

PROJECT MANUAL

Worth County Conservation - Monarch RV Park Implementation

Worth County Conservation Board

Northwood, Iowa

July 2026

BMI Project No. 24X.136996.000

SECTION 00005 - CERTIFICATION PAGE

**PROJECT MANUAL
FOR
WORTH COUNTY CONSERVATION - MONARCH RV PARK IMPLEMENTATION
WORTH COUNTY CONSERVATION BOARD
NORTHWOOD, IOWA
JULY 2026
BMI PROJECT NO. 24X.136996.000**

	I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa. _____ Date: _____ Emily Naylor License No. 00424 My renewal date is June 30, 2028 Pages or sheets covered by this seal: <u>ALL</u>_____
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Worth County Conservation – Monarch RV Park Implementation
Worth County Conservation Board

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DRAWINGS (UNDER SEPARATE COVER):

28 sheets numbered A.01 through U.01, inclusive, dated July, 2026, and with each sheet bearing the following general title:

Worth County Conservation -Monarch RV Park Implementation
Worth County Conservation Board

**This project is based on
SUDAS STANDARD SPECIFICATIONS, 2026 EDITION
unless modified herein.**

******END OF SECTION******

SECTION 00100 - NOTICE TO BIDDERS

Worth County Conservation - Monarch RV Park Implementation
Worth County Conservation Board
Northwood, Iowa

Receipt and Opening of Sealed Proposals. Sealed proposals for the work comprising the repair or improvement as stated below must be filed before 2:00 p.m. on August 11, 2026, in the office of the Director, 503 1st Avenue North, Northwood, Iowa 50459. Sealed proposals will be opened and publicly read, with bids being tabulated at that time. The results will be reported to the Worth County Conservation Board at its meeting at 7:00 p.m. on August 13, 2026, at which time the Board may take action on the proposals submitted or at such time as may then be fixed. The Worth County Conservation Board reserves the right to reject any or all bids, to waive informalities or technicalities in any bid, and to enter into such contract, or contracts, as it shall deem to be in the best interest of the Worth County Conservation Board.

The results will be reported to the Worth County Conservation Board at its meeting at 7:00 p.m. on August 13, 2026 at which time the Board may take action on the proposals submitted or at such time as may then be fixed. The Worth County Conservation Board reserves the right to reject any or all bids, to waive informalities or technicalities in any bid, and to enter into such contract, or contracts, as it shall deem to be in the best interest of the Worth County Conservation Board.

To access the electronic proposal form, download the project documents and click the online bidding button at the top of the advertisement. Prospective Bidders must be on the plan holders list through QuestCDN for bids to be accepted and pay the required fee for submission of the online bid.

Time for Commencement and Completion of Work. Work on the improvement shall commence upon approval of the contract by the Board and as stated in the Notice to Proceed. All work under the contract must be completed on or before June 30, 2027. Liquidated damages are as set forth in Section 00500 – Contract.

Bid Security. Each Bidder shall accompany its bid with bid security, as defined in Iowa Code Section 26.8, as security that the successful Bidder will enter into a contract for the work bid upon. The Bidder's security shall be in an amount equal to 5 percent of the total amount of the bid. The bid shall contain no condition except as provided in the specifications. If the Bidder fails to execute the contract and to furnish an acceptable Performance, Payment, and Maintenance Bond or provide a Certificate of Insurance within ten (10) days after acceptance of the bid by the County, the bid security may be forfeited or cashed by the County as liquidated damages.

Contract Documents. Copies of the project documents are available for a price of \$25.00 per set. This fee is refundable, provided the plans and specifications are returned complete and in reusable condition, and they are returned within fourteen (14) calendar days after the award of the project. Please make your check payable to Bolton & Menk, Inc. and send it to 430 East Grand Avenue, Suite 101, Des Moines, IA 50309. Complete digital project bidding documents are available at www.bolton-menk.com or www.questcdn.com. You may view the digital plan documents for free by entering QuestCDN Project #10282221 on the website's Project Search page. Documents may be downloaded for \$0.00. Please contact QuestCDN.com at 952-233-1632 or info@questcdn.com for assistance in free membership registration, viewing, downloading, and working with this digital project information.

Preference of Products and Labor. By virtue of statutory authority, a preference will be given to products and provisions grown and coal produced within the State of Iowa, to the extent lawfully required under Iowa statutes.

Sales Tax Exemption Certificates. The Bidder shall not include sales tax in the bid. The Worth County Conservation Board will distribute tax exemption certificates and authorization letters to the contractor and all subcontractors who are identified. The contractor and subcontractor may make copies of the tax exemption certificates and provide a copy to each supplier providing construction materials. These tax exemption certificates and authorization letters are applicable only for this specific project under the contract.

PROJECT DESCRIPTION: Worth County Conservation seeks to install a modern RV park in a new business subdivision south of the Diamond Jo Casino in Northwood, Iowa. The project will include concrete drive approaches, campground roads, campsites, and amenity pads. Each of the 16 campsites will have a granular utility band featuring a water connection, a 50/30/20-amp electrical pedestal, and a sanitary sewer connection. The project will include a pre-manufactured shower house, a prefabricated shelter with concrete paving, and accommodation for an owner-provided playground.

The Notice is given by order of the Board of the Worth County Conservation Board.

Jim Hanson
Director

SECTION 00110 - NOTICE OF PUBLIC HEARING

Worth County Conservation - Monarch RV Park Implementation
Worth County Conservation Board
Northwood, Iowa

Public Hearing on Proposed Contract Documents and Estimated Costs for Repair or Improvement. A public hearing will be held by the Worth County Conservation Board on the proposed contract documents (plans, specifications and form of contract) and estimated cost for the improvement at its meeting at 7:00 p.m. on June 30, 2026, at 503 1st Avenue North, Northwood, Iowa 50459.

PROJECT DESCRIPTION: Worth County Conservation seeks to install a modern RV park in a new business subdivision south of the Diamond Jo Casino in Northwood, Iowa. The project will include concrete drive approaches, campground roads, campsites, and amenity pads. Each of the 16 campsites will have a granular utility band featuring a water connection, a 50/30/20-amp electrical pedestal, and a sanitary sewer connection. The project will include a pre-manufactured shower house, a prefabricated shelter with concrete paving, and accommodation for an owner-provided playground.

At said hearing, the Board will consider the plans, specifications, proposed form of contract, and estimated total cost for the project, the same now being on file in the office of the Director, 503 1st Avenue North, Northwood, Iowa 50459, reference to which is made for a more detailed and complete description of the proposed improvements, and at said time and place the said Board will also receive and consider any objections to said plans, specifications, estimate of cost, and form of contract made by any interested party.

SECTION 00200 - INSTRUCTIONS TO BIDDERS

Worth County Conservation - Monarch RV Park Implementation
Worth County Conservation Board
Northwood, Iowa

The work comprising the above referenced project shall be constructed in accordance with the SUDAS Standard Specifications, 2026 Edition, and as further modified by the supplemental specifications and special provisions included in the contract documents. The terms used in the contract version of the documents are defined in said standard specifications. Before submitting a bid, please review the requirements of Division One, General Provisions and Covenants. Please be certain that all documents have been completed properly, as failure to complete and sign all documents and to comply with the requirements listed below can cause a submitted bid not to be read.

ARTICLE 1—BID SECURITY

- 1.01 The bid security must be in the minimum amount of 5% of the total bid amount including all add alternates (do not deduct the amount of deduct alternates).
- 1.02 Bid security other than said bid bond shall be in accordance with Chapter 26 of the Iowa Code.
- 1.03 Bid security shall be in the form of a cashier's check or certified check drawn on a state chartered or federally chartered bank; or a certified share draft drawn on a state chartered or federally chartered credit union; or a bidder's bond with corporate surety satisfactory to the Worth County Conservation Board, hereinafter called the "Jurisdiction".
- 1.04 All signatures on the bid bond must be original signatures in ink; electronic, copies, or facsimile (fax) of any signature on the bid bond is not acceptable.
- 1.05 The bid bond must be submitted on the enclosed Bid Bond form as no other bid bond forms are acceptable.

ARTICLE 2—SUBMISSION OF THE PROPOSAL AND IDENTITY OF BIDDERS

- 2.01 The Proposal shall be sealed in an envelope, properly identified as the "Proposal", with the project title and the name and address of the Bidder. The bid security shall be sealed in a separate envelope identified as the "Bid Security" and attached to the outside of the bid proposal envelope. The Proposal and Bid Security shall be deposited with the Jurisdiction at or before the time and at the place provided in the Notice to Bidders. It is the sole responsibility of the Bidder to see that its proposal is delivered to the Jurisdiction prior to the time for opening bids along with the appropriate bid security. Any proposal received after the scheduled time for the receiving of proposals will be returned to the Bidder unopened and will not be considered.
- 2.02 The following documents shall be completed, signed, and returned in the proposal envelope. The bid cannot be read if any of these documents are omitted from the proposal envelope.
 - A. PROPOSAL – Complete each of the following parts:
 - Part B – Acknowledgment of Addenda, if any have been issued;
 - Part C – Bid Items, Quantities and Prices;
 - Part F – Additional Requirements; and
 - Part G – Identity of Bidder.
- 2.03 Sign the proposal. The signature on the proposal and all proposal attachments must be an original signature in ink signed by the same individual who is the company owner or an authorized officer of the company; copies or facsimile of any signature will not be accepted.
- 2.04 Documents must be submitted as printed. No alterations, additions, or deletions are permitted. If the Bidder notes a requirement in the contract documents which the Bidder believes will require a conditioned or unsolicited

alternate bid, the Bidder must immediately notify the Engineer in writing. The Engineer will issue any necessary interpretation by an addendum.

2.05 Division 1 - General Provisions and Covenants of the 2026 SUDAS Standard Specifications is modified as follows:

A. Section 1020.1.09B, Unit Price Attachment.

A computer-generated unit price attachment may be submitted by the Bidder as specified by this section.

ARTICLE 3—PROSECUTION AND PROGRESS OF THE WORK

3.01 The work is located in Northwood, Iowa, Worth County.

Work on the improvement shall commence upon approval of the contract by the Board and as stated in the Notice to Proceed. All work under the contract must be completed as stated in Section 00500 - Contract. Liquidated damages will be assessed as detailed in Section 00500 - Contract.

3.02 Community Events.

Successful Bidder will be required to coordinate with the Jurisdiction and accommodate the Jurisdiction's requirements for the following list of events:

None

3.03 Each successful Bidder will be required to furnish a corporate surety bond in an amount equal to 100% of its contract price. Said bond shall be issued by a responsible surety approved by Worth County Conservation Board and shall guarantee the faithful performance of the contract, the terms and conditions therein contained, the prompt payment of all material and labor, protect and save harmless the Worth County Conservation Board from claims and damages of any kind caused by the operations of the contract, and shall also guarantee the maintenance of the improvement caused by failures in materials and construction for a period of 2 year underground, 4 year paving years from and after acceptance of the work.

3.04 The Worth County Conservation Board, in accordance with Title VI of the Civil Rights Act of 1964, 78 Stat. 252, 42U.S.C. 2000d to 2000d-4 and Title 49 Code of Federal Regulations, Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Nondiscrimination in Federally-Assisted programs of the Department of Transportation issued pursuant to such Act, hereby notifies all Bidders that it will affirmatively ensure that with any contract entered into pursuant to this advertisement, minority business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

ARTICLE 4—PREFERENCE OF PRODUCTS AND LABOR

4.01 In accordance with Iowa statutes, a resident bidder shall be allowed preference against a nonresident bidder from a state or foreign country provided that state or foreign country gives or requires any preference to bidders from that state or foreign country. This includes, but is not limited to any preference to bidders, the imposition of any type of labor force preference, or any other form of preferential treatment to bidders or laborers from that state or foreign country. The preference allowed shall be equal to the preference given or required by the state or foreign country in which the nonresident bidder is a resident. In the instance of a resident labor force preference, a nonresident bidder shall apply the same resident labor force preference to a public improvement in this state as would be required in the construction of a public improvement by the state or foreign country in which the nonresident bidder is a resident. If it is determined that this may cause denial of federal funds which would otherwise be available or would otherwise be inconsistent with requirements of any federal law or regulation, this resident bidder preference

shall be suspended, but only to the extent necessary to prevent denial of the funds or to eliminate the inconsistency with federal requirements.

ARTICLE 5—TAXES

- 5.01 The County will issue a sales tax exemption certificate and authorization letters to the contractor and all subcontractors for all materials purchased on the project. Tax exemption certificates are applicable only for the specific project for which the tax exemption certificate is issued.
- 5.02 The contractor shall provide a listing identifying all appropriate subcontractors qualified for use of the tax exemption certificate. The contractor and subcontractors may make copies of the certificate and provide to each supplier providing construction material.
- 5.03 Income Tax:
 - A. Successful Bidder is subject to payment of Iowa income tax on income from this work in amounts prescribed by law.
 - B. If successful Bidder is a non-Iowa partnership, individual, or association, Bidder shall furnish evidence prior to execution of contract that bond or securities have been posted with the Iowa Department of Revenue in the amount required by law.

ARTICLE 6—ADDITIONAL ITEMS

- 6.01 Bidder shall conduct the required site visit during normal working hours.

******END OF SECTION******

SECTION 00410 - PROPOSAL

Worth County Conservation - Monarch RV Park Implementation
Worth County Conservation Board
Northwood, Iowa

PROPOSAL: PART A – SCOPE

The Worth County Conservation Board, hereinafter called the “Jurisdiction”, has need of a qualified contractor to complete the work comprising of the below referenced repair or improvement. The undersigned Bidder hereby proposes to complete the work comprising of the below referenced repair or improvement as specified in the contract documents, which are officially on file with the Jurisdiction, in the office of the Board Chair, at the prices hereinafter provided in Part C of the Proposal, for the improvements on the Worth County Conservation - Monarch RV Park Implementation.

PROPOSAL: PART B – ACKNOWLEDGMENT OF ADDENDA

The Bidder hereby acknowledges that all addenda become a part of the contract documents when issued and that each such addendum has been received and utilized in the preparation of this bid. The Bidder hereby acknowledges receipt of the following addenda by inserting the number of each addendum in the blanks below:

ADDENDUM NUMBER _____

ADDENDUM NUMBER _____

ADDENDUM NUMBER _____

ADDENDUM NUMBER _____

and certifies that said addenda were utilized in the preparation of this bid.

PROPOSAL: PART C – BID ITEMS AND QUANTITIES

LUMP SUM CONTRACTS: The Bidder must provide Unit Bid Prices that total up to a Lump Sum Price on the Proposal attachment: Part C – Bid Items and Quantities.

SEE INCLUDED PROPOSAL ATTACHMENT

PROPOSAL: PART D – GENERAL

The Bidder hereby acknowledges that the Jurisdiction, in advertising for public bids for this project reserves the right to:

1. Reject any or all bids. Award of the contract, if any, to be to the lowest responsible, responsive Bidder; and
2. Reject any or all alternates in determining the items to be included in the contract. Designation of the lowest responsible, responsive Bidder to be based on comparison of the total bid only, and may include inclusion of the alternate:
3. Make such alterations in the contract documents or in the proposal quantities as it determines necessary in accordance with the contract documents after execution of the contract. Such alterations shall not be considered a waiver of any conditions of the contract documents, and shall not invalidate any of the provisions thereof; and

The Bidder hereby agrees to:

1. Enter into a contract, if this proposal is selected, in the form approved by the Jurisdiction, provide proof of registration with the Iowa Division of Labor in accordance with Chapter 91C of the Iowa Code, and furnish a performance, maintenance, and payment bond; and
2. Forfeit bid security, not as a penalty but as liquidated damages, upon failure to enter into such contract and/or to furnish said bond; and
3. Commence the work upon written Notice to Proceed; and
4. Complete the work in accordance with the completion dates defined in Section 00500 – Contract; and
5. Pay liquidated damages for noncompliance with said completion provisions at the rate detailed in Section 00500 – Contract for each calendar day thereafter that the work remains incomplete.

PROPOSAL: PART E – NON-COLLUSION AFFIDAVIT

The Bidder hereby certifies:

1. That this proposal is not affected by, contingent on, or dependent on any other proposal submitted for any improvement with the Jurisdiction; and
2. That no individual employed by the Bidder has employed any person to solicit or procure the work on this project, nor will any employee of the Bidder make any payment or agreement for payment of any compensation in connection with the procurement of this project; and
3. That no part of the bid price received by the Bidder was or will be paid to any person, corporation, firm, association, or other organization for soliciting the bid, other than the payment of their normal compensation to persons regularly employed by the Bidder whose services in connection with the construction of the project were in the regular course of their duties for the Bidder; and
4. That this proposal is genuine and not collusive or sham; that the Bidder has not colluded, conspired, connived, or agreed, directly or indirectly, with any Bidder or person, to submit a sham bid or to refrain from bidding; and
5. That the bid has not in any manner, directly or indirectly, sought, by agreement or collusion, or communication or conference, with any person, to fix the bid price of the Bidder or of any other Bidder; and
6. That all statements in this proposal are true; and
7. That the individual(s) executing this proposal have the authority to execute this proposal on behalf of the Bidder.

PROPOSAL: PART F – ADDITIONAL REQUIREMENTS

The Bidder hereby agrees to comply with the additional requirements listed below which are included in this proposal and identified as proposal attachments:

ITEM NO.	DESCRIPTION OF ATTACHMENT
1.	None

PROPOSAL: PART G - IDENTITY OF BIDDER

The Bidder shall indicate whether the bid is submitted by a/an:

☐ Individual,
Sole Proprietorship

Bidder

☐ Partnership

Signature

☐ Corporation

Name (Print/Type)

☐ Limited Liability Company

Title

☐ Joint Venture; all parties must join in and
execute all documents

Street Address

☐ Other

City, State, Zip Code

Telephone Number

The Bidder shall enter its
Public Registration Number

E-Mail Address

_____ - _____ issued by the
Iowa Commissioner of Labor Pursuant
Section 91C.5 of the Iowa Code.

**Type or print the name and title of the company's
owner, president, CEO, etc. if a different person
than entered above.**

Failure to provide said Registration
Number shall result in the bid being read
under advisement. A contract will not be
executed until the contractor is registered.

Name

Title

NOTE: The signature on this proposal must be an original signature in ink; copies, facsimiles, or electronic signatures will not be accepted.

All bidders must submit the following completed form to the governmental body requesting bids per 875 Iowa Administrative Code Chapter 156.

BIDDER STATUS FORM

To be completed by all bidders.

Part A

Please answer "Yes" or "No" for each of the following:

- ☐ Yes ☐ No My company is authorized to transact business in Iowa.
(To help you determine if your company is authorized, please review the worksheet on the next page).
- ☐ Yes ☐ No My company has an office to transact business in Iowa.
- ☐ Yes ☐ No My company's office in Iowa is suitable for more than receiving mail, telephone calls, and e-mail.
- ☐ Yes ☐ No My company has been conducting business in Iowa for at least 3 years prior to the first request for bids on this project.
- ☐ Yes ☐ No My company is not a subsidiary of another business entity or my company is a subsidiary of another business entity that would qualify as a resident bidder in Iowa.
If you answered "Yes" for each question above, your company qualifies as a resident bidder. Please complete Parts B and D of this form.
If you answered "No" to one or more questions above, your company is a non-resident bidder. Please complete Parts C and D of this form.

To be completed by resident bidders.

Part B

My company has maintained offices in Iowa during the past 3 years at the following addresses:

Dates: _____ to _____ Address: _____
(mm/dd/yyyy) City, State, Zip: _____

Dates: _____ to _____ Address: _____
(mm/dd/yyyy) City, State, Zip: _____

Dates: _____ to _____ Address: _____
(mm/dd/yyyy) City, State, Zip: _____

You may attach additional sheet(s) if needed.

To be completed by non-resident bidders.

Part C

- Name of home state or foreign country reported to the Iowa Secretary of State: _____
- Does your company's home state or foreign country offer preferences to bidders who are residents? ☐ Yes ☐ No
- If you answered "Yes" to question 2, identify each preference offered by your company's home state or foreign country and the appropriate legal citation.

You may attach additional sheet(s) if needed.

To be completed by all bidders.

Part D

I certify that the statements made on this document are true and complete to the best of my knowledge and I know that my failure to provide accurate and truthful information may be reason to reject my bid.

Firm Name: _____

Signature: _____ Date: _____

WORKSHEET: AUTHORIZATION TO TRANSACT BUSINESS

This worksheet may be used to help complete Part A of the Resident Bidder Status form. If at least one of the following describes your business, you are authorized to transact business in Iowa.

- ☐ Yes ☐ No My business is currently registered as a contractor with the Iowa Division of Labor.
- ☐ Yes ☐ No My business is a sole proprietorship and I am an Iowa resident for Iowa income tax purposes.
- ☐ Yes ☐ No My business is a general partnership or joint venture. More than 50 percent of the general partners or joint venture parties are residents of Iowa for Iowa income tax purposes.
- ☐ Yes ☐ No My business is an active corporation with the Iowa Secretary of State and has paid all fees required by the Secretary of State, has filed its most recent biennial report, and has not filed articles of dissolution.
- ☐ Yes ☐ No My business is a corporation whose articles of incorporation are filed in a state other than Iowa, the corporation has received a certificate of authority from the Iowa Secretary of State, has filed its most recent biennial report with the Secretary of State, and has neither received a certificate of withdrawal from the Secretary of state nor had its authority revoked.
- ☐ Yes ☐ No My business is a limited liability partnership which has filed a statement of qualification in this state and the statement has not been canceled.
- ☐ Yes ☐ No My business is a limited liability partnership which has filed a statement of qualification in a state other than Iowa, has filed a statement of foreign qualification in Iowa and a statement of cancellation has not been filed.
- ☐ Yes ☐ No My business is a limited partnership or limited liability limited partnership which has filed a certificate of limited partnership in this state and has not filed a statement of termination.
- ☐ Yes ☐ No My business is a limited partnership or a limited liability limited partnership whose certificate of limited partnership is filed in a state other than Iowa, the limited partnership or limited liability limited partnership has received notification from the Iowa Secretary of state that the application for certificate of authority has been approved and no notice of cancellation has been filed by the limited partnership or the limited liability limited partnership.
- ☐ Yes ☐ No My business is a limited liability company whose certificate of organization is filed in Iowa and has not filed a statement of termination.
- ☐ Yes ☐ No My business is a limited liability company whose certificate of organization is filed in a state other than Iowa, has received a certificate of authority to transact business in Iowa and the certificate has not been revoked or canceled.

PROPOSAL ATTACHMENT: PART C – BID ITEMS AND QUANTITIES

Worth County Conservation - Monarch RV Park Implementation
Worth County Conservation Board
Northwood, Iowa

This is a LUMP SUM CONTRACT. The Bidder must provide Unit Bid Prices, and the total will become the Lump Sum Price on the Proposal Attachment: Part C – Bid Items and Quantities.

BASE BID

ITEM NO.	ITEM CODE	DESCRIPTION	UNIT	APPROX. QUANTITY	UNIT PRICE	AMOUNT
1	2010-D-1	TOPSOIL, ON-SITE	CY	1,100	\$	\$
2	2010-E	EXCAVATION, CLASS 10	CY	3,100	\$	\$
3	2010-G	SUBGRADE PREPARATION	SY	6,240	\$	\$
4	2010-J	SUBBASE, MODIFIED, 4-INCH	SY	555	\$	\$
5	2010-J	SUBBASE, MODIFIED, 6-INCH	SY	6,240	\$	\$
6	4010-A-1	SANITARY SEWER GRAVITY MAIN, TRENCHED, PVC, 8-INCH	LF	136	\$	\$
7	4010-E	SANITARY SEWER SERVICE STUB, PVC, 4-INCH	LF	760	\$	\$
8	4010-E	SANITARY SEWER SERVICE STUB, PVC, 6-INCH	LF	324	\$	\$
9	4010-I	SANITARY SEWER CLEANOUT, 4-INCH	EA	16	\$	\$
10	4010-999-A	CLEANING, INSPECTION AND TESTING OF SEWERS, CONTRACTOR SUPPLIED WATER	MGAL	100	\$	\$
11	4020-A-1	STORM SEWER, TRENCHED, RCP, 15-INCH	LF	76	\$	\$
12	4020-A-1	STORM SEWER, TRENCHED, RCP, 18-INCH	LF	72	\$	\$
13	4030-B	PIPE APRON, RCP, 15-INCH	EA	1	\$	\$
14	4030-B	PIPE APRON, RCP, 18-INCH	EA	1	\$	\$
15	4030-C	FOOTING FOR CONCRETE PIPE APRON, RCP, 15-INCH	EA	1	\$	\$
16	4030-C	FOOTING FOR CONCRETE PIPE APRON, RCP, 18-INCH	EA	1	\$	\$
17	4030-D	PIPE APRON GUARD, 15-INCH	EA	1	\$	\$
18	4030-D	PIPE APRON GUARD, 18-INCH	EA	1	\$	\$

ITEM NO.	ITEM CODE	DESCRIPTION	UNIT	APPROX. QUANTITY	UNIT PRICE	AMOUNT
19	4040-A	SUBDRAIN, CASE D, TYPE 2, 6-INCH	LF	196	\$	\$
20	4040-C-1	SUBDRAIN CLEANOUT, TYPE A-2	EA	2	\$	\$
21	4040-C-1	SUBDRAIN CLEANOUT, TYPE B	EA	1	\$	\$
22	4040-D-1	SUBDRAIN OUTLET TO DITCH	EA	1	\$	\$
23	5010-E-1	WATER SERVICE PIPE, POLYETHYLENE CLASS 200, 1-INCH	LF	1,040	\$	\$
24	5010-E-1	WATER SERVICE PIPE, POLYETHYLENE CLASS 200, 2-INCH	LF	400	\$	\$
25	5010-E-3	WATER SERVICE CURB STOP AND BOX, 2-INCH	EA	2	\$	\$
26	5010-999-B	FROST FREE YARD HYDRANT	EA	17	\$	\$
27	5011-999-A	TESTING AND DISINFECTION, CONTRACTOR SUPPLIED WATER	MGAL	100	\$	\$
28	6010-A	SANITARY MANHOLE, SW-301, 60-INCH	EA	1	\$	\$
29	6010-A	STORM MANHOLE, SW-401, 48-INCH	EA	1	\$	\$
30	6010-B	INTAKE, SW-513, 48-INCH X 48-INCH	EA	1	\$	\$
31	6010-B	INTAKE, SW-513, OUTLET CONTROL STRUCTURE	EA	1	\$	\$
32	6010-F	INTAKE ADJUSTMENT, MAJOR	EA	2	\$	\$
33	6010-G	CONNECTION TO EXISTING MANHOLE	EA	1	\$	\$
34	6010-G	CONNECTION TO EXISTING INTAKE	EA	1	\$	\$
35	6010-999-A	YARD HYDRANT DRAIN POINT, GRADE ADJUSTING RING	EA	17	\$	\$
36	7010-A	PAVEMENT, PCC, 6-INCH, CLASS C	SY	5,873	\$	\$
37	7010-A	PAVEMENT, PCC, 6-INCH, CLASS C, AMENITY PAD	SY	268	\$	\$
38	7010-E	CURB AND GUTTER, DROP CURB, 3.5-FOOT WIDE, 6-INCH THICK	LF	165	\$	\$
39	7030-E	SIDEWALK, REINFORCED PCC, 6-INCH	SY	172	\$	\$
40	7040-I	CURB AND GUTTER REMOVAL, 3.5-FOOT WIDE	LF	165	\$	\$

ITEM NO.	ITEM CODE	DESCRIPTION	UNIT	APPROX. QUANTITY	UNIT PRICE	AMOUNT
41	8020-B	PAINTED PAVEMENT MARKINGS, WATERBORNE OR SOLVENT	LF	200	\$	\$
42	8020-G	PAINTED SYMBOLS AND LEGENDS, WATERBORNE OR SOLVENT	EA	1	\$	\$
43	8030-A	TEMPORARY TRAFFIC CONTROL	LS	1	\$	\$
44	8040-A	TRAFFIC SIGNS, TYPE A, 24-INCH X 24-INCH, R5-1 "DO NOT ENTER"	EA	1	\$	\$
45	8040-A	TRAFFIC SIGNS, TYPE A, 12-INCH X 18-INCH, R7-8 "RESERVED PARKING"	EA	1	\$	\$
46	8040-A	TRAFFIC SIGNS, TYPE A, 12-INCH X 6-INCH, R7-8AP "VAN ACCESSIBLE" PLAQUE	EA	1	\$	\$
47	8040-I	REMOVE AND REINSTALL TRAFFIC SIGNS	EA	1	\$	\$
48	9010-B	HYDRAULIC SEEDING, SEEDING, FERTILIZING, AND MULCHING, TYPE 1	AC	3	\$	\$
49	9010-B	HYDRAULIC SEEDING, SEEDING, FERTILIZING, AND MULCHING, TYPE 3	AC	0.25	\$	\$
50	9040-A-1	SWPPP PREPARATION	LS	1	\$	\$
51	9040-A-2	SWPPP MANAGEMENT	LS	1	\$	\$
52	9040-D-1	FILTER SOCK, 12-INCH	LF	209	\$	\$
53	9040-D-2	FILTER SOCK, REMOVAL	LF	209	\$	\$
54	9040-E	TEMPORARY RECP, 2.B	SY	736	\$	\$
55	9040-J	RIP RAP, CLASS E	TON	25	\$	\$
56	9040-N-1	SILT FENCE OR SILT FENCE DITCH CHECK	LF	1,500	\$	\$
57	9040-N-2	SILT FENCE OR SILT FENCE DITCH CHECK, REMOVAL OF SEDIMENT	LF	1,500	\$	\$
58	9040-N-3	SILT FENCE OR SILT FENCE DITCH CHECK, REMOVAL OF DEVICE	LF	1,500	\$	\$
59	9040-T-1	INLET PROTECTION DEVICE, CULVERT	EA	2	\$	\$
60	9040-T-1	INLET PROTECTION DEVICE, INTAKE SEDIMENT FILTER	EA	2	\$	\$
61	9040-T-2	INLET PROTECTION DEVICE, MAINTENANCE	EA	12	\$	\$

ITEM NO.	ITEM CODE	DESCRIPTION	UNIT	APPROX. QUANTITY	UNIT PRICE	AMOUNT
62	11020-A	MOBILIZATION	LS	1	\$	\$
63	11050-A	CONCRETE WASHOUT	LS	1	\$	\$
64	11999-X	PARKING BUMPER	EA	5	\$	\$
65	11999-X	ELECTRICAL SYSTEM	LS	1	\$	\$
66	11999-X	RESTROOM AND SHOWER HOUSE	LS	1	\$	\$
67	11999-X	SHELTER FOOTINGS	LS	1	\$	\$
68	11999-X	PLAYGROUND SITE PREPARATION	LS	1	\$	\$
69	12020-A	BOLLARD GUARD POST	EA	32	\$	\$
TOTAL AMOUNT BASE BID:						\$

TOTAL - BASE BID (Written Format):

NOTE: IT IS UNDERSTOOD THAT THE ABOVE QUANTITIES ARE ESTIMATED FOR THE PURPOSE OF THIS BID. ALL QUANTITIES ARE SUBJECT TO REVISION BY THE JURISDICTION AS NOTED IN SECTION 00500 - "CONTRACT" OF THIS PROJECT MANUAL.

Bidder Name

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SECTION 00420 - BID BOND

Worth County Conservation - Monarch RV Park Implementation
Worth County Conservation Board
Northwood, Iowa

KNOW ALL BY THESE PRESENTS:

That we, _____, as Principal, and
_____, as Surety, are held and firmly bound unto,
Worth County Conservation Board as Oblige, (hereinafter referred to as "the Jurisdiction"), in the penal sum of _____
_____ dollars (\$ _____), lawful money of the United States,
for which payment said Principal and Surety bind themselves, their heirs, executors, administrators, successors, and assigns
jointly and severally, firmly by these presents.

The condition of the above obligation is such that whereas the Principal has submitted to the Jurisdiction a certain proposal,
in a separate envelope, and hereby made a part hereof, to enter into a contract in writing, for the following project:

Project Title: Worth County Conservation - Monarch RV Park Implementation

Project Description: Worth County Conservation Board seeks to install a modern RV park in a new business subdivision south
of the Diamond Jo Casino in Northwood, Iowa. The project will include concrete drive approaches, campground roads,
campsites, and amenity pads. Each of the 16 campsites will have a granular utility band featuring a water connection, a
50/30/20-amp electrical pedestal, and a sanitary sewer connection. The project will include a pre-manufactured shower
house, a prefabricated shelter with concrete paving, and accommodation for an owner-provided playground.

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

In the event that any actions or proceedings are initiated with respect to this Bond, the parties agree that the venue thereof
shall be Worth County, State of Iowa. If legal action is required by the Jurisdiction against the Surety or Principal to enforce
the provisions of the bond or to collect the monetary obligation incurring to the benefit of the Jurisdiction, the Surety or
Principal agrees to pay the Jurisdiction all damages, costs, and attorney fees incurred by enforcing any of the provisions of
this Bond. All rights, powers, and remedies of the Jurisdiction hereunder shall be cumulative and not alternative and shall be
in addition to all rights, powers, and remedies given to the Jurisdiction, by law. The Jurisdiction may proceed against Surety
for any amount guaranteed hereunder whether action is brought against Principal or whether Principal is joined in any such
action or actions or not.

NOW, THEREFORE, if said proposal by the Principal be accepted, and the Principal shall enter into a contract with Jurisdiction
in accordance with the terms of such proposal, including the provision of insurance and of a bond as may be specified in the
contract documents, with good and sufficient surety for the faithful performance of such contract, for the prompt payment
of labor and material furnished in the prosecution thereof, and for the maintenance of said improvements as may be required
therein, then this obligation shall become null and void; otherwise, the Principal shall pay to the Jurisdiction the full amount
of the bid bond, together with court costs, attorney's fees, and any other expense of recovery.

Signed and sealed this ____ day of _____, 2026.

SURETY:

PRINCIPAL:

Surety Company

Bidder

By:

By:

Signature Attorney-in-Fact/Officer

Signature

Name of Attorney-in-Fact/Officer

Name (Print/Type)

Company Name

Title

Company Address

Address

City, State, Zip Code

City, State, Zip Code

Company Telephone Number

Telephone Number

Company E-Mail

E-Mail

NOTE: All signatures on this bid bond must be original signatures in ink; electronic, copies or facsimile of any signature will not be accepted. This bond must be sealed with the Surety's raised, embossing seal or official adhesive seal. The Certificate or Power of Attorney accompanying this bond must be valid on its face and sealed with the Surety's raised, embossing seal or official adhesive seal.

SECTION 00500 - CONTRACT

Worth County Conservation - Monarch RV Park Implementation
Worth County Conservation Board
Northwood, Iowa

THIS CONTRACT, made and entered into this _____ day of _____, 2026, by and between the Worth County Conservation Board hereinafter called the "Jurisdiction", and _____, hereinafter called the "Contractor".

WITNESSETH:

The Contractor hereby agrees to complete the work comprising the Worth County Conservation - Monarch RV Park Implementation as specified in the contract documents, which are officially on file with the Jurisdiction, in the office of the Director, Worth County Conservation Board, 503 1st Avenue North, Northwood, Iowa. This Contract includes all such contract documents. All work under this Contract shall be constructed in accordance with the SUDAS Standard Specifications, 2026 Edition and as further modified by the Special Provisions, Technical Specifications and Supplemental Specifications included in said contract documents and the Contract Attachment which is attached hereto. The Contractor further agrees to complete the work in strict accordance with said contract documents, and to guarantee the work as required by law for the time required in said contract documents after its acceptance by the Jurisdiction.

This Contract is awarded and executed for completion of the work specified in the contract documents for the bid prices shown on the Contract Attachment: Bid Items and Quantities which were proposed by the Contractor in its Proposal submitted in accordance with the Notice to Bidders and Notice of Public Hearing for the following project:

Project Title: Worth County Conservation - Monarch RV Park Implementation

Project Description: Worth County Conservation seeks to install a modern RV park in a new business subdivision south of the Diamond Jo Casino in Northwood, Iowa. The project will include concrete drive approaches, campground roads, campsites, and amenity pads. Each of the 16 campsites will have a granular utility band featuring a water connection, a 50/30/20-amp electrical pedestal, and a sanitary sewer connection. The project will include a pre-manufactured shower house, a prefabricated shelter with concrete paving, and accommodation for an owner-provided playground.

The Contractor agrees to perform said work for and in consideration of the Jurisdiction's payment of the bid amount of _____ dollars (\$_____), which amount shall constitute the required amount of the Performance, Payment and Maintenance Bond. The Contractor hereby agrees to commence work as stated in the written Notice to Proceed; and substantially complete the work in accordance with the following contract provisions:

CONTRACT PROVISIONS

- A. The work will be substantially completed on or before April 15, 2026, and completed and ready for final payment in accordance with General Conditions on or before May 1, 2026.
- B. Liquidated Damages
 1. Pay liquidated damages for noncompliance with said completion provisions in the amount of Three Hundred Dollars (\$300) for each calendar day the work remains incomplete.

C. Maintenance Bond & Warranty

1. To remedy any and all defects that may develop in or result from work to be performed under the Contract within the Worth County Conservation Board, from the date of acceptance of the work under the Contract, by reason of defects in workmanship or materials used in construction of said work.
2. Shall also guarantee the maintenance of the improvement caused by failures in materials and construction for a period of 2 year underground, 4 year paving years from and after acceptance of the work.

D. Bid Quantity Revisions

1. All quantities are estimates and subject to revision by the Jurisdiction.
2. Quantity changes that do not materially change the character of the work to be performed and amount to less than Twenty (20) percent of a given bid item or less than Five (5) percent of the total contract amount shall not affect the unit price bid.

IN WITNESS WHEREOF, the Parties hereto have executed this instrument, in triplicate on the date first shown written.

JURISDICTION: Worth County Conservation Board

CONTRACTOR:

By: _____
Terry Reese, Board Chair

Company Name

ATTEST:

Signature

By: _____
Jim Hanson, Director

Name (Print/Type)

Title

Street Address

City, State, Zip Code

Telephone

E-Mail

CONTRACTOR PUBLIC REGISTRATION INFORMATION to be Provided By:

1. All Contractors: The Contractor shall enter its Public Registration No. _____ issued by the Iowa Commissioner of Labor pursuant to Section 91C.5 of the Iowa Code.

2. Out-of-State Contractors:

A. Pursuant to Section 91C.7 of the Iowa Code, an out-of-state contractor, before commencing a contract in excess of five thousand dollars in value in Iowa, shall file a bond with the division of labor services of the department of workforce development. The Contractor should contact 515-242-5871 for further information. Prior to contract execution, the Jurisdictional Engineer may forward a copy of this contract to the Iowa Department of Workforce Development as notification of pending construction work. It is the Contractor's responsibility to comply with said Section 91C.7 before commencing this work.

B. Prior to entering into contract, the designated low bidder, if it is a corporation organized under the laws of a state other than Iowa, shall file with the Jurisdictional Engineer a certificate from the Secretary of the State of Iowa showing that it has complied with all the provisions of Chapter 490 of the Code of Iowa, as amended, governing foreign corporations. For further information contact the Iowa Secretary of State Office at 515-281-5204.

Bond No. _____

Name of Surety _____

NOTE: All signatures on this contract must be original signatures in ink; electronic, copies or facsimile of any signature will not be accepted.

CORPORATE ACKNOWLEDGMENT

State of _____)
) SS
_____ County)

On this _____ day of _____, 20_____, before me, the undersigned, a Notary Public in and for the State of _____, personally appeared _____ and _____, to me known, who, being by me duly sworn, did say that they are the _____, and _____, respectively, of the corporation executing the foregoing instrument; that (no seal has been procured by) (the seal affixed thereto is the seal of) the corporation; that said instrument was signed (and sealed) on behalf of the corporation by authority of the Board of Directors; that _____ and _____ acknowledged the execution of the instrument to be the voluntary act and deed of the corporation, by it and by them voluntarily executed.

Notary Public in and for the State of _____

My commission expires _____, 20_____

PARTNERSHIP ACKNOWLEDGMENT

State of _____)
) SS
_____ County)

On this _____ day of _____, 20_____, before me, the undersigned, a Notary Public in and for the State of _____, personally appeared _____ to me personally known, who being by me duly sworn, did say that the person is one of the partners of _____, a partnership, and that the instrument was signed on behalf of the partnership by authority of the partners and the partner acknowledged the execution of the instrument to be the voluntary act and deed of the partnership by it and by the partner voluntarily executed.

Notary Public in and for the State of _____
My commission expires _____, 20_____

INDIVIDUAL ACKNOWLEDGMENT

State of _____)
) SS
_____ County)

On this _____ day of _____, 20_____, before me, the undersigned, a Notary Public in and for the State of _____, personally appeared _____ and _____, to me known to be the identical person(s) named in and who executed the foregoing instrument, and acknowledged that (he) (she) (they) executed the instrument as (his) (her) (their) voluntary act and deed.

Notary Public in and for the State of _____
My commission expires _____, 20_____

LIMITED LIABILITY COMPANY ACKNOWLEDGMENT

State of _____)
) SS
_____ County)

On this _____ day of _____, 20_____, before me a Notary Public in and for said State, personally appeared _____, to me personally known, who being by me duly sworn did say that person is _____ of said _____, that (the seal affixed to said instrument is the seal of said _____ OR no seal has been procured by the said) _____, and that said instrument was signed and sealed on behalf of the said _____, by authority of its managers and the said _____ acknowledged the execution of said instrument to be the voluntary act and deed of said _____, by it voluntarily executed.

Notary Public in and for the State of _____
My commission expires _____, 20_____

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SECTION 00610 - PERFORMANCE, PAYMENT AND MAINTENANCE BOND

Worth County Conservation - Monarch RV Park Implementation
Worth County Conservation Board
Northwood, Iowa

KNOW ALL BY THESE PRESENTS:

That we, _____, as Principal (hereinafter the "Contractor" or "Principal") and _____, as Surety are held and firmly bound unto _____, as Oblige (hereinafter referred to as "the Jurisdiction"), and to all persons who may be injured by any breach of any of the conditions of this Bond in the penal sum of _____ DOLLARS (\$_____), lawful money of the United States, for the payment of which sum, well and truly to be made, we bind ourselves, our heirs, legal representatives and assigns, jointly or severally, firmly by these presents.

The conditions of the above obligations are such that whereas said Contractor entered into a contract with the Jurisdiction, bearing date the _____ day of _____, 2026, hereinafter the "Contract" wherein said Contractor undertakes and agrees to construct the Worth County Conservation - Monarch RV Park Implementation, Northwood, Iowa.

Project Description: Worth County Conservation seeks to install a modern RV park in a new business subdivision south of the Diamond Jo Casino in Northwood, Iowa. The project will include concrete drive approaches, campground roads, campsites, and amenity pads. Each of the 16 campsites will have a granular utility band featuring a water connection, a 50/30/20-amp electrical pedestal, and a sanitary sewer connection. The project will include a pre-manufactured shower house, a prefabricated shelter with concrete paving, and accommodation for an owner-provided playground.

And to faithfully perform all the terms and requirements of said Contract within the time therein specified, in a good and workmanlike manner, and in accordance with the Contract documents. Provided, however, that one year after the date of acceptance as complete of the work under the above referenced Contract, the maintenance portion of this Bond shall continue in force for the stated maintenance period.

It is expressly understood and agreed by the Contractor and Surety in this Bond that the following provisions are a part of this Bond and are binding upon said Contractor and Surety, to-wit:

PERFORMANCE: The Contractor shall well and faithfully observe, perform, fulfill, and abide by each and every covenant, condition, and part of said Contract and Contract Documents, by reference made a part hereof, for the above referenced improvements and shall indemnify and save harmless the Jurisdiction from all outlay and expense incurred by the Jurisdiction by reason of the Contractor's default of failure to perform as required. The Contractor shall also be responsible for the default or failure to perform as required under the Contract and Contract Documents by all its subcontractors, suppliers, agents, or employees furnishing materials or providing labor in the performance of the Contract.

PAYMENT: The Contractor and the Surety on this Bond are hereby agreed to pay all just claims submitted by persons, firms, subcontractors, and corporations furnishing materials for or performing labor in the performance of the Contract on account of which this Bond is given, including but not limited to claims for all amounts due for labor, materials, lubricants, oil, gasoline, repairs on machinery, equipment and tools, consumed or used by the Contractor or any subcontractor, wherein the same are not satisfied out of the portion of the contract price which the Jurisdiction is required to retain until completion of the improvement, but the Contractor and Surety shall not be liable to said persons, firms, or corporations unless the claims of said claimants against said portion of the contract price shall have been established as provided by law. The Contractor and Surety hereby bind themselves to the obligations and conditions set forth in Chapter 573, Code of Iowa, which by this reference is made a part hereof as though fully set out herein.

MAINTENANCE: The Contractor and the Surety on this Bond hereby agree, at their own expense:

To remedy any and all defects that may develop in or result from work to be performed under the Contract as detailed in Section 00500 - Contract, from the date of acceptance of the work under the Contract, by reason of defects in workmanship or materials used in construction of said work;

To keep all work in continuous good repair; and

To pay the Jurisdiction's reasonable costs of monitoring and inspection to assure that any defects are remedied and to repay the Jurisdiction all outlay and expense incurred as a result of Contractor's and Surety's failure to remedy any defect as required by this section.

Maintenance Bond requirements shall not apply to the following: work that is not permanently incorporated into the project; pavement markings, seeding, sodding, and plant material and planting.

Contractor's and Surety's agreement herein made extends to defects in workmanship or materials not discovered or known to the Jurisdiction at the time such work was accepted.

GENERAL: Every Surety on this Bond shall be deemed and held bound, any contract to the contrary notwithstanding, to the following provisions:

To consent without notice to any extension of time to the Contractor in which to perform the Contract;

To consent without notice to any change in the Contract or Contract Documents, which thereby increases the total contract price and the penal sum of this Bond, provided that all such changes do not, in the aggregate, involve an increase of more than twenty percent of the total contract price, and that this Bond shall then be released as to such excess increase; and

To consent without notice that this Bond shall remain in full force and effect until the Contract is completed, whether completed within the specified contract period, within an extension thereof, or within a period of time after the contract period has elapsed and the liquidated damage penalty is being charged against the Contractor.

The Contractor and every Surety on the Bond shall be deemed and held bound, any contract to the contrary notwithstanding, to the following provisions:

That no provision of this Bond or of any other contract shall be valid which limits to less than five years after the acceptance of the work under the Contract the right to sue on this Bond.

That as used herein, the phrase "all outlay and expense" is not to be limited in any way, but shall include the actual and reasonable costs and expenses incurred by the Jurisdiction including interest, benefits and overhead where applicable. Accordingly, "all outlay and expense" would include but not be limited to all contract or employee expense, all equipment usage or rental, materials, testing, outside experts, attorney's fees (including overhead expenses of the Jurisdiction's staff attorneys), and all costs and expenses of litigation as they are incurred by the Jurisdiction. It is intended the Contractor and Surety will defend and indemnify the Jurisdiction on all claims made against the Jurisdiction on account of Contractor's failure to perform as required in the Contract and Contract Documents, that all agreements and promises set forth in the Contract and Contract Documents, in approved change orders, and in this Bond will be fulfilled, and that the Jurisdiction will be fully indemnified so that it will be put into the position it would have been in had the Contract been performed in the first instance as required.

In the event the Jurisdiction incurs any "outlay and expense" in defending itself with respect to any claim as to which the Contractor or Surety should have provided the defense, or in the enforcement of the promises given by the Contractor in the Contract, Contract Documents, or approved change orders, or in the enforcement of the promises given by the Contractor and Surety in this Bond, the Contractor and Surety agree that they will make the Jurisdiction whole for all such outlay and expense, provided that the Surety's obligation under this Bond shall not exceed 125% of the penal sum of this Bond.

In the event that any actions or proceedings are initiated with respect to this Bond, the parties agree that the venue thereof shall be Worth County, State of Iowa. If legal action is required by the Jurisdiction to enforce the provisions of this Bond or to collect the monetary obligation incurring to the benefit of the Jurisdiction, the Contractor and the Surety agree, jointly and severally, to pay the Jurisdiction all outlay and expense incurred therefor by the Jurisdiction. All rights, powers, and remedies of the Jurisdiction hereunder shall be cumulative and not alternative and shall be in addition to all rights, powers and remedies given to the Jurisdiction, by law. The Jurisdiction may proceed against surety for any amount guaranteed hereunder whether action is brought against the Contractor or whether Contractor is joined in any such action(s).

NOW THEREFORE, the condition of this obligation is such that if said Principal shall faithfully perform all the promises of the Principal, as set forth and provided in the Contract, in the Contract Documents, and in this Bond, then this obligation shall be null and void, otherwise it shall remain in full force and effect.

When a work, term, or phrase is used in this Bond, it shall be interpreted or construed first as defined in this Bond, the Contract, or the Contract Documents; second, if not defined in the Bond, Contract, or Contract Documents, it shall be interpreted or construed as defined in applicable provisions of the Iowa Code; third, if not defined in the Iowa Code, it shall be interpreted or construed according to its generally accepted meaning in the construction industry; and fourth, if it has no generally accepted meaning in the construction industry, it shall be interpreted or construed according to its common or customary usage.

Failure to specify or particularize shall not exclude terms or provisions not mentioned and shall not limit liability hereunder. The Contract and Contract Documents are hereby made a part of this Bond.

(CON'T – PERFORMANCE, PAYMENT AND MAINTENANCE BOND)

Witness our hands, in triplicate, this _____ day of _____, 2026.

SURETY:

PRINCIPAL:

Surety Company

By: _____
Signature of Attorney-in-Fact/Officer

Name of Attorney-in-Fact/Officer

Company Name

Company Address

City, State, Zip Code

Company Telephone Number

Company E-Mail

Bidder

By: _____
Signature

Name (Print/Type)

Title

Address

City, State, Zip Code

Telephone Number

E-Mail

NOTE:

1. All signatures on this Performance, Maintenance & Payment Bond must be original signatures in ink; electronic, copies, or facsimile of any signature will not be accepted.
2. This Bond must be sealed with the Surety's raised, embossing seal or official adhesive seal.
3. The Certificate or Power of Attorney accompanying this Bond must be valid on its face and sealed with the Surety's raised, embossing seal or official adhesive seal.
4. The name and signature of the Surety's Attorney-in-Fact/Officer entered on this Bond must be exactly as listed on the Certificate or Power of Attorney accompanying this Bond.

SECTION 00800 - SPECIAL PROVISIONS

FOR

Worth County Conservation - Monarch RV Park Implementation
Worth County Conservation Board
Northwood, Iowa

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1) CONTRACT PROVISIONS

a) Completion Date

- i) All work under the Contract must be completed as detailed in Section 00500 – Contract.

b) Liquidated Damage

- i) Damages in the amount as detailed in Section 00500 – Contract will be assessed for each calendar or working day the work remains incomplete.

c) Maintenance Bond & Warranty

- i) To remedy any and all defects as detailed in Section 00500 – Contract.

d) Bid Quantity Revisions

- i) All quantities are estimates and subject to revision by the Jurisdiction.
- ii) Quantity changes that do not materially change the character of the work to be performed and amount to less than Twenty (20) percent of a given bid item or less than Five (5) percent of the total contract amount shall not affect the unit price bid.

2) DEFINITION AND INTENT

a) The Specifications that apply to the materials and construction practices for this project are defined as follows:

- i) The 2026 Edition of the SUDAS Standard Specifications, except as modified by these Special Provisions to the Technical Specifications.
- b) Omissions of words or phrases such as “the Contractor shall”, “in accordance with”, “shall be”, “as noted on the Plans”, “according to the Plans”, “a”, “an”, “the” and “all” are unintentional; supply omitted words or phrases by inference.
- c) “Final Acceptance” and “Final Completion” shall mean final approval of the project as defined in SUDAS 1090, 1.08, C.
- d) “Owner”, “Jurisdiction” and “City” shall mean the Worth County Conservation, acting through the Board.
- e) “Person” shall mean any individual, partnership, limited partnership, joint venture, society, association, joint stock company, corporation, limited liability company, estate, receiver, trustee, assignee, or referee, whether appointed by a court or otherwise, and any combination of individuals.
- f) “Engineer” shall mean the Engineer of Record.
- g) The intent of the Technical Specifications is to describe the construction desired, performance requirements, and standards of materials and construction.
- h) “Standard Drawings” shall mean the Figures bound within the SUDAS Standard Specifications and/or the Typical Drawings bound within the Plans.
- i) “Substantial Completion” shall be as defined by the Iowa Administrative Code Chapter 573.28.
- j) “Work” shall mean the work to be done and the equipment, supplies, and materials to be furnished under the Contract unless some other meaning is indicated by the context.
- k) “Or equal” shall follow manufacturers names used to establish standards and, if not stated, is implied.
- l) Engineer: Bolton & Menk, Inc., 430 East Grand Avenue, Suite 101, Des Moines, IA 50309.

3) GENERAL PROVISIONS AND COVENANTS

- a) Division 1 of the General Provisions and Covenants of the 2026 Edition SUDAS Standard Specifications is modified as follows:
- i) Section 1020.1.09B, Unit Price Attachment.

- (a) A computer-generated unit price attachment may be submitted by the Bidder as specified by this Section.
- ii) Section 1050, 1.05 - Shop Drawings, Certificates, and Equipment Lists
 - (a) Electronic submittal of shop drawings will be allowed.
 - (b) If hardcopy submittals are used, the Contractor shall submit a minimum of three (3) copies plus any additional required by the Contractor.
- iii) Section 1050, 1.15 – Additional Contractor Responsibilities
 - (a) No Changes.
- 4) WORK REQUIRED
 - a) Work under this Contract includes all materials, equipment, transportation, traffic control, and associated work for the construction of the Worth County Conservation - Monarch RV Park Implementation as described in the Official Publication.
- 5) PLANS AND SPECIFICATIONS
 - a) The Jurisdiction will furnish five (5) sets of plans and specifications to the Contractor after award of the Contract. The Contractor shall compensate the Jurisdiction for printing costs for additional copies required.
 - b) Contractor shall provide one set of plans and specifications for each foreman and superintendent in charge of each crew on the job.
- 6) SUBMITTALS
 - a) Contractor shall provide a construction schedule showing dates of starting and completing various portions of work. Schedule shall be updated as needed or as requested by Engineer due to changes in progress of construction from original schedule. Updates shall be completed within one week of request.
 - b) Contractor shall submit the following information for Engineer's review. Three (3) copies plus any additional copies required by Contractor shall be submitted to the Engineer at the preconstruction conference or at least 14 days prior to utilization of the particular item on this project.
 - i) Testing reports.
 - ii) Manufacturer's data for materials that are to be permanently incorporated into the project.
 - iii) Details of proposed methods of any special construction required.
 - iv) Purchase orders and subcontracts without prices.
 - v) Traffic control and staging plan.
 - vi) Such other information as the Engineer may request to ensure compliance with contract documents.
 - vii) List of Subcontractors and Suppliers.
- 7) STANDARDS AND CODES
 - a) Construct improvements with best present day construction practices and equipment.
 - b) Conform with and test in accordance with applicable sections of the following standards and codes.
 - i) American Association of State Highway and Transportation Officials (AASHTO).
 - ii) American Society for Testing and Materials (ASTM).
 - iii) Iowa Department of Transportation Standard Specifications (Iowa DOT).
 - iv) American National Standards Institute (ANSI).
 - v) American Water Works Association (AWWA).

- vi) American Welding Society (AWS).
- vii) Federal Specifications (FS).
- viii) Iowa Occupational Safety and Health Act of 1972 (IOSHA).
- ix) Manual of Accident Prevention in Construction by Associated General Contractors of America, Inc. (AGC).
- x) Standards and Codes of the State of Iowa and the ordinances of the Jurisdiction.
- xi) Other standards and codes which may be applicable to acceptable standards of the industry for equipment, materials and installation under the Contract.

8) EMPLOYMENT PRACTICES

- a) Neither the Contractor nor the Contractor's subcontractors shall employ any person whose physical or mental condition is such that their employment will endanger the health and safety of anyone employed on the Project.
- b) The Contractor shall not commit any of the following employment practices and agrees to include the following clauses in any subcontracts:
 - i) To discharge from employment or refuse to hire any individual because of sex, race, color, religion, national origin, sexual orientation, marital status, age, or disability unless such disability is related to job performance of such person or employee.
 - ii) To discriminate against any individual in terms, conditions, or privileges or employment because of sex, race, color, religion, national origin, sexual orientation, marital status, age, or disability unless such disability is related to job performance of such person or employee.

9) RESPONSIBILITY OF CONTRACTOR

- a) Contractor shall provide supervision of the work.
- b) Contractor shall provide protection of all property from injury or loss resulting from construction operations.
- c) Contractor shall replace or repair objects sustaining any such damage, injury, or loss, to the satisfaction of the Jurisdiction and Engineer.
- d) Contractor shall cooperate with Jurisdiction, Engineer, and representatives of utilities in locating underground utility lines and structures. Incorrect, inaccurate, or inadequate information concerning location of utilities or structures shall not relieve the Contractor of responsibility for damage thereto caused by construction operations.
- e) Contractor shall keep cleanup current with construction operations.
- f) Contractor shall comply with all Federal, State of Iowa, and local laws and ordinances.

10) WORK HOURS/COMMUNITY EVENTS

- a) The Contractor will be required to limit work hours on the Project from 7:00 a.m. to 7:00 p.m., Monday through Saturday, unless otherwise directed by the Engineer.
- b) The following Community Events are scheduled. Contractor is required to coordinate with the Jurisdiction as needed to allow use of public property as necessary for the event(s). If Contract continues for multiple years, event is still in force even though dates and locations may change.
 - i) None.

11) CONSTRUCTION FACILITIES

- a) Contractor shall provide telephone numbers where Contractor's representative can be reached during work days and on nights and weekends in event of emergency.
- b) Contractor shall provide and maintain suitable sanitary facilities for construction personnel for duration of work; remove upon completion of work.
- c) Contractor shall not store construction equipment, employee vehicles, or materials on streets open to traffic.

- d) Contractor shall provide suitable storage facilities necessary for proper storage of materials and equipment. Location for storage of equipment by Contractor is subject to approval of the Engineer.
- e) Contractor will be required to make arrangements for all services required during the construction period and pay for such services at no additional cost to the Jurisdiction.

12) PROJECT SUPERVISION

- a) The Contractor shall be represented in person at the construction site at all times that construction operations are proceeding. Representation constitutes a qualified superintendent or other designated, qualified representative capable of providing adequate supervision. The representative must be duly authorized to receive and execute instructions, notices, and written orders from the Engineer.
- b) Resolution of issues that arise during construction relating to traffic control, construction staging, etc. is the responsibility of the Contractor.
- c) Weekly progress meetings, if specified at the preconstruction conference, may be held at the project site to review project schedules, coordinate activities, resolve conflicts, and coordinate the construction work. The day and time for this meeting will be set at the preconstruction conference. The Contractor shall provide qualified representation at each meeting.
- d) Refer to Division 1 – General Provisions and Covenants, Section 1080 – Contractual Provisions, Part 1 – Prosecution and Progress of the Work, Section 1.10 Contractors Employees, Methods and Equipment for additional requirements.
- e) Contractor shall provide supervision of all sub-contractors and their personnel while on the site.

13) COORDINATION WITH OTHERS

- a) Contractor shall cooperate and coordinate construction with the Jurisdiction, utility companies, affected property owners, and other contractors working in the vicinity of this project.
- b) It is the Contractor's responsibility to schedule and coordinate work to minimize construction delays and conflicts.
- c) Contractor shall cooperate and coordinate with property owners prior to beginning work that will affect their parcel.

14) CONSTRUCTION GENERAL

- a) Procedures outlined herein are not intended to fully cover all special construction procedures but are offered as an aid to the Contractor in planning work.
- b) Contractor shall cooperate with the City of Northwood, Iowa and Worth County to minimize inconvenience to property owners, other jurisdictions and motorists and to prevent delays in construction and interruption to continuous operation of utility services and site access.
- c) The Contractor is expected to provide adequate personnel and equipment to perform work within the specified time of construction.
- d) Contractor shall install and maintain orange safety fence around all open trenches or open structures when left unattended.
- e) Contractor shall complete surface restoration and cleanup activities as construction progresses.

15) CONSTRUCTION LIMITS

- a) Contractor shall confine the construction operations within the construction limits shown on the plans.
- b) Contractor shall not store equipment, vehicles, or materials within the right-of-way of any streets open to traffic or on temporary access roads at any time.
- c) Areas disturbed outside of construction limits shall be restored at the contractor's expense to the satisfaction of the Jurisdiction.
- d) Contractor shall protect trees, fences and landscaping within the construction limits not marked for removal.

- e) All work on this project will be within City Right-of-Way, Easements or Public Property.

16) CONSTRUCTION SCHEDULE

- a) The Contractor will prepare and submit to the Engineer a project schedule that will assure the completion of the project within the time specified within the Contract.
- b) Adequate equipment and forces shall be made available by the Contractor to start work immediately upon receipt of the Notice to Proceed.
- c) Contractor shall submit a construction schedule at the preconstruction conference.
- d) Contractor shall periodically update the construction schedule as needed due to changes in progress of construction from the original schedule or as requested by the Engineer. Updates shall be completed within one week of request.
- e) The Contractor shall be required to meet the final completion date as specified in Section 00500 – Contract.
- f) Contractor shall notify the Jurisdiction and property owners at least 48 hours prior to any street closures.
 - i) Notification shall be provided by written notice placed on the front door. The following items shall be included within the notice:
 - (a) The street name, location and proposed date of street closure.
 - (b) The estimated schedule for completion of work.
 - (c) The estimated date for reopening of the street.
 - (d) Procedure for garbage collection recycling and postal service.

17) CONSTRUCTION PHASING

- a) Contractor shall refer to construction staging and traffic control plans when included in construction plans.
- b) Contractor shall include construction phasing on the required construction schedule submittal.

18) CONSTRUCTION STAKING

- a) Unless otherwise specified in the specific sections, Jurisdiction shall provide engineering surveys to establish reference points for construction as follows:
 - i) Storm Sewer: Staking will be furnished and set by the Engineer at 50.0-foot spacing (usually offset for construction) for the control of the underground construction herein described. Cuts to the proposed pipeline grade will be furnished by the Engineer. Manholes and catch basins will be staked with an offset and a witness with a cut to the lowest structure invert.
 - ii) Watermain: The staking interval for watermain shall be 25.0-feet. Cuts to the proposed pipeline grade will be furnished by the Engineer. Location staking shall be provided for valves and fittings. Hydrants will be staked with an offset and a witness with a cut to the ground elevation at the hydrant. The Engineer will provide horizontal and vertical control points on the project's datum.
 - iii) Street Grading, Form Grade and Top of Curb: A control line (usually offset from the curb line) with cuts and fills to proposed grade at 50.0-foot spacing on tangents, and 25.0-foot spacing on horizontal or vertical curves, shall be furnished and set on both sides for control of the construction herein described.
 - iv) Concrete Paving: Control lines for paving forms or stringline control with cuts and fills to proposed finished grade at 25.0 or 50.0-foot stations shall be furnished and set by the Engineer for control of the concrete construction herein described. The offset and actual form or stringline locations shall be in accordance with the paver manufacturer's recommendations and the approved paving strategy as determined at the preconstruction conference.
- b) The Engineer will provide stakes indicating the right of way and/or temporary easement construction limits.
- c) Contractor is responsible to have all areas where stakes need to be set to be clear of debris. The Contractor needs to also provide a clear line of sight for staking.

- d) The Contractor shall submit staking requests a minimum of two (2) working days, excluding Saturdays, Sundays and legal holidays, prior to the date requested stakes are needed on the project. Staking requests submitted after 2pm shall be recorded as being received the next business day.
- e) The stakes are an integral part of the project and the Contractor shall protect and preserve all such stakes and marks and will be charged with the expense of resetting all such stakes and marks destroyed or disturbed due to the Contractor's carelessness or negligence. Stakes that are destroyed due to vandalism, erosion or other incidents shall be re-staked by the Engineer and will not be at the Contractor's expense.
- f) In the event of apparent or questionable errors or inconsistencies in such stakes set for control of line and/or grade, the Contractor shall promptly notify the Engineer of such error or inconsistency and shall not proceed with the work until such stake, grade or mark shall have been verified or corrected by the Engineer.
- g) The Engineer will mark the existing boundary monuments prior to construction. The Contractor is responsible for protecting the monuments during construction. If monuments are removed, the Engineer will reset them post construction at the Contractor's expense.
- h) All other line and grade staking shall be the responsibility of the Contractor. The Contractor shall furnish sufficient equipment and personnel for determination of plan grades, cross sections, course thicknesses, etc. The survey cost of establishing stakes requested by the Contractor for the convenience of the Contractor, beyond those cited as basic project control, will be charged to the Contractor, or withheld from the amounts due to the Contractor.

19) CONSTRUCTION SURVEY DOCUMENTATION & RESPONSIBILITIES OF ENGINEER AND CONTRACTOR

- a) The Contractor shall maintain at the construction site one complete set of drawings suitably marked to show all deviations from the original set of drawings and other information as specified. Supplementary sketches shall be included, if necessary, to clearly indicate all work as constructed.
- b) All manholes and valves shall be located with tie-off dimensions to known items on the plans or in the field to enable the Contractor or City personnel to locate these structures for adjustment.
- c) Survey work documentation shall be a combination of digital and hard copy format and is the property of the Engineer.
- d) Tie-ins with existing pavements and utilities shall be verified for correctness of alignment and elevation prior to construction staking. Any discrepancies discovered during this verification process will be brought to the attention of the Engineer for review and assistance with resolution prior to staking.
- e) When survey work is done under traffic conditions, the traffic control shall be in place prior to commencement of survey work.
- f) The Engineer will have a representative at the preconstruction conference to discuss construction staking.
- g) The Jurisdiction and Engineer will not be responsible for delays due to lack of grade or line stakes unless the Contractor has given the Engineer a 48 hour, working day, notice that such stakes will be needed and the Contractor's work is being conducted in a satisfactory manner and at the specified rate of progress.

20) MATERIALS TESTS

- a) Testing shall follow the requirements of the SUDAS Standards Specifications. Contractor specified testing shall be completed by an independent testing laboratory retained by the Contractor and approved by the Engineer. Required testing not specified as Contractor or Supplier responsibility will be completed by an independent testing laboratory retained by the Jurisdiction or the Engineer.
- b) The Contractor shall coordinate all material testing with the Engineer.
- c) The Contractor shall not deliver materials to the project site until laboratory tests and/or certifications have been furnished which verify compliance of materials with specifications.
- d) Contractor shall provide gradation and materials certifications for all granular materials. Certify that sources of Portland Cement and aggregate sources are Iowa DOT approved.

21) SOIL BORINGS

- a) Not available.

22) EXISTING UTILITIES

- a) Location of utility lines, mains, cables and appurtenances shown on plans are from information provided by utility companies and records of the Jurisdiction.
- b) Prior to construction, Contractor shall contact all utility companies and have all utility lines and services located. The Contractor is responsible for excavating and exposing underground utilities in order to confirm their locations ahead of the work.
- c) The Contractor is solely responsible for damage to utilities or private or public property due to utility disruption.
- d) The Contractor shall notify utility companies immediately if utility infrastructure is damaged during construction.
- e) The Contractor shall support and protect all utilities that are not moved.
- f) Utility services are not generally shown on plans; protect and maintain services during construction. Notify Jurisdiction and affected property Jurisdictions 48 hours prior to any planned utility service interruptions.
- g) If private utility work occurs within/adjacent to the site during the construction period, Contractor shall coordinate work schedules with the Engineer.
- h) Existing utilities shall remain in substantially continuous operation during construction. Contractor shall select the order and methods of construction that will not interfere with the operation of the utility systems. Interrupt utility services only with approval of Jurisdiction and Engineer.
- i) No claims for additional compensation or time extensions will be allowed to the Contractor for interference or delay caused by utility companies.

23) SALVAGE OF MATERIALS / DISPOSAL

- a) The Contractor shall remove from the project site and dispose of trees, shrubs, vegetation, excess soil excavation, rubbish, concrete, granular materials and other materials encountered as shown on plans and as specified. Excess soil excavation not designated for waste locations shall be disposed of as directed by the Engineer.
- b) The Contractor shall dispose of materials in accordance with applicable laws and ordinances. Disposal sites are subject to the review and approval of the Engineer.
- c) Burning of brush and other debris is not permitted. Contractor is responsible for selecting disposal location off site.
- d) The Contractor shall dispose of broken concrete, asphalt, granular material, rubble and excess or unsuitable excavated material. Contractor is responsible for selecting disposal location off site.
- e) The Contractor shall cooperate with all applicable City, State and Federal agencies concerning disposal of materials.
- f) The Contractor shall carefully remove, in a manner to prevent damage, all materials and equipment specified or indicated as salvage. The Contractor shall protect and store items specified.
- g) Any items damaged in removal, storage or handling through carelessness or improper procedures shall be replaced by the Contractor in kind with new items.

24) TRAFFIC CONTROL

- a) The Contractor shall provide sufficient surveillance of the traffic control devices to ensure compliance during the entire construction period. The Contractor shall furnish names, addresses, and phone numbers of at least two (2) local individuals capable of immediate response who will be responsible for the site security and traffic control devices to:
 - i) The Engineer;
 - ii) The Jurisdiction; and
 - iii) Local Law Enforcement Agencies.

- b) The Contractor shall schedule the work to cooperate fully with business property owners and occupants abutting the project to minimize the time of restricted access to their property during the construction period.
- c) The Contractor shall notify the City and property owners at least 48 hours prior to any street closures.
 - i) Notification shall be provided by written notice delivered to the business. The following items shall be included within the notice:
 - (1) The street name, location and proposed date of street closure;
 - (2) The estimated schedule for completion of work;
 - (3) The estimated date for reopening of the street; and
 - (4) Procedure for garbage collection/recycling and postal service.
 - ii) Contractor shall accommodate and maintain safe access to homes for property owners. Access to homes shall be considered incidental to the project.
- d) The cost of maintaining vehicular and pedestrian traffic on temporary surfaced drives and walkways, including the eventual removal of the temporary surfacing material, shall be considered incidental to traffic control.
- e) In the event that any of the above right-of-way require traffic to be detoured around the construction zone, the Contractor shall prepare the detour route with the appropriate Agency representatives. The Contractor shall provide and maintain all signing and other traffic control required. The affected Agency shall be notified by the Contractor before re-routing traffic. Dust control and road maintenance of the by-pass route shall be the Contractor's responsibility.
- f) Contractor shall furnish, erect and maintain traffic control devices as specified in the construction drawings and directed by the Engineer including signs, barrels, cones and barricades to direct traffic and separate traffic from work areas. Traffic control shall be in place prior to the closing of any streets.
- g) Contractor shall provide traffic control devices in accordance with the Iowa DOT Standard Specification, Section 2528, Traffic Control, and the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD).
- h) Adjustments to the traffic control or the addition of flaggers will be required if, in the opinion of the Engineer, undue traffic congestion occurs.
- i) Contractor shall provide continuous access for police, fire and other emergency vehicles.
- j) Contractor shall notify the Engineer in writing at least 72 hours prior to the start of any construction operation that will necessitate land closure or internal traffic control signing.

25) TEMPORARY FENCES

- a) Contractor shall install temporary fencing around open excavations or material storage areas and as directed by Engineer to prevent access of unauthorized persons to construction areas.
- b) Contractor shall provide orange plastic mesh safety fence with a nominal height of 48". Support fence securely on driven posts in vertical position without sagging.
 - i) Refer to Iowa DOT Section 4188.03 for fence materials.
- c) Temporary fencing installed around open excavations or material storage areas is incidental to construction and will not be measured for payment.
- d) Contractor shall remove temporary fencing upon completion of construction.

26) EROSION CONTROL (NPDES Permit)

- a) If Contractor fails to install and/or perform the appropriate erosion and sediment control practices, as determined by the Engineer, the Engineer may issue a written order to the Contractor. Failure to perform this work within 72 hours of notification of non-compliance may result in the Jurisdiction or Engineer arranging for completion of the work by others. A contract deduction may be made equal to the total of all costs to perform such work so arranged, including but not limited to, labor, materials, equipment and administrative costs.

- b) It shall be the Contractor's responsibility to update the Erosion Control Plan during construction and have the plan available on site at all times.
- c) Contractor is responsible for preparing the SWPPP to match staging, phasing and construction methods as work progresses. Contractor shall comply with the erosion control requirements of said plan, the Iowa Code and local ordinances. Protect against erosion and dust pollution on this project site and any off-site deposit or borrow area used for this project.
- d) The Contractor will publish the necessary notification for the NPDES permit prior to the start of construction. The Contractor shall obtain an NPDES permit from the Iowa DNR for the area within the limits of this project based on the Pollution Prevention Plan. It shall be the Contractor's responsibility to update the plan during construction and have the plan available on site at all times.
- e) The Contractor shall protect adjoining property (including public sanitary/storm sewer systems and streets) from any damage resulting from movement of earth or other debris from the project site. Any damage shall be repaired immediately.
- f) Contractor shall prevent the accumulation of earth or debris on adjoining public or private property. Contractor shall remove any accumulation of earth or debris immediately and prevent the repetition of any instance where earth or debris moves from the project site to adjoining public or private property.
- g) Contractor shall provide erosion control measures necessary to protect against siltation and erosion from the flow of storm water. Maintain continuous operation of the storm sewer system throughout the construction period.
- h) Contractor shall use silt fence and similar Best Management Practices (BMP) at all drainage courses, swales and storm sewer system inlets/outlets to protect against siltation and erosion as shown in the construction drawings or as directed by the Engineer.
- i) Erosion protection measures, other than those specified as unit price pay items, are incidental.
- j) The Contractor will be fully liable for all damages to public and private property caused by their action or inaction in providing for handling of storm water flow during construction.
- k) As construction progresses, stabilization is required in those segments of the corridor that become available to do so. The Contractor shall not wait until all grading and paving operations are completed before commencing final surface restoration.
- l) The Contractor shall anticipate multiple mobilizations to complete finish grading operations in surface restoration areas.

27) DEWATERING

- a) Contractor shall perform all construction work in dry conditions.
- b) Unless specified in the Bid Items, all costs associated with dewatering activities shall be incidental to the project.
- c) Contractor shall submit dewatering methods to the Engineer for review. Obtain the Engineer's approval on methods prior to construction.
- d) Groundwater levels are subject to variation. No additional compensation will be permitted due to high groundwater conditions.
- e) Should cohesive soils with no wet sand seams or layers be encountered, it may be possible to control water seepage by draining groundwater to temporary construction sumps and pumping it outside the perimeter of the excavation.
- f) The Contractor shall not pump water from open excavation in sand and gravel below the natural ground water level.
- g) Contractor shall maintain water levels 2 feet or more below the bottom of excavations in saturated cohesionless (sand and/or gravel) soils to prevent upward seepage, which could reduce subgrade support.
 - i) A dewatering system (well points or shallow wells) shall be installed when working in cohesionless soils.
 - ii) Costs of installing and operating dewatering system are incidental, unless specified otherwise.

- h) Contractor shall provide means for conveying surface water encountered during construction.
 - i) Surface water shall be prevented from flowing into excavation and accumulated water shall be removed.
 - ii) Surface water and storm sewer flows shall be diverted around areas of construction.
 - iii) Sanitary sewers shall not be used for the disposal of dewatering or trench water.
- i) Contractor shall backfill pipe and structures prior to stopping dewatering operations. Contractor shall not lay pipe or construct concrete structures on excessively wet soils.
- j) Costs of conveying both surface water and groundwater are incidental.

28) READY MIX CONCRETE USED ON PAVING PROJECTS

- a) Contractor will be required to provide plant/truck batch tickets as detailed in the Iowa DOT Construction Manual, Chapter 9, Section 9.03.
- b) Contractor shall be required to provide a batch ticket for each delivered load to the Engineer or their field staff at the time of delivery on site.

29) INCIDENTAL CONTRACT ITEMS

- a) The furnishing and installing of specific items and/or the performance of work under certain circumstances shall not be individually paid in the absence of a specific bid item for the work. These costs shall be included in the Unit Price Bid for the individual items associated with the stated specific item or work effort. Such items of work include, but are not limited to:

- Concrete header removal
- Connections to existing storm sewer structures and pipes unless specified for separate payment
- Construction and removal of temporary access roads
- Construction fencing
- Construction staging and phasing
- Coordination and cooperation with affected property owners
- Coordination and cooperation with the Worth County Conservation Board
- Coordination and cooperation with other contractors
- Coordination and cooperation with other projects in the area
- Coordination and cooperation with utility companies
- Dewatering and handling storm water flow during construction
- Dust control measures
- Engineering fabric
- Excavation, verification and protection of existing utilities
- Field and wood fence removal
- Field testing
- Finish grading
- Full depth saw-cutting of existing pavement
- Grading for storm sewer outlets
- Granular backfill and bedding for storm and sanitary sewer installation
- Granular surfacing removal
- Maintenance and watering for seeding and sodding
- Maintenance of erosion control measures, including silt removal
- Material testing
- Monitoring weather conditions
- Mowing
- Overhaul
- Pipe and structure bedding material
- Porous backfill for subdrain
- Proof rolling

Protection of existing hydrant(s) and valve(s)
Protection of existing trees and plantings not shown as removals
Protection of existing utilities and light poles
Removing and reinstalling existing signs
Reseeding
Site cleanup/restoration
Temporary safety closures
Temporary sheeting and shoring
Water valve removal
Working backfill to reduce moisture content
Working subgrade to achieve acceptable moisture content
Wrapping of storm sewer pipe joints

******END OF SECTION******

TECHNICAL SPECIFICATIONS
FOR
WORTH COUNTY CONSERVATION - MONARCH RV PARK IMPLEMENTATION
WORTH COUNTY CONSERVATION BOARD
NORTHWOOD, IOWA

TECHNICAL SPECIFICATIONS
FOR
WORTH COUNTY CONSERVATION - MONARCH RV PARK IMPLEMENTATION
WORTH COUNTY CONSERVATION BOARD
NORTHWOOD, IOWA

SECTION 13 34 23 – RESTROOM AND SHOWER HOUSE

PART 1: GENERAL

1.1 SCOPE

- A. Construction and onsite placement of a prefabricated precast concrete RESTROOM AND SHOWER HOUSE.

1.2 MANUFACTURER

- A. Manufacturer shall be Huffcutt Concrete or a pre-approved equal.
- B. Contact Reed Sorensen 4033 123rd Street Chippewa Falls, WI 54729 Direct: 715-438-6245, e-mail: reed.sorensen@huffcutt.com.
- C. Manufacturer shall be an NPCA Certified Plant or equal with verifiable references demonstrating quality, design, and service upon request.
- D. Manufacturer will provide a written warranty providing 20 years structural, manufacturer's warranty on all hardware and components not produced at precast concrete manufacturer's plant, and 3 years against defects in paint, caulk, and grout.

1.3 DESIGN

- A. Building will be manufactured using precast concrete including the roof. The building's structural and foundation design will be relevant to the region and the properties associated with its final placement and will be provided by the Engineer. Design will also meet ADA and building code requirements.

1.4 SUBMITTALS

- A. Manufacturer shall provide submittals and engineering if requested.
- B. Plumbing contractor shall provide schematic layout detailing installation of all components in to the mechanical/plumbing chase. Submittals are relative to the footings and foundation. See Sheet S.01. Submittals are required to illustrate compliance with all notes.

PART 2: PRODUCTS

2.1 MATERIALS

A. Doors and Frames

1. Doors shall be 18ga galvanized metal, louvered with 16ga frames. Doors and frames shall include one coat of rust-inhibitive primer and two finish coats of enamel paint.

B. Door Hardware

1. Aluminum drip cap. Reese or equal.
2. Door closure with hold open. Cal-Royal or equal.
3. Stainless hinges with non-removable pin. Cal-Royal or equal.
4. Grade 1 lockset. Function and keying to be verified with owner.
5. Brush style sweep. Reese or equal.
6. ADA compliant threshold. Reese or equal.

C. Windows

1. Vinyl frame, obscure glass, non-operable. Parco or equal.

D. Plumbing – Provided by Manufacturer

1. Stools

- (a) Kohler porcelain wall mounted, ADA compliant, elongated bowl.
- (b) Sloan flush valve, concealed, hydraulic actuator.

2. Urinal

- (a) Kohler porcelain wall-mounted, ADA compliant.
- (b) Sloan flush valve, concealed, hydraulic actuator.

3. Lavatories

- (a) Kohler wall mounted sink, ADA compliant.
- (b) Moen single handle ADA metering faucet.

4. Water Heater

- (a) Bradford white electric water heater. Size to be sufficient for number of showers and lavatories.

5. Mixing Valve
 - (a) Honeywell thermostatic mixing valve, adjustable.
 6. Shower
 - (a) Acorn Penal-Ware Series, ADA compliant.
 7. Floor Drains
 - (a) Sioux Chief on grade adjustable floor drain.
 8. Sediment Filter
 - (a) Rusco sediment filter.
- E. Plumbing and products provided by the contractor. All work, materials, and products shall be incidental to the Structure, Showerhouse bid item. All plumbing shall be per SUDAS section 5020.
1. Install fixtures to allow connection to compressed air for winterization.
 2. Provision and installation of a water meter.
 3. Routing and installation of the ventilation piping for each plumbing fixture.
 - (a) The shower house manufacturer will stub ventilation pipes to the mechanical chase and provide piping material for the complete ventilation system. The contractor will install the plumbing in coordination with all other equipment to be placed in the chase. The contractor is responsible for elbows and wall connectors, and all shall be incidental to the shower house bid item.
- F. Electrical
1. Interior
 - (a) RAB Vandal-proof Tuff Dome motion sensor.
 - (b) RAB VAN1 lights.
 - (c) GFI receptacles.
 - (d) Murdock super secure.
 2. Exterior
 - (a) RAB Tallpack lights.

- (b) Two (2) GFI receptable with weather-proof, lockable covers. One shall be placed high to power a wifi extender and one shall be at standard height.
- (c) Chase
- (d) 200amp load center.
- (e) (2) LED light fixtures. (1 per modular section)
- (f) Solar & Palau exhaust fan.

G. Interior Hardware

- 1. Stainless 3-roll toilet paper dispenser.
- 2. ADA toilet stalls shall have (1) 18" stainless vertical grab bar, (1) 36" stainless horizontal grab bar, (1) 42" stainless horizontal grab bar.
- 3. ADA showers shall have (1) 18" stainless vertical grab bar, (1) 30" stainless horizontal grab bar, (1) 42" stainless horizontal grab bar.
- 4. Stainless frame 18" X 36" mirror.
- 5. Bradley ADA compliant reversible phenolic shower seat.
- 6. (2) coat hooks.

H. Sealers

- 1. Floor shall be sealed using a deep penetrating, high alkali resistant, low volatility product. TK-290 or equal.

I. Caulks and Grout

- 1. All joints between precast panels shall be caulked using a durable, flexible polyurethane sealant. BASF Sonolastic NP-1 or equal.
- 2. Weld plate panel connections shall be grouted flush with interior wall surface. Speed Crete Red Line or equal.

2.2 FINISHES

A. Interior

1. Smooth trowel finish.

B. Exterior

1. Exterior wall appearance to be approved by owner using an architectural form liner.
2. Roof shall be cedar shake architectural form liner.

C. Paint

1. Interior

- (a) Wall panels shall be primed with a premium quality water based acrylic bonding primer moisture and alkali resistant. Finish coat shall be a high-performance acrylic enamel.

2. Exterior

- (a) Roof shall be covered with a quality 100% acrylic satin paint. Owner to determine color.
- (b) Walls shall be covered with a quality concrete stain. Owner to determine color.
- (c) Doors shall be covered using 2 coats of a high-performance 100% acrylic satin enamel. Owner to determine color.

PART 3: EXECUTION

3.1 PRECAST CONCRETE RESTROOM AND SHOWER HOUSE

- A. Building manufacturer shall construct, assemble, paint, install plumbing and electrical at their plant so that it may be transported to the jobsite in finished modules and placed using a crane.
- B. Building manufacturer shall provide mechanical rough in drawings showing where electrical, water supply line, waste line, and floor drains are to be located for hook up to building.

- C. Contractor will make final mechanical connections after the building is placed by manufacturer.
- D. Manufacturer will caulk interior and exterior seams between modules.
Manufacturer will also perform any shipping and handling repairs during installation.

3.2 ONSITE

- A. Contractors shall provide adequate access and a level pad for the crane and semis to sit side by side under their own power. Working radius shall be 35' from center pin on crane.
- B. Contractor shall install the foundation per plans.
- C. Foundation shall be level to within ¼".
- D. Contractor shall rough in mechanicals according to mechanical rough in drawing provided by building manufacturer. Mechanicals shall be terminated at top of foundation. Final mechanical connections shall be done by contractor including floor drains.
- E. Contractor shall install equipment in the plumbing chase including the ventilation pipe for the plumbing fixtures.
- F. Contractor shall coordinate use of crane per manufacturer's specifications.

SECTION 26 05 11 - REQUIREMENTS FOR ELECTRICAL INSTALLATIONS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Furnish and install electrical wiring, systems, equipment and accessories in accordance with the specifications and drawings. Capacities and ratings of cable, panelboards, and other items and arrangements for the specified items are shown on drawings or schedules.
- B. Electrical service entrance equipment shall conform to NEC requirements. Coordinate fuses, circuit breakers and relays with the 15kV system, and obtain Owner approval for sizes and settings of these devices.
- C. Wiring ampacities specified, scheduled, or shown on the drawings are based on copper conductors unless otherwise noted, with the conduit and raceways accordingly sized.

1.2 MINIMUM REQUIREMENTS

- A. References to the International Building Code (IBC), National Electrical Code (NEC), Underwriters Laboratories, Inc. (UL) and National Fire Protection Association (NFPA) are minimum installation requirement standards.
- B. Drawings and other specification sections shall govern in those instances where requirements are greater than those specified in the above standards.

1.3 TEST STANDARDS

- A. All materials and equipment shall be listed, labeled or certified by a nationally recognized testing laboratory to meet Underwriters Laboratories, Inc., standards where test standards have been established. Equipment and materials which are not covered by UL Standards will be accepted provided equipment and material is listed, labeled, certified or otherwise determined to meet safety requirements of a nationally recognized testing laboratory. Equipment of a class which no nationally recognized testing laboratory accepts, certifies, lists, labels, or determines to be safe, will be considered if inspected or tested in accordance with national industrial standards, such as NEMA, or ANSI. Evidence of compliance shall include certified test reports and definitive shop drawings.
- B. Definitions:
 - 1. Listed: Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of

production or listed equipment or materials or periodic evaluation of services, and whose listing states that the equipment, material, or services either meets appropriate designated standards or has been tested and found suitable for a specified purpose.

2. Labeled: Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.
3. Certified: equipment or product which:
 - a. 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.
 - b. Production of equipment or product is periodically inspected by a nationally recognized testing laboratory.
 - c. Bears a label, tag, or other record of certification.
4. Nationally recognized testing laboratory; laboratory which is approved, in accordance with OSHA regulations, by the Secretary of Labor.

1.4 QUALIFICATIONS (PRODUCTS AND SERVICES)

- A. Manufacturers Qualifications: The manufacturer shall regularly and presently produce, as one of the manufacturer's principal products, the equipment and material specified for this project, and shall have manufactured the item for at least three years.
- B. Product Qualification: Manufacturer's product shall have been in satisfactory operation, on three installations of similar size and type as this project, for approximately three years.
- C. Service Qualifications: There shall be a permanent service organization maintained or trained by the manufacturer which will render satisfactory service to this installation within four hours of receipt of notification that service is needed. Submit name and address of service organizations.

1.5 MANUFACTURED PRODUCTS

- A. Materials and equipment furnished shall be of current production by manufacturers regularly engaged in the manufacture of such items, for which replacement parts shall be available.
- B. When more than one unit of the same class or type of equipment is required, such units shall be the product of a single manufacturer.

- C. Equipment Assemblies and Components:
 - 1. Components of an assembled unit need not be products of the same manufacturer.
 - 2. Manufacturers of equipment assemblies, which include components made by others, shall assume complete responsibility for the final assembled unit.
 - 3. Components shall be compatible with each other and with the total assembly for the intended service.
 - 4. Constituent parts which are similar shall be the product of a single manufacturer.
- D. Factory wiring shall be identified on the equipment being furnished and on all wiring diagrams.

1.6 EQUIPMENT PROTECTION

- A. Equipment and materials shall be protected during shipment and storage against physical damage, vermin, dirt, corrosive substances, fumes, moisture, cold and rain.
 - 1. Store equipment indoors in clean dry space with uniform temperature to prevent condensation. Equipment shall include but not be limited to switchboards, panelboards, transformers, enclosures, controllers, circuit protective devices, cables, wire, wiring devices, electronic equipment, and accessories.
 - 2. During installation, equipment shall be protected against entry of foreign matter; and be vacuum-cleaned both inside and outside before testing and operating. Compressed air shall not be used to clean equipment. Remove loose packing and flammable materials from inside equipment.
 - 3. Damaged equipment shall be, as determined by the Engineer, placed in first class operating condition or be returned to the source of supply for repair or replacement.
 - 4. Painted surfaces shall be protected with factory installed removable heavy kraft paper, sheet vinyl or equal.
 - 5. Damaged paint on equipment and materials shall be refinished with the same quality of paint and workmanship as used by the manufacturer so repaired areas are not obvious.

1.7 WORK PERFORMANCE

- A. All electrical work must comply with the requirements of NFPA 70 (NEC), NFPA 70B, NFPA 70E, OSHA Part 1910 subpart J, OSHA Part 1910 subpart S and OSHA Part 1910 subpart K in addition to other references required by contract.
- B. Contractor shall be responsible for all permits and inspections required to complete the work.
- C. Job site safety and worker safety is the responsibility of the contractor.

- D. Electrical work shall be accomplished with all affected circuits or equipment de-energized. When an electrical outage cannot be accomplished in this manner for the required work, the following requirements are mandatory:
 - 1. Electricians must use full protective equipment (i.e., certified and tested insulating material to cover exposed energized electrical components, certified and tested insulated tools, etc.) while working on energized systems in accordance with NFPA 70E.
 - 2. Electricians must wear personal protective equipment while working on energized systems in accordance with NFPA 70E.
 - 3. Before initiating any work, a job specific work plan must be developed by the contractor with a peer review conducted and documented. The work plan must include procedures to be used on and near the live electrical equipment, barriers to be installed, safety equipment to be used and exit pathways.
 - 4. Work on energized circuits or equipment cannot begin until prior written approval is obtained from the Owner.
- E. For work on existing buildings, arrange, phase and perform work to assure electrical service for other buildings at all times.
- F. New work shall be installed and connected to existing work neatly, safely and professionally. Disturbed or damaged work shall be replaced or repaired to its prior conditions. Existing installation conditions discovered or uncovered during the course of new work shall be reported to Construction Manager or Engineer as soon as practical and not later than the end of the day the condition is discovered.
- G. Coordinate location of all equipment and conduit with other trades to minimize interferences.

1.8 ELECTRICAL INSTALLATIONS

- A. Equipment location shall be as close as practical to locations shown on the drawings.
- B. Working spaces shall not be less than specified in the NEC for all voltages specified.
- C. Inaccessible Equipment:
 - 1. Where the Engineer determines that the Contractor has installed equipment not conveniently accessible for operation and maintenance, the equipment shall be removed and reinstalled as directed at no additional cost to the Owner.
 - 2. "Conveniently accessible" is defined as being capable of being reached quickly for operation, maintenance, or inspections without the use of ladders, or without climbing or crawling under or over obstacles such as, but not limited to, motors, pumps, belt guards, transformers, piping, ductwork, conduit and raceways.

- D. Coordinate electrical equipment and materials installation with other building components.
- E. Verify all dimensions by field measurements.
- F. Arrange for chases, slots, and openings in other building components to allow for electrical installations.
- G. Coordinate the installation of required supporting devices and sleeves to be set in poured in place concrete and other structural components, as they are constructed.
- H. Sequence, coordinate, and integrate installations of electrical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing-in the building.
- I. Coordinate connection of electrical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connection for each service.
- J. Install systems, materials, and equipment to conform to project requirements and approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Engineer.
- K. Systems, materials, and equipment, which will be exposed in finished areas shall be installed level and plumb, parallel and perpendicular to other building systems and components.
- L. Install electrical equipment to facilitate maintenance and repair or replacement of equipment components. Maintain code clearances in front of and about all electrical equipment. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.
- M. Include in the work all labor, materials, equipment, services, apparatus, drawings (in addition to the Contract Documents) as required to complete the intended work.
- N. Only new, clean and perfect equipment, apparatus, materials and supplies of latest design and manufacture shall be incorporated in the work in order to assure an electrical system of high quality.
- O. The work required to be done by the contractor, the utility companies and the owner, in order to obtain electric utility services, is delineated in these specifications and on the

drawings. Unless otherwise noted, construction or connection charges (except for temporary power) by those companies shall be paid by the Owner.

1.9 CONNECTIONS TO EQUIPMENT AND APPLIANCES

- A. In many instances the drawings show an outlet box and power supply for specific equipment, be it Owner or contractor furnished. It is to be understood, unless otherwise noted, that the work includes a connection from the box to the equipment or appliance. Verify circuit conductor quantities and sizes and overcurrent device number of poles and rating as well as any special grounding requirements, for all owner furnished equipment and adjust the required work accordingly.

1.10 CUTTING AND PATCHING

- A. General: Perform cutting and patching in accordance with Division 01 Section "Cutting and Patching." In addition to the requirements specified in Division 01, the following requirements apply:
 - 1. Perform cutting, fitting, and patching of electrical equipment and materials required to:
 - a. Uncover Work to provide for installation of ill-timed Work.
 - b. Remove and replace defective Work.
 - c. Remove and replace Work not conforming to requirements of the Contract Documents.
 - d. Remove samples of installed Work as specified for testing.
 - e. Cut, remove, and legally dispose of selected electrical equipment, components, and materials as indicated, including, but not limited to, removal of electrical items indicated to be removed and items made obsolete by the new Work.
 - 2. Coordinate the cutting and patching of building components to accommodate the installation of electrical equipment and materials.
 - 3. Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed.
 - 4. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.

1.11 QUALITY ASSURANCE

- A. Comply with NFPA 70.
- B. Installer Qualifications: Engage an experienced Installer for the installation and application of sealers and access panels and access doors.

- C. Fire-Resistance Ratings: Where a fire-resistance classification is indicated, provide access door assembly with panel door, frame, hinge, and latch from manufacturer listed in the UL "Building Materials Directory" for rating shown.
- D. Provide UL Label on each fire-rated access door.

1.12 EQUIPMENT AND PATHWAY IDENTIFICATION

- A. As defined in Section 260553 - Identification for Electrical Systems.

PART 2 - PRODUCTS

2.1 MISCELLANEOUS METALS

- A. Steel plates, shapes, bars, and bar grating: ASTM A 36.
- B. Cold-Formed Steel Tubing: ASTM A 500.
- C. Hot-Rolled Steel Tubing: ASTM A 501.
- D. Steel Pipe: ASTM A 53, Schedule 40, welded.
- E. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, non-staining, non-corrosive, nongaseous grout, recommended for interior and exterior applications.
- F. Fasteners: Zinc-coated, type, grade, and class as required.

2.2 CONCRETE BASES:

- A. Concrete: Portland cement mix, 3000 psi.
- B. Cement: ASTM C 150, Type I.
 - 1. Fine Aggregate: ASTM C 33, sand.
 - 2. Coarse Aggregate: ASTM C 33, crushed gravel.
- C. Fabric Reinforcement: ASTM A 185, welded-wire fabric, plain.
- D. Reinforcement Bars: ASTM A 615, Grade 60, deformed.
- E. Provide concrete bases where shown and outlined on drawings.
- F. Construct concrete bases of dimensions indicated, but not less than 4 inch (100 mm) larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.
- G. Anchor equipment to concrete base as follows:

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

2.3 FIRE-STOPPING MATERIALS:

- A. Products: Subject to compliance with project and Underwriters Laboratories requirements, provide materials by one of the following:
 1. 3M, unless otherwise required by the UL System to be used.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting installation and application of sealants and access panels. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 CONCRETE BASES

- A. Provide concrete bases for all floor-mounted electrical equipment, except that stand alone dry type transformers with integral floor channels may be placed without equipment bases when located in finished areas and electrical closets.
- B. Use 3000 psi (20.7 MPa), 28-day compressive-strength concrete. Concrete materials, reinforcement.
- C. Form concrete equipment bases using nominal 2 inch by 4 inch framing lumber (use larger framing if larger pads, such as for engine-generators are required) with form release compounds. Locate as indicated and construct 4 inches larger in both directions than supported unit. Except where otherwise indicated, pour bases 4-inches higher than surrounding slab. Anchor or key to floor slab. Chamfer top edges and corners.
- D. Install reinforcing bars, and place anchor bolts and sleeves using manufacturer's installation template.
- E. Place concrete and allow to cure before installation of equipment.

3.3 ERECTION OF METAL SUPPORTS AND ANCHORAGE

- A. Cut, fit, and place miscellaneous metal fabrications accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- B. Field Welding: Comply with AWS "Structural Welding Code."

3.4 APPLICATION OF SEALERS

- A. General: Comply with sealer manufacturers' printed application instructions applicable to products and applications indicated, except where more stringent requirements apply.
 - 1. Comply with recommendations of ASTM C 962 for use of elastomeric sealants.
- B. Tooling: Immediately after sealant application and prior to time shinning or curing begins, tool sealants to form smooth, uniform beads; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

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

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Copper building wire.
 - 2. Aluminum building wire.
 - 3. Connectors and splices.

PART 2 - PRODUCTS

2.1 COPPER BUILDING WIRE

- A. Description: Flexible, insulated and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.
- B. Standards:
 - 1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
 - 2. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."
- C. Conductors: Copper, complying with ASTM B3 for bare annealed copper and with ASTM B8 for stranded conductors.
- D. Conductor Insulation:
 - 1. Type USE-2 and Type XLPE. Comply with UL 854.
 - 2. Type TC-ER. Comply with NEMA WC 70/ICEA S-95-658 and UL 1277.
 - 3. Type THHN and Type THWN-2. Comply with UL 83.
 - 4. Type XHHW-2. Comply with UL 44.
 - 5. Minimum 90 degree C insulation rating.
 - 6. .

2.2 ALUMINUM BUILDING WIRE

- A. Description: Flexible, insulated and uninsulated, drawn aluminum current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less. Suitable for direct buried installations

B. Standards:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
2. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

C. Conductors: Aluminum, complying with ASTM B800 and ASTM B801.

D. Conductor Insulation:

1. Type USE-2 and Type XLPE. Comply with UL 854.
2. Type THHN and Type THWN-2. Comply with UL 83.

2.3 NONMETALLIC UNDERGROUND CONDUIT WITH CONDUCTORS, TYPE NUCC

A. Description: A factory assembly of conductors or cables inside a nonmetallic, smooth wall raceway with a circular cross section.

B. Applicable Standards:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
2. General Characteristics:
 - a. Reference Standards: UL 1990.

2.4 CONNECTORS AND SPLICES

A. Description: Factory-fabricated connectors, splices, and lugs of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.

B. Jacketed Cable Connectors: For steel and aluminum jacketed cables, zinc die-cast with set screws, designed to connect conductors specified in this Section.

C. Lugs: One piece, seamless, designed to terminate conductors specified in this Section.

D. Wiring Connectors for Terminations:

1. Provide terminal lugs for connecting conductors to equipment furnished with terminations designed for terminal lugs.
2. Provide connections insulated with heat-shrink tubing for motor connections #8 AWG or larger.
3. Do not use split bolt connectors or scotch lock type wire connectors.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that work likely to damage wire and cable has been completed.
- B. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with NFPA 70.
- C. Verify that raceway installation is complete and supported.
- D. Verify that field measurements are as shown on the drawings.
- E. Verify that conditions are satisfactory for installation prior to starting work.

3.2 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders:
 - 1. Copper; solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B. Branch Circuits:
 - 1. Copper; solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

3.3 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Service Entrance: Type XHHW-2, single conductors in raceway.
- B. Exposed Feeders: Type THHN/THWN-2, single conductors in raceway.
- C. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN/THWN-2, single conductors in raceway.
- D. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN/THWN-2, single conductors in raceway.
- E. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN/THWN-2, single conductors in raceway.

3.4 INSTALLATION, GENERAL

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

- B. Complete raceway installation between conductor and cable termination points in accordance with Section 260533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- E. 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.
 - 3. Color Code:
 - a. 208Y/120 V, 3 Phase, 4 Wire System:
 - 1) Phase A: Black.
 - 2) Phase B: Red.
 - 3) Phase C: Blue.
 - 4) Neutral/Grounded: White.
 - b. Equipment Ground, All Systems: Green.

3.5 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
 - 1. Use oxide inhibitor in each splice, termination, and tap for aluminum conductors.
- C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inch (150 mm) of slack.

3.6 IDENTIFICATION

- A. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

3.7 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

END OF SECTION

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SECTION 26 05 26 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Grounding and bonding conductors.
 - 2. Grounding and bonding clamps.
 - 3. Grounding and bonding bushings.
 - 4. Grounding and bonding hubs.
 - 5. Grounding and bonding connectors.
 - 6. Grounding and bonding busbars.
 - 7. Grounding (earthing) electrodes.

PART 2 - PRODUCTS

2.1 GROUNDING AND BONDING CONDUCTORS

- A. Equipment Grounding Conductor:
 - 1. General Characteristics: 600 V, THHN/THWN-2, copper wire or cable, green color, in accordance with Section 260519 "Low-Voltage Electrical Power Conductors and Cables."
- B. Referenced Standards: Complying with one or more of the following:
 - a. Soft or Annealed Copper Wire: ASTM B3
 - b. Concentric-Lay Stranded Copper Conductor: ASTM B8.
 - c. Tin-Coated Soft or Annealed Copper Wire: ASTM B33.
 - d. 19-Wire Combination Unilay-Stranded Copper Conductor: ASTM B787/B787M.
- C. UL KDSH - Protector Grounding Conductor:
 - 1. Description: Conductors intended to be used for grounding primary protector or metallic members of cable sheath in accordance with Chapters 7 and 8 of NFPA 70.
 - 2. Regulatory Requirements:
 - a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
 - 3. Listing Criteria:

- a. Grounding and Bonding Equipment for Communications: UL CCN KDSH; including UL 467.

2.2 GROUNDING AND BONDING CLAMPS

- A. Description: Clamps suitable for attachment of grounding and bonding conductors to grounding electrodes, pipes, tubing, and rebar. Grounding and bonding clamps specified in this article are also suitable for use with communications applications; see Section 270526 "Grounding and Bonding for Communications Systems," for selection and installation guidelines.
- B. Source Limitations: Obtain products from single manufacturer.
- C. Performance Criteria:
 - 1. Regulatory Requirements:
 - a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
 - 2. Listing Criteria:
 - a. Grounding and Bonding Equipment: UL CCN KDER; including UL 467.
 - b. Grounding and Bonding Equipment for Communications: UL CCN KDSH; including UL 467.
- D. UL KDER and KDSH - Hex-Fitting-Type Rod Grounding and Bonding Clamp:
 - 1. General Characteristics:
 - a. Two pieces with stainless steel bolts.
 - b. Clamp Material: Brass.
 - c. Listed for outdoor use.
- E. UL KDER and KDSH - U-Bolt-Type Pipe and Rod Grounding and Bonding Clamp:
 - 1. General Characteristics:
 - a. Clamp Material: Brass.
 - b. Listed for outdoor use.
- F. UL KDER - Exothermically Welded Connection
 - 1. General Characteristics: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

2.3 GROUNDING AND BONDING BUSHINGS

- A. Description: Bonding bushings connect conduit fittings, tubing fittings, threaded metal conduit, and unthreaded metal conduit to metal boxes and equipment enclosures, and

have one or more bonding screws intended to provide electrical continuity between bushing and enclosure. Grounding bushings have provision for connection of bonding or grounding conductor and may or may not also have bonding screws.

- B. Source Limitations: Obtain products from single manufacturer.
- C. Performance Criteria:
 - 1. Regulatory Requirements:
 - a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
 - 2. Listing Criteria:
 - a. Grounding and Bonding Equipment: UL CCN KDER; including UL 467.
- D. UL KDER - Bonding Bushing:
 - 1. General Characteristics: Threaded bushing with insulated throat.
- E. UL KDER - Grounding Bushing:
 - 1. General Characteristics: Threaded bushing with insulated throat and mechanical-type wire terminal.

2.4 GROUNDING AND BONDING HUBS

- A. Description: Hubs with certified grounding or bonding locknut.
- B. Source Limitations: Obtain products from single manufacturer.
- C. Performance Criteria:
 - 1. Regulatory Requirements:
 - a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
 - 2. Listing Criteria:
 - a. Grounding and Bonding Equipment: UL CCN KDER; including UL 467.
- D. UL KDER - Grounding and Bonding Hub:
 - 1. General Characteristics: Insulated, gasketed, watertight hub with mechanical-type wire terminal.

2.5 GROUNDING AND BONDING CONNECTORS

- A. Source Limitations: Obtain products from single manufacturer.
- B. Performance Criteria:
 - 1. Regulatory Requirements:
 - a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
 - 2. Listing Criteria:
 - a. Grounding and Bonding Equipment: UL CCN KDER; including UL 467.
 - b. Grounding and Bonding Equipment for Communications: UL CCN KDSH; including UL 467.
- C. UL KDER - Crimped Lug Pressure-Type Grounding and Bonding Busbar Terminal:
 - 1. General Characteristics: Cast silicon bronze, solderless compression-type wire terminals; with long barrel and two holes spaced on 5/8 or 1 inch (16 or 25 mm) centers for two-bolt connection to busbar.

2.6 GROUNDING AND BONDING BUSBARS

- A. Description: Miscellaneous grounding and bonding device that serves as common connection for multiple grounding and bonding conductors.
- B. Source Limitations: Obtain products from single manufacturer.
- C. Performance Criteria:
 - 1. Regulatory Requirements:
 - a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
 - 2. Listing Criteria:
 - a. Grounding and Bonding Equipment: UL CCN KDER; including UL 467.

2.7 GROUNDING (EARTHING) ELECTRODES

- A. Description: Grounding electrodes include rod electrodes, ring electrodes, metal underground water pipes, metal building frames, concrete-encased electrodes, and pipe and plate electrodes.
- B. Source Limitations: Obtain products from single manufacturer.
- C. Performance Criteria:

1. Regulatory Requirements:
 - a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
 2. Listing Criteria:
 - a. Grounding and Bonding Equipment: UL CCN KDER; including UL 467.
- D. UL KDER - Rod Electrode:
1. General Characteristics: Copper-clad steel; 3/4 inch by 10 ft (19 mm by 3 m).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine facility's grounding electrode system and equipment grounding for compliance with requirements for maximum ground-resistance level and other conditions affecting performance of grounding and bonding of electrical system.
- B. Inspect test results of grounding system measured at point of electrical service equipment connection.
- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- D. Proceed with connection of electrical service equipment only after unsatisfactory conditions have been corrected.

3.2 SELECTION OF GROUNDING AND BONDING CONDUCTORS

- A. Conductors: Install solid conductor for 8 AWG and smaller, and stranded conductors for 6 AWG and larger unless otherwise indicated.
- B. Custom-Length Insulated Equipment Bonding Jumpers: 6 AWG, 19-strand, Type THHN/THWN.
- C. Bonding Cable: 28 kcmil, 14 strands of 17 AWG conductor, 1/4 inch (6 mm) in diameter.
- D. Bonding Conductor: 4 AWG or 6 AWG, stranded conductor.
- E. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inch (41 mm) wide and 1/16 inch (1.6 mm) thick.
- F. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inch (41 mm) wide and 1/16 inch (1.6 mm) thick.

- G. Underground Grounding Conductors: Install bare copper conductor, 2/0 AWG minimum.
 - 1. Bury at least 30 inch (750 mm) below grade.

3.3 SELECTION OF CONNECTORS

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

3.4 INSTALLATION

- A. Comply with manufacturer's published instructions.
- B. Reference Standards:
 - 1. Ground Bonding Common with Lightning Protection System: Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system. Bond electrical power system ground directly to lightning protection system grounding conductor at closest point to electrical service grounding electrode. Use bonding conductor sized same as system grounding electrode conductor, and install in conduit.
 - 2. Consult Architect for resolution of conflicting requirements.
- C. Special Techniques:
 - 1. Conductors:
 - a. Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
 - 2. Connections: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact are galvanically compatible.
 - a. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer in order of galvanic series.
 - b. Make connections with clean, bare metal at points of contact.
 - c. Make aluminum-to-steel connections with stainless steel separators and mechanical clamps.
 - d. Make aluminum-to-galvanized-steel connections with tin-plated copper jumpers and mechanical clamps.

- e. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.
 - f. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
 - 1) Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate adjacent parts.
 - 2) Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
 - 3) Use exothermic-welded connectors for outdoor locations; if disconnect-type connection is required, use bolted clamp.
3. Electrodes:
- a. Ground Rods: Drive rods until tops are 2 inch (50 mm) below finished floor or final grade unless otherwise indicated.
 - 1) Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
 - 2) Use exothermic welds for below-grade connections.
 - b. For grounding electrode system, install at least three rods spaced at least one-rod length from each other and located at least same distance from other grounding electrodes, and connect to service grounding electrode conductor.
 - c. Test Wells: Ground rod driven through drilled hole in bottom of handhole. Handholes are specified in Section 260543 "Underground Ducts and Raceways for Electrical Systems," and must be at least 12 inch (300 mm) deep, with cover.
 - 1) Install at least one test well for each service unless otherwise indicated. Install at ground rod electrically closest to service entrance. Set top of test well flush with finished grade or floor.
4. Grounding at Service:
- a. Equipment grounding conductors and grounding electrode conductors must be connected to ground bus. Install main bonding jumper between neutral and ground buses.
 - b. A minimum of two grounding electrodes are required. Provide a supplemental ground rod, pipe, or plate electrode and bond to the grounding electrode system if only one other grounding electrode is unavailable.
5. Equipment and Pathway Grounding:

- a. Install insulated equipment grounding conductors with feeders and branch circuits.
- b. Conduit Systems:
 - 1) Ground all metallic conduit systems. All metallic conduit systems shall contain an equipment grounding conductor.
 - 2) Non-metallic conduit systems shall contain an equipment grounding conductor, except that non-metallic feeder conduits which carry a grounded conductor from exterior transformers to interior or building-mounted service entrance equipment need not contain an equipment grounding conductor.
 - 3) Conduit containing only a grounding conductor, and which is provided for mechanical protection of the conductor, shall be bonded to that conductor at the entrance and exit from the conduit.
- c. Boxes, Cabinets, Enclosures, and Panelboards:
 - 1) Bond the equipment grounding conductor to each pullbox, junction box, outlet box, device box, cabinets, and other enclosures through which the conductor passes (except for special grounding systems for intensive care units and other critical units shown).
 - 2) Provide lugs in each box and enclosure for equipment grounding conductor termination.
 - 3) Provide ground bars in panelboards, bolted to the housing, with sufficient lugs to terminate the equipment grounding conductors.
- d. Motors and Starters: Provide lugs in motor terminal box and starter housing or motor control center compartment to terminate equipment grounding conductors.
- e. Receptacles shall not be grounded through their mounting screws. Ground with a jumper from the receptacle green ground terminal to the device box ground screw and the branch circuit equipment grounding conductor.

3.5 FIELD QUALITY CONTROL

- A. Tests and Inspections:
 - 1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
 - 2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with calibrated torque wrench in accordance with manufacturer's published instructions.
 - 3. Test completed grounding system at each location where maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, and at individual ground rods. Make tests at ground rods before conductors are connected.

- a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
- b. Perform tests by fall-of-potential method in accordance with IEEE Std 81.
- c. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

B. Nonconforming Work:

1. Grounding system will be considered defective if it does not pass tests and inspections.
2. Remove and replace defective components and retest.

C. Collect, assemble, and submit test and inspection reports.

1. Report measured ground resistances that exceed the following values:
 - a. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10 Ω .
 - b. Power and Lighting Equipment or System with Capacity of 500 to 1000 kVA: 5 Ω .

3.6 PROTECTION

- A. After installation, protect grounding and bonding cables and equipment from construction activities. Remove and replace items that are contaminated, defaced, damaged, or otherwise caused to be unfit for use prior to acceptance by Owner.

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SECTION 26 05 33 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metal conduits and tubing.
2. Fittings for conduit, tubing, and cable.
3. Threaded metal joint compound.
4. Solvent cements.
5. Metallic outlet boxes, device boxes, rings, and covers.
6. Nonmetallic outlet boxes, device boxes, rings, and covers.
7. Cabinets, cutout boxes, junction boxes, pull boxes, and miscellaneous enclosures.

PART 2 - PRODUCTS

2.1 TYPE EMT-S RACEWAYS AND ELBOWS

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
2. General Characteristics: UL 797 and UL Category Control Number FJMX.

B. Steel Electrical Metal Tubing (EMT-S) and Elbows:

1. Material: Steel.
2. Options:
 - a. Exterior Coating: Zinc.
 - b. Interior Coating: Zinc with organic top coating.
 - c. Minimum Trade Size: Metric designator 21 (trade size 3/4).
 - d. Colors: As indicated on Drawings and in Specifications.

2.2 TYPE IMC RACEWAYS

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
2. General Characteristics: UL 1242 and UL Category Control Number DYBY.

B. Steel Electrical Intermediate Metal Conduit (IMC):

1. Options:

- a. Exterior Coating: Zinc.
- b. Minimum Trade Size: Metric designator 21 (trade size 3/4).

2.3 TYPE LFMC RACEWAYS

A. Performance Criteria:

- 1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
- 2. General Characteristics: UL 360 and UL Category Control Number DXHR.

B. Steel Liquidtight Flexible Metal Conduit (LFMC-S):

- 1. Material: Steel.
- 2. Options:
 - a. Minimum Trade Size: Metric designator 21 (trade size 3/4).

2.4 TYPE PVC RACEWAYS AND FITTINGS

A. Performance Criteria:

- 1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
- 2. General Characteristics: UL 651 and UL Category Control Number DZYR.

B. Schedule 40 Rigid PVC Conduit (PVC-40) and Fittings:

- 1. Dimensional Specifications: Schedule 40.
- 2. Options:
 - a. Minimum Trade Size: Metric designator 21 (trade size 3/4).
 - b. Markings: For use with maximum 90 deg C wire.

2.5 FITTINGS FOR CONDUIT, TUBING, AND CABLE

A. Performance Criteria:

- 1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.

B. Fittings for Type IMC, Type PVC Raceways:

- 1. General Characteristics: UL 514B and UL Category Control Number DWTT.
- 2. Options:
 - a. Material: Steel.
 - b. Coupling Method: Raintight compression coupling with distinctive color gland nut.
 - c. Conduit Fittings for Hazardous (Classified) Locations: UL 1203.

- d. Expansion and Deflection Fittings: UL 651 with flexible external bonding jumper.
 - C. Fittings for Type EMT Raceways:
 - 1. General Characteristics: UL 514B and UL Category Control Number FKAV.
 - 2. Options:
 - a. Material: Steel.
 - b. Coupling Method: Setscrew coupling. Setscrew couplings with only single screw per conduit are unacceptable.
 - c. Conduit Fittings for Hazardous (Classified) Locations: UL 1203.
 - d. Expansion and Deflection Fittings: UL 651 with flexible external bonding jumper.
- 2.6 ELECTRICALLY CONDUCTIVE CORROSION-RESISTANT COMPOUNDS FOR THREADED CONDUIT
- A. Performance Criteria:
 - 1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
 - 2. General Characteristics: UL 2419 and UL Category Control Number FOIZ.
- 2.7 SOLVENT CEMENTS
- A. Performance Criteria:
 - 1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
 - 2. General Characteristics: As recommended by conduit manufacturer in accordance with UL 514B and UL Category Control Number DWTT.
 - 3. Sustainability Characteristics:
 - B. Solvent Cements for Type PVC Raceways and Fittings:
- 2.8 METALLIC OUTLET BOXES, DEVICE BOXES, RINGS, AND COVERS
- A. Performance Criteria:
 - 1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
 - 2. General Characteristics: UL 514A and UL Category Control Number QCIT.
 - B. Metallic Outlet and Device Boxes:
 - 1. Description: Box having pryout openings, knockouts, threaded entries, or hubs in either the sides of the back, or both, for entrance of conduit, conduit or cable

fittings, or cables, with provisions for mounting outlet box cover, but without provisions for mounting wiring device directly to box.

2. Options:

- a. Material: Sheet steel.
- b. Device Box Dimensions
 - 1) Minimum size: 4 inches square by 2-1/8 inches deep (100 mm square by 600mm deep).
 - 2) Boxes for receptacle outlets shall be 4-11/16 inches square by 2-1/8 inches deep, unless additional depth required for device.
- c. Luminaire Outlet Boxes and Covers: Nonadjustable, listed and labeled for attachment of luminaire weighing up to 50 lb (23 kg).

C. Metallic Conduit Bodies:

- 1. Description: Means for providing access to interior of conduit or tubing system through one or more removable covers at junction or terminal point. In the United States, conduit bodies are listed in accordance with outlet box requirements.

D. Metallic Extension Rings:

- 1. Description: Ring intended to extend sides of outlet box or device box to increase box depth, volume, or both.

2.9 TERMINATION BOXES

- A. Description: Enclosure for termination base consisting of lengths of bus bars, terminal strips, or terminal blocks with provision for wire connectors to accommodate incoming or outgoing conductors or both.

B. Performance Criteria:

- 1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
- 2. General Characteristics: UL 1773 and UL Category Control Number XCKT.

C. Termination Boxes and Termination Bases for Installation on Line Side of Service Equipment:

- 1. Additional Characteristics: Listed and labeled for installation on line side of service equipment.

D. Termination Boxes and Termination Bases for Installation on Load Side of Service Equipment:

- 1. Additional Characteristics: Listed and labeled for installation on load side of service equipment.

2.10 CABINETS, CUTOOT BOXES, JUNCTION BOXES, PULL BOXES, AND MISCELLANEOUS ENCLOSURES

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70 and marked for intended location and use.
2. General Characteristics:
 - a. Non-Environmental Characteristics: UL 50.
 - b. Environmental Characteristics: UL 50E.

B. Indoor Sheet Metal Junction and Pull Boxes:

1. Description: Box with a blank cover that serves the purpose of joining different runs of raceway or cable.
2. Additional Characteristics: UL Category Control Number BGUZ.
3. Options:
 - a. Degree of Protection: Type 1.

C. Outdoor Sheet Metal Junction and Pull Boxes:

1. Description: Box with a blank cover that serves the purpose of joining different runs of raceway or cable.
2. Additional Characteristics: UL Category Control Number BGUZ.
3. Options:
 - a. Degree of Protection: Type 3R.

PART 3 - EXECUTION

3.1 SELECTION OF RACEWAYS

- A. Unless more stringent requirements are specified in Contract Documents or manufacturers' written instructions, comply with NFPA 70 for selection of raceways. Consult Architect for resolution of conflicting requirements.
- B. Outdoors:
 1. Exposed and Subject to Physical Damage: IMC.
 2. Exposed and Not Subject to Physical Damage: IMC.
 3. Concealed Aboveground: PVC-40.
 4. Direct Buried: PVC-80.
- C. Indoors:
 1. Exposed and Subject to Physical Damage: IMC. Subject to physical damage includes the following locations:

- a. Locations less than 2.5 m (8 ft) above finished floor.
- 2. Exposed and Not Subject to Physical Damage: EMT.
- 3. Concealed in Ceilings and Interior Walls and Partitions: EMT.
- 4. Damp or Wet Locations: IMC.

3.2 SELECTION OF BOXES AND ENCLOSURES

- A. Unless more stringent requirements are specified in Contract Documents or manufacturers' written instructions, comply with NFPA 70 for selection of boxes and enclosures. Consult Architect for resolution of conflicting requirements.
- B. Degree of Protection:
 - 1. Outdoors:
 - a. Type 3R unless otherwise indicated.
 - b. Locations Exposed to Hosedown: Type 6.
 - c. Locations Subject to Potential Flooding: Type 6P.
 - d. Locations Aboveground Where Mechanism Must Operate When Ice Covered: Type 3S.
 - e. Locations in-Ground or Exposed to Corrosive Agents: Type 4X.
 - f. Locations in-Ground or Exposed to Corrosive Agents Where Mechanism Must Operate When Ice Covered: Type 3SX.
 - 2. Indoors:
 - a. Type 1 unless otherwise indicated.
 - b. Damp or Dusty Locations: Type 12.
 - c. Locations Exposed to Hosedown: Type 6.

3.3 INSTALLATION OF RACEWAYS

- A. Installation Standards:
 - 1. Unless more stringent requirements are specified in Contract Documents or manufacturers' written instructions, comply with NFPA 70 for installation of raceways. Consult Architect for resolution of conflicting requirements.
 - 2. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.
 - 3. Comply with requirements in Section 26 05 29 "Hangers and Supports for Electrical Systems" for hangers and supports.
 - 4. Comply with NECA NEIS 101 for installation of steel raceways.
 - 5. Comply with NECA NEIS 102 for installation of aluminum raceways.
 - 6. Comply with NECA NEIS 111 for installation of nonmetallic raceways.
 - 7. Install raceways square to the enclosure and terminate at enclosures without hubs with locknuts on both sides of enclosure wall. Install locknuts hand tight, plus one-quarter turn more.

8. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to metric designator 35 (trade size 1-1/4) and insulated throat metal bushings on metric designator 41 (trade size 1-1/2) and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.
 - a. Provide insulating bushings to protect conductors, including conductors smaller than No. 4 AWG..

B. General Requirements for Installation of Raceways:

1. Complete raceway installation before starting conductor installation.
2. Provide stub-ups through floors with coupling threaded inside for plugs, set flush with finished floor. Plug coupling until conduit is extended above floor to final destination or a minimum of 2 ft (0.6 m) above finished floor.
3. Install no more than equivalent of three 90-degree bends in conduit run. Support within 12 inch (300 mm) of changes in direction.
4. Make bends in raceway using large-radius preformed ells except for parallel bends. Field bending must be in accordance with NFPA 70 minimum radii requirements. Provide only equipment specifically designed for material and size involved.
5. Conceal conduit within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.
6. Support conduit within 12 inch (300 mm) of enclosures to which attached.
7. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal interior of raceways at the following points:
 - a. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 - b. Where an underground service raceway enters a building or structure.
 - c. Conduit extending from interior to exterior of building.
 - d. Conduit extending into pressurized duct and equipment.
 - e. Conduit extending into pressurized zones that are automatically controlled to maintain different pressure set points.
 - f. Where otherwise required by NFPA 70.
8. Do not install conduits within 2 inch (50 mm) of the bottom side of a metal deck roof.
9. Keep raceways at least 6 inch (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
10. Cut conduit perpendicular to the length. For conduits metric designator 53 (trade size 2) and larger, use roll cutter or a guide to make cut straight and perpendicular to the length. Ream inside of conduit to remove burrs.
11. Install pull wires in empty raceways. Provide polypropylene or monofilament plastic line with not less than 200 lb (90 kg) tensile strength. Leave at least 12 inch

(300 mm) of slack at both ends of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.

12. Install #12 copper tracer wire in all exterior buried conduits.

C. Requirements for Installation of Specific Raceway Types:

1. Type IMC:

- a. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound that maintains electrical conductivity to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

2. Types PVC:

- a. Do not install Type PVC conduit where ambient temperature exceeds 122 deg F (50 deg C). Conductor ratings must be limited to 75 deg C except where installed in a trench outside buildings with concrete encasement, where 90 deg C conductors are permitted.
- b. Comply with manufacturer's written instructions for solvent welding and fittings.

D. Raceway Fittings: Install fittings in accordance with NEMA FB 2.10 guidelines.

1. EMT: Provide setscrew, fittings. Comply with NEMA FB 2.10.
2. Flexible Conduit: Provide only fittings listed for use with flexible conduit type. Comply with NEMA FB 2.20.

E. Expansion-Joint Fittings:

1. Install in runs of aboveground PVC that are located where environmental temperature change may exceed 30 deg F (17 deg C) and that have straight-run length that exceeds 25 ft (7.6 m). Install in runs of aboveground IMC conduit that are located where environmental temperature change may exceed 100 deg F (55 deg C) and that have straight-run length that exceeds 100 ft (30 m).
2. Install type and quantity of fittings that accommodate temperature change listed for the following locations:
 - a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F (70 deg C) temperature change.
 - b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F (86 deg C) temperature change.
 - c. Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F (70 deg C) temperature change.
3. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F (0.06 mm per meter of length of straight run per deg C) of temperature change for PVC conduits. Install fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of

length of straight run per deg F (0.0115 mm per meter of length of straight run per deg C) of temperature change for metal conduits.

4. Install expansion fittings at locations where conduits cross building or structure expansion joints.
5. Install expansion fittings at exterior locations to allow for frost heave where conduits extend from below grade and terminate in an enclosure or junction box. Required at all exterior utility meter locations.
6. Install expansion-joint fitting with position, mounting, and piston setting selected in accordance with manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.

3.4 INSTALLATION OF BOXES AND ENCLOSURES

- A. Provide boxes in wiring and raceway systems wherever required for pulling of wires, making connections, and mounting of devices or fixtures.
- B. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.
- C. Locate boxes so that cover or plate will not span different building finishes.
- D. Support boxes in recessed ceilings independent of ceiling tiles and ceiling grid.
- E. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for purpose.
- F. Fasten junction and pull boxes to, or support from, building structure. Do not support boxes by conduits.
- G. Do not install aluminum boxes, enclosures, or fittings in contact with concrete or earth.
- H. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to ensure a continuous ground path.
- I. Boxes and Enclosures in Areas or Walls with Acoustical Requirements:
 1. Seal openings and knockouts in back and sides of boxes and enclosures with acoustically rated putty.
 2. Provide gaskets for wallplates and covers.

3.5 FIRESTOPPING

- A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Section 07 84 13 "Penetration Firestopping."

3.6 PROTECTION

- A. Protect coatings, finishes, and cabinets from damage and deterioration.
 - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
 - 2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

3.7 CLEANING

- A. Boxes: Remove construction dust and debris from device boxes, outlet boxes, and floor-mounted enclosures before installing wallplates, covers, and hoods.

END OF SECTION

SECTION 26 05 53 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Electrical identification requirements.
- B. Buried electrical line warnings.
- C. Identification nameplates and labels.
- D. Wire and cable markers.
- E. Conduit markers.
- F. Warning signs and labels.

1.2 REFERENCE STANDARDS

- A. ANSI Z535.2 - American National Standard for Environmental and Facility Safety Signs; 2007.
- B. ANSI Z535.4 - American National Standard for Product Safety Signs and Labels; 2007.
- C. NFPA 70 - National Electrical Code; National Fire Protection Association; 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.

PART 2 - PRODUCTS

2.1 ELECTRICAL IDENTIFICATION PRODUCTS

- A. Underground Line Marking Tape: Permanent, bright-colored, continuous-printed, plastic, tape compounded for direct-burial service not less than 6 inches wide by 4 mils thick. Printed legend shall be indicative of general type of underground line below, such as "CAUTION – BURIED ELECTRIC LINE BELOW". Tape shall have integral metallic facing or metallic core to allow locating buried tape with electronic detection equipment. Provide marking tape similar to Thomas & Betts NAF series.
- B. Wire and Cable Designation Tape Markers: Vinyl or vinyl-cloth, self-adhesive, wraparound, cable and conductor markers with preprinted numbers and letter.

- C. Plasticized Card Stock Tags: Vinyl cloth with preprinted and field-printed legends to suit the application. Orange background, except as otherwise indicated, with eyelet for fastener.
- D. Engraved, Plastic-Laminated Labels, Signs, and Instruction Plates: Engraving stock melamine plastic laminate, 1/16-inch minimum thick for signs up to 20 square inches, or 8 inches in length; 1/8-inch thick for larger sizes. Engraved legend in black letters on white face. Punched for mechanical fasteners if screws are used to fasten.
- E. Fasteners for Plastic-Laminated and Metal Signs: Self-tapping stainless steel screws or number 10-32 stainless steel machine screws with nuts and flat and lock washers.
- F. Cable Ties: Fungus-inert, self-extinguishing, nylon one-piece, self-locking cable ties, 0.18-inch minimum width, 50-lb minimum tensile strength, and suitable for a minimum temperature range from minus 50 deg F to 350 deg F. Provide ties in specified colors when used for color-coding.
- G. Identification Cable Ties: Same as "Cable Ties" above, except with integral tab of suitable size for marking requirements.

2.2 IDENTIFICATION REQUIREMENTS

- A. Identification for Equipment:
 - 1. Use identification nameplate, labels, and markers to identify each piece of electrical distribution, control equipment and associated sections, compartments, and components.
- B. Identification for Conductors and Cables:
 - 1. Color Coding for Power Conductors 600 V and Less: Comply with Section 26 05 19 Low-Voltage Electrical Power Conductors and Cables.
 - 2. 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.

2.3 NAMEPLATES

- A. Nameplates shall be laminated black phenolic resin with a white core with engraved lettering for normal power system.
- B. Nameplates shall identify the following:
 - 1. Equipment ID.
 - 2. Voltage/Phase/# of Wires

- 3. Wire Size
 - 4. Where the equipment is Fed From
- C. Locations:
 - 1. All disconnect switches, and panelboards.
- D. Secure Nameplates with screws or permanent adhesive.
- E. Letter Size:
 - 1. Use 1/2 inch high capital letters. Minimum font size 48.
- 2.4 CIRCUIT IDENTIFICATION LABELS
 - A. Labels shall identify panelboard and branch circuit breaker position for installed power wiring.
 - B. Locations:
 - 1. Electrical outlet faceplates.
 - 2. Blank cover plates on gutters, pull boxes, and junction boxes.
 - C. Labels: Embossed adhesive tape, with 3/16 inch black letters on clear background.
- 2.5 WIRE AND CABLE MARKERS
 - A. 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.
 - B. Markers for Conductor and Cable Bundles: Use plastic marker tags secured by nylon cable ties.
 - C. Legend: Power source and circuit number or other designation indicated.
 - D. Text: Use factory pre-printed or machine-printed text, all capitalized unless otherwise indicated.
 - E. Minimum Text Height: 1/8 inch.
 - F. Color: Black text on white background unless otherwise indicated.
 - G. Description: Vinyl cloth or Nylon type self-adhesive wire markers.

- H. Locations: Each conductor at panelboard termination, gutters, pull boxes, outlet boxes, junction boxes and load connection. Neutral conductors to identify breaker position(s) of associated phase conductor(s).

2.6 CONDUIT MARKERS

- A. Minimum Size: 3/8 inch high letters.
- B. Color: Black text on white background unless otherwise indicated.
- C. Description: Vinyl cloth or Nylon type self-adhesive marker.
- D. Location:
 - 1. All conduits entering or leaving a panelboard or switchboard to be identified with the far end location.
 - 2. Furnish markers identified in Legend at 20 ft. spacing for each conduit longer than 6 feet.
- E. Legend:
 - 1. 208 Volt System: 208V.
 - 2. 120 Volt System: 120V.

2.7 WARNING SIGNS AND LABELS

- A. Comply with ANSI Z535.2 or ANSI Z535.4 as applicable.
- B. Warning Signs:
 - 1. Engraved, Plastic-Laminated Labels as described in this Section.
 - 2. The letters shall be at least ¾ in. in height. Size 72 font.
 - 3. Locations:
 - a. Electrical Service Entrance: A sign shall be located at the service-entrance equipment.
 - 1) Sign shall be laminated yellow phenolic resin with a black core with engraved lettering.
 - 2) Descriptive text size: ¼" high all capital letters. Minimum font size of 28.
- C. Nameplates shall be laminated black phenolic resin with a white core with engraved lettering for normal power system.
- 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.

2. Machine-Printed Labels: Use thermal transfer process printing machines and accessories recommended by label manufacturer.
3. Minimum Size: The letters shall be at least ½" (13 mm) in height.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean surfaces to receive adhesive products according to manufacturer's instructions.
- B. Degrease and clean surfaces to receive nameplates and labels.

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. Free-Standing Equipment: Enclosure front
 3. Conductors and Cables: Legible from the point of access.
- C. Install identification products centered, level, and parallel with lines of item being identified.
- D. Install self-adhesive labels and markers to achieve maximum adhesion, with no bubbles or wrinkles and edges properly sealed.
- E. Install Nameplates, Labels, and Markers on all equipment, boxes, wire, conduit, and devices identified in Part 2 Products of this Section.

END OF SECTION

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SECTION 26 24 16 - PANELBOARDS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Power panelboards.
 - 2. Lighting and appliance branch-circuit panelboards.
 - 3. Disconnecting and overcurrent protective devices.

1.2 DEFINITIONS

- A. GFEP: Ground-fault equipment protection.
- B. MCCB: Molded-case circuit breaker.
- C. VPR: Voltage protection rating.

1.3 ACTION SUBMITTALS

- A. Product Data:
 - 1. Power panelboards.
 - 2. Lighting and appliance branch-circuit panelboards.
 - 3. Disconnecting and overcurrent protective devices.
 - 4. Include materials, switching and overcurrent protective devices, SPDs, accessories, and components indicated.
 - 5. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.
- B. Shop Drawings: For each panelboard and related equipment.
 - 1. Include dimensioned plans, elevations, sections, and details.
 - 2. Show tabulations of installed devices with nameplates, conductor termination sizes, equipment features, and ratings.
 - 3. Detail enclosure types including mounting and anchorage, environmental protection, knockouts, corner treatments, covers and doors, gaskets, hinges, and locks.
 - 4. Detail bus configuration, current, and voltage ratings.
 - 5. Short-circuit current rating of panelboards and overcurrent protective devices.
 - 6. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
 - 7. Include wiring diagrams for power wiring.

- C. Field Quality-Control Submittals:
 - 1. Field quality-control reports.

1.4 CLOSEOUT SUBMITTALS

- A. Warranty documentation. Minimum 12 months from substantial completion.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Spare Parts: Furnish to Owner spare parts, for repairing panelboards, that are packaged with protective covering for storage on-site and identified with labels describing contents. Include the following:
 - 1. Keys: Two spares for each type of panelboard cabinet lock.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Remove loose packing and flammable materials from inside panelboards
- B. Handle and prepare panelboards for installation in accordance with NECA 407.

PART 2 - PRODUCTS

2.1 PANELBOARDS AND LOAD CENTERS COMMON REQUIREMENTS

- A. Product Selection for Restricted Space: Drawings indicate maximum dimensions for panelboards including clearances between panelboards and adjacent surfaces and other items. Comply with indicated maximum dimensions.
- B. Electrical Components, Devices, and Accessories: Listed and labeled in accordance with NFPA 70, by qualified electrical testing agency recognized by authorities having jurisdiction, and marked for intended location and application.
- C. Comply with NEMA PB 1.
- D. Comply with NFPA 70.
- E. Enclosures: Surface-mounted, dead-front cabinets, as identified on schedules.
 - 1. Rated for environmental conditions at installed location.
 - a. Outdoor Locations: UL 50E, Type 3R.
 - 2. Height: 7 ft (2.13 m) maximum.
 - 3. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover. Trims must cover live parts and may have no exposed hardware.

4. Finishes:

- a. Panels and Trim: Steel, factory finished immediately after cleaning and pretreating with manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat.
- b. Back Boxes: Same finish as panels and trim.

F. Incoming Mains:

1. Location: Convertible between top and bottom.
2. Main Breaker: Main lug interiors up to 400 A must be field convertible to main breaker.

G. Phase, Neutral, and Ground Buses:

1. Material: Hard-drawn copper, 98 percent conductivity.
 - a. Plating must run entire length of bus.
 - b. Bus must be fully rated for entire length. Horizontal bussing shall be fully rated, non-tapered, extended, drilled and tapped for extension to future sections without modifying the bus. Vertical bussing in each section shall be non-tapered, extended, drilled and tapped to accommodate all future devices presently indicated as spaces, without modifying the bus. Neutral bus to be rated at 100 per cent of the main bus rating. Ground bus to be rated minimum 25% per cent of the main bus rating.
2. Interiors must be factory assembled into unit. Replacing switching and protective devices may not disturb adjacent units or require removing main bus connectors.
3. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment grounding conductors; bonded to box. Equipment ground bus shall be large enough and have sufficient quantity and sizes of terminations to allow for termination of panelboard feeder plus one equipment grounding conductor per circuit, based on the maximum number of branch circuit protective devices allowed in the panelboard plus 6 additional conductors. Increase terminations to accommodate additional feeder conductors where double lugged panelboards are indicated. Ground busses shall be bonded to enclosure.
4. Full-Size Neutral: Equipped with full-capacity bonding strap for service entrance applications. Mount electrically isolated from enclosure.
5. Do not mount neutral bus in gutter.

H. Conductor Connectors: Suitable for use with conductor material and sizes.

1. Material: Hard-drawn copper, 98 percent conductivity.
2. Terminations must allow use of 75 deg C rated conductors without derating.
3. Size: Lugs suitable for indicated conductor sizes, with additional gutter space, if required, for larger conductors.
4. Main and Neutral Lugs: Mechanical type, with lug on neutral bar for each pole in panelboard.

5. Ground Lugs and Bus-Configured Terminators: Mechanical type, with lug on bar for each pole in panelboard.
 6. Feed-Through Lugs: Mechanical type, suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.
- I. Quality-Control Label: Panelboards or load centers must be labeled, by qualified electrical testing laboratory recognized by authorities having jurisdiction, for use as service equipment with one or more main service disconnecting and overcurrent protective devices. Panelboards or load centers must have meter enclosures, wiring, connections, and other provisions for utility metering. Coordinate with utility company for exact requirements.
 - J. Future Devices: Panelboards or load centers must have mounting brackets, bus connections, filler plates, and necessary appurtenances required for future installation of devices.
 1. Percentage of Future Space Capacity: 5 percent.
 - K. Panelboard Short-Circuit Current Rating:
 1. Rated for series-connected system with integral overcurrent protective devices and labeled by qualified electrical testing laboratory recognized by authorities having jurisdiction. Include label or manual with size and type of allowable upstream and branch devices listed and labeled, by qualified electrical testing laboratory recognized by authorities having jurisdiction, for series-connected short-circuit rating.
 - a. Panelboards rated 240 V or less must have short-circuit ratings as shown on Drawings, but not less than 10 000 A(rms) symmetrical.
 2. Fully rated to interrupt symmetrical short-circuit current available at terminals. Assembly listed, by qualified electrical testing laboratory recognized by authorities having jurisdiction, for 100 percent interrupting capacity.
 - a. Panelboards and overcurrent protective devices rated 240 V or less must have short-circuit ratings as shown on Drawings, but not less than 10 000 A(rms) symmetrical.

2.2 POWER PANELBOARDS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. ABB Electrification Installations Products.
 2. Eaton.
 3. Siemens Industry, Inc., Energy Management Division.
 4. Square D; Schneider Electric USA.

- B. Listing Criteria: NEMA PB 1, distribution type.
- C. Doors: Secured with vault-type latch with tumbler lock; keyed alike.
 - 1. For doors more than 36 inch high, provide two latches, keyed alike.
- D. Mains: Circuit breaker.
- E. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes 125 A and Smaller: Plug-in circuit breakers.
- F. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes Larger Than 125 A: Bolt-on circuit breakers.

2.3 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. ABB Electrification Installations Products.
 - 2. Eaton.
 - 3. Siemens Industry, Inc., Energy Management Division.
 - 4. Square D; Schneider Electric USA.
- B. Listing Criteria: NEMA PB 1, lighting and appliance branch-circuit type.
- C. Mains: Circuit breaker.
- D. Branch Overcurrent Protective Devices: Plug-in circuit breakers, replaceable without disturbing adjacent units.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify actual conditions with field measurements prior to ordering panelboards to verify that equipment fits in allocated space in, and comply with, minimum required clearances specified in NFPA 70.
- B. Receive, inspect, handle, and store panelboards in accordance with NECA 407.
- C. Examine panelboards before installation. Reject panelboards that are damaged, rusted, or have been subjected to water saturation.
- D. Examine elements and surfaces to receive panelboards for compliance with installation tolerances and other conditions affecting performance of the Work.

- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with manufacturer's published instructions.
- B. Reference Standards:
 - 1. Panelboards: Unless more stringent requirements are specified in Contract Documents or manufacturers' published instructions, comply with NECA 407.
 - 2. Consult Architect for resolution of conflicting requirements.
- C. Special Techniques:
 - 1. Equipment Mounting:
 - a. Attach panelboard to vertical finished or structural surface behind panelboard.
 - b. Mount surface-mounted panelboards to steel slotted supports 1-1/4 inch in depth. Orient steel slotted supports vertically.
 - 2. Mount top of trim 7.5 ft above finished floor unless otherwise indicated.
 - 3. Mount panelboard cabinet plumb and rigid without distortion of box.
 - 4. Install overcurrent protective devices and controllers not already factory installed.
 - a. Tighten bolted connections and circuit breaker connections using calibrated torque wrench or torque screwdriver in accordance with manufacturer's published instructions.
 - 5. Make grounding connections and bond neutral for services and separately derived systems to ground. Make connections to grounding electrodes, separate grounds for isolated ground bars, and connections to separate ground bars.
 - 6. Install filler plates in unused spaces.
- D. Interfaces with Other Work:
 - 1. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

3.3 IDENTIFICATION

- A. Identify field-installed conductors, interconnecting wiring, and components; install warning signs complying with requirements in Section 26 05 53 "Identification for Electrical Systems."

- B. Panelboard Nameplates: Label each panelboard with nameplate complying with requirements for identification specified in Section 26 05 53 "Identification for Electrical Systems."
- C. Device Nameplates: Label each branch circuit device in power panelboards with nameplate complying with requirements for identification specified in Section 26 05 53 "Identification for Electrical Systems."
- D. Install warning signs complying with requirements in Section 26 05 53 "Identification for Electrical Systems" identifying source of remote circuit.
- E. Panelboard Label: Manufacturer's name and trademark, voltage, amperage, number of phases, and number of poles must be located on interior of panelboard door.
- F. Breaker Labels: Faceplate must list current rating, UL and IEC certification standards, and AIC rating.
- G. Circuit Directory:
 - 1. Provide directory card inside panelboard door, mounted in transparent card holder.
 - a. Circuit directory must identify specific purpose with detail sufficient to distinguish it from other circuits.

3.4 FIELD QUALITY CONTROL

- A. Acceptance Testing Preparation:
 - 1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
 - 2. Test continuity of each circuit.
- B. Nonconforming Work:
 - 1. Panelboards will be considered defective if they do not pass tests and inspections.
 - 2. Remove and replace defective units and retest.
- C. Collect, assemble, and submit test and inspection reports, including certified report that identifies panelboards included. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

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SECTION 26 27 13 - ELECTRICITY METERING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes equipment for electricity metering by utility company.

1.2 QUALITY ASSURANCE

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

1.3 COORDINATION

- A. Electrical Service Connections: Coordinate with utility companies and components they furnish as follows:
 - 1. Comply with requirements of utilities providing electrical power services.
 - 2. Coordinate installation and connection of utilities and services, including provision for electricity-metering components.

PART 2 - PRODUCTS

2.1 EQUIPMENT FOR ELECTRICITY METERING BY UTILITY COMPANY

- A. Meters will be furnished by utility company.
- B. Current-Transformer Cabinets: Comply with requirements of electrical-power utility company.
- C. Meter Sockets: Comply with requirements of electrical-power utility company.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with equipment installation requirements in NECA 1.
- B. Install meters furnished by utility company. Install raceways and equipment according to utility company's written requirements. Provide empty conduits for metering leads and extend grounding connections as required by utility company.

END OF SECTION

SECTION 26 27 26 - WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. General-grade straight-blade receptacles.
 - 2. Receptacles with ground-fault protective devices.
 - 3. Connectors, cords, and plugs.

1.2 ACTION SUBMITTALS

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

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Arrow Hart, Wiring Devices; Eaton, Electrical Sector.
 - 2. Hubbell Wiring Device-Kellems; brand of Hubbell Electrical Solutions; Hubbell Incorporated.
 - 3. Leviton Manufacturing Co., Inc.
 - 4. Pass & Seymour; Legrand North America, LLC.

2.2 GENERAL WIRING DEVICE REQUIREMENTS

- A. Device Color: Gray
- B. Accessories:
 - 1. Cover Plate: 0.060 inch (1.5 mm) thick, high-impact thermoplastic (nylon) with smooth finish and color matching wiring device; from same manufacturer as wiring device.
 - 2. Securing Screws for Cover Plate: Metal with head color matching wallplate finish.

2.3 GENERAL-GRADE STRAIGHT-BLADE RECEPTACLES

- A. Duplex Straight-Blade Receptacle:
 - 1. Regulatory Requirements:

- a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
- 2. General Characteristics:
 - a. Reference Standards: UL CCN RTRT and UL 498.
- 3. Configuration:
 - a. Heavy-duty, NEMA 5-20R.

2.4 RECEPTACLES WITH GROUND-FAULT PROTECTIVE DEVICES

- A. General-Grade, Weather-Resistant, Tamper-Resistant Duplex Straight-Blade Receptacle with GFCI Device:
 - 1. Regulatory Requirements:
 - a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
 - 2. General Characteristics:
 - a. Reference Standards: UL CCN KCXS, UL 498, and UL 943.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Receptacles:
 - 1. Verify that receptacles to be procured and installed for Owner-furnished equipment are compatible with mating attachment plugs on equipment.

3.2 SELECTION OF GFCI RECEPTACLES

- A. Unless protection of downstream branch-circuit wiring, cord sets, and power-supply cords is required by NFPA 70 or NFPA 99, provide non-feed-through GFCI receptacles.

3.3 INSTALLATION OF STRAIGHT-BLADE RECEPTACLES

- A. Comply with manufacturer's instructions.
 - 1. Consult Architect for resolution of conflicting requirements.
- B. Identification:
 - 1. Identify cover or cover plate for device with panelboard identification and circuit number in accordance with Section 26 05 53 "Identification for Electrical Systems."

3.4 FIELD QUALITY CONTROL OF STRAIGHT-BLADE RECEPTACLES

A. Tests and Inspections:

1. Insert and remove test plug to verify that device is securely mounted.
2. Verify polarity of hot and neutral pins.
3. Measure line voltage.
4. Measure percent voltage drop.
5. Measure grounding circuit continuity; impedance must be not greater than 2 ohms.
6. Perform additional installation and maintenance inspections and diagnostic tests in accordance with NECA NEIS 130 and manufacturers' instructions.

B. Nonconforming Work:

1. Device will be considered defective if it does not pass tests and inspections.
2. Remove and replace defective units and retest.

3.5 PROTECTION

A. Devices:

1. Schedule and sequence installation to minimize risk of contamination of wires and cables, devices, device boxes, outlet boxes, covers, and cover plates by plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other materials.
2. After installation, protect wires and cables, devices, device boxes, outlet boxes, covers, and cover plates from construction activities. Remove and replace items that are contaminated, defaced, damaged, or otherwise caused to be unfit for use prior to acceptance by Owner.

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