated acrylic or electrically non-conductive phenolic with beveled edges; minimum thickness of 1/16 inch; engraved text.
      a. Exception: Provide minimum thickness of 1/8 inch when any dimension is greater than 4 inches.
   4. Stainless Steel Nameplates: Minimum thickness of 1/32 inch; engraved or laser-etched text.
   5. Aluminum Nameplates: Anodized; minimum thickness of 1/32 inch; engraved or laser-etched text.
   6. Mounting Holes for Mechanical Fasteners: Two, centered on sides for sizes up to 1 inch high; Four, located at corners for larger sizes.

B. Identification Labels:
   1. Manufacturers:
      a. Brady Corporation: www.bradyid.com.
      b. Brother International Corporation: www.brother-usa.com/#sle.
      c. Panduit Corp: www.panduit.com/#sle.
      d. Substitutions: Submit Manufacture's Data Sheet for Approval.
   2. Materials: Use self-adhesive laminated plastic labels; UV, chemical, water, heat, and abrasion resistant.
      a. Use only for indoor locations.
   3. Text: Use factory pre-printed or machine-printed text. Do not use handwritten text unless otherwise indicated.

2.3 WIRE AND CABLE MARKERS

A. Manufacturers:
   1. Brady Corporation: www.bradyid.com.
   2. HellermannTyton: www.hellermanntyton.com.
   3. Panduit Corp: www.panduit.com/#sle.
   4. Substitutions: Submit Manufacture's Data Sheet for Approval.

B. Markers for Conductors and Cables: Use wrap-around self-adhesive vinyl cloth, wrap-around self-adhesive vinyl self-laminating, heat-shrink sleeve, plastic sleeve, plastic clip-on, or vinyl split sleeve type markers suitable for the conductor or cable to be identified.

C. Markers for Conductor and Cable Bundles: Use plastic marker tags secured by nylon cable ties.

D. Legend: Power source and circuit number or other designation indicated.

E. Text: Use factory pre-printed or machine-printed text, all capitalized unless otherwise indicated.
   1. Do not use handwritten text.

F. Minimum Text Height: 1/8 inch.

G. Color: Black text on white background unless otherwise indicated.

2.4 VOLTAGE MARKERS

A. Markers for Conduits: Use factory pre-printed self-adhesive vinyl, self-adhesive vinyl cloth, or vinyl snap-around type markers.
B. Minimum Size:
   1. Markers for Conduits: As recommended by manufacturer for conduit size to be identified.
C. Legend:
   1. Markers for Voltage Identification: Highest voltage present.
D. Color: Black text on orange background unless otherwise indicated.

2.5 UNDERGROUND WARNING TAPE

A. Manufacturers:
   1. Brady Corporation: www.bradyid.com.
   2. Brimar Industries, Inc: www.brimar.com/#sle.
   3. Seton Identification Products: www.seton.com.
   4. Substitutions: Submit Manufacture's Data Sheet for Approval.
B. Materials: Use non-detectable type polyethylene tape suitable for direct burial, unless otherwise indicated.
   1. Exception: Use foil-backed detectable type tape where required by serving utility or where directed by Owner.
C. Non-detectable Type Tape: 6 inches wide, with minimum thickness of 4 mil.
D. Foil-backed Detectable Type Tape: 3 inches wide, with minimum thickness of 5 mil, unless otherwise required for proper detection.
E. Legend: Type of service, continuously repeated over full length of tape.
F. Color:
   1. Tape for Buried Power Lines: Black text on red background.
   2. Tape for Buried Communication, Alarm, and Signal Lines: Black text on orange background.

2.6 WARNING SIGNS AND LABELS

A. Manufacturers:
   1. Brimar Industries, Inc: www.brimar.com/#sle.
   2. Clarion Safety Systems, LLC: www.clarionsafety.com.
   3. Seton Identification Products: www.seton.com.
   4. Substitutions: Submit Manufacture's Data Sheet for Approval.
B. Comply with ANSI Z535.2 or ANSI Z535.4 as applicable.
C. Warning Signs:
   1. Materials:
      a. Indoor Dry, Clean Locations: Use factory pre-printed rigid plastic or self-adhesive vinyl signs.
      b. Outdoor Locations: Use factory pre-printed rigid aluminum signs.
   2. Rigid Signs: Provide four mounting holes at corners for mechanical fasteners.
   3. Minimum Size: 7 by 10 inches unless otherwise indicated.
D. Warning Labels:
   1. Materials: Use factory pre-printed or machine-printed self-adhesive polyester or self-adhesive vinyl labels; UV, chemical, water, heat, and abrasion resistant; produced using materials recognized to UL 969.
      a. Do not use labels designed to be completed using handwritten text.
   2. Machine-Printed Labels: Use thermal transfer process printing machines and accessories recommended by label manufacturer.
   3. Minimum Size: 2 by 4 inches unless otherwise indicated.

PART 3 EXECUTION

3.1 PREPARATION

A. Clean surfaces to receive adhesive products according to manufacturer's instructions.

3.2 INSTALLATION

A. Install products in accordance with manufacturer's instructions.
B. Install identification products to be plainly visible for examination, adjustment, servicing, and maintenance. Unless otherwise indicated, locate products as follows:
   1. Surface-Mounted Equipment: Enclosure front.
   2. Flush-Mounted Equipment: Inside of equipment door.
   3. Free-Standing Equipment: Enclosure front; also enclosure rear for equipment with rear access.
   4. Elevated Equipment: Legible from the floor or working platform.
   5. Branch Devices: Adjacent to device.
   6. Interior Components: Legible from the point of access.
   7. Conduits: Legible from the floor.
   8. Conductors and Cables: Legible from the point of access.
   9. Devices: Outside face of cover.
C. Install identification products centered, level, and parallel with lines of item being identified.
D. Secure nameplates to exterior surfaces of enclosures using stainless steel screws and to interior surfaces using self-adhesive backing or epoxy cement.
E. Install self-adhesive labels and markers to achieve maximum adhesion, with no bubbles or wrinkles and edges properly sealed.
F. Install underground warning tape above buried lines with one tape per trench at 3 inches below finished grade.
G. Secure rigid signs using stainless steel screws.
H. Mark all handwritten text, where permitted, to be neat and legible.

3.3 FIELD QUALITY CONTROL

A. Replace self-adhesive labels and markers that exhibit bubbles, wrinkles, curling or other signs of improper adhesion.

END OF SECTION

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SECTION 26 05 83 - WIRING CONNECTIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Electrical connections to equipment.

1.2 RELATED REQUIREMENTS

A. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables.
B. Section 26 05 33.13 - Conduit for Electrical Systems.
C. Section 26 05 33.16 - Boxes for Electrical Systems.
D. Section 26 27 26 - Wiring Devices.

1.3 REFERENCE STANDARDS

A. NEMA WD 1 - General Color Requirements for Wiring Devices; 1999 (Reaffirmed 2020).
B. NEMA WD 6 - Wiring Devices - Dimensional Specifications; 2021.
C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Obtain and review shop drawings, product data, manufacturer's wiring diagrams, and manufacturer's instructions for equipment furnished under other sections.
   2. Determine connection locations and requirements.
B. Sequencing:
   1. Install rough-in of electrical connections before installation of equipment is required.
   2. Make electrical connections before required start-up of equipment.

1.5 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.
B. Products: Listed, classified, and labeled as suitable for the purpose intended.

PART 2 PRODUCTS

2.1 MATERIALS

A. Cords and Caps: NEMA WD 6; match receptacle configuration at outlet provided for equipment.
   1. Colors: Conform to NEMA WD 1.
   2. Size: Suitable for connected load of equipment, length of cord, and rating of branch circuit overcurrent protection.
B. Disconnect Switches: As specified in Section 26 28 16.16 and in individual equipment sections.
C. Wiring Devices: As specified in Section 26 27 26.
D. Flexible Conduit: As specified in Section 26 05 33.13.
E. Wire and Cable: As specified in Section 26 05 19.
F. Boxes: As specified in Section 26 05 33.16.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that equipment is ready for electrical connection, wiring, and energization.

3.2 ELECTRICAL CONNECTIONS

A. Make electrical connections in accordance with equipment manufacturer's instructions.
B. Make conduit connections to equipment using flexible conduit. Use liquidtight flexible conduit with watertight connectors in damp or wet locations.

C. Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.
D. Provide receptacle outlet to accommodate connection with attachment plug.
E. Provide cord and cap where field-supplied attachment plug is required.
F. Install suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.
G. Install disconnect switches, controllers, control stations, and control devices to complete equipment wiring requirements.
H. Install terminal block jumpers to complete equipment wiring requirements.
I. Install interconnecting conduit and wiring between devices and equipment to complete equipment wiring requirements.

END OF SECTION

SECTION 26 21 00 - LOW-VOLTAGE ELECTRICAL SERVICE ENTRANCE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Electrical service requirements.

1.2 RELATED REQUIREMENTS

A. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables.
B. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
C. Section 26 05 29 - Hangers and Supports for Electrical Systems.
D. Section 26 05 33.13 - Conduit for Electrical Systems.
E. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.
F. Section 26 24 16 - Panelboards: Service entrance equipment.
G. Section 26 43 00 - Surge Protective Devices: Service entrance surge protective devices.

1.3 PRICE AND PAYMENT PROCEDURES

A. Allowances:
   1. See Section 01 21 00 - Allowances, for allowances affecting this section.
   2. Include cash allowance for Utility Company charges associated with providing service.

1.4 DEFINITIONS

A. Service Point: The point of connection between the facilities of the serving utility and the premises wiring as defined in NFPA 70, and as designated by the Utility Company.

1.5 REFERENCE STANDARDS

A. IEEE C2 - National Electrical Safety Code(R) (NESC(R)); 2023.
B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.6 ADMINISTRATIVE REQUIREMENTS

A. No later than two weeks following date of the Agreement, notify Utility Company of anticipated date of service.
B. Coordination:
   1. Verify the following with Utility Company representative:
      a. Utility Company requirements, including division of responsibility.
      b. Exact location and details of utility point of connection.
      c. Utility easement requirements.
      d. Utility Company charges associated with providing service.
   2. Coordinate the work with other trades to avoid placement of other utilities or obstructions within the spaces dedicated for electrical service and associated equipment.
   3. Coordinate arrangement of service entrance equipment with the dimensions and clearance requirements of the actual equipment to be installed.
   4. Notify Architect/Engineeer of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.
C. Arrange for Utility Company to provide permanent electrical service. Prepare and submit documentation required by Utility Company.
D. Utility Company charges associated with providing permanent service to be paid by Contractor and reimbursed by Owner.
E. Preinstallation Meeting: Convene one week prior to commencing work of this section to review service requirements and details with Utility Company representative.

F. Scheduling:
   1. Where work of this section involves interruption of existing electrical service, arrange service interruption with OWNER.
   2. Arrange for inspections necessary to obtain Utility Company approval of installation.

1.7 QUALITY ASSURANCE

A. Comply with the following:
   1. IEEE C2 (National Electrical Safety Code).
   2. NFPA 70 (National Electrical Code).
   3. The requirements of the Utility Company.
   4. The requirements of the local authorities having jurisdiction.
B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
C. Products: Listed, classified, and labeled as suitable for the purpose intended.
D. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.
B. Store products indoors in a clean, dry space having a uniform temperature to prevent condensation (including outdoor rated products which are not weatherproof until completely and properly installed). Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
C. Handle products carefully to avoid damage to internal components, enclosure, and finish.

PART 2 PRODUCTS

2.1 ELECTRICAL SERVICE REQUIREMENTS

A. Provide new electrical service consisting of all required conduits, conductors, equipment, metering provisions, supports, accessories, etc. as necessary for connection between Utility Company point of supply and service entrance equipment.
B. Electrical Service Characteristics: As indicated on drawings.
C. Utility Company: As indicated on drawings.
D. Division of Responsibility: Per Utility Company requirements.
E. Products Furnished by Contractor: Comply with Utility Company requirements.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that field measurements are as indicated.
B. Verify that ratings and configurations of service entrance equipment are consistent with the indicated requirements.
C. Verify that conditions are satisfactory for installation prior to starting work.

3.2 PREPARATION

A. Verify and mark locations of existing underground utilities.

3.3 INSTALLATION

A. Install products in accordance with manufacturer's instructions and Utility Company requirements.
B. Perform work in accordance with NECA 1 (general workmanship).
C. Arrange equipment to provide minimum clearances and required maintenance access.

D. Provide required support and attachment components in accordance with Section 26 05 29.
E. Provide grounding and bonding for service entrance equipment in accordance with Section 26 05 26.
F. Identify service entrance equipment, including main service disconnect(s) in accordance with Section 26 05 53.

3.4 PROTECTION

A. Protect installed equipment from subsequent construction operations.

END OF SECTION

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SECTION 26 24 16 - PANELBOARDS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Power distribution panelboards.
B. Lighting and appliance panelboards.
C. Overcurrent protective devices for panelboards.

1.2 RELATED REQUIREMENTS

A. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
B. Section 26 05 29 - Hangers and Supports for Electrical Systems.
C. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.
D. Section 26 43 00 - Surge Protective Devices.

1.3 REFERENCE STANDARDS

A. FS W-C-375 - Circuit Breakers, Molded Case; Branch Circuit and Service; Revision E with Supplement 1, 2013.
B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
C. NECA 407 - Standard for Installing and Maintaining Panelboards; 2015.
D. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.
E. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts; 2008 (Reaffirmed 2020).
F. NEMA BS 31047 - Heavy Duty Enclosed and Dead-Front Switches (600 Volts Maximum); 2013 (Reaffirmed 2023).
G. NEMA PB 1 - Panelboards; 2011.
H. NEMA PB 1.1 - General Instructions for Proper Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less; 2013.
I. NETA ATS - Standard for Acceptance Testing Specifications for Electrical Power Equipment And Systems; 2025.
J. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
K. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.
L. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.
M. UL 67 - Panelboards; Current Edition, Including All Revisions.
N. UL 98 - Enclosed and Dead-Front Switches; Current Edition, Including All Revisions.
O. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches and Circuit Breaker Enclosures; Current Edition, Including All Revisions.
P. UL 869A - Reference Standard for Service Equipment; Current Edition, Including All Revisions.
Q. UL 943 - Ground-Fault Circuit-Interrupters; Current Edition, Including All Revisions.
R. UL 1053 - Ground-Fault Sensing and Relaying Equipment; Current Edition, Including All Revisions.
S. UL 1699 - Arc-Fault Circuit-Interrupters; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.
2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
3. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted panelboards where indicated.
4. Verify with manufacturer that conductor terminations are suitable for use with the conductors to be installed.
5. Notify Architect/Engineer of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.5 SUBMITTALS

A. Product Data: Provide manufacturer's standard catalog pages and data sheets for panelboards, enclosures, overcurrent protective devices, and other installed components and accessories.
   1. Include characteristic trip curves for each type and rating of overcurrent protective device upon request.
B. Shop Drawings: Indicate outline and support point dimensions, voltage, main bus ampacity, overcurrent protective device arrangement and sizes, short circuit current ratings, conduit entry locations, conductor terminal information, and installed features and accessories.
C. Field Quality Control Test Reports.
D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
E. Project Record Documents: Record actual installed locations of panelboards and actual installed circuiting arrangements.

1.6 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.
B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.
C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
D. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store panelboards in accordance with manufacturer's instructions and NECA 407.
B. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
C. Handle carefully in accordance with manufacturer's written instructions to avoid damage to panelboard internal components, enclosure, and finish.

1.8 FIELD CONDITIONS

A. Maintain ambient temperature within the following limits during and after installation of panelboards:
   1. Panelboards Containing Circuit Breakers: Between 23 degrees F and 104 degrees F.
   2. Panelboards Containing Fusible Switches: Between -22 degrees F and 104 degrees F.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Eaton Corporation: www.eaton.com.
B. General Electric Company: www.geindustrial.com.
C. Schneider Electric; Square D Products: www.schneider-electric.us.
D. Siemens Industry, Inc: www.usa.siemens.com.
E. Substitutions: Submit Manufacture's Data Sheet for Approval.
F. Source Limitations: Furnish panelboards and associated components produced by the same manufacturer as the other electrical distribution equipment used for this project and obtained from a single supplier.

2.2 PANELBOARDS - GENERAL REQUIREMENTS

A. Provide products listed, classified, and labeled as suitable for the purpose intended.
B. Unless otherwise indicated, provide products suitable for continuous operation under the following service conditions:
    1. Altitude: Less than 3,500 feet.
    2. Ambient Temperature:
        a. Panelboards Containing Circuit Breakers: Between 23 degrees F and 104 degrees F.
        b. Panelboards Containing Fusible Switches: Between -22 degrees F and 104 degrees F.
C. Short Circuit Current Rating:
    1. Provide panelboards with listed short circuit current rating not less than the available fault current at the installed location as indicated on the drawings.
D. Panelboards Used for Service Entrance: Listed and labeled as suitable for use as service equipment according to UL 869A.
E. Mains: Configure for top or bottom incoming feed as indicated or as required for the installation.
F. Branch Overcurrent Protective Devices: Replaceable without disturbing adjacent devices.
G. Bussing: Sized in accordance with UL 67 temperature rise requirements.
    1. Provide fully rated neutral bus unless otherwise indicated, with a suitable lug for each feeder or branch circuit requiring a neutral connection.
    2. Provide solidly bonded equipment ground bus in each panelboard, with a suitable lug for each feeder and branch circuit equipment grounding conductor.
H. Conductor Terminations: Suitable for use with the conductors to be installed.
I. Enclosures: Comply with NEMA EN 10250, and list and label as complying with UL 50 and UL 50E.
    1. Environment Type per NEMA EN 10250: Unless otherwise indicated, as specified for the following installation locations:
        a. Indoor Clean, Dry Locations: Type 1.
        b. Outdoor Locations: Type 3R.
    2. Boxes: Galvanized steel unless otherwise indicated.
        a. Provide wiring gutters sized to accommodate the conductors to be installed.
    3. Fronts:
        a. Fronts for Surface-Mounted Enclosures: Same dimensions as boxes.
        b. Fronts for Flush-Mounted Enclosures: Overlap boxes on all sides to conceal rough opening.
        c. Finish for Painted Steel Fronts: Manufacturer's standard grey unless otherwise indicated.
    4. Lockable Doors: All locks keyed alike unless otherwise indicated.

J. Future Provisions: Prepare all unused spaces for future installation of devices including bussing, connectors, mounting hardware and all other required provisions.
K. Surge Protective Devices: Where factory-installed, internally mounted surge protective devices are provided in accordance with Section 26 43 00, list and label panelboards as a complete assembly including surge protective device.
L. Panelboard Contactors: Where panelboard contactors are indicated, provide electrically operated, mechanically held magnetic contactor complying with NEMA ICS 2.
    1. Ampere Rating: Not less than ampere rating of panelboard bus.
    2. Short Circuit Current Rating: Not less than the panelboard short circuit current rating.
    3. Coil Voltage: As required for connection to control system indicated.
M. Ground Fault Protection: Where ground-fault protection is indicated, provide system listed and labeled as complying with UL 1053.
    1. Where electronic circuit breakers equipped with integral ground fault protection are used, provide separate neutral current sensor where applicable.
    2. Where accessory ground fault sensing and relaying equipment is used, equip companion overcurrent protective devices with ground-fault shunt trips.
        a. Use zero sequence ground fault detection method unless otherwise indicated.
        b. Provide test panel and field-adjustable ground fault pick-up and delay settings.
N. Provide the following features and accessories where indicated or where required to complete installation:
    1. Feed-through lugs.
    2. Sub-feed lugs.

2.3 POWER DISTRIBUTION PANELBOARDS

A. Description: Panelboards complying with NEMA PB 1, power and feeder distribution type, circuit breaker type, and listed and labeled as complying with UL 67; ratings, configurations and features as indicated on the drawings.
B. Conductor Terminations:
    1. Main and Neutral Lug Material: Copper, suitable for terminating copper conductors only.
    2. Main and Neutral Lug Type: Mechanical.
C. Bussing:
    1. Phase and Neutral Bus Material: Copper.
    2. Ground Bus Material: Copper.
D. Circuit Breakers:
    1. Provide bolt-on type or plug-in type secured with locking mechanical restraints.
    2. Provide thermal magnetic circuit breakers unless otherwise indicated.
    3. Provide electronic trip circuit breakers where indicated.
E. Enclosures:
    1. Provide surface-mounted enclosures unless otherwise indicated.
    2. Fronts: Provide trims to cover access to load terminals, wiring gutters, and other live parts, with exposed access to overcurrent protective device handles.
    3. Provide clear plastic circuit directory holder mounted on inside of door.

2.4 LIGHTING AND APPLIANCE PANELBOARDS

A. Description: Panelboards complying with NEMA PB 1, lighting and appliance branch circuit type, circuit breaker type, and listed and labeled as complying with UL 67; ratings, configurations and features as indicated on the drawings.
B. Conductor Terminations:
    1. Main and Neutral Lug Material: Copper, suitable for terminating copper conductors only.
    2. Main and Neutral Lug Type: Mechanical.
C. Bussing:

1. Phase Bus Connections: Arranged for sequential phasing of overcurrent protective devices.
2. Phase and Neutral Bus Material: Copper.
3. Ground Bus Material: Copper.

D. Circuit Breakers: Thermal magnetic bolt-on type unless otherwise indicated.

E. Enclosures:
1. Provide surface-mounted or flush-mounted enclosures as indicated.
2. Fronts: Provide lockable hinged door with concealed hinges for access to overcurrent protective device handles without exposing live parts.
3. Provide clear plastic circuit directory holder mounted on inside of door.

F. Provide column-width panelboards with accessory column-width cable trough and pullbox where indicated.

2.5 OVERCURRENT PROTECTIVE DEVICES

A. Fusible Switches:
1. Description: Quick-make, quick-break, dead-front fusible switch units complying with NEMA BS 31047, and listed and labeled as complying with UL 98; ratings, configurations, and features as indicated on the drawings.
2. Fuse Clips: As required to accept indicated fuses.
a. Where NEMA Class R fuses are installed, provide rejection feature to prevent installation of fuses other than Class R.
3. Provide externally operable handle with means for locking in the OFF position. Provide means for locking switch cover in the closed position. Provide safety interlock to prevent opening the cover with the switch in the ON position with capability of overriding interlock for testing purposes.
4. Conductor Terminations:
a. Provide mechanical lugs unless otherwise indicated.
b. Provide compression lugs where indicated.
c. Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.

B. Molded Case Circuit Breakers:
1. Description: Quick-make, quick-break, over center toggle, trip-free, trip-indicating circuit breakers listed and labeled as complying with UL 489, and complying with FS W-C-375 where applicable; ratings, configurations, and features as indicated on the drawings.
2. Interrupting Capacity:
a. Provide circuit breakers with interrupting capacity as required to provide the short circuit current rating indicated, but not less than:
1) 10,000 rms symmetrical amperes at 240 VAC or 208 VAC.
2) 14,000 rms symmetrical amperes at 480 VAC.
b. Fully Rated Systems: Provide circuit breakers with interrupting capacity not less than the short circuit current rating indicated.
3. Conductor Terminations:
a. Provide mechanical lugs unless otherwise indicated.
b. Provide compression lugs where indicated.
c. Lug Material: Copper, suitable for terminating copper conductors only.
4. Thermal Magnetic Circuit Breakers: For each pole, furnish thermal inverse time tripping element for overload protection and magnetic instantaneous tripping element for short circuit protection.
a. Provide field-adjustable magnetic instantaneous trip setting for circuit breaker frame sizes 225 amperes and larger.
b. Provide interchangeable trip units where indicated.
5. Electronic Trip Circuit Breakers: Furnish solid state, microprocessor-based, true rms sensing trip units.
a. Provide the following field-adjustable trip response settings:

1) Long time pickup, adjustable by replacing interchangeable trip unit or by setting dial.
2) Long time delay.
3) Short time pickup and delay.
4) Instantaneous pickup.
5) Ground fault pickup and delay where ground fault protection is indicated.

6. Multi-Pole Circuit Breakers: Furnish with common trip for all poles.
7. Provide the following circuit breaker types where indicated:
   a. Ground Fault Circuit Interrupter (GFCI) Circuit Breakers: Listed as complying with UL 943, class A for protection of personnel.
   b. Ground Fault Equipment Protection Circuit Breakers: Designed to trip at 30 mA for protection of equipment.
   c. Arc-Fault Circuit Interrupter (AFCI) Circuit Breakers: Combination type listed as complying with UL 1699.
   d. 100 Percent Rated Circuit Breakers: Listed for application within the panelboard where installed at 100 percent of the continuous current rating.
8. Do not use tandem circuit breakers.
9. Do not use handle ties in lieu of multi-pole circuit breakers.
10. Provide multi-pole circuit breakers for multi-wire branch circuits as required by NFPA 70.
11. Provide the following features and accessories where indicated or where required to complete installation:
    a. Shunt Trip: Provide coil voltage as required for connection to indicated trip actuator.

2.6 SOURCE QUALITY CONTROL

A. Factory test panelboards according to NEMA PB 1.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that field measurements are as indicated.
B. Verify that the ratings and configurations of the panelboards and associated components are consistent with the indicated requirements.
C. Verify that mounting surfaces are ready to receive panelboards.
D. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

A. Perform work in accordance with NECA 1 (general workmanship).
B. Install products in accordance with manufacturer's instructions.
C. Install panelboards in accordance with NECA 407 and NEMA PB 1.1.
D. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
E. Provide required supports in accordance with Section 26 05 29.
F. Install panelboards plumb.
G. Install flush-mounted panelboards so that trims fit completely flush to wall with no gaps and rough opening completely covered.
H. Mount panelboards such that the highest position of any operating handle for circuit breakers or switches does not exceed 79 inches above the floor or working platform.
I. Provide grounding and bonding in accordance with Section 26 05 26.
   1. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on isolated/insulated ground bus.
   2. Terminate branch circuit isolated grounding conductors on isolated/insulated ground bus only. Do not terminate on solidly bonded equipment ground bus.

J. Install all field-installed branch devices, components, and accessories.
K. Multi-Wire Branch Circuits: Group grounded and ungrounded conductors together in the panelboard as required by NFPA 70.
L. Set field-adjustable circuit breaker tripping function settings as indicated.
M. Set field-adjustable ground fault protection pickup and time delay settings as indicated.
N. Provide filler plates to cover unused spaces in panelboards.
O. Identify panelboards in accordance with Section 26 05 53.

3.3 FIELD QUALITY CONTROL

A. Inspect and test in accordance with NETA ATS, except Section 4.
B. Fusible Switches: Perform inspections and tests listed in NETA ATS, Section 7.5.1.1.
C. Molded Case Circuit Breakers: Perform inspections and tests listed in NETA ATS, Section 7.6.1.1 for all main circuit breakers. Tests listed as optional are not required.
D. Ground Fault Protection Systems: Test in accordance with manufacturer's instructions as required by NFPA 70.
E. Test GFCI circuit breakers to verify proper operation.
F. Test AFCI circuit breakers to verify proper operation.
G. Test shunt trips to verify proper operation.
H. Correct deficiencies and replace damaged or defective panelboards or associated components.

3.4 ADJUSTING

A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.
B. Adjust alignment of panelboard fronts.
C. Load Balancing: For each panelboard, rearrange circuits such that the difference between each measured steady state phase load does not exceed 20 percent and adjust circuit directories accordingly. Maintain proper phasing for multi-wire branch circuits.

3.5 CLEANING

A. Clean dirt and debris from panelboard enclosures and components according to manufacturer's instructions.
B. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION

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SECTION 26 27 26 - WIRING DEVICES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Wall switches.
B. Wall dimmers.
C. Receptacles.
D. Wall plates.
E. Access floor boxes.

1.2 RELATED REQUIREMENTS

A. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables: Manufactured wiring systems for use with access floor boxes with compatible pre-wired connectors.
B. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
C. Section 26 05 33.16 - Boxes for Electrical Systems.
D. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.
E. Section 26 05 83 - Wiring Connections: Cords and plugs for equipment.

1.3 REFERENCE STANDARDS

A. FS W-C-596 - Connector, Electrical, Power, General Specification for; Revision H, 2014.
B. FS W-S-896 - Switches, Toggle (Toggle and Lock), Flush-mounted (General Specification); Revision G, 2014.
C. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
D. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2016.
E. NEMA WD 1 - General Color Requirements for Wiring Devices; 1999 (Reaffirmed 2020).
F. NEMA WD 6 - Wiring Devices - Dimensional Specifications; 2021.
G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
H. UL 20 - General-Use Snap Switches; Current Edition, Including All Revisions.
I. UL 498 - Attachment Plugs and Receptacles; Current Edition, Including All Revisions.
J. UL 514D - Cover Plates for Flush-Mounted Wiring Devices; Current Edition, Including All Revisions.
K. UL 943 - Ground-Fault Circuit-Interrupters; Current Edition, Including All Revisions.
L. UL 1310 - Class 2 Power Units; Current Edition, Including All Revisions.
M. UL 1449 - Standard for Surge Protective Devices; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate the placement of outlet boxes with millwork, furniture, equipment, etc. installed under other sections or by others.
   2. Coordinate wiring device ratings and configurations with the electrical requirements of actual equipment to be installed.
   3. Coordinate the placement of outlet boxes for wall switches with actual installed door swings.
   4. Coordinate the installation and preparation of uneven surfaces, such as split face block, to provide suitable surface for installation of wiring devices.
   5. Coordinate the core drilling of holes for poke-through assemblies with the work covered under other sections.

6. Notify Architect of any conflicts or deviations from the contract documents to obtain direction prior to proceeding with work.

B. Sequencing:
1. Do not install wiring devices until final surface finishes and painting are complete.

1.5 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.
B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
C. Products: Listed, classified, and labeled as suitable for the purpose intended.

1.6 DELIVERY, STORAGE, AND PROTECTION

A. Store in a clean, dry space in original manufacturer's packaging until ready for installation.

PART 2 PRODUCTS

2.1 WIRING DEVICE APPLICATIONS

A. Provide wiring devices suitable for intended use and with ratings adequate for load served.
B. For single receptacles installed on an individual branch circuit, provide receptacle with ampere rating not less than that of the branch circuit.
C. Provide weather resistant GFCI receptacles with specified weatherproof covers for receptacles installed outdoors or in damp or wet locations.
D. Provide GFCI protection for receptacles installed within 6 feet of sinks.
E. Provide GFCI protection for receptacles installed in kitchens.
F. Provide GFCI protection for receptacles serving electric drinking fountains.
G. Unless noted otherwise, do not use combination switch/receptacle devices.

2.2 WIRING DEVICE FINISHES

A. Provide wiring device finishes as described below unless otherwise indicated.
B. Wiring Devices, Unless Otherwise Indicated: White with white nylon wall plate.
C. Wiring Devices Installed in Finished Spaces: White with white nylon wall plate.
D. Wiring Devices Installed in Unfinished Spaces: Gray with galvanized steel wall plate.
E. Wiring Devices Installed in Wet or Damp Locations: White with specified weatherproof cover.
F. Isolated Ground Convenience Receptacles: Orange.
G. Surge Protection Receptacles: Blue.
H. Wiring Devices Connected to Emergency Power: Red with red nylon wall plate.
I. Clock Hanger Receptacles: Brown with stainless steel wall plate.
J. Above-Floor Service Fittings: Gray wiring devices with satin aluminum housing.
K. Flush Floor Box Service Fittings: Gray wiring devices with aluminum cover and ring/flange.
L. Flush Poke-Through Service Fittings: Gray wiring devices with aluminum cover and aluminum flange.
M. Access Floor Boxes: Gray wiring devices with gray steel cover with insert to match floor covering.

2.3 WALL SWITCHES

A. Manufacturers:
1. Hubbell Incorporated: www.hubbell-wiring.com.
2. Leviton Manufacturing Company, Inc: www.leviton.com.
3. Pass & Seymour, a brand of Legrand North America, Inc: www.legrand.us
4. Substitutions: Submit Manufacture's Data Sheet for Approval.

B. Wall Switches - General Requirements: AC only, quiet operating, general-use snap switches with silver alloy contacts, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 20 and where applicable, FS W-S-896; types as indicated on the drawings.
   1. Wiring Provisions: Terminal screws for side wiring and screw actuated binding clamp for back wiring with separate ground terminal screw.
C. Standard Wall Switches: Industrial specification grade, 20 A, 120/277 V with standard toggle type switch actuator and maintained contacts; single pole single throw, double pole single throw, three way, or four way as indicated on the drawings.

2.4 WALL DIMMERS

A. Manufacturers:
   1. Leviton Manufacturing Company, Inc: www.leviton.com.
   2. Lutron Electronics Company, Inc; Maestro Series: www.lutron.com/#sle.
   3. Pass & Seymour, a brand of Legrand North America, Inc: www.legrand.us
   4. Cooper Lighting, Inc: www.cooperlighting.com
   5. Substitutions: See Section 01 60 00 - Product Requirements.
B. Wall Dimmers - General Requirements: Solid-state with continuous full-range even control following square law dimming curve, integral radio frequency interference filtering, power failure preset memory, air gap switch accessible without removing wall plate, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 1472; types and ratings suitable for load controlled as indicated on the drawings.
C. Control: Slide control type with separate on/off switch.
D. Power Rating, Unless Otherwise Indicated or Required to Control the Load Indicated on the Drawings:

2.5 RECEPTACLES

A. Manufacturers:
   1. Hubbell Incorporated: www.hubbell-wiring.com.
   2. Leviton Manufacturing Company, Inc: www.leviton.com.
   3. Lutron Electronics Company, Inc; Designer Style: www.lutron.com/#sle.
   4. Substitutions: Submit Manufacture's Data Sheet for Approval.
   5. Source Limitations: Where wall controls are furnished as part of lighting control system, provide accessory matching receptacles and wallplates by the same manufacturer in locations indicated.
B. Receptacles - General Requirements: Self-grounding, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 498, and where applicable, FS W-C-596; types as indicated on the drawings.
   1. Wiring Provisions: Terminal screws for side wiring or screw actuated binding clamp for back wiring with separate ground terminal screw.
   2. NEMA configurations specified are according to NEMA WD 6.
C. Convenience Receptacles:
   1. Standard Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R; single or duplex as indicated on the drawings.
   2. Tamper Resistant Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R, listed and labeled as tamper resistant type; single or duplex as indicated on the drawings.
   3. Tamper Resistant and Weather Resistant Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R, listed and labeled as tamper resistant type and as weather resistant type complying with UL 498 Supplement SE suitable for installation in damp or wet locations; single or duplex as indicated on the drawings.
D. GFCI Receptacles:

1. GFCI Receptacles - General Requirements: Self-testing, with feed-through protection and light to indicate ground fault tripped condition and loss of protection; listed as complying with UL 943, class A.
   a. Provide test and reset buttons of same color as device.
2. Standard GFCI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style.
3. Weather Resistant GFCI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style, listed and labeled as weather resistant type complying with UL 498 Supplement SE suitable for installation in damp or wet locations.
4. Tamper Resistant GFCI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style, listed and labeled as tamper resistant type.
5. Tamper Resistant and Weather Resistant GFCI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style, listed and labeled as tamper resistant type and as weather resistant type complying with UL 498 Supplement SE suitable for installation in damp or wet locations.

2.6 WALL PLATES

A. Manufacturers:
   1. Hubbell Incorporated: www.hubbell-wiring.com.
   2. Leviton Manufacturing Company, Inc: www.leviton.com.
   3. Lutron Electronics Company, Inc: www.lutron.com/sle.
   4. Pass & Seymour, a brand of Legrand North America, Inc: www.legrand.us
   5. Substitutions: Submit Manufacture's Data Sheet for Approval.
   6. Source Limitations: Where wall controls are furnished as part of lighting control system, provide accessory matching receptacles and wallplates by the same manufacturer in locations indicated.
B. Wall Plates: Comply with UL 514D.
   1. Configuration: One piece cover as required for quantity and types of corresponding wiring devices.
   2. Size: Standard.
   3. Screws: Metal with slotted heads finished to match wall plate finish.
   4. Provide screwless wallplates with concealed mounting hardware where indicated.
   5. Fill all wallplate holes as necessary
C. Nylon Wall Plates: Smooth finish, high-impact thermoplastic.
D. Stainless Steel Wall Plates: Brushed satin finish, Type 302 stainless steel.
E. Weatherproof Covers for Damp Locations: Gasketed, cast aluminum, with self-closing hinged cover and corrosion-resistant screws; listed as suitable for use in wet locations with cover closed.
F. Weatherproof Covers for Wet Locations: Gasketed, cast aluminum, with hinged lockable cover and corrosion-resistant screws; listed as suitable for use in wet locations while in use with attachment plugs connected and identified as extra-duty type.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that field measurements are as indicated.
B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.
C. Verify that wall openings are neatly cut and will be completely covered by wall plates.
D. Verify that final surface finishes are complete, including painting.
E. Verify that floor boxes are adjusted properly.

F. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.
G. Verify that core drilled holes for poke-through assemblies are in proper locations.
H. Verify that openings in access floor are in proper locations.
I. Verify that conditions are satisfactory for installation prior to starting work.

3.2 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface.
B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.3 INSTALLATION

A. Perform work in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.
B. Coordinate locations of outlet boxes provided under Section 26 05 33.16 as required for installation of wiring devices provided under this section.
    1. Mounting Heights: Unless otherwise indicated, as follows:
        a. Wall Switches: 48 inches above finished floor.
        b. Wall Dimmers: 48 inches above finished floor.
        c. Receptacles: 18 inches above finished floor or 6 inches above counter.
    2. Orient outlet boxes for vertical installation of wiring devices unless otherwise indicated.
    3. Where multiple receptacles, wall switches, or wall dimmers are installed at the same location and at the same mounting height, gang devices together under a common wall plate.
    4. Locate wall switches on strike side of door with edge of wall plate 3 inches from edge of door frame. Where locations are indicated otherwise, notify Architect/Engineer to obtain direction prior to proceeding with work.
    5. Locate receptacles for electric drinking fountains concealed behind drinking fountain according to manufacturer's instructions.
C. Install wiring devices in accordance with manufacturer's instructions.
D. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.
E. Where required, connect wiring devices using pigtails not less than 6 inches long. Do not connect more than one conductor to wiring device terminals.
F. Connect wiring devices by wrapping conductor clockwise 3/4 turn around screw terminal and tightening to proper torque specified by the manufacturer. Where present, do not use push-in pressure terminals that do not rely on screw-actuated binding.
G. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
H. For isolated ground receptacles, connect wiring device grounding terminal only to identified branch circuit isolated equipment grounding conductor. Do not connect grounding terminal to outlet box or normal branch circuit equipment grounding conductor.
I. Provide GFCI receptacles with integral GFCI protection at each location indicated. Do not use feed-through wiring to protect downstream devices.
J. Where split-wired duplex receptacles are indicated, remove tabs connecting top and bottom receptacles.
K. Install wiring devices plumb and level with mounting yoke held rigidly in place.
L. Install wall switches with OFF position down.
M. Install wall dimmers to achieve full rating specified and indicated after derating for ganging as instructed by manufacturer.

N. Do not share neutral conductor on branch circuits utilizing wall dimmers.
O. Install vertically mounted receptacles with grounding pole on top and horizontally mounted receptacles with grounding pole on left.
P. Install wall plates to fit completely flush to wall with no gaps and rough opening completely covered without strain on wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use oversized wall plates in lieu of meeting this requirement.
Q. Install blank wall plates on junction boxes and on outlet boxes with no wiring devices installed or designated for future use.
R. Identify wiring devices in accordance with Section 26 05 53.
S. Install poke-through closure plugs in each unused core holes to maintain fire rating of floor.

3.4 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.
B. Inspect each wiring device for damage and defects.
C. Operate each wall switch, wall dimmer, and fan speed controller with circuit energized to verify proper operation.
D. Test each receptacle to verify operation and proper polarity.
E. Test each GFCI receptacle for proper tripping operation according to manufacturer's instructions.
F. Inspect each surge protection receptacle to verify surge protection is active.
G. Correct wiring deficiencies and replace damaged or defective wiring devices.

3.5 ADJUSTING

A. Adjust devices and wall plates to be flush and level.
B. Adjust presets for wall dimmers according to manufacturer's instructions as directed by Architect/Engineer.

3.6 CLEANING

A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

END OF SECTION

SECTION 26 28 16.13 - ENCLOSED CIRCUIT BREAKERS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Enclosed circuit breakers.

1.2 RELATED REQUIREMENTS

A. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
B. Section 26 05 29 - Hangers and Supports for Electrical Systems.
C. Section 26 05 53 - Identification for Electrical Systems: Identification products and requirements.

1.3 REFERENCE STANDARDS

A. FS W-C-375 - Circuit Breakers, Molded Case; Branch Circuit and Service; Revision E with Supplement 1, 2013.
B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
C. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.
D. NETA ATS - Standard for Acceptance Testing Specifications for Electrical Power Equipment And Systems; 2025.
E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
F. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.
G. UL 50E - Enclosures for Electrical Equipment, Environmental Considerations; Current Edition, Including All Revisions.
H. UL 489 - Molded-Case Circuit Breakers, Molded-Case Switches and Circuit Breaker Enclosures; Current Edition, Including All Revisions.
I. UL 869A - Reference Standard for Service Equipment; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate work with other trades. Avoid placement of ductwork, piping, equipment, or other potential obstructions within dedicated equipment spaces and within working clearances for electrical equipment required by NFPA 70.
   2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
   3. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted enclosed circuit breakers where indicated.
   4. Verify with manufacturer that conductor terminations are suitable for use with the conductors to be installed.
   5. Notify Architect/Engineer of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

1.5 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.
B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.

B. Handle carefully in accordance with manufacturer's written instructions to avoid damage to enclosed circuit breaker internal components, enclosure, and finish.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Eaton Corporation: www.eaton.com.
B. General Electric Company: www.geindustrial.com.
C. Schneider Electric; Square D Products: www.schneider-electric.us.
D. Siemens Industry, Inc: www.usa.siemens.com.
E. Substitutions: Submit Manufacture's Data Sheet for Approval.
F. Source Limitations: Furnish enclosed circuit breakers and associated components produced by the same manufacturer as the other electrical distribution equipment used for this project and obtained from a single supplier.

2.2 ENCLOSED CIRCUIT BREAKERS

A. Description: Units consisting of molded case circuit breakers individually mounted in enclosures.
B. Provide products listed, classified, and labeled as suitable for the purpose intended.
C. Unless otherwise indicated, provide products suitable for continuous operation under the following service conditions:
    1. Altitude: Less than 3,500 feet.
    2. Ambient Temperature: Between 23 degrees F and 104 degrees F.
D. Short Circuit Current Rating:
    1. Provide enclosed circuit breakers with listed short circuit current rating not less than the available fault current at the installed location indicated on the drawings.
E. Enclosed Circuit Breakers Used for Service Entrance: Listed and labeled as suitable for use as service equipment according to UL 869A.
F. Conductor Terminations: Suitable for use with the conductors to be installed.
G. Provide thermal magnetic circuit breakers unless otherwise indicated.
H. Provide electronic trip circuit breakers where indicated.
I. Provide solidly bonded equipment ground bus in each enclosed circuit breaker, with a suitable lug for terminating each equipment grounding conductor.
J. Enclosures: Comply with NEMA EN 10250, and list and label as complying with UL 50 and UL 50E.
    1. Environment Type per NEMA EN 10250: Unless otherwise indicated, as specified for the following installation locations:
        a. Indoor Clean, Dry Locations: Type 1.
        b. Outdoor Locations: Type 3R.
    2. Finish for Painted Steel Enclosures: Manufacturer's standard, factory applied grey unless otherwise indicated.
    3. Provide surface-mounted enclosures unless otherwise indicated.
K. Provide externally operable handle with means for locking in the OFF position.
L. Selectivity: Where the requirement for selectivity is indicated, furnish products as required to achieve selective coordination.

2.3 MOLDED CASE CIRCUIT BREAKERS

A. Description: Quick-make, quick-break, over center toggle, trip-free, trip-indicating circuit breakers listed and labeled as complying with UL 489, and complying with FS W-C-375 where applicable; ratings, configurations, and features as indicated on the drawings.

B. Interrupting Capacity:
   1. Provide circuit breakers with interrupting capacity as required to provide the short circuit current rating indicated, but not less than:
      a. 10,000 rms symmetrical amperes at 240 VAC or 208 VAC.
      b. 14,000 rms symmetrical amperes at 480 VAC.
   2. Fully Rated Systems: Provide circuit breakers with interrupting capacity not less than the short circuit current rating indicated.
C. Conductor Terminations:
   1. Provide mechanical lugs unless otherwise indicated.
   2. Provide compression lugs where indicated.
   3. Lug Material: Copper, suitable for terminating copper conductors only.
D. Thermal Magnetic Circuit Breakers: For each pole, furnish thermal inverse time tripping element for overload protection and magnetic instantaneous tripping element for short circuit protection.
E. Multi-Pole Circuit Breakers: Furnish with common trip for all poles.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that field measurements are as indicated.
B. Verify that the ratings of the enclosed circuit breakers are consistent with the indicated requirements.
C. Verify that mounting surfaces are ready to receive enclosed circuit breakers.
D. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

A. Install products in accordance with manufacturer's instructions.
B. Perform work in accordance with NECA 1 (general workmanship).
C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
D. Provide required supports in accordance with Section 26 05 29.
E. Install enclosed circuit breakers plumb.
F. Install flush-mounted enclosed circuit breakers so that trims fit completely flush to wall with no gaps and rough opening completely covered.
G. Except where indicated to be mounted adjacent to the equipment they supply, mount enclosed circuit breakers such that the highest position of the operating handle does not exceed 79 inches above the floor or working platform.
H. Provide grounding and bonding in accordance with Section 26 05 26.

3.3 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.
B. Inspect and test in accordance with manufacturer's instructions and NETA ATS, except Section 4.
C. Perform inspections and tests listed in NETA ATS, Section 7.6.1.1 for circuit breakers used for service entrance. Tests listed as optional are not required.
D. Test GFCI circuit breakers to verify proper operation.
E. Correct deficiencies and replace damaged or defective enclosed circuit breakers.

3.4 ADJUSTING

A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

3.5 CLEANING

A. Clean dirt and debris from circuit breaker enclosures and components according to manufacturer's instructions.
B. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION

SECTION 26 43 00 - SURGE PROTECTIVE DEVICES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Surge protective devices for service entrance locations.
B. Surge protective devices for distribution locations.
C. Surge protective devices for branch panelboard locations.

1.2 RELATED REQUIREMENTS

A. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
B. Section 26 24 16 - Panelboards.

1.3 ABBREVIATIONS AND ACRONYMS

A. EMI/RFI: Electromagnetic Interference/Radio Frequency Interference.
B. SPD: Surge Protective Device.

1.4 REFERENCE STANDARDS

A. MIL-STD-220 - Method of Insertion Loss Measurement; 2009c (Validated 2024).
B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
C. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.
D. NETA ATS - Standard for Acceptance Testing Specifications for Electrical Power Equipment And Systems; 2025.
E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
F. UL 1283 - Standard for Electromagnetic Interference Filters; Current Edition, Including All Revisions.
G. UL 1449 - Standard for Surge Protective Devices; Current Edition, Including All Revisions.

1.5 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate size and location of overcurrent device compatible with the actual surge protective device and location to be installed. Notify Architect of any conflicts or deviations from the contract documents to obtain direction prior to ordering equipment.

1.6 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.
B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.7 DELIVERY, STORAGE, AND PROTECTION

A. Store in a clean, dry space in accordance with manufacturer's written instructions.

1.8 FIELD CONDITIONS

A. Maintain field conditions within manufacturer's required service conditions during and after installation.

1.9 WARRANTY

A. Manufacturer's Warranty: Provide minimum five year warranty covering repair or replacement of surge protective devices showing evidence of failure due to defective materials or workmanship.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Factory-installed, Internally Mounted Surge Protective Devices:
   1. Same as manufacturer of equipment containing surge protective device, to provide a complete listed assembly including SPD.
B. Substitutions: Submit Manufacture's Data Sheet for Approval.
C. Source Limitations: Furnish surge protective devices produced by a single manufacturer and obtained from a single supplier.

2.2 SURGE PROTECTIVE DEVICES - GENERAL REQUIREMENTS

A. Description: Factory-assembled surge protective devices (SPDs) for 60 Hz service; listed, classified, and labeled as suitable for the purpose intended; system voltage as indicated on the drawings.
B. Protected Modes:
   1. Wye Systems: L-N, L-G, N-G, L-L.
   2. Delta Systems: L-G, L-L.
   3. Single Split Phase Systems: L-N, L-G, N-G, L-L.
   4. High Leg Delta Systems: L-N, L-G, N-G, L-L.
C. UL 1449 Voltage Protection Ratings (VPRs):
   1. 240/120V System Voltage: Not more than 1,000 V for L-N, L-G, and N-G modes and 1,200 V for L-L mode.
D. UL 1449 Maximum Continuous Operating Voltage (MCOV): Not less than 115% of nominal system voltage.
E. Enclosure Environment Type per NEMA EN 10250: Unless otherwise indicated, as specified for the following installation locations:
   1. Indoor clean, dry locations: Type 1.
   2. Outdoor locations: Type 3R.
F. Mounting for Field-installed, Externally Mounted SPDs: Unless otherwise indicated, as specified for the following locations:
   1. Provide surface-mounted SPD where mounted in non-public areas or adjacent to surface-mounted equipment.
   2. Provide flush-mounted SPD where mounted in public areas or adjacent to flush-mounted equipment.
G. Equipment Containing Factory-installed, Internally Mounted SPDs: Listed and labeled as a complete assembly including SPD.
   1. Panelboards: See Section 26 24 16.

2.3 SURGE PROTECTIVE DEVICES FOR SERVICE ENTRANCE LOCATIONS

A. Unless otherwise indicated, provide field-installed, externally mounted or factory-installed, internally mounted SPDs.
B. List and label as complying with UL 1449, Type 1 when connected on line side of service disconnect overcurrent device and Type 1 or 2 when connected on load side of service disconnect overcurrent device.
C. Provide SPDs utilizing field-replaceable modular or non-modular protection circuits.
D. Surge Current Rating: Not less than 60 kA per mode/120 kA per phase.
E. UL 1449 Nominal Discharge Current (I-n): 20 kA.
F. UL 1449 Short Circuit Current Rating (SCCR): Not less than the available fault current at the installed location as indicated on the drawings.
G. Diagnostics:

1. Protection Status Monitoring: Provide indicator lights to report the protection for each phase.
2. Alarm Notification: Provide indicator light and audible alarm to report alarm condition. Provide button to manually silence audible alarm.

2.4 SURGE PROTECTIVE DEVICES FOR BRANCH PANELBOARD LOCATIONS

A. Unless otherwise indicated, provide field-installed, externally mounted or factory-installed, internally mounted SPDs.
B. List and label as complying with UL 1449, Type 1 or Type 2.
C. Provide SPDs utilizing field-replaceable modular or non-modular protection circuits.
D. Surge Current Rating: Not less than 60 kA per mode/120 kA per phase.
E. UL 1449 Nominal Discharge Current (I-n): 20 kA.
F. UL 1449 Short Circuit Current Rating (SCCR): Not less than the available fault current at the installed location as indicated on the drawings.
G. Diagnostics:
   1. Protection Status Monitoring: Provide indicator lights to report the protection status.
   2. Alarm Notification: Provide indicator light and audible alarm to report alarm condition. Provide button to manually silence audible alarm.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that field measurements are as indicated.
B. Verify that the service voltage and configuration marked on the SPD are consistent with the service voltage and configuration at the location to be installed.
C. Verify that electrical equipment is ready to accept connection of the SPD and that installed overcurrent device is consistent with requirements of drawings and manufacturer's instructions.
D. Verify system grounding and bonding is in accordance with Section 26 05 26, including bonding of neutral and ground for service entrance and separately derived systems where applicable. Do not energize SPD until deficiencies have been corrected.
E. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

A. Perform work in accordance with NECA 1 (general workmanship).
B. Install products in accordance with manufacturer's instructions.
C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
D. Provide conductors with minimum ampacity as indicated on the drawings, as required by NFPA 70, and not less than manufacturer's recommended minimum conductor size.
E. Install conductors between SPD and equipment terminations as short and straight as possible, not exceeding manufacturer's recommended maximum conductor length. Breaker locations may be reasonably rearranged in order to provide leads as short and straight as possible. Twist conductors together to reduce inductance.
F. Do not energize SPD until bonding of neutral and ground for service entrance and separately derived systems is complete in accordance with Section 26 05 26 where applicable. Replace SPDs damaged by improper or missing neutral-ground bond.

3.3 FIELD QUALITY CONTROL

A. Inspect and test in accordance with NETA ATS, except Section 4.

3.4 CLEANING

A. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION

SECTION 26 56 00 - EXTERIOR LIGHTING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Exterior luminaires.

1.2 RELATED REQUIREMENTS

A. Section 26 05 26 - Grounding and Bonding for Electrical Systems.
B. Section 26 05 33.16 - Boxes for Electrical Systems.
C. Section 26 27 26 - Wiring Devices: Receptacles for installation in poles.

1.3 REFERENCE STANDARDS

A. IEEE C2 - National Electrical Safety Code(R) (NESC(R)); 2023.
B. IESNA LM-63 - ANSI Approved Standard File Format for Electronic Transfer of Photometric Data and Related Information; 2002 (Reaffirmed 2008).
C. IES LM-79 - Approved Method: Optical and Electrical Measurements of Solid-State Lighting Products; 2024.
D. IES LM-80 - Approved Method: Measuring Maintenance of Light Output Characteristics of Solid-State Light Sources; 2021.
E. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2023.
F. NECA/IESNA 501 - Standard for Installing Exterior Lighting Systems; 2000 (Reaffirmed 2006).
G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
H. UL 1598 - Luminaires; Current Edition, Including All Revisions.
I. UL 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products; Current Edition, Including All Revisions.

1.4 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Shop Drawings:
    1. Provide photometric calculations where luminaires are proposed for substitution upon request.
C. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, weight, effective projected area (EPA), and installed accessories; include model number nomenclature clearly marked with all proposed features.
    1. LED Luminaires:
        a. Include estimated useful life, calculated based on IES LM-80 test data.
    2. Provide electronic files of photometric data certified by a National Voluntary Laboratory Accreditation Program (NVLAP) lab or independent testing agency in IESNA LM-63 standard format upon request.
    3. Lamps: Include rated life and initial and mean lumen output.

1.5 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Receive, handle, and store products according to NECA/IESNA 501 and manufacturer's written instructions.

B. Keep products in original manufacturer's packaging and protect from damage until ready for installation.

1.7 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
B. Provide three year manufacturer warranty for all LED luminaires, including drivers.

PART 2 PRODUCTS

2.1 LUMINAIRE TYPES

A. Furnish products as indicated in luminaire schedule included on the drawings.

2.2 LUMINAIRES

A. Manufacturers:
   1. Acuity Brands, Inc: www.acuitybrands.com.
   2. Cooper Lighting, a division of Cooper Industries: www.cooperindustries.com.
   3. U.S Architectural Lighting, Inc; www.usaltg.com.
   4. Hubbell Lighting, Inc: www.hubbelllighting.com.
   5. Substitutions: See Section 01 60 00 - Product Requirements.
B. Provide products that comply with requirements of NFPA 70.
C. Provide products that are listed and labeled as complying with UL 1598, where applicable.
D. Provide products listed, classified, and labeled as suitable for the purpose intended.
E. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.
F. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, poles, foundations, supports, trims, accessories, etc. as necessary for a complete operating system.
G. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that field measurements are as indicated.
B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with NFPA 70.
C. Verify that suitable support frames are installed where required.
D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.
E. Verify that conditions are satisfactory for installation prior to starting work.

3.2 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface.
B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.3 INSTALLATION

A. Coordinate locations of outlet boxes provided under Section 26 05 33.16 as required for installation of luminaires provided under this section.
B. Perform work in accordance with NECA 1 (general workmanship).
C. Install products in accordance with manufacturer's instructions.
D. Install luminaires in accordance with NECA/IESNA 501.

E. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.
F. Recessed Luminaires:
   1. Install trims tight to mounting surface with no visible light leakage.
G. Wall-Mounted Luminaires: Unless otherwise indicated, specified mounting heights are to center of luminaire.
H. Install accessories furnished with each luminaire.
I. Bond products and metal accessories to branch circuit equipment grounding conductor.
J. Install lamps in each luminaire.

3.4 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.
B. Inspect each product for damage and defects.
C. Operate each luminaire after installation and connection to verify proper operation.
D. Correct wiring deficiencies and repair or replace damaged or defective products. Repair or replace excessively noisy ballasts as determined by Architect.

3.5 ADJUSTING

A. Luminaires with Field-Rotatable Optics: Position optics according to manufacturer's instructions to achieve lighting distribution as indicated or as directed by Architect.

3.6 CLEANING

A. Clean surfaces according to NECA/IESNA 501 and manufacturer's instructions to remove dirt, fingerprints, paint, or other foreign material and restore finishes to match original factory finish.

END OF SECTION

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SECTION 31 10 00 - SITE CLEARING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Clearing and protection of vegetation.
B. Removal of existing debris.

1.2 RELATED REQUIREMENTS

1.3 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Site Plan: Showing:
   1. Vegetation removal limits.
   2. Areas for temporary construction and field offices.

1.4 QUALITY ASSURANCE

A. Clearing Firm: Company specializing in the type of work required.
   1. Minimum of ___ years of documented experience.

PART 2 PRODUCTS -- NOT USED

2.1 MATERIALS

A. Fill Material: As specified in Section 31 22 00 - Grading

PART 3 EXECUTION

3.1 SITE CLEARING

A. Comply with other requirements specified in Section 01 70 00.
B. Minimize production of dust due to clearing operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

3.2 EXISTING UTILITIES AND BUILT ELEMENTS

A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.
B. Protect existing utilities to remain from damage.
C. Do not disrupt public utilities without permit from authority having jurisdiction.
D. Protect existing structures and other elements that are not to be removed.

3.3 VEGETATION

A. Scope: Remove trees, shrubs, brush, and stumps in areas to be covered by building structure, paving, playing fields, lawns, and planting beds.
B. Do not begin clearing until vegetation to be relocated has been removed.
C. Do not remove or damage vegetation beyond the limits indicated on drawings.
   1. 40 feet outside the building perimeter.
   2. 10 feet each side of surface walkways, patios, surface parking, and utility lines less than 12 inches in diameter.
   3. 15 feet each side of roadway curbs and main utility trenches.
   4. 25 feet outside perimeter of pervious paving areas that must not be compacted by construction traffic.
   5. Exception: Specific trees and vegetation indicated on drawings to be removed.
   6. Exception: Selective thinning of undergrowth specified elsewhere.
D. Install substantial, highly visible fences at least 3 feet high to prevent inadvertent damage to vegetation to remain:
   1. At vegetation removal limits.

2. Around trees to remain within vegetation removal limits; locate no closer to tree than at the drip line.
3. Around other vegetation to remain within vegetation removal limits.
4. See Section 01 50 00 for fence construction requirements.

E. In areas where vegetation must be removed but no construction will occur other than pervious paving, remove vegetation with minimum disturbance of the subsoil.

F. Vegetation Removed: Do not burn, bury, landfill, or leave on site, except as indicated.
1. Chip, grind, crush, or shred vegetation for mulching, composting, or other purposes; preference should be given to on-site uses.
2. Trees: Sell if marketable; if not, treat as specified for other vegetation removed; remove stumps and roots to depth of 18 inches.
3. Existing Stumps: Treat as specified for other vegetation removed; remove stumps and roots to depth of 18 inches.
4. Sod: Re-use on site if possible; otherwise sell if marketable, and if not, treat as specified for other vegetation removed.
5. Fill holes left by removal of stumps and roots, using suitable fill material, with top surface neat in appearance and smooth enough not to constitute a hazard to pedestrians.

G. Dead Wood: Remove all dead trees (standing or down), limbs, and dry brush on entire site; treat as specified for vegetation removed.

H. Restoration: If vegetation outside removal limits or within specified protective fences is damaged or destroyed due to subsequent construction operations, replace at no cost to OWNER.

3.4 DEBRIS

A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 32 12 16 - ASPHALT PAVING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Aggregate base course.
B. Single course bituminous concrete paving.
C. Double course bituminous concrete paving.
D. Surface sealer.

1.2 RELATED REQUIREMENTS

1.3 PRICE AND PAYMENT PROCEDURES

A. See Section 01 22 00 - Unit Prices for requirements applicable to this section. Measurement and payment will be as follows:
B. Asphalt Pavement Mix (Base Course): By the ton. Includes preparing base, tack coating surfaces, placing, compacting and rolling, testing. Includes mix design, supplying to site, testing.
C. Asphalt Pavement Mix (Binder Course): By the ton. Includes preparing base, tack coating surfaces, placing, compacting and rolling, testing. Includes mix design, supplying to site, testing.
D. Asphalt Pavement Mix (Wearing Course): By the ton. Includes preparing base, tack coating surfaces, placing, compacting and rolling, testing. Includes mix design, supplying to site, testing.
E. Seal Coat: By the square yard. Includes preparing surfaces and applying.

1.4 REFERENCE STANDARDS

A. AASHTO M 147 - Standard Specification for Materials for Aggregate and Soil-Aggregate Subbase, Base and Surface Courses; 2017.
B. AI MS-2 - Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types; 2015.
C. AI MS-19 - A Basic Asphalt Emulsion Manual; Fourth Edition.
D. ASTM C136/C136M - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 2014.
E. ASTM D946 - Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction; 2009a.
F. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2011.
G. ASTM D4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils; 2010.

1.5 PERFORMANCE REQUIREMENTS

A. Design paving and subbase at [_____] for movement of trucks up to 60,000 lbs (27 200 kg).
B. Design paving and subbase at [_____] for movement of trucks up to 30,000 lbs (13 600 kg).
C. Design paving and subbase at [_____] for main arterial street traffic.
D. Design paving and subbase at [_____] for light duty commercial vehicle traffic.
E. Design paving and subbase at [_____] for residential street traffic.
F. Design paving and subbase at [_____] for parking.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with State of _____ Highways standard.
B. Mixing Plant: Conform to State of _____ Highways standard.

C. Obtain materials from same source throughout.

1.7 REGULATORY REQUIREMENTS

A. Conform to applicable code for paving work on public property.

1.8 FIELD CONDITIONS

A. Do not place asphalt when ambient air or base surface temperature is less than 40 degrees F, or surface is wet or frozen.

B. Place bitumen mixture when temperature is not more than 15 F degrees below bitumen supplier's bill of lading and not more than maximum specified temperature.

PART 2 PRODUCTS

2.1 MATERIALS

A. Asphalt Cement: ASTM D946.

B. Aggregate for Base Course: In accordance with State of _____ Highways standards.

C. Aggregate for Base Course- Gravel - Fill Type ____: AASHTO M 147, Grade ____; passing the No. ____ sieve with a liquid limit of not more than 25; a plasticity index of not more than 5 in accordance with ASTM D4318.

D. Aggregate for Base Course- Gravel - Fill Type ____: Angular crushed washed stone; free of shale, clay, friable material and debris.
   1. Graded in accordance with ASTM D2487 Group Symbol GW.
   2. Graded in accordance with ASTM C136/C136M, within the following limits:
      a. 2 inch sieve: 100 percent passing.
      b. 1 inch sieve: 95 percent passing.
      c. 3/4 inch sieve: 95 to 100 percent passing.
      d. 5/8 inch sieve: 75 to 100 percent passing.
      e. 3/8 inch sieve: 55 to 85 percent passing.
      f. No. 4 sieve: 35 to 60 percent passing.
      g. No. 16 sieve: 15 to 35 percent passing.
      h. No. 40: 10 to 25 percent passing.
      i. No. 200: 5 to 10 percent passing.

E. Aggregate for Binder Course: In accordance with State of _____ Highways standards.

F. Aggregate for Binder Course- Gravel - Fill Type ____: AASHTO M 147, Grade ____; passing the No. ____ sieve with a liquid limit of not more than 25; a plasticity index of not more than 5 in accordance with ASTM D4318.

G. Aggregate for Binder Course- Gravel - Fill Type ____: Angular crushed washed stone; free of shale, clay, friable material and debris.
   1. Graded in accordance with ASTM D2487 Group Symbol GW.
   2. Graded in accordance with ASTM C136/C136M, within the following limits:
      a. 2 inch sieve: 100 percent passing.
      b. 1 inch sieve: 95 percent passing.
      c. 3/4 inch sieve: 95 to 100 percent passing.
      d. 5/8 inch sieve: 75 to 100 percent passing.
      e. 3/8 inch sieve: 55 to 85 percent passing.
      f. No. 4 sieve: 35 to 60 percent passing.
      g. No. 16 sieve: 15 to 35 percent passing.
      h. No. 40: 10 to 25 percent passing.
      i. No. 200: 5 to 10 percent passing.

H. Aggregate for Wearing Course: In accordance with State of _____ Highways standards.

I. Aggregate for Wearing Course- Gravel - Fill Type ____: AASHTO M 147, Grade ____; passing the No. ____ sieve with a liquid limit of not more than 25; a plasticity index of not more than 5 in accordance with ASTM D4318.
J. Aggregate for Wearing Course- Gravel - Fill Type ____: Angular crushed washed stone; free of shale, clay, friable material and debris.
    1. Graded in accordance with ASTM D2487 Group Symbol GW.
    2. Graded in accordance with ASTM C136/C136M, within the following limits:
        a. 2 inch sieve: 100 percent passing.
        b. 1 inch sieve: 95 percent passing.
        c. 3/4 inch sieve: 95 to 100 percent passing.
        d. 5/8 inch sieve: 75 to 100 percent passing.
        e. 3/8 inch sieve: 55 to 85 percent passing.
        f. No. 4 sieve: 35 to 60 percent passing.
        g. No. 16 sieve: 15 to 35 percent passing.
        h. No. 40: 10 to 25 percent passing.
        i. No. 200: 5 to 10 percent passing.
K. Fine Aggregate: In accordance with State of _____ Highways standards.
L. Mineral Filler: Finely ground particles of limestone, hydrated lime or other mineral dust, free of foreign matter.
M. Fiber Reinforcement: Synthetic fibers shown to have long-term resistance to deterioration when in contact with alkalis and moisture; 1/2 inch length.
    1. Manufacturers:
        a. Forta Corporation: www.forta-fi.com/#sle.
        b. _____
        c. _____
        d. _____
        e. Substitutions: See Section 01 60 00 - Product Requirements.
N. Primer: In accordance with State of _____ Highways standards.
O. Tack Coat: Homogeneous, medium curing, liquid asphalt.
P. Seal Coat: AI MS-19, sand type. Provide _____ manufactured by _____ .

2.2 ASPHALT PAVING MIXES AND MIX DESIGN

A. Use dry material to avoid foaming. Mix uniformly.
B. Base Course: 3.0 to 6 percent of asphalt cement by weight in mixture in accordance with AI MS-2.
C. Binder Course: 4.5 to 6 percent of asphalt cement by weight in mixture in accordance with AI ____.
D. Wearing Course: 5 to 7 percent of asphalt cement by weight in mixture in accordance with AI MS-2.
E. Submit proposed mix design of each class of mix for review prior to beginning of work.

2.3 SOURCE QUALITY CONTROL

A. Test mix design and samples in accordance with AI MS-2.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that compacted subgrade is dry and ready to support paving and imposed loads.
B. Verify gradients and elevations of base are correct.

3.2 BASE COURSE

A. Place and compact base course.

B. See Section 32 11 23.

3.3 PREPARATION - PRIMER

A. Apply primer in accordance with manufacturer's instructions.
B. Apply primer on aggregate base or subbase at uniform rate of 1/3 gal/sq yd.
C. Apply primer to contact surfaces of curbs, gutters, and _____.
D. Use clean sand to blot excess primer.

3.4 PREPARATION - TACK COAT

A. Apply tack coat in accordance with manufacturer's instructions.
B. Apply tack coat on asphalt or concrete surfaces over subgrade surface at uniform rate of 1/3 gal/sq yd.
C. Apply tack coat to contact surfaces of curbs, gutters and _____.
D. Coat surfaces of manhole frames with oil to prevent bond with asphalt pavement. Do not tack coat these surfaces.

3.5 PLACING ASPHALT PAVEMENT - SINGLE COURSE

A. Install Work in accordance with State of _____ Highways standards.
B. Place asphalt within 24 hours of applying primer or tack coat.
C. Place to ____ inch compacted thickness.
D. Install gutter drainage grilles and frames in correct position and elevation.
E. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.
F. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

3.6 PLACING ASPHALT PAVEMENT - DOUBLE COURSE

A. Place asphalt binder course within 24 hours of applying primer or tack coat.
B. Place binder course to ____ inch compacted thickness.
C. Place wearing course within two hours of placing and compacting binder course.
D. Place wearing course to ____ inch compacted thickness.
E. Install gutter drainage grilles and frames in correct position and elevation.
F. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.
G. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks.

3.7 CURBS

A. Install extruded asphalt curbs of _____ profile as indicated.

3.8 SEAL COAT

A. Apply seal coat to surface course and asphalt curbs in accordance with AI MS-19.

3.9 TOLERANCES

A. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.
B. Compacted Thickness: Within 1/4 inch of specified or indicated thickness.
C. Variation from True Elevation: Within 1/2 inch.

3.10 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for general requirements for quality control.
B. Provide field inspection and testing. Take samples and perform tests in accordance with AI MS-2.

3.11 PROTECTION

A. Immediately after placement, protect pavement from mechanical injury for ____ days or until surface temperature is less than 140 degrees F.

3.12 SCHEDULE

A. Pavement at Truck Ramp and Garbage Area: Single course of 3-1/2 inch compacted thickness, sand seal coat.
B. Pavement at Parking Areas: Two courses; binder course of 2-1/2 inch compacted thickness and wearing course of 1 inch compacted thickness, fog seal coat.
C. Pavement at Rear Bus Loading Area: Thickness and compaction of subbase to support vehicles up to 30,000 lb.
D. Pavement Front Sidewalks: Thickness and compaction of subbase to support moderate pedestrian traffic.

END OF SECTION

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SECTION 32 13 65 - SURFACING FOR CONCRETE BASKETBALL AND PICKELBALL COURT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Surfacing proposed concrete basketball and pickelball court.

1.2 RELATED REQUIREMENTS

1.3 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
B. Product Data: For each type of product..
   1. Provide detailed preparation guidelines and step-by-step application instructions
C. Provide Samples for each type of topcoat product
D. Samples for Initial Selection:for each type of product.
   1. Submit Samples on rigid backing, 8 inches square
   2. Apply coats on samples in steps to show each coat required for system.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store unused materials in tightly sealed containers located in well-ventilated areas, where the ambient temperature is consistently maintained at a minimum of 45 Degrees F.
   1. Keep all containers clean and free of contaminants or residue.
   2. Remove rags and waste materials from storage areas on a daily basis.

1.5 FIELD CONDITIONS

A. Apply coatings only when both the surface and ambient air temperatures are between 50°F and 95°F, or within the temperature range specified by the manufacturer.
B. Do not apply paint under the following conditions: when relative humidity exceeds 85 percent, when the temperature is less than 5°F above the dew point, on damp or wet surfaces, or contrary to manufacturer recommendations.

1.6 WARRANTY

A. The Installer and Manufacturer shall warrant the Work for a period of two (2) years from the date of Substantial Completion as confirmed by the Owner. This warranty shall cover the following, ensuring that the court preparation materials and surfacing treatments:
   1. Have been manufactured and applied in accordance with these Specifications and the Manufacturer’s requirements.
   2. Properly adhere, bond, and remain fastened to the newly constructed courts and preparation materials.
   3. Have been applied in the specified quantities and thicknesses.
   4. Will perform in accordance with the Manufacturer’s currently published product literature and Specification sheets.

1.7 PROTECTION OF EXISTING IMPROVEMENTS

A. The Contractor is responsible for protecting all existing improvements—such as buildings, lawn areas, landscaping, curbing, parking lots, fences, net posts, wind screens, and similar features—from damage, discoloration, or unintended application of surfacing materials. These areas must be properly masked or otherwise protected. Any damage or adverse effects caused by the Contractor’s operations shall be cleaned, repaired, or restored to their original condition at the Contractor’s expense.

1.8 STANDARDS AND WORKMANSHIP

A. Pickleball court color finishes and preparation materials shall be applied using methods generally consistent with the standards set by the U.S. Pickleball Association (USPA) and the

USA Basketball. In the event of any conflict between those standards and this Specification, the requirements of this Specification shall take precedence. Any work that does not meet the specified requirements shall be removed or corrected by the Contractor at their own expense, with no extension of time granted for completion. All corrective actions shall be performed as directed by the Engineer or Owner.

1.9 QUALIFICATIONS

A. The basketball and pickleball court surfacing installer shall submit a list of completed basketball and pickleball court projects, including the client's name, project location, date of completion, and the Owner's contact telephone number. In addition, the Surfacing Contractor must be a certified pickleball court builder, holding current certification from both the U.S. Pickleball Association (USPA) and the USA Basketball.

PART 2 PRODUCTS

2.1 COURT PREPARATION MATERIALS

A. Acid Cleaning and Etching - Concrete Court Surface
   An acid pre-treatment shall be applied to uncoated Portland cement concrete surfaces to clean, etch, and prepare the surface for subsequent material applications.
   1. Use "Concrete Preparer", manufactured by California Products Corporation (containing phosphoric acid and zinc chloride), or an approved equal. This product is self-neutralizing, requires no rinse, and creates a water-insoluble surface reaction. This reaction forms a barrier that minimizes the osmotic effects of moisture and water vapor, helping to prevent blisters and ensuring proper adhesion of subsequent coatings.
   2. Acid treatment shall be applied only to previously uncoated or untreated Portland cement concrete surfaces.

B. Primer – Concrete Court Surface
   After acid pre-treatment, a lightly pigmented acrylic emulsion primer shall be applied to the concrete surface to promote bonding of subsequent materials.
   1. Use "California Ti-Coat", manufactured by California Products Corporation, or an approved equal.
   2. Priming shall be performed only on previously uncoated Portland cement concrete surfaces.

C. Crack Filler
   Crack filler shall be an acrylic latex, high-solids compound that is pourable, injectable, or pressure-applied. Once cured, it must remain highly flexible, exhibit minimal expansion/contraction under temperature changes, and be waterproof. It must adhere to the interior surfaces of cracks and serve as a compatible base for subsequent patching materials, slurry coats, and color finishes.
   1. Use "Plexipave Crack Filler", manufactured by California Products Corporation, or an approved equal.

D. Deep Patching Material
   For depressions or areas deeper than 1/4 inch, a high-strength patching material shall be used. It shall consist of an acrylic latex bonding liquid mixed with silica sand and Portland cement. Deep patching shall only be performed as directed by the Owner's Representative.
   1. Use "Court Patch Binder", manufactured by California Products Corporation, or an approved equal.

E. Slurry – Base Filler Coat and Shallow Patching
   1. Slurry material shall be an acrylic latex binder designed for mixing with water, graded silica sand, and Portland cement. It shall form a smooth, uniform slurry with thickness not exceeding 1/4 inch per coat. Slurry shall be applied for the following purposes:

a. Patch shallow depressions (birdbaths) in multiple thin layers (≤ 1/4 inch each).
b. Fill hairline cracks, pores, and other minor surface irregularities.
c. Level the surface in preparation for color coating.
d. Provide a consistent texture across the court for uniform appearance, traction, ball bounce, and playability.

2. Use black-pigmented "California Acrylic Resurfacer", manufactured by California Products Corporation, or an approved equal.
3. Apply a minimum of two (2) slurry coats over the entire court surface (refer to PART 3 – EXECUTION).
4. Note: The use of asphaltic emulsion in base filler coats is strictly prohibited.

2.2 COLOR FINISH MATERIALS

A. Color finish materials shall consist of highly pigmented, texturized acrylic latex coatings formulated exclusively with inert mineral pigment colorants suitable for exterior use. The coating shall contain sufficient filler to ensure uniform texture and appearance and must be fade-resistant, tack-free, and resistant to deterioration from temperature changes, moisture, and ultraviolet radiation. Coatings must not include any ingredients that could damage the existing or newly applied court surfaces or preparation materials. The color finish system shall contain no vinyls, butadiene styrene, alkyds, asphalt, tar emulsions, or non-acrylic resins. Thinning shall be done only with clean water and strictly in accordance with the manufacturer’s instructions.

B. Apply a minimum of two (2) coats of job-mixed "Fortified Plexipave" and one (1) final coat of "Plexichrome", manufactured by California Products Corporation, or an approved equal.

C. Final color selection (two colors) shall be made by the Owner. A current manufacturer’s color chart shall be included in each submittal package, as required under PART 1 – GENERAL.

2.3 STRIPING PAINT

A. Striping paint shall be a non-glare, high-hiding, highly reflective acrylic latex paint. Oil-based or solvent-type paints are not permitted. The paint shall be pre-mixed with fine silica fillers, per the manufacturer’s recommendations, to provide a textured line finish matching the court surface texture.

B. Paint shall be a 100% acrylic emulsion containing no alkyds, vinyls, or butadiene styrene. Thinning shall be with water only. The paint must be suitable for application by brush, spray, or roller. All ingredients must be of commercial-grade quality, appropriate for long-term exterior use.

1. For white striping paint, the pigment shall include rutile titanium dioxide as the primary opaque component.
2. The vehicle shall consist of 100% acrylic polymer dispersed in water, with only essential additives such as pigment dispersants, anti-foaming agents, and preservatives.
3. Driers are not allowed.
4. White paint shall meet the following minimum requirements:
   a. Total solids: 51.5% (by weight)
   b. Maximum pigment content: 34% (by weight)
   c. Titanium dioxide content: Minimum 3 lbs/gallon
   d. Fineness of grind: Minimum 4
   e. Viscosity: 70–85 Krebs Units
5. Paint shall exhibit excellent brushing, leveling, and spreading characteristics.

C. Use "Hi-Hide Plexicolor Line Paint" (white), manufactured by California Products Corporation, or an approved equal.

2.4 MATERIAL LABELS AND CONTAINERS

A. All surfacing and patching materials shall be delivered to the site in original, sealed containers bearing the manufacturer's label and batch code number. Materials packaged or labeled inconsistently with these requirements will not be accepted. All water required for mixing shall be clean, fresh, and added on-site only.

2.5 APPROVED EQUAL SUBSTITUTIONS

A. The following products may be considered as acceptable substitutes, subject to written approval by the Owner and Engineer:
   1. Court Master
   2. Laykold
   3. Novacrylic
   4. Dynaflex
   5. WorldClass

PART 3 EXECUTION

3.1 SURFACE PLANE AND CONDITION OF PICKLEBALL COURTS

A. The basketball/pickleball court pavement must be installed to meet specified slope, pitch, and grade requirements. No surface variation shall exceed 1/8 inch when measured with a 10-foot straightedge in any direction.
   1. Minor surface irregularities must be corrected as outlined in Section 3.9.
   2. Significant defects or poor pavement quality shall be reported to the Owner's Representative for further instruction.
   3. Concrete surfaces must have a uniform light broom finish. Alternate finishes are not acceptable and must be corrected using approved methods prior to the commencement of any surface work.

3.2 ADVERSE CONDITIONS

A. No court preparation or color surfacing materials shall be applied under adverse environmental conditions, which include (but are not limited to):
   1. Airborne pollutants
   2. Blowing sand or debris
   3. High humidity
   4. Any form of precipitation (current or forecasted)
   5. Extreme temperatures
   6. Unsuitable surface conditions
   7. Other factors as defined by the product manufacturers that could impair product performance or final results

   Work shall not be performed when:
   1. Ambient temperatures are below 50°F or expected to drop below 50°F during curing/drying
   2. Surface temperature exceeds 140°F

B. Material Protection

   All materials and containers stored on-site must be protected from extreme heat, cold, and direct sunlight to prevent damage or degradation of product performance.

3.3 ORDER OF WORK

A. The following steps must be completed in the order listed. Allow proper drying and curing time between each step as per manufacturer guidelines.

B. Initial Curing: Allow the concrete court pavement to cure for a minimum of 30 days before starting surface treatments.

C. Grind off ridges and bumps if necessary. Feather all edges to avoid texture differences. Tools may include a terrazzo grinder, hand stone, or scraper.
D. Sweep and wash all court surfaces.
E. Perform acid treatment on entire surface (after test area is approved).
F. Apply epoxy primer.
G. Apply one coat of acrylic resurfacer.
H. Fill cracks as needed.
I. Patch birdbaths and deep areas if directed.
J. Apply two coats (minimum) of acrylic resurfacer.
K. Apply two coats of job-mixed Fortified Plexipave.
L. Apply one coat of Plexichrome (no sand).
M. Paint court striping.
N. Final cleanup.
O. Inspection and approval by Owner’s Representative.

3.4 SWEEPING AND WASHING COURTS

A. All court surfaces must be thoroughly cleaned before beginning any subsequent work.
B. Sweeping: Remove gravel, dust, loose soil, plant debris, chipped concrete, and all foreign materials.
C. Washing: Clean surfaces using scrub brushes, strong detergent, and a high-pressure water stream to remove grease, oil, dirt, and pollutants.

3.5 ACID TREATMENT

A. Conduct a test application on a small corner section of the court. Proceed with full application only upon approval from the Owner’s Representative.
B. Application Procedure:
    1. Mix 1 gallon of "Concrete Preparer" with 4 gallons of clean water.
    2. Apply at a rate equivalent to 1 undiluted gallon per 700–900 square feet.
    3. Pour and spread liberally with a broom.
    4. Do not rinse. Allow surface to dry completely.
    5. Use a broom or squeegee to disperse puddles after reaction ends.

3.6 PRIMING

A. Apply a thin, even coat of epoxy primer to cleaned, acid-treated concrete using a short nap phenolic core roller.
    1. Apply one coat of acrylic resurfacer within 1 to 2 hours after priming.

3.7 CRACK FILLING

A. All cracks must be thoroughly cleaned using compressed air or high-pressure water.
    1. Structural cracks or signs of slab settlement must be reported to the Owner’s Representative.
    2. For minor or hairline cracks:
        a. Apply crack filler with a blunt-nose hand trowel or broad knife to a minimum depth of 1/4 inch.
        b. Wipe surrounding edges clean with a damp cloth to prevent buildup and avoid the need for sanding.

3.8 DEEP PATCHING

A. Deep patching shall be performed only as directed by the Owner’s Representative to repair major pavement defects.

B. For depressions up to 3/4 inch thick, use the following patch mix applied by steel trowel or metal screed to fill and level the area:
   1. 100 lbs #100 mesh silica sand
   2. 3 gallons "Court Patch Binder"
   3. 1 gallon Portland cement
C. Mix thoroughly in a clean mortar box or mixer to a workable consistency. Add a small amount of water if surface temperatures are high to improve workability. Apply patch directly to cleaned depressed areas. Allow patch to cure for 24 hours before applying subsequent materials.
D. For depressions deeper than 3/4 inch, apply multiple patching layers with 24 hours curing time between coats. Feather each layer to a fine edge. Smooth rough edges by grinding or abrasive rubbing.

3.9 PATCH BIRDBATHS AND MINOR SURFACE IRREGULARITIES

A. Identification: A birdbath is a depression where water collects after rain or flooding. All courts will be flooded under Owner’s supervision. After drying, any depression holding water deeper than a new 5-cent coin shall be marked (chalk or keel) for patching.
B. Mixing: Prepare shallow patch slurry as follows:

Material	Quantity
Acrylic Resurfacer	55 gallons
Water	28 gallons
Sand (40-60 mesh)	1,100 lbs
Portland Cement (Type I or Hi Early)	4 lbs

C. Filling: Apply the patch slurry to birdbaths once courts are flooded and dry. If needed, apply multiple coats not exceeding 1/4 inch each to build up the patch. Avoid overly thick layers to ensure proper curing and adhesion.
D. Leveling: Use a trowel or straight edge longer than the birdbath width to level the patch flush with surrounding surfaces. Birdbaths are typically circular or elliptical; finished patches should be roughly square or rectangular and aligned parallel to court edges.
E. Other Irregularities: Patch other surface imperfections similarly, adjusting patch thickness to the depth of irregularities. Bumps and ridges should be removed prior to sweeping and acid treatment.

3.10 APPLY SLURRY FOR BASE FILLER COATS

A. Begin only after all prior steps are completed and approved by the Owner’s Representative.
B. Mixing: Prepare "Acrylic Resurfacer" slurry per manufacturer guidelines, adjusting water-sand ratios as needed to achieve a uniform texture and level surface (see PART 2 - PRODUCTS). Target a creamy, spreadable slurry that resists sand separation, using the following mix proportions:

Material	Quantity
Acrylic Resurfacer	55 gallons
Water	20–40 gallons
Sand (60-80 mesh for first coat, 720 sand for second)	600–900 lbs

Liquid yield approximately 112–138 gallons.
C. Mix thoroughly with clean, dry sand and potable water. Adjust sand and water quantities by up to 10% based on surface roughness and temperature.
D. Application:

1. Apply slurry uniformly with a 24 to 36-inch, 70 Durometer flexible rubber squeegee.
2. Achieve a smooth, consistent surface that completely covers all concrete imperfections without shrinkage or mud cracks.
3. Allow each coat to dry fully before applying the next. Remove ridges and rough spots by scraping prior to subsequent coats.
4. Apply a minimum of two coats; add more if necessary to meet finish requirements.
5. Coverage rate: 1 gallon unmixed acrylic resurfacer per 135–180 sq ft per coat.
6. Maximum thickness per coat: 1/4 inch.

3.11 APPLY COLOR FINISH COATS

A. Begin only after base slurry coats are complete and approved.
B. Job-Mixed Fortified Plexipave:
   1. Mix components as follows:
      a. Plexipave Color Base: 30 gallons
      b. Plexichrome: 20 gallons
      c. Water: 20 gallons
   2. Adjust mixture on-site within approved limits based on surface porosity and ambient temperature.
C. Application:
   1. Apply at least two coats using 24- or 36-inch, 50 Durometer long flexible rubber squeegees approved by the manufacturer.
   2. Coverage: 1 gallon of mix per 135–180 sq ft, depending on surface porosity.
   3. Apply final coat crosswise to the court's length.
   4. Ensure a smooth, uniform surface free of puddles, thick spots, or mud cracking.
   5. Inspect carefully before the final coat; remove ridges, debris, and bumps.
D. Plexichrome Finish Coat:
   1. Dilute Plexichrome no more than 1:1 with water.
   2. Apply with a wide hair push broom or rubber squeegee followed by a broom.
   3. Application is crosswise to court length.
   4. Coverage rate: 1 undiluted gallon per 180–225 sq ft.
E. Color Uniformity: The finished court shall display uniform color from 25 feet away, at midday, when viewed from any edge.

3.12 PAINT COURT STRIPING

A. Apply 2-inch-wide textured white lines per U.S. Pickleball Association specifications.
   1. Lines shall be accurately marked according to drawings.
   2. Apply paint using brush, roller, or spray, ensuring no fogging, splatter, or overspray.

3.13 CLEAN UP

A. The contractor shall remove and properly dispose of all containers, excess materials, rubbish, debris, and other waste generated by the work.
   1. The site shall be left clean, orderly, and acceptable to the Owner.

3.14 INSTALLATION

END OF SECTION

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SECTION 32 16 23 - SIDEWALKS

PART 2 PRODUCTS

END OF SECTION

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SECTION 32 17 23 - PAVEMENT MARKINGS

PART 2 PRODUCTS

END OF SECTION

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SECTION 32 31 13 - CHAIN LINK FENCES AND GATES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Posts, rails, and frames.
B. Wire fabric.
C. Barbed wire.
D. Concrete.
E. Manual gates and related hardware.
F. Accessories.

1.2 RELATED REQUIREMENTS

A. Section 03 30 00 - Cast-in-Place Concrete: Concrete anchorage for posts.
B. Section 08 71 00 - Door Hardware: Gate locking device.
C. Section 33 79 00 - Site Grounding.

1.3 PRICE AND PAYMENT PROCEDURES

A. Allowances: See Section 01 21 00 - Allowances, for cash allowances affecting this section.
B. Unit Prices: See Section 01 22 00 - Unit Prices, for additional unit price requirements.
   1. Provide the work under the unit price method.
C. See Section 01 22 00 - Unit Prices, for additional unit price requirements.
   1. Fencing: Measurement and payment by the linear foot, to the fence height specified, based on the specified post spacing. Includes posts, rails, tension wire, fabric, accessories, attachments.
   2. Post Footings: Measurement and payment by each unit of footing, to the depth specified. Includes excavation, concrete placed, finishing.
   3. Gates: Measurement and payment by square foot. Includes frame posts, fabric, accessories, and hardware.

1.4 REFERENCE STANDARDS

A. ASTM A121 - Standard Specification for Metallic-Coated Carbon Steel Barbed Wire; 2013.
B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2015.
C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
D. ASTM A392 - Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric; 2011a (Reapproved 2017).
E. ASTM A428/A428M - Standard Test Method for Weight (Mass) of Coating on Aluminum-Coated Iron or Steel Articles; 2010 (Reapproved 2014).
F. ASTM A491 - Standard Specification for Aluminum-Coated Steel Chain-Link Fence Fabric; 2011 (Reapproved 2017).
G. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2020.
H. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2015.
I. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2016a.
J. ASTM F567 - Standard Practice for Installation of Chain-Link Fence; 2014a.

K. ASTM F668 - Standard Specification for Polyvinyl Chloride (PVC) and Other Organic Polymer-Coated Steel Chain-Link Fence Fabric; 2011.
L. ASTM F1043 - Standard Specification for Strength and Protective Coatings on Steel Industrial Fence Framework; 2016a.
M. ASTM F1083 - Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures; 2013.
N. ASTM F1665 - Standard Specification for Poly(Vinyl Chloride)(PVC) and Other Conforming Organic Polymer-Coated Steel Barbed Wire Used with Chain-Link Fence; 2008 (Reapproved 2013).
O. CLFMI CLF-FIG0111 - Field Inspection Guide; 2014.
P. CLFMI CLF-PM0610 - Product Manual; 2017.
Q. CLFMI CLF-SFR0111 - Security Fencing Recommendations; 2014.
R. CLFMI WLG 2445 - Wind Load Guide for the Selection of Line Post and Line Post Spacing; 2018.

1.5 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on fabric, posts, accessories, fittings and hardware.
C. Design Calculations: For high wind load areas, provide calculations for fence fabric and accessory selection as well as line post spacing and foundation details. See CLFMI WLG 2445 for line post and spacing guidance.
D. Shop Drawings: Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage, and schedule of components. See CLFMI CLF-SFR0111 for planning and design recommendations.
E. Samples: Submit two samples of fence fabric, slat infill, ____ inch by ____ inch in size illustrating construction and colored finish.
F. Manufacturer's Installation Instructions: Indicate installation requirements, post foundation anchor bolt templates, and _____.
G. Project Record Documents: Accurately record actual locations of property perimeter posts relative to property lines _____.
H. Field Inspection Records: Provide installation inspection records that include post settings, framework, fabric, barbed wire, fittings and accessories, gates, and workmanship.
I. Fence Installer Qualification Statement.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
B. Fence Installer: Company with demonstrated successful experience installing similar projects and products, with not less than five years of documented experience.

1.7 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
B. Correct defective Work within a five year period after Date of Substantial Completion.
C. Provide five year manufacturer warranty for _____.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Chain Link Fences and Gates:
1. Master-Halco, Inc; _____: https://www.masterhalco.com/#sle.

2. Merchants Metals; _____: https://www.merchantsmetals.com/#sle.
3. _____.
4. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 MATERIALS

A. Posts, Rails, and Frames: _____:
   1. ASTM A1011/A1011M Designation SS; hot-rolled steel strip, cold formed to pipe configuration, longitudinally welded construction, minimum yield strength of 50 ksi; zinc coating conforming to ASTM F1043 Type B on pipe exterior and interior.
   2. Formed from hot-dipped galvanized steel sheet, ASTM A653/A653M, HSLAS, Grade 50, with G90 (Z275) zinc coating.
   3. Line Posts: Type I round.
   4. Terminal, Corner, Rail, Brace, and Gate Posts: Type I round.
   5. Conform to CLFMI CLF-PM0610.

B. Wire Fabric: _____:
   1. ASTM A392 zinc coated steel chain link fabric.
   2. Conform to CLFMI CLF-PM0610.

C. Barbed Wire: _____:
   1. Zinc-coated steel, complying with ASTM A121 Type Z Coating Class 1; 2 strands of 0.099 inch diameter wire, with 2-pointed barbs at 4 inches on center.
   2. Aluminum-coated steel, complying with ASTM A121; 2 strands of 0.099 inch diameter wire, with 4-pointed barbs at 3 inches on centers.
   3. PVC-coated steel, complying with ASTM F1665; 2 strands of 0.099 inch diameter wire, with 2-pointed barbs at 4 inches on center.
   4. Stainless steel, 0.025 inch thick by 1 inch wide, coil diameter of 24 inch, die stamped to produce 4 barbed points at 4 inch on center; cold clench over stainless steel core.

D. Concrete: _____:
   1. Type specified in Section 03 30 00.
   2. Ready-mixedcomplying with ASTM C94/C94M; normal Portland cement; 2,500 psi strength at 28 days, 3 inch slump; ____ inch nominal size aggregate.

2.3 COMPONENTS

A. Line Posts: 1.9 inch diameter.
B. Curved Line Posts: 1.9 inch diameter formed with a 55 degree angle in the direction of the climber.
C. Corner and Terminal Posts: 2.38 inch diameter.
D. Curved Corner and Terminal Posts: 2.38 inch diameter formed with a 55 degree angle in the direction of the climber.
E. Gate Posts: 3.5 inch diameter.
F. Curved Gate Posts: 3.5 inch diameter formed with a 55 degree angle in the direction of the climber.
G. Top and Brace Rail: 1.66 inch diameter, plain end, sleeve coupled.
H. Bottom Rail: 1.66 inch diameter, plain end, sleeve coupled.
I. Gate Frame: 1.66 inch diameter for welded fabrication.
J. Fabric: 2 inch diamond mesh interwoven wire, 6 gage, 0.1620 inch thick, top selvage knuckle end closed, bottom selvage twisted tight.
K. Tension Wire: 6 gage, 0.1620 inch thick steel, single strand.
L. Tension Band: ____ inch thick steel.
M. Tension Strap: ____ inch thick steel.
N. Tie Wire: Aluminum alloy steel wire.

2.4 MANUAL GATES AND RELATED HARDWARE

A. Hardware for Single Swinging Gates: 180 degree hinges, 2 for gates up to 60 inches high, 3 for taller gates; fork latch with gravity drop and padlock hasp; keeper to hold gate in fully open position.
B. Hardware for Double Swinging Gates: 180 degree hinges, 2 for gates up to 60 inches high, 3 for taller gates; drop bolt on inactive leaf engaging socket stop set in concrete, active leaf latched to inactive leaf preventing raising of drop bolt, padlock hasp; keepers to hold gate in fully open position.

2.5 ACCESSORIES

A. Caps: Cast steel galvanized; sized to post diameter, set screw retainer.
B. Fittings: Sleeves, bands, clips, rail ends, tension bars, fasteners and fittings; steel.
C. Extension Arms: Cast steel galvanized, to accommodate 3 strands of barbed wire, single arm, vertical.
D. Privacy Slats: Vinyl strips, sized to fit fabric weave.

2.6 FINISHES

A. Components (Other than Fabric): Galvanized in accordance with ASTM A123/A123M, at 1.7 oz/sq ft.
B. Components (Other than Fabric): Aluminum coated at 0.40 oz/sq ft, when measured in accordance with ASTM A428/A428M.
C. Components and Fabric: Vinyl coated over coating of 1.8 oz/sq ft galvanizing.
D. Hardware: Hot-dip galvanized to weight required by ASTM A153/A153M.
E. Accessories: Same finish as framing.
F. Color(s): To be selected by Architect from manufacturer's standard range.
G. Color(s): Medium green.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: Verify that areas are clear of obstructions or debris and _____.
B. Preinstallation Testing: Test areas for ledge and _____.

3.2 PREPARATION

A. Removal: Obstructions or debris.
B. Ground Preparation:
    1. Grading _____.

3.3 INSTALLATION

A. Install framework, fabric, accessories and gates in accordance with ASTM F567.
B. Place fabric on outside of posts and rails.
C. Set intermediate posts plumb , in concrete footings with top of footing 2 inches above finish grade. Slope top of concrete for water runoff.
D. Line Post Footing Depth Below Finish Grade: ASTM F567.
E. Corner, Gate and Terminal Post Footing Depth Below Finish Grade: ASTM F567.
F. Brace each gate and corner post to adjacent line post with horizontal center brace rail _____. Install brace rail one bay from end and gate posts.
G. Provide top rail through line post tops and splice with 6 inch long rail sleeves.
H. Install a 7 gauge coil spring wire in place of top rail.
I. Install center brace rail on corner gate leaves.

J. Do not stretch fabric until concrete foundation has cured 28 days.
K. Stretch fabric between terminal posts or at intervals of 100 feet maximum, whichever is less.
L. Position bottom of fabric 2 inches above finished grade.
M. Bury the chain link fabric 12 inches or more below finish grade.
N. Fasten fabric to top rail, line posts, braces, and bottom tension wire with tie wire at maximum 15 inches on centers.
O. Attach fabric to end, corner, and gate posts with tension bars and tension bar clips.
P. Install bottom tension wire stretched taut between terminal posts.
Q. Install support arms sloped inward and attach barbed wire; tension and secure.
R. Do not attach the hinged side of gate to building wall; provide gate posts.
S. Install hardware and gate with fabric _____ to match fence.
T. Provide concrete center drop to footing depth and drop rod retainers at center of double gate openings.
U. Ground fence in accordance with Section 33 79 00.
V. Install gate locking device specified in Section 08 71 00.
W. Peen all bolts upon installation.
X. Perform three random field inspections confirming proper installation.

3.4 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch.
B. Maximum Offset From True Position: 1 inch.
C. Do not infringe on adjacent property lines.

3.5 FIELD QUALITY CONTROL

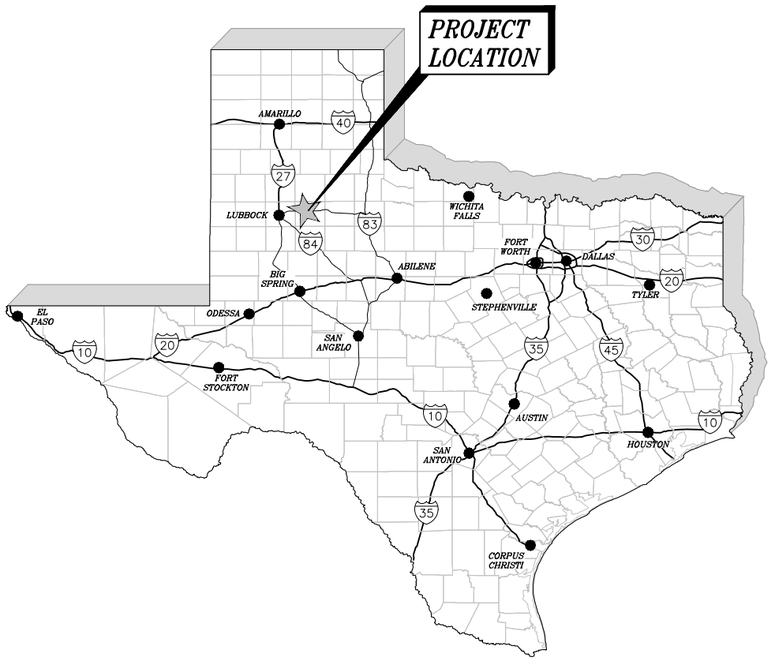
A. See Section 01 40 00 - Quality Requirements, for additional requirements.
B. Layout: Verify that fence installation markings are accurate to design, paying attention to gate locations, underground utilities, and property lines.
C. Post Settings: Randomly inspect three locations against design for:
    1. Hole diameter.
    2. Hole depth.
    3. Hole spacing.
D. Fence Height: Randomly measure fence height at three locations or at areas that appear out of conformance against design.
E. Barbed Wire: Randomly inspect three locations against design for:
    1. Spacing of barb wire.
    2. Diameter of loops.
    3. Quantity of loops per length of fence.
F. Gates: Inspect for level, plumb, and alignment.
G. Workmanship: Verify neat installation free of defects. See CLFMI CLF-FIG0111 for field inspection guidance.

3.6 SCHEDULES

A. _____: _____.

END OF SECTION

PLANS FOR
CITY OF IDALOU
2025 MULTI-PURPOSE COURT IMPROVEMENTS
AUGUST 2025



CITY OF IDALOU
CITY COUNCIL

WILLIAM RUSS PERKINS - MAYOR

JOE SISK - MAYOR PRO - TEM

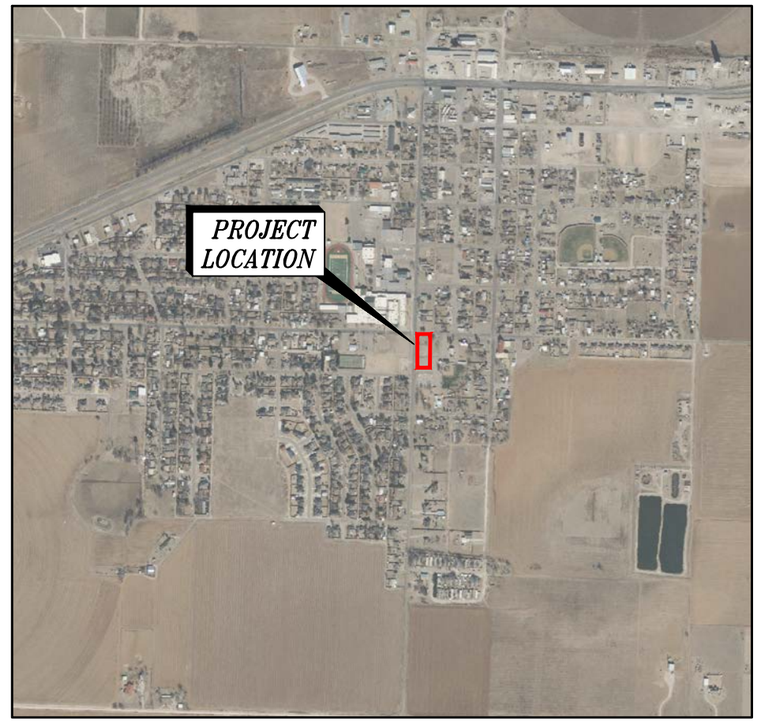
BRENDI PIERCE KYLE DUBOIS

DARRELL FULLER ALBERT BRAVO

RENEE WILBANKS - CITY SECRETARY

SUZETTE WILLIAMS - CITY ADMINISTRATOR

OSCAR RODRIQUEZ - PUBLIC WORKS DIRECTOR



PROJECT VICINITY MAP

SCALE: 1"=1,000'

NORTH

JACOB MARTIN
FIRM# F-2448

3465 CURRY LANE
ABILENE, TX 79606
325-695-1070

1508 SANTA FE DR, STE 204
WEATHERFORD, TX 76086
817-594-9880

4920 S. LOOP 289, STE 106
LUBBOCK, TX 79414
806-368-6375

STATE OF TEXAS
JAMES A. PHILLIPS
105116
LICENSED
PROFESSIONAL ENGINEER
08/08/2025

PROJECT LOCATION MAP

N.T.S.

NORTH

GENERAL NOTES

1. ***THE CONTRACTOR SHALL APPOINT, IN WRITING, A SUPERINTENDENT FOR THIS PROJECT. SAID SUPERINTENDENT SHALL BE HIRED BY THE CONTRACTOR AND BE FULLY RESPONDENT TO THE ADMINISTRATION OF THE CONTRACT. HE/SHE WILL BE ON THE PROJECT DAILY. SHOULD THIS SUPERINTENDENT LEAVE THE EMPLOYER OR MOVE TO ANOTHER PROJECT, THE CONTRACTOR IS TO APPOINT ANOTHER SUPERINTENDENT IMMEDIATELY. CONTRACTOR WILL PROVIDE 24HR PHONE NUMBER FOR SUPERINTENDENT IN CASE OF EMERGENCY.***
2. ***THE CONTRACTOR WILL ENSURE THAT ALL EXISTING DRAINAGE WILL REMAIN UNALTERED UNLESS GRADES ARE SHOWN TO BE ADJUSTED AND OR DRAINAGE STRUCTURES ADDED OR ALTERED.***
3. ***CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING ALL SURFACES DISTURBED TO A CONDITION THAT IS EQUAL TO OR BETTER THAN THE ORIGINAL CONDITION. THIS INCLUDES (BUT IS NOT LIMITED TO) UTILITIES, PAVEMENT, CURBS, AND LANDSCAPE.***
4. ***CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY QUESTIONS THAT MAY ARISE CONCERNING THE INTENT, PLACEMENT OR LIMITS OF THE DIMENSIONS OR GRADES NECESSARY FOR CONSTRUCTION OF THIS PROJECT. ENGINEER SHALL PROVIDE CONSTRUCTION STAKING FOR THE PROJECT.***
5. ***CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITED TO; WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES, SITE LIGHTING LINES, SITE LIGHTING ELECTRIC, SECONDARY ELECTRIC, PRIMARY ELECTRIC, DUCT BANKS, LANDSCAPING IRRIGATION FACILITIES AND GAS LINES, ANY UTILITY CONFLICTS THAT ARISE SHOULD BE COMMUNICATED TO THE ENGINEER IMMEDIATELY AND PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION. ANY DAMAGES TO EXISTING UTILITIES SHALL BE AT THE CONTRACTORS SOLE EXPENSE WHETHER THE UTILITY IS SHOWN ON THE PLANS OR NOT.***
6. ***THE CONTRACTOR SHALL HAVE AVAILABLE AT THE JOB SITE AT ALL TIMES A COPY OF ANY REQUIRED CONSTRUCTION PERMITS, EROSION CONTROL PLANS, SW3P WITH INSPECTION REPORTS, AND THE CONTRACT DOCUMENTS INCLUDING PLANS, SPECIFICATIONS, AND SPECIAL CONDITIONS.***
7. ***CONTRACTOR SHALL VERIFY BENCHMARKS AND DATUM PRIOR TO COMMENCING CONSTRUCTION OR STAKING OF IMPROVEMENTS.***
8. ***ALL MARKERS, TRAFFIC CONTROL PLAN, AND OR OTHER TRAFFIC RELATED INCIDENTALS SHALL BE AS OUTLINED IN THE TEXAS MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. THE CONTRACTOR IS REQUIRED TO CONTROL TRAFFIC BY FLAG MEN WHEN PLACING CONCRETE OR USING EQUIPMENT IN THE TRAFFIC AREAS. PAY FOR THIS WILL BE SUBSIDIARY TO THE TRAFFIC HANDLING ITEM. FLAG MEN SHALL HAVE A LEGAL STOP/SLOW PADDLE (STANDARD) OR RED FLAG (ALTERNATE) AND WEAR A REFLECTIVE VEST WHILE PERFORMING THIS WORK.***
9. ***CONTRACTOR SHALL SUBMIT A SEQUENCE OF WORK PLAN AND A CONSTRUCTION SCHEDULE FOR APPROVAL AT THE PRE-CONSTRUCTION CONFERENCE. UPDATED CONSTRUCTION SCHEDULES WILL BE REQUIRED MONTHLY PRIOR TO PROGRESS PAYMENTS.***
10. ***ALL WORK IS INTENDED TO TAKE PLACE WITHIN THE EXISTING CITY RIGHT-OF-WAY AND CITY OBTAINED EASEMENTS. ANY WORK NEEDED OUTSIDE THE RIGHT-OF-WAY WILL BE COORDINATED WITH THE CITY, COUNTY, AND ENGINEER PRIOR TO BEGINNING WORK.***
11. ***CONTRACTOR TO DISPOSE OF EXCESS MATERIALS OFFSITE AT HIS OWN EXPENSE.***
12. ***TESTING REQUIREMENTS***

DESCRIPTION	*TESTING REQUIREMENTS*
HYDRAULIC CEMENT	*ASTM C 143 - SLUMP, 1 TEST PER DAY OF CONCRETE POUR*
	ASTM C 39 - COMPRESSIVE STRENGTH, 4 CYLINDERS PER DAY OF CONCRETE POUR
	ASTM C 1064 - TEMPERATURE, 1 TEST PER DAY OF CONCRETE POUR

THE ENGINEER MAY REQUIRE ADDITIONAL TESTING TO INSURE THE MATERIAL MEETS SPECIFICATIONS.

Sheet List

LEGEND

- PROPOSED UTILITY EASEMENT
- PROPOSED STREET R.O.W.
- PROPOSED LOT LINES
- PROPOSED DRAINAGE EASEMENT
- PROPOSED PROPERTY BOUNDARY
- PROPOSED CONCRETE PAVING
- PROPOSED CURB AND GUTTER
- PROPOSED ASPHALT REPAIR
- EXISTING CONCRETE PAVEMENT
- PROPOSED FLOWLINE DIRECTION
- EXISTING MANHOLE (MH)
- EXISTING WATER METER (WM)
- EXISTING GAS METER (GM)
- EXISTING WATER VALVE
- EXISTING FIRE HYDRANT
- EXISTING PHONE PEDESTAL (T)
- EXISTING UTILITY POLE
- EXISTING SIGN
- EXISTING TREE
- EXISTING STREET R.O.W.
- EXISTING WATER LINE (W)
- EXISTING CONTOUR LINE
- EXISTING FIBER OPTIC (UFO)
- EXISTING OVERHEAD ELECTRIC (OE)

ABBREVIATIONS AND SYMBOLS

AE ACCESS EASEMENT	ER END RADIUS	ROW RIGHT-OF-WAY
BOC BACK OF CURB	FH FIRE HYDRANT	S SLOPE
BR BEGIN RADIUS	FL FLOW LINE ELEVATION	SL SEWER LINE
C&G CURB & GUTTER	FO FIBER OPTIC LINE	SLE STREET LIGHT EASEMENT
CO CLEAN-OUT	MH SEWER MANHOLE	UE UTILITY EASEMENT
DE DRINAGE EASEMENT	PE POLYETHYLENE	WL WATER LINE
EOP EDGE OF PAVING	PVC POLYVINYL CHLORIDE	WV WATER VALVE

JAMES A. PHILLIPS 105116 LICENSED PROFESSIONAL ENGINEER
08/08/25

ISSUED FOR REVIEW

JACOB MARTIN
TBPELS FIRM # 10194493
TBAE FIRM # BR 2261
TBPE FIRM # 2448

CITY OF IDALOU
2025 - MULTI PURPOSE COURT IMPROVEMENTS

GENERAL NOTES AND SHEET INDEX

NO.	REVISION	DATE
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PROJECT # 25285
SCALE NTS
BAR IS ONE INCH IN LENGTH ON ORIGINAL DRAWING. CHECK SCALE AND ADJUST ACCORDINGLY.

SEQ. 01/11
SHEET 01

EXISTING TREE LINE, TYP.

EXISTING SIDEWALK TO REMAIN

EXISTING FENCE TO BE REMOVED

EXISTING TREE TO BE REMOVED

EXISTING PARK GRILL, TYP.

EXISTING CONCRETE MONUMENT CIRCLE TO BE PROTECTED WHILE SITE IS UNDER CONSTRUCTION

EXISTING TREE TO BE REMOVED

EXISTING CONCRETE SIDEWALK TO BE REMOVED

EXISTING BASKETBALL GOALS TO BE REMOVED AND SALVAGED FOR FUTURE USE BY THE CITY

EXISTING CONCRETE SLAB TO BE REMOVED

EXISTING POWER LINES TO REMAIN. CONTRACTOR TO EXERCISE CAUTION AND TAKE APPROPRIATE MEASURES TO AVOID CONTACT WITH EXISTING POWER LINES.

EXISTING FENCE TO BE REMOVED

EXISTING FENCE TO BE REMOVED

E 7TH ST.

WALNUT ST.

NORTH

DEMOLITION LEGEND

- EXISTING FENCE
- EXISTING CURB
- EXTENTS OF PROPOSED DEMOLITION
- EXISTING CONCRETE PAVEMENT
- PROPOSED FLOWLINE DIRECTION
- EXISTING MANHOLE
- EXISTING WATER METER
- EXISTING GAS METER
- EXISTING WATER VALVE
- EXISTING FIRE HYDRANT
- EXISTING PHONE PEDESTAL
- EXISTING UTILITY POLE
- EXISTING SIGN
- EXISTING TREE
- EXISTING STREET R.O.W.
- EXISTING WATER LINE
- EXISTING CONTOUR LINE
- EXISTING FIBER OPTIC
- EXISTING OVERHEAD ELECTRIC

JAMES A. PHILLIPS
105116
LICENSED PROFESSIONAL ENGINEER
08/08/25

ISSUED FOR REVIEW

JACOB MARTIN
TBPELS FIRM # 10194493
TBAE FIRM # BR 2261
TBPE FIRM # 2448

CITY OF IDALOU
2025 - MULTI PURPOSE COURT IMPROVEMENTS

DEMOLITION PLAN

NO.	REVISION	DATE
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PROJECT # 25285
SCALE 1"=30'

BAR IS ONE INCH IN LENGTH ON ORIGINAL DRAWING. CHECK SCALE AND ADJUST ACCORDINGLY.

SEQ. 02 / 11
SHEET 02

LEGEND

- PROPOSED UTILITY EASEMENT
- PROPOSED STREET R.O.W.
- PROPOSED LOT LINES
- PROPOSED DRAINAGE EASEMENT
- PROPOSED PROPERTY BOUNDARY
- PROPOSED CONCRETE SIDEWALK
- PROPOSED CURB AND GUTTER
- PROPOSED ASPHALT REPAIR
- EXISTING CONCRETE PAVEMENT
- PROPOSED FLOWLINE DIRECTION
- EXISTING MANHOLE
- EXISTING WATER METER
- EXISTING GAS METER
- EXISTING WATER VALVE
- EXISTING FIRE HYDRANT
- EXISTING PHONE PEDESTAL
- EXISTING UTILITY POLE
- EXISTING SIGN
- EXISTING TREE
- EXISTING STREET R.O.W.
- EXISTING WATER LINE
- EXISTING CONTOUR LINE
- EXISTING FIBER OPTIC
- EXISTING OVERHEAD ELECTRIC

ABBREVIATIONS AND SYMBOLS

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CO CLEAN-OUT	MH SEWER MANHOLE	UE UTILITY EASEMENT
DE DRINAGE EASEMENT	PE POLYETHYLENE	WL WATER LINE
EOP EDGE OF PAVING	PVC POLYVINYL CHLORIDE	WV WATER VALVE

NORTH

PROPOSED ASPHALT REPAIR, SEE SHEET 06

PROPOSED CURB AND GUTTER, SEE SHEET 06

PROPOSED ADA RAMP AND PARKING STRIPING, SEE SHEET 07

PROPOSED ADA SIGN, PAINTED SYMBOL AND WHEEL STOP, SEE SHEET 07

PROPOSED ELECTRICAL PANEL, SEE SHEET 09–11

PROPOSED LIGHTING, TYP. SEE SHEET 09–11

PROPOSED MULTI–PURPOSE BASKETBALL AND PICKLEBALL FACILITY WITH 4' BUFFER BORDER, SEE DETAIL SHEET 08

PROPOSED SIDEWALK

PROPOSED 5' WIDE PEDESTRIAN GATE

TOP OF CONCRETE=3188.60

TOP OF CONCRETE=3189.10

102'

58'

EXPANSION JOINT FOR GOAL POST FOOTING

EXISTING OVERHEAD ELECTRICAL LINES — CONTRACTOR SHALL EXERCISE CAUTION AND IMPLEMENT ALL NECESSARY SAFETY MEASURES TO AVOID CONTACT OR INTERFERENCE DURING CONSTRUCTION

BASKETBALL GOAL SEE SHEET 06

PROPOSED 10' CHAIN LINK FENCE

PROPOSED DOUGLAS SPORTS–GOOSNECK 4.5" RST BASKETBALL SYSTEM WITH CHAIN NET (TYP.)

PROPOSED DOUGLAS SPORTS–PICKEL–MAX PORTABLE PICKELBALL SYSTEM TO BE PROVIDED AND FULLY ASSEMBLED

SEE BASKETBALL AND PICKELBALL COURT DETAIL ON SHEET 08

EXISTING CONCRETE MONUMENT CIRCLE TO BE PROTECTED WHILE SITE IS UNDER CONSTRUCTION

E 7TH ST.

WALNUT ST.

JAMES A. PHILLIPS 105116 LICENSED PROFESSIONAL ENGINEER
08/08/25

ISSUED FOR REVIEW

JACOB MARTIN

TBPELS FIRM # 10194493
TBAE FIRM # BR 2261
TBPE FIRM # 2448

CITY OF IDALOU
2025 - MULTI PURPOSE COURT IMPROVEMENTS

PROPOSED SITE PLAN

NO.	REVISION	DATE
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PROJECT # 25285 | SCALE 1"=20'

BAR IS ONE INCH IN LENGTH ON ORIGINAL DRAWING. CHECK SCALE AND ADJUST ACCORDINGLY.

SEQ. 03 / 11 | SHEET 03

Plotted by: brendon doy Plot Date: 8/8/2025 12:27 PM

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1% SLOPE
1% SLOPE
TOP OF CONCRETE=3189.10
TOP OF CONCRETE=3189.10
PROPOSED BASKETBALL AND PICKELBALL COURT
PROPOSED 10' CHAIN LINK FENCE
PROPOSED 5' WIDE CONCRETE SIDEWALK
TOP OF CONCRETE=3188.70
TOP OF CONCRETE=3188.60
TOP OF CONCRETE=3188.60
PROPOSED 5' WIDE PEDESTRIAN GATE
TOP OF CONCRETE=3188.32
MATCH TO EXISTING TOP OF CURB=3188.30
EXISTING BOC= 3188.20'
EXISTING BOC= 3188.23'
EXISTING BOC= 3188.26'
EXISTING BOC= 3188.18'
EXISTING BOC= 3188.10'
EXISTING BOC= 3187.97'
EXISTING EDGE OF ASPHALT= 3187.51'
EXISTING CURB AND GUTTER
EXISTING EDGE OF ASPHALT= 3187.65'
EXISTING EDGE OF ASPHALT= 3187.74'
EXISTING EDGE OF ASPHALT= 3187.75'
EXISTING EDGE OF ASPHALT= 3187.86'
EDGE OF ASPHALT=3187.85
EDGE OF ASPHALT=3187.82
MATCH TO EXISTING ASPHALT=3187.81
EXISTING EDGE OF ASPHALT= 3187.74'
APPX. EXISTING GRADE=3187.92
RAMP LANDING=3187.97 TC=3188.47
RAMP LANDING=3187.87
ADA SIGN
SW/TC=3188.46
SW/TC=3188.36
ADA RAMP
RAMP LANDING=3187.88
RAMP LANDING=3187.98 TC=3188.48
SW/TC=3188.49
SW/TC=3188.40
EDGE OF ASPHALT=3187.86
EDGE OF ASPHALT=3187.85
ADA SYMBOL AND STRIPING
APPX. EXISTING GRADE=3187.88
APPX. EXISTING GRADE=3187.82
TOC=3188.41
PROPOSED 24" CURB AND GUTTER
MATCH TO EXISTING CURB=3188.44
MATCH TO EXISTING ASPHALT=3187.94
EXISTING BOC= 3188.43'
SW/TC=3188.40
2' WIDE ASPHALT REPAIR SECTION
EXISTING EDGE OF ASPHALT= 3187.95'
EDGE OF ASPHALT=3187.90
TOC=3188.39
MATCH TO EX. ASPHALT
PARKING STRIPE, TYP.
NORTH

JAMES A. PHILLIPS
105116
LICENSED PROFESSIONAL ENGINEER
08/08/25

ISSUED FOR REVIEW

JACOB MARTIN
TBPELS FIRM # 10194493
TBAE FIRM # BR 2261
TBPE FIRM # 2448

CITY OF IDALOU
2025 - MULTI PURPOSE COURT IMPROVEMENTS

PROPOSED GRADING PLAN

NO.	REVISION	DATE
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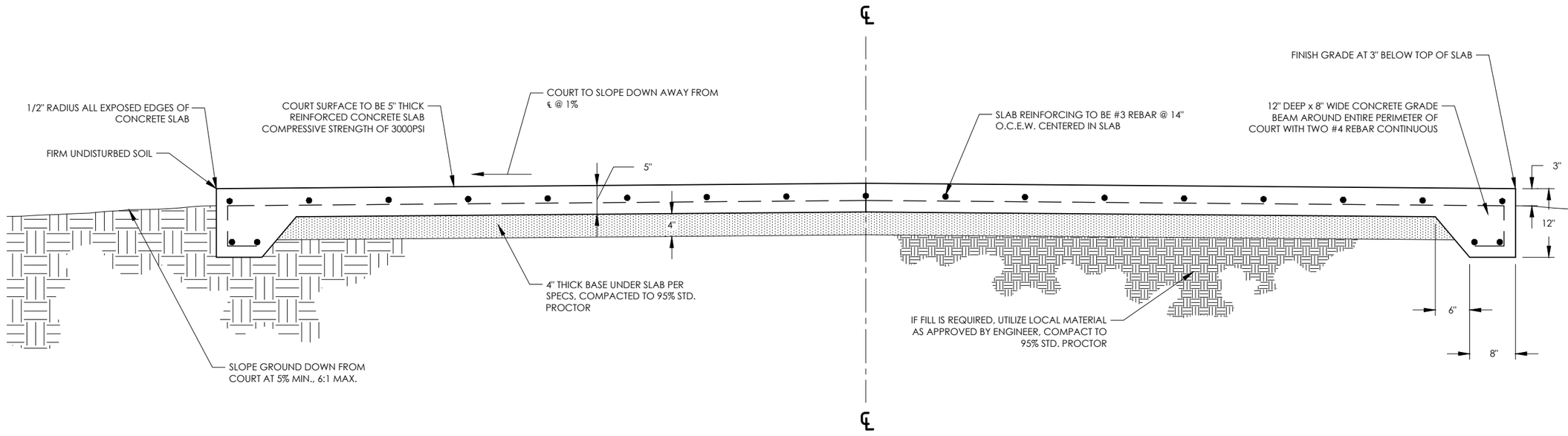
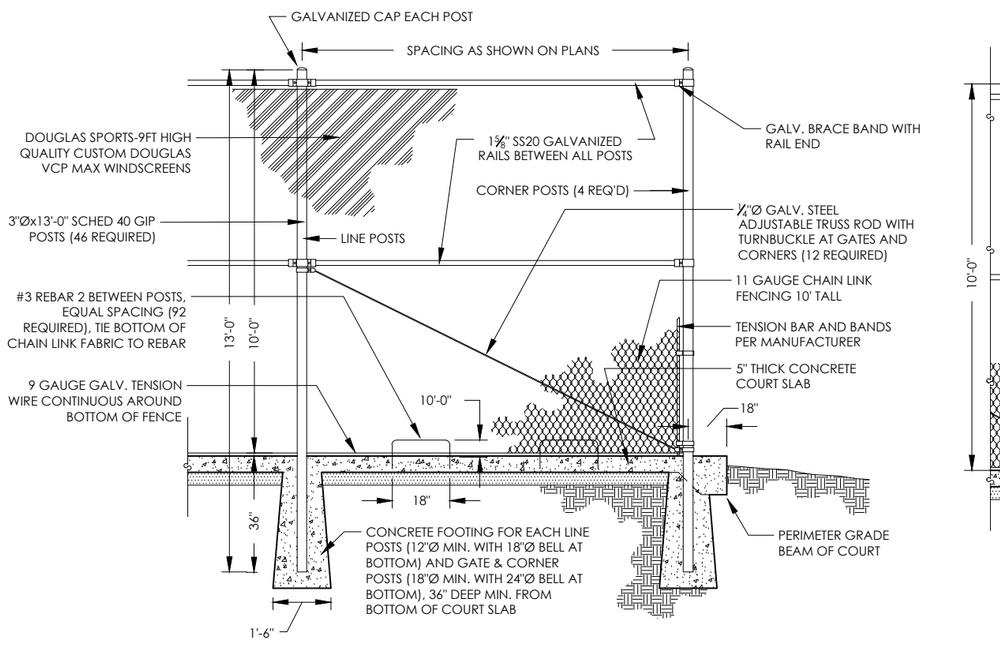
PROJECT # 25285
SCALE 1"=10'
BAR IS ONE INCH IN LENGTH ON ORIGINAL DRAWING. CHECK SCALE AND ADJUST ACCORDINGLY.

SEQ. 04 / 11
SHEET 04



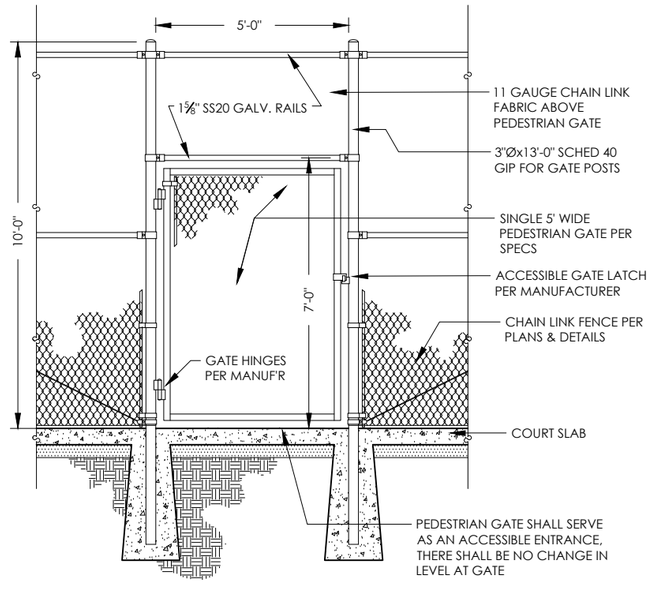
SECTION MULTIPURPOSE COURT

N.T.S.



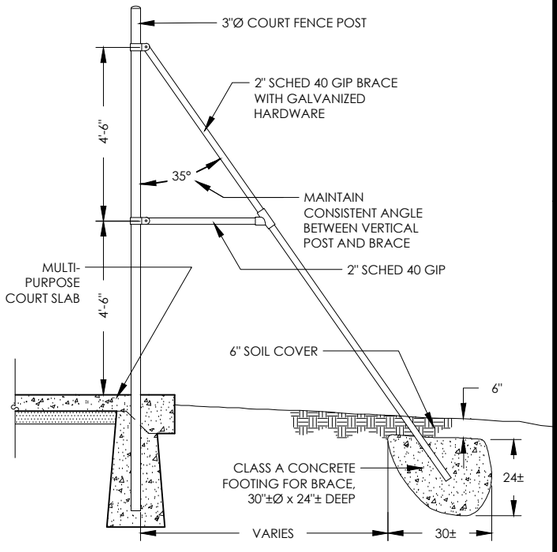
FENCE ENCLOSURE DETAIL

N.T.S.



PEDESTRIAN GATE DETAIL

N.T.S.



FENCE BRACE DETAIL

N.T.S.

JAMES A. PHILLIPS
105116
LICENSED PROFESSIONAL ENGINEER
08/08/25

ISSUED FOR REVIEW

JACOB MARTIN
TBPELS FIRM # 10194493
TBAE FIRM # BR 2261
TBPE FIRM # 2448

CITY OF IDALOU
2025 - MULTI PURPOSE COURT IMPROVEMENTS

GENERAL DETAILS

NO.	REVISION	DATE
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PROJECT # 25285 | SCALE N.T.S.

BAR IS ONE INCH IN LENGTH ON ORIGINAL DRAWING. CHECK SCALE AND ADJUST ACCORDINGLY.

SEQ. 05 / 11 | SHEET 05

Plotted by: brendon doy Plot Date: 8/8/2025 12:27 PM
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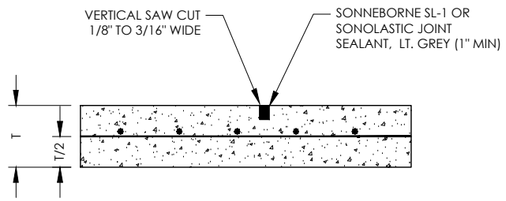
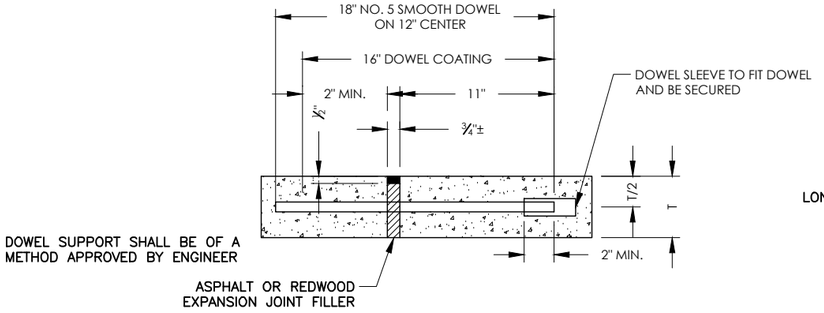
NOTES:

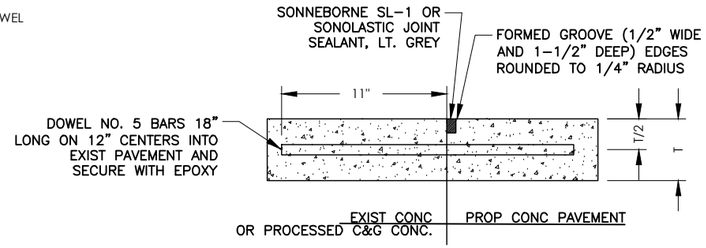
1.) NO GRATINGS, ACCESS COVERS OR APPURTENANCES WITHIN CURB RAMPS.
2.) ALL SUBGRADE SHALL BE COMPACTED TO 95% PROCTOR DENSITY.
3.) PROVIDE ¾" EXPANSION JOINTS BETWEEN SIDEWALKS AND ALL FIXED OBJECTS.
4.) SIDEWALK CROSS SLOPES SHALL NOT EXCEED 2% AND RUNNING SLOPES SHALL NOT EXCEED 5%.
5.) RAMPS SHALL NOT EXCEED 2% ACROSS SLOPE AND 8.33% RUNNING ON RAMP SLOPE.



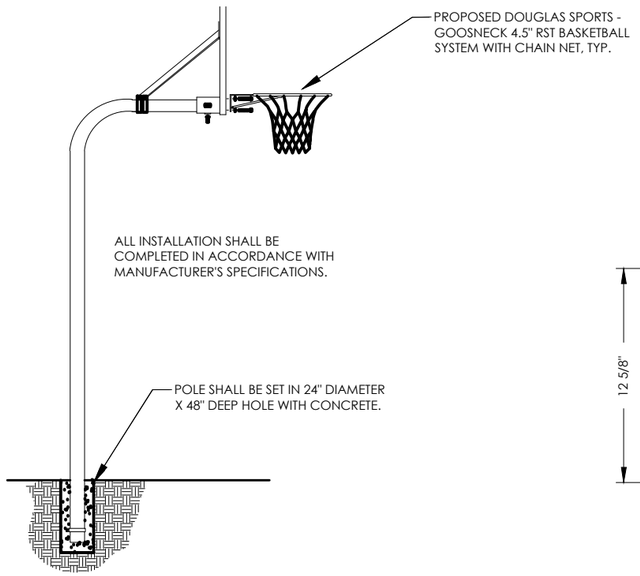
SAWED CONTRACTION JOINT
N.T.S.



EXPANSION JOINT
N.T.S.

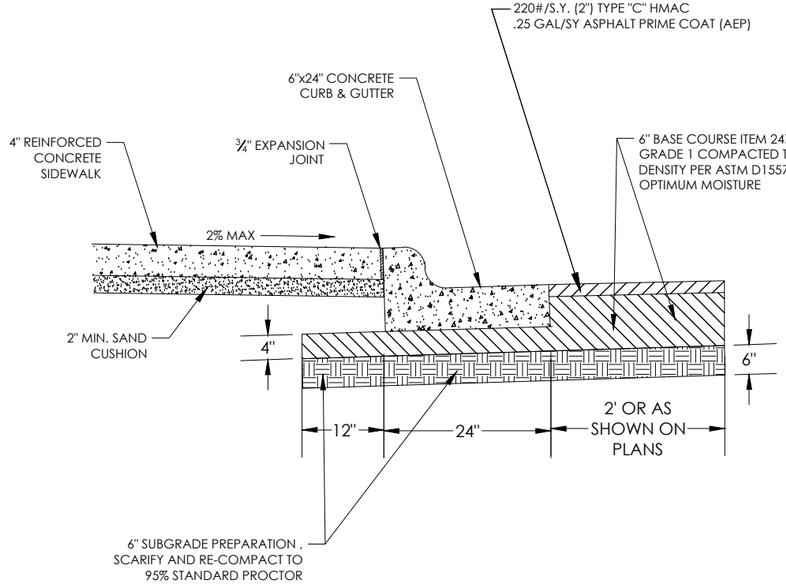


CONSTRUCTION OR DOWEL JOINT
N.T.S.



BASEKETBALL GOAL DETAIL
N.T.S.

CURB AND GUTTER DETAIL
N.T.S.



TYPICAL PAVEMENT SECTION
N.T.S.

JAMES A. PHILLIPS
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PROFESSIONAL ENGINEER
08/08/25

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JACOB MARTIN
TBPELS FIRM # 10194493
TBAE FIRM # BR 2261
TBPE FIRM # 2448

CITY OF IDALOU
2025 - MULTI PURPOSE COURT
IMPROVEMENTS

GENERAL DETAILS (2)

NO.	REVISION	DATE
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PROJECT # 25285 | SCALE N.T.S.

BAR IS ONE INCH IN LENGTH ON ORIGINAL DRAWING.
CHECK SCALE AND ADJUST ACCORDINGLY.

SEQ. 06 / 11 | SHEET 06

Plotted by: brendon doy Plot Date: 8/8/2025 12:27 PM
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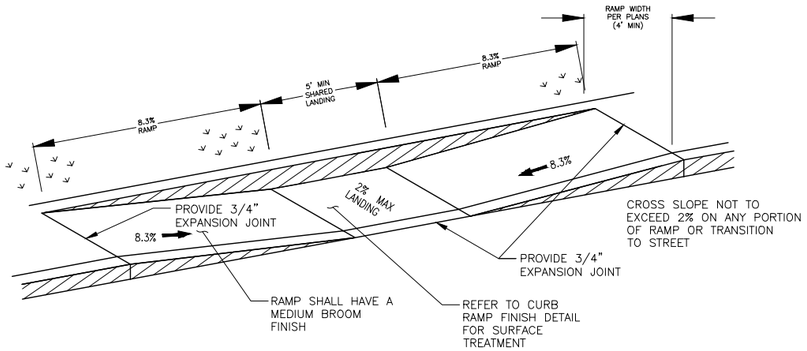
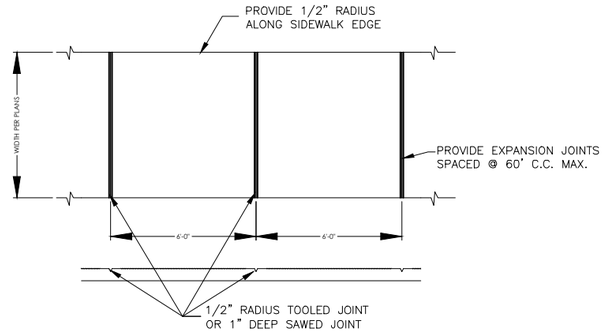


TYPE 1 CURB RAMP DETAIL

NTS

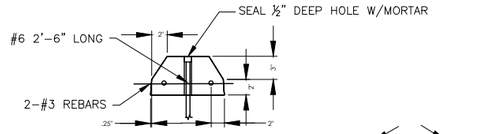


SIDEWALK FINISH DETAIL

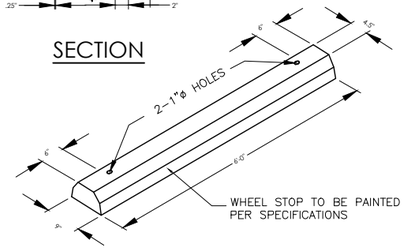
NTS

SIDEWALK NOTES:

1. ALL CONCRETE SIDEWALKS TO RECEIVE A MEDIUM BROOM FINISH.
2. SIDEWALKS IN DRIVE AREAS SHALL BE 6" THICK. SIDEWALKS ADJACENT TO BUILDING SHALL BE 4" THICK
3. NO GRATINGS, ACCESS COVERS OR APPURTENANCES ON CURB RAMPS AND LANDING
4. ALL CURB RAMPS CONSTRUCTED INTO AREAS WITHOUT SIDEWALKS SHALL HAVE A MIN. 5'X5' LANDING AT THE TOP.
5. ALL SUBGRADE SHALL BE COMPACTED TO EQUIVALENT OF 95% PROCTOR DENSITY.
6. WET SUBGRADE SHALL BE CORRECTED PRIOR TO PLACEMENT OF CONCRETE.
7. PROVIDE 3/4" EXPANSION JOINTS BETWEEN SIDEWALKS AND ALL FIXED OBJECTS.
8. EXPANSION JOINT SPACING SHALL BE 60' MAXIMUM EACH WAY AND SAWED CONTRACTION JOINTS SHALL BE 5' MAXIMUM FOR CONCRETE SIDEWALKS. JOINTS SHALL INTERSECT ALL PAVEMENT EDGES AT 90° INCLUDING RADIUS RETURNS.

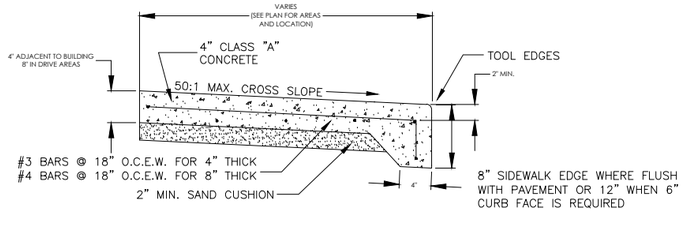


SECTION



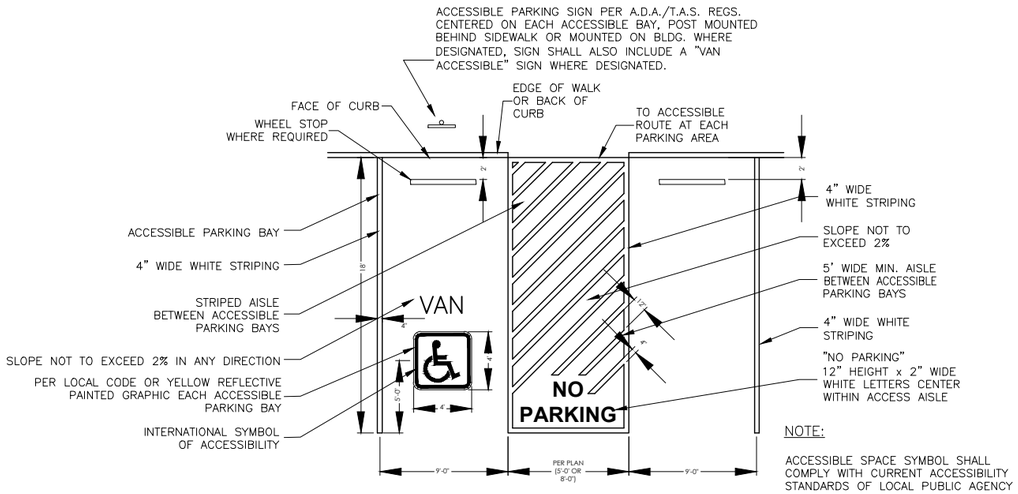
PRECAST CONCRETE WHEEL STOP

NTS



TYPICAL SIDEWALK DETAIL

NTS

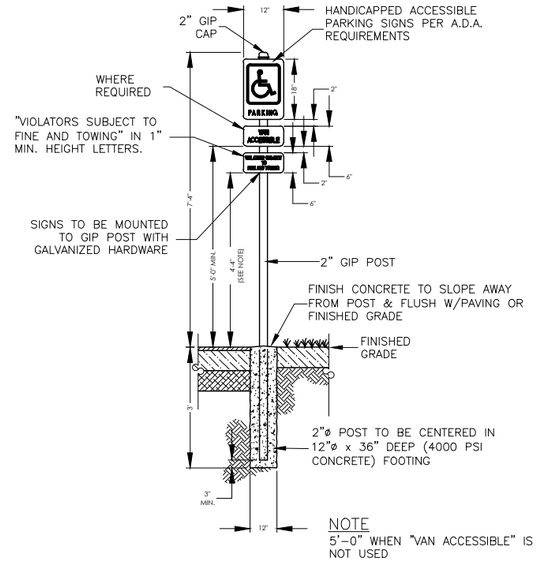


NOTE:

ACCESSIBLE SPACE SYMBOL SHALL COMPLY WITH CURRENT ACCESSIBILITY STANDARDS OF LOCAL PUBLIC AGENCY

ACCESSIBLE PARKING DETAIL

NTS



NOTE

5'-0" WHEN "VAN ACCESSIBLE" IS NOT USED

HANDICAP PARKING SIGN DETAIL

NTS

STATE OF IDAHO
JAMES A. PHILLIPS
105116
LICENSED PROFESSIONAL ENGINEER
08/08/25

ISSUED FOR REVIEW

JACOB MARTIN
TBPELS FIRM # 10194493
TBAE FIRM # BR 2261
TBPE FIRM # 2448

CITY OF IDALOU
2025 - MULTI PURPOSE COURT IMPROVEMENTS

GENERAL DETAILS (3)

NO.	REVISION	DATE
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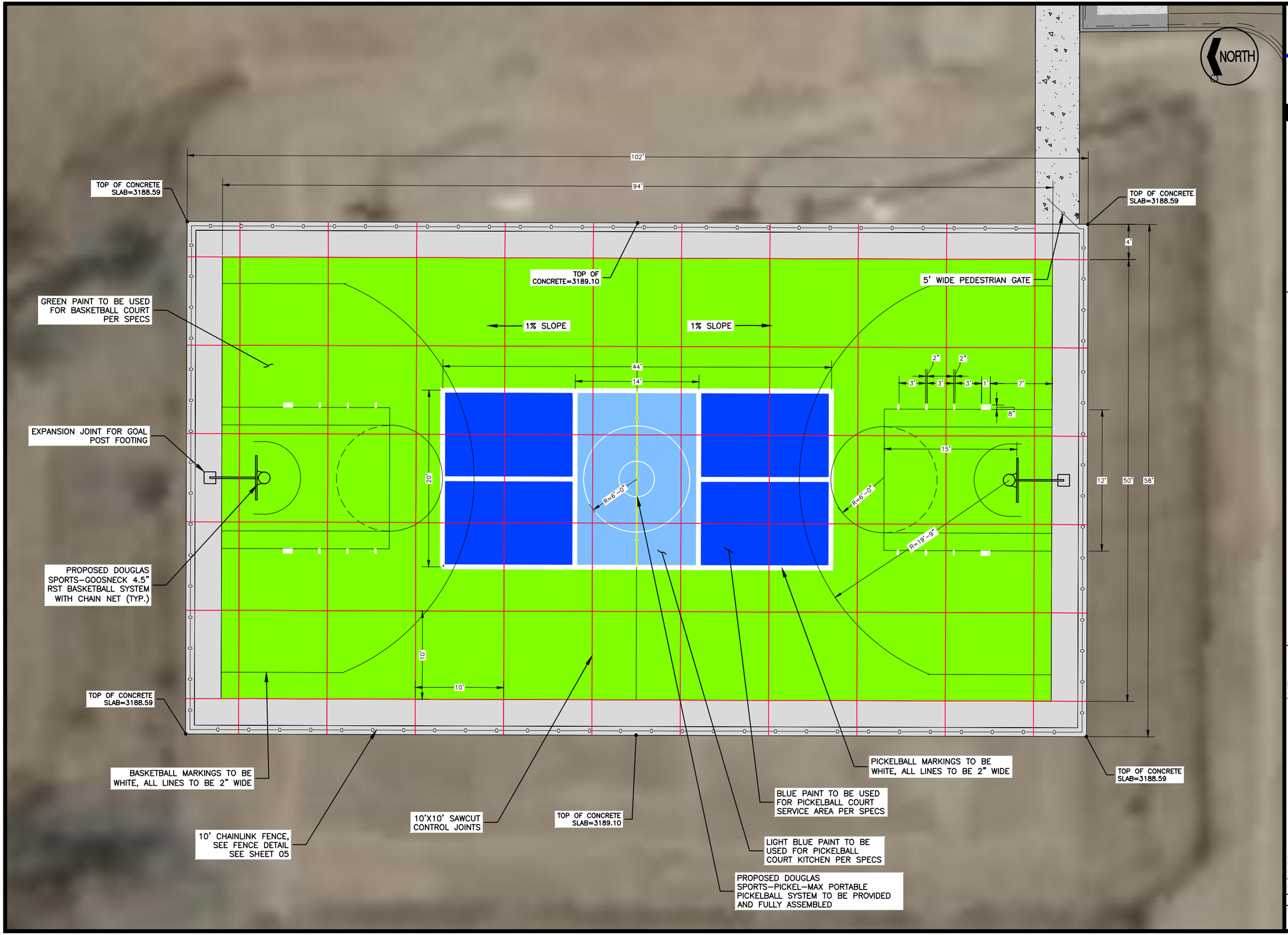
BAR IS ONE INCH IN LENGTH ON ORIGINAL DRAWING. CHECK SCALE AND ADJUST ACCORDINGLY.

PROJECT # 25285 | SCALE N.T.S.

SEQ. 07 / 11 | SHEET 07



STATE OF TEXAS
JAMES A. PHILLIPS
105116
LICENSED PROFESSIONAL ENGINEER
08/08/25

ISSUED FOR REVIEW

JACOB MARTIN
TBPELS FIRM # 10194493
TBAE FIRM # BR 2261
TBPE FIRM # 2448

CITY OF IDALOU
2025 - MULTI PURPOSE COURT IMPROVEMENTS

COURT DETAIL

NO.	REVISION	DATE
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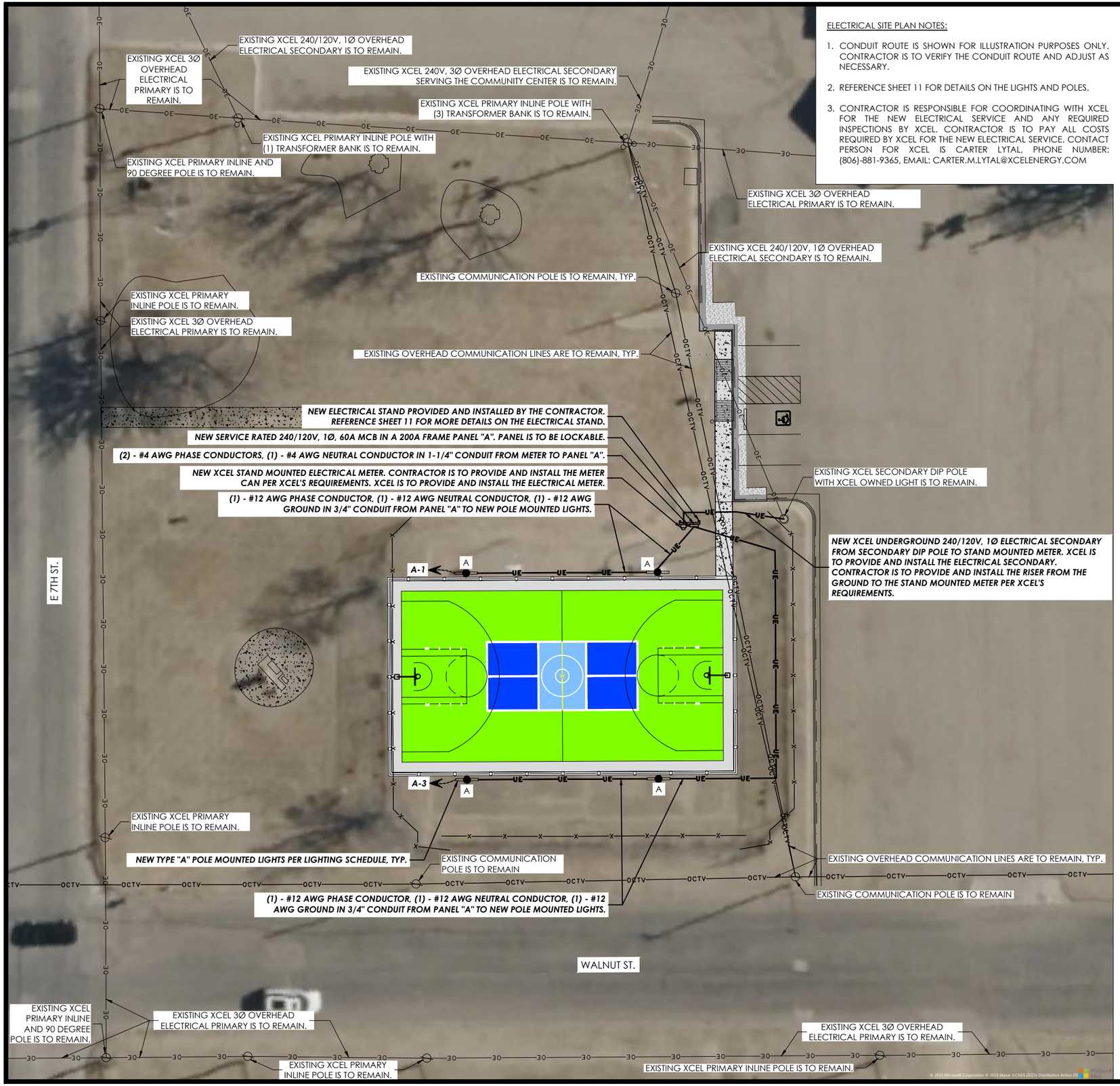
PROJECT # 25285 | SCALE N.T.S.

BAR IS ONE INCH IN LENGTH ON ORIGINAL DRAWING. CHECK SCALE AND ADJUST ACCORDINGLY.

SEQ. 08 / 11 | SHEET 08



ELECTRICAL SITE PLAN NOTES:

1. CONDUIT ROUTE IS SHOWN FOR ILLUSTRATION PURPOSES ONLY. CONTRACTOR IS TO VERIFY THE CONDUIT ROUTE AND ADJUST AS NECESSARY.
2. REFERENCE SHEET 11 FOR DETAILS ON THE LIGHTS AND POLES.
3. CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH XCEL FOR THE NEW ELECTRICAL SERVICE AND ANY REQUIRED INSPECTIONS BY XCEL. CONTRACTOR IS TO PAY ALL COSTS REQUIRED BY XCEL FOR THE NEW ELECTRICAL SERVICE. CONTACT PERSON FOR XCEL IS CARTER LYTAL, PHONE NUMBER: (806)-881-9365, EMAIL: CARTER.M.LYTAL@XCELENERGY.COM

NORTH

GRAPHIC SCALE 1"=30'

0 30 60

GENERAL ELECTRICAL NOTES:

1. ALL ELECTRICAL COMPONENTS OF THIS PROJECT SHALL COMPLY WITH: NFPA 70 - NATIONAL ELECTRICAL CODE: MOST RECENT EDITION ADOPTED BY AUTHORITY HAVING JURISDICTION, INCLUDING ALL APPLICABLE AMENDMENTS AND SUPPLEMENTS.
2. ALL CIRCUITS SHALL BE A MINIMUM SIZE OF 12 GAUGE AND A MINIMUM 3/4" CONDUIT.
3. ALL CIRCUITS SHALL CONTAIN A GROUND WIRE.
4. EACH CIRCUIT SHALL CONTAIN ITS OWN NEUTRAL WIRE. NO NEUTRAL SHARING SHALL BE ALLOWED.
5. ALL CONDUCTORS SHALL BE COPPER UNLESS OTHERWISE SHOWN ON PLAN. USE THHW, THW, THWN, OR XHHW.
6. CLEAR, READABLE PANEL DIRECTORIES ARE REQUIRED FOR ALL PANELS.
7. COORDINATE THE LOCATIONS OF ALL ELECTRICAL EQUIPMENT, DEVICES, FIXED EQUIPMENT, ETC. WITH WITH OWNER PRIOR TO ROUGH-IN-WORK.
8. ELECTRICAL DESIGN PROVIDES A NUMBER OF BRANCH CIRCUITS, PHASES, AMPACITY AND OVERCURRENT PROTECTION CONFORMING TO MANUFACTURER'S SPECIFICATIONS AVAILABLE AT TIME OF DESIGN. IF REQUIREMENTS OF EQUIPMENT ACTUALLY PROVIDED UNDER CONTRACT FOR CONSTRUCTION ARE DIFFERENT, CONTRACTOR SHALL MAKE ALL CHANGES REQUIRED. SUCH CHANGES MAY INCLUDE, BUT ARE NOT LIMITED TO: SIZE OF WIRES, SIZE OF CONDUIT, NUMBER, TYPE AND SIZE OF CIRCUIT BREAKERS, FUSE PROTECTION AND ADDITIONAL DISCONNECT SWITCHES.
9. CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF EXISTING UTILITIES AND EQUIPMENT PRIOR TO CONSTRUCTION. CONTRACTOR IS RESPONSIBLE TO REPAIR ANY DAMAGE TO UTILITIES OR EQUIPMENT, WHETHER SHOWN ON THESE PLANS OR NOT.
10. ELECTRICAL CONTRACTOR SHALL VERIFY EQUIPMENT AND CONDUCTOR SIZE PRIOR TO ORDERING AND INSTALLATION OF ANY EQUIPMENT OR CONDUCTORS. REPORT ALL DISCREPANCIES TO THE ENGINEER.
11. CONTRACTOR SHALL PROVIDE SUITABLE MATERIALS AND CONSTRUCTION METHODS TO PREVENT DAMAGE TO CONDUIT SWEEPS RESULTING FROM INSTALLATION OF LARGE CONDUCTORS.
12. ALL OUTLETS TO BE RATED AT A MINIMUM OF 20 AMPS.
13. CONTRACTOR IS TO MAINTAIN 3' MINIMUM WORKING SPACE IN FRONT OF ELECTRICAL EQUIPMENT PER NEC CODE. CONTRACTOR IS TO REFERENCE NEC TABLE 110.26(A)(1) FOR ADDITIONAL CLEARANCE REQUIREMENTS AND ADJUST AS NECESSARY.
14. CONTRACTOR IS TO PROVIDE AND INSTALL PVC SCHEDULE 40 CONDUIT BELOW GRADE. GALVANIZED RIGID CONDUIT (GRC) IS TO BE USED FOR INSTALLATIONS ABOVE GRADE. CONTRACTOR IS TO TRANSITION FROM PVC TO GRC CONDUIT AT 12" BELOW GRADE. CONDUIT IS TO BE A MINIMUM OF 24" BELOW GRADE.

ELECTRICAL LEGEND

- NEW POLE MOUNTED LIGHT PER SCHEDULE
- EXISTING ONCOR SECONDARY POLE WITH LIGHT
- OE — EXISTING OVERHEAD ELECTRICAL
- UE — NEW UNDERGROUND ELECTRICAL
- OCTV — EXISTING OVERHEAD COMMUNICATION LINE
- EXISTING POWER POLE
- PANEL / BREAKER # / X-1,3 / HOMERUN

NOTE: X DENOTES FIXTURES SCHEDULE DESIGNATION

STATE OF TEXAS — COLE W. CARPENTER — 156124 — LICENSED PROFESSIONAL ENGINEER

08/08/25

ISSUED FOR CONSTRUCTION

JACOB MARTIN

TBPELS FIRM # 10194493 | TBAE FIRM # BR 2261 | TBPE FIRM # 2448

CITY OF IDALOU
2025 - MULTIPURPOSE COURT IMPROVEMENTS

ELECTRICAL SITE PLAN (ALTERNATE BID)

NO.	REVISION	DATE
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BAR IS ONE INCH IN LENGTH ON ORIGINAL DRAWING. CHECK SCALE AND ADJUST ACCORDINGLY.

PROJECT # 25285 | SCALE 1" = 30'

SEQ. 09 | SHEET 09 / 11

Plotted By: brendon day Plot Date: 8/8/2025 12:27 PM
Saved By: ccarpenter Save Time: 8/8/2025 9:21 AM
X:\CL_Idalou\25285 - 2025 - Multi Purpose Court Improvements - City of Idalou\Drafting_Plans_E_Electrical\08 ELECTRICAL SITE PLAN (ALTERNATE BID).dwg

City of Idalou 2025 Multipurpose Court Improvements
New Panel "A" Schedule

			1 Phase 3 Wire	Conductor Color Code			Load
Main Breaker Rating:	60	AMPS	120/240 VAC	Line 1 ----------	BLACK	Phase 1 Load:	7
M.L.O. Bus Rating:	20	AMPS		Line 2 ----------	RED	Phase 2 Load:	6
Sym. Inter. Cap.:	18k >	AMPS		Neutral ----------	WHITE or GRAY		
				Ground ----------	GREEN		

Surface Mount.: X — NEMA 1: ____
Flush Mount.: ____ — NEMA 3R: X

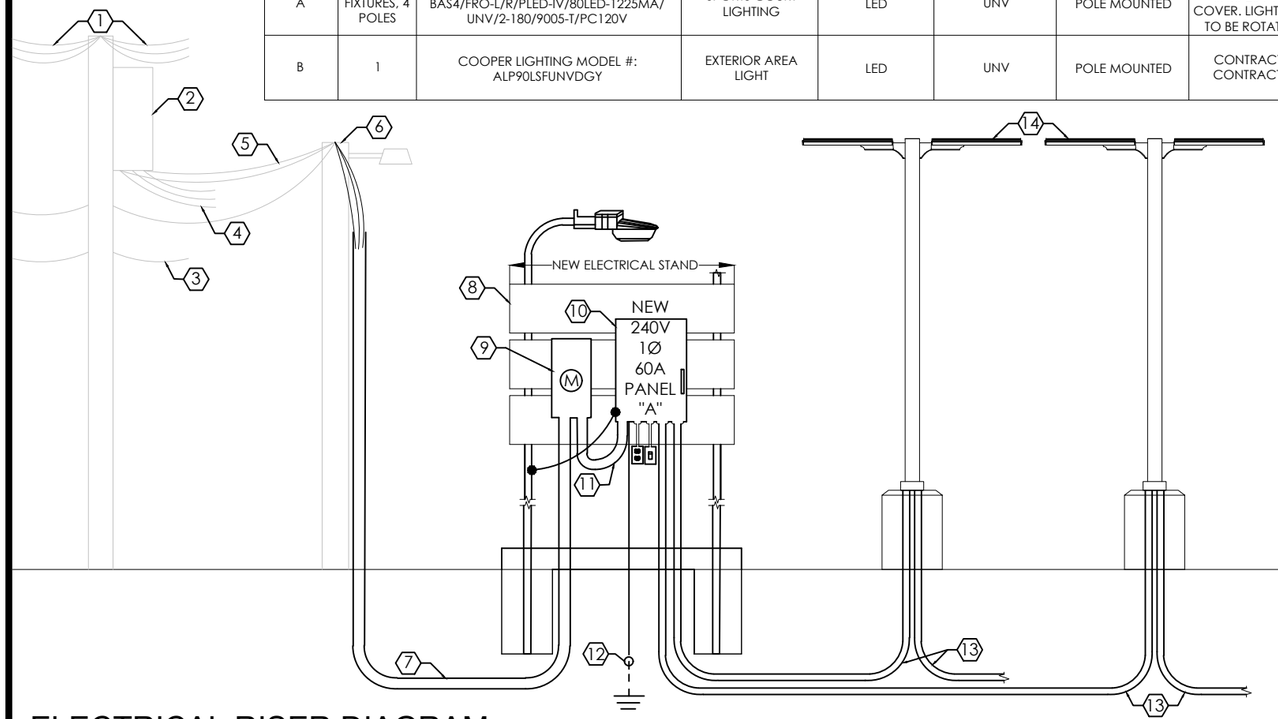
Contractor is to provide and install a Surge Protection Device (SPD) with this panel.

POLE	SERVICE	W	LOAD LINE 1	LOAD LINE 2	BREAKER POLES	POLE	1	2	POLE	SERVICE	W	LOAD LINE 1	LOAD LINE 2	BREAKER POLES	POLE
1	Court Lights - East	636	5		20 / 1	1	X		2	Stand Mounted Convenience Receptacle	180	2		20 / 1	2
3	Court Lights - West	636		5	20 / 1	3		X	4	Stand Mounted Light	120		1	20 / 1	4
5	Spare Breaker (Note 1)				20 / 1	5	X		6						6
7	Spare Breaker (Note 1)				20 / 1	7		X	8						8
9						9	X		10						10
11						11		X	12						12
13						13	X		14						14
15						15		X	16	SPD		X			16
17						17	X		18	SPD			X		18

Notes:
1. Contractor is to provide the breaker only. No wiring or conduit is required to be installed as part of this contract for these spaces.

LIGHTING FIXTURE SCHEDULE

FIXTURE MARK	QUANTITY	MANUFACTURER & CATALOG NUMBER	TYPE	LAMPS BULBS	VOLTAGE	SUPPORT	NOTES
A	8 TOTAL FIXTURES, 4 POLES	US ARCHITECTURAL LIGHTING MODEL #: BAS4/FRO-L/R/PLED-IV/80LED-1225MA/ UNV/2-180/9005-T/PC120V	SPORTS COURT LIGHTING	LED	UNV	POLE MOUNTED	LIGHT IS TO BE PROVIDED WITH 20' 4" BLACK SQUARE POLE. BASIS OF DESIGN IS US POLE MODEL #: SNTS-204-11/2-180/RAL-9005-S/VBDS-M2. POLE IS TO BE PROVIDED WITH VIBRATION DAMPENERS AND A SQUARE BASE COVER. LIGHT FIXTURES ARE TO BE FACTORY ROTATED FOR A 5° TILT. FOUR FIXTURES ARE TO BE ROTATED LEFT AND FOUR ARE TO BE ROTATED RIGHT. LIGHT FIXTURES ARE TO BE CONTROLLED VIA PHOTOCELL. THERE ARE (2) LIGHT FIXTURES PER POLE.
B	1	COOPER LIGHTING MODEL #: ALP90LSFUNVDGY	EXTERIOR AREA LIGHT	LED	UNV	POLE MOUNTED	CONTRACTOR IS TO PROVIDE AND INSTALL COOPER CURVED MOUNT MODEL #: EA24 AS REQUIRED FOR MOUNTING. CONTRACTOR IS TO PROVIDE AND INSTALL A SHORTING CAP FOR PHOTOCELL TO OPERATE VIA SINGLE POLE SWITCH.



ELECTRICAL RISER DIAGRAM
N.T.S.

ELECTRICAL RISER DIAGRAM NOTES BY REFERENCE (#)

1. EXISTING XCEL OVERHEAD 3Ø ELECTRICAL PRIMARY IS TO REMAIN.
2. EXISTING XCEL PRIMARY INLINE POLE WITH (3) TRANSFORMER BANK IS TO REMAIN.
3. EXISTING OVERHEAD COMMUNICATION LINES ARE TO REMAIN.
4. EXISTING XCEL 240V, 3Ø OVERHEAD ELECTRICAL SECONDARY SERVING THE COMMUNITY CENTER IS TO REMAIN.
5. EXISTING XCEL 240V, 1Ø OVERHEAD ELECTRICAL SECONDARY IS TO REMAIN.
6. EXISTING XCEL SECONDARY DIP POLE WITH XCEL OWNED LIGHT IS TO REMAIN.
7. NEW XCEL UNDERGROUND 240/120V, 1Ø ELECTRICAL SECONDARY FROM SECONDARY DIP POLE TO STAND MOUNTED METER. XCEL IS TO PROVIDE AND INSTALL THE ELECTRICAL SECONDARY. CONTRACTOR IS TO PROVIDE AND INSTALL THE RISER FROM THE GROUND TO STAND MOUNTED METER PER XCEL'S REQUIREMENTS.
8. NEW ELECTRICAL STAND PROVIDED AND INSTALLED BY THE CONTRACTOR. REFERENCE ELECTRICAL STAND DETAILS SHEET 11 FOR MORE INFORMATION ON THE STAND AND STAND MOUNTED EQUIPMENT.
9. NEW XCEL STAND MOUNTED ELECTRICAL METER. CONTRACTOR IS TO PROVIDE AND INSTALL THE METER CAN PER XCEL'S REQUIREMENTS. XCEL IS TO PROVIDE AND INSTALL THE ELECTRICAL METER.
10. NEW SERVICE RATED 240/120V, 1Ø, 60A MCB IN A 200A FRAME PANEL "A". BOND NEUTRAL TO GROUND IN THIS PANEL. PANEL IS TO BE LOCKABLE.
11. (2) - #4 AWG PHASE CONDUCTORS, (1) - #4 AWG NEUTRAL CONDUCTOR IN 1-1/4" CONDUIT FROM METER TO PANEL "A".
12. (1) - #8 AWG GROUND IN 1/2" PVC CONDUIT. CADWELD TO 5/8" x 10'-0" COPPER CLAD STEEL GROUND ROD.
13. (1) - #12 AWG PHASE CONDUCTOR, (1) - #12 AWG NEUTRAL CONDUCTOR, (1) - #12 AWG GROUND IN 3/4" CONDUIT TO NEW POLE MOUNTED LIGHTS. CONTRACTOR IS TO VERIFY THE CONDUIT ROUTE AND ADJUST AS NECESSARY.
14. NEW TYPE "A" POLE MOUNTED LIGHTS PER LIGHTING SCHEDULE. THERE ARE TO BE (2) LIGHT FIXTURES PER POLE.

COLE W. CARPENTER
156124
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
08/08/25

ISSUED FOR CONSTRUCTION

JACOB MARTIN
TBPELS FIRM # 10194493
TBAE FIRM # BR 2261
TBPE FIRM # 2448

CITY OF IDALOU
2025 - MULTIPURPOSE COURT IMPROVEMENTS

ELECTRICAL RISER DIAGRAM AND SCHEDULES (ALTERNATE BID)

NO.	REVISION	DATE
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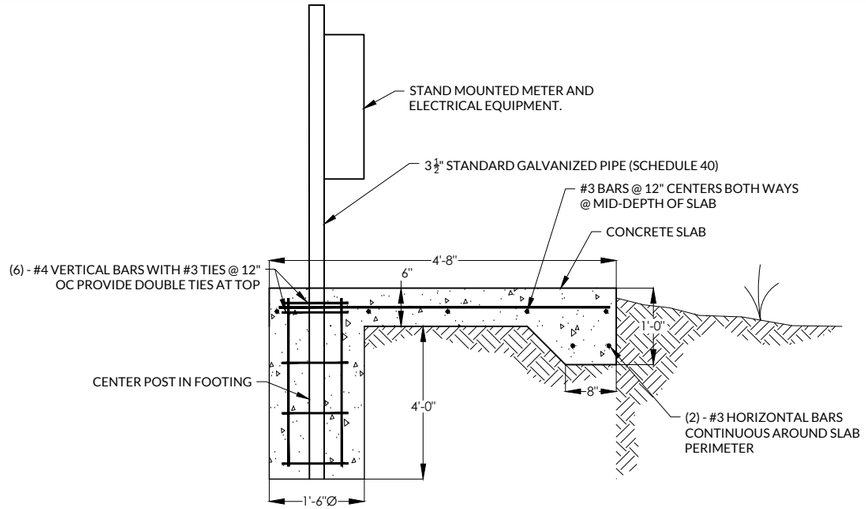
PROJECT # 25285 | SCALE NTS

BAR IS ONE INCH IN LENGTH ON ORIGINAL DRAWING. CHECK SCALE AND ADJUST ACCORDINGLY.

SEQ. 10 / 11 | SHEET 10



ELECTRICAL STAND DETAIL (SIDE VIEW)

N.T.S.

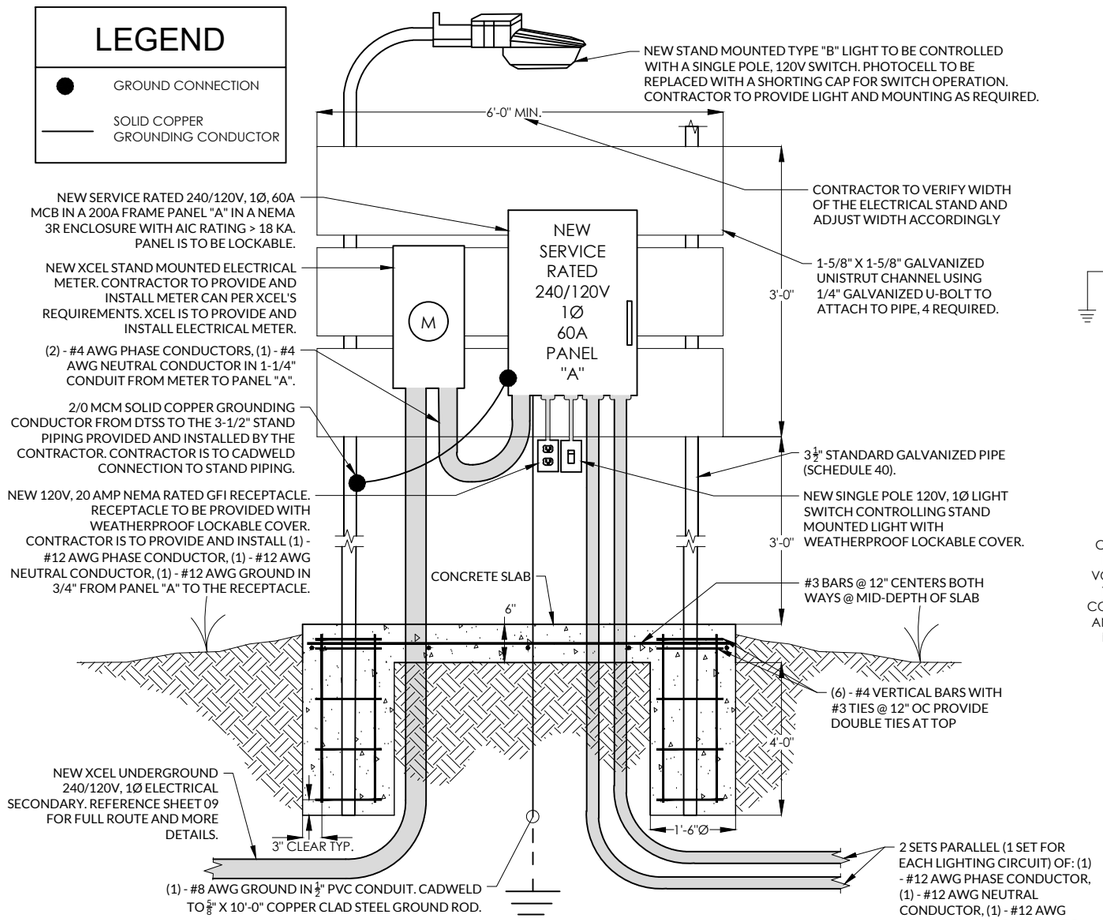
NEW U.S. ARCHITECTURAL LIGHTING BASELINE SPORTS LIGHTING FIXTURE WITH (4) LED SQUARES (TOTAL OF 80 LEDS)(DETAIL SHOWS (6) LED SQUARE MODEL). LED BOARD IS TO BE FACTORY ROTATED AT 5° TILT FOR ADEQUATE LIGHTING. HALF OF THE FIXTURES ARE TO BE ROTATED LEFT AND HALF ARE TO BE ROTATED RIGHT. LIGHT FIXTURE TO HAVE TYPE IV LIGHTING DISTRIBUTION. LIGHT FIXTURE PROVIDES APPROXIMATELY 35,110 LUMENS AND CONSUMES 317.9 WATTS. LIGHTS ARE TO BE CONTROLLED WITH PHOTOCELLS LOCATED ON THE FIXTURES AND BE BLACK IN COLOR.

LIGHT FIXTURE DETAIL

N.T.S.

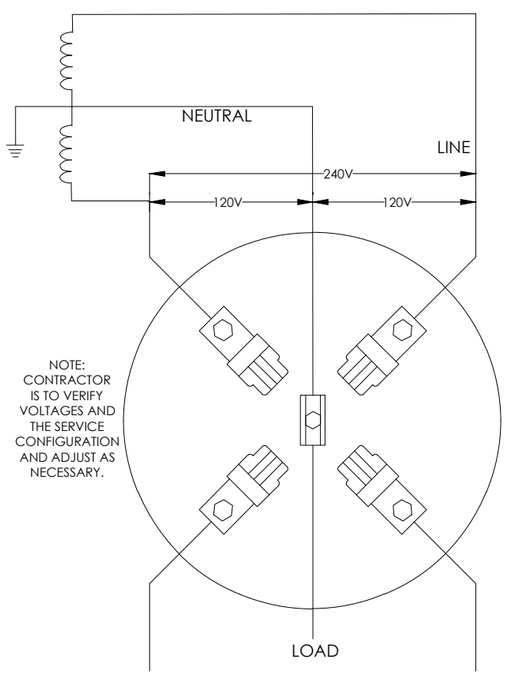
LEGEND

- GROUND CONNECTION
- SOLID COPPER GROUNDING CONDUCTOR



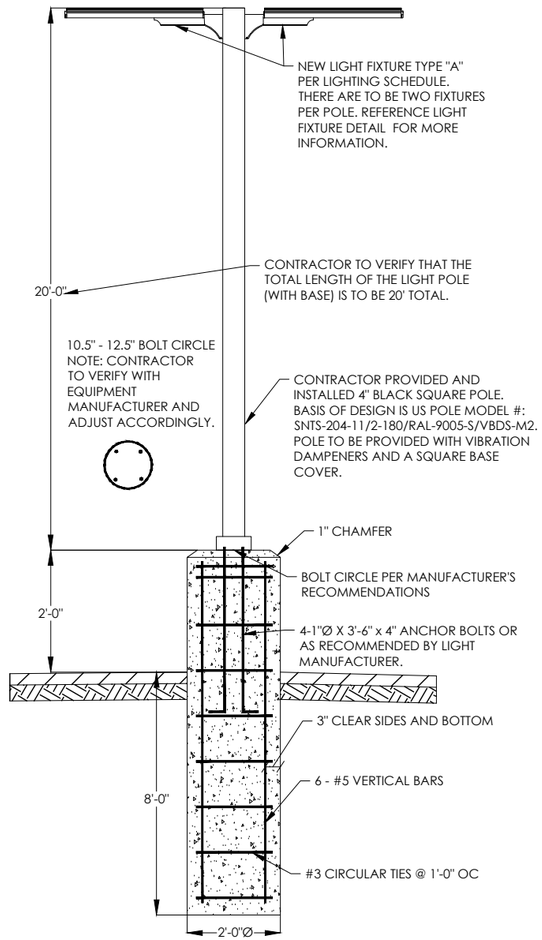
ELECTRICAL STAND DETAIL

N.T.S.



NEW XCEL ELECTRICAL SERVICE DETAIL

N.T.S.



LIGHT POLE & FOUNDATION DETAIL

N.T.S.

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ELECTRICAL DETAILS (ALTERNATE BID)

NO.	REVISION	DATE
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BAR IS ONE INCH IN LENGTH ON ORIGINAL DRAWING. CHECK SCALE AND ADJUST ACCORDINGLY.

PROJECT # 25285 | SCALE NTS

SEQ. 11 / 11 | SHEET 11