PUBLIC IMPROVEMENTS
CONTRACT DOCUMENTS

INGERSOLL AVENUE STREETSCAPE FROM ML. KING JR. PARKWAY TO 24TH STREET (NORTH SIDE)

ACTIVITY ID
042019007

PLAN FILE NO.
615-001/109

CITY COUNCIL APPROVAL

APPROVAL DATE
March 9, 2020

ROLL CALL NO.

CONTRACT NO.

CONTRACTOR

CONTRACT AMOUNT
$0.00

ENGINEERING DEPARTMENT
Steven L. Naber, P.E.
Des Moines City Engineer

Funding Information
Object Code 543060
Organization No. C038EG99
Project No. ST276
ENGINEERING DEPARTMENT
CITY OF DES MOINES, IOWA

Ingersoll Avenue Streetscape from M.L. King Jr. Parkway to 24th Street (north side)

Activity ID 04-2019-007

The following documents are part of this contract:

- Document
- Instructions to Bidders
- Official Publications
- Proposal
- Bid Bond
- Contract
- Performance, Payment and Maintenance Bond

Addenda:

Special Provisions:

- Bidding Requirements
- Contractual Requirements
- Technical Specifications

Supplemental Specifications:

- General Supplemental Specifications to SUDAS, 2019 Edition

April 22, 2019

PROJECT ENGINEER: Christopher Kuhl, P.E.

Phone Number: (515) 283-4073
INSTRUCTIONS TO BIDDERS

Activity ID 04-2019-007
Project Name Ingersoll Avenue Streetscape from M.L. King Jr. Parkway to 24th Street (north side)
Fed/St. Project No.

The work comprising the above referenced project shall be constructed in accordance with the SUDAS Standard Specifications, 2019 Edition; and as further modified by the supplemental specifications and special provisions included in the contract documents. The Des Moines City Engineer is the Engineer. The terms used in the contract documents are defined in said SUDAS Standard Specifications. The City of Des Moines is the Contracting Authority on this project and shall hereinafter be referred to as the "Jurisdiction". Before submitting your bid, please review the SUDAS Standard Specifications, in particular, Division 1 - General Provisions and Covenants, including the sections regarding proposal requirements, bonding, contract execution and insurance requirements. Please be certain that all documents have been properly completed and submit them to the City Clerk, 1st Floor, City Hall, 400 Robert D. Ray Drive, Des Moines, Iowa, 50309.

I. BID SECURITY

The bid security must be in the minimum amount of 10% of the total bid amount including all add alternates (do not deduct the amount of deduct-altternates). Bid security shall be as defined in Section 26.8 of the Iowa Code and 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 bond bond executed by a corporation authorized to contract as a surety in Iowa or satisfactory to the Jurisdiction. The bid bond must be submitted on the enclosed Bid Bond form (DSM Urban 04/20/98) as no other bid bond forms are acceptable. All signatures on the bid bond must be original signatures in ink; facsimile (fax) of any signature on the bid bond is not acceptable. Bid security other than said bid bond shall be made payable to the City of Des Moines. "Miscellaneous Bank Checks", and personal checks, as well as "Money Orders" and "Traveler's Checks" issued by persons, firms or corporations licensed under Chapter 533B of the Iowa Code, are not acceptable bid security. NOTE: If the Bidder submits Bid Security in the form of a Bid Bond, and the Bidder wishes to have their Bid Bond returned to them after an approved contract and bond has been executed or after there is a rejection of all bids (in accordance with Iowa Code 26.10), the Bidder shall include a self-addressed envelope with the Bid Bond.

II. SUBMISSION OF THE PROPOSAL AND IDENTITY OF BIDDER

A. 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, and 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 sealed in the separate envelope identified as Bid Security and attached to the outside of the bid proposal envelope. Any proposal received after the scheduled time for the receiving of proposals will be returned to the bidder unopened and will not be considered. Bidders must either utilize the two envelopes provided with the Bidding documents, or Bidders provide their own two envelopes, for their proposals and bid security for submission of their bids.

Sales Tax: The bidder should not include sales tax in the bid pursuant to Iowa Code. A sales tax exemption certificate will be available for all material purchased for incorporation in the project.

Accessibility for individuals with disabilities. The City of Des Moines is pleased to provide accommodations to individuals with disabilities or groups and encourages participation in City government. To better serve you, please notify us at least three business days in advance when possible at 515-283-4209, should special accommodations be required.
B. All pages of the Proposal must be returned. The following documents shall be completed, signed and returned in the Proposal envelope.

PROPOSAL - Complete each of the following parts:
- Part B - Acknowledgement of Addenda, if any have been issued;
- Part C - Bid Items, Quantities and Prices;
- Part F - Additional Requirements; The following proposal attachment documents must be completed and attached:

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>DESCRIPTION OF ATTACHMENT</th>
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<tbody>
<tr>
<td>1.</td>
<td>Reciprocal Resident Bidder and Labor Force</td>
</tr>
<tr>
<td>2.</td>
<td>General</td>
</tr>
</tbody>
</table>

- Part G - Identity of Bidder.

The Bidder shall 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. The Bidder Status Form (PROPOSAL Part F Item 2B), is required by the Iowa Labor Commissioner, pursuant to Iowa Admin. Code rule 875-156.2(1). The Bidder must complete and submit the Bidder Status Form, signed by an authorized representative of the Bidder, with their bid proposal. Under Iowa Admin. Code rule 875-156.2(1), failure to provide the Bidder Status Form with the bid may result in the bid being deemed non-responsive and may result in the bid being rejected. The Worksheet: Authorization to Transact Business from the Labor Commissioner is included on page 3 of 3 of the Instructions to Bidders, to assist Bidders in completing the Bidder Status Form.

C. Out-of-State Contractors:

1. 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 Iowa Department of Workforce Development. The contractor should contact 515-242-5871 for further information. Prior to contract execution, the City 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.

2. Prior to entering into contract, the designated low bidder, if it be a corporation organized under the laws of a state other than Iowa, shall file with the 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, or as amended, governing foreign corporations. For further information contact the Iowa Secretary of State Office at 515-281-5204.

III. GENERAL

A. All bid documents must be submitted as printed. No alterations, additions, or deletions are permitted. If the Bidder notes a requirement in the contract documents that 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.

B. Additional information regarding addenda, plan holders, bid tabulations, etc. can be found on the Engineering Department web site at <http://www.dmgov.org/Departments/Engineering/Pages/BidsContracts.aspx>.
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.
NOTICE TO BIDDERS

CITY OF DES MOINES PUBLIC IMPROVEMENT PROJECT

Time and Place for Filing Sealed Proposals. Sealed bids for the work comprising each improvement as stated below must be filed at or before 11:00 a.m. on February 25, 2020, in the office of the City Clerk, 1st Floor, City Hall, 400 Robert D. Ray Drive, Des Moines, Iowa, 50309.

Accessibility for individuals with disabilities. The City of Des Moines is pleased to provide accommodations to individuals with disabilities or groups and encourages participation in City government. To better serve you, please notify us at least three business days in advance when possible at 515-283-4209, should special accommodations be required.

Time and Place Sealed Proposals Will be Opened and Considered. Sealed proposals will be opened and bids tabulated at 11:00 a.m., on February 25, 2020, in the City Council Chambers, 2nd Floor, City Hall, 400 Robert D. Ray Drive, Des Moines, Iowa, for consideration by the City Council (Council) at its meeting on March 9, 2020. The City of Des Moines (Jurisdiction) reserves the right to reject any and all bids.

Time for Commencement and Completion of Work. Work on each improvement shall be commenced upon approval of the contract by the Council, and completed as stated below.

Bid Security. Each bidder shall accompany its bid with bid security as defined in Section 26.8 of the Iowa Code and as specified by the Jurisdiction.

Contract Documents. Copies of the contract documents will be available after January 27, 2020, from the City Engineer's Office, 2nd Floor, City Hall, 400 Robert D. Ray Drive, Des Moines, Iowa 50309, at no cost, phone (515) 283-4573.

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

Sales Tax. The bidder should not include sales tax in the bid. A sales tax exemption certificate will be available for all material purchased for incorporation in the project.

General Nature of Public Improvement.
Ingersoll Avenue Streetscape from M.L. King Jr. Parkway to 24th Street (north side), 04-2019-007
The improvement includes construction of Portland Cement Concrete (PCC) sidewalks, driveways, pavement, colored concrete, and Hot Mix Asphalt (HMA) paving, together with the necessary removals, earthwork, clearing and grubbing, erosion control, subdrains, storm sewers, traffic control, traffic signals, conduit, site furnishings, plantings, permeable pavers, and surface restoration; all in accordance with the contract documents, including Plan File Nos. 615-001/109, on Ingersoll Avenue from M.L. King Jr. Parkway to 24th Street, Des Moines, Iowa.

This project shall be fully completed not later than June 1, 2021, and in accordance with the Completion Provisions.

Engineer's Construction Estimate. $2,680,000.00

Preletting Conference.
NOTICE OF PUBLIC HEARING
CITY OF DES MOINES PUBLIC IMPROVEMENT PROJECT

Public Hearing on Proposed Contract Documents and Estimated Costs for Improvement. A public hearing will be held by the City Council on the proposed contract documents (plans, specifications and form of contract) on file in the City Engineer’s Office, and estimated cost for each improvement at its meeting on March 9, 2020, at 5:00 p.m., in the City Council Chambers, 2nd Floor, City Hall, 400 Robert D. Ray Drive, Des Moines, Iowa. The City Council Meetings are open to all individuals regardless of disability. To better serve you, please notify the City Clerk at least three business days in advance, when possible, should special accommodations be required.

General Nature of Public Improvement

Ingersoll Avenue Streetscape from M.L. King Jr. Parkway to 24th Street (north side), 04-2019-007
The improvement includes construction of Portland Cement Concrete (PCC) sidewalks, driveways, pavement, colored concrete, and Hot Mix Asphalt (HMA) paving, together with the necessary removals, earthwork, clearing and grubbing, erosion control, subdrains, storm sewers, traffic control, traffic signals, conduit, site furnishings, plantings, permeable pavers, and surface restoration; all in accordance with the contract documents, including Plan File Nos. 615-001/109, on Ingersoll Avenue from M.L. King Jr. Parkway to 24th Street, Des Moines, Iowa

Published in the Des Moines Register
February 19, 2020
PUBLIC NOTICE OF STORM WATER DISCHARGE

The City of Des Moines, or its Contractor for the following work, plans to submit a Notice of Intent to the Iowa Department of Natural Resources to be covered under NPDES General Permit No. 2 “Storm Water Discharge Associated with Industrial Activity for Construction Activities.” The storm water discharge will be from the construction of the Ingersoll Streetscape from M.L. King, Jr. Parkway to 24th Street (north side), Activity ID 04-2019-007.

located in ______ SE ¼ Sec. 5, T78N, R24W, Polk County ____________________________

Storm water will be discharged from ______ 1 ______ point source and will be discharged to the following stream: ______ Des Moines River ______.

Comments may be submitted to the Storm Water Discharge Coordinator, IOWA DEPARTMENT OF NATURAL RESOURCES, Environmental Protection Division, 502 E. 9th Street, Des Moines, IA, 50319-0034. The public may review the Notice of Intent from 8:00 a.m. to 4:30 p.m., Monday through Friday, at the above address after it has been received by the department.

Published in the ______ The Des Moines Register ______
January 29, 2020
PROPOSAL

To the Honorable Mayor and Members of the City Council, City of Des Moines, Iowa

PROPOSAL: PART A - SCOPE

The City of Des Moines, hereinafter called the "Jurisdiction", has need of a qualified contractor to complete the work comprising the below referenced improvement. The undersigned Bidder hereby proposes to complete the work comprising the below referenced improvements or project as specified in the contract documents, which are officially on file with the Jurisdiction, in the Des Moines City Engineer's Office, at the prices hereinafter provided in Part C of this Proposal, for the following described improvements:

Ingersoll Avenue Streetscape from M.L. King Jr. Parkway to 24th Street (north side), 04-2019-007

The improvement includes construction of Portland Cement Concrete (PCC) sidewalks, driveways, pavement, colored concrete, and Hot Mix Asphalt (HMA) paving, together with the necessary removals, earthwork, clearing and grubbing, erosion control, subdrains, storm sewers, traffic control, traffic signals, conduit, site furnishings, plantings, permeable pavers, and surface restoration; all in accordance with the contract documents, including Plan File Nos. 615-001/109, on Ingersoll Avenue from M.L. King Jr. Parkway to 24th Street, Des Moines, Iowa

PROPOSAL: PART B - ACKNOWLEDGEMENT 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, QUANTITIES AND PRICES

UNIT BID PRICE CONTRACTS: The bidder must provide all unit prices, the amount, the total construction cost, any alternate price(s), and the total construction cost plus any add-alternates if there are alternates on the proposal on Proposal Attachment: Part C - Bid Items, Quantities, and Prices. The total construction cost plus any alternates selected by the Jurisdiction shall be used for comparison of bids. The total construction cost plus any add-alternates shall be used for determining the sufficiency of the bid security.
BASE BID CONTRACTS: The bidder must provide any bid price(s), the total base bid price, any alternate price(s), and the total base bid plus any add-alternates if there are alternates on the proposal on Proposal Attachment: Part C - Bid Items, Quantities, and Prices. The total base bid plus any alternates selected by the Jurisdiction shall be used for comparison of bids. The total base bid plus any add-alternates shall be used for determining the sufficiency of the bid security.

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 plus any selected alternates; and

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 and provide the following documents:
   - Proof of registration with the Iowa Division of Labor in accordance with Chapter 91C of the Iowa Code by providing a valid Registration Number,
   - Proof of insurance by a Certificate(s) of Insurance,
   - 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 documents and information as requested in Item 1 above acceptable to the Des Moines City Engineer; and

3. Commence the work on this project on or before a date to be specified in a written notice to proceed by the Jurisdiction, and to fully complete the project not later than June 1, 2021, and in accordance with the Completion Provisions; and to pay liquidated damages for noncompliance with said completion provisions at the rate of five hundred and 00/100 dollars ($500.00) 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 paid 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 put in a sham bid or to refrain from bidding, and 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 that all statements in this proposal are true; and

5. 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:

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</table>
PROPOSAL: PART G - IDENTITY OF BIDDER

The Bidder shall indicate whether the bid is submitted by an

☐ Individual,
☐ Sole Proprietorship
☐ Partnership
☐ Corporation
☐ Limited Liability Company
☐ Joint-venture: all parties must join-in and execute all documents
☐ Other

By

Bidder

Signature

Name (Print/Type)

Title

Street Address

City, State, Zip Code

Telephone Number/ Email Address

A contract will not be executed until the apparent low Bidder is registered with the Iowa Commissioner of Labor pursuant to Section 91C.5 of the Iowa Code. The Bidder should contact 515-242-5871 for registration information.

Engineering Department Staff will contact the apparent low Bidder and obtain the name and title of the company's owner, president, CEO, etc. if a different person than entered above.

NOTE: The signature on this proposal must be an original signature in ink; copies or facsimile of any signature will not be accepted.
**PROPOSAL ATTACHMENT: PART C - BID ITEMS, QUANTITIES AND PRICES: 1 of 6**

This is a unit bid price contract. The bidder must provide all unit prices, the amount, the total construction cost, any alternate price(s), and the total construction cost plus any add-altnerates if there are alternates on the proposal. The total construction cost plus any alternates selected by the Jurisdiction shall be used for comparison of bids. The total construction cost plus any add-altnerates shall be used for determining the sufficiency of the bid security.

Activity ID 04-2019-007

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<th>QUANTITY</th>
<th>UNIT PRICE</th>
<th>AMOUNT</th>
</tr>
</thead>
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<tr>
<td>0001</td>
<td>Clearing &amp; Grubbing</td>
<td>UNIT</td>
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<td>0002</td>
<td>Excavation, Class 10, Waste</td>
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<td>Subgrade Preparation, 6 In.</td>
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<td>Subgrade Treatment, Geogrid, Type 2</td>
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<td>0006</td>
<td>Granular Backfill</td>
<td>TON</td>
<td>500.00</td>
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<tr>
<td>0007</td>
<td>Sanitary Sewer Service Relocation</td>
<td>EA</td>
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<tr>
<td>0008</td>
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<td>Storm Sewer, Trenched, 18 In.</td>
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<td>0010</td>
<td>Subdrain, 6 In., Perforated</td>
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<td>0012</td>
<td>Manhole Type SW-402, 60&quot;X48&quot;</td>
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<td>Intake Type, SW-505</td>
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<td>Intake Type, SW-501</td>
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<td>0015</td>
<td>Manhole Adjustment, Minor</td>
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<td>0016</td>
<td>Remove Intake</td>
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Proposal for: Ingersoll Avenue Streetscape from M.L. King Jr. Parkway to 24th Street (north side)
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<tr>
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<th>AMOUNT</th>
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<td>0021</td>
<td>* Removal of Sidewalk</td>
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<td>Sidewalk, PCC, 5-Inch</td>
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Proposal for: Ingersoll Avenue Streetscape from M.L. King Jr. Parkway to 24th Street (north side)
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Proposal for: Ingersoll Avenue Streetscape from M.L. King Jr. Parkway to 24th Street (north side)
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<td>Prepare Excavation for Tapping Sleeve &amp; Valve</td>
<td>EA 1.00</td>
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<td>0208</td>
<td>6&quot; Cap/Plug</td>
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<td>12&quot; Cap w/ 2&quot; Blowoff</td>
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<td>Remove Unsuitable Materials</td>
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<td>500.00</td>
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**DIVISION 2 SUBTOTAL:** $___________

**TOTAL CONSTRUCTION COST (DIVISION 1 + DIVISION 2):** $___________

*Item does not have to be included in 4-year maintenance bond but shall be covered by a 1-year maintenance bond.

**NOTE:** It is understood that the above quantities are estimated for the purpose of this bid. All quantities are subject to revision by the City. Quantity changes which amount to twenty (20) percent or less of the total bid shall not affect the unit bid price of that item.
Iowa Code section 73A.21 provides for a Reciprocal Resident Bidder and Labor Force preference.

Because of the nature of this project (i.e. Federal-aid participation), the Reciprocal Resident Bidder and Labor Force preference,

☐ shall not apply to this project, and the bidder need not complete the Resident Bidder Information below.

☒ shall apply to this project, and the bidder shall complete the Resident Bidder Information below.

To implement section 73A.21, the Iowa Labor Commissioner adopted chapter 156 of the Iowa Administrative Code, “Bidder Preferences in Government Contracting”. Iowa Admin. Code rule 875-156.2(1) requires each bidder to complete the attached Bidder Status Form. The Bidder must complete and submit the Bidder Status Form, signed by an authorized representative of the bidder, with their bid Proposal. Under Iowa Admin. Code rule 875-156.2(1), failure to provide the statement with the bid may result in the bid being deemed nonresponsive and may result in the bid being rejected.
Bidder Status Form

To be completed by all bidders

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:
  Authorization to Transact Business", on page 3 of the "Instructions to Bidders").

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 nonresident bidder. Please complete Parts C and D of this form.

To be completed by resident bidders

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

| Dates: ____ / ____ / ____ to ____ / ____ / ____ | Address: ________________________________ |
| City, State, Zip: ____________________________ |

| Dates: ____ / ____ / ____ to ____ / ____ / ____ | Address: ________________________________ |
| City, State, Zip: ____________________________ |

| Dates: ____ / ____ / ____ to ____ / ____ / ____ | Address: ________________________________ |
| City, State, Zip: ____________________________ |

You may attach additional sheet(s) if needed.

To be completed by non-resident bidders

1. Name of home state or foreign country reported to the Iowa Secretary of State:

2. Does your company’s home state or foreign country offer preferences to bidders who are residents? Yes__ No__

3. 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

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 a reason to reject my bid.

Firm Name:

Signature: __________________________ Date: ________________

You must submit the completed form to the governmental body requesting bids pet875 Iowa Administrative Code Chapter 156.

This form has been approved by the Iowa Labor Commissioner.

309-6001 02-14
PROPOSAL ATTACHMENT E  PART F- ADDITIONAL REQUIREMENTS
ITEM 2 - GENERAL

1. The work under this proposal shall be constructed in accordance with the SUDAS Standard Specifications, 2019 Edition, and as further modified by the supplemental specifications and special provisions included in the contract documents.

   Alternate Sales Tax
   Section 1020, 1.08, B, of the Supplemental Specifications shall apply. The bidder should not include sales tax in the bid. A sales tax exemption certificate will be available for all material purchased for incorporation in the project.

2. The Bidder hereby acknowledges that the City of Des Moines in advertising for public bids for this work reserves the right to give a limited notice to proceed of a duration not longer than three months. This limited notice to proceed shall be given where all necessary right-of-way has not yet been acquired. The limited notice to proceed will allow construction to proceed as far as possible and practical on the right-of-way, which has been acquired.

3. The Bidder hereby acknowledged and agrees:
   • To comply with the Equal Employment Opportunity Program included in the City of Des Moines Contract Compliance Program, which is available at the following website <http://www.dm.gov/Departments/Engineering/PDF/Contract%20Compliance%20Program%20(June%202017).pdf> or from the City Engineer’s Office.
   • To comply with any and all applicable provisions of the Des Moines Human Rights Ordinance, Chapter 62, of the Des Moines Municipal Code.
   • Not to discriminate against any employees, or applicants for employment, on the basis of age, race, religion, creed, color, sex, sexual orientation, national origin, ancestry, disability, familial status or gender identity.

4. The City’s Overall Annual DBE/TSB Goal for calendar year 2020 is 5.94%, which represents a target that the City would like to achieve in include DBE/TSB participation on City contracts; and is not a mandatory goal for this project. The Certified Directory of DBEs is available at the following website <https://secure.iowadot.gov/DBE/Directory/Index/>. The Certified Directory of TSBs is available at the following website <https://iowaeda.dynamics365portals.us/tsb-search/>.

PROPOSAL ATTACHMENT E  PART F- ADDITIONAL REQUIREMENTS
ITEM 3 - COMPLETION PROVISIONS

The bidder hereby agrees to commence and complete the work in accordance with the attached Completion Provisions.
PROPOSAL: PART F – ADDITIONAL REQUIREMENTS
ITEM 3 – COMPLETION PROVISIONS

The Bidder hereby agrees to:

1. Commence the work on the project on or after May 1, 2020 and to fully complete the project by June 1, 2021; and to pay liquidated damages for noncompliance with said completion provision in the amount of five hundred and no/100 dollars ($500.00) for each calendar day thereafter.

2. Undertake and schedule work in compliance with intermediate completion provisions as described below. The work to be completed by the intermediate completion dates shall be such work as required to satisfy the intermediate completion date description.

Intermediate Completion Conditions:

A. The contractor shall have all work complete to open all proposed roadway lanes of Ingersoll Avenue to vehicular traffic on or before November 1, 2020 including, but not limited to, roadway and driveway pavement replacement, paver parking installation and permanent traffic control installation complete and in accordance with the plans and specifications; and to pay liquidated damages for noncompliance with said completion provision in the amount of five hundred and no/100 dollars ($500.00) for each calendar day thereafter.

B. The contractor shall have all work complete to open all proposed sidewalk and trail pavement of Ingersoll Avenue to pedestrian and bicycle traffic on or before September 1, 2020 in accordance with the plans and specifications; and to pay liquidated damages for noncompliance with said completion provision in the amount of five hundred and no/100 dollars ($500.00) for each calendar day thereafter.

3. Pay separate sums of liquidated damages that will be assessed for each of the conditions described hereinbefore, and they shall be cumulative if multiple conditions have not been satisfied.
BID BOND

KNOW ALL BY THESE PRESENTS

That we, __________________________________________________________________________________, as Principal, and
______________________________________________________________________________________________, as Surety, are held and firmly
bound unto the City of Des Moines, as Obligee (hereinafter the "Jurisdiction"), in the penal sum of
______________________________________________________________________________________________ dollars

($______________) lawful money of the United States, for which payment the Principal and Surety bind
themselves, their heirs, executors, administrators, successors, and assigns jointly and severally, firmly by
these presents.

The Principal has submitted to the Jurisdiction a proposal to enter into a contract in writing, for the following
described improvements:

Ingersoll Avenue Streetscape from M.L. King Jr. Parkway to 24th Street (north side), 04-2019-007
The improvement includes construction of Portland Cement Concrete (PCC) sidewalks, driveways, pavement,
colored concrete, and Hot Mix Asphalt (HMA) paving, together with the necessary removals, earthwork,
clearing and grubbing, erosion control, subdrains, storm sewers, traffic control, traffic signals, conduit, site
furnishings, plantings, permeable pavers, and surface restoration; all in accordance with the contract
documents, including Plan File Nos. 615-001/109, on Ingersoll Avenue from M.L. King Jr. Parkway to 24th
Street, Des Moines, Iowa

The Surety hereby stipulates and agrees that the obligations of the Surety and its Bond will be in no way impaired
or affected by any extension of the time within which the Jurisdiction may accept the Bid or execute a Contract;
and the 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 will be Polk County, State of Iowa. If legal action is required by the Jurisdiction against the Surety or
Principal to enforce the provisions of this bond or to collect the monetary obligation accruing to the benefit of the
Jurisdiction, the Surety or Principal agrees to pay the Jurisdiction all outlay and expense incurred by the
Jurisdiction in enforcing any of the provisions of this Bond. All rights, powers, and remedies of the Jurisdiction
are cumulative and not alternative and are in addition to all rights, powers and remedies given to the Jurisdiction
by law. The Jurisdiction may proceed against the Surety for any amount guaranteed hereunder whether action is
brought against Principal or whether or not the Principal is joined in the action. As used herein, the phrase "all
outlay and expense" is not to be limited in any way, but includes 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, outside experts, attorneys
fees (including overhead expenses of the Jurisdiction's staff attorneys), and all costs and expenses of litigation as
they are incurred by the Jurisdiction.
If the proposal by the Principal is accepted and the Principal enters into a contract with the Jurisdiction in accordance with the terms of the proposal, including the provision of insurance and bond as specified in the contract documents with good and sufficient surety for the faithful performance of the contract, for the prompt payment of labor and material furnished in the prosecution of the work, and for the maintenance of the improvements as may be required in the contract documents or, in the event the Principal does not enter into a contract and provide the required insurance and bonds, the Principal pays the penal sum to the Jurisdiction, then this obligation will become null and void; otherwise, the Surety 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 __________________, 20________

SURETY:

________________________________________
Surety Company

By ______________________________________
Signature Attorney-in-Fact/Officer

________________________________________
Name of Attorney-in-Fact/Officer

________________________________________
Company Name

________________________________________
Company Address

________________________________________
City, State  Zip Code

________________________________________
Company Telephone Number

PRINCIPAL:

________________________________________
Bidder

By ______________________________________
Signature

________________________________________
Name

________________________________________
Title

________________________________________
Address

________________________________________
City, State  Zip Code

________________________________________
Telephone Number

NOTE:

1. All signatures on this bid bond must be original signatures in ink; copies or facsimile of any signature will not be accepted.

2. This bond must be sealed with the Surety's raised, embossed 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 security watermark.

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.
ENGINEERING DEPARTMENT  
CITY OF DES MOINES, IOWA  

CONTRACT NO.  
DATE  
ROLL CALL NO.  

3/9/2020 

CONTRACT

THIS CONTRACT, made and entered into at Des Moines, Iowa, on ________________, by and between the City of Des Moines, by its Mayor, upon order of its City Council, hereinafter the "Jurisdiction", and ________________, hereinafter the "Contractor".

WITNESSETH:

The Contractor hereby agrees to complete the work comprising the below referenced improvement as specified in the contract documents, which are officially on file with the Jurisdiction, in the Des Moines City Engineer's Office. This contract includes all contract documents. The work under this contract shall be constructed in accordance with the SUDAS Standard Specifications, 2019 Edition; and as further modified by the supplemental specifications and special provisions included in said contract documents, and the Contract Attachments attached hereto. The Des Moines City Engineer is the Engineer. 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: Item 2: Bid Items, Quantities and Prices which were proposed by the Contractor in its proposal submitted in accordance with the Notice to Bidders for the following described improvements:

Ingersoll Avenue Streetscape from M.L. King Jr. Parkway to 24th Street (north side), 04-2019-007
The improvement includes construction of Portland Cement Concrete (PCC) sidewalks, driveways, pavement, colored concrete, and Hot Mix Asphalt (HMA) paving, together with the necessary removals, earthwork, clearing and grubbing, erosion control, subdrains, storm sewers, traffic control, traffic signals, conduit, site furnishings, plantings, permeable pavers, and surface restoration; all in accordance with the contract documents, including Plan File Nos. 615-001/109, on Ingersoll Avenue from M.L. King Jr. Parkway to 24th Street, Des Moines, Iowa

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 under this contract on or before a date to be specified in a written notice to proceed by the Jurisdiction and to fully complete the project not later than June 1, 2021, and in accordance with the Completion Provisions; and to pay liquidated damages for noncompliance with said completion provisions in the amount of five hundred and 00/100 dollars ($500.00), for each calendar day thereafter that the work remains incomplete.
IN WITNESS WHEREOF, the Parties hereto have executed this instrument, in triplicate on the date first shown written.

**JURISDICTION:**

By

T. M. Franklin Cowrie, Mayor

(Seal)

ATTEST:

P. Kay Cmelik, City Clerk

**FORM APPROVED BY:**

Kathleen Vanderpool, Deputy City Attorney

**CONTRACTOR:**

Contractor

By

Signature

Title

Street Address

City, State - Zip Code

Telephone Number / Email Address

CONTRACTOR PUBLIC REGISTRATION INFORMATION To Be Provided By

1. **All Contractors:** The Contractor's Public Registration Number, issued by the Iowa Commissioner of Labor pursuant to Section 91C.5 of the Iowa Code, is as follows:

   Number

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 City 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 be a corporation organized under the laws of a state other than Iowa, shall file with the 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, or as amended, governing foreign corporations. For further information contact the Iowa Secretary of State Office at 515-281-5204.

   **NOTE:** All signatures on this contract must be original signatures in ink: copies or facsimile of any signature will not be accepted.
CORPORATE ACKNOWLEDGEMENT

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 this Board of Directors; that ________________________ 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 ___________________________
CONTRACT ATTACHMENT: ITEM 1: GENERAL

1. The Contractor acknowledges and agrees:
   - To comply with the Equal Employment Opportunity Program included in the City of Des Moines Contract Compliance Program, which is available at the following website <http://www.dmgov.org/Departments/Engineering/PDF/Contract%20Compliance%20Program%20(June%202017).pdf> or from the City Engineer’s Office.
   - To comply with any and all applicable provisions of the Des Moines Human Rights Ordinance, Chapter 62, of the Des Moines Municipal Code.
   - Not to discriminate against any employees, or applicants for employment, on the basis of age, race, religion, creed, color, sex, sexual orientation, national origin, ancestry, disability, familial status or gender identity.
   - To include this provision in all subcontracts for this project.

2. The Contractor agrees to comply with the requirements of the City of Des Moines Contract Compliance Program as referenced in the proposal. Final acceptance of the project will not be made until the Contractor has submitted to the City Engineer a notarized summary of payments to and scope of work by all DBE/TSB subcontractors.

3. The City of Des Moines Master Construction Safety Packet (Safety Plan) is available at <http://www.dmgov.org/Departments/Engineering/PDF/MasterConstructionSafetyPacket.pdf> and is also available upon request from the Engineering Department. The Engineering Department will make available a copy of the City of Des Moines Safety Plan to the Contractor when the contract is awarded. The Contractor understands and agrees that said Safety Plan is for the Contractor's information only and that it is the Contractor’s sole responsibility to provide, or make available, this safety information to all its Subcontractors.

4. The Contractor understands and agrees that the construction of the work included in this contract is by its nature dangerous work. The Contractor agrees:
   - That the Contractor should have a safety program; however, the Contractor need not submit a safety program to the City of Des Moines, and City of Des Moines staff will not review or approve the Contractor’s safety program. The City of Des Moines assumes that the Contractor will maintain a safe worksite; however, City of Des Moines staff will not intrude in the Contractor’s responsibility for safety issues.
   - That until the work is accepted by the Jurisdiction; the work shall be in the custody of and under the charge, care, and control of the Contractor.
   - That the Contractor is responsible for the project area or work site.
   - That the Contractor is solely responsible for the safety of everyone on its work site.
   - That it is the Contractor’s sole responsibility to provide as safe a working site as possible given the nature of the work.
   - That it is the Contractor’s responsibility to notify and advise its employees, subcontractors, suppliers, and everyone on the worksite of the dangers associated with the work, and provide them with appropriate safety information to protect them from those dangers.
5. The Contractor acknowledges and agrees that no contract shall be binding upon the City of Des Moines until said contract has been executed by the Bidder, and shall have been approved by the City Council and executed by the Mayor and attested to by the City Clerk.

6. The Contractor agrees that sixty (60) days shall constitute a reasonable time within which it shall be required to make progress payments or final payment to subcontractors after each subcontractor's satisfactory performance of its work, all as required by Section 573.12 2.b.(2) of the Code of Iowa.
This contract is awarded and executed for completion of the work specified in the contract documents for the bid price tabulated below as proposed by the contractor in its proposal submitted in accordance with notice to bidders and notice of public hearing. All quantities are subject to revision by the Jurisdiction. Quantity changes which amount to twenty (20) percent or less of the amount bid shall not affect the unit bid price of that item.

**DIVISION 1: INGERSOLL STREETSCAPE (CITY OF DES MOINES)**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>UNITS</th>
<th>QUANTITY</th>
<th>UNIT PRICE</th>
<th>AMOUNT</th>
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<td>0052</td>
<td>Relocate RRFB Signals and Mast Arm</td>
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<td>0053</td>
<td>* Hydraulic Seeding, Seeding, Fertilizing, and Mulching, Special</td>
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<td>0054</td>
<td>* Sod</td>
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<td>0055</td>
<td>Topsoil, Import</td>
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<td>Soil Cell Soil</td>
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<td>0058</td>
<td>* Overstory Tree</td>
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<td>Filter Socks, 12 In.</td>
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<td>Concrete Steps</td>
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<td>0069</td>
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<td>Bench</td>
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<td>0080</td>
<td>At-Grade Planter Curb</td>
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<td>0081</td>
<td>Bus Shelter Foundation</td>
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<tr>
<td>0082</td>
<td>* Mobilization</td>
<td>LS</td>
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**DIVISION 1 SUBTOTAL:**

**DIVISION 2: DES MOINES WATER WORKS**

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<th>ITEM</th>
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<td>0203</td>
<td>* Prepare Excavation for Tapping Sleeve &amp; Valve</td>
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<td>0207</td>
<td>4&quot; Cap/Plug</td>
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<td>12&quot; Valve</td>
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<td>Hydrant Assembly</td>
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<td>0216</td>
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<td>0221</td>
<td>Cathodic Protection Test Station</td>
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<td>12&quot; Pipe Isolation Coupling</td>
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<td>Full Depth Patch, PCC, 10 In.</td>
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<td>Sidewalk, PCC, 5 IN - DMWW Work Outside of Phase 1 Area</td>
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<td>* Removal of Sidewalk - DMWW Work Outside of Phase 1 Area</td>
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<td>Foundation Rock</td>
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<td>0231</td>
<td>* Remove Unsuitable Materials</td>
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DIVISION 2 SUBTOTAL:

TOTAL CONSTRUCTION COST (DIVISION 1 + DIVISION 2):

* Item does not have to be included in 4-year maintenance bond but shall be covered by a 1-year maintenance bond.

NOTE: It is understood that the above quantities are estimated for the purpose of this bid. All quantities are subject to revision by the City. Quantity changes which amount to twenty (20) percent or less of the total bid shall not affect the unit bid price of that item.
CONTRACT ATTACHMENT: ITEM 3 – COMPLETION PROVISIONS

The Bidder hereby agrees to:

1. Commence the work on the project on or after May 1, 2020 and to fully complete the project by June 1, 2021; and to pay liquidated damages for noncompliance with said completion provision in the amount of five hundred and no/100 dollars ($500.00) for each calendar day thereafter.

2. Undertake and schedule work in compliance with intermediate completion provisions as described below. The work to be completed by the intermediate completion dates shall be such work as required to satisfy the intermediate completion date description.

Intermediate Completion Conditions:

A. The contractor shall have all work complete to open all proposed roadway lanes of Ingersoll Avenue to vehicular traffic on or before November 1, 2020 including, but not limited to, roadway and driveway pavement replacement, paver parking installation and permanent traffic control installation complete and in accordance with the plans and specifications; and to pay liquidated damages for noncompliance with said completion provision in the amount of five hundred and no/100 dollars ($500.00) for each calendar day thereafter.

B. The contractor shall have all work complete to open all proposed sidewalk and trail pavement of Ingersoll Avenue to pedestrian and bicycle traffic on or before September 1, 2020 in accordance with the plans and specifications; and to pay liquidated damages for noncompliance with said completion provision in the amount of five hundred and no/100 dollars ($500.00) for each calendar day thereafter.

3. Pay separate sums of liquidated damages that will be assessed for each of the conditions described hereinbefore, and they shall be cumulative if multiple conditions have not been satisfied.
PERFORMANCE, PAYMENT & MAINTENANCE BOND

KNOW ALL BY THESE PRESENTS

That we, ________________________________________, as Principal (the "Contractor" or "Principal"), and ________________________________________, as Surety, are held and firmly bound unto the City of Des Moines, as Obligee (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 and severally, firmly by these presents.

The conditions of the above obligations are such that whereas the Contractor entered into a contract with the Jurisdiction, bearing the date of ______________________, (the "Contract") wherein the Contractor undertakes and agrees to construct the following described improvements:

Ingersoll Avenue Streetscape from ML. King Jr. Parkway to 24th Street (north side), 04-2019-007

The improvement includes construction of Portland Cement Concrete (PCC) sidewalks, driveways, pavement, colored concrete, and Hot Mix Asphalt (HMA) paving, together with the necessary removals, earthwork, clearing and grubbing, erosion control, subdrains, storm sewers, traffic control, traffic signals, conduit, site furnishings, plantings, permeable pavers, and surface restoration; all in accordance with the contract documents, including Plan File Nos. 615-001/109, on Ingersoll Avenue from M.L. King Jr. Parkway to 24th Street, Des Moines, Iowa

and to faithfully perform all the terms and requirements of the Contract within the time specified, in a good and workmanlike manner, and in accordance with the Contract Documents. Provided however, that one year after the date of acceptance by the Jurisdiction as complete, of the work under the above referenced Contract, the maintenance portion of this Bond shall continue in force but the penal sum for maintenance shall be reduced to ________________________ dollars ($________________________), which is the cost associated with those items shown on the Proposal and in the Contract which require a maintenance bond period in excess of one year.

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

1. PERFORMANCE: The Contractor shall well and faithfully observe, perform, fulfill and abide by each and every covenant, condition and part of the Contract and Contract Documents, by reference made a part hereof, and shall indemnify and save harmless the Jurisdiction from all outlay and expense incurred by the Jurisdiction by reason of the Contractor's default or 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.

DSM Urban 09/05/2008 PERFORMANCE, PAYMENT & MAINTENANCE BOND Page 1 of 4 Pages
2. PAYMENT: The Contractor and Surety on this bond hereby agree to pay all just claims submitted by persons, firms, subcontractors, and corporations furnishing materials for or performing labor in the performance of the Contract, 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 unless the claims have been established as provided by law. The Contractor and Surety hereby bind themselves to the obligations and conditions set forth in Iowa Code Chapter 573.

3. MAINTENANCE: The Contractor and the Surety shall, at their own expense:
   A. Remedy any and all defects that may develop in or result from work to be performed under the Contract within the period of four (4) year(s) from the date of acceptance of the work under the Contract, by reason of defects in workmanship or materials used in construction of the work;
   B. Keep all work in continuous good repair; and
   C. Pay the Jurisdiction's reasonable costs of monitoring and inspecting 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.

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

4. GENERAL: Every Surety on this Bond shall be deemed and held bound, any contract to the contrary notwithstanding, to the following provisions:
   A. To consent without notice to any extension of time to the Contractor in which to perform the Contract;
   B. To consent without notice to any change in the Contract or Contract Documents, that 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
   C. 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 liquidated damages are being charged against the Contractor.

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

A. 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.
B. 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 as 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, attorneys 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.

C. 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 Polk 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 accruing to the benefit of the Jurisdiction, the Contractor and Surety agree, jointly and severally, to pay the Jurisdiction all outlay and expense incurred 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 the Surety for any amount guaranteed hereunder whether action is brought against the Contractor or whether or not the Contractor is joined in the action.

NOW THEREFORE, the condition of this obligation is such that if the Principal shall faithfully perform all of 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 word, 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.

Witness our hands, in triplicate, this __________ day of ____________________, 20________

PRINCIPAL:

________________________________________
Contractor

By

______________________________
Signature

______________________________
Title

FORM APPROVED BY:

______________________________
Kathleen Vanderpool
Deputy City Attorney

SURETY:

______________________________
Surety Company

By

______________________________
Signature Attorney-in-Fact/Officer

______________________________
Name of Attorney-in-Fact/Officer

______________________________
Company Name

______________________________
Company Address

______________________________
City, State Zip Code

______________________________
Company Telephone Number

NOTE:

1. All signatures on this performance, payment & maintenance bond must be original signatures in ink; copies or facsimile of any signature will not be accepted.

2. This bond must be sealed with the Surety’s raised, embossed 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.

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.

5. This bond form must be utilized as printed; no additions/deletions/alterations are permitted, other than providing the required information.
ENGINEERING DEPARTMENT
CITY OF DES MOINES, IOWA

SPECIAL PROVISION
BIDDING REQUIREMENTS
ON
INGERSOLL STREETSCEAPE FROM M.L. KING JR. PARKWAY TO 24TH STREET (NORTH SIDE)
ACTIVITY ID 04-2019-007

1) AWARD OF CONTRACT

The apparent low Bidder on this project will be required to furnish executed contract; Performance, Payment, and Maintenance Bond; Certificate of Insurance; and NPDES Certification Statements, if required, in substantial compliance with the contract documents to the Engineering Department before 12:00 noon on Friday, March 6, 2020. Completed documents in accordance with the contract documents and acceptable to the City of Des Moines Engineering and Legal Departments will be presented to the City Council for award of this contract on Monday, March 9, 2020. This would allow construction to begin upon issuance of the Notice to Proceed by the City Engineer.

By submission of a bid, the Bidder agrees that if the Bidder fails to furnish said executed contract; Performance, Payment, and Maintenance Bond; Certificate of Insurance; and NPDES Certification Statements, if required, in substantial compliance with the contract documents to the Engineering Department before 12:00 noon on Friday, March 6, 2020; the amount of the Bidder's bid security may become the property of the City and may be retained—not as a penalty but as liquidated damages. The award of the contract may then, at the discretion of the City, be made to the next-lowest responsible Bidder, or the work may be re-advertised or may be constructed by the City in any legal manner. Notice to Proceed will not be issued until the Contractor's insurance is in compliance with the specifications.

The Bidder is reminded that all subcontractors must be approved by the City Council. The Council policy is that subcontractors be approved at the time the contract is awarded, if possible. The Bidder should submit a letter requesting approval of any subcontractors along with the subcontractor's NPDES Certification Statement, if required, at the time its executed contracts are submitted for approval.

2) CONTRACT COMPLIANCE PROGRAM


a. EEO Program – Complaints of discrimination in violation of the Des Moines Human Rights Ordinance, or corresponding state or federal law, should still be filed with the appropriate city, state, or federal agency. If a Contractor is found by one of these agencies to be engaging in illegal discrimination, the Contractor will be in breach of its contract with the City of Des Moines and appropriate action will be taken.

b. DBE/TSB Program: Certification – The City of Des Moines’ program is a DBE/TSB Program whereby both certified DBEs and certified TSBs are equally eligible under the program. All DBEs shall be certified by the Iowa Department of Transportation (IDOT),
and the Certified Directory of DBEs is available at the following website https://secure.iowadot.gov/DBE/Directory/Index/.

All TSBs shall be certified by the Iowa Economic Development Authority, and the Certified Directory of TSBs is available at the following website https://iowaeda.microsoftimportals.com/tsb-search/. The TSB website allows the user to search by name or other keyword. If the user enters the keyword "CONST" in the space next to Service Description and clicks SEARCH, the database will provide a listing of all TSBs that have identified various forms of construction as their type of work. The Directories will not be printed in the contract documents. Copies of the DBE and TSB Directories are available from the Engineering Department upon request.

c. DBE/TSB Program: Annual and Contract Goals – The City’s overall annual DBE/TSB goal will be based on the IDOT DBE overall annual goal established for the corresponding federal fiscal year as further adjusted and established by the Engineering Department to consider such factors as the current capacity of DBEs/TSBs to perform work, differences in the DBE versus TSB market, etc. By utilizing the IDOT overall annual DBE goal as the City’s overall annual DBE/TSB goal, the goal will be independently reviewed annually and updated regarding the availability of the DBEs that are ready, willing, and able to perform work. Many DBEs are also certified as TSBs and the availability is similar. The City’s overall annual DBE/TSB goal represents a target that the City would like to achieve by including DBE/TSB participation on City contracts; and is not a mandatory goal for this project. The Bidder is encouraged to use its best efforts to meet, and if possible exceed, the City’s overall annual DBE/TSB goal.

3) ALTERNATE SALES AND USE TAX

Section 1020, 1.08, B, of the General Supplemental Specifications shall apply to this contract. The Bidder should not include sales tax in the bid pursuant to Iowa Code. A sales tax exemption certificate will be available for all material purchased for incorporation in the project. Complete information on qualifying materials and supplies can be found at www.state.ia.us/tax, the Iowa Department of Revenue and Finance’s (IDRF) web site. Links are found in the Business Taxes and Local Government categories. Contact the IDRF at idrf@idrf.state.ia.us if you have questions on this requirement.
SPECIAL PROVISION
CONTRACTUAL REQUIREMENTS
FOR NPDES PERMIT REQUIREMENTS ON

INGERSSOLL STREETScape FROM M.L. KING JR. PARKWAY TO 24TH STREET (NORTH SIDE)
ACTIVITY ID 04-2019-007

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1. GENERAL

A. This project is subject to Section 402(b) of the Clean Water Act and Iowa Code Section 455B.174 and Iowa Administrative Code 567-64.4 (projects disturbing one or more total acres) and requires inclusion in the National Pollution Discharge Elimination System (NPDES) General Permit No. 2, or an individual NPDES Permit for stormwater (also storm water) discharge associated with industrial activity for construction activities. All Work shall be in accordance with Section 9040 – Erosion and Sediment Control of the SUDAS Standard Specifications and the General Supplemental Specifications. Measurement for payment shall be in accordance with the General Supplemental Specifications.

B. The City of Des Moines has caused a general Storm Water Pollution Prevention Plan (SWPPP) to be prepared which is included in these contract documents. Said general SWPPP is based upon general construction methods and does not include any information regarding the Contractor’s scheduling or specific construction methods. **The Contractor shall be responsible to review said general SWPPP, complete the SWPPP by providing data and/or information as necessary, and propose any revisions necessary for compliance with the General Permit No. 2 based on the Contractor’s proposed scheduling and construction methods. The Contractor will be responsible for the preparation of any modifications to said general SWPPP. If necessary, the Contractor shall be responsible to retain or engage persons knowledgeable in the preparation of a SWPPP.** The SWPPP shall be prepared in a manner that complies with all applicable requirements.

C. The City of Des Moines will be responsible for publishing the Public Notice of Storm Water Discharge, as required for General Permit No. 2, and will provide the Contractor with the affidavits of publication for said notices.

D. Except as specifically otherwise stated herein, the Contractor shall be responsible for any and all compliance with erosion control, stormwater discharge, the SWPPP and/or permit requirements regarding same, including all fees. The Contractor shall be the “operator” of the project for all compliance purposes, notwithstanding the status of the City as a co-permittee. The Contractor shall indemnify the City and hold the City harmless from any and all claims, including without limitation penalties, fines, attorneys fees, consulting fees, and costs, arising out of the work at this project and/or the alleged violation of erosion control requirements, stormwater discharge and management, the
SWPPP and/or permit requirements regarding same. The Contractor shall take prompt action to address and/or avoid any potential or real violation of same at their own cost.

E. The Contractor shall submit to the Engineer a copy of the Iowa Department of Natural Resources authorization prior to the City’s issuance of the Notice to Proceed for the work.

F. The Contractor shall incorporate all erosion control features into the project at the earliest practicable time, as outlined in the SWPPP or work schedule. Stormwater Pollution Prevention measures shall be constructed at locations shown in the contract documents and as determined by the Contractor, at locations where conditions develop during construction that were unforeseen during design, or where needed to control water pollution that develops during normal construction practices.

G. The Engineer may suspend operations, without cost to the City of Des Moines, if the Contractor fails to provide adequate erosion control measures in a timely manner.

2. GENERAL STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

A. Erosion and Sediment Controls

Erosion and Sediment Controls are measures to be used for controlling erosion and sediment throughout the construction project and include stabilization measures for controlling erosion from disturbed areas and structural controls to divert runoff and remove sediment. Contractor/subcontractor is responsible for the implementation and management of control measures specific to this site. As work progresses, field investigation may indicate additional erosion control measures may be required as determined by the contractor, owner, engineer, city or other governmentally regulated agencies.

1. Stabilization

a. Preserve existing vegetation in areas not disturbed during construction.

b. Area of disturbed soil at any one time by construction operations shall be held to a minimum.

c. Temporary Stabilization - areas where construction activity is not planned to occur for at least 14 days will be stabilized immediately by temporary erosion controls.
   • Topsoil stockpiles and disturbed portions of the site will be stabilized with temporary mulch.
   • Frequent watering during construction in dry weather shall minimize wind erosion from exposed soil.

d. Permanent Stabilization - areas where construction activity has permanently ended will be stabilized within 14 days of ceasing construction activities in that area.
   • Permanent seeding and mulch in all areas where final grading is complete.
   • Permanently seed drainage swales immediately upon reaching final grade to facilitate sediment deposition in surface runoff.

e. Vegetative buffer strips
   • Where possible, existing vegetation strips should be left in place to increase infiltration and sediment deposition by reducing runoff velocity.

f. Protection of Trees and Natural Vegetation
   • Undisturbed areas will utilize existing vegetation as a natural buffer zone to increase infiltration and sediment deposition by reducing runoff velocity.

g. Dust Control
   • Utilize mulch or watering of surface to control wind erosion of susceptible soils during and/or immediately after mass site grading operations.
h. Stream Bank Stabilization
   • Stage the installation of any rip rap so that the time that the bank is disturbed is minimized.

2. Structural Controls
   a. At all areas where runoff can move offsite, silt fence or approved equal will be installed along the perimeter of the project downstream of disturbing activities. Also protect storm water discharge points prior to site clearing and grading operations as required and/or shown on the plans.
   b. Temporary sediment basins provided at the rate of 3,600 cubic feet of storage per acre for disturbed areas over 10 acres. If not attainable, a combination of silt fences, multiple sediment traps, or equivalent sediment controls are required for all side slopes and down slope boundaries of the disturbed area.
   c. Areas of 10 acres or less disturbed will require silt fence, sediment traps or equivalent measures for all side slopes and down slope boundaries of the disturbed area.
   d. Silt fences and ditch checks should be installed along concentrated drainage ways to control sediment deposition.
   e. Permanently seed all drainage swales immediately upon reaching final grade to facilitate sediment deposition in surface runoff. Use in conjunction with sediment traps, ditch checks, or other control measures to trap sediment.
   f. Additional silt fences or other measures may be required on all embankments, stockpiles and other areas to ensure runoff control.

B. Other Controls

Undertake measures for controlling other sources of potential pollution that may exist on the construction site. During the course of construction, it is possible that situations may arise where unknown materials will be encountered. When such situations occur, they will be handled according to all applicable federal, state, and local regulations in effect at the time.

1. Waste materials
   a. Disposal of unused construction materials and construction material wastes shall comply with applicable state and local waste disposal, sanitary sewer, or septic system regulations. In the event of a conflict with other governmental laws, rules and regulations, the more restrictive laws, rules or regulations shall apply.

2. Hazardous waste
   a. Hazardous waste materials will be disposed of in accordance with applicable local, state, and/or federal regulations.
   b. Equipment refueling and maintenance operations will be carried out in such a manner so as to prevent any spills and contamination to the soil and groundwater.
   c. Potentially hazardous materials will be used with great care to prevent spillage in any volume.

3. Sanitary waste
   a. If a portable restroom facility is on the project site, wastes shall be collected and disposed of in complete compliance with local, state and federal regulations. This facility shall be located in an area where contact with the storm water discharge is minimal.

4. Vehicle tracking
   a. Stabilized construction entrances should be installed at all site access points to reduce vehicle tracking of sediment offsite.
b. Paved streets adjacent to the site shall be inspected daily and cleaned as necessary to remove any excess mud, dirt or rock tracked from the site.
c. Dump trucks hauling material shall be properly loaded or covered with a tarpaulin to prevent loss of material.
d. Dust control measures should be utilized as necessary.

5. Non-storm water discharges
   a. Expected sources of non-storm water discharges from the site during construction could include:
      • Potable water sources including water line flushings, irrigation drainage and fire fighting activities.
      • Uncontaminated groundwater from de-watering excavation.
      • Natural springs, wetland, water sources.
   b. Non-storm water discharges should be directed to non-erosive areas prior to discharge offsite.

C. Implementation: State and Local Requirements

1. The storm water pollution prevention plan reflects the State of Iowa requirements for storm water management and erosion and sediment control, as established in 161A.64 Code of Iowa, State of Iowa Statutory Requirements Pertaining to Erosion Control Plans.
2. Prior to initiating a land disturbing activity, a person engaged in land disturbing activity shall file a signed affidavit with the soil and water conservation district that the project will not exceed the soil loss limits.
3. All work shall be done in accordance with Division 9 of the SUDAS Standard Specifications as referenced in the contract.
4. Code Compliance: The Contractor shall comply with the soil erosion control requirements of the Iowa Code, the Iowa DNR NPDES permit and all local ordinances.

D. Implementation: Timing of Controls/Measures

1. Install down-slope and side-slope perimeter silt fence prior to commencing land-disturbing activity.
2. Install construction entrance and vehicle tracking controls.
3. Construct sediment basins, ditch checks, or other erosion control measures at storm water discharge points.
4. Do not disturb an area until necessary for construction to proceed.
5. Install interior silt fences, sediment traps, etc. as grading progresses.
6. Cover or stabilize disturbed areas immediately after ceasing construction for more than 14 days.
7. Construct riprap aprons at storm outlets and creek crossings that are disturbed by the construction.
8. Place swale control measures (erosion control mats, silt traps, ditch checks, seed & mulch) in drainage ways as soon as final grades are achieved.
9. As areas reach their final grade, provide additional silt fence, sediment traps, earthen dikes, and ditch checks as necessary.
10. Complete permanent stabilization seeding as soon as possible after work is complete.
11. Remove temporary sediment controls and accumulated sediment once entire site is stabilized. Re-seed any areas disturbed during removal.
E. Hazardous substance spill prevention and response

1. The Contractor is responsible for training all personnel in the proper handling and cleanup of spilled materials. No spilled hazardous materials or wastes will be allowed to come into contact with storm water discharges. If contact does occur, the storm water discharge will be contained onsite until appropriate measures in compliance with all federal, state, and local regulations are followed to dispose of the hazardous substance.

2. In addition to good housekeeping and material management practices, the following practices shall be done by the Contractor to minimize the potential for hazardous material spills and to reduce the risk of the spill coming in contact with storm water.
   - Manufacturer’s recommended methods for spill cleanup will be clearly posted and site personnel will be trained regarding these procedures and the location of the information and cleanup supplies.
   - Materials and equipment necessary for spill control, containment and cleanup will be provided onsite in a material storage area.

3. In the event of a spill, the following procedures will be followed by the Contractor:
   - All spills will be cleaned up immediately following discovery.
   - The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with the hazardous substance.
   - Spill of toxic or hazardous material will be reported to the appropriate state or local governmental agency and to the project manager and engineer, regardless of the size of the spill.

4. In the event the construction site has a release of a hazardous substance or oil in an amount which exceeds a reportable quantity (RQ) as defined at 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302 then the Contractor shall:
   - Have its person in charge of the site at the time of the spill immediately call the EPA National Response Center to report the spill (800-424-8802, or 202-426-2675).
   - Modify the Pollution Prevention Plan accordingly within 14 days of the spill including the items mentioned below.
   - Within 14 days of the release, submit a written description of the release including: a description of the release, type of material, estimated amount of spill, date of release, explanation of why the spill happened, and a description of the steps taken to prevent and control future releases.

F. Materials Management

Site sources of pollution generated as a result of this work related to silts and sediment which may be transported as a result of a storm event. However, this SWPPP provides conveyance for other (non-project related) operations. These other operations have storm water runoff, the regulation of which is beyond the control of this SWPPP.

1. Materials or substances expected to be present onsite during construction:
   a. Concrete
   b. Detergents
   c. Glue
   d. Tar
   e. Fertilizers
   f. Petroleum based additives
   g. Wood
   h. Solids and construction wastes
2. Material Management Practices – the following is a list of practices that will be used by the Contractor on site to minimize the risk of spills or other accidental exposure of materials and substances to storm water runoff.
   a. Good housekeeping
      • An effort will be made to store onsite only enough products required to complete the job.
      • All materials stored onsite will be kept in a neat, orderly manner and in their appropriate containers. If possible, products shall be kept under a roof or other enclosure.
      • Materials will be kept in their original containers with the original manufacturer’s label.
      • Substances will not be mixed with one another unless recommended by the manufacturer.
      • Whenever possible, all of a product will be used up before disposing of the container.
      • Manufacturer’s recommendations for proper use and disposal will be followed.
      • The job site superintendent will be responsible for daily inspections to ensure proper use and disposal of materials.
   b. Hazardous products
      • Products will be kept in their original containers with the original manufacturer’s label.
      • The original labels and material safety data sheets will be kept for each of the materials as they contain important product information.
      • Disposal of any excess product will be done in a manner that follows all manufacturers’, federal, local and state recommended methods for proper disposal.

3. Product Specific Practices – the following is a list of potential sources of pollution and specific practices to be used by the Contractor to reduce pollutant discharges from materials or sources expected to be present during construction.
   a. Petroleum Storage Tanks
      • All onsite vehicles shall be inspected and monitored for leaks and receive preventative maintenance to reduce the chance of leakage.
      • Steps will be taken by the Contractor to eliminate contaminants from storage tanks from entering ground soil. Any petroleum storage tanks kept onsite will be located with an impervious surface between the tank and the ground.
   b. Fertilizers – shall be applied in the amounts specified. It shall be worked into the soil as to minimize the contact with storm water discharge.
   c. Concrete wastes
      • Concrete trucks will be allowed to washout or discharge excess concrete only in specifically designated areas which have been prepared to minimizes contact between the concrete and storm water discharge from the site.
      • The hardened product from the concrete washout areas will be disposed of by the Contractor as other non-hazardous waste materials or may be broken up and used on the site for other appropriate uses.
   d. Solid and construction wastes – All trash and construction debris shall be collected and disposed of offsite by the Contractor. No construction waste materials will be buried onsite.
### 3. SITE INFORMATION

<table>
<thead>
<tr>
<th><strong>Project Name</strong></th>
<th>Ingersoll Streetscape – Phase 1, Activity ID 04-2019-007</th>
</tr>
</thead>
</table>
| **Project Location (address, lat./long. or Section-T-R)** | City of Des Moines, Polk County, Iowa  
Section 5, Township 78N, Range 24W |
| **Owner Name** | City of Des Moines |
| **Representative** | Chris Kuhl |
| **Owner Address/Phone** | Engineering Department  
City Hall - 400 Robert D. Ray Drive  
Des Moines, Iowa | Office Phone: 515-283-4073  
Cell Phone: 515-205-6915 |
| **Contractor Name** | |
| **Representative** | |
| **Contractor Address/Phone** | |
| **Site Area** | Approximately 1.2 Acres |
| **Disturbed Area** | Approximately 1.2 Acres |
| **Final Runoff Coefficient** | 0.85 |
| **Soil type / characteristics** | Sandy Lean Clay |
| **Receiving Waters** | Des Moines River |
| **Description (purpose and types of soil disturbing activities)** | This project or work involves following described improvement:  
Provide all labor, material and equipment necessary for street and sidewalk reconstruction, providing erosion control, and sodding; in accordance with the contract documents commencing with Plan File Nos. 615-100/118 along Ingersoll Avenue between SE 24th Street and ML King Jr. Parkway.  
Soil disturbing activities necessary to complete the work are clearing and grubbing, rough grading, final grading, and surface restoration. Site sources of pollution generated as a result of this project relate to silts and sediments that may be transported as a result of a stormwater event. |
| **Expected Sequence of Major Construction Activities to be Completed by Contractor (subject to change; any deviations shall be noted on this plan)** | |
4. PUBLIC NOTICE OF STORM WATER DISCHARGE

The City of Des Moines, or its Contractor for the following work, plans to submit a Notice of Intent to the Iowa Department of Natural Resources to be covered under NPDES General Permit No. 2 “Storm Water Discharge Associated with Industrial Activity for Construction Activities.” The storm water discharge will be from the construction of the Ingersoll Streetscape Phase 1 from M.L. King, Jr. Parkway to 28th Street, Activity ID 04-2019-007.

located in  SE ¼ Sec. 5, T78N, R24W, Polk County

Storm water will be discharged from 1 point source and will be discharged to the following stream: Des Moines River.

Comments may be submitted to the Storm Water Discharge Coordinator, IOWA DEPARTMENT OF NATURAL RESOURCES, Environmental Protection Division, 502 E. 9th Street, Des Moines, IA, 50319-0034. The public may review the Notice of Intent from 8:00 a.m. to 4:30 p.m., Monday through Friday, at the above address after it has been received by the department.

Published in the  The Des Moines Register
January 29, 2020
5. NPDES CERTIFICATION STATEMENT

A. This project is subject to Section 402(b) of the Clean Water Act and Iowa Code Section 455B.174 and Iowa Administrative Code 567-64.4 (projects disturbing one or more total acres) and requires inclusion in the National Pollution Discharge Elimination System (NPDES) General Permit No. 2, or an individual NPDES Permit for stormwater (also storm water) discharge associated with industrial activity for construction activities. A general stormwater pollution prevention plan for this project is included in the contract documents. A copy of the stormwater pollution prevention plan must be kept at the construction site from the time construction begins until the site has reached final stabilization. The Contractor must sign the NPDES Certification Statement and submit it with the contract documents. By doing so the Contractor becomes a co-permittee with the City of Des Moines and other co-permittee contractors. The Contractor is solely responsible for the development and implementation of a specific stormwater pollution prevention plan for this project, as necessary and appropriate to comply with the law, and must identify any contracting entity charged with the development and/or implementation of any portion of the stormwater pollution prevention plan. The Contractor is the party responsible for maintaining compliance with the stormwater pollution prevention plan and NPDES Permit for the project.

B. All subcontractors, including short-term contractors and subcontractors, prior to approval, must sign the NPDES Certification Statement before conducting any work at the site. The certification must be signed in accordance with the signatory requirements found in the general permit; i.e., principal executive officer, vice president, general partner, proprietor, elector official, and will be incorporated into the Stormwater Pollution Prevention Plan (SWPPP).

C. Upon signing the certification and to the extent allowed by law, other contractors and sub-contractors become co-permittees with the City of Des Moines, the Contractor, and other co-permittees. In signing the plan, the authorized representative certifies that the information is true and assumes liability for the plan. Note that Section 309 of the Clean Water Act provides for significant penalties where information is false or the permittee violates, either knowingly or negligently, permit requirements.

D. All contractors/subcontractors shall conduct their operations in a manner that minimizes erosion and prevents erosion of sediment from the project site. The Contractor shall be responsible for compliance and implementation of the SWPPP for their entire contract. The Contractor is responsible for the identification, coordination and cooperation of all other contractors and subcontractors whose work is a likely source of potential pollution under the law, the NPDES permit and the SWPPP, and to develop and implement the SWPPP.

E. A copy of the NPDES Certification Statement of the Contractor and all subcontractors shall be filed with the City of Des Moines and shall also become a part of the project SWPPP.
NPDES CERTIFICATION STATEMENT
of Contractor or Subcontractor

"I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit that authorizes the storm water discharges associated with industrial activity from the construction site as part of this certification. Further, by my signature, I understand that I am becoming a co-permittee, along with the owner(s) and other contractors and subcontractors signing such certifications, to the Iowa Department of Natural Resources NPDES General Permit No. 2 for 'Storm Water Discharge Associated with Industrial Activity for Construction Activities' at the identified site. As a co-permittee, I understand that I, and my company, are legally required under the Clean Water Act and the Code of Iowa, to ensure compliance with the terms and conditions of the storm water pollution prevention plan developed under this NPDES permit and the terms of this NPDES permit.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

<table>
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<tr>
<th>Project Description</th>
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<tr>
<td>Project Address</td>
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<tr>
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<tr>
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<tr>
<td>Activity ID</td>
<td>04-2019-007</td>
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</table>

NOTE:
1) The signature on this certification must be an original signature in ink; copies or facsimile of any signature will not be accepted.
2) The Contractor and all subcontractors must sign the NPDES certification statement and return it to the City Engineer before conducting any work at the site. The certification must be incorporated in the SWPPP.
3) The person who signs this certification for the Contractor or subcontractor shall be:
   a. Corporations. In the case of a corporation, a principal executive officer of at least the level of vice president.
   b. Partnerships. In the case of a partnership, a general partner.
   c. Sole proprietorships. In the case of a sole proprietorship, the proprietor.
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 this 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 ___.

LIMITED LIABILITY COMPANY ACKNOWLEDGEMENT

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 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 its voluntarily executed.

Notary Public in and for the State of __________
My commission expires ________________, 20 ___.

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DEPARTMENT OF ENGINEERING
CITY OF DES MOINES, IOWA

SPECIAL PROVISION
TECHNICAL SPECIFICATIONS

ON

INGERSOLL STREETSCAPE FROM M.L. KING JR. PARKWAY TO 24TH STREET
(NORTH SIDE)

Activity ID 04-2019-007
PART 1 - GENERAL

1.1 SUMMARY
A. Section Includes:

1.2 ACTION SUBMITTALS
A. Product Data: For each type of product.
   1. For cast-stone units, include dimensions and finishes.
B. Shop Drawings: Show fabrication and installation details for cast-stone units. Include dimensions, details of reinforcement and anchorages if any, and indication of finished faces.
C. Closeout Submittal: Manufacturer's written warranty.

1.3 QUALITY ASSURANCE
A. Manufacturer Qualifications: A qualified manufacturer of cast-stone units similar to those indicated for this Project, that has sufficient production capacity to manufacture required units.

PART 2 - PRODUCTS

2.1 CAST-STONE PLANTERS
   1. Name: International 36 x 24.
B. Colors and Textures: Natural Dry Cast Limestone, LS 0009.
C. Cast-Stone Planters: Dry Cast Limestone.
   1. Units shall be manufactured using the vibrant dry tamp method.
   2. Units shall resist freezing and thawing when sufficient drainage is provided and the product is installed according to the manufacturer's written instructions and recommendations.
D. Fabricate units with accurately reproduced details, with indicated texture on all exposed surfaces unless otherwise indicated.

E. Cure Units as Follows:
   1. Cure units in enclosed, moist curing room at 95 to 100 percent relative humidity and temperature of 100 deg F for 12 hours or 70 deg F for 16 hours.
   2. Keep units damp and continue curing to comply with one of the following:
      a. No fewer than five days at mean daily temperature of 70 deg F or above.
      b. No fewer than six days at mean daily temperature of 60 deg F or above.
      c. No fewer than seven days at mean daily temperature of 50 deg F or above.
      d. No fewer than eight days at mean daily temperature of 45 deg F or above.

PART 3 - EXECUTION

3.1 MOVING CAST STONE PLANTER
   A. By Hand: Move planter with cast stone planter with crew of 3 persons using sling or harness straps. Place clean padding in areas where lifting straps, harness or similar touch the cast stone planter.
   B. Mechanically: Move planter with machine that is capable of lifting 1000-pounds. Use a soft material sling or harness to wrap the planter. Place clean padding in areas where lifting straps, harness or similar touch the cast stone planter.
   C. Do not slide the planter. Prevent rubbing or scraping during moving operations.

3.2 INSTALLING CAST STONE PLANTER
   A. Drill 5/8-inch, 6-inch depth hole into center of cast-in place concrete pedestal. Place 1/2-inch diameter zinc-plated steel threaded rod plumb into hole. Secure threaded rod into hole with Red Head A7+ epoxy (or approved equal).
      1. Cut excess threaded rod so it does not protrude more than 1-inch above the lock nut. The threaded rod shall extend no more than 3-inches into bottom of the planter.
   B. Set cast stone planters level, plumb and centered on top of cast-in-place concrete pedestal, over 1/2-inch diameter threaded rod. Install plastic shims, as necessary.
      1. Threaded rod shall be centered through the planter drain hole, and planter shall be centered on the concrete pedestal.
   C. Secure stone planter with manufacturer-provided Security Kit flange, a 1/2" I.D. x 1-1/2" O.D. stainless steel fender washer and 1/2" zinc-plated steel nylon insert lock nut.
      a. Do not overtighten lock nut to damage flange or cast stone.
      b. Place supplied drain mat over security kit and drain hole, felt side up.
   D. Soil Media: Use well drain, high quality, loose growing media in planter.

END OF SPECIAL PROVISION
SPECIAL PROVISION
SITE FURNISHINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:
   1. Seating.
   2. Bicycle racks.
   3. Trash receptacles.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.
   1. Include: product data, storage and handling requirements and recommendations, installation methods and available colors, styles, patterns and textures.

B. Shop Drawings: Submit manufacturer's shop drawings, including plans and elevations, indicating overall dimensions.

1.3 CLOSEOUT SUBMITTALS

A. Maintenance data.

B. Warranty: Manufacturer's standard warranty, as specified in Part 1.6 of this Special Provision.

1.4 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Manufacturer regularly engaged in manufacture of site furnishings for 15 years.

B. Product Support: Products are supported with complete engineering drawings and design patents.

1.5 DELIVERY, STORAGE AND HANDLING

A. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Storage: Store materials in clean, dry area in accordance with manufacturer's instructions. Keep materials in manufacturer's original, unopened contains and packaging until installation.

C. Handling: Protect materials and finish during handling and installation to prevent damage. Repair and/or replacement of damaged products during handling and installation is the responsibility of the installer.
1.6 WARRANTY

A. Products will be free from defects in material and/or workmanship for a period of three years from the date of invoice.

PART 2 - PRODUCTS

2.1 SEATING

A. Provide product by Landscape Forms, Inc. or approved equivalent.
   1. 7800 E. Michigan Avenue, Kalamazoo, Michigan 49048. Phone: 800-521-2546. Fax: 269-381-3455.

B. Benches
   1. Model: Towne Square.
   2. Style: Backed.
   3. Length: 70-inches.
   7. Color: Black.

C. Materials
   1. Seat and Back Panel: A single panel is formed to make a comfortable seat and back. Panels are made of ASTM A 1011 hot rolled pickled and oiled commercial steel type B. Panel is welded to frame with clips 0.187" x 1" x 1.15" type 304 stainless steel sheet.
      a. Perforated Panel: Perforated panel is 0.134" thick with 0.312 diameter holes on 0.5" centers.
   2. Frame: ASTM A 513 type 1 steel tubing, 1-1/4" outer diameter x 0.120" wall.

D. Finishes
   1. Finish on Metal: Landscape Forms, Inc. “Pangard II”.
      a. Primer: Rust inhibitor.
      b. Topcoat: Thermosetting polyester powdercoat. UV, chip, and flake resistant.
   2. Test Results: “Pangard II”.
      b. UV Resistance, Color and Gloss, ASTM G 155, Cycle 7: Delta E less than 2 at 2.0 mils and less than 20 percent loss.
      c. Cross-Hatch Adhesion, ASTM D 3359, Method B: 100 percent pass.
      d. Flexibility Test, Mandrel, ASTM D 522: 3 mm at 2 mils.
      e. Erichsen Cupping, ISO 1520: 8 mm.
      g. Impact Test, ASTM D 2794: 60 inches/pound at 2.5 mils
      h. Pencil Hardness, ASTM D 3363: 2H minimum.
      i. Corrosion Resistance, 1,500-Hour Test, ASTM B 117: Max. undercutting 1 mm.
      j. Humidity Resistance, 1,500-Hour Test, ASTM D 2247: Max. blisters 1 mm.

2.2 BICYCLE RACKS

A. Provide product by Landscape Forms, Inc. or approved equivalent.
INGERSOLL STREETSCAPE PHASE 1

1. 7800 E. Michigan Avenue, Kalamazoo, Michigan 49048. Phone: 800-521-2546. Fax: 269-381-3455.

B. Bicycle Rack

C. Materials
   2. Wall Thickness: .120 inches.
      a. Powder Coated ASTM A513 Carbon Steel.

D. Finishes
   1. Primer: Rust inhibitor.
   2. Topcoat: Thermosetting TGIC polyester powder coat. UV, chip, and flake resistant.
   3. Test Results: "Pangard II".
      a. Gloss Consistency, Gardner 60 Degrees, ASTM D 523: Plus or minus 5 percent from standard.
      b. UV Resistance, Color and Gloss, ASTM G 155, Cycle 7: Delta E less than 2 at 2.0 mils and less than 20 percent loss.
      c. Cross-Hatch Adhesion, ASTM D 3359, Method B: 100 percent pass.
      d. Flexibility Test, Mandrel, ASTM D 522: 3 mm at 2 mils.
      e. Erichsen Cupping, ISO 1520: 8 mm.
      g. Impact Test, ASTM D 2794: 60 inch-pounds at 2.5 mils.
      h. Pencil Hardness, ASTM D 3363: 2H minimum.
      i. Corrosion Resistance, 1,500-Hour Test, ASTM B 117: Max undercutting 1 mm.
      j. Humidity Resistance, 1,500-Hour Test, ASTM D 2247: Max blisters 1 mm.

2.3 TRASH RECEPTACLES

A. Provide product by Landscape Forms, Inc. or approved equivalent.
   1. 7800 E. Michigan Avenue, Kalamazoo, Michigan 49048. Phone: 800-521-2546. Fax: 269-381-3455.

B. Trash Receptacle.
   2. Style: Side-Opening.
   3. Dimensions:
      a. Height: 40-inches.
      b. Nominal Size: 26-inch square.
   5. Liners
      a. Capacity: 30-gallons.
      b. Color: Black.
   6. Options
      a. Keyed Lock.

C. Materials
   1. Frame: Leg and upper frame construction of tubular steel 1-1/4" outer diameter, 0.120" wall thickness. Lower frame constructed of tubular steel 1" outer diameter, 0.120" wall thickness.
2. Side Panels: Constructed of 5/8" outer diameter round, steel rod, welded to frame.
3. Door Mechanism: Door latch U-bolt, hinge pin, and catch plate for stainless steel. Foot latch lever is HDPE, natural color.
4. Lids: Constructed of 1-1/4" steel tubing 0.120" wall thickness. Insert panel constructed of steel sheet.
   a. Side Opening: 14-gauge.
5. Liners: Polyethylene pigmented to coordinate with powdercoat color.
6. Keyed Lock: Nickel finish, double sided, 8 tumbler, keyed alike. Lock plate is stainless steel.

D. Accessories
1. Anchor Bolts: Corrosion resistant recommended, not supplied by manufacturer.

E. Finishes
1. Primer: Rust inhibitor
2. Topcoat: Thermosetting TGIC polyester powder coat. UV, chip, and flake resistant.
3. Test Results: "Pangard II".
   a. Gloss Consistency, Gardner 60 Degrees, ASTM D 523: Plus or minus 5 percent from standard.
   b. UV Resistance, Color and Gloss, ASTM G 155, Cycle 7: Delta E less than 2 at 2.0 mils and less than 20 percent loss.
   c. Cross-Hatch Adhesion, ASTM D 3359, Method B: 100 percent pass.
   d. Flexibility Test, Mandrel, ASTM D 522: 3 mm at 2 mils.
   e. Erichsen Cupping, ISO 1520: 8 mm.
   g. Impact Test, ASTM D 2794: 60 inch-pounds at 2.5 mils.
   h. Pencil Hardness, ASTM D 3363: 2H minimum.
   i. Corrosion Resistance, 1,500-Hour Test, ASTM B 117: Max. undercutting 1 mm.
   j. Humidity Resistance, 1,500-Hour Test, ASTM D 2247: Max. blisters 1 mm.

2.4 FABRICATION

A. Metal Components: Form to required shapes and sizes with true, consistent curves, lines, and angles. Separate metals from dissimilar materials to prevent electrolytic action.

B. Welded Connections: Weld connections continuously. Weld solid members with full-length, full-penetration welds and hollow members with full-circumference welds. At exposed connections, finish surfaces smooth and blended, so no roughness or unevenness shows after finishing and welded surface matches contours of adjoining surfaces.

C. Pipes and Tubes: Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of handrail and railing components.

D. Factory Assembly: Factory assemble components to greatest extent possible to minimize field assembly. Clearly mark units for assembly in the field.
PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with manufacturer’s written installation instructions unless more stringent requirements are indicated. Complete field assembly of site furnishings where required.

B. Unless otherwise indicated, install site furnishings after landscaping and paving have been completed.

C. Install site furnishings level, plumb, true, and securely anchored at locations indicated on Drawings.

END OF SPECIAL PROVISION
SPECIAL PROVISION

TOPSOIL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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


1.2 SUMMARY

A. Section includes:
   1. Topsoil for plant stock.
   2. Topsoil for Soil Cell System.

B. Related Sections:
   1. Special Provision 5 “Plants” for planting soils.
   2. Special Provision 7 “Soil Cell Soil” for soils within soil cells.

1.3 SUBMITTALS

A. Import Topsoil Analysis: Furnish soil analysis to the Owner’s Representative by a qualified soil-testing laboratory, state-operated or university-operated laboratory; experience in soil science, soil testing and plant nutrition; with the experience and capability to conduct the testing indicated; and that specializes in type(s) of tests to be performed, stating percentages of organic matter, gradation of sand, silt and clay content; cation exchange capacity; sodium absorption ratio, deleterious material, pH and mineral and plant-nutrient content of topsoil.

B. Import Topsoil Source: Submit the proposed topsoil source(s) as soon as possible after the contract award. Topsoil from proposed sources may be used only after sample texts show the material is acceptable.

C. Import Topsoil Noxious Weed Free Status: Prior to bringing any imported topsoil on site, provide to the Owner’s Representative, a letter from the Weed District Coordinator stating that the source of the topsoil is noxious weed seed free.

D. Soil Cell Topsoil: Provide testing data that includes recommendations amendments to meet topsoil fertility for plant stock.
PART 2 - PRODUCTS

2.1 IMPORTED TOPSOIL

A. Imported Topsoil Classification and Fertility
   1. Imported Topsoil Classification: Provide imported topsoil with a textural classification of
      loam, sandy loam or silty loam.
   2. Imported Topsoil Fertility: Provide topsoil that is sufficiently fertile to sustain normal
      healthy plant growth. Amendments and fertilizers may be required to allow the topsoil to
      meet these requirements and shall be incorporated into all topsoil fill by rototilling or other
      approved means.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Optimal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ph</td>
<td>5.5</td>
<td>7.5</td>
<td>6.5</td>
</tr>
<tr>
<td>Nitrates (mg/kg)</td>
<td>1.0</td>
<td>150</td>
<td>20</td>
</tr>
<tr>
<td>Organic Matter (%)</td>
<td>1.0</td>
<td>10.0</td>
<td>&gt;3.0</td>
</tr>
<tr>
<td>Olsen Phosphorus (mg/kg)</td>
<td>1.0</td>
<td>150</td>
<td>&gt;50</td>
</tr>
<tr>
<td>Potassium (mg/kg)</td>
<td>100</td>
<td>1,500</td>
<td>&gt;500</td>
</tr>
<tr>
<td>Sodium (meg/100g)</td>
<td>n/a</td>
<td>2.0</td>
<td>&lt;1.0</td>
</tr>
<tr>
<td>Calcium (meg/100g)</td>
<td>0.2</td>
<td>5.0</td>
<td>&gt;0.3</td>
</tr>
<tr>
<td>Sulfate (mg/kg)</td>
<td>1.0</td>
<td>1,500</td>
<td>&gt;20</td>
</tr>
<tr>
<td>Conductivity (mmhos/cm)</td>
<td>n/a</td>
<td>2.0</td>
<td>&lt;1.0</td>
</tr>
<tr>
<td>Lime (qualitative)</td>
<td>n/a</td>
<td>Moderate</td>
<td>Slight</td>
</tr>
</tbody>
</table>

B. Imported Topsoil Source
   1. Imported Topsoil Source: Do not obtain topsoil from wetland areas. Imported topsoil
      must be free of stones one inch or larger in any dimension and free of other extraneous
      materials or construction debris that is harmful to plant growth.

2.2 SOIL CELL TOPSOIL

A. A mixture of imported topsoil, coarse sand and compost to make a new soil that meets the
   project goals for the indicated planting area.
   1. The approximate ratio of imported topsoil, coarse sand and compost shall be:

<table>
<thead>
<tr>
<th>Mix Component</th>
<th>Percent by Moist Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imported topsoil</td>
<td>50 to 60 percent</td>
</tr>
<tr>
<td>Coarse Sand</td>
<td>30 to 40 percent</td>
</tr>
<tr>
<td>Compost</td>
<td>10 percent</td>
</tr>
</tbody>
</table>


B. Mix the coarse sand and compost together first and then add to the topsoil. Mix with a loader
   bucket to loosely incorporate the topsoil into the coarse sand/compost mix. Do not over mix. Do
   not mix with a soil blending machine. Clumps and clods of soil and loosely mixed compost and
   coast sand will be permitted in the overall mix.

C. At the time of soil installation, add amendments, fertilizers and/or biological amendments, if
   required, to the planting soil mix at rates recommended by a qualified testing laboratory.
PART 3 - EXECUTION

3.1 FINE GRADING
   A. Fine grade all topsoil areas to the lines, grades and elevations specified. Note areas to receive organic or mineral mulch or sod and adjust grades accordingly. Do not place topsoil until the designated areas are prepared and all construction work in the area is completed.
   B. Remove and dispose of all clods, rocks, large roots, litter, construction debris and all other foreign material from the topsoil before placement.

3.2 TOPSOIL DEPTH
   A. Open Planting Bed Areas: Provide a minimum of 12 inch depth of topsoil in all planting bed areas not located within the soil cell areas.

3.3 INSTALLATION OF TOPSOIL IN SOIL CELL AREA
   A. Install topsoil located in soil cell areas according to Section 3.10 of Special Provision 6, "Soil Cells."

3.4 COMPACTION
   A. Compact all areas to receive seed, sod or plantings to 85 percent proctor density.

END OF SPECIAL PROVISION
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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


1.2 SUMMARY

A. Section Includes:
   1. Brick pavers set in bituminous setting beds.

1.3 ACTION SUBMITTALS

A. Product Data: For materials other than water and aggregates.

B. Samples: For each type of unit paver indicated and the following:
   1. Joint materials involving color selection.

1.4 INFORMATIONAL SUBMITTALS

A. Material Certificates: For unit pavers. Include statements of material properties indicating compliance with requirements, including compliance with standards. Provide for each type and size of unit.

1.5 FIELD CONDITIONS

A. Cold-Weather Protection: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds. Remove and replace unit paver work damaged by frost or freezing.

B. Weather Limitations for Bituminous Setting Bed: Install bituminous setting bed only when ambient temperature is above 40 deg F and when base is dry.
PART 2 - PRODUCTS

2.1 BRICK PAVERS

A. Brick Pavers: Light-traffic paving brick; ASTM C 902, Class SX, Type I, Application PS or PX. Provide brick without frogs or cores in surfaces exposed to view in the completed Work.

1. Approved Manufacturers:
   b. The Belden Brick Company, PO Box 20910, Canton, Ohio 44701-0910. Phone: 330-451-2031.

2. Thickness: 2-1/4 inches.
3. Face Size: 4 by 8 inches.
4. Color: As indicated by manufacturer's designations.

B. Temporary Protective Coating: Precoat exposed surfaces of brick pavers with a continuous film of a temporary protective coating that is compatible with brick, mortar, and grout products and can be removed without damaging grout or brick. Do not coat unexposed brick surfaces; handle brick to prevent coated surfaces from contacting backs or edges of other units. If, despite these precautions, coating does contact bonding surfaces of brick, remove coating from bonding surfaces before setting brick.

2.2 BITUMINOUS SETTING-BED MATERIALS

A. Primer for Base: ASTM D 2028/D 2028M, cutback asphalt, grade as recommended by unit paver manufacturer.

B. Fine Aggregate for Setting Bed: ASTM D 1073, No. 2 or No. 3.

C. Asphalt Cement: ASTM D 3381/D 3381M, Viscosity Grade AC-10 or Grade AC-20.

D. Neoprene-Modified Asphalt Adhesive: Paving manufacturer's standard adhesive consisting of oxidized asphalt combined with 2 percent neoprene and 10 percent long-fibered mineral fibers containing no asbestos.

E. Sand for Joints: Fine, sharp, washed, natural sand or crushed stone with 100 percent passing No. 16 sieve and no more than 10 percent passing No. 200 sieve.

2.3 BITUMINOUS SETTING-BED MIX

A. Mix bituminous setting-bed materials at an asphalt plant in approximate proportion, by weight, of 7 percent asphalt cement to 93 percent fine aggregate unless otherwise indicated. Heat mixture to 300 deg F.
PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Mix pavers from several pallets or cubes, as they are placed, to produce uniform blend of colors and textures.

B. Cut unit pavers with motor-driven masonry saw equipment to provide clean, sharp, unchipped edges. Cut units to provide pattern indicated and to fit adjoining work neatly. Use full units without cutting where possible. Hammer cutting is not acceptable.

   1. Block splitter may not be used.

C. Joint Pattern: Basket weave.

D. Tolerances: Do not exceed 1/4 inch in 10 feet from level, or indicated slope, for finished surface of paving.

E. Expansion and Control Joints: Provide for sealant-filled joints at locations and of widths indicated. Provide compressible foam filler as backing for sealant-filled joints. Install joint filler before setting pavers.

3.2 BITUMINOUS SETTING-BED APPLICATIONS

A. Apply primer to concrete slab or binder course immediately before placing setting bed.

B. Prepare for setting-bed placement by locating 3/4-inch- deep control bars approximately 11 feet apart and parallel to one another, to serve as guides for striking board. Adjust bars to subgrades required for accurate setting of paving units to finished grades indicated.

C. Place bituminous setting bed where indicated, in panels, by spreading bituminous material between control bars. Spread mix at a minimum temperature of 250 deg F. Strike setting bed smooth, firm, even, and not less than 3/4 inch thick. Add fresh bituminous material to low, porous spots after each pass of striking board. After each panel is completed, advance first control bar to next position in readiness for striking adjacent panels. Carefully fill depressions that remain after removing depth-control bars.

   1. Roll setting bed with power roller to a nominal depth of 3/4 inch. Adjust thickness as necessary to allow accurate setting of unit pavers to finished grades indicated. Complete rolling before mix temperature cools to 185 deg F.

D. Apply neoprene-modified asphalt adhesive to cold setting bed by squeegeeing or troweling to a uniform thickness of 1/16 inch. Proceed with setting of paving units only after adhesive is tacky and surface is dry to touch.

E. Place pavers carefully by hand in straight courses, maintaining accurate alignment and uniform top surface. Protect newly laid pavers with plywood panels on which workers can stand. Advance protective panels as work progresses, but maintain protection in areas subject to continued movement of materials and equipment to avoid creating depressions or disrupting alignment of pavers. If additional leveling of paving is required, and before treating joints, roll paving with power roller after sufficient heat has built up in the surface from several days of hot weather.
F. Joint Treatment: Place unit pavers with hand-tight joints. Fill joints by sweeping sand over paved surface until joints are filled. Remove excess sand after joints are filled.

END OF SPECIAL PROVISION
SPECIAL PROVISION

PLANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Plants.
   2. Tree-watering devices.

B. Related Requirements:
   1. Iowa Statewide Urban Design and Specifications (SUDAS) manual, current edition, shall take precedence, unless specified otherwise in this Specification.

1.2 DEFINITIONS

A. Backfill: The earth used to replace or the act of replacing earth in an excavation.

B. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant. Some sources classify herbicides separately from pesticides.

C. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth. See Special Provision 4 “Topsoil” for drawing designations for planting soils.

D. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Plant Procurement List.
   1. Plant procurement list must be submitted at least 6-months before installation.

B. Product Data: For each type of product.

C. Samples of each type of mulch.

1.5 INFORMATIONAL SUBMITTALS

A. Product certificates.
B. Sample warranty.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of plants during a calendar year.

B. Installer's written plant warranty.

1.7 QUALITY ASSURANCE

A. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
   1. Pesticide Applicator: State licensed, commercial.

B. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.

B. Handle planting stock by root ball.

C. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.

1.9 WARRANTY

A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner.
      b. Structural failures including plantings falling or blowing over.
   2. Warranty Periods: From date of Substantial Completion.
      a. Trees and Shrubs: 12 months.
      b. Perennials and Ornamental Grasses: Six months.
PART 2 - PRODUCTS

2.1 PLANT MATERIAL

A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant List, Plant Schedule, or Plant Legend indicated on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

B. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which begins at root flare according to ANSI Z60.1. Root flare shall be visible before planting.

2.2 FERTILIZERS

A. Planting Tablets: Tightly compressed chip-type, long-lasting, slow-release, commercial-grade planting fertilizer in tablet form. Tablets shall break down with soil bacteria, converting nutrients into a form that can be absorbed by plant roots.
   1. Size: 21-gram tablets.
   2. Nutrient Composition: 20 percent nitrogen, 10 percent phosphorous, and 5 percent potassium, by weight plus micronutrients.

2.3 MULCHES

A. Organic Mulch: Shredded hardwood.

2.4 WEED-CONTROL BARRIERS

A. Nonwoven Geotextile Filter Fabric: Polypropylene or polyester fabric, 3 oz./sq. yd. minimum, composed of fibers formed into a stable network so that fibers retain their relative position. Fabric shall be inert to biological degradation and resist naturally encountered chemicals, alkalis, and acids.

2.5 PESTICIDES

A. General: Pesticide registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

2.6 TREE-WATERING DEVICES

A. Slow-Release Watering Device: Standard product manufactured for drip irrigation of plants and emptying its water contents over an extended time period; manufactured from UV-light-stabilized nylon-reinforced polyethylene sheet, PVC, or HDPE plastic.
   1. Approved Tree-Watering Devices
      a. Treegator, as manufactured by Spectrum Products, Inc.
b. Tree Diaper, as manufactured by Zinnovation, LLC.
2. Other proprietary tree-watering devices may be considered with approval from Owner’s Representative.

PART 3 - EXECUTION

3.1 PLANTING AREA ESTABLISHMENT

A. General: Prepare planting area for soil placement according to Special Provision 4 “Topsoil.”
B. Placing Planting Soil: Place imported topsoil over exposed subgrade.
C. Before planting, obtain Owner’s Representative’s acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.2 EXCAVATION FOR TREES AND SHRUBS

A. Planting Pits and Trenches: Excavate circular planting pits.
   1. Excavate planting pits with sides sloping inward at a 45-degree angle. Excavations with vertical sides are unacceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.
   2. Excavate approximately three times as wide as ball diameter.
   3. Excavate at least 12 inches wider than root spread and deep enough to accommodate vertical roots for bare-root stock.
   4. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.
B. Backfill Soil: Subsoil and topsoil removed from excavations may not be used as backfill soil unless otherwise indicated.

3.3 TREE & SHRUB PLANT PLANTING

A. Inspection: At time of planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.
B. Roots: Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.
C. Set each plant plumb and in center of planting pit or trench with root flare 2 inches adjacent finish grades.
   1. Backfill: Planting soil for all backfill.
   2. Balled and Burlapped Stock: After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
3. Container-Grown Stock: Carefully remove root ball from container without damaging root ball or plant.
4. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
5. Place planting tablets equally distributed around each planting pit when pit is approximately one-half filled. Place tablets beside the root ball about 1 inch from root tips; do not place tablets in bottom of the hole.
   a. Quantity: Two per plant or three for each caliper inch of plant, whichever is greater.

3.4 TREE & SHRUB PRUNING

A. Remove only dead, dying, or broken branches. Do not prune for shape.
B. Prune, thin, and shape trees, shrubs, and vines as directed by Owner's Representative.
C. Prune, thin, and shape trees, shrubs, and vines according to standard professional horticultural and arboricultural practices. Unless otherwise indicated by Architect, do not cut tree leaders; remove only injured, dying, or dead branches from trees and shrubs; and prune to retain natural character.
D. Do not apply pruning paint to wounds.

3.5 ORNAMENTAL GRASS & PERENNIAL PLANT PLANTING

A. Set out and space ground cover and plants other than trees and shrubs as indicated on Drawings in even rows with triangular spacing.
B. Use planting soil for backfill.
C. Dig holes large enough to allow spreading of roots.
D. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.
E. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.
F. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.6 PLANTING AREA MULCHING

A. Install weed-control barriers before mulching according to manufacturer's written instructions. Completely cover area to be mulched, overlapping edges a minimum of 6 inches and secure seams with galvanized pins.
B. Mulch backfilled surfaces of planting areas and other areas indicated.
   1. Organic Mulch in Planting Areas: Apply 3-inch average thickness of organic mulch over whole surface of planting area, and finish level with adjacent finish grades. Do not place mulch within 2-inches of trunks or stems.
3.7 INSTALLING SLOW-RELEASE WATERING DEVICE
A. Provide one device for each tree.

3.8 PLANT MAINTENANCE
A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings.

B. Fill in, as necessary, soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.

C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices when possible to minimize use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

D. Apply pesticides and other chemical products and biological control agents according to authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

E. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

F. At time of Substantial Completion, verify that tree-watering devices are in good working order and leave them in place. Replace improperly functioning devices.

3.9 MAINTENANCE SERVICE
A. Maintenance Service: Provide maintenance by skilled employees of landscape Installer. Maintain as required in "Plant Maintenance" Article. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established, but for not less than maintenance period below:

1. Maintenance Period for Trees and Shrubs: 12 months from date of Substantial Completion.
2. Maintenance Period for Ornamental Grasses and Perennials: Six months from date of Substantial Completion.

END OF SPECIAL PROVISION
INGERSOLL STREETSCAPE PHASE 1

SPECIAL PROVISION
SOIL CELLS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Silva Cell system for planting and paving, including Silva Cell assemblies and related accessories.
   2. Other materials including, but not limited to, geotextile, geogrid, aggregate, subbase material, backfill, root barrier, Water + Air System, and planting soil.

B. Materials Installed But Not Furnished Under This Section:
   1. Planting soils are furnished in Special Provision 3 "Topsoil."

C. Related Requirements:
   1. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

1.02 REFERENCES

A. Definitions:
   1. AGGREGATE BASE COURSE: Aggregate material between the paving and the top of the Silva Cell deck below, designed to distribute loads across the top of the deck.

   2. AGGREGATE SETTING BED FOR PAVERS: Aggregate material between the aggregate base course and unit surface pavers, designed to act as a setting bed for the pavers.

   3. AGGREGATE SUBBASE: Aggregate material between the bottom of the Silva Cell base and the compacted subgrade below, designed to distribute loads from the Silva Cell bases to the subgrade.

   4. BACKFILL: The earth used to replace or the act of replacing earth in an excavation beside the Silva Cell system to the excavation extents.

   5. FINISH GRADE: Elevation of finished surface of planting soil or paving.

   6. PLANTING SOIL: Soil as defined in Division 32, Section 32 94.56 - Planting Soil for Silva Cells, intended to fill the Silva Cell system and other planting spaces.

   7. SILVA CELL SYSTEM:
      a. Silva Cell: One assembled unit made up of 1 base, 6 post assemblies, and 1 Silva Cell deck.
      b. Silva Cell System: Two or more Silva Cells used in combination with each other and with required accessories.

   8. SUBGRADE: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill.

   9. WALK-THROUGH COMPACTION: A process for light compaction of soils by walking through the soil following placement.
      a. Walk through compaction shall result in 75-85 percent of maximum dry density in accordance with ASTM D698, Standard Proctor Method. Do not exceed root limiting compaction for the given soil type.

B. Reference Standards:

   1. American Association of State Highway and Transportation Officials (AASHTO):
      a. AASHTO H-20

   2. ASTM International (ASTM):
      a. ASTM D448-12, Standard Classification for Sizes of Aggregate for Road and Bridge Construction
b. ASTM D698-12e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft·lbf/ft³ [600 kN·m/m³])
d. ASTM D3786/D3786M-13, Standard Test Method for Bursting Strength of Textile Fabrics-Diaphragm Bursting Strength Tester Method
e. ASTM D4491-99a(2014)e1, Standard Test Methods for Water Permeability of Geotextiles by Permittivity
g. ASTM D4632-D4632M-15, Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
h. ASTM D4751-12, Standard Test Method for Determining Apparent Opening Size of a Geotextile
k. ASTM D6241-14, Standard Test Method for Static Puncture Strength of Geotextile and Geotextile-Related Products Using a 50mm Probe
l. ASTM D6637-11, Standard Test Method for Determining Tensile Properties of Geogrids by the Single or Multi-Rib Tensile Method

1.03 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Conference: Prior to installation of the Silva Cell system and associated Work, meet with the Contractor, Silva Cell system installer and their field supervisor, manufacturer’s technical representative, the Owner’s Representative, the Owner at the Owner’s discretion, and other entities concerned with the Silva Cell system performance.
1. Provide at least 72 hours advance notice to participants prior to convening preinstallation conference.
2. Introduce and provide a roster of individuals in attendance with contact information.
3. The preinstallation conference agenda will include, but is not limited to the review of:
   a. Required submittals both completed and yet to be completed.
   b. The sequence of installation and the construction schedule.
   c. Coordination with other trades.
   d. Details, materials and methods of installation.
      1) Review requirements for substrate conditions, special details, if any, installation procedures.
      2) Installation layout, procedures, means and methods.
   e. Mock-up requirements.

B. Sequencing and Scheduling:
1. General: Prior to beginning Work of this Section, prepare a detailed schedule of the Work involved for coordination with other trades.
2. Schedule utility installations prior to beginning Work of this Section.
3. Where possible, schedule the installation of the Silva Cell system after the area is no longer required for use by other trades and Work. Where necessary to prevent damage, protect installed system if Work must occur over or adjacent to the installed Silva Cell system.

1.04 SUBMITTALS

A. Action Submittals: Submit these to the Owner’s Representative for review and acceptance not less than 45 days prior to start of installation of materials and products specified in this Section.
1. Product Data: For each type of product, submit manufacturer’s product literature with technical data sufficient to demonstrate that the product meets these specifications.
2. Test and Evaluation Reports:
   a. Submit results of compaction testing required by the Specifications for approval.
b. Include analysis of bulk materials including soils and aggregates, by a recognized laboratory that demonstrates that the materials meet the Specification requirements.

3. Samples:
   a. One full size sample of an assembled Silva Cell (copy of manufacturers brochure with images of product may be accepted in lieu of product sample).
   b. Manufacturer’s product data/specification sheet for geogrid.
   c. Manufacturer’s product data/specification sheet for geotextile.
   d. Manufacturer’s product data/specification sheet for Water+Air System components (when specified as part of the system)

4. Manufacturer’s Report: Submit Silva Cell system manufacturer’s letter of review and approval of the Project, including Drawings and Specifications, Addenda, Clarifications and Modifications, and for compliance with product installation requirements.

5. Qualification Statements:
   a. Manufacturer:
      1) Submit list of completed projects demonstrating durability and longevity of in-place systems.
         a) Include project name, location, and date of completion.
   b. Installer:
      1) Submit documentation of the qualifications of the Silva Cell system installer and their field supervisor, sufficient to demonstrate that both meet the requirements specified in Article 1.05 QUALITY ASSURANCE.
      2) Submit list of completed projects of similar scope and scale demonstrating capabilities and experience.

B. Closeout Submittals: Submit these to the Owner’s Representative at completion of installation.
   1. Warranty: Submit manufacturer’s warranty, fully executed.

1.05 QUALITY ASSURANCE

A. Comply with applicable requirements of the laws, codes, ordinances and regulations of Federal, State and Municipal authorities having jurisdiction. Obtain necessary permits/approvals from these authorities.

B. Manufacturer Qualifications:
   1. A manufacturer whose product is manufactured in an ISO/TS 16949 compliant and ISO 9001 - 2008 registered factory.
   2. A manufacturer with not less than 100 Silva Cell systems in-place, each system in use for not less than 7 years, confirming durability and longevity of the system.
   3. A manufacturer with documented written approval of their product for use as a stormwater treatment device by a minimum of 3 governmental jurisdictions.
   4. A manufacturer with an established and demonstrated utility service and repair process, including written procedure and photographs demonstrating work.
   5. A manufacturer with a published operating and maintenance manual

C. Installer Qualifications: A qualified installer with not less than 5 years of successful experience installing Silva Cell systems or related products and materials, and whose work has resulted in successful installation of underground piping, chambers and vault structures, planting soils, and planter drainage systems of a similar scope and scale in dense urban areas.

D. Installer's Field Supervisor: A full-time supervisor employed by the installer with not less than 5 years of successful experience similar to that of the installer and present at the Project site when Work is in progress. Utilize the same field supervisor throughout the Project, unless a substitution is submitted to and approved in writing by the Owner’s Representative.

E. Mock-Up: Prior to the installation of the Silva Cell system, construct a mock-up of the complete installation at the Project site in the presence of the Landscape Architect.
   1. Size and Extent: Minimum of 100 sq. ft. (10 sq. m.) in area and including the complete Silva Cell system installation with subbase, aggregate subbase, drainage installation, Silva
Cell decks, posts, and bases, base course aggregate, geotextile, geogrid, backfill, planting soil, and necessary accessories.

2. The mock-up area may remain as part of the installed Work at the end of the Project provided that it remains undamaged and meets the requirements of the Drawings and Specifications.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Silva Cell System: Protect Silva Cell system components from damage during delivery, storage and handling.
   1. Store components on smooth surfaces, free from dirt, mud and debris. Store under tarp to protect from sunlight when time from delivery to installation exceeds one week.
   2. Perform handling with equipment appropriate to the size (height) of Silva Cells and site conditions; equipment may include, hand, handcart, forklifts, extension lifts, or small cranes, with care given to minimize damage to Silva Cell bases, posts, decks and adjacent assembled Silva Cells.

B. Packaged Materials: Deliver packaged materials in original, unopened containers indicating weight, certified analysis, name and address of manufacturer, and indication of conformance with State and Federal laws, if applicable. Protect materials from deterioration during delivery and while on the Project site.
   1. Do not deliver or place backfill, soils, or soil amendments in frozen, wet, or muddy conditions.
   2. Provide protection including tarps, plastic and/or matting between bulk materials and finished surfaces sufficient to protect the finish material.
   3. Bring planting soil to the site using equipment and methods that do not overly mix and further damage soil peds within the soil mix.

D. Provide erosion-control measures to prevent erosion or displacement of bulk materials and discharge of soil-bearing water runoff or airborne dust to adjacent properties, water conveyance systems, and walkways. Provide additional sediment control to retain excavated material, backfill, soil amendments and planting mix within the Project limits as needed.

1.07 FIELD CONDITIONS

A. Existing Conditions: Do not proceed with Work when subgrades, soils and planting soils are in a wet, muddy or frozen condition.

1.08 WARRANTY

A. The Contractor shall warrant the Silva Cell system to be free of faults and defects in accordance with the General Conditions, except that the warranty shall be extended by manufacturer's written warranty against defects in materials and workmanship as follows:
   1. DeepRoot® warrants to the original purchaser of its Silva Cell™ product that such product will be free from defects in materials and workmanship, and perform to DeepRoot's written specifications for the warranted product, when installed and used as specifically provided in the product's installation guidelines for a period of 20 years from the date of purchase. This warranty does not cover wear from normal use, or damage caused by abuse, mishandling, alterations, improper installation and/or assembly, accident, misuse, or lack of reasonable care of the product. This warranty does not apply to events and conditions beyond DeepRoot's control, such as ground subsidence or settlement, earthquakes and other natural events, acts of third parties, and/or Acts of God. If this warranty is breached, DeepRoot® will provide a replacement product. Incurred costs, such as labor for removal of the original product, installation of replacement product, and the cost of incidental or other materials or expenses are not covered under this warranty.
   2. Deeproot® makes no other warranties, express or implied, and specifically disclaims the warranty of merchantability or fitness for a particular purpose. Deeproot® shall not be liable either in tort or in contract for any direct, incidental or consequential damages, lost profits, lost revenues, loss of use, or any breach of any express or implied warranty.
PART 2 - PRODUCTS

2.01 MANUFACTURER

A. Acceptable Manufacturers:

DeepRoot Green Infrastructure, LLC
101 Montgomery Street, Suite 2850
San Francisco, CA, 94104

Phone: 415.781.9700
Toll Free: 800.458.7668
Fax: 415.781.0191
www.deeproot.com

B. Substitutions: Manufacturers seeking approval of their products are required to comply with the Owner's Instructions to Bidders, generally contained in the Project Manual.

2.02 DESCRIPTION

A. The term Silva Cell shall be used to refer to a single Silva Cell.
B. Silva Cells shall be designed for the purpose of growing healthy trees and providing stormwater management.
C. Silva Cells shall be modular, structural systems.
D. Each Silva Cell shall be structurally-independent from all adjacent Silva Cells for incorporating utilities and other site features as well as for future repairs.
E. Silva Cells shall be capable of supporting loads up to and including AASHTO H-20 (United States) or CSA-S6 87.5 kN (Canada) when used in conjunction with approved pavement profiles.
F. Silva Cells shall be open on all vertical faces and horizontal planes and shall have no interior walls or diaphragms.
G. Silva Cells shall be capable of providing a large, contiguous, continuous volume of planting soil that does not inhibit or prevent the following:
   1. Placement of planting soil
   2. Walk through compaction
   3. Compaction testing of planting soil, once in place
   4. Movement and growth of roots
   5. Movement of water within the provided soil volume, including lateral capillary movement
   6. Installation and maintenance of utilities placed within, adjacent to, or below the Silva Cell.
H. Silva Cells shall be able capable of being filled with a variety of soil types and soils that include peds 2 inches (50 mm) or larger in diameter as is appropriate for the application, location of the installation, and tree species.

2.03 SILVA CELL MATERIALS AND ACCESSORIES

A. Silva Cell System Components: Each "Silva Cell" soil cell module (hereafter Silva Cell or "cell") is composed of one base, 6 post assemblies, and one deck.

   1. 2x Silva Cell System:
      a. Components: One base, six 2x posts, and one deck.
      b. Assembled Dimensions (Each Cell): 47.2 inches long by 23.6 inches wide by 30.9 inches high.

B. Silva Cell Materials and Fabrication:

C. Manufacturer's Related Silva Cell Installation Accessories:
   1. Strongbacks: An accessory designed to stabilize the Silva Cell posts temporarily, during soil placement, and removed for reuse prior to placing decks.
2. Anchoring Spikes: 10” landscape spike for securing assembled Silva Cells to subbase.

2.04 RELATED PRODUCTS

A. Root Barrier: Recyclable, black, injection molded panels manufactured with a minimum 50 percent post-consumer recycled polypropylene plastic with UV inhibitors, and integrated zipper joining system which allows instant assembly by sliding one panel into another; for redirecting tree roots down and away from hardscapes.
   1. Panel Sizes:
      a. No. UB12-2: 24 inches long by 12 inches deep by 0.080 inches thick (61 cm long by 30 cm deep by 2.03 mm thick); for use with 1x systems and for pavement profiles less than 12 inches (30 cm) deep.
      b. No. UB18-2: 24 inches long by 18 inches deep by 0.080 inches thick (61 cm long by 46 cm deep by 2.03 mm thick); for use with 2x and 3x systems, and for pavement profiles 12 inches or more in depth.

2. Products meeting this specification:
   a. DeepRoot Tree Root Barrier (DeepRoot Green Infrastructure, LLC)

B. Geogrid: Net-shaped woven polyester fabric with PVC coating, uniaxial or biaxial geogrid, inert to biological degradation, resistant to naturally occurring chemicals, alkalis, and acids; used to provide a stabilizing force within soil structure as the fill interlocks with the grid.
   1. Tensile strength at ultimate (ASTM D6637):
      a. 1850 lbs/ft (27.0 kN/m) minimum
   2. Creep reduced strength (ASTM D5262):
      a. 1000 lbs/ft (14.6 kN/m) minimum
   3. Long term allowable design load (GRI GG-4):
      a. 950 lbs/ft (13.9 kN/m) minimum
   4. Grid aperture size (MD):
      a. 0.8 inch (20 mm) minimum
   5. Grid aperture size (CD):
      a. 1.28 inch (32 mm) maximum
   6. Roll size: 6-foot (1.8-m) width is preferred, up to 18-foot (5.4-m).
   7. Products meeting this specification:
      a. Stratagrid SG 150; http://www.geogrid.com
      b. Miragrid 2XT; http://www.tencate.com
      c. Fortrac 35 Geogrid; http://www.hueskerinc.com
      d. SF 20 Biaxial Geogrid; http://www.synten.com

C. Geotextile: composed of high tenacity polypropylene yarns which are woven into a network such that the yarns retain their relative position and is inert to biological degradation and resistant to naturally encountered chemicals, alkalis, and acids.
   1. Tensile strength at ultimate (ASTM D4595):
      a. 4800 lbs/ft (70.0 KN/m) MD minimum
      b. 4800 lbs/ft (70.0 KN/m) CD minimum
   2. Tensile strength at 5% strain (ASTM D4595):
      a. 2400 lbs/ft (35.0 KN/m) MD minimum
      b. 3000 lbs/ft (43.8 KN/m) CD minimum
   3. Flow rate (ASTM D4491):
      a. 30 gal/min/ft² (2648 l/min/m²) minimum
   4. Apparent opening size (ASTM D4751):
      a. 30 sieve (0.60 mm)
   5. UV Resistance (at 500 hours):
      a. 80 percent strength retained
   6. Products meeting this specification:
      a. Mirafi HP570; http://www.tencate.com
      b. Geolon PP40; http://www.tencate.com
      c. Nilex Woven 2044 (Nilex); http://www.nilex.com
D. Plastic Cable Ties: A tensioning device or tool used to tie similar or different materials together with a specific degree of tension.

2.05 OTHER RELATED MATERIALS

A. Wood Blocking: Nominal dimensioned untreated lumber used for spacing assembled Silva Cells.

B. Aggregate Subbase (Below Silva Cell Base):
   1. Aggregate meeting one of the following specifications:
      a. Complying ASTM D1241, Type I, Gradation B: Type I mixtures shall consist of stone, gravel, or slag with natural or crushed sand and fine mineral particles passing a No. 200 sieve.

      | Sieve                  | Percent Passing |
      |------------------------|-----------------|
      | 1-1/2 inches (37.5 mm) | 100             |
      | 1 inch (25 mm)         | 75 to 95        |
      | 3/8 inch (9.5 mm)      | 40 to 75        |
      | No 4 (4.75 mm)         | 30 to 60        |
      | No 10 (2 mm)           | 20 to 45        |
      | No 40 (425 μm)         | 15 to 30        |
      | No 200 (75 μm)         | 5 to 15         |

      b. Local Department of Transportation (DOT) virgin aggregate that most closely meets the gradation of ASTM D1241.

C. Aggregate Base Course (Above Silva Cell Deck):
   1. Same as aggregate subbase specified above.

D. Setting Bed for Unit Pavers (Above Silva Cell Deck):
   1. Aggregate complying with ASTM D448, No. 8.

      | Sieve              | Percent Passing |
      |-------------------|-----------------|
      | 1/2 inch (12.5 mm) | 100             |
      | 3/8 inch (9.5 mm)  | 85 to 100       |
      | No 4 (4.75 mm)     | 10 to 30        |
      | No 8 (2.36 mm)     | 0 to 10         |
      | No 16 (1.18 mm)    | 0 to 5          |

G. Backfill Material (Adjacent to Silva Cells): Clean, compactable, coarse grained fill soil free of organic material, trash and other debris, and free of toxic material injurious to plant growth.

H. Planting Soil: Refer to Special Provision 3 - Topsoil.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine the conditions under which the Silva Cells are to be installed.
   1. Carefully check and verify dimensions, quantities, and grade elevations.
   2. Carefully examine the Drawings to become familiar with the existing underground conditions before digging. Verify the location of aboveground and underground utility lines, infrastructure, other improvements, and existing trees, shrubs, and plants to remain including their root system.
   3. Notify the Contractor and the Owner’s Representative in writing in the event of conflict between existing and new improvements, of discrepancies, and other conditions detrimental to proper and timely completion of the installation.
   4. Obtain written approval of changes to the Work prior to proceeding. Proceed with installation only after changes have been made and unsatisfactory conditions have been corrected.
3.02 PREPARATION

A. Take proper precautions as necessary to avoid damage to existing improvements and plantings.
B. Prior to the start of Work, layout and stake the limits of excavation and horizontal and vertical control points sufficient to install the complete Silva Cell system.
C. Coordinate installation with other trades that may impact the completion of the Work.

3.03 TEMPORARY PROTECTION

A. Protect open excavations and Silva Cell system from access and damage both when Work is in progress and following completion, with highly visible construction tape, fencing, or other means until related construction is complete.
B. Do not drive vehicles or operate equipment over the Silva Cell system until the final surface material has been installed.

3.04 EXCAVATION

A. General: Excavate to the depths and shapes indicated on the Drawings. Provide smooth and level excavation base free of lumps and debris.
B. Confirm that the depth of the excavation is accurate and includes the full section of materials required to place the subbase aggregate, Silva Cell, and pavement profile as indicated on the Drawings.
C. Over-excavate beyond the perimeter of the Silva Cell to allow for:
   1. The extension of aggregate subbase beyond the Silva Cell layout as shown on the Drawings.
   2. Adequate space for proper compaction of backfill around the Silva Cell system.
D. If unsuitable subgrade soils are encountered, consult the Owner’s geotechnical consultants for directions on how to proceed.
E. If conflicts arise during excavation, notify the Owner’s Representative in writing and make recommendations for action. Proceed with Work only when action is approved in writing.

3.05 SUBGRADE COMPACTION

A. Compact subgrade to a minimum of 95 percent of maximum dry density at optimum moisture content in accordance with ASTM D698, Standard Proctor Method, or as approved by the Owner’s geotechnical representative.
B. Do not exceed 10 percent slope for subgrade profile in any one direction. If the 10 percent slope is exceeded, contact manufacturer’s representative for directions on how to proceed.

3.06 INSTALLATION OF GEOTEXTILE OVER SUBGRADE

A. Install geotextile over compacted subgrade.
   1. Lay geotextile flat with no folds or creases.
   2. Install the geotextile with a minimum joint overlap of 18 inches (450 mm).

3.07 INSTALLATION OF AGGREGATE SUBBASE BELOW SILVA CELL BASES

A. Install aggregate subbase to the depths indicated on the Drawings.
B. Extend subbase aggregate a minimum of 6 inches (150 mm) beyond the base of the Silva Cell layout.
C. Compact aggregate subbase to a minimum of 95 percent of maximum dry density at optimum moisture content in accordance with ASTM D698, Standard Proctor Method.
D. Do not exceed 10 percent slope on the surface of the subbase. Where proposed grades are greater than 10 percent, step the Silva Cells to maintain proper relation to the finished grade.
3.08 INSTALLATION OF SILVA CELL BASE

A. Install the Silva Cell system in strict accordance with manufacturer's instructions and as specified herein; where requirements conflict or are contradictory, follow the more stringent requirements.

B. Layout and Elevation Control:
   1. Provide layout and elevation control during installation of the Silva Cell system to ensure that layout and elevations are in accordance with the Drawings.

C. Establish the location of the tree openings in accordance with the Drawings. Once the trees are located, mark the inside dimensions of the tree openings on the prepared subbase.

D. Locate and mark other Project features located within the Silva Cell layout (e.g. light pole bases, utility pipes). Apply marking to identify the extent of the Silva Cell layout around these features. Follow the layout as shown on the Drawings to ensure proper spacing of the Silva Cell bases. Refer to the Drawings for offsets between these features and the Silva Cells.

E. Check each Silva Cell component for damage prior to placement. Reject cracked or chipped units.

F. Place the Silva Cell bases on the compacted aggregate subbase. Start at the tree opening and place Silva Cell bases around the tree openings as shown on the Drawings.

G. Working from tree opening to tree opening, place Silva Cell bases to fill in the area between tree openings.
   1. Maintain spacing no less than 1 inch (25 mm) and no more than 6 inches (150 mm) apart, assuming geotextile covering the decks meets the specifications in section 2.04 paragraph C.

H. Follow the Silva Cell layout plan as shown on the Drawings.

I. Install Silva Cell bases around, over, or under existing or proposed utility lines, as indicated on the Drawings.

J. Level each Silva Cell base as needed to provide full contact with subbase. Adjust subbase material, including larger pieces of aggregate, so each base sits solidly on the surface of the subbase. Silva Cell bases that rock or bend over any stone or other obstruction protruding above the surface of the subbase material are not allowed. Silva Cell bases which bend into dips in the subbase material are not allowed. The maximum tolerance for deviations in the plane of the subbase material under the bottom of the horizontal beams of each Silva Cell base is 1/4 inch in 4 feet (6 mm in 1200 mm).

K. Anchor Silva Cell base with 2 anchoring spikes per base.
   1. For applications where Silva Cells are installed over waterproofed structures, use wood blocking or similar spacing system consistent with requirements of the waterproofing system to maintain required spacing.

3.09 INSTALLATION OF SILVA CELL POSTS

A. 2x Silva Cell System:
   1. Attach 2x posts to the installed Silva Cell base. Each base will receive six 2x posts. Place the end of the post with tabs into the base. Rotate post clockwise to snap in place.

3.10 INSTALLATION OF STRONGBACKS, GEOGRID, BACKFILL AND PLANTING SOIL

A. Install strongbacks on top of the Silva Cell posts by snapping into place over installed posts prior to installing planting soil and backfill.
   1. Strongbacks are required only during the placement and compaction of the planting soil and backfill.
   2. Move strongbacks as the Work progresses across the installation.
   3. Remove strongbacks prior to the installation of the Silva Cell decks.

B. Install geogrid around the perimeter of the Silva Cell system where the compacted backfill and planting soil interface.
   1. Do not place geogrid between the edge of the Silva Cells and adjacent planting areas.
   2. Cut the geogrid to allow for a 6-inch (150-mm) overlap at the Silva Cell base and a 12-inch (300-mm) overlap at the Silva Cell deck.
   3. Provide a minimum 12-inch (300-mm) overlap between adjacent sheets of geogrid.
   4. Secure geogrid with cable ties below the top of the posts, along the post ridges.
C. Place the first lift of backfill material loosely around the perimeter of the Silva Cell system, between the geogrid and the sides of the excavation. Place backfill to approximately the midpoint of the Silva Cell post. Do not compact.

D. Place the first lift of planting soil in the Silva Cell system to approximately the midpoint of the Silva Cell post.
   1. Level the planting soil throughout the system.
   2. Walk-through the placed planting soil to remove air pockets and settle the soil.
      a. Lightly compact soils by walking through the soil following placement.
      b. Walk through compaction shall result in 75-85 percent of maximum dry density in accordance with ASTM D698, Standard Proctor Method. Do not exceed root limiting compaction for the given soil type.

E. Compact the first lift of backfill material, previously spread, to 95 percent of maximum dry density in accordance with ASTM D698, Standard Proctor Method or in accordance with Project Specifications for hardscape areas, whichever is greater.

F. Add and compact additional backfill material so that the final finished elevation is at approximately the same level of the placed planting soil within the Silva Cells.
   1. Maintain the geogrid between the Silva Cell system and the backfill material at all times.

G. Place the second lift of backfill material loosely around the perimeter of the Silva Cell system, between the geogrid and the sides of the excavation so that the material is 2 to 3 inches below the top of the posts. Do not compact.

H. Place the second lift of planting soil inside of the Silva Cell to the bottom of the strongbacks. Walk through compact.

3.11 INSTALLATION OF SILVA CELL DECK

A. Obtain final approval by the Owner's Representative of planting soil installation prior to installation of the Silva Cell decks.

B. Remove strongbacks, level out the planting soil, and immediately install decks over the posts below. Place deck over the top of the posts. Push decks down until the deck clips lock into the posts, snapping the deck into place.

C. Fold the 12 inches (300 mm) of geogrid onto the top of the decks.

3.12 FINAL BACKFILL PLACEMENT AND COMPACTION

A. Place and compact final lift of backfill material to 95 percent of maximum dry density in accordance with ASTM D698, Standard Proctor Method, such that the backfill is flush with the top of the installed deck. Do not allow compacting equipment to come in contact with the decks.

3.13 INSTALLATION OF GEOTEXTILE AND AGGREGATE BASE COURSE OVER THE DECK

A. Ensure geotextile meets the specifications in section 2.04 paragraph C.

B. Place geotextile over the top of the deck and extend to the edge of the excavation. Overlap joints a minimum of 18 inches (450 mm). Leave enough slack in the geotextile for the aggregate base course to push the geotextile down in the gaps in between the decks.

C. Install the aggregate base course (including aggregate setting bed if installing unit pavers) over the geotextile immediately after completing the installation of the fabrics. Work the aggregate from one side of the layout to the other so that the fabric and aggregate conform to the Silva Cell deck contours.

D. Maintain equipment used to place aggregate base course completely outside the limits of the Silva Cell excavation area to prevent damage to the installed system.

E. For large or confined areas, where aggregate cannot easily be placed from the edges of the excavated area, obtain approval for the installation procedure and types of equipment to be used in the installation from the Silva Cell manufacturer.

F. Compact aggregate base course(s) to 95 percent of maximum dry density in accordance with ASTM D698, Standard Proctor Method. Utilize a vibration or plate compactor with a maximum weight of 800 lbs (362.87 kg).

G. Do not drive vehicles or operate equipment over the completed aggregate base course.
3.14 INSTALLATION OF CONCRETE CURBS AT TREE OPENINGS, AGGREGATE SUBBASE AND PAVEMENT ABOVE THE SILVA CELL SYSTEM

A. Place concrete curbs along planting areas and tree openings as shown on the Drawings to retain the aggregate base course from migrating into the planting soil.
B. When staking concrete forms (e.g. curbs around the tree openings), prevent stakes from penetrating the Silva Cell decks.
C. Turn down edge of concrete paving to the Silva Cell deck along the edges of tree openings or planting areas to retain the aggregate base course material.
D. When paving type is a unit paver or other flexible material, provide a concrete curb under the paving at the edge of the Silva Cell deck to retain the aggregate base course material at the tree opening.
E. Place paving material over Silva Cell system in accordance with the Drawings.
   1. The Silva Cell system does not fully meet loading strength until the final paving is installed. Do not operate construction equipment on top of the Silva Cell system until paving installation has been completed.
F. Use care when placing paving or other backfill on top of Silva Cell system to prevent damage to the Silva Cell system or its components.

3.15 INSTALLATION OF ROOT BARRIERS

A. Install root barrier in accordance with manufacturer’s installation instructions.

3.16 INSTALLATION OF PLANTING SOIL WITHIN THE TREE PLANTING AREA

A. Remove rubble, debris, dust and silt from the top of the planting soil within the tree opening that may have accumulated after the initial installation of the planting soil within the Silva Cells.
B. Install additional planting soil within the tree openings, to the depths indicated on the Drawings.
   1. Use the same soil used within the Silva Cells for planting soil within the tree openings.
C. Compact planting soil under the tree root ball as needed to prevent settlement of the root ball.
D. Place trees in accordance with the Drawings.

3.17 PROTECTION

A. Keep construction traffic away from the limits of the Silva Cells until the final pavement profile is in place. The Silva Cell system does not fully meet loading strength until the final paving is installed.
   1. Do not operate equipment directly on top of the Silva Cell system until paving installation has been completed.
   2. Provide fencing and other barriers to prevent vehicles from entering into the Silva Cell area.
B. When the Silva Cell installation is completed and the permanent pavement is in place, limit traffic and construction related activities to only loads less than the design loads.

3.18 CLEAN UP

A. Perform clean up during installation and upon completion of the Work. Maintain the site free of soil, sediment, trash and debris. Remove excess soil materials, debris, and equipment from the site following completion of the Work of this Section.
B. Repair damage to adjacent materials and surfaces resulting from installation of this Work using mechanics skilled in remedial work of the construction type and trades affected.

END OF SPECIAL PROVISION
SPECIAL PROVISION
PERMEABLE INTERLOCKING PAVERS
(REPLACEMENT OF SECTIONS 3.05 TO 3.09)

SUDAS SECTION 7080 – "PERMEABLE INTERLOCKING PAVERS" SHALL REMAIN IN FULL-EFFECT WITH THE EXCEPTION OF THE SECTIONS REPLACED WITHIN THIS SPECIAL PROVISION.

3.05 STORAGE AGGREGATE

A. Place storage aggregate in 6 inch maximum lifts to the thickness specified in the contract documents. If underdrain is specified, take care not to damage or displace pipe during placement of storage aggregate.

B. Compact each lift with a vibratory drum roller until no visible movement can be seen in the aggregate layer. Do not operate compaction equipment directly over underdrain, until a minimum of 12 inches of storage aggregate is placed over the underdrain.

C. Install storage aggregate to the elevation specified in the contract documents.

3.06 FILTER AGGREGATE

A. Place filter aggregate directly over storage aggregate.

B. Install aggregate in a single lift with thickness of 3 inches.

C. Compact filter aggregate with at least two passes from a vibratory plate compactor capable of 5,000 lbs centrifugal force or a vibratory roller. If a vibratory roller is used, perform the final pass without vibration. Compact filter aggregate until no visible movement can be seen. A proof roll with a fully loaded tandem dump truck shall be performed prior to approval of the filter bed and storage aggregate bed.

3.07 BEDDING AGGREGATE

A. Place bedding aggregate directly over filter aggregate.

B. Install aggregate in single lift with a thickness of 2 inches.

C. Use laser guided spreader or place screen rails on the completed filter aggregate layer. Use screed width no less than the full width of each cross-section component. Surface variations must be within 3/8 inch when tested with a 10 foot straightedge.

D. DO NOT COMPACT BEDDING AGGREGATE PRIOR TO INSTALLATION OF PAVERS

E. Restrict pedestrians and equipment from screeded bedding prior to placement of pavers.

PERMEABLE INTERLOCKING PAVERS
3.09 INSTALLING INTERLOCKING PERMEABLE PAVER SYSTEM

Place and install pavers according to the pattern specified, the paver manufacturer’s published installation specifications, and the following:

A. Where pavers are placed against a curb and gutter or other pavement, installation of an edge course or soldier course is required if the pavement edge is not straight. Trim pavers as required to compensate for deviations in the adjacent pavement edge. Do not cut pavers to less than 1/3 their original size.

B. Pavers shall be uniformly placed ¼" to ¾" higher than the adjacent PCC pavements to account for settlement during compaction.

C. Place chalk lines on the bedding course to maintain straight joint lines.

D. After pavers have been installed on the bedding course, and all cut pavers have been inserted to provide a full and complete surface, inspect pavers for damaged units and irregular joint lines. Remove and replace pavers as required.

E. After inspection and replacement of damaged pavers, fill joint openings with bedding stone. Sweep the surface clean.

F. Compact the pavement surface and setting bed with 3 to 4 passes with a vibratory plate compactor capable of at least 5,000 lbs centrifugal compaction force. Compact in opposite directions and at 45-degree angles.

G. Reinspect pavers and remove and replace all damaged units. Refill joint openings completely. Sweep pavers clean. Complete compaction with two additional passes of plate compactor in opposite directions.

H. Refill all paver joint openings with bedding aggregate 6 months after installation.

END SPECIAL PROVISION
SPECIAL PROVISION
WATER MAINS

I. GENERAL INFORMATION

A. Submittals

The Des Moines Water Works (DMWW) will review all shop drawings for materials related to water main construction. Shop drawings shall be provided to DMWW 2 weeks prior to any water main construction. The Contractor shall submit these shop drawings to:

Des Moines Water Works
Attn.: Carla Schumacher
2201 George Flagg Parkway
Des Moines, Iowa 50321
OR
cschumacher@dmww.com

B. Preparation

Notify DMWW (515-283-8729) 48 hours prior to the start of any water main related construction.

Verify proposed grades prior to construction to ensure adequate finished cover will be provided over all water mains.

The Contractor shall maintain construction stakes from City's construction surveys required to install water main on line and grade as shown on the plans.

The Contractor shall arrange with DMWW for all valves and hydrants to be operated only by DMWW’s personnel.

C. Connections to the Existing Water System

Expose existing buried pipe at locations that will be connected to new piping. Confirm location, depth, orientation, type of pipe, outside diameter, and type and location of joints.

Verify outside diameter of water main to determine if it is oversized. Procure materials as appropriate prior to altering the water main.

Connections to the existing DMWW’s system shall be coordinated with the Engineer and scheduled a minimum of 48 hours in advance. Customers who will be without water shall be notified by the Contractor a minimum of 72 hours in advance. Water main shutdowns may need to be completed outside of normal working hours to minimize impact on affected customers. No additional compensation will be paid for work outside normal working hours.

D. Abandonment of Existing Facilities

Existing water mains shall be abandoned as shown on the plans. Mains shall be capped and hydrant assemblies and valve boxes shall be removed incidental to water main construction.
CONTRACT DOCUMENTS
AND
SPECIFICATIONS
FOR
INGERSOLL AVENUE STREETSCAPE
FROM 24TH STREET TO M.L.K PARKWAY
(PHASE 1)

DES MOINES WATER WORKS
Des Moines, Iowa

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.

Carla J. Schumacher, P.E.  Date
Des Moines Water Works
License Number:  18191
My license renewal date is:  December 31, 2020
Pages or sheets covered by this seal:  ALL
PART 1  GENERAL

1.01 SUMMARY OF WORK

A. Excavating, backfilling, and compacting specifications, as applicable, for installation of water main and appurtenances.

1.02 RELATED SECTIONS

A. Section 02 22 70 – Augured Pipe Casing.
B. Section 02 61 00 – Ductile Iron and Polyvinyl Chloride Pipe for Water Mains.
C. Section 02 64 00 – Valves and Hydrants.
D. Section 02 66 00 – Water Service Transfers.

1.03 REFERENCES

D. Federal Register – Occupational Safety and Health Administration (OSHA), Occupational Safety and Health Standards - Excavations.
E. Iowa Department of Transportation (IDOT) Standard Specifications for Highway and Bridge Construction – current version, including Supplemental Specification.
F. Iowa Statewide Urban Design and Specifications (SUDAS).

1.04 SUBMITTALS (NOT USED)

1.05 MEASUREMENT AND PAYMENT

A. Stabilization Materials: per ton, based on quantities shown on material delivery tickets provided to Engineer.
   1. Include cost for all material, equipment, labor, and associated work necessary to complete work associated with stabilization materials in the unit bid price for "Foundation Rock" on the Proposal.
   2. Estimated quantity shown on Proposal for "Foundation Rock" is not to be used as an indication of site conditions that will be encountered during the course of the Work.

B. Special Pipe Embedment and Encasement Material: per cubic yard, based on quantities shown on material delivery tickets provided to Engineer.
   1. Include cost for all material, equipment, labor, and associated work necessary to complete work associated with special pipe embedment and encasement material in the unit bid price for "Utility Embedment Material" on the Proposal.
   2. Estimated quantity shown on Proposal for "Utility Embedment Material" is not to be used as an indication of site conditions that will be encountered during the course of the Work.
PART 2 PRODUCTS

2.01 EXCAVATED MATERIALS

A. Strip, grub, and stockpile topsoil for finished grading.

B. Backfill material to be:
   1. Approved for use by Engineer.
   2. Selected material taken from the excavation or select borrow material, if sufficient quantities of compliant excavated material are not available.
   3. Inorganic clays, clayey sands, or inorganic and clayey silts, compatible with and having an obtainable density no less than adjacent soils.
   4. Free of lumps or clods over 3 inches in the largest dimension.
   5. Free of foreign debris including rocks, organic materials, and man-made debris.
   6. Material that is not frozen.

2.02 BEDDING MATERIAL

A. Steel Pipe: Bed pipe using sand free of frozen material, foreign debris, including rocks, organic materials, and man-made debris.

B. Ductile iron pipe, prestressed concrete cylinder pipe, polyvinyl chloride pipe, and corrugated steel pipe: Bed pipe using material taken from the excavation with the following characteristics:
   1. Inorganic clay, clayey sand, or inorganic and clayey silt.
   2. Free of lumps or clods over 2 inches in the largest dimension.
   3. Free of foreign debris including rocks, organic materials, and man-made debris.
   4. With a soil moisture range of optimum moisture to 4 percentage points above optimum moisture content.
   5. Material that is not frozen.

2.03 STABILIZATION MATERIAL

A. When required by field conditions, use stabilization material of crushed limestone, dolomite, or quartzite generally meeting the following characteristics:
   1. 2-inch nominal maximum size.
   2. 95 percent retained on a 3/4-inch screen.
   3. Generally free from deleterious substances as determined by Engineer.

2.04 BORROW MATERIALS

A. If sufficient quantity of suitable material is not available from excavations, obtain material from approved off-site sources. Off-site sources must hold a National Pollutant Discharge Elimination System (NPDES) permit from the IDNR for storm water discharge associated with construction activity.

B. Conform borrow materials, including topsoil and backfill material, to specifications for excavated materials in Part 2.01.

C. Topsoil borrow material to be:
   1. Natural loam and humus with characteristics consistent with the existing topsoil on site.
   2. Finely graded and free of clumps larger than 2 inches in the largest dimension.
   3. Free of man-made materials and debris.
   4. Free of rock or organic matter, including wood and roots, greater than 3/4-inch, in the largest dimension.
   5. Comprised of less than 0.5 percent clay.
2.05 SPECIAL PIPE EMBEDMENT AND ENCASEMENT MATERIAL

A. When directed by Engineer, install controlled low-strength material to provide support to existing utilities.
   1. Controlled Low-Strength Material (CLSM):
      a. Approximate quantities per cubic yard:
         (1) Cement: 50 pounds.
         (2) Fly ash: 250 pounds.
         (3) Fine aggregate: 2,910 pounds.
         (4) Water: 60 gallons.
      b. A compressive strength of at least 50 psi compressive strength at 28 calendar days.
      c. Comply with material requirements of Section 2506.02 of IDOT Standard Specifications, current version.

2.06 MANUFACTURED SAND MATERIAL

A. When directed by Engineer, install manufactured sand.
   1. Stone sand complying with the following gradation:

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PART 3 EXECUTION

3.01 GENERAL

A. General Description
   1. Complete trenching, backfilling, and compacting for water main in accordance with the SUDAS manual. These specifications are intended to highlight or modify basic requirements; see SUDAS manual for more detailed information.

B. Quality Assurance
   1. Give Engineer the opportunity to review excavated or borrowed soils prior to placement as backfill.
   2. Owner will commission and compensate a qualified soils engineer to develop Proctor curves indicating moisture-density relationships for all soil types used as backfill.
   3. Use Proctor curves and soil analysis information in determining proper compaction of soils placed.

C. General Safety
   1. Blasting not permitted.
   2. Safety and protection:
      a. Provide shoring, sheeting, and bracing, as required, to protect Work, adjacent property, private or public utilities, and workers.
      b. Strictly observe laws and ordinances regulating health and safety measures.
      c. Excavations that Owner’s personnel are required to enter shall comply with OSHA standards.
D. Soil Testing
1. Field tests for density and moisture content to be performed by the soils engineer, defined in Part 3.01.B above, to ensure that specified density is being obtained. Perform testing using ASTM D2922 nuclear methods or another method approved by Engineer.
2. Take density tests at finished grade, at 3 feet below finished grade, and as directed by Engineer under special conditions. Test locations to be selected by Engineer immediately prior to performing tests. Excavate, as directed by Engineer, for tests at intermediate depths. As a minimum, take density tests at approximately 200-foot intervals along the trench. The following locations require additional testing:
   a. Over jacking pits where casing was installed.
   b. Immediately adjacent to all structures.
3. When test results indicate compaction is not as specified:
   a. Additional tests will be required in both directions from the failed test until satisfactory results are obtained.
   b. Remove, replace, and recompact all material between the satisfactory tests in lifts to meet specifications. Compaction corrections are made at no expense to Owner.
   c. Provide density tests to recompacted areas at the same frequency as the original tests. Testing of recompacted areas performed at the Contractor's expense.
4. Notify Engineer if petroleum-based materials are detected in soils. Appropriate action will be taken by Owner.
5. Tests that are not conducted in the presence of the Engineer, or are conducted at locations not selected by the Engineer, will be rejected.

E. Protection of Utility Lines
1. Conduct trenching operations to avoid damaging underground utilities.
2. Protect all underground utilities. Damage resulting from trenching or backfilling to be repaired by Contractor or utility company at Contractor's expense.
3. Underground utilities discovered by Contractor are to be protected.

3.02 DISPOSAL OF EXCAVATED MATERIAL

A. Remove excess material excavated for water main trench from site and in compliance with environmental regulations.

B. Backfill consisting of suitable material, which comes from an off-site source, must conform to Part 2.01.

3.03 TRENCH EXCAVATION

A. Strip and stockpile topsoil for finished grading. A minimum of 12 inches of topsoil must be segregated from other materials in agricultural areas.

B. Excavate trenches so as to:
   1. Follow lines and grades as indicated on plans.
   2. Provide uniform bearing on undisturbed soil and continuous support along the entire length of pipe.
   3. Prevent over-excavation in locations where suitable subgrade conditions exist.
   4. Provide vertical trench walls to an elevation no less than 12 inches above the pipe.

C. Correct unstable trench bottoms, as determined by Engineer, as follows:
   1. Over-excavate the trench to stable soil or to a maximum of 2 feet below the bottom of the pipe.
   2. If stable soil is reached, bring trench back to grade using suitable backfill material or bedding material compacted to 90 percent Standard Proctor Density.
   3. If stable soil is not reached after 2 feet of over-excavation, place one (1) foot of the specified trench stabilization material in the trench bottom and compact. Bring trench back to grade using suitable backfill material or bedding material compacted to 90 percent Standard Proctor Density.
   4. Place pipe only after trench bottom has been fully stabilized.
D. Remove stones encountered during excavation. When large rocks are encountered, remove to an elevation 6 inches below the bottom of the proposed improvement. Fill voids created through removal of stones with approved backfill material and thoroughly compact to 90 percent Standard Proctor Density.

E. Excavate trench bottoms deeper at location of bell joints to permit body of pipe to rest uniformly supported upon trench bottom. Use bell holes no longer than is necessary for practical installation of pipe.

F. The length of trench to be opened at one time is as follows:
   1. In extended runs, open trench length is not to exceed 100 feet.
   2. In street crossings, trench shall not be open in more than one lane at a time, unless specified differently in traffic control plan.
   3. Backfill driveways and entrances immediately after placement of pipe.

G. Place excavated material:
   1. As approved by Engineer when these specifications do not apply.
   2. Compactly along sides of excavation.
   3. To provide continuous access to fire hydrants and utility valves.
   4. To provide as little inconvenience as possible to public travel.
   5. To minimize damage to adjacent lawns and planted areas.

3.04 PIPE BEDDING

A. Bed pipe with 4-inch-thick layer of specified bedding material for pipes 20-inch and larger.

B. Place bedding alongside of pipe to an elevation above springline (no lower than half the height of the pipe).

C. Compact bedding to a minimum of 90 percent Standard Proctor Density.

D. Obtain required compaction within a soil moisture range of optimum moisture to 4 percentage points above optimum moisture content.

E. Do not damage pipe coating or wrapping system during bedding placement and compaction.

3.05 BACKFILLING

A. Perform backfilling of trenches only after pipe installation, jointing, and bedding are complete, inspected, and approved.

B. Use backfill material complying with Part 2 above.

C. Mechanically tamp backfill with impact or vibrating compaction equipment.

D. Place backfill in layers and compact to required density.

E. Backfill to be:
   1. Compacted to 90 percent Standard Proctor Density to a level one (1) foot above the pipe.
   2. For the remainder of the trench:
      b. Compact easement areas to 90 percent Standard Proctor Density.
   3. Within a soil moisture range of optimum moisture to 4 percentage points above optimum moisture content.

F. Protect pipe coating or pipe wrapping system from damage during backfill operations.

G. Hydraulic compaction or water jetting of pipe trenches is not permitted.
H. Adjust moisture content of material that exceeds optimum moisture range, but is otherwise acceptable, by spreading and aerating or otherwise drying as necessary until moisture content is within required moisture range and required compaction can be obtained.

I. Adjust moisture content of material that is below optimum moisture, but is otherwise acceptable, by wetting as necessary until moisture content is within required moisture range and required compaction can be obtained.

3.06 GRADING

A. Finish-grade surfaces with a well-compactad, free-draining, uniform surface without obstructive protrusions or depressions.

B. Place topsoil at a uniform depth equal to surrounding topsoil, but not less than 4 inches.

C. Place topsoil to a minimum depth of 6 inches when ample native topsoil is available.

D. Place topsoil only under lawn and planted areas.

3.07 CONTROL OF WATER

A. Install pipe in the dry.

B. Dewater as necessary to prevent water from entering pipe or rising around pipe.

C. Do not allow water pumped or diverted from excavation site to be:
   1. Pooled anywhere on site.
   2. Removed in such a manner as to disperse silt.
   3. Placed on surfaces heavily traveled by pedestrian traffic.

D. Do not use installed pipe as a conduit for trench dewatering.

E. Control surface water as follows:
   1. Divert surface water to prevent entry into pipe trenches.
   2. Remove surface water accumulated in pipe trenches and other excavations prior to continuation of excavation work.
   3. Remove surface water saturated soil from excavation.

F. Control groundwater as follows:
   1. Where groundwater is encountered, dewater trenches and other excavations, as necessary, to permit proper execution of the Project.
   2. When large quantities of groundwater are encountered, stabilize trenches with the specified stabilization material, and bed pipe as specified.

3.08 DISPOSAL OF UNSUITABLE OR EXCESS MATERIAL

A. Dispose of surplus material and material not suitable for backfill off-site at a location provided by Contractor.
   1. Off-site disposal locations must hold a National Pollutant Discharge Elimination System (NPDES) permit from the IDNR for storm water discharge associated with construction activity.
   2. Contractor to provide transportation of such material.
3.09 CLEANUP AND RESTORATION

A. Clear the site in and around the excavation of mud and construction debris to a condition equal to, or better than, that existing prior to trenching work.

B. Remove construction remnant materials from site.

C. Repair damage to adjacent property suffered during installation work to a condition equal to, or better than, that condition existing prior to trenching Work.

** END OF SECTION **
PART 1  GENERAL

1.01  SUMMARY OF WORK

A. Install water main using horizontal directional drilling techniques. Drill a small-diameter pilot hole along a predetermined directional alignment, followed by enlargement of the pilot hole to a suitable diameter for installation of the water main.

1.02  RELATED SECTIONS

A. Section 02 22 00 – Excavating, Backfilling, and Compacting for Water Mains.

B. Section 02 60 00 – Protection of Water Supply.

C. Section 02 61 00 – Ductile Iron and Polyvinyl Chloride Pipe for Water Mains.

D. Section 02 67 40 – Pressure Testing Water Mains.

1.03  REFERENCES (NOT USED)

1.04  SUBmittals

A. Submit detailed description of procedures to be followed during horizontal directional drilling process.

B. Submit details describing equipment and materials to be used at the site.
   1. Water main: type, diameter, wall thickness, weights, tensile strength at yield, factor of safety, certifications, applicable standards, and other technical information required by the Engineer to ensure conformance to the specifications.
   2. Include information on the thrust, pullback, and torque capabilities of drilling machine.
   3. Include information on sediment removal methods and water transport methods for drilling fluid system.

C. Provide list of names of personnel that will be present at the jobsite for the following positions: site superintendent, driller, and guidance technician.

D. Control Surveys: Submit plan showing proposed entry points, proposed exit points, existing utilities, clearance between existing utilities, drill path, and other information that will be used to control drilling operations.

E. Provide construction site layout information indicating storage areas, equipment set-up areas, construction staging areas, and locations of major supporting equipment.

F. Submit information regarding method of removing spoils from drilling fluid returns, equipment to remove spoils from the site, disposal methods, and locations where the material will be disposed.

G. Address how specification requirements on quality control items will be satisfied.

H. Submit tabulation of coordinates, referenced from drill entry point, which accurately describes location of pilot hole. Submit to Owner’s on-site representative at completion of drilling pilot hole for review prior to proceeding with pre-reaming operations.

I. Provide plan and profile information for the installed water main showing permanent references and other adjacent surface and subsurface features.

J. Submit two copies of the following information:
   1. List of at least ten projects consisting of directional drilling in conditions similar to this Project. Include project name, scope, duration of project, and references, with phone numbers.
   2. Résumés of personnel listed in Part 3.01.B. below.
1.05 MEASUREMENT AND PAYMENT

A. Install Regular Joint Pipe items by Open Trench: Include costs for material, equipment, and labor for Work included in this Section in the unit bid price on the Proposal for "Water Main". No additional payment shall be made for directional drilling in open trench areas.

B. Install restrained joint pipe items by Horizontal Directional Drilling: Include costs for material, equipment, and labor for work included in this Section in the unit bid price on the Proposal for "Water Main".

PART 2 PRODUCTS

2.01 MATERIALS

A. Refer to Related Sections for materials specifications for excavation, fill, pipe, fittings, and other miscellaneous materials associated with the Work.

2.02 DRILLING FLUIDS

A. Provide drilling fluids and additives to complete the work described in this Section. Provide equipment and water associated with drilling fluid program.

2.03 WATER

A. Provide sufficient volumes of water for use with drilling fluids. Ensure compatibility of water source with drilling fluids and additives.

B. Conduct tests necessary to ensure compatibility of water source with drilling fluids and additives.

2.04 EQUIPMENT REQUIREMENTS

A. Provide equipment, including auxiliary and support equipment, needed to complete the Work.

B. Provide drill rig capable of generating sufficient thrust and pullback force necessary to complete the Work.

C. Provide guidance system capable of:
   1. Giving X-Y coordinates of the pilot bore independent of a down-hole radio beacon strength for up to 40 feet below ground surface.
   2. Accuracy within plus or minus 5 percent of pilot bore depth.
   3. Displaying azimuth, inclination, and tool face orientation information on console(s) for driller at drill rig.
PART 3 EXECUTION

3.01 QUALIFICATIONS

A. Corporate experience requirements of Contractor or subcontractor completing work described in this Section: minimum 2 years continuous experience in using horizontal directional drilling for installing utilities of similar size and scope.

B. Jobsite Personnel Experience:
   2. Guidance Technician: minimum 2 years continuous experience using wire line (accelerometer-magnetometer) or walkover guidance systems, including minimum ten projects where technician guided a pilot hole in drilling conditions similar to this Project.
   3. Driller: minimum 2 years continuous experience in horizontal directional drilling, including minimum ten projects with conditions similar to this Project.

C. Control Survey: Provide staff with capability to conduct survey necessary to set reference points required to provide horizontal and vertical control of drilling operations.

3.02 EXAMINATION

A. Examine site conditions to ensure that horizontal directional drilling operations pose no hazards to adjacent utilities, structures, or roadways.

B. Determine and mark location of existing utilities that could be affected by drilling activities.

C. Handle pipe carefully.

D. Use blocking and hold-downs during shipment to prevent movement or shifting.

E. Do not telescope small pipe inside larger pipe for shipment and storage.

F. Handle pipe materials by use of slings, hoists, skids, or other approved means.

G. Dropping or rolling of pipe material is not permitted.

H. Do not store PVC pipe in direct sunlight for prolonged periods of time.

3.03 PREPARATION

A. Obtain permission from proper agencies prior to closing roads or streets. Comply with traffic control requirements.

B. Deliver clean drill pipe to site. Keep ends of drill pipe capped during transportation and storage.

C. Place barricades around the perimeter of any equipment pit.

D. Protect adjacent structures and roadways to prevent damage from horizontal directional drilling operations.

E. Construct sediment barriers to confine soil within project site. Maintain sediment barriers until the Project is complete.

F. Preserve and protect existing utilities, trees, plants, and vegetation.

G. Strip topsoil from areas to be excavated and stockpile for future use.

H. Confirm and verify location of utilities before drilling pilot hole.
I. Implement use of relief casings or other methods of protection for utilities that may be affected by drilling activities.

J. Provide Owner with minimum of one (1) week advance notice prior to commencing drilling activities.

3.04 INSTALLATION

A. Install water main pipe in accordance with the guidelines and recommendations of the manufacturer.

B. Install water main pipe in the location and to the line and grade shown on the plans with modifications determined from control survey.

C. Align drill path in manner that water main pipe will avoid subsurface obstructions.

D. Keep drill-staging and pipe-staging areas neat and orderly; disturb as little area as possible. Keep drill pipe clean and capped until ready for use.

E. Take directional heading for drilling on the proposed horizontal alignment of the water main pipe.

F. Provide sufficient distance from iron/magnetic objects to avoid interference with the drilling guidance system.

G. Establish reconnaissance stations at mutually agreeable intervals to calculate and plot true vertical depth, horizontal distance, and right- and left-bearing drift.

H. Provide and maintain instrumentation that will accurately locate pilot hole, measure drill string axial and torsional loads, and measure drilling fluid discharge rate and pressure.

I. Drill pilot hole along path determined from control survey.
   1. Vertical tolerance of water main centerline: plus or minus one (1) foot from planned elevation.
   2. Horizontal tolerance of horizontal portion of centerline: final azimuth plus or minus one (1) degree of planned path.
   3. Tolerances listed herein do not relieve Contractor from responsibility for ensuring safe operations or from damage to adjacent structures and utilities.

J. Once drilling of pilot hole has commenced, do not track equipment or machinery over or around path until installation is completed.

K. Drill curves at radii equal to or greater than those recommended by pipe manufacturer.

L. Submit tabulation of coordinates to Owner for review that accurately describes location and depth of pilot hole. Reference coordinates to drilled entry point. Do not begin pre-reaming operations until Owner approves pilot hole.

M. Begin pre-reaming operations.

N. Do not impose load on pull section that exceeds 90 percent of maximum allowable tensile load of the pull strength of the water main pipe without review by Engineer.

O. Connect reaming assembly with pull section using swivel to minimize torsional stress imposed on the pull section.

P. Install pull section in the reamed hole so external pressures are minimized.

Q. Install water main pipe in bore hole. Maintain tolerances specified.
   1. Clean dirt and debris from water main pipe.
   2. Conform to grade and alignment tolerances specified.
R. Drilling Fluids: Maintain drilling fluids that optimize gel strength, viscosity, and filtration control necessary to transport cuttings and maintain integrity of wellbore.
   1. Provide products in sufficient quantities to ensure rheological properties necessary to accommodate drilling operations and maintain integrity of wellbore.
   2. Make adjustments to drilling fluid operation as necessary to maintain desirable rheological properties.
   3. Maximize recirculation of drilling surface returns. Provide solids control and fluid-cleaning equipment of a configuration and capacity capable of processing surface returns and produce drilling fluid suitable for reuse.
   4. Employ best efforts to maintain full annular circulation of drilling fluids.
   5. Minimize drilling fluid returns at locations other than wellbore entry and exit points.
      a. Use of relief casing(s) to minimize pressure in the bore hole is permitted. Remove relief casings when casing pipe installation is complete.
      b. If inadvertent surface returns of drilling fluid occur, immediately contain flow with barriers and collect excess fluid. Suspend drilling operations if surface return of drilling fluid poses hazards.
   6. Properly dispose of excess drilling fluids. Comply with environmental regulations and permit requirements.
   7. Prevent all drilling fluid from entering sewer or surface waters. Immediately stop construction if fluids enter sewers or surface waters and contain drilling fluid before proceeding with construction.

3.05 BACKFILL AND COMPACTION

A. Backfill and compact boring pits as specified in Section 02 22 00.

3.06 DISPOSAL, CLEANUP, AND RESTORATION

A. Dispose of excess materials, restore, and clean up site as specified in Section 02 22 00.

B. Remove excavated material unsuitable for backfill and not used as backfill upon Project.

C. Pavement repairs resulting from potholing to locate utilities shall be paid according to related pavement repair bid item.

** END OF SECTION **
PART 1 GENERAL

1.01 SUMMARY OF WORK

A. Implementation of construction practices to minimize soil erosion and control water pollution.

B. Prevention of eroded soil from leaving construction site and entering onto adjacent property or into waterways.

C. Installation and maintenance of slope protection, slope stabilization, erosion control devices, and construction exit.

D. Removal of temporary erosion control devices used during construction.

1.02 RELATED SECTIONS

A. Section 02 22 00 – Excavating, Backfilling, and Compacting for Water Mains.

1.03 REFERENCES

A. Iowa Department of Transportation (IDOT) Standard Specifications for Highway and Bridge Construction – Series 2012, including Supplemental Specification.

B. Iowa Statewide Urban Design and Specifications (SUDAS).

1.04 SUBMITTALS

A. Submit erosion control work plan to Owner a minimum of 2 weeks prior to beginning construction. Include the following information:
   1. Materials, methods, and equipment to be used.
   2. Location of silt fences and other temporary erosion control measures.
   3. Schedule for installation of erosion control and pollution control measures as construction progresses.

B. Submit catalog data on items to prove complete compliance with specifications.

1.05 MEASUREMENT AND PAYMENT

A. Measure Silt Fence in linear feet, including material, labor, and equipment to place, remove, and clean out silt fence, as directed by Engineer.

B. Measure Filter Sock in linear feet, including material, labor, and equipment to place, remove, and clean out, as directed by Engineer.

C. Measure Erosion Control Matting area per square yard; including material, equipment, and labor to install matting, as directed by Engineer.

D. Measure riprap per ton, including supplying and placing riprap, engineering geotextile fabric, and other associated work.

E. Measure erosion stone per ton; including supplying and placing erosion stone, geotextile fabric, and other associated work to install a check dam.

F. All other work included in this Section is considered incidental to the Contract. Include cost for all material, equipment, labor, and associated work necessary to complete remaining work in this Section in the appropriate bid item.
PART 2  PRODUCTS

2.01  MATERIALS

A. Silt Fence:
   1. Conform to Section 4196.01.B.1 of IDOT Standard Specifications, current version.
   2. Approved Manufacturers:
      a. SCF 1500 I by Fab Tex Solutions, Inc.
      b. Geo 2130D by Propex Inc.
      c. Style 1215 by Willacoochee Industrial Fabrics, Inc.
      d. Or approved equal.

B. Filter Sock
   1. Material to be derived from wood, bark, or non-toxic vegetative feedstocks.
   2. Use tubular knitted mesh netting with 3/8-inch opening that is 5 mils thick.
   3. Stake with 1-inch by 2-inch wood stakes.

C. Erosion Control Matting:
   2. Approved Manufacturers:
      a. Excelsior Curlex II Iowa Blanket by American Excelsior Co.
      b. SC150 by North American Green.
      c. EXCEL S-2 by Western Excelsior.

D. Staples for Erosion Control Matting:
   1. 6-inch by 2-inch by 6-inch U-shaped, 11-gauge staples.

E. Riprap:
   1. IDOT Class E Revetment Stone.
   2. Sound and durable broken limestone, dolomite, or quartzite.
   3. Recycled PCC pavement, broken concrete, or rubble is not acceptable.

F. Erosion Stone for Check Dam:
   1. Sound and durable broken limestone, dolomite, or quartzite or concrete with steel removed.
   2. Graded per Section 4130.04 of IDOT Standard Specifications, current version; nominal size: 6 inches.

G. Geotextile Fabric for Riprap and Check Dam:
   1. Conform to Section 4196.01.B.3 of IDOT Standard Specifications, current version.
   2. Approved Manufacturers:
      a. Geo Tex 60I by Propex Inc.
      b. GT160 by Skaps.
      c. Mirafi 160N by Ten Cate Geosynthetics.
   3. Securing Pins
      a. Material: steel, 3/16-inch-diameter, pointed at one end and fabricated with head to retain steel washer having outside diameter of not less than 1.5 inch.
      b. Length: not less than 12 inches.
PART 3 EXECUTION

3.01 GENERAL

A. Complete erosion control in accordance with Division 9, Section 9040, of the SUDAS manual. These specifications are intended to highlight basic requirements; see SUDAS manual for more detailed information and requirements.

B. Regulatory Requirements:
1. Conform to applicable codes, requirements, and statutes for environmental requirements for erosion control.
2. Comply with National Pollutant Discharge Elimination System (NPDES) Permit.
3. Owner will prepare Storm Water Pollution Prevention Plan (SWPPP) as provided by 63 Federal Register 7897, February 14, 1998. Owner will provide copy of SWPPP to Contractor.
   a. Maintain copy of the SWPPP on site from the time construction commences until Project is completed.
   b. Inform Owner of where the SWPPP will be kept on site prior to commencing construction.
4. Comply with all provisions on the SWPPP.

3.02 SILT FENCE INSTALLATION

A. Install silt fence at locations shown on plans, at base of stockpiles of excavated material, and other locations as required or directed by Engineer.

B. Place fabric to cover graded slope from the normal high waterline to toe of slope.

C. Place fabric on graded slope, with each section overlapping previous section by approximately 2 feet.

D. Smooth any rough areas and wrinkles in the fabric.

E. Attach fabric to graded slope by driving staples through fabric and into slope. Place staples as recommended by fabric manufacturer.

F. Reattach any loose staples.

G. Install additional staples as necessary for secure attachment of fabric to slope.

H. Allow Owner the opportunity to inspect slope after attachment of fabric.

3.03 FILTER SOCK INSTALLATION

A. Install filter sock at location shown on plans as required or directed by Engineer.

B. Drive stake into center of sock so it sticks a minimum of 12 inches into the ground.

C. Place stakes every 10 feet along centerline of filter sock.

3.04 EROSION CONTROL MATTING INSTALLATION

A. Ensure that seeding has been completed, in accordance with Section 02 93 60, in all areas where erosion control matting will be placed, prior to placing matting.

B. Place fabric to cover graded slope as directed by Engineer.

C. Overlap downstream end of each roll on top of upstream end of previous roll. Overlap ends by one (1) foot.

D. Overlap lower edge of each roll on top of upper edge of previous roll. Overlap edges by 6 inches.
E. Smooth any rough areas and wrinkles in matting.

F. Attach matting to graded slope by driving staples through matting and into slope. Place staples as recommended by manufacturer of the matting.

G. Reattach any loose staples.

H. Install additional staples as necessary for secure attachment of matting to slope.

3.05 RIPRAP INSTALLATION

A. Use no fabric with defects, rips, holes, flaws, deterioration, or damage incurred during manufacture, transportation, or storage.

B. Cut fabric to length required to cover slope from top of embankment to bottom. Place fabric with width dimension parallel to top of embankment and lay smooth and free of tension, stress, folds, wrinkles, or creases. Place strips to provide minimum width of 2-foot overlap.

C. Insert securing pins with washers through both strips of overlapped fabric at not greater than 2-foot intervals along a line through midpoint of overlap. Install additional pins, regardless of location, as necessary to prevent any slippage of filter fabric.

D. Place fabric so upstream strip of fabric will overlap downstream strip.

E. Protect fabric at all times during construction from contamination by surface runoff, and any fabric contaminated is to be removed and replaced with uncontaminated fabric.

F. Place material on fabric to prevent tearing or shoving of cloth. Allow no vehicles or construction equipment on fabric prior to placement of riprap.

G. Replace any damage to fabric during its installation or during placement of riprap at no cost to Owner.

H. Torn fabric may be patched in-place by placing piece of same fabric over tear. Measure dimensions of patch to be at least 2 feet larger than largest dimension of tear and be pinned to prevent granular material from causing lap separation.

I. Schedule work so covering of fabric with layer of specified material is accomplished within 7 days after placement of fabric. Replacement of fabric will be required with failure to comply.

J. Start placing riprap at bottom of slope.

K. Use methods to prevent segregation and sloughing of materials down slope and produce reasonably well-graded mass of stone. Do not dump, push, or otherwise slide riprap into position.

L. Place to full-course thickness at one operation and to avoid tearing, displacing, or otherwise damaging filter fabric.
   1. 2-foot maximum drop height of riprap onto filter fabric.

M. Distribute larger stones uniformly, with the entire mass of stone conforming approximately to gradation specified. Place and distribute riprap so that there will be no large accumulations of either larger or smaller sizes of stone.

N. Some roughness in surface is desirable to decrease velocity of water, but the mass is to be fairly compact with all sizes of material placed in their proper proportions. Hand placing or rearranging of individual stones by mechanical equipment may be required to extent necessary to secure results specified.

O. Mechanically tamp riprap after placement to ensure that pieces are interlocked.
3.06 CHECK DAM INSTALLATION

A. Use no fabric with defects, rips, holes, flaws, deterioration, or damage incurred during manufacture, transportation, or storage.

B. Cut fabric to length required to cover slope from top of embankment to the bottom. Place fabric with width dimension parallel to top of embankment and lay smooth and free of tension, stress, folds, wrinkles, or creases. Place strips to provide minimum width of 2-foot overlap.

C. Insert securing pins with washers through both strips of overlapped fabric at not greater than 2-foot intervals along a line through midpoint of overlap. Install additional pins, regardless of location, as necessary to prevent any slippage of filter fabric.

D. Place fabric so upstream strip of fabric will overlap downstream strip.

E. Protect fabric at all times during construction from contamination by surface runoff, and remove and replace any contaminated fabric with uncontaminated fabric.

F. Place material on fabric, to prevent tearing or shoving of cloth. No vehicles or construction equipment allowed to drive on fabric.

G. Replace any damage to fabric during its installation or during placement of erosion at no cost to Owner.

H. Torn fabric may be patched in-place by placing piece of same fabric over tear. Dimensions of patch to be at least 2 feet larger than largest dimension of tear and be pinned to prevent granular material from causing lap separation.

I. Schedule work so covering of fabric with layer of specified material is accomplished within 7 days after placement of fabric. Replacement of fabric will be required with failure to comply.

J. Start placing erosion stone at bottom of slope.

K. Use methods to prevent segregation and sloughing of materials down slope and produce reasonably well-graded mass of stone. Do not dump, push, or otherwise slide riprap into position.

L. Place to full course thickness at one operation to avoid tearing, displacing, or otherwise damaging filter fabric.
   1. 2-foot maximum drop height of stone onto filter fabric.

M. Distribute larger stones uniformly, with the entire mass of stone conforming approximately to gradation specified. Place and distribute erosion stone so that there will be no large accumulations of either larger or smaller sizes of stone.

N. Some roughness in surface is desirable to decrease velocity of water, but the mass is to be fairly compact with all sizes of material placed in their proper proportions. Hand placing or rearranging of individual stones by mechanical equipment may be required to extent necessary to secure results specified.

O. Prevent equipment from tracking on the installed filter fabric while placing erosion stone.
3.07 EXAMINATION

A. Ensure that soil erosion is minimized; prevent eroded soil from leaving construction areas and entering adjacent property or waterways.

B. Engineer has authority to limit surface area of erodible material exposed by clearing and grubbing, excavation, and backfill operations.

C. Provide immediate, permanent or temporary, erosion control and pollution control measures as clearing, backfill, and grading activities are completed.

3.08 CONTROLS

A. Install silt fence along perimeter of work area on downslope sides of site prior to site clearing and grading operations.

B. Preserve existing vegetation in areas not needed for construction.

C. Provide additional siltation fence, temporary silt basins, diversion dikes, earth dikes, and straw bales around storm sewer inlets and outlets.

D. Provide temporary and permanent seeding of areas upon completion of grading as soon as practical.

E. Stabilize disturbed areas where construction activity has ceased but has not been completed.

3.09 MAINTENANCE AND INSPECTION

A. Anchor any temporary toilet facility on jobsite so it does not tip over in wind.

B. Maintain temporary and permanent erosion control measures in appropriate functional condition. Clean, repair, and replace control devices as needed.

C. Owner to inspect the site every 7 calendar days.

D. Owner will prepare reports summarizing inspections and retain as part of storm water pollution prevention control plan.

3.10 CLEANUP, RESTORATION, AND REMOVAL

A. Remove eroded soil retained by erosion control devices; distribute over eroded areas.

B. Remove temporary erosion control devices once areas disturbed by construction have been restored and stabilized.

C. Provide seeding or sodding for areas disturbed by construction.

** END OF SECTION **
PART 1  GENERAL

1.01  SUMMARY OF WORK

A. Portland cement concrete (PCC) pavement.
B. Asphalt cement concrete (ACC) pavement.
C. Sidewalks, driveways, and parking lots.
D. Gravel drives.

1.02  RELATED SECTIONS

A. Section 01 00 00 – General Requirements for the Project.
B. Section 02 22 00 – Excavating, Backfilling, and Compacting for Water Mains.

1.03  REFERENCES

A. American Concrete Institute (ACI) 304 – Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.
B. American Society for Testing and Materials (ASTM) A615 – Deformed and Plain Billet-Steel for Concrete Reinforcement.
E. Iowa Department of Transportation (IDOT) Standard Specifications for Highway and Bridge Construction – current version, including Supplemental Specification.
F. Iowa Statewide Urban Design and Specifications (SUDAS).

1.04  SUBMITTALS

A. Retain material delivery tickets and give tickets to Owner's representative.
B. Delivery tickets to include the following information:
   1. Project name and location.
   2. Contractor's name.
   3. Material supplier.
   4. Date and time of batching.
   5. Date and time of delivery to site.
   6. Indication of the mix provided, including source and quantity of constituent materials, and a complete account of water added to the mix, if any.
   7. Information recording the project location where supplied material is used.
C. Delivery tickets to be substantiated, with a signature or like verification, by supplier.
1.05 MEASUREMENT AND PAYMENT

A. Measure pavement removal and replacement in square yards.

B. Maximum quantities to be plan quantities, unless extended by Engineer.

C. Material, equipment, and labor necessary to comply with this Section incidental to unit price bid for the appropriate bid item on the Proposal.

PART 2 PRODUCTS

2.01 ASPHALT CEMENT

A. Use AC-5 grade per Section 4137 of IDOT Standard Specification, current version, for base course.

B. Use AC-10 grade per Section 4137 of IDOT Standard Specification, current version, for surface and binder courses.

C. Aggregate for asphalt cement:
   1. Base course: Type B per Section 4127 of IDOT Standard Specifications, current version.
   2. Surface and binder course: per Section 4127 of IDOT Standard Specifications, current version.

2.02 TACK COAT

A. Emulsified asphalt per Section 4140 of the IDOT Standard Specifications, current version, diluted between 2:1 and 3:1 water to emulsion.

2.03 PORTLAND CEMENT CONCRETE

A. Concrete for Portland cement pavement and driveways to comply with IDOT mix specifications for Class M concrete.

B. Concrete for Portland cement sidewalks and parking lots to comply with IDOT mix specifications for Class C concrete.

C. Portland Cement: Type I, ASTM C150, less than one (1) year of age.

D. Potable Water.

E. Compressive Strength: minimum 4,000 psi at 28 days cure.

F. Chloride containing admixtures not permitted, unless approved by Engineer.

2.04 FORMS FOR CONCRETE

A. Construct concrete forms out of steel or wooden products, which deposit no form material at interface of form and concrete surface.

B. The forming system shall have adequate strength to maintain configuration of formed concrete without deflection of forms or displacement of formed concrete.

C. Longitudinal alignment of top surface of form not varying more than 1/4 inch in 10 feet out of true alignment.

2.05 CURING COMPOUND

A. White Pigmented: ASTM C309, Type 1.

B. Dark Colored: asphalt emulsion containing not less than 50 percent asphalt.
2.06 REINFORCING STEEL

A. Conform steel for reinforcing rods and dowels to ASTM A615.

B. Epoxy-coat reinforcing steel in accordance with IDOT Standard Specifications.

2.07 GRANULAR SUBBASE MATERIAL

A. Sand, gravel, or crushed stone meeting the requirements of Section 4121.01 of IDOT Standard Specifications, current version.

B. Gradation No. 12 per Section 4109 of IDOT Standard Specifications, current version.

2.08 GRANULAR SURFACING

A. Crushed limestone, dolomite, or quartzite meeting the requirements of Section 4120.04 of IDOT Standard Specifications, current version, for Class A crushed stone.

B. Gradation No. 11 per Section 4109 of IDOT Standard Specifications, current version.

2.09 JOINT MATERIAL


B. Joint Sealer: hot-poured petopolymer meeting the requirements of Section 4136 of IDOT Standard Specifications, current version.

C. Backer Rod: closed-cell urethane foam meeting the requirements of Section 4136 of IDOT Standard Specifications, current version.

2.10 DOWEL SETTING EPOXY

A. Two-part epoxy providing minimum 9,000-pound pullout after 7-day cure.

B. Sikadur 31 Hi-Mod Gel, manufactured by Sika Corporation, Lyndhurst, New Jersey, or approved equal.

PART 3 EXECUTION

3.01 GENERAL

A. General Description
   1. As a minimum, remove and replace paving shown cross-hatched on the Plans.
   2. Replace in kind paving or surfacing removed due to construction, including aggregate base course, if any.
   3. Complete paving and surfacing in accordance with the City of Des Moines Standard Specifications for Construction of Full Depth Pavement Patches, current version.

B. Quality Assurance
   1. Provide mix-design documentation to, and for approval by, Engineer when material does not comply directly with these specifications.
   2. Obtain materials from the same source throughout.
3.02 PAVEMENT REMOVAL

A. Saw full depth, or 10 inches, whichever is less, all edges adjacent of pavement that will remain.

B. Make saw cuts either parallel or perpendicular to centerline. No diagonal saw cuts will be allowed, unless approved by the City of Des Moines.

C. Remove existing reinforcement even with edge of pavement removal.

D. Minimum patch size is 4 feet by 4 feet.

E. Extend pavement removal to joint when distance between edge of removal and joint is less than 4 feet.

F. Remove driveway approaches from curb to right-of-way line or next joint if closer than right-of-way line.

G. Remove sidewalk in full panels.

H. Remove pavement in a way that will not damage adjacent pavement to remain. If adjacent pavement is cracked, spalled, or otherwise damaged, re-saw and remove damaged area.

I. Dispose of debris resulting from pavement removal off-site at a location provided by Contractor.

3.03 SUBGRADE PREPARATION

A. Verify subgrade has been properly compacted as specified in Section 02 22 00.

B. Place and compact granular subbase material in areas where granular subbase is present under existing pavement. Compacted thickness of subbase material to equal the thickness of existing subbase with a minimum thickness of 6 inches.

C. Verify gradients and elevations of subgrade are correct. Pavement thickness to match thickness of existing pavement with a minimum thickness of 10 inches for streets, 6 inches for driveways and parking lots, and 4 inches for sidewalks.

3.04 EXPANSION JOINTS

A. Form expansion joints using specified filler material.

B. Set filler material 1/4 to 1/2 inch below surface of concrete. Extend filler material to full depth of concrete.

C. Place filler material to form a true straight line without varying more than 1/4 inch in 5 feet.

D. Fully seal surfaces with specified expansion joint sealer placed to an elevation at, or slightly above, top surface of concrete.

E. Install expansion joints:
   1. To continue existing expansion joints.
   2. When pavement is placed against structures.
   3. In driveway approaches at sidewalks and curb.
   4. At intervals not greater than 40 feet on sidewalk.
3.05 REINFORCEMENT

A. Dowel joints in PCC paving abutting existing pavement as specified below.

B. Dowels shall be:
   1. Epoxy-coated deformed bars when replacing pavement that formed a continuous slab.
   2. Epoxy-coated smooth bars when spanning across an expansion joint in the pavement.
   3. Spaced at 18-inch horizontal centers.
   4. Placed at vertical thickness center of existing slab.
   5. Placed horizontally parallel to surface of pavement.
   6. Placed generally perpendicular to pavement edge with special alignment considerations given smooth bars, as specified below.

C. Place deformed bar dowels wherever existing pavement slabs have been cut. Deformed bar dowels shall:
   1. Not require strict horizontal bar alignment.
   2. Be placed along existing pavement edges at 18 inches on center.
   3. Be No. 8 bars for pavement thickness greater than or equal to 8 inches, and No. 6 bars for pavement thickness less than 8 inches.
   4. Be installed as follows:
      a. Tap holes no larger than 1/8 inch greater than the outside bar dimension 6 inches deep into vertical center of existing slab, parallel to pavement surface.
      b. Properly clean and prepare holes in accordance with epoxy manufacturer's specification for preparation.
      c. Fill holes one-third to one-half full with specified epoxy prior to insertion of dowel.
      d. Thoroughly clean dowels with a solvent and allow to dry.
      e. Dip dowels into properly mixed epoxy to a depth of no less than the depth of penetration into existing concrete.
      f. Place liberally-coated dowel bars deeply in holes, rotate a full turn, and drive to full-depth penetration, ensuring a complete distribution of epoxy.
      g. Distribute epoxy material uniformly over interface between dowel bar and existing concrete.
      h. Clear away excess epoxy migrating out of the hole from abutting concrete surfaces.
      i. Permit epoxy to harden prior to placement of concrete.

D. Place smooth bar dowels wherever existing pavement exhibits an expansion joint or wherever an expansion joint is designed into the new pavement. Smooth dowel bars shall:
   1. Require strict horizontal-bar alignment lying truly parallel to each other in a true plane.
   2. Be placed only along expansion joints.
   3. Form a uniform slip plane that permits directional movement of the joined slabs.
   4. Terminate within separated grease sleeves, made of non-corrosive material, in both existing pavement and new pavement.
   5. Be fully lubricated within grease sleeve with grease approved by Engineer for use.
   6. Penetrate expansion joint filler material through 1-inch holes perforated through filler.
   7. Be 1-inch bars for pavement thickness greater than or equal to 8 inches, and 3/4-inch bars for pavement thickness less than 8 inches.

3.06 FORMING

A. Form outside edges of pavement to minimum full thickness of pavement.

B. Place forms around entire outside perimeter of pavement, as specified in Part 2.04.

C. Place and secure forms with stakes in correct locations, with dimensions and profile established to provide proper construction of pavement.

D. Strip and dismantle formwork without damaging concrete.
E. Surface of forms not to exceed 1/4 inch in 10 feet out of true alignment, as determined by a stringline.

F. Protect forms with struts, barricades, or temporary backfilling to prevent shifting during concrete placement operations.

3.07 PREPARATION

A. Position and anchor joint fillers prior to placement of concrete.

B. Moisten subbase to minimize water absorption from the fresh concrete.

C. Arrange for jurisdictional inspection prior to paving.

3.08 PORTLAND CEMENT CONCRETE (PCC) PLACEMENT

A. Place concrete at a uniform thickness equal to thickness of existing concrete and:
   1. No less than 10 inches for streets.
   2. No less than 6 inches for driveways and parking lots.
   3. No less than 4 inches for sidewalk.

B. Place concrete so as to maintain formwork in proper orientation without separating, shifting, distorting, or moving out of position.

C. Place concrete as follows:
   1. Guide concrete into position and do not permit to drop freely from an elevation exceeding 2 feet above placement location.
   2. Use screed equipment for pavement, preferably vibrating screed acceptable to Engineer, to ensure proper control of slab thickness. Hard screeds acceptable for sidewalk construction.
   3. Allow no more than 30 minutes to elapse between adjacent pours in the same slab.
   4. Place each distinct slab continuously, unless construction joints are approved by Engineer.
   5. Place fresh concrete against existing concrete with tightly closed margins free of voids, protrusions, and other disfigurements.

D. Vibrate concrete with a mechanical vibrator so as to:
   1. Consolidate mix completely without segregating constituent materials.
   2. Eliminate cold joints, construction seams, or weakened interfaces between adjacent pours.
   3. Tightly close margins between new and existing concrete.
   4. Eliminate voids, honeycomb, and bugholes on formed faces.

E. Screed concrete so as to:
   1. Meet design elevations and provide proper slopes for complete drainage.
   2. Meet elevation of adjacent slabs within tolerances specified.
   3. Eliminate surface protrusions and depressions to form a uniform surface plane.
   4. Fully depress coarse aggregate, allowing a cement and fine aggregate mix to form the pavement surface.

F. Match curbs to existing curbs.

G. Hold down concrete 2 inches from finished grade in areas where existing pavement consists of a composite concrete/aspalt section.

3.09 PCC FINISHING

A. Generally finish paving with a surface texture consistent with existing abutting pavement.

B. Broom striations are to be uniform throughout the slab and generally run perpendicular to the longitudinal axis of pavement.

C. Expose no aggregate at surface of pavement.
D. Permit no voids, protrusions, depressions, bugholes, or foreign materials in surface of pavement.

E. Surface transitions shall not exceed 1/4 inch in 10 feet off true plane.

3.10 PCC CONTRACTION JOINTS

A. Place contraction joints so as to continue joint configuration of existing pavement and form generally rectangular panels wherever existing pavement is not adjacent.

B. Place longitudinal joints to be parallel to, and transverse joints to be perpendicular to, the centerline of the pavement.

C. Contraction joints:
   1. Sawn within 24 hours after concrete placement.
   2. Chalked with a stringline before sawing.
   3. Sawn to one-quarter the depth of pavement and not greater than 1/8-inch-wide.
   4. Fully sealed with specified joint sealer.

D. Place sealant neatly to lie within 1/2 inch of edges of saw kerf.

E. Place sidewalk contraction joints at intervals equal to width of sidewalk.

3.11 ASPHALT CEMENT CONCRETE (ACC) PLACEMENT

A. Place ACC at a uniform thickness equal to thickness of existing ACC and:
   1. No less than 10 inches for full-depth ACC on streets.
   2. No less than 6 inches for full-depth ACC on driveways or shoulders.
   3. No less than 2 inches for ACC over a PCC base.

B. Place ACC overlays and paving in accordance with the requirements of Section 2303 of the IDOT Standard Specification, current version.

C. Lightly tack edges of existing pavement for full-depth ACC patches or entire patch area for patches to receive ACC over a PCC base. Apply tack coat just prior to placing ACC.

D. Deposit ACC in layers. Place upper 5 inches in at least two layers, the top layer not to exceed 2 inches in thickness.

E. Thoroughly compact each layer while hot by rolling or compacting with a vibratory compactor to provide a dense, compact surface.

F. Place succeeding layers only after preceding layer is properly compacted.

G. Smooth final layer with a steel-tired finish roller sized for the operation.

H. The final compacted surface is to be level with, or not more than 1/8 inch above, the surrounding pavement.

I. Smoothness to comply with Section 2316 of IDOT Standard Specifications, current version.

J. Do not extend patch material beyond edges of patch. Remove excess edge material.

K. Open patch to traffic only after patch has cooled sufficiently to provide stability.

L. Do not place ACC when ambient air or base-surface temperature is less than 40 degrees F, or when surface is wet or frozen.

548-795  Section 02 50 00 - 7  Paving
Ingersoll Avenue Streetscape
From 24th Street to M.L.K. Parkway
(Phase 1)
3.12 PCC CURING

A. Cure PCC pavement with specified curing compound.

B. Use white pigmented curing compound to cure finished PCC surfaces.

C. Use dark pigmented curing compound to cure PCC that will receive an ACC overlay.

D. Apply specified curing compound in accordance with manufacturer's specifications.

E. Immediately cure exposed surfaces after finishing is complete and surface water has disappeared.

F. Apply curing compound heavily enough to prevent incidental wash-off or surface dusting.

G. Apply curing compound so as not to contaminate surfaces or objects not to be cured.

3.13 GRANULAR SURFACING PLACEMENT

A. Place new granular surfacing in areas where granular surfacing is removed.

B. Place granular surfacing to a minimum thickness of 6 inches in areas where existing surfacing is removed and to a minimum thickness of 2 inches in areas where existing surfacing is contaminated with excavated material or other debris.

C. Treat surface with two coats of diluted emulsified asphalt.
   1. Use 1/4 gallon of emulsified asphalt per square yard of granular surfacing. Mix three parts water to one part emulsion.
   2. Apply coats approximately one (1) week apart.
   3. Cover emulsion with sand to prevent tracking.

3.14 FIELD QUALITY CONTROL

A. Cylinder and air entrainment tests are to be taken by Owner in accordance with ACI 304.

B. Two concrete test cylinders may be taken for every class of concrete placed each day for each supplier of concrete.

C. One slump test will be taken for each set of test cylinders taken.

3.15 CLEANUP AND RESTORATION

A. Clear site in and around work area of mud and debris resulting from construction activities.

B. Completely remove construction remnant materials from site, including forming materials and excess concrete.

C. Finish-grade surfaces with a well-compacted, free-draining, uniform surface, free of obstructive protrusions or depressions. Complete surface restoration in accordance with Section 02 22 00.

D. Restore damage to adjacent property suffered during installation work to a condition equal to or better than that existing prior to commencement of construction work on the Project.

E. Pavement markings that have been removed or faded from construction activities are to be repainted.
3.16 DISPOSAL OF DEBRIS AND EXCESS MATERIAL

A. Remove and dispose of excess material off-site, which resulted from pavement construction.

B. Completely remove containers or other construction debris from site and properly dispose of in accordance with state and local laws governing disposal procedures.

3.17 PROTECTION AND PRECAUTIONS

A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.

B. Protect newly-placed pavement against rain and run-off damage using plastic sheeting sufficient for complete coverage and weights sufficient for stability of the sheeting.

C. Protect PCC pavement from vehicular traffic for no less than 7 days when Class C concrete is used and for no less than 36 hours when Class M concrete is used. Protect all PCC pavement from foot traffic for 12 hours.

D. Provide complete protection to protect Work from incidental damage from foot or vehicular traffic. Provide protection in the form of substantial physical barriers.

E. Provide protection measures that are temporary and easily removed without imparting damage to existing facility. Use non-destructive adhesives or fasteners as required to install protective equipment or receive written approval from the Engineer.

F. Pavement damaged during the curing period to be removed and replaced by the Contractor at the Contractor's expense.

G. Provide precautions and adequate protection to site and adjacent property to ensure that no damage is suffered through construction activities. Precautions and protection requirements include the entire site and extend to grounds surrounding site during construction operations and hauling and handling of construction materials.

** END OF SECTION **
PART 1   GENERAL

1.01 SUMMARY OF WORK

A. This Section describes Iowa Department of Natural Resources (IDNR) requirements for protection of water supply systems from the Standard Specifications on file with IDNR dated October 10, 2014.

1.02 RELATED SECTIONS

A. Section 02 22 80 – Horizontally Directional Drilled Water Main.
B. Section 02 61 00 – Ductile Iron and Polyvinyl Chloride Pipe for Water Mains.
C. Section 02 64 00 – Valves and Hydrants.
D. Section 02 67 40 – Pressure Testing Water Mains.
E. Section 02 67 50 – Disinfection of Water Distribution Systems.

1.03 REFERENCES

A. Iowa Wastewater Facilities Design Standards.

1.04 SUBMITTALS (NOT USED)

1.05 MEASUREMENT AND PAYMENT (NOT USED)

PART 2   PRODUCTS

NOT USED.

PART 3   EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

A. Lay water mains to avoid high points where air can accumulate. Grade piping so that proposed hydrants will be at the highest points.

B. Do not locate hydrants within 10 feet of sanitary sewers or storm drains.

C. Plug hydrant drain ports in areas where groundwater rises above water main and pump hydrant barrel dry following construction.

D. Pressure test and disinfect new water mains prior to placing them in service.

3.02 SEPARATION DISTANCE

A. Horizontal separation of water mains from gravity sewers:
   1. Provide a horizontal separation distance of at least 10 feet between water mains and gravity sewer mains, unless both of the following conditions can be met:
      a. Bottom of water main is at least 18 inches above top of sewer.
      b. Water main is placed in a separate trench with a minimum 3-foot horizontal separation.
   2. When it is impossible to obtain the required 3-foot horizontal clearance and 18-inch vertical separation, the sewer must be replaced with water main quality materials having a minimum pressure rating of 150 psi and meeting requirements of Section 02 61 00. In no case shall linear separation be less than 2 feet.
B. Horizontal separation of water mains from sewer force mains:
   1. Provide a horizontal separation distance of at least 10 feet between water mains and sewer force mains, unless both of the following conditions can be met:
      a. Force main is constructed of water main quality materials having a minimum pressure rating of 150 psi and meeting requirements of Section 02 61 00.
      b. Water main is laid at least 4 linear feet from sewer force main.

C. Vertical separation of water mains from sanitary sewer crossovers:
   1. Provide a vertical separation of at least 18 inches from bottom of water main to top of sanitary sewer whenever possible where water mains cross over sanitary sewers. If 18 inches cannot be met, provide a minimum vertical separation of 6 inches and place water main inside 20 feet of a larger diameter polyvinyl chloride water main casing pipe with no casing chocks centered on the sanitary sewer.
   2. Provide a vertical separation of at least 18 inches from bottom of sanitary sewer to top of water main in cases where water mains cross under the sanitary sewer. Place water main inside 20 feet of a larger diameter polyvinyl chloride water main casing pipe with no casing chocks centered on the sanitary sewer.
   3. Adequately support both water and sanitary sewer pipes and provide watertight joints.

D. Vertical separation of water mains from storm sewer crossovers:
   1. Provide a vertical separation of at least 18 inches from bottom of water main to top of storm sewer whenever possible where water mains cross over storm sewers. If 18 inches cannot be met, provide a minimum vertical separation of 6 inches and construct with one of the following methods:
      a. Verify storm sewer has gasketed joints.
      b. Install water main of 20 feet of ductile iron pipe material with nitrile gaskets.
      c. Encase storm sewer.
      d. Encase water main.
   2. Provide a minimum vertical separation of at least 18 inches from bottom of storm sewer to top of water main in cases where water mains cross under storm sewer mains and construct with one of the following methods:
      a. Verify storm sewer has gasketed joints.
      b. Install water main of 20 feet of ductile iron pipe material with nitrile gaskets.
      c. Encase storm sewer.
      d. Encase water main.
   3. Adequately support both water and storm sewer pipes and provide watertight joints.

E. Separation of water mains from sewer manholes:
   1. No water pipe shall pass through or come in contact with any part of a sewer manhole.
   2. Provide a horizontal separation distance of at least 10 feet between water mains and sewer manholes.

F. Advise Engineer should physical conditions exist such that exceptions to Part 3.02 of this Section are necessary.

3.03 WATER CROSSINGS

A. Above-water Crossings:
   1. Adequately support and anchor pipe used for above-water crossings.
   2. Protect pipe from damage and freezing.
   3. Ensure pipe is accessible for repair or replacement.

B. Underwater Crossings:
   1. Use restrained joint pipe for water mains entering or crossing streams that are 15 feet in width or larger.
      a. Place top of water main a minimum of 5 feet below natural bottom of streambed.
      b. Securely anchor water main to prevent movement of pipe and provide easily accessible shutoff valves located outside the floodway at each end of the water crossing.
c. Backfill trench with crushed rock or gravel.
d. Seed, sod, or otherwise protect streambank from erosion upon completion of the Project.
2. For smaller streams, the same requirements shall apply except that shutoff valves do not need to be located immediately adjacent to the water crossing.
3. Water crossings, in areas where no evidence of erosion exists, are excluded from these requirements.
4. DMWW will electronically pinpoint leaks in lieu of inserting a small meter to determine leakage and obtain water samples on each side of shutoff valve.

3.04 DEPTH OF COVER AND WIDTH OF TRENCH

A. Provide 5 feet minimum depth of cover from top of pipe to ground surface.

B. Where possible, provide an additional 6 inches of cover under pavement.

C. Insulate water mains where conditions prevent adequate earth cover.

D. Provide a trench width adequate to lay and joint pipe properly but not more than 12 inches on either side of the pipe.

** END OF SECTION **
PART 1   GENERAL

1.01 SUMMARY OF WORK

A. This Section includes water mains, fittings, as shown on the plans, complete with accessories.

1.02 RELATED SECTIONS

A. Section 02 22 00 – excavating, backfilling, and compacting for water mains.
B. Section 02 60 00 – protection of water supply.
C. Section 02 64 00 – valves and hydrants.
D. Section 02 67 40 – pressure testing water mains.
E. Section 02 67 50 – disinfection of water distribution systems.

1.03 REFERENCES

N. American Water Works Association (AWWA) C900 – Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 in. Through 60 in.
1.04 SUBMITTALS
A. Submit the following items for materials provided by the Contractor:
   1. Manufacturer’s certification that materials furnished are in compliance with applicable
      requirements of referenced standards and this Section.
   2. Drawings and manufacturer’s data showing details of pipe and fittings to comply with this Section.
   3. Class of pipe and fittings.
   4. Restraint joint details for Engineer’s approval.
   5. List of at least ten projects similar to this Project. Include project name, scope, duration of
      Project, and references with phone numbers.
B. Provide dimensional drawings, fabrication details, functional description, and properly identified
   catalog data on pipe and equipment to prove complete compliance with Drawings and Specifications.

1.05 MEASUREMENT AND PAYMENT
A. Measure water main in linear feet, along centerline of pipe.
B. Include costs for material, equipment, and labor for Work included in this Section.

PART 2 PRODUCTS

2.01 DUCTILE IRON PIPE (12-INCH AND SMALLER)
A. Special Thickness Class 52 per AWWA C150.
B. Manufacture pipe in accordance with AWWA C151.
C. Provide asphaltic outside coating per AWWA C151, 1 mil in thickness.
D. Cement Mortar Lining:
   1. Provide pipe with standard thickness cement mortar lining per AWWA C104.
   2. Seal-coat cement mortar lining in accordance with AWWA C104.

2.02 POLYVINYL CHLORIDE PIPE
A. Use Class 235 (DR 18) pipe with ductile iron pipe equivalent outside diameters.
B. Manufacture pipe in accordance with AWWA C900.
C. Use restrained-joint PVC pipe for pipe installed utilizing horizontal directional drilling.
D. Use blue pipe.

2.03 FITTINGS FOR DUCTILE IRON AND POLYVINYL CHLORIDE PIPE
A. Use compact fittings in accordance with AWWA C153, or full size in accordance with AWWA C110.
B. Use ductile iron material for construction in accordance with AWWA C110.
C. Joints
   1. Mechanical in accordance with AWWA C111 with restraint.
      a. T-bolts and hex-head nuts for mechanical joints in accordance with AWWA C111.
         (1) Material: low carbon alloy weathering Cor-Ten steel.
         (2) Coating: Cor-Blue fluorocarbon resin.
         (3) Color: Blue.
         (4) Approved Manufacturers:
            (a) Birmingham Fastener Manufacturing Fluorocarbon Coated T-Head Bolt.
            (b) Or approved equal.
   2. Flanged in accordance with AWWA C115, as indicated on plans, with ANSI Class 125 full-faced flange.
      b. Nuts and bolts: stainless steel in accordance with ASTM A230, Type 304.

D. Pressure Rating:
   
<table>
<thead>
<tr>
<th>Size (inches)</th>
<th>Pressure Rating (psi)</th>
</tr>
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<tr>
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</tr>
<tr>
<td>30 – 48</td>
<td>250</td>
</tr>
<tr>
<td>54 – 64</td>
<td>150</td>
</tr>
</tbody>
</table>

E. Provide asphaltic outside coating per AWWA C110, 1 mil in thickness.

F. Cement Mortar Lining:
   1. Provide standard thickness cement mortar lining per AWWA C104.
   2. Seal-coat cement mortar lining in accordance with AWWA C104.

2.04 JOINTS FOR DUCTILE IRON AND POLYVINYL CHLORIDE PIPE

   A. Use push-on joints using an integral bell with an elastomeric or nitrile gasket in accordance with AWWA C111, mechanical in accordance with AWWA C111, or restrained as needed for thrust restraint.

   B. Use ductile iron follower glands for mechanical joints.

   C. Solvent cement joints are strictly prohibited.

   D. T-bolts and hex-head nuts for mechanical joints in accordance with AWWA C111.
      2. Coating: Cor-Blue fluorocarbon resin.
      4. Approved Manufacturers:
         a. Birmingham Fastener Manufacturing Fluorocarbon Coated T-Head Bolt.
         b. Or approved equal.

2.05 RESTRAINED JOINTS

   A. Mechanical Joint
      1. Incorporate restraint for all mechanical joints into the design of the follower gland.
      2. Use retainer gland designed to impart multiple wedging actions against the pipe, increasing its resistance as pressure increases.
      3. Restrained joints to consist of a mechanical joint with retainer gland or manufacturer's proprietary-restrained joint.
      4. Conform dimensions to the requirements of AWWA C111 and AWWA C153.
5. Pressure rating:
   b. Minimum of 350 psi for ductile iron pipe for sizes 16-inch and smaller.
   c. Minimum of 250 psi for ductile iron pipe for sizes 18-inch and larger.

6. Color:
   a. Red for PVC pipe.
   b. Black for ductile iron pipe.

7. Materials for construction:
   a. Body, wedge segments, and break-off bolt assemblies: Grade 65-45-12 ductile iron as specified by ASTM A536.
   b. Coating to be electrostatically applied and heat-cured.
      (1) Approved manufacturers:
         (a) MEGA-BOND by EBAA Iron, Inc.
         (b) CORRSAFE by Sigma.
         (c) Starbond by Star Products.
         (d) Resicoat R2-ES by Tyler Union.
         (e) EZ Shield by SIP Industries.
         (f) Or approved equal.


9. Use ductile iron retainer wedge segments heat treated to a minimum Brinell hardness number of 370.

10. Incorporate twist-off nuts, the same size as hex-head nuts for T-bolts, into the design to ensure proper actuating torque is applied during installation.

11. Approved manufacturers for PVC pipe:
    a. Megalug by EBAA Iron Inc. Series 2000PV.
    b. One-Lok by Sigma Series SLCE.
    c. Stargrip by Star Products Series 4000.
    d. TUGrip by Tyler Union Series 2000.
    e. EZ Grip by SIP Industries Series EZP.
    f. Or approved equal.

12. Approved manufacturers for ductile iron pipe:
    b. One-Lok by Sigma Series SLDE.
    c. Stargrip by Star Products Series 3000.
    d. TUGrip by Tyler Union Series 1000.
    e. EZ Grip by SIP Industries Series EZD.
    f. Or approved equal.

B. PVC Pipe Joint
   1. Provide restraint for in-line PVC pipe through the use of groove and spline or grip ring located in the bell that provides full-circumferential restrained joint.
   2. Restraint joints to have a minimum pressure rating of 150 psi.
   3. Manufacturers:
      b. Diamond Lok-21 by Diamond Plastics.
      c. Eagle Loc 900 by JM Eagle.
      d. Or approved equal.

C. Ductile Iron Pipe Joint
   1. Restraint for in-line ductile iron pipe shall consist of the manufacturer's proprietary-restrained joint.
   2. Restraint joints to have a minimum pressure rating of 250 psi.

2.06 POLYETHYLENE PIPE ENCASEMENT MATERIAL (DUCTILE IRON PIPE AND FITTINGS)

A. Polyethylene encasement manufactured in accordance with AWWA C105.

B. Linear low-density polyethylene film.
C. Minimum thickness of be 8 mils.

D. Color: Blue.

E. Physical Properties:
1. Tensile strength 3600 psi, minimum.
2. Elongation 800 percent, minimum.
3. Dielectric strength 800 V/mil, minimum.
4. Impact resistance 600 g, minimum.
5. Propagation tear resistance 2550 gf, minimum.

F. Use flat-width tubing of the following sizes:

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>Tubing Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 inches</td>
<td>14 inches</td>
</tr>
<tr>
<td>4 inches</td>
<td>14 inches</td>
</tr>
<tr>
<td>6 inches</td>
<td>16 inches</td>
</tr>
<tr>
<td>8 inches</td>
<td>20 inches</td>
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<tr>
<td>12 inches</td>
<td>27 inches</td>
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<tr>
<td>16 inches</td>
<td>34 inches</td>
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<tr>
<td>20 inches</td>
<td>41 inches</td>
</tr>
<tr>
<td>24 inches</td>
<td>54 inches</td>
</tr>
<tr>
<td>30 inches</td>
<td>67 inches</td>
</tr>
<tr>
<td>36 inches</td>
<td>81 inches</td>
</tr>
</tbody>
</table>

G. Provide markings containing the following information spaced every 2 feet apart:
1. Name of manufacturer.
2. Year of manufacture.
3. ANSI/AWWA C105-A21.5.
4. 8 mil linear low-density polyethylene (LLDPE).
5. Applicable range of nominal pipe diameter.

H. Sheet material can be used to wrap irregular-shaped valves and fittings.

I. Use 2-inch-wide, 10-mil-thick pressure-sensitive polyethylene tape to close seams and hold overlaps.

2.07 TRACER SYSTEM

A. Tracer Wire:
1. Open Cut:
   a. No. 14 AWG high-strength copper clad steel (HS-CCS) manufactured by Copperhead Industries, or pre-approved equal.
      (1) Insulation: 30 mil, high-density, high molecular weight polyethylene (HDPE) and rated for direct burial at 30 volts.
      (2) HW-CCS Conductor: 21 percent conductivity for locating purposes with a minimum 282 pounds break load.
      (3) Origin of copper clad steel manufacture is required, and steel core must be manufactured in the United States.
      (4) Color: Blue.

2. Directional Drilling/Boring:
   a. No. 12 AWG extra-high-strength copper clad steel conductor (EHS-CCS) manufactured by Copperhead Industries for directional drilling and boring applications, or pre-approved equal.
      (1) Insulation: 45 mil, high-density, high molecular weight polyethylene (HDPE) and rated for direct burial at 30 volts.
      (2) EHS-CCS Conductor: 21 percent conductivity for locating purposes with a minimum 1150 pounds break load.
(3) Origin of copper clad steel manufacture is required, and steel core must be manufactured in the United States.
(4) Color: Blue.
   b. Install tracer wire on pipe installations with a combination of open cut and directional drilling to meet directional drilling requirements.

B. Anode Ground Rod:
   1. 1-pound magnesium drive-in anode, 1.315-inch diameter by 18.5-inch length, manufactured by Copperhead Industries, or pre-approved equal.
   2. Cap installed on one end of anode ground rod to be HDPE.
   3. Provide a beveled pointed end on anode ground rod opposite of cap to aid in hammering into ground.
   4. Wire from cap for anode ground rod to tracer wire connection:
      a. No. 14 AWG copper clad steel (HS-CCS) manufactured by Copperhead Industries, or approved equal.
      b. Insulation: 30 mil, high-density, high molecular weight polyethylene (HDPE) and rated for direct burial at 30 volts.
      c. Length: 10 feet.
      (1) HS-CCS Conductor: 21 percent conductivity for locating purposes with a minimum 250 pounds break load.
      d. Color: Red.

C. Wire Splice Connector:
   1. Tracer wire splices shall only be used to connect the anode ground rod to the tracer wire.
   2. Tracer wire splices will not be allowed between anode ground rods and connection terminal.
   3. Splices used for tracer wire repair must be approved by Engineer.
      b. Or approved equal.

D. Tracer Wire Connection:
   1. Rhino TriView TracerPed, or approved equal.
      a. Three internal terminals with two shunts.
      b. 5-foot white plastic triangular post.
      c. Removable top cap with lock.
      d. Three 2-7/8-inch by 14-inch custom vinyl decals No. SD-5594K.
      e. Tri-grip anchor.

PART 3 EXECUTION

3.01 HANDLING, STORAGE, AND SHIPPING

A. Handle pipe carefully.

B. Use blocking and hold-downs during shipment to prevent movement or shifting.

C. Pipe with damage to cement mortar lining will be rejected with field-patching not permitted.

D. Do not telescope small pipe inside larger pipe for shipment and storage.

E. Handle pipe materials by use of nylon straps, wide canvas or padded slings, wide-padded forks and skids, or other approved means designed to prevent damage to the polyethylene encasement. Unpadded chains, sharp edges or buckets, wire ropes, narrow forks, hooks, and metal bars are unacceptable.

F. Dropping or rolling of pipe material is not permitted.
G. Do not store PVC pipe in direct sunlight for prolonged periods of time.
H. Protect pipe to prevent dirt entering the pipe.

3.02 GENERAL PIPE INSTALLATION

A. Protect pipe joints from injury while handling and storing.
B. Use no deformed, defective, gouged, or otherwise impaired pipe.
C. Excavate and prepare trench as specified in Section 02 22 00.
D. Install ductile iron pipe in accordance with AWWA C600.
E. Install PVC pipe in accordance with AWWA C605.
F. Prepare trench bottom with sufficient exactness before pipe is installed so that only minor movement of the pipe will be necessary after installation.
G. Clean pipe interior prior to placement in trench.
H. Install pipe to line and grade shown on plans with an allowable tolerance of 6 inches, plus or minus.
I. Maintain uniform bearing along full length of pipe barrel at all times. Blocking the pipe up will not be acceptable. Excavate trench bottoms deeper at location of bell joints to permit body of pipe to rest uniformly supported upon trench bottom. Use bell holes no longer than is necessary for practical installation of the pipe.

J. Clean joint surfaces of dirt and foreign matter using a wire brush before jointing pipe.

K. Lubricate gasket and pipe bell. Provide food grade lubricant meeting manufacturer's recommendations. Use lubricant approved for use with potable water.

L. Make joints in strict accordance with manufacturer's recommendations.

M. Deflect joints within manufacturer's specifications for maximum deflections.

N. Tighten bolts on mechanical joints evenly around pipe by alternating from one side of the pipe to the other.

O. Cut pipe in a neat manner, without damage to pipe or cement mortar lining, if any. Leave a smooth end at right angles to axis of pipe. Bevel cut pipe ends for push-on-type joints in accordance with manufacturer's recommendations.

P. Do no install pipe in water, nor allow water to rise in trench above bottom of pipe.

Q. Place watertight bulkheads on exposed ends of pipe at all times when pipe installation is not actually in progress.

R. Backfill and compact around pipe as outlined in Section 02 22 00.

3.03 INSTALLATION OF POLYETHYLENE PIPE ENCASEMENT MATERIAL

A. Use polyethylene encasement material on buried ductile iron pipe, fittings, rods, and appurtenances in accordance with AWWA C105, Method A.

B. Use polyethylene tubing to encase pipe.
C. Cut tubing 2 feet longer than pipe section. Overlap tubing one (1) foot at each end of pipe.

D. Gather and lap tubing to provide a snug fit.

E. Secure lap at quarter points with polyethylene tape. Secure each end of tube with a complete wrap of polyethylene tape.

F. Use polyethylene encasement to prevent contact between the pipe and bedding material. The polyethylene encasement is not intended to be a completely airtight and watertight enclosure.

G. Repair damaged polyethylene encasement material using polyethylene tape or replace damaged section(s).

H. Pick and move polyethylene-encased pipe with nylon slings; wire rope is not permitted.

3.04 THRUST BLOCKS

A. Provide concrete thrust blocks or collars at changes in alignment, tees, and dead ends.

B. Carry thrust blocks or collars to undisturbed soil that will provide adequate bearing.

C. The bearing area of thrust blocks or collars, in square feet, to be as shown on the plans. Minimum thickness for any thrust block to be 1.5 times outside pipe diameter or 18 inches, whichever is greater.

D. Hold thrust blocks or collars back 3 inches from all bolts, nuts, glands, or other jointing materials. Ensure joints could be remade without disturbing thrust block or collar.

E. Provide bond breaker between thrust block or collar and pipe. Polyethylene encasement material will be considered an acceptable bond breaker.

F. Provide thrust blocks at all connections to existing water mains.

3.05 TRACER SYSTEM INSTALLATION

A. Install tracer wire with buried piping.

B. Duct tape tracer wire to pipe every 5 feet in the 5 or 7 o'clock position to prevent damage to wire during backfill and future construction exposure.

C. Install anode ground rods adjacent to connections to existing piping and at each fire hydrant.

D. Terminate tracer wire in tracer wire connection next to each fire hydrant or other locations directed by Engineer.

E. Wire splice connectors can only be used to connect ground rods to tracer wire. Wire splice connectors are not allowed at any other locations unless approved by Engineer. Provide long enough roll of tracer wire to not need the use of wire splice connectors.

F. Allow Engineer to inspect underground splices prior to backfilling.

G. Tracer wire installation is considered incidental to water main installation.
3.06 TESTING AND CHLORINATION

A. Perform hydrostatic and leakage tests in accordance with Section 02 67 40.

B. Disinfect all water mains in accordance with Section 02 67 50.

C. A tracer wire test will be conducted by Owner prior to any pavement or surface restoration. The tracer wire system including terminations at all TrnViews, anode ground rods, and splice kits are to be completely installed prior to tracer wire test. Any deficiency found in tracer wire system to be corrected by Contractor at Contractor’s expense.

** END OF SECTION **
PART 1  GENERAL

1.01 SUMMARY OF WORK
   A. This Section includes valves and hydrants as shown on the plans, complete with accessories.

1.02 RELATED SECTIONS
   A. Section 02 22 00 – Excavating, Backfilling, and Compacting for Water Mains.
   B. Section 02 60 00 – Protection of Water Supply.
   C. Section 02 61 00 – Ductile Iron and Polyvinyl Chloride Pipe for Water Mains.
   D. Section 02 67 40 – Pressure Testing
   E. Section 02 67 50 – Disinfection

1.03 REFERENCES
1.04 SUBMITTALS

A. Submit manufacturer's certification that materials furnished are in compliance with applicable requirements of referenced standards and this Section.

B. Provide dimensional drawings, fabrication details, functional description, and properly identified catalog data on all items to prove complete compliance with Drawings and Specifications.

1.05 MEASUREMENT AND PAYMENT

A. All material, equipment, and labor necessary to comply with this Section incidental to unit price bids on the Proposal.

PART 2 PRODUCTS

2.01 GATE VALVES

A. Provide resilient-seated gate valves manufactured in accordance with AWWA C509 or AWWA C515.
   1. Type of service: buried service handling potable water with a pH range of 9.5 to 9.8.
   3. Provide valves with non-rising stem.
   4. Provide 2-inch by 2-inch wrench operating nut that opens valves when turned in clockwise direction (open to the right), unless noted otherwise on Drawings.
   5. Valve gearing for 20-inch to 48-inch valves:
      a. Provide valve with gear box.
      b. Provide vertical valve unless otherwise specified on Drawings.
      c. Use the following gear ratios for the corresponding sizes:


<table>
<thead>
<tr>
<th>Valve Size (inches)</th>
<th>Gear Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>3 to 1</td>
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<tr>
<td>24</td>
<td>3 to 1</td>
</tr>
<tr>
<td>30</td>
<td>6 to 1</td>
</tr>
<tr>
<td>36</td>
<td>6 to 1</td>
</tr>
<tr>
<td>42</td>
<td>8 to 1</td>
</tr>
<tr>
<td>48</td>
<td>8 to 1</td>
</tr>
</tbody>
</table>

   d. Totally enclosed type, oil-filled, and designed for buried and submerged service.
   e. Materials of construction:
      (1) Gear housing: ductile iron.
      (2) Gears: carbon steel.
      (3) Pinion shaft: 304 stainless steel.
      (4) Design input shaft with a ball bearing and sealed with O-rings.
      (5) Exposed hex nuts and bolts: 304 stainless steel.

B. Materials of Construction:
   2. Gate: cast or ductile iron fully encapsulated with synthetic rubber.
   4. O-rings: Buna-N.
   5. Exposed hex bolts and nuts: 304 stainless steel.
   6. Joints:
      a. Mechanical in accordance with AWWA C111.
         (1) Gaskets: Buna-N or nitrile.
         (2) Nuts and bolts:
            (a) All T-bolts and hex-head nuts for mechanical joints in accordance with AWWA C111.
            (b) Material: low carbon alloy weathering Cor-Ten steel.
            (c) Coating: Cor-Blue fluorocarbon resin.
(d) Color: Blue,
(e) Approved Manufacturers:
   1) Birmingham Fastener Manufacturing Fluorocarbon Coated T-Head Bolt.
   2) Or approved equal.
   b. Flanged in accordance with AWWA C115, as indicated on the plans, with ANSI Class 125 full-faced flange.
      (1) Gaskets: Buna-N or nitrile, of thickness compatible with machining tolerances of flange faces. Minimum thickness: 1/8-inch.
      (2) Nuts and bolts: 304 stainless steel.

C. Design valve to:
   1. Allow replacement of upper O-ring while valve is under pressure in the full-open position.
   2. Not permit metal-to-metal contact between gate and body.
   3. Accommodate full-size tapping machine shell cutter.

D. Horizontal valves are required to have a cleaning system on both sides of the gate consisting of materials that are non-corrosive.

E. Interior and exterior valve coating minimum of 10-mil-thick fusion-bonded epoxy per AWWA C550.

F. Operating valve through 500 cycles at rated pressure must not result in disbondment or degradation of the coating. Certification will be required for manufacturers not listed below.

G. Indicate manufacturer, casting year, size, working pressure, and body material (ductile iron) in valve casting.

H. Manufacturers’ Models for 4-inch to 16-inch valves:
   1. Clow Model 2638.
   4. M & H Style 4067.
   5. EJ Flowmaster.
   6. Approved equal.

I. Manufacturers’ Models for 20-inch to 48-inch valves:
   1. Clow Model 2638.
   4. EJ Flowmaster.
   5. Approved equal.

2.02 SWING CHECK VALVE (WHEN NEEDED)

A. Provide swing check valves manufactured in accordance with AWWA C508.
   1. Type of service: buried service handling potable water with a pH range of 9.5 to 9.8.

B. Materials of Construction:
   1. Body and cover: ductile iron per ASTM A536.
   2. Disc: molded Buna-N (NBR) per ASTM D2000-BG.
   3. Disc accelerator: Type 302 stainless steel.
   4. Exposed hex bolts and nuts: stainless steel.
   5. Joints:
      a. Flanged in accordance with AWWA C115, as indicated on the plans, with ANSI Class 125 full-faced flange.
      (1) Gaskets: Buna-N or nitrile, of thickness compatible with machining tolerances of flange faces. Minimum thickness: 1/8-inch.
      (2) Nuts and bolts: Conform to ASTM A320, Type 304.
C. Provide full-size top access port to allow removal of the disc without removing the valve from the line.

D. Provide one-piece disc with alloy steel and nylon reinforcement.

E. Provide one-piece disc accelerator, enclosed within the valve, field adjustable, and replaceable without removing the valve from the line.

F. Interior and exterior valve coating shall be ANSI/NSF approved fusion-bonded epoxy.

G. Manufacturers:
   1. Val-Matic Series #7200 Surgebuster Swing Check Valve.
   2. Approved equal.

2.03 HYDRANTS (DES MOINES)

A. Hydrants manufactured in accordance with AWWA C502.

B. Use dry-barrel, breakaway type hydrants designed to break near ground line on impact. The breaking ring consists of a full circumference one piece or split contact retaining ring.

C. Provide flanged connections for head and base to hydrant barrel.

D. Provide 6-inch mechanical joint shoe with harnessing lugs.

E. Provide 4-1/2-inch-minimum-diameter main valve with bronze seat ring. Thread seat ring directly to bronze bushing or drain ring that is securely locked to hydrant shoe.

F. Provide pentagon-shaped operating nut with weather cap. Dimension from point to flat at top of operating nut: 1-3/16-inch.

G. Provide two 2-1/2-inch hose nozzles and one 4-inch pumper nozzle with caps having nut with dimensions identical to operating nut:
   1. Hose nozzle threads
      a. Outside diameter of male thread: 3-1/16 inches
      b. Diameter at root of male thread: 2-7/8 inches
      c. Threads per inch: 7-1/2
      d. Length of nozzle threads: 1 inch
      e. Cut off at top of threads: 1/4 inch
   2. Pumper nozzle threads
      a. Outside diameter of male thread: 4-31/32 inches
      b. Diameter at root of male thread: 4-19/32 inches
      c. Threads per inch: 4
      d. Length of nozzle threads: 1-1/2 inches
      e. Cut off at top of threads: 1/4 inch

H. Provide markings cast-in-bonnet that indicate direction of opening. Hydrants to open clockwise (to the right).

I. Provide anti-thrust washers for ease of operation.

J. Provide grease chamber or oil reservoir, sealed by means of O-rings, for lubrication of operation threads. Provide lubricant suitable for contact with potable water.

K. Painting:
   1. Prepare surfaces to be coated according to SSPC-SP6, commercial blast cleaning.
   2. Coat hydrant in accordance with AWWA C502 and coating manufacturer's instructions.
   3. Tnemec epoxy paint system (Alternative 1)
      a. Coat interior surfaces, other than machined surfaces, with asphaltic coating.
      b. Coat exterior surfaces below grade with two coats of asphaltic coating.
c. Prime exterior surfaces above grade using an aromatic urethane, zinc-rich system with 2.5 to 3.5 mils dry film thickness. Tnemec Series 90-97.
d. Paint exterior surfaces above grade using an aliphatic acrylic polyurethane system at 2.5 to 3.5 mils dry film thickness. Tnemec Series 73.
e. Apply a 2 to 3 mils dry film thickness of high gloss clear coat to exterior surfaces above grade after paint has been allowed to dry thoroughly. Tnemec Series 1079.
f. Color:
   (1) Asphaltec coating: Black.
   (2) Primer: Reddish-gray.
   (3) Body: Bright Yellow (03SF).
   (4) Bonnet: Safety Green (09SF).
   (5) Caps: Bright Yellow (03SF).

4. Tnemec epoxy paint system (Alternative 2)
a. Coat interior surfaces, other than machined surfaces, with asphaltec coating.
b. Coat exterior surfaces below grade with two coats of asphaltec coating.
c. Prime exterior surfaces above grade using a polyamide epoxy system, Tnemec Series 20, FC20 or 66, and paint using an aliphatic acrylic polyurethane system, Tnemec Series 75, or approved equal. Provide total dry mil thickness of 5 to 7 mils.
d. Apply a 2 to 4 mils dry thickness of clear coat to exterior surfaces above grade after paint has been allowed to dry thoroughly.
e. Color:
   (1) Asphaltec coating: Black.
   (2) Primer: White (AA83).
   (3) Paint: Bright Yellow (SC02).
   (4) Bonnet: Safety Green (SC07).
   (5) Caps: Bright Yellow (SC02).

5. Approved equal.
a. System must be approved by DMWW prior to bid opening.

L. Materials of Construction:
1. Breakaway stem coupling: steel, cast iron, or stainless steel.
2. Bonnet barrel, shoe, gate, and nozzle caps: cast iron.
3. Threaded internal components exposed to water, valve seats, and nozzles: bronze.
4. Cotter pins, drive pins, bolts, and screws exposed to water: stainless steel or brass.
5. Exterior bolts, nuts, set screws, and other miscellaneous fasteners: stainless steel or bronze.
   Metal components in contact with water to comply with requirements of ASTM B584 copper alloy
   UNS No. C89520 or UNS No. C89833. Residual lead levels of the metal not to exceed 0.25 percent
   by weight as cast or extruded.

M. Manufacturers:
1. Clow Medallion.
2. Mueller Centurion.
3. Approved equal.

2.04 JOINTS FOR VALVES AND HYDRANTS

A. Use mechanical joints in accordance with AWWA C111, or restrained as indicated on plans.

B. Use ductile iron follower glands for mechanical joints.

C. Bolts:
1. All T-bolts and hex-head nuts for mechanical joints in accordance with AWWA C111.
   b. Coating: Cor-Blue fluorocarbon resin.
   c. Color: Blue.
   d. Approved Manufacturers:
      (1) Birmingham Fastener Manufacturing Fluorocarbon Coated T-Head Bolt.
      (2) Or approved equal.
2. All bolts and hex nuts for flanged joints of 304 stainless steel.
D. Use flange joints having 1/8-inch rubber ring gaskets for nominal diameters of 24 inches or less and 1/8-inch rubber ring gaskets for nominal diameter greater than 24 inches.

E. Use elastomeric or nitrile gaskets in accordance with AWWA C111.

2.05  RETAINER GLANDS

A. Incorporate restraint for all mechanical joints into design of follower gland.

B. Use a retainer gland design imparting multiple wedging actions against the pipe, increasing its resistance as pressure increases.

C. Restrained joints to consist of a mechanical joint with retainer gland or manufacturer’s proprietary-restrained joint.

D. Dimensions conforming to the requirements of AWWA C111 and AWWA C153.

E. Pressure rating:
   3. Minimum of 250 psi for ductile iron pipe for sizes 18-inch and larger.

F. Color:
   1. Red for PVC pipe.
   2. Black for ductile iron pipe.

G. Materials for construction:
   1. Body, wedge segments, and break-off bolt assemblies: Grade 65-45-12 ductile iron as specified by ASTM A536.
   2. Coating to be electrostatically applied and heat-cured.
      a. Approved manufacturers:
         (1) MEGA-BOND by EBAA Iron, Inc.
         (2) CORRSAFE by Sigma.
         (3) Starbond by Star Products.
         (4) Resicoat R2-ES by Tyler Union.
         (5) EZ Shield by SIP Industries.
         (6) Or approved equal.

H. Minimum factor of safety of 2.

I. Use ductile iron retainer wedge segments heat-treated to a minimum Brinell hardness number of 370.

J. Incorporate twist-off nuts, the same size as hex-head nuts for T-bolts, into the design to ensure proper actuating torque is applied during installation.

K. Approved manufacturers for PVC pipe:
   1. Megalug by EBAA Iron Inc. Series 2000PV.
   2. One-Lok by Sigma Series SLCE.
   4. TUFGrip by Tyler Union Series 2000.
   5. EZ Grip by SIP Industries Series EZP.
   6. Or approved equal.
L. Approved manufacturers for ductile iron pipe:
   2. One-Lok by Sigma Series SLDE.
   4. TUFGrip by Tyler Union Series 1000.
   5. EZ Grip by SIP Industries Series EZD.
   6. Or approved equal.

2.06 VALVE BOXES

A. Provide cast iron screw-type adjustable heavy-duty valve box with cast iron stay-put cover marked "WATER" for each buried valve.

B. Minimum inside diameter of valve boxes of 5-1/8 inches.

C. Weight of valve box assembled, top and bottom sections, without valve box lid as follows:

<table>
<thead>
<tr>
<th>Extension Height (inches)</th>
<th>Weight (pounds)</th>
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<tbody>
<tr>
<td>27-37</td>
<td>71</td>
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<td>33-43</td>
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<td>36-52</td>
<td>93</td>
</tr>
<tr>
<td>39-60</td>
<td>100</td>
</tr>
</tbody>
</table>

D. Tyler No. 6850 29-U Domestic, or approved equal.

E. For an approved equal, provide proof that all parts of proposed valve box can be interchangeable with Tyler No. 6850 29-U Domestic.

F. Install valve boxes upon valve with use of a rubber Valve Box Adapter II as manufactured by Adaptor Inc., or approved equal.

2.07 POLYETHYLENE ENCASEMENT MATERIAL

A. Polyethylene encasement manufactured in accordance with AWWA C105.

B. Linear low-density polyethylene film.

C. Minimum thickness of 8 mils.

D. Color: Blue.

E. Physical Properties:
   1. Tensile strength 3600 psi, minimum.
   2. Elongation 800 percent, minimum.
   3. Dielectric strength 800 V/mil, minimum.
   4. Impact resistance 600 g, minimum.
   5. Propagation tear resistance 2550 gf, minimum.

F. Sheet material can be used to wrap irregular-shaped valves and fittings.

G. Use 2-inch-wide, 10-mil-thick pressure-sensitive polyethylene tape to close seams and hold overlaps.
PART 3  EXECUTION

3.01  HANDLING, STORAGE, AND SHIPPING

A. Handle valves and hydrants carefully.

B. Use blocking and hold-downs during shipment to prevent movement or shifting.

3.02  GENERAL INSTALLATION REQUIREMENTS

A. Protect valves and hydrants from injury while handling and storing.

B. Use no defective, damaged, or otherwise impaired materials.

C. Prepare excavation as outlined in Section 02 22 00.

D. Install valves and hydrants in accordance with AWWA C600.

E. Clean interior of valve or hydrant prior to placement in trench.

F. Install valves and hydrants to line and grade as shown on plans.

G. Install valves and hydrants plumb.

H. Clean joint surfaces of dirt and foreign matter using a wire brush before jointing.

I. Lubricate gasket and bell. Provide food grade lubricant meeting manufacturer's recommendations. Use lubricant approved for use with potable water.

J. Make joints in strict accordance with manufacturer’s recommendations.

K. Evenly tighten bolts on mechanical joints or flanged joints around pipe by alternating from one side of pipe to the other. Follow manufacturer’s installation specifications for electrical isolation flanges to prevent damage during bolt torquing.

L. Backfill and compact around hydrants and valves as outlined in Section 02 22 00.

3.03  VALVE INSTALLATION

A. Do not support valves off of piping.

B. Ensure valve box is centered over operating nut.

C. Install rubber Valve Box Adapter II as manufactured by Adapter Inc., or approved equal, inside of valve box centered on valve.

3.04  HYDRANT INSTALLATION

A. Anchor auxiliary valve to hydrant tee.

B. Install hydrant with break flange more than 1 inch and less than 7 inches above finished grade.

C. The use of hydrant extensions will not be allowed to set hydrant to appropriate height, unless approved by Engineer. Hydrant extensions, if approved, must be from same manufacture as the fire hydrant.

D. Use restrained joints in hydrant branch.

E. Set hydrant on a solid concrete cinder block not smaller than 8-inch by 16-inch by 4-inch.
F. Provide poured concrete thrust blocks behind hydrant and hydrant tee.

G. Ensure hydrant drain is free-flowing and unobstructed in areas where normal groundwater level is below drain opening.

H. Provide not less than one (1) cubic yard of open-graded granular fill around base of hydrant for drainage.

I. Lubricate and exercise each of the three (3) hydrant caps to prevent seizing. Provide food grade grease lubricant meeting manufacturer’s recommendations. Use lubricant approved for use with potable water.

3.05 INSTALLATION OF POLYETHYLENE PIPE ENCASEMENT MATERIAL

A. Use polyethylene encasement material on buried valves and buried portion of hydrants in accordance with AWWA C105.

B. Wrap valves using polyethylene sheet material to prevent contact with bedding. Secure sheet to adjacent pipe and just below valve operation nut using polyethylene tape.

C. Wrap buried portions of hydrants using 24-inch flat-width polyethylene tubing. Secure tubing to hydrant barrel just below grade using polyethylene tape.

D. The polyethylene encasement preventing contact with bedding material is not intended to be an airtight and watertight enclosure.

E. Repair damaged polyethylene encasement material using polyethylene tape, or replace the damaged section.

3.06 THRUST BLOCKS

A. Provide concrete thrust blocks at hydrants and hydrant tees.

B. Carry thrust blocks to undisturbed soil that will provide adequate bearing.

C. The bearing area of thrust blocks, in square feet, as shown on the plans. Minimum thickness for thrust block of 1.5 times outside pipe diameter or 18 inches, whichever is greater.

D. Hold thrust blocks back 3 inches from bolts, nuts, glands, or other jointing materials. Ensure joints could be remade without disturbing thrust block.

E. Provide bond breaker between thrust block and pipe or hydrant. Polyethylene encasement material will be considered an acceptable bond breaker.

3.07 REMOVAL OF ABANDONED FIRE HYDRANTS AND VALVE BOXES

A. Surface restoration items including pavement removal and replacement, seeding, or sodding, needed to remove abandoned fire hydrants or valve boxes to be paid in accordance with appropriate bid item in Contract.

B. All other items related to removal of abandoned fire hydrants and valve boxes including repairs to traffic loops and lawn irrigations systems incidental to Contract.

C. Remove abandoned fire hydrants by disconnecting pipe from fire hydrant at the shoe.

D. Return abandoned fire hydrants to Des Moines Water Works at 408 Fleur Drive, unless Engineer approves their disposal.
E. Backfill and restore all excavations for fire hydrant removals according to Sections 02 22 00 and 02 50 00 of these Specifications.

F. Remove abandoned valve box and entire top section, backfill the lower section and excavation, and restore according to Sections 02 22 00 and 02 50 00 of these Specifications.

** END OF SECTION **
PART 1  GENERAL

1.01  SUMMARY OF WORK

A. Transferring existing water services from existing water mains to new water mains to the extent shown in the Plans.

1.02  RELATED SECTIONS

A. Section 02 22 00 – Excavating, Backfilling, and Compacting for Water Mains.

B. Section 02 60 00 – Protection of Water Supply.

C. Section 02 61 00 – Ductile Iron and Polyvinyl Chloride Pipe for Water Mains.

D. Section 02 64 00 – Valves and Hydrants.

E. Section 02 67 40 – Pressure Testing Water Mains.

F. Section 02 67 50 – Disinfection of Water Distribution Systems.

1.03  REFERENCES

A. American Society for Testing and Materials (ASTM) B62 – Composition Bronze or Ounce Metal Castings.


E. Federal Register – Occupational Safety and Health Administration (OSHA), Occupational Safety and Health Standards – Excavations.

1.04  SUBMITTALS

A. Submit the following items for materials provided by the Contractor:
   1. Manufacturer’s certification that materials furnished are in compliance with the applicable requirements of the referenced standards and this Section.
   2. Drawings and manufacturer’s data showing details of the pipe and fittings to comply with this Section.

B. Provide dimensional drawings, fabrication details, functional description, and properly identified catalog data on all equipment to prove complete compliance with Drawings and Specifications.
1.05 MEASUREMENT AND PAYMENT

A. Payment for installation of 1-inch to 2-inch water service transfer is made as a unit, including the connection to new water main with insulated corporation and corporation 90, installation of new curb stop and stop box, installation of pipe, connection to existing water service, excavation, backfill, and compaction.

B. Payment for installation of 4-inch and larger water service transfer is made as a unit, including the tee, valve, DI pipe, valve box, valve box adapter, needed fittings, poly wrap, bonded joints, and thrust restraint.

C. All work related to water service transfer is considered incidental to the installation of the water service transfer.

PART 2 PRODUCTS

2.01 CORPORATION VALVES

A. Type: one-quarter-turn ball valve in accordance with AWWA C800.

B. Inlet Threads: standard AWWA corporation valve inlet threads.

C. Outlet Threads: flared copper connection.

D. Provide corporations to be used on iron pipe with a dielectric insulator that prevents the passage of electric current.

E. Metal components in contact with water to comply with the requirements of ASTM B584 copper alloy UNS No. C89520 or UNS No. C89833. Residual lead levels of the metal not to exceed 0.25 percent by weight as cast or extruded.

F. Metal components not in contact with water to comply with the requirements of ASTM B62 copper alloy UNS No. C38600 or the material as described in Part 2.01.E.


H. Approved Manufacturers for Corporation Valves on Non-iron Pipe:
   1. A.Y. McDonald Mfg. Co., Model No. 74701B.
   2. The Ford Meter Box Company, Inc., Catalog No. FB600-NL.

I. Approved Manufacturers for Corporation Valves on Iron Pipe:
   1. A.Y. McDonald Mfg. Co., Model No. 74701BDB.
   2. The Ford Meter Box Company, Inc., Catalog No. SI-FB600-NL.

2.02 COPPER PIPE

A. Copper Tubing: ASTM B88, Type K, annealed.

B. Joints: flared.

C. Meet Des Moines Water Works Rules and Regulations for Water Services.
2.03 FITTINGS (2-INCH AND SMALLER)

A. Joints: flared.

B. Metal components in contact with water to comply with the requirements of ASTM B584 copper alloy UNS No. C89520 or UNS No. C89833. Residual lead levels of the metal not to exceed 0.25 percent by weight as cast or extruded.

C. Metal components not in contact with water to comply with the requirements of ASTM B62 copper alloy UNS No. C38600 or the material as described in Part 2.03.B.


2.04 CURB STOP

A. Type: "T" handle, quarter-turn, ball pattern valves conforming to AWWA C800, with flared copper inlet and outlet connections.

B. Provide pre-drilled valve head for attaching stationary shutoff rod.

C. Provide valve head checks that limit rotation to 90 degrees. Valve head to be parallel to valve body when open; valve head to be perpendicular to valve body when closed (Operate right to shutoff).

D. Metal components in contact with water to comply with the requirements of ASTM B584 copper alloy UNS No. C89520 or UNS No. C89833. Residual lead levels of the metal not to exceed 0.25 percent by weight as cast or extruded.

E. Metal components not in contact with water to comply with the requirements of ASTM B62 copper alloy UNS No. C38600 or the material as described in Part 2.04.D.

F. Meet Des Moines Water Works Rules and Regulations for Water Services.

G. Approved Manufacturers:
   3. The Ford Meter Box Company, Inc., Catalog No. B22-444M-NL or B22-777M-NL.
   4. The Ford Meter Box Company, Inc., Catalog No. B22-444-NL or B22-777-NL.
   5. Mueller Co., Model No. 300 Catalog No. B-25204N.

2.05 CURB BOX

A. Body:
   2. Base section: arch base pattern, with telescoping 1-inch upper section, stainless steel rod and pin, and lid.
   3. Adjust to accommodate:
      a. 5-foot-minimum service depth.
      b. 7-foot-maximum service depth.
   4. Provide a positive means of preventing rotation of upper section during removal of lid.

B. Lid:
   1. Material: cast iron.
   2. Style: two-hole Erie pattern, to fit spanner wrench.
   3. Provide 1-inch NPT female-threaded brass bushing to screw onto curb box with 1-inch-diameter upper section. Bushing shall be secure and rotate integrally with lid.
   4. Acceptable lids:
      a. A.Y. McDonald Mfg. Co., Model No. 5601L.
      b. The Ford Meter Box Company, Inc., Type HS.
d. Or approved equal.

C. Stationary Shutoff Rod
2. Diameter: approximately 1/2-inch.
3. Rod:
   a. Self-centered in curb box.
   b. Extending above curb box joint. Distance between top of rod and top of box to be:
      (1) No less than 12 inches.
      (2) No greater than 24 inches.
4. Provide a blade at the upper end of rod in a plane parallel to the curb stop valve head with
   thickness appropriate for operation using a stationary rod key.
5. Provide a fork at the lower end of rod to fit over and operate the valve head of a standard curb
   stop. Provide holes in fork to align with hole in curb stop valve head.
6. Connect rod to curb stop using stainless steel cotter pin, or approved equal, inserted through
   holes in rod fork and curb stop valve head.


E. Approved Manufacturers:
   2. The Ford Meter Box Company, Inc., Catalog No. EA1-____-40-____R, with #1 being
      extended length of stop box housing and #2 being rod length.
   3. Or approved equal.

2.06 LARGE WATER SERVICE TRANSFERS (4-INCH AND LARGER)

A. Use products listed in Sections 02 61 00 and 02 64 00.

B. Use ductile iron for all pipe.

PART 3 EXECUTION

3.01 GENERAL

A. Qualifications:
   1. Plumbing work covered by this Section to be completed by a plumber who is bonded with Des
      Moines Water Works and licensed in accordance with local plumbing codes.
   2. Contractors will not be permitted to make their own 1-inch direct taps on mains installed under
      this Contract. Contact Des Moines Water Works 24 hours in advance to schedule taps.

B. Plumbing Permits and Inspections:
   1. Obtain permits necessary for service transfers.
   2. Arrange for and schedule required plumbing inspections in accordance with local plumbing
      codes.

C. Scheduling:
   1. Install services only after the new water main passes pressure test per Section 02 67 40 and
      disinfection per Section 02 67 50.
   2. The Contractor is to notify residential customers 24 hours in advance when their water service will
      be interrupted for service transfer.
   3. The Contractor is to notify commercial and industrial customers a minimum of 24 hours in
      advance when water service will be interrupted for service transfer and to coordinate the
      interruption completely with the customer. Commercial and industrial service transfers may need
      to be completed outside normal working hours to minimize impact on the affected customers. No
      additional compensation will be paid for work outside normal working hours.
3.02 EXAMINATION

A. Confirm location, elevation, and orientation of existing utilities and modify elevation of new water services to omit conflicts with utilities while maintaining 5-foot-minimum cover.

B. Verify location and size of existing service line prior to excavation and installation of new tap.

3.03 SIZE OF SERVICE LINES AND TAPS

A. Transfer water service lines according to Plans and Specifications as follows:
   1. Complete 1/2-inch, 3/4-inch, and 1-inch service transfers with 1-inch taps and 1-inch pipe needed to make connection.
   2. Complete 1-1/2-inch and 2-inch service transfers with 2-inch taps and pipe same size as existing.

B. Complete 4-inch and larger service transfers with valve, pipe, and fittings needed to make connection.

3.04 PREPARATION

A. Excavate in accordance with Section 02 22 00.

B. Cut pipe ends square, ream tube ends to full pipe diameter, and remove burrs.

C. Remove scale and dirt on inside and outside before assembly.

3.05 INSTALLATION

A. Schedule taps to be made by Owner a minimum of 24 hours in advance. Such taps will be made only between the hours of 8 a.m. and 3:30 p.m. and only on the Owner's normal work days.

B. Shore excavations for taps to be made by Owner according to OSHA Trench Shoring Standards.

C. Provide 12-inch clear area behind and below main and 48-inch clear area in front of main to be tapped.

D. Install service lines in accordance with local plumbing codes.

E. Use trenchless construction methods when installing water service lines underneath roads, driveways, shoulders, or other traffic-carrying surfaces.

F. Corporation:
   1. Install corporations no closer than 18 inches from a pipe joint, another corporation, or side of excavation.
   2. One-inch corporations will be installed at a 45-degree angle above horizontal; 2-inch corporations will be installed horizontal.
   3. Corporation to face the property to be served.
   4. Corporation taps will not be allowed on dry mains.

G. Pipe:
   1. Maintain minimum separation between water piping and sewer piping in accordance with IDNR requirements as described in Section 02 60 00.
   2. Maintain 5-foot-minimum cover below final grade. Do not exceed 7-foot cover without Owner's authorization.
   3. Install 4-inch SDR 26 PVC encasement for all 1-inch water services installed under storm sewers as indicated on Plans.

H. Curb Stop:
   1. Set curb stop on solid bearing.
   2. Center and plumb curb box over curb stop.
3. Install stationary shutoff rod. Attach shutoff rod to curb stop as specified above.
4. Set box cover flush with finished grade and plumb.
5. Location:
   a. In public right-of-way.
   b. 1 to 6 feet from property line in the City of Des Moines.
   c. 1 foot from property line in Polk County.
   d. Not within driveway or sidewalk.

I. Repair leaks that develop in new service lines or water mains due to water service installation operations.
J. Coordinate necessary inspections to satisfaction of jurisdictional authority for water service lines.
K. Install large service transfers in accordance with Section 02 61 00.

3.06 RETIREMENT OF EXISTING SERVICE LINES

A. Effectively cap existing service stub after service is transferred to new main.

B. Repair of leaks that develop in existing service lines or mains due to service transfer operations are the responsibility of the Contractor and costs are incidental to service line transfer.

3.07 BACKFILL, COMPACTION, AND RESTORATION

A. Backfill and compact excavations as specified in Section 02 22 00 for trenches.

B. Restore affected areas as specified elsewhere and as shown on Plans.

** END OF SECTION **
PART 1 GENERAL

1.01 SUMMARY OF WORK
   A. Pressure test water mains in accordance with this Section.

1.02 RELATED SECTIONS
   A. Section 02 22 80 – Horizontally Directional Drilled Water Main.
   B. Section 02 61 00 – Ductile Iron and Polyvinyl Chloride Pipe for Water Mains.
   C. Section 02 64 00 – Valves and Hydrants

1.03 REFERENCES

1.04 SUBMITTALS (NOT USED)

1.05 MEASUREMENT AND PAYMENT
   A. Work under this Section incidental to Contract.

PART 2 PRODUCTS
   NOT USED.

PART 3 EXECUTION

3.01 PRESSURE TESTING
   A. Perform Work in accordance with AWWA C600 and AWWA C605.
   B. Test piping at 150 psi or as indicated on plans for 2 hours.
   C. Fill and flush new piping with potable water, ensuring that all trapped air is removed.
   D. Isolate new piping from the existing system.
   E. Pressure test new piping in sections by isolating each section using in-line gate valves. Relieve pressure on non-test side of gate valve.
   F. Pressurize new piping to test pressure at lowest point in the isolated system. Do not pressurize to more than 5 psi over test pressure at lowest point in the isolated system.
   G. Monitor pressure in line being tested for a period of not less than 2 hours.
   H. If at any point during that 2-hour period the pressure drops to 5 psi below test pressure, re-pressurize by pumping water into the line in sufficient quantity to bring pressure back to between test pressure and 5 psi above test pressure. Accurately measure the quantity of water required to re-pressurize the main.
I. At the end of the 2-hour period, if pressure in the line has dropped below test pressure, re-pressurize to test pressure. Accurately measure the quantity of water required to re-pressurize the main.

J. Allowable leakage, in gallons, per hour of testing shall equal (LD(P)^{1/2}) / 148,000.
   \[ L = \text{length of pipe section being tested in feet} \]
   \[ D = \text{nominal diameter of pipe in inches} \]
   \[ P = \text{average test pressure in psig} \]

K. Leakage equals total quantity of water required to keep line pressurized during the 2-hour test period and re-pressurize line at the end of the test period.

L. If average leakage per hour is less than allowable leakage, the pressure test is acceptable.

M. If average leakage per hour is more than allowable leakage, the pressure test is not acceptable. Locate and make approved repairs as necessary until leakage is within specific allowance.

N. If pressure in the isolated line never drops to test pressure, having started no more than 5 psi above test pressure, the pressure test is acceptable.

O. Repair visible leaks regardless of the quantity of leakage.

** END OF SECTION **
PART 1 GENERAL

1.01 SUMMARY OF WORK
   A. Disinfect water mains and 2-inch and larger water services in accordance with this Section.

1.02 RELATED SECTIONS
   A. Section 02 22 00 – Excavating, Backfilling, and Compacting for Water Mains.
   B. Section 02 22 80 – Horizontally Directional Drilled Water Main.
   C. Section 02 61 00 – Ductile Iron and Polyvinyl Chloride Pipe for Water Mains.
   D. Section 02 64 00 – Valves and Hydrants
   E. Section 02 66 00 – Water Service Transfers.

1.03 REFERENCES
   A. American Water Works Association (AWWA) B300 – Hypochlorites.
   B. American Water Works Association (AWWA) B301 – Liquid Chlorine.
   C. American Water Works Association (AWWA) C651 – Disinfecting Water Mains.

1.04 SUBMITTALS (NOT USED)

1.05 MEASUREMENT AND PAYMENT
   A. Work under this Section incidental to Contract.

PART 2 PRODUCTS

2.01 CHLORINE
   A. Calcium hypochlorite granules conforming to AWWA B300.
   B. Liquid chlorine conforming to AWWA B301.

2.02 DE-CHLORINATION CHEMICALS
   A. Vita-D-Chlor (Ascorbic Acid) by Integra Chemical Company.
   B. Vita-D-Chlor, Neutral (Sodium Ascorbate) by Integra Chemical Company.
   C. No-Chlor (Ascorbic Acid) by Measurement Technologies.
   D. Approved equal.
PART 3  EXECUTION

3.01  EXAMINATION

A. Water for disinfection will be provided by Owner for two disinfection attempts. If additional attempts are necessary, the Contractor will be billed for water used at the normal rate set for industrial customers.

B. Perform disinfection of piping and appurtenances only after satisfactory pressure testing.

C. Ensure piping to be disinfected is isolated from portion of distribution system that is in service.

D. Review procedures and coordinate disinfection with Owner.

E. Perform Work in accordance with AWWA C651.

F. Bacteriological samples shall be taken and tested by Owner to ensure satisfactory disinfection.

3.02  CHLORINATION OF PIPING

A. Provide equipment and materials necessary to complete chlorination.

B. Use continuous feed method as outlined in AWWA C651.

C. Prior to feeding chlorine, fill and flush new piping to remove trapped air and particulates. Provide equipment and materials necessary to obtain a minimum flushing velocity of 3.0 fps in piping to be disinfected. When flushing velocities of 3.0 fps cannot be obtained, swab pipe until pipe is free of debris. Type of swab and procedures for use shall be approved by Owner prior to its use.

D. Induce flow of potable water through new piping at required flushing velocity. Make provisions for diverting and disposing of flushing water that does not damage surroundings. Repair damage caused by flushing activities.

E. At a point within five pipe diameters of connection to existing distribution system, introduce highly chlorinated water in sufficient quantity to provide at least 25 mg/L free chlorine in the new piping. Provide all metering and feed equipment and temporary chlorination taps. Remove temporary chlorination taps and cap the main once the main passes.

F. Introduce highly chlorinated water continuously until entire section of new piping contains a minimum of 25 mg/L free chlorine. Do not exceed 100 mg/L free chlorine.

G. Isolate newly chlorinated piping for a contact period of at least 24 hours, and not more than 48 hours, taking care not to backflow chlorinated water into existing potable water system.

H. After the contact period, water in new piping must have a residual-free chlorine content of not less than 10 mg/L. If residual is less than 10 mg/L, rechlorinate as outlined above.

3.03  FLUSHING CHLORINATED PIPING

A. After the contact period, flush recently chlorinated piping with potable water.

B. Continue flushing until chlorine residual in new piping is equal to chlorine residual in existing distribution system.

C. Isolate new piping from existing distribution system for a period of not less than 24 hours.
D. Chlorinated water, flushed from new piping, shall be dechlorinated and disposed of so not to cause damage to the environment. Conform to state and federal requirements.

E. De-chlorinate all water from flushing activities and testing before it is released into the ground, stream, or storm sewers. Method to be approved by Owner prior to any flushing activities.

3.04 BACTERIOLOGICAL TESTING

A. Immediately following flushing of pipelines and again at least 24 hours after flushing pipelines, samples will be taken and tested by Owner.

B. The Owner reserves the right to take and test additional samples 48 hours after flushing.

C. Approximately one sample will be taken for each 1,200 feet of new water main.

D. Additional samples may be taken at the discretion of Owner.

E. Samples must show the absence of coliform organisms and other contaminants and meet requirements of the Iowa Department of Natural Resources to be considered acceptable.

F. If any sample is not satisfactory with either sampling, the piping represented by that sample must be flushed and rechlorinated by the Contractor at the discretion of, and as directed by, the Owner.

** END OF SECTION **
PART 1 GENERAL

1.01 SUMMARY OF WORK
A. Provide labor, equipment, and materials necessary to install cathodic protection for 16-inch and smaller diameter ductile iron pipe with field-applied polyethylene encasement.

1.02 RELATED SECTIONS
A. Section 02 22 00 – Excavating, Backfilling, and Compacting for Water Mains.
B. Section 02 61 00 – Ductile Iron and Polyvinyl Chloride Pipe for Water Mains.
C. Section 02 64 00 – Valves and Hydrants
D. Section 02 66 00 - Water Services

1.03 REFERENCES
A. American Society for Testing and Materials (ASTM) – Applicable testing methods and materials.
B. National Electrical Code (NEC).
C. National Electrical Manufacturers Association (NEMA) – Standards and Specifications.
D. Underwriters Laboratories, Inc. (UL) – Standards for Safety.

1.04 SUBMITTALS
A. Product Data
   1. Submit manufacturer’s specifications, recommendations, and installation instructions for each of the following products specified in this Section:
      a. Electrical Continuity Bond Cables.
      b. Corrosion Monitoring Test Stations.
      c. Electrical Isolation Devices.
      d. Galvanic Anodes and Accessories.
      e. Wire, Cable, and Splices.
      f. Exothermic Welds and Repair Coatings.

1.05 MEASUREMENT AND PAYMENT
A. Install bonding cables across all pipe joints. Include costs for material, equipment, and labor in Pipe, Valve, or Fitting Installation.

B. Install corrosion monitoring test stations with test wires as shown on Plans. Include costs for material, equipment, and labor in Cathodic Protection Test Station bid item.

C. Install isolation pipe couplings as shown on Plans. Include costs for materials, equipment, and labor in Pipe Isolation Coupling bid item.

D. Install electric isolators in all corporation stops. Include cost for isolators in Water Service price.

E. Install anodes at locations determined by Engineer according to spacing by pipe size shown in Cathodic Protection Detail Sheet of Specifications. Include costs for materials, equipment, and labor in 32-pound Magnesium Anode bid item.
PART 2 PRODUCTS

2.01 WARRANTY ON CONTRACTOR-PROVIDED MATERIALS

A. All Contractor-provided materials shall be guaranteed for a period of 2 years.

B. The 2-year period commences at the time of final installation of all components by Contractor and after system has been tested and properly adjusted for operation by Owner's Corrosion Engineer.

2.02 ELECTRICAL CONTINUITY BOND CABLES

A. Install factory-prefabricated high molecular weight polyethylene insulated stranded copper continuity bond cables across all pipe joints of mechanically-coupled pipe. Insulation shall conform to ASTM D1248 – Specification for Plastic Molding and Extrusion Materials, Type 1, Class C, Grade 5.

1. Size pipe joint continuity bond cables as follows:
   a. Wire gauge: No. 4.
   b. Number of strands: 7.
   c. Outer jacket: 0.110-inch thickness.
   d. Length: 18-inch (minimum).
   e. Number of bonds: one (1) across each pipe joint.

2.03 CORROSION MONITORING TEST STATIONS

A. Monitoring stations shall be as follows:

1. Tube of the test station of Acrylonitrile Butadiene Styrene.
2. Test station minimum of 24 inches in height and 6-1/8 inches in diameter.
3. Cast iron collar and lid.
4. Stainless steel lid with hold-down bolt with stainless steel nut.
5. Minimum weight of 22.0 pounds.
7. A terminal board equipped with terminal posts to permit ready access and testing constructed as follows:
   a. Terminal Board: polycarbonate plastic.
   c. Two shunts between posts.
   d. Terminal Board shall sit in the top of test station.
8. Repackaged Cu-CuSO4 Reference Electrodes
   a. Description: Cu-CuSO4 electrodes shall be used for soil environments to provide a stable electrical benchmark from which to measure the cathodic protection system’s effectiveness. Construct electrodes as follows:
      (1) Element: copper rod encapsulated in a proprietary backfill electrolyte containing high purity copper sulfate crystals and a chloride ion trap to prevent contamination of the electrolyte.
      (2) Service life of reference electrode no less than 20 years.
      (3) Lead Wire: No. 1 RH-RHW (Yellow) stranded copper wire. Lead wire sufficiently long to reach its termination point without splicing.
      (4) Approved manufacturers:
         (a) Borin Manufacturing, Inc., Model SRE-007-CUY.
         (b) GMC Electrical, Inc., Model CU-1-UGPC.

B. Subject to meeting the requirements of this Section, acceptable manufacturer’s products that may be incorporated into Work include the following, or an approved equal:

1. Cathodic Protection Test Services #668 Roadway Test Station with Locking Cast Iron Lid and Collar with five-terminal board and shunt.
2.04 ELECTRICAL ISOLATION DEVICES

A. Construct electrically isolating pipe couplings as follows:
   1. Follower rings shall meet requirements of AISI C1012 carbon steel or ASME SA36 ductile iron.
   2. Middle ring shall meet requirements of ASTM A513, ASTM A635, or ASME SA675 GR60.
   3. Use stainless-steel bolts and nuts.
   4. Gaskets shall be Nitrile Grade 27 Buna-S compounded to resist aliphatic hydrocarbons within a
temperature range of minus 20 degrees F to 180 degrees F.
   5. Use fusion-bonded epoxy coating.
   6. Subject to meeting the requirements of this Section, acceptable manufacturer's products that may
be incorporated into Work include the following, or an approved equal:
      b. Smith Blair, Style 416 Insulating Coupling.

B. Use electrically isolating corporation stops for all 2-inch and smaller service connections; see
Section 02 66 00.
   1. Subject to meeting the requirements of this Section, acceptable manufacturer's products that may
be incorporated into Work include the following, or an approved equal:
      a. Ford Meter Box Company, Model Service Insulator Corporation Stops.
      b. Approved equal.

2.05 SACRIFICIAL ANODES AND ACCESSORIES

A. Magnesium Anodes
   1. Use magnesium anodes capable of delivering a minimum efficiency of 500 amp-hours per pound
of magnesium and having the following metallurgical analysis and physical properties:
      a. Bare Ingot Weight: 32 pounds.
      b. Metallurgy:
         (1) Aluminum: 0.01 percent (maximum).
         (2) Manganese: 0.50 percent - 1.3 percent.
         (3) Copper: 0.02 percent (maximum).
         (4) Nickel: 0.001 percent (maximum).
         (5) Iron: 0.03 percent (maximum).
         (6) Other (each): 0.05 percent (maximum).
         (7) Other (total): 0.30 percent (maximum).
         (8) Magnesium: balance.

B. Packaged Magnesium Anode Backfill
   1. Magnesium anodes shall be packaged within a cotton sack in a special chemical backfill having
the following proportions:
      a. Ground Hydrated Gypsum: 75 percent.
      b. Powdered Bentonite: 20 percent.
      c. Anhydrous Sodium Sulfate: 5 percent.
   2. Use backfill having a grain size such that 100 percent is capable of passing a 20-mesh screen
and a 100-mesh screen retaining 50 percent.
      a. Backfill completely surrounding the anode ingot without voids.
      b. Package dimensions: 8-inch diameter by 28-inches long.
      c. Package weight: 76 pounds (nominal).

C. Anode Lead Wire
   1. 10-foot length of No. 12 AWG solid copper wire with Type TW (red) thermoplastic insulation is to
be used as the standard lead wire for a magnesium anode.
   2. Lead Wire Connection to Anode Core
      a. Use magnesium anodes cast with a minimum 20-gauge galvanized steel core.
      b. Recess one end of the anode to expose core for silver-soldering the lead wire.
      c. Fill the silver-soldered lead wire connection and anode recess with an electrical potting
compound before packaging.
2.06 TEST WIRES FOR CATHODIC PROTECTION SYSTEM MONITORING

A. Use oil- and gas-resistant insulated/jacketed stranded copper wire for structure connections as part of the system's monitoring circuits. Insulation conforms to ASTM Standard UL-83 for Thermoplastic Insulated Wires.
   1. Size test wires as follows:
      a. Number of strands: 19.
      b. Primary insulation: 0.015-inch-thick thermoplastic.
      c. Outer jacket: 0.004-inch-thick nylon.

2.07 EXOTHERMIC WELDS AND REPAIR COATINGS

A. Exothermic Weld Connections:
   1. Exothermic weld all connections used within the DC cathodic protection system circuit. Use the proper size welders, metal charges, and wire sleeves in accordance with manufacturer's recommendations.
   2. Subject to meeting the requirements of this Section, acceptable manufacturer's products that may be incorporated into Work include the following, or an approved equal:
      b. Erico Products, Model Cadweld.

B. Repair Coatings:
   1. Apply an oil- and gas-resistant, cold-applied, coal tar mastic compound to exothermic weld connections.
   2. Subject to meeting the requirements of this Section, acceptable manufacturer's products that may be incorporated into Work include the following, or an approved equal:
      b. Koppers Company, Bitumastic No. 50.
      c. Berry Plastics, Polyken 937/938.

PART 3 EXECUTION

3.01 REGULATORY REQUIREMENTS

A. Conform to applicable federal, state, and local regulations for safe installation of the system.

3.02 DESCRIPTION OF WORK

A. Refer to additional notes and Cathodic Protection Details included in Plans to install all cathodic protection components and equipment.

B. Examine areas and conditions under which cathodic protection materials are to be installed, and notify Engineer in writing of conditions detrimental to proper and timely completion of Work. Do not proceed with Work until unsatisfactory conditions have been corrected.

3.03 INSTALLATION OF ELECTRICAL CONTINUITY BOND CABLES

A. General:
   1. Inspect each cable to ensure a continuous electrical conductor with no cuts or tears in the cable insulation.
   2. Do not install continuity bonding cables across points of connection to existing structures or across electrical isolation devices.
   3. Continuity bonding cables will not be required across joints with retainer glands.

B. Method:
   1. Attach cable to water main by exothermic welding process.
   2. Perform exothermic welding of bond cables in accordance with manufacturer's instructions.
   3. Coat all exothermic welds with a cold-applied coal tar mastic as described in this Section.
C. Post-Installation Inspection:
   1. Inspect electrical continuity bond cables by visually examining each exothermic weld connection for strength and suitable coating prior to backfilling.
   2. If, in the opinion of the Engineer, the exothermic weld is deficient, Contractor shall remove and replace the weld at no expense to Owner.

D. Backfilling of Bond Cables:
   1. Perform backfilling that will prevent damage to bond cables and connections to the water main.
   2. If construction activity damages a bond cable, Contractor shall remove and replace the bond cable at no expense to Owner.

3.04 INSTALLATION OF CORROSION MONITORING TEST STATIONS

A. Test Wires:
   1. Provide test station lead wire that is continuous with no cuts or tears in the insulation covering the conductor.
   2. Attach test lead to water main by exothermic welding process.
   3. Route test wire into test station and attach wire nut or tape exposed end of copper conductor.
   4. Thoroughly backfill and compact area immediately surrounding test station to prevent settling or tipping.

B. Backfilling of Test Station:
   1. Protect test leads during backfilling operation to avoid damage to wire insulation and integrity of the conductor.
   2. If, in the opinion of the Engineer, the installation of the test station wires is deficient, Contractor shall remove and replace the test wires at no expense to Owner.
   3. Install corrosion-monitoring test stations at locations shown on Plans or as directed by Engineer.

3.05 INSTALLATION OF ELECTRICAL ISOLATION DEVICES

A. General: Follow manufacturer’s written instructions for specific device to be installed.

B. Acceptance:
   1. Immediately after an electrical isolation device has been installed, an electrical isolation test will be conducted by Engineer.
   2. If, in the opinion of the Engineer, the installation of the isolation device is deficient, Contractor shall remove and replace these components at Contractor’s expense.

3.06 INSTALLATION OF GALVANIC ANODES

A. General: Install the required number of anodes at locations shown on Plans or as directed by Engineer.

B. Method:
   1. Remove plastic or paper shipping bags from around prepackaged anodes prior to installation.
   2. Install in the manner and at the dimensions from the water main as shown on the Cathodic Protection Details on Plans. Make field modifications only with approval of Engineer.
   3. Handle galvanic anodes to avoid damaging anode materials and wire connections.
   4. Attach anode lead wire directly to pipe. Splices are not permitted within the lead wire of an anode except to repair damaged lead wires.
   5. Install prepackaged anodes with compacted backfill material, such that no voids exist between anode material and backfill.
   6. In very dry or coarse soils, pour 5 gallons of water over anode after backfilling and tamping have been completed to a point about 6 inches above anode. After the water has been absorbed by the earth, complete backfilling to ground surface level.
3.07 INSTALLATION OF WIRE, CABLE, AND SPLICES

A. Install underground wires, cables, and connections at a minimum 24 inches below final grade with a minimum separation of 6 inches from other underground structures.

3.08 INSTALLATION OF EXOTHERMIC WELDS AND CONNECTION DEVICES

A. Perform all exothermic welding in accordance with manufacturer’s recommendations for welding equipment, weld metal charge size, and applicability to the metallurgy of the structure.

B. Do not use exothermic weld equipment if graphite mold is wet. Follow manufacturer’s MSDS for storage and handling.
   1. Structure Surface Preparation
      a. Remove all dust, dirt, grease, oil, and other foreign matter by either power or hand-wire brushing to expose bright shiny metal free of coating, soil residue, or oxidation.
      b. Grind or file to remove sharp edges or burrs.
   2. Installation of Elastomeric Cover over Exothermic Welds
      a. After cooling, remove all slag from exothermic weld connection.
      b. Clean pipe surface that is to be covered by removing all moisture, dirt, grease, and other contaminants.
      c. Coat welded connection to completely cover all exposed copper or damaged pipe coating.

3.09 FIELD QUALITY CONTROL

A. Contractor’s Quality Control System
   1. Cathodic protection system components conform to applicable Plans and Specifications established by Contract Documents.
   2. Standards for materials, workmanship, construction, and functional performance are adhered to throughout the course of the Work.
   3. Contractor’s superintendent to monitor the Contractor’s quality control system.

** END OF SECTION **
This project will be constructed in accordance with the SUDAS Standard Specifications, 2019 Edition, which were adopted by the City of Des Moines on April 22, 2019, under Roll Call No. 19-0621, as amended by these City of Des Moines General Supplemental Specifications.

The SUDAS Standard Specifications, 2019 Edition, may be viewed at the Iowa SUDAS website https://iowasudas.org/manuals/specifications-manual/, or can be purchased online from the Iowa SUDAS website at: https://iowasudas.org/order-the-manuals/.

Said SUDAS Standard Specifications are hereby amended as follows:

SECTION 1010 – DEFINITIONS

1010, 1.03 DEFINITIONS AND TERMS. Add the following new definition:

PRIVATE CONSTRUCTION CONTRACT. A contract awarded by a private agency or individual for construction of a publicly owned or privately-owned improvement, which by agreement of the parties is subject to these specifications.

SECTION 1020 – PROPOSAL REQUIREMENTS AND CONDITIONS

1020, 1.01 QUALIFICATION OF THE BIDDERS: Add the following new E.

*E. The City of Des Moines may disqualify a Contractor from bidding on future work or from participating as a subcontractor for a period of up to 3 years in accordance with Section 94-198 of the Municipal Code of the City of Des Moines.

1020, 1.03 QUANTITIES AND UNIT PRICES: Delete B. and replace with the following new B.

B. When unit prices are requested in the proposal form, the quantities indicated on the proposal form are approximate only, and do not constitute a warranty or guarantee by the Jurisdiction as to the actual quantities involved in the work. Such quantities are to be used for the purpose of comparison of bids and determining the amount of bid security, contract, and performance, payment, and maintenance bond. In the event of discrepancies between unit prices and unit price extensions listed in a bidder’s proposal, unit prices shall govern and unit price extensions shall be corrected, as necessary, for agreement with unit prices; except in the case of an obvious, serious, clerical error where the Engineer is able to determine the bidder’s intent from the proposal; in which case, the Jurisdiction may waive irregularities that are in best interest of the Jurisdiction, as long as the integrity of the bid process can be maintained. The Jurisdiction expressly reserves the right to increase or decrease the quantities during construction as outlined in Section 1040, 1.06 - Increase or Decrease of Work, and to make reasonable changes in design, provided such changes do not materially change the intent of the contract. The amount of work to be paid for shall be based upon the actual quantities performed.

*This highlighted language and Section 94-198 of the Municipal Code of the City of Des Moines are not the current law of the State of Iowa and not applicable to the City’s current bidding process.
1020, 1.09 PREPARATION OF THE PROPOSAL: Delete D. and replace with the following D:

D. When unit prices are requested, they shall be submitted on each and every item of work included for which bids are requested. The format for unit prices will be in dollars and whole cents only. In the case of discrepancy, the unit price shall govern; except in the case of an obvious, serious, clerical error where the Engineer is able to determine the bidder’s intent from the proposal; in which case, the Jurisdiction may waive irregularities that are in best interest of the Jurisdiction, as long as the integrity of the bid process can be maintained.

1020, 1.15 LIMITATION ON WITHDRAWAL OF PROPOSALS AFTER OPENING OF PROPOSALS: Add the following new C:

C. After bids are opened, if the low bidder claims that it has made a serious error in the preparation of its bid, and can support such a claim with evidence satisfactory to the Jurisdiction, said bidder shall be allowed to withdraw its bid and its bid security shall be returned; *provided however, as a condition for return of its bid security, said bidder shall be required to agree that it will not be allowed to again bid on the project, either as a prime bidder or as a subcontractor, if the project, or a substantial portion of the project, is rebid within six months of the first bid opening. Under no circumstances should said bidder be permitted to alter or adjust its bid, as this would undermine the entire system of competitive bidding and be an open invitation to abuse.

SECTION 1040 – SCOPE OF WORK

1040, 1.05 PLANS: Delete the 2nd paragraph and replace with the following:

Electronic support files, will not be provided prior to letting and may be provided to the low bidder and are for information only. Should there be a discrepancy between an electronic support file and a contract document, the contract documents shall govern. No guarantee is made that the data systems used by the Engineer will be directly compatible with the systems the Contractor uses.

1040, 1.07 CHANGE ORDERS, B. Written Orders: Add the following to the end of the section:

Formal approval by the Jurisdiction shall be defined as follows:
The authority of the Des Moines City Manager and the Engineer to approve change orders shall be limited to those change orders which will cost $50,000 or less. Change orders for work to cost more than $50,000 shall be approved by the City Council prior to the payment of the work provided for under the change order.

*This highlighted language is not the current law of the State of Iowa and not applicable to the City’s current bidding process.

1040, 1.09 CHANGED SITE CONDITIONS, A. Latent or Subsurface Conditions: Delete 1. and 2. in their entirety and replace with the following 1. and 2.; and add the following new 3.

1. If the Contractor encounters latent or subsurface conditions differing materially from those indicated in the contract documents which the Contractor could not have discovered by a reasonable site investigation and examination of the type customarily undertaken by prudent and competent contractors, and if these changed conditions are considered by the Contractor as a basis for compensation in addition to the contract price, the Contractor shall within three working days after discovery thereof notify the Engineer of its claim by written notice as sent forth herein. Before disturbing the site at which the latent or subsurface condition is alleged to exist, the Contractor shall give the Engineer the opportunity to inspect the same.
a. For claims greater than $50,000 the Contractor shall notify the Engineer by written notice either (i) personally delivered, (ii) sent by certified mail, return receipt requested, or (iii) delivered by a nationally recognized prepaid overnight courier service (receipt requested), to the address below:

City of Des Moines  
Engineering Department  
400 Robert D. Ray Drive  
Des Moines, IA  50309-1891  
Attention: Steve Naber, P.E., City Engineer

Under no circumstance will an email, text message, verbal communication or any other informal communication, be considered acceptable or satisfactory written notice required by this section. The written notice shall:

1) Expressly state that it is a request for a contract change under Section 1040, 1.09;
2) Expressly identify the latent or subsurface conditions that the Contractor alleges differ materially from those indicated in the contract documents which the Contractor could not have discovered by a reasonable site investigation and examination of the type customarily undertaken by prudent and competent contractors;
3) Expressly state the reason the Contractor believes extra compensation is due;
4) Identify work that Contractor alleges will be impacted.

b. For claims less than $50,000 the Contractor shall notify the Project Engineer by written notice sent as set forth above or sent by email providing the same detail as identified in a.1) through 4) above. Under no circumstances will a text message, verbal communication or any other informal communication be considered acceptable or satisfactory written notice required by this section.

2. After inspection by the Engineer, the Jurisdiction may, in its discretion, authorize the Contractor to proceed with or abandon the work. The Contractor shall resume construction operations pending a decision regarding its claim by the Jurisdiction. Failure of the Contractor to give written notice within three working days of discovering the conditions and to give the Engineer full opportunity to inspect the condition before disturbing the site shall be deemed a waiver by the Contractor of all claims for extra compensation arising out of the alleged condition.

3. Latent or subsurface conditions that do not materially differ from those shown on the plans shall not form the basis for additional compensation. No additional compensation or extension of time shall be provided for conditions that do not materially differ, regardless of the nature of the condition encountered.

1040, 1.10 DISPUTED CLAIMS FOR EXTRA COMPENSATION: Delete 1.10 in its entirety and replace with the following:

A. Basis of Claim for Extra Compensation:

1. In any case where the Contractor believes extra compensation is due for work or material beyond the scope of the Work under the contract and not ordered by the Engineer as Extra Work as defined in Section 1010, 1.03, the Contractor shall provide written notice to the Engineer, as set forth herein, of its intention to make claim for such extra compensation within thirty (30) days of discovering the circumstances regarding the claim and before beginning the work on which the claim is based (hereinafter referred to as a “Claim”).

a. For claims greater than $50,000 the Contractor shall notify the Engineer by written notice either (i) personally delivered, (ii) sent by certified mail, return receipt requested, or (iii)
delivered by a nationally recognized prepaid overnight courier service (receipt requested) to the address below:

City of Des Moines
Engineering Department
400 Robert D. Ray Drive
Des Moines, IA 50309-1891
Attention: Steve Naber, P.E., City Engineer

Under no circumstance will an email, text message, verbal communication or any other informal communication, be considered acceptable or satisfactory written notice required by this section. The written notice shall:

1) Expressly state that it is a request for a contract change under Section 1040, 1.10;
2) Expressly state the reason the Contractor believes extra compensation is due;
3) Identify the underlying work or material that Contractor claims is beyond the scope of the Work under the contract and not ordered by the Engineer as Extra Work as defined in Section 1010, 1.03;
4) Identify any work that will be impacted.

b. For claims less than $50,000 the Contractor shall notify the Project Engineer by written notice sent as set forth above or sent by email providing the same detail as identified in a.1) through 4) above. Under no circumstances will a text message, verbal communication or any other informal communication be considered acceptable or satisfactory written notice required by this section.

The Contractor shall not proceed with that work until the Contractor and the Jurisdiction have executed a change order with respect to the Claim. The Contractor shall have no right to submit a Claim for any matter which is exclusively reserved to authority of the Engineer under the Contract Documents.

2. The Jurisdiction shall not be responsible for damages attributable to the performance, nonperformance, or delay, of any other contractor, governmental agency, utility agency, firm, corporation, or individual authorized to do work on the project, except if such damages result from negligence on the part of the Jurisdiction, its Engineer, or any of its officers or employees.

3. For any Claim, if such written notification is not given, or if after such written notification is given the Engineer is not allowed facilities for keeping strict account of actual costs as defined for force-account construction, the Contractor thereby agrees to waive the Claim for extra compensation for such work. Such written notice by the Contractor, and the fact the Engineer has kept account of the cost as aforesaid, shall not be construed as establishing the validity of the Claim.

4. The Claim, when filed, shall be in writing and in sufficient detail to permit auditing and an evaluation by the Jurisdiction. The Claim shall be supported by such documentary evidence as the Contractor has available and shall be verified by affidavit of the Contractor or other person having knowledge of the facts.

B. Presentation and Consideration of Claim: If the Contractor wishes an opportunity to present its Claim in person, the Claim shall be accompanied by a written request to do so. Where the Contractor asks an opportunity to present its Claim in person, the Jurisdiction, within thirty (30) calendar days of the filing of the Claim, shall fix a time and place for a meeting between the Contractor and the Jurisdiction or its designated representatives or representative. The Jurisdiction shall, within a reasonable time after the filing of the Claim or the meeting above referred to, whichever is later, rule upon the validity of the Claim and notify the Contractor, in writing, of its ruling together with the reasons therefore. In case the Claim is found to be just, in whole or in part, it shall be allowed and paid to the extent so found.
**Request for Claim Review:** In the event a Contractor’s Claim as outlined in the above procedure in Sections 1040, 1.10(A) and (B) has been disallowed, in whole or in part, the Contractor may, within thirty (30) calendar days from the date the ruling of the Jurisdiction is mailed, make a written request to the Jurisdiction that its Claim or Claims be submitted to a board of review. The written request shall be either (i) personally delivered, (ii) sent by certified mail, return receipt requested, or (iii) delivered by a nationally recognized prepaid overnight courier service (receipt requested) addressed as follows:

City of Des Moines  
Engineering Department  
400 Robert D. Ray Drive  
Des Moines, IA 50309-1891  
Attention: City Engineer

The Jurisdiction shall decide if the matter is subject to further review and shall, within thirty (30) calendar days of the receipt of the request for review, grant or deny the request for review. The Jurisdiction’s decision shall be final. In the event the Contractor fails to make a timely written demand for review of its Claim as provided by this Section 1040, 1.10(C), the decision of the Jurisdiction shall be deemed to be final and the Contractor shall have no right to pursue arbitration of its Claim.

**C. Board of Review:**

1. The Board shall have jurisdiction to pass upon questions involving compensation to the Contractor for work actually performed or materials furnished and upon claims for extra compensation that have not been allowed by the Jurisdiction. The Board’s jurisdiction shall not extend to matters exclusively reserved to the Engineer, to a determination of quality of workmanship or materials furnished, or to an interpretation of the intent of the Plans and Specifications except as to matters of compensation. Jurisdiction of the Board shall not extend to setting aside or modifying the terms or requirements of the contract.

2. Following the timely written demand for review of the Claim and the decision of the Jurisdiction to grant the request, a board of review shall be appointed to review the Claim. The board of review shall consist of three (3) members as follows: the Engineer, or designated representative; and two persons to be appointed by the Engineer (hereinafter the “Board”).

3. The Board shall set a date for the Contactor to present its Claim for review within sixty (60) days of the date the Jurisdiction issued its decision granting the Contractor’s request for review. The presentation before the Board shall not be in accordance with the Iowa rules of civil procedure and the Contractor shall not have the right to conduct discovery or compel the testimony of witnesses as part of the presentation. The Contractor shall submit three (3) copies of a written Claim summary and all documents it considers to be relevant to its Claim at least fourteen (14) days prior to the date set for the presentation before the Board. The presentation before the Board is intended to be an informal process to allow the Contractor to further explain its Claim and why it believes it is entitled to additional compensation. The Board reserves the right to impose such rules as it deems reasonably necessary to allow for a fair and efficient presentation.

4. Following the presentation before the Board, the Board shall render a written decision regarding the Claim within ten (10) days of the presentation. In the event the Board renders a decision in favor of the Contractor for some or all of the Claim, the Contractor and the Jurisdiction shall promptly proceed in good faith to prepare a change order consistent with the decision of the Board. If the Board denies the Claim, in part or in full, the Contractor’s sole and exclusive remedy is to demand final resolution of the Claim that has been denied subject to the procedure provided below.
E. Final Resolution by Binding Arbitration or Litigation: For any Claim denied by the Board, the Jurisdiction shall have the sole and exclusive right to determine whether final resolution of the Claim shall be through Binding Arbitration or litigation. The Contractor shall not have the right to pursue final resolution of any Claim that the Contractor did not submit to the Board. The Contractor must make a written demand for final resolution of the Claim upon the Jurisdiction within thirty (30) days of the date when the Board rendered its decision or it will be deemed to have waived this right and the decision of the Board will be final. The written demand shall be either (i) personally delivered, (ii) sent by certified mail, return receipt requested, or (iii) delivered by a nationally recognized prepaid overnight courier service (receipt requested) addressed as follows:

City of Des Moines
Engineering Department
400 Robert D. Ray Drive
Des Moines, IA 50309-1891
Attention: Steve Naber, P.E., City Engineer

The Jurisdiction shall notify the Contractor within thirty (30) days of the date of receiving the Contractor’s written demand for final resolution of the Claim, whether the Jurisdiction will elect to use binding arbitration or litigation to reach a final resolution of the Claim. The decision to pursue binding arbitration or litigation, shall be the sole and exclusive decision of the Jurisdiction. The decision of the Jurisdiction on whether to pursue binding arbitration or litigation is final.

1. Arbitration.

(a) If the Jurisdiction elects to use binding arbitration for final resolution of the Claim, the sole and exclusive remedy for final resolution of the Claim shall be binding arbitration (the “Arbitration”). The Arbitration shall be submitted to a single arbitrator as is mutually agreed upon by the Contractor and Jurisdiction. If the Contractor and Jurisdiction cannot agree upon a single arbitrator within twenty-one (21) days of the date of the Jurisdiction’s notification to the Contractor of the Jurisdiction’s decision to pursue binding arbitration, the Arbitration shall be submitted to a three (3) member panel appointed as follows: the Contractor shall appoint one arbitrator; the Jurisdiction shall appoint one arbitrator; and the third arbitrator shall be chosen by the first two appointed arbitrators (for the sake of convenience, the arbitrator, or arbitrators as the case may be, shall be referred to hereinafter as the “Arbitrator”). The parties agree to work toward appointment of a three (3) member Arbitration panel within twenty-one (21) days after not being able to agree on a single arbitrator. The Arbitration shall be conducted in general accord with the Construction Industry Arbitration Rules of the American Arbitration Association then in effect. The parties reserve the right to alter and amend the rules for the Arbitration as they may mutually agree in writing.

(b) The Arbitrator shall have jurisdiction to pass upon questions involving compensation to the Contractor for work actually performed or materials furnished and upon claims for extra compensation that have not been allowed by the Jurisdiction. The Arbitrator’s jurisdiction shall not extend to matters exclusively reserved to the Engineer, to a determination of quality of workmanship or materials furnished, or to an interpretation of the intent of the Plans and Specifications, except as to matters of compensation. Jurisdiction of the Arbitrator shall not extend to setting aside or modifying the terms or requirements of the contract.

(c) Subject to agreement of the parties and the Arbitrator, the parties shall work in good faith to schedule the Arbitration and allow for the decision of the Arbitrator within two hundred forty (240) days after appointment of the Arbitrator.
(d) The Arbitrator shall render a written decision within twenty (20) days after the Claim has been fully submitted. For Arbitrations before more than one arbitrator, the decision of a majority of the panel shall govern. The Arbitrator’s decision shall provide a basis for the findings and legal conclusions and shall determine how the cost of the proceedings shall be borne by the parties.

(e) The decision of the Arbitrator shall be binding and final. There shall be no further appeal or judicial review, except under the limited circumstances as allowed by Iowa law.

2. Litigation. If the Jurisdiction elects not to use arbitration as the means to reach final resolution of the claim, then the sole and exclusive remedy for final resolution of the Claim shall be litigation which must be brought in Iowa District Court in and for the County where the Jurisdiction is located or in the United Stated District Court in and for the District where the Jurisdiction is located.

SECTION 1050 – CONTROL OF WORK

1050, 1.10 PROTECTION OF LINE AND GRADE STAKES: Add the following new D.

D. The Jurisdiction shall provide all construction survey staking on projects funded by the Jurisdiction unless otherwise indicated on the plans or in the Contract Documents. On Private Construction Contracts, the Owner, in accordance with the Private Construction Contract, shall hire a Licensed Surveyor for all survey work.

SECTION 1060 – CONTROL OF MATERIALS

1060, 1.03 SAMPLES AND TESTING: Add the following new D.

D. All on-site inspection and testing, as well as testing of materials, will be provided by the Jurisdiction unless otherwise indicated on the plans or by special provisions.

SECTION 1070 – LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

1070, 1.03 PERMITS AND LICENSES: Delete and replace with the following:

The Contractor shall procure and pay for all necessary permits and licenses for the construction of the work and for temporary excavations, obstructions, enclosures, and street openings arising from the construction and completion of the work described in the Contract Documents. The Contractor shall be responsible for all violations of the law for any cause in connection with the construction of the work or caused by the obstruction of roads, streets, highways or sidewalks, and shall give all requisite notices to the Jurisdiction or other public authorities in connection therewith.

1070, 2.02 CONVENIENCE AND SAFETY: E. Project Area or Work Site Safety: Add the following new 6.

6. The City of Des Moines, Engineering Department, Master Construction Safety Packet is available at [http://www.dmgov.org/Departments/Engineering/PDF/MasterConstructionSafetyPacket.pdf](http://www.dmgov.org/Departments/Engineering/PDF/MasterConstructionSafetyPacket.pdf) and is also available upon request from the Engineering Department. The Engineering Department will make available a copy of the City of Des Moines Master Construction Safety Plan to the Contractor when the contract is awarded. Said Safety Plan is for the Contractor’s information only and it is the Contractor’s sole responsibility to provide, or make available, this safety information to all its Subcontractors.
1070, 1.12, CONSENT TO JURISDICTION OF IOWA DISTRICT COURT OR FEDERAL DISTRICT COURT: Delete 1.12 in its entirety and replace with the following new 1.12:

1070, 1.12 DISPUTE RESOLUTION AND CONSENT TO JURISDICTION OF IOWA DISTRICT COURT OR FEDERAL DISTRICT COURT IN IOWA

A. The Contractor agrees any claims, disputes, causes of action that accrue to it, or which by subrogation or assignment accrue to its sureties or insurers, arising out of or connected with this contract, and that the Jurisdiction has determined in writing is not subject to Section 1040, 1.10, shall be resolved by arbitration or litigation as elected by the Jurisdiction. As to any such causes of action, Contractor shall provide written notice to Jurisdiction requesting that Jurisdiction make its election as to whether the dispute shall be settled by arbitration or litigation. The written notice shall be either (i) personally delivered, (ii) sent by certified mail, return receipt requested, or (iii) delivered by a nationally recognized prepaid overnight courier service (receipt requested) addressed as follows:

City of Des Moines
Engineering Department
400 Robert D. Ray Drive
Des Moines, IA 50309-1891
Attention: Steve Naber, P.E., City Engineer

Jurisdiction shall notify Contractor in writing as to its election within thirty (30) days of receipt of Contractor’s written notice requesting a determination by Jurisdiction.

1. Arbitration

(a) If the Jurisdiction elects to use binding arbitration for final resolution, the sole and exclusive remedy for final resolution of the dispute shall be binding arbitration (the “Arbitration”). The Arbitration shall be submitted to a single arbitrator as is mutually agreed upon by the Contractor and Jurisdiction. If the Contractor and Jurisdiction cannot agree upon a single arbitrator within twenty-one (21) days of the date of the Jurisdiction’s notification to the Contractor of the Jurisdiction’s decision to pursue binding arbitration, the Arbitration shall be submitted to a three (3) member panel appointed as follows: the Contractor shall appoint one arbitrator; the Jurisdiction shall appoint one arbitrator; and the third arbitrator shall be chosen by the first two appointed arbitrators (for the sake of convenience, the arbitrator, or arbitrators as the case may be, shall be referred to hereinafter as the “Arbitrator”). The parties agree to work toward appointment of a three (3) member Arbitration panel within twenty-one (21) days after not being able to agree on a single arbitrator. The Arbitration shall be conducted in general accord with the Construction Industry Arbitration Rules of the American Arbitration Association then in effect. The parties reserve the right to alter and amend the rules for the Arbitration as they may mutually agree in writing.

(b) Jurisdiction of the Arbitrator shall not extend to setting aside or modifying the terms or requirements of the contract.

(c) Subject to agreement of the parties and the Arbitrator, the parties shall work in good faith to schedule the Arbitration and allow for the decision of the Arbitrator within two hundred forty (240) days after appointment of the Arbitrator.

(d) The Arbitrator shall render a written decision within twenty (20) days after the matter has been fully submitted. For Arbitrations before more than one
arbitrator, the decision of a majority of the panel shall govern. The Arbitrator’s decision shall provide a basis for the findings and legal conclusions and shall determine how the cost of the proceedings shall be borne by the parties.

(e) The decision of the Arbitrator shall be binding and final. There shall be no further appeal or judicial review, except under the limited circumstances as allowed by Iowa law.

2. Litigation. If the Jurisdiction elects not to use arbitration as the means to reach final resolution of the claim or fails to notify Contractor in writing within thirty (30) days of its election, then the sole and exclusive remedy for final resolution of the Claim shall be litigation which must be brought in Iowa District Court in and for the County where the Jurisdiction is located or in the United States District Court in and for the District where the Jurisdiction is located.

B. Contractor further consents that it will require its subrogees and assigns to enter into an agreement to comply with the terms of Section, 1.12, and consent to the jurisdiction of either the Iowa District Court in and for the County where the Jurisdiction is located or the United States District Court in and for the District where the Jurisdiction is located, as to any causes of action brought against it arising out of this contract or any work performed under it by Contractor or its subcontractors, and further agrees, on behalf of itself, its subrogees and assigns, to waive any and all objections to the jurisdiction of said court as to any such cause of action. Contractor shall make such consent a condition of the retention of subrogees and assigns.

1070, 2.10 DUST CONTROL:  Add the following paragraph:

The Contractor shall be responsible to remove any project-related construction materials deposited on a public street as well as related dust control measures. The Contractor shall employ all means necessary to prevent tracking soil, or loss of material, onto public streets; including but not limited to, rocking private access roads and removing excess material from equipment before leaving the construction site. The Contractor shall promptly remove any material deposited on a public street utilizing mechanical scraping and street sweeping, or other means as required by the Jurisdictional Engineer.

1070, 2.16 READY MIX CONCRETE WASTE:  New Section - Add the following 2.16:

2.16 READY MIX CONCRETE WASTE

Concrete trucks will be allowed to washout or discharge excess concrete only in specifically designated areas which have been prepared to minimize contact between the concrete and storm water discharge from the site. The hardened product from the concrete washout areas will be disposed of by the Contractor as other non-hazardous waste materials or may be broken up and used on the site for other appropriate uses.

1070, 3.02 INSURANCE REQUIREMENTS, A:  Delete A and replace them with the following A.

A. The contractor shall not purchase liability insurance in the name of the jurisdiction unless such purchase is allowed by special provision.
1070, 3.02 INSURANCE REQUIREMENTS, 2. Commercial General Liability Insurance: Revise the following limits on the Commercial General Liability Insurance:

- The Each Occurrence Limit shall be changed from $1,000,000 to $2,000,000.
- The Personal and Advertising Injury Limit, under Commercial General Liability, changed from $1,000,000 to $2,000,000.
- All other limits shall remain unchanged.

1070, 3.02 INSURANCE REQUIREMENTS, 3. Automobile Liability Insurance: Revise the following limits on the Automobile Liability Insurance:

- Minimum combined single limit per accident shall be changed from $1,000,000 to $2,000,000.

1070, 3.02 INSURANCE REQUIREMENTS, C: Add the following sentence at the end of 1, 2, 3, and 5: “Waiver of Subrogation in favor of Jurisdiction is required.”

1070, 3.02 INSURANCE REQUIREMENTS, C, 6. Additional Insured Endorsements: Replace “Except for Workers Compensation, the insurance specified shall:”, with “Except for Workers Compensation and Railroad Protective Liability Insurance, the insurance specified shall:”.

1070, 3.02 INSURANCE REQUIREMENTS, C: Add the following new 8.

8. WAIVER OF SUBROGATION: To the fullest extent permitted by law, Contractor hereby releases the Jurisdiction, including their respective elected and appointed officials, agents, employees and volunteers and others working on their behalf from and against any and all liability or responsibility to the Contractor or anyone claiming through or under the Contractor by way of subrogation or otherwise, for any loss arising out of liability or occupational injury without regard to the fault of the Jurisdiction or the type of loss involved. This provision shall be applicable and in full force and effect only with respect to loss or damage occurring during the time of this Agreement. The Contractor’s policies of insurance shall contain a clause or endorsement to the effect that such releases shall not adversely affect or impair such policies or prejudice the right of the Contractor to recover thereunder.

1070, 3.03 CONTRACTOR’S INDEMNITY – CONTRACTUAL LIABILITY INSURANCE: Delete B; and replace with the following B.

B. Except to the extent caused by or resulting from the negligent act or omission of the Jurisdiction or the Jurisdiction’s employees, consultants, agents or other for whom the Jurisdiction is responsible, to the fullest extent permitted by law, the Contractor shall defend, indemnify, and hold harmless the Jurisdiction and its officers, agents, employees, and consultants from and against all claims, damages, losses, and expenses, including but not limited to, attorney's fees, arising out of or resulting from the performance or prosecution of the work by the Contractor, its subcontractors, agents, or employees; or arising from any neglect, default, or mismanagement or omissions by the Contractor, its subcontractors or consultants, suppliers, third parties, or the agents, officers, or employees of any of them in the performance of any duties imposed by the contract or by law; provided any such claim, damage, loss, or expense:

1. is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the work itself) including economic damages and the loss of use resulting therefrom, and

2. is caused in whole or in part by any act or omission of the Contractor, its subcontractors or consultants, suppliers, third parties, or the agents, officers, or employees of any of them, or anyone for whose acts any of them may be liable.
Such obligation shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity that would otherwise exist as to any party or person described in this subsection.

1070, 3.04 CONTRACTORS INSURANCE FOR OTHER LOSSES; WAIVER OF SUBROGATION, B:
Delete B and replace with the following B.

B. Contractor shall cause each of its subcontractors, consultants, suppliers, third parties, or the agents of any of them, to carry insurance sufficient to cover all loss to such materials, tools, motor vehicles, and equipment. All insurance carried by the Contractor, or its subcontractors, consultants, suppliers, third parties or the agents of any of them, covering risk of loss or damage to materials, tools, motor vehicles, and equipment used in the performance of the Work, shall provide a waiver of subrogation against the Jurisdiction, as specified in Section 1070, 3.02 Insurance Requirements, C.8. To the extent that any subcontractors, consultants, suppliers, third parties or the agents of any of them, do not provide such coverage, any uninsured loss shall be the sole responsibility of the Contractor.

1070, 3.05 PROPERTY INSURANCE: Delete A, D, and M; and replace them with the following A, D, and M.

A. Property Insurance Required: The Contractor shall purchase and maintain property insurance, being either Builder’s Risk Insurance or an Installation Floater, for the period of the contract until final acceptance of the work by the Jurisdiction, on all construction contracts where a building, electrical, mechanical, or plumbing permit is required by the permitting entity.

1. Builder’s Risk Insurance by Contractor: On contracts for construction of new buildings or on contracts when Builder’s Risk Insurance is applicable to the contract by definition, the Contractor shall purchase and maintain Builder’s Risk Insurance for the duration of the contract; unless the Jurisdiction states by special provision that the Jurisdiction shall purchase and maintain the Builder’s Risk Insurance. This property insurance, Builder's Risk Insurance, provided by the Contractor shall be in the amount of the initial bid amount, or in an amount equal to the estimated value of actual building construction, whichever is less, as well as applicable modifications thereto for the entire work at the site on a replacement cost basis. Such property insurance shall be maintained, unless otherwise provided in the contract documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final acceptance of the work by the Jurisdiction. The insurance shall include interests of the Jurisdiction, the Contractor, subcontractors, and sub-subcontractors in the work. If the Contractor’s property insurance covering the work has any deductible, the Contractor shall be responsible to pay the cost associated with the deductible. Flood and Earthquake Insurance shall be required as part of the Builder’s Risk Policy, and the minimum required policy limits shall be not less than 10% of the full amount of the contract. If Boiler and Machinery Insurance is required by the contract documents or by law, the Contractor shall purchase the Boiler and Machinery Insurance if the Contractor is required to purchase the Builder’s Risk Insurance. If Boiler and Machinery Insurance coverage is included in the Contractor’s Builder Risk Insurance policy, it may be used to satisfy the Boiler and Machinery Insurance requirement to the extent such coverage specifically covers such objects during installation, testing, and until final acceptance by the Jurisdiction.

2. Builder’s Risk Insurance by the Jurisdiction: When stated in the special provisions, the Jurisdiction shall purchase and maintain property insurance, a.k.a. Builder's Risk Insurance in the amount of the initial bid amount, or in an amount equal to the estimated value of actual building construction, whichever is less, as well as applicable modifications thereto for the entire work at the site on a replacement cost basis. Such property insurance shall be maintained, unless otherwise provided in the contract documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final acceptance of the work by the Jurisdiction. The insurance shall include interests of the Jurisdiction, the Contractor, subcontractors, and sub-subcontractors in the work. This property insurance covering the work will have a deductible of $5,000 for each occurrence, or as stated in the special provisions, which will be the responsibility of the Contractor. Flood
and Earthquake Insurance shall be required as part of the Builder’s Risk Policy, and the minimum required policy limits shall be not less than 10% of the full amount of the contract. If Boiler and Machinery Insurance is required by the contract documents or by law, the Jurisdiction shall purchase the Boiler and Machinery Insurance if the Jurisdiction is required to purchase the Builder’s Risk Insurance. If Boiler and Machinery Insurance coverage is included in the Jurisdiction’s Builders Risk Insurance policy, it may be used to satisfy the Boiler and Machinery Insurance requirement to the extent such coverage specifically covers such objects during installation, testing, and until final acceptance by the Jurisdiction.

3. Installation Floater: On the remainder of these contracts where Builder’s Risk Insurance is not applicable to a contract by definition and an Installation Floater is applicable by definition, the Contractor shall purchase and maintain an Installation Floater for the duration of the contract. This Installation Floater shall cover all materials, fixtures, equipment, and supplies provided for the job. Such insurance shall be on an “all risk” form in an amount equal to the maximum value of such materials, equipment, or supplies covered on the job site, off-premises at any temporary storage location, or in transit, and shall include coverage for hoisting and rigging. The Installation Floater shall be maintained until final acceptance of the work by the Jurisdiction. If the Contractor’s Installation Floater covering the equipment and work has any deductible, the Contractor shall be responsible to pay the cost associated with the deductible. If Boiler and Machinery Insurance is required by the contract or by law, the Contractor shall purchase the Boiler and Machinery Insurance; the Installation Floater may be used to satisfy this requirement to the extent the Boiler and Machinery Insurance coverage specifically covers such objects during installation, testing, and until final acceptance by the Jurisdiction.

D. Boiler and Machinery Insurance: When required by the contract documents or by law, Boiler and Machinery Insurance shall specifically cover such insured objects during installation, testing, and until final acceptance by the Jurisdiction; this insurance shall include interest of the Jurisdiction, Contractor, subcontractors, and sub-subcontractors in the work, and the Jurisdiction and Contractor shall be named insureds. A Builders Risk Insurance policy or an Installation Floater, when also required by the contract documents or by law, may satisfy this requirement as indicated in 1070, 3.05 A.1, 2. and 3. above. If Boiler and Machinery Insurance is required by the contract documents or by law, the Contractor shall purchase the Boiler and Machinery Insurance. However, if the contract, requires the Jurisdiction to purchase the Builder’s Risk Insurance, the Jurisdiction shall also purchase the Boiler and Machinery Insurance.

M. Installation Floater: See Section 1070, 3.05, A.3 above.

1070, 3.06 ENDORSEMENT NAMING JURISDICTION AS AN ADDITIONAL INSURED / CANCELLATION AND MATERIAL CHANGE/ GOVERNMENTAL IMMUNITIES ENDORSEMENT: Under C. delete the first full paragraph regarding the Cancellation and Material Change Endorsement language and replace it with the following:

Thirty (30) days Advance Written Notice of Cancellation, ten (10) days Written Notification of Cancellation due to non-payment of premium and forty-five (45) days Advance Written Notification of Non-Renewal shall be sent to the Jurisdiction at the office and attention of the Certificate Holder. This endorsement supersedes the standard cancellation statement on the Certificate of Insurance to which this endorsement is attached.
1070, 3.07 PROOF OF INSURANCE: Add the following sentence at the end of A: “Mail Certificate of Insurance to: Engineering Department, City of Des Moines, City Hall, 400 Robert D. Ray Drive, Des Moines, Iowa 50309.”

SECTION 1080 – PROSECUTION AND PROGRESS

1080, 1.03 WORK PROGRESS AND SCHEDULE: Add the following new D:

D. No person shall operate or permit the operation of any tools or equipment in construction, drilling or demolition work or in preventive maintenance work for public service utilities between the hours of 10:00 p.m. and 7:00 a.m. without the written permission of the Engineer.

1080, 1.09 EXTENSION OF TIME, B. – Request for Extension of Time: Add the following sentence before the last sentence in the first paragraph: “The request for an extension of time is the sole and exclusive remedy of the Contractor for the events listed below.

SECTION 1090 – MEASUREMENT AND PAYMENT

1090, 1.04 PAYMENT FOR CHANGE ORDERS, B: Add the following new 4:

4. Extra Work Performed by the Subcontractor: The percentage markup to be allowed to the Contractor for extra performed by a Subcontractor shall be a maximum of 10%.

1090, 1.05 PROGRESS PAYMENTS, B. Retainage: Delete B. in its entirety and replace with the following B.

B. Retainage: The Jurisdiction shall retain from each monthly progress payment 3% of the amount determined to be due according to the estimate of the Engineer. Early release of retained funds may be requested by the Contractor according to Iowa Code Section 573.28.

SECTION 2010 – EARTHWORK, SUBGRADE, AND SUBBASE

2010, 3.06 SUBGRADE PREPARATION, A. Uniform Composition: 1. Subgrade Compaction in Fill Sections: Add the following new c.

c. Proof roll subgrade as specified in Section 3.06, B to locate soft or yielding areas prior to placement of top six-inch lift.

2010, 3.06 SUBGRADE PREPARATION, A. Uniform Composition: 2. Subgrade Compaction in Cut Sections: Add the following new d.

d. Prior to scarify, mix, and re-compact the bottom six inches of subgrade (paragraph 2.b above), proof roll subgrade as specified in Section 3.06, B to locate soft or yielding areas.

2010, 3.06 SUBGRADE PREPARATION, B. Subgrade Stability: Delete 1. in its entirety and replace with the following 1.

1. Perform proof rolling with a fully loaded single axle or tandem axle truck. Operate trucks at less than 10 mph. Make multiple passes for every lane. The subgrade will be considered to be unstable if, under the operation of the loaded truck, the surface shows yielding (soil wave in front of the loaded tires) or rutting of more than 2 inches, measured from the top to the bottom of the rut at the outside edges.
SECTION 3010 – TRENCH EXCAVATION AND BACKFILL

3010, 3.02 ROCK OR UNSTABLE SOILS IN TRENCH BOTTOM: Delete B. and replace with the following new B.
   B. The Engineer will review the contractor’s request for the need for over-excavation and trench foundation stabilization and authorize the work prior to installation of pipes and structures.

3010, 3.05 PIPE BEDDING AND BACKFILL, E. Final Trench Backfill: 3. Class I and Class II Backfill Material: Delete a. and replace with the following new a.
   a. Compact to at least 65% relative density within right-of-way or under any paved surface or within two feet thereof.

3010, 3.05 PIPE BEDDING AND BACKFILL, E. Final Trench Backfill: 4. Class III and Class IVA Backfill Material: Delete a. and replace with the following new a.
   a. Compact to at least 95% of Standard Proctor Density within right-of-way or under any paved surface or within two feet thereof.

SECTION 4010 – SANITARY SEWERS

4010, 3.06 SANITARY SEWER SERVICE STUBS, C: Add the following new 7:
   7. Mark the location of all sanitary sewer service stubs at the time of installation by a two-inch wide detectable marking tape installed at a depth of 18 inches to 24 inches below finished grade, directly over the service stub, for its entire length and brought up to the surface at the end of the service stub adjacent to the post marking the stub location. The tape shall be green in color and marked “Sanitary Sewer Service Stub Buried Below”.

4010, 3.10 SANITARY SEWER CLEANOUT: Delete in its entirety and replace with the following:
   Cleanouts are not allowed on sanitary sewer mains in the City of Des Moines. Figure 4010.203 shall apply to services only.

SECTION 4020 – STORM SEWERS

4020, 2.01 STORM SEWERS, Parts A-L: Reinforced Concrete Pipe shall be required for storm sewer construction in the Right-Of-Way or Public Easement areas. Minimum size of storm sewer pipe in the Right-Of-Way and Public Easement areas shall be 15-inch minimum diameter.

SECTION 4030 – PIPE CULVERTS

4030, 2.01 Pipe Culverts, Parts A-D: Reinforced Concrete Pipe shall be required for pipe culvert construction in the Right-Of-Way or Public Easement areas. Minimum size of pipe culverts in the Right-Of-Way and Public Easement areas shall be 15-inch minimum diameter.

SECTION 4040 – SUBDRAINS AND FOOTING DRAIN COLLECTORS

4040, 2.01 FOOTING DRAIN COLLECTORS: Use material for pipe and fittings complying with the current Adopted Edition of the Uniform Plumbing Code (UPC). In addition to the materials identified in the UPC, the pipe shall comply with ASTM D 3034, SDR 23.5 pipe will be allowed.
4040, 2.02  **TYPE 1 SUBDRAINS (LONGITUDINAL SUBDRAIN), C. Corrugated Polyethylene Tubing and Fittings (Corrugated PE):** Delete Type C and Type CP. Only Type S or Type SP are allowed in the City of Des Moines.

4040, 2.03  **TYPE 2 SUBDRAINS (COMBINATION SUBDRAIN/FOOTING DRAIN COLLECTOR), B.3. HDPE Pipe:** Delete Type CP. Only Type SP is allowed in the City of Des Moines.

4040, 2.09  **FOOTING DRAIN SERVICE STUBS** - Add this new 2.09 and the following note: Use material for pipe and fittings complying with the current Adopted Edition of the Uniform Plumbing Code (UPC). In addition to the materials identified in the UPC, the use of SDR 23.5 pipe will be allowed.

4040, 3.02  **FOOTING DRAIN COLLECTORS, C:** Add the following new 3:

3. Type B cleanouts should be used for footing drain collectors less than 5 feet in depth in the City of Des Moines. Footing drain collectors greater than 5 feet deep, a Type A cleanout shall be used.

4040, 3.03  **FOOTING DRAIN SERVICE STUBS:** Add the following new D and E.

D. Mark the location of all footing drain service stubs at the time of installation by a two-inch wide detectable marking tape installed at a depth of 18 inches to 24 inches below finished grade, directly over the service stub, for its entire length and brought up to the surface at the end of the service stub adjacent to the post marking the stub location. The tape shall be green in color and marked “Footing Drain Service Stub Buried Below”.

E. ABS, PVC and SDR 23.5 pipe shall be installed with a minimum bedding of 4” below and up all side with 3/8” clean smooth gravel or a bedding product approved by the Engineer.

4040, **FIGURE 4040.232, SUBDRAIN CLEANOUTS:** Add the following new Note 7 to Figure 4040.232.

7. Type B cleanouts should be used for footing drain collectors or combination subdrain/footing drain collectors less than 5 feet in depth in the City of Des Moines. Footing drain collectors greater than 5 feet deep, a Type A cleanout shall be used.

**SECTION 4060 – CLEANING, INSPECTION, AND TESTING OF SEWERS**

4060, 3.03  **VIDEO INSPECTION, A. General:** Delete 1. and replace with the following new 1.

1. Conduct video inspection of all new and rehabilitated sanitary sewers, storm sewers, pipe culverts, and footing drain collectors after all backfill and compaction operations are completed, but prior to paving, unless otherwise specified in the contract documents.

**SECTION 6010 – STRUCTURES FOR SANITARY AND STORM SEWERS**

6010, **PARTS 1, 2, 3, and Figures:** Delete all references in this entire section to “precast rectangular intakes”. Only circular precast intakes and manholes are allowed in the City of Des Moines. All square or rectangular shaped intakes and manholes shall be cast-in-place.

6010, 2.03, **B. REINFORCEMENT:** Add the following second sentence: All reinforcement for cast-in-place structures shall be epoxy coated.

6010, 2.09  **MANHOLE OR INTAKE ADJUSTMENT RINGS (Grade Rings):** Add the following new C.

C. Manhole adjustment rings are not required to have pre-formed or pre-drilled holes for the anchor bolts.
6010, 2.10 CASTINGS (Ring, Cover, Grate, and Extensions), D. Casting Types: Delete b. and replace it with the following b.

b. Castings shall include design shown in this General Supplemental for lids on Type E, F, and G storm sewer castings shown for Figure 6101.602.

6010, 2.13 STEPS: Delete entire Section as manhole steps are not allowed in the City of Des Moines.

6010, 2.15 ANCHOR BOLTS AND WASHERS, B. Diameter: Delete B. and replace it with the following B.

B. Provide bolts and washers 1/8 inch smaller than hole or slot in the casting frame but not less than 7/8 inch diameter.

6010, 3.01 GENERAL REQUIREMENTS FOR INSTALLATION OF MANHOLES AND INTAKES, J. Castings: Delete J. and replace with the following J.:

Install the type of casting specified in the contract documents and adjust to proper grade. Where a manhole or intake is to be in a paved area, adjust the casting to match the slope of the finished surface. When castings with a bolt down cover (Type C or D) are specified, attach casting frame to the structure with four anchor bolts.

SECTION 7010 – PORTLAND CEMENT CONCRETE PAVEMENT

7010, 3.02 PAVEMENT CONSTRUCTION, E. Bar and Reinforcement Placement, 1. Tie Bars: Delete a. and replace it with the following a.

a. Place bars prior to vibration. Bars shall be supported by approved chairs. Placement in position by a machine is not allowed.

7010, 3.02 PAVEMENT CONSTRUCTION, E. Bar and Reinforcement Placement: Add the following new 5:

5. PCC pavement slabs with manhole castings, with or without boxouts, shall have reinforcement similar to PV-103 around the castings.

7010, 3.02 PAVEMENT CONSTRUCTION, F. Concrete Pavement Placement: Delete 1. and replace it with the following 1.

1. Use paving machine for all full-width paving, pavement widening, and pavement reconstruction 100 feet or more in length.

7010, 3.07 CURB AND GUTTER CONSTRUCTION: Delete B. and replace it with the following B.

B. Use curb and gutter machine for all curb and gutter construction 100 feet or more in length.

7010, 3.07 QUALITY CONTROL, D. Pavement Thickness: Add the following as the first sentences under 1:

Coring of pavement will not be required by the City of Des Moines if depth checks of the plastic thickness of the pavement are within one-half inch of the design thickness. If the variance exceeds one-half inch this section shall apply.

7010, FIGURE 7010.101, JOINTS: On Sheet 2 of 8 under ‘C’ Joint in Curb add the following: The entire curb shall be sealed with Joint Sealant Material.

7010, FIGURE 7010.101, JOINTS: On Sheet 3 of 8 delete Note 11 and replace with the following Note 11.

11. Sawing and sealing of the joint is required. See Detail D-2.

On Sheet 3 of 8 Joint Types KT-1, KT-2, and KT-3 shall not be used.
7010, FIGURE 7010.901, PCC PAVEMENT JOINTING: Add Note 6 with the following:

6. All new roadway pavements shall be a minimum width of 27 feet back to back with parking on one side and 33 feet with parking on two sides.

SECTION 7020 – HOT MIX ASPHALT PAVEMENT

7020, 3.01 HMA PAVEMENT, Add the following new H.:

H. The paver shall be capable of paving a minimum continuous width of twenty (20) foot wide strip without seam. Pavers in tandem will be acceptable; however, an adequate number of personnel shall be available to operate both pavers simultaneously.

7020, FIGURE 7020.901, HMA PAVEMENT: Add Note 3 with the following:

3. All new roadway pavements shall be a minimum width of 27 feet back to back with parking on one side and 33 feet with parking on two sides.

SECTION 7030 – SIDEWALKS, SHARED USE PATHS, AND DRIVEWAYS

7030, 2.07 DETECTABLE WARNINGS: Add the following sentence at the end: Only cast iron detectable warnings are allowed in the City of Des Moines.

7030, 3.04 PCC SIDEWALKS, SHARED USE PATHS, AND DRIVEWAYS, A. Form Setting: Add the following new 6:

6. The turning space for a sidewalk or shared use path shall be formed separately from the adjoining ramps and sidewalk or shared use path.

7030, 3.04 PCC SIDEWALKS, SHARED USE PATHS, AND DRIVEWAYS, B. Concrete Pavement Placement, 1. Shared Use Path: Add the following sentence at the end: “When the Portland Cement Concrete is delivered to the project on the prepared subgrade or subbase, the loads shall be limited to 5 tons for single axle vehicles or 10 tons for tandem axle or larger vehicles.”

7030, 3.04 PCC, SIDEWALKS, SHARED USE PATHS, AND DRIVEWAYS, B. Concrete Pavement Placement, 2. Sidewalk: Add the following new g:

g. The turning space for a sidewalk or shared use path shall be placed separately from the adjoining ramps and sidewalk or shared use path.

7030, 3.04 PCC SIDEWALKS, SHARED USE PATHS, AND DRIVEWAYS, F. Jointing: 4. Isolation Joints: Delete b. and replace it with the following new b.

b. For a sidewalk constructed with a driveway, install a ½” expansion joint on the property side of the sidewalk and a ½” expansion joint on the street side of the sidewalk.

7030, 3.05 HMA SHARED USE PATHS AND DRIVEWAYS: Add the following second sentence: When Hot Mix Asphalt is delivered to the project on the prepared subgrade or subbase, the loads shall be limited to 5 tons for single axle vehicles or 10 tons for tandem axle or larger vehicles.

7030, FIGURE 7030.101, CONCRETE DRIVEWAY, TYPE A: Delete the references to “E Joint” on the property side of the sidewalk and “C or E Joint” on the street side of the sidewalk, and replace with “install a ½” expansion joint on the property side of the sidewalk and a ½” expansion joint on the street side of the sidewalk”. In addition, install a ½” expansion joint in the sidewalk at the extension of both edges of the driveway. Delete 7 and replace with the following 7; “Install a ½” expansion joint at the back of curb.”
7030, FIGURE 7030.102, CONCRETE DRIVEWAY, TYPE B: Delete the references to “E Joint” on the property side of the sidewalk and “C or E Joint” on the street side of the sidewalk, and replace with “install a ½” expansion joint on the property side of the sidewalk and a ½” expansion joint on the street side of the sidewalk”. In addition, install a ½” expansion joint in the sidewalk at the extension of both edges of the driveway.

7030, FIGURE 7030.201, CLASSES OF SIDEWALKS: The detail for CLASS A SIDEWALK shall be revised to delete the “4” min.” thickness dimension of the sidewalk and replace with “5” min.”.

7030, FIGURE 7030.202, CURB DETAILS FOR CLASS A SIDEWALK: On Detail 3 delete the note “Sealed ‘E’ joint” and replace it with the following note “Sealed ‘B’ joint”. On Detail 1, 2, and 3 delete the “4 min.” thickness dimension of the sidewalk and replace with “5” min.”.

SECTION 9020 – SODDING

9020, 3.03 – SOD INSTALLATION: Delete A. and replace it with the following new A.
A. Do not install sod between the dates of June 1 and August 31, unless authorized by the Engineer.

SECTION 9040 – EROSION AND SEDIMENT CONTROL

9040, 1.03 – SUBMITTALS: Add the following sentences: The Jurisdiction will not approve the contractor’s Stormwater Pollution Prevention Plan (SWPPP) or revisions to the SWPPP; instead, the Jurisdiction will only review and comment on the SWPPP and any revisions. The contractor shall submit to the Engineer a copy of the Iowa Department of Natural Resources authorization prior to the Jurisdiction’s issuance of the Notice to Proceed for the work.

9040, 1.08 – MEASUREMENT FOR PAYMENT, A. Stormwater Pollution Prevention Plan (SWPPP): Delete A. in its entirety and replace with the following A.

A. Stormwater Pollution Prevention: Item will be paid for as a lump sum for the project based on the following formula: 30% of the bid amount after review of the SWPPP by the Engineer and filing a Notice of Intent by the contractor, an additional 20% of the bid amount when 25% of the total original contract amount is earned, an additional 20% of the bid amount when 50% of the total original contract amount is earned, an additional 20% of the bid amount when 75% of the total original contract amount is earned, and the remaining 10% of the bid amount upon filing the Notice of Discontinuation by the contractor. Item shall include the following activities and work:

1. Stormwater Pollution Prevention Plan (SWPPP) Preparation: Item includes reviewing and preparation of any modifications necessary to the general SWPPP provided by the Jurisdiction based on the Contractor’s proposed scheduling and construction methods, filing a Notice of Intent for coverage of the project under the Iowa DNR NPDES General Permit No. 2, and payment of associated NPDES permit fees. The Jurisdiction will publish the Public Notice of Storm Water Discharge and provide an affidavit of publication to the contractor.

2. Management: Item includes all work required to comply with the administrative provisions of the Iowa DNR NPDES General Permit No. 2; including record keeping, documentation, updating the SWPPP, filing the Notice of Discontinuation, etc. Item also includes weekly inspections required to satisfy the provisions of General Permit No. 2, unless otherwise stated in the contract documents.

3. Inspection: Item includes inspection of the disturbed areas, and erosion and sediment control measures performed by the contractor, at least once every seven (7) calendar days until the disturbed areas have been stabilized with a perennial vegetative cover of sufficient density to preclude erosion.
4. **Additional Erosion and Sediment Control Measures:** Item includes the cost of erosion and sediment control measures included in the contractor’s modifications to the general SWPPP provided by the Jurisdiction that are either not included as bid items on the proposal or exceed 20% of the proposal unit quantity for the measure, as well as replacement of these measures if needed. The contractor will be paid at the unit bid price for additional erosion and sediment control measures constructed that are included in the contractor’s modifications to the general SWPPP provided by the Jurisdiction when the quantity of these additional measures is less than or equal to 20% of the contract quantity for the measure.

9040, 3.01 – **SWPPP PREPARATION:** Delete in its entirety and replace with the following.

A. Review and prepare any modifications necessary to the general SWPPP provided by the Jurisdiction based on the Contractor’s proposed scheduling and construction methods. Prepare a Stormwater Pollution Prevention Plan (SWPPP) according to the requirements of the Iowa DNR NPDES General Permit No. 2.

B. Have the SWPPP prepared by an individual experienced in erosion and sediment control.

C. Ensure that controls utilized in the SWPPP conform to the type and quantity of erosion and sediment controls shown in the contract documents. See 9040, 1.08, 4 above for measurement for payment of any erosion and sediment control measure used that is not shown in the contract documents or exceeds 20% of the contract quantity for the measure.

D. Submit the completed SWPPP to the Engineer for review and comment prior to filing the Notice of Intent.

E. The Jurisdiction will publish the Public Notice of Storm Water Discharge, as required by the NPDES General Permit No. 2 and provide an affidavit of publication to the contractor.

F. File the Notice of Intent and fee, as required by the NPDES General Permit No. 2.

G. Prior to beginning grading, excavation, or clearing and grubbing operations, all erosion and sediment control measures identified in the SWPPP shall be installed or constructed.

9040, 3.02 – **SWPPP MANAGEMENT:** Delete C. in its entirety and replace with the following C.

C. Submit all SWPPP revisions to the Engineer for review and comment.

**SECTION 9080 – CONCRETE STEPS AND HANDRAIL**

9080, 2.01 – **MATERIALS, B. Reinforcing Steel:** Add the following sentence at the end: “All reinforcement shall be epoxy coated.”