A preletting conference will be held at 10:00 a.m. on Tuesday, March 31, 2020, at the Center Street Park & Ride Garage, Des Moines, Iowa.

CITY OF DES MOINES

PUBLIC IMPROVEMENTS
CONTRACT DOCUMENTS

2020 PARKING GARAGE REPAIR PROGRAM

ACTIVITY ID
042020009

PLAN FILE NO.
615-244/270

CITY COUNCIL APPROVAL

APPROVAL DATE
May 4, 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
542010
Organization No.
E054EG99
Project No.
PG016
2020 Parking Garage Repair Program

Activity ID 04-2020-009

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: Timothy B. Brady, P.E.

Phone Number: (515) 283-4025

Index

ACTIVITY ID 04-2020-009
INSTRUCTIONS TO BIDDERS

Activity ID 04-2020-009
Project Name 2020 Parking Garage Repair Program

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 bid bond executed by a corporation authorized to contract as a surety in Iowa or satisfactory to the Jurisdiction. The 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 bond must be original signatures in ink; facsimile (fax) of any signature on the 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>
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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.dmegov.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 April 7, 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 April 7, 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 May 4, 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 March 09, 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.
2020 Parking Garage Repair Program, 04-2020-009
The improvement includes the repair of parking garages structural members to include concrete removal, reinforcing steel, concrete patching, structural concrete, expansion joint repair, traffic coating, roof cap, and concrete sealing; all in accordance with the contract documents, including Plan File Nos. 615-244/270, located at the Center Street Park & Ride, 5th & Keosauqua, and 9th & Locust Parking Garages, in Des Moines, Iowa.

This project shall be fully completed within one hundred (100) working days.

Engineer's Construction Estimate. $915,000.00

Preletting Conference. A preletting conference will be held at 10:00 a.m. on Tuesday, March 31, 2020, at the Center Street Park & Ride Garage, Des Moines, Iowa.
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 May 4, 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

2020 Parking Garage Repair Program, 04-2020-009
The improvement includes the repair of parking garages structural members to include concrete removal, reinforcing steel, concrete patching, structural concrete, expansion joint repair, traffic coating, roof cap, and concrete sealing; all in accordance with the contract documents, including Plan File Nos. 615-244/270, located at the Center Street Park & Ride, 5th & Keosauqua, and 9th & Locust Parking Garages, in Des Moines, Iowa

Published in the Des Moines Register
April 15, 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:

2020 Parking Garage Repair Program, 04-2020-009

The improvement includes the repair of parking garages structural members to include concrete removal, reinforcing steel, concrete patching, structural concrete, expansion joint repair, traffic coating, roof cap, and concrete sealing; all in accordance with the contract documents, including Plan File Nos. 615-244/270, located at the Center Street Park & Ride, 5th & Keosauqua, and 9th & Locust Parking Garages, in 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 within one hundred (100) working days; 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 working 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:

<table>
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<tr>
<td>2.</td>
<td>General</td>
</tr>
</tbody>
</table>
(CONT - PROPOSAL)

PROPOSAL: PART G - IDENTITY OF BIDDER

The Bidder shall indicate whether the bid is submitted by a/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 1

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-alternates 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-alternates shall be used for determining the sufficiency of the bid security.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>UNITS</th>
<th>QUANTITY</th>
<th>UNIT</th>
<th>PRICE</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MOBILIZATION (1.1)</td>
<td>EA</td>
<td>1.00</td>
<td>$</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>PARTIAL DEPTH CONCRETE FLOOR REPAIR (2.3)</td>
<td>SF</td>
<td>1400.00</td>
<td>$</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>CONCRETE CURB REPAIR (2.6)</td>
<td>SF</td>
<td>30.00</td>
<td>$</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>OVERHEAD PRESTRESSED SLAB REPAIR (3.7)</td>
<td>LF</td>
<td>2000.00</td>
<td>$</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>COLUMN REPAIR (5.1)</td>
<td>SF</td>
<td>5.00</td>
<td>$</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>EXPANSION JOINT REPLACEMENT - ELASTOMERIC CONCRETE EDGED (6.2)</td>
<td>SF</td>
<td>650.00</td>
<td>$</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>CRACK REPAIR (7.1)</td>
<td>LF</td>
<td>1000.00</td>
<td>$</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>JOINT SEALANT REPLACEMENT (7.3)</td>
<td>LF</td>
<td>300.00</td>
<td>$</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>TRAFFIC COATING REPLACEMENT (7.8)</td>
<td>SF</td>
<td>1800.00</td>
<td>$</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>CLEAN AND COAT CORRODED STEEL (10.5)</td>
<td>SF</td>
<td>100.00</td>
<td>$</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>BOLLARD REPAIR (12.4)</td>
<td>EA</td>
<td>3.00</td>
<td>$</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>SHEET METAL CAP AT ROOF LEVEL (12.5)</td>
<td>LF</td>
<td>240.00</td>
<td>$</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>TRAFFIC CONTROL (12.7)</td>
<td>LS</td>
<td>1.00</td>
<td>$</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>PEDESTRIAN BRIDGE REPAIR (7TH &amp; CTR) (SHTS S1.0-S6.0)</td>
<td>LS</td>
<td>1.00</td>
<td>$</td>
<td>$</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL CONSTRUCTION COST $__________

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.
PROPOSAL ATTACHMENT:  PART F - ADDITIONAL REQUIREMENTS  
ITEM 1 - RECIPROCAL RESIDENT BIDDER AND LABOR FORCE

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

Part A

Please answer “Yes” or “No” for each of the following:

Yes No My company is authorized to transact business in Iowa.

(To help you determine if your company is authorized, please review the "Worksheet: 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

Part B

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

Part C

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

Part D

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

Firm Name:

Signature: __________________________ Date: __________________________

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

This form has been approved by the Iowa Labor Commissioner.

309-6001 02-14
PROPOSAL ATTACHMENT: 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.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.

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 including 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/>
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:

2020 Parking Garage Repair Program, 04-2020-009
The improvement includes the repair of parking garages structural members to include concrete removal, reinforcing steel, concrete patching, structural concrete, expansion joint repair, traffic coating, roof cap, and concrete sealing; all in accordance with the contract documents, including Plan File Nos. 615-244/270, located at the Center Street Park & Ride, 5th & Keosauqua, and 9th & Locust Parking Garages, in 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.

5/4/2020

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:

2020 Parking Garage Repair Program, 04-2020-009
The improvement includes the repair of parking garages structural members to include concrete removal, reinforcing steel, concrete patching, structural concrete, expansion joint repair, traffic coating, roof cap, and concrete sealing; all in accordance with the contract documents, including Plan File Nos. 615-244/270, located at the Center Street Park & Ride, 5th & Keosauqua, and 9th & Locust Parking Garages, in 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 within one hundred (100) working days; 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 working 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 Cowie, Mayor

(Seal)
ATTEST:
P. Kay Cmelik, City Clerk

FORM APPROVED BY:

Kathleen Vanderpool, Deputy City Attorney

CONTRACTOR:

By
Contractor

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 ___________________________ )
______________________________ County ) SS

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 ________________________
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
     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
   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.
CONTRACT ATTACHMENT: ITEM 2 - BID ITEMS, QUANTITIES AND PRICES: 1 OF 1

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.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DESCRIPTION</th>
<th>UNITS</th>
<th>ESTIMATED QUANTITY</th>
<th>UNIT PRICE</th>
<th>AMOUNT</th>
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<tr>
<td>1</td>
<td>MOBILIZATION (1.1)</td>
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<td>7</td>
<td>CRACK REPAIR (7.1)</td>
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<td>8</td>
<td>JOINT SEALANT REPLACEMENT (7.3)</td>
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<td>9</td>
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<tr>
<td>13</td>
<td>TRAFFIC CONTROL (12.7)</td>
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<td>14</td>
<td>PEDESTRIAN BRIDGE REPAIR (7TH &amp; CTR) (SHTS S1.0-S6.0)</td>
<td>LS</td>
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</tbody>
</table>

TOTAL CONSTRUCTION COST

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.
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:

2020 Parking Garage Repair Program, 04-2020-009

The improvement includes the repair of parking garages structural members to include concrete removal, reinforcing steel, concrete patching, structural concrete, expansion joint repair, traffic coating, roof cap, and concrete sealing; all in accordance with the contract documents, including Plan File Nos. 615-244/270, located at the Center Street Park & Ride, 5th & Keosauqua, and 9th & Locust Parking Garages, in 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.
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 one (1) 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.
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, May 1, 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, May 4, 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, May 1, 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/](https://secure.iowadot.gov/DBE/Directory/Index/).
All TSBs shall be certified by the Iowa Department of Inspections and Appeals, and the Certified Directory of TSBs is available at the following website https://www.iowa.gov/tsb/index.php/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.
The City of Des Moines will not purchase and maintain Builder’s Risk Insurance on this project as referenced in the General Supplemental Specifications in Section 1070, 3.05A.2 (Builder’s Risk Insurance by the Jurisdiction). The Contractor shall purchase and maintain an Installation Floater as referenced in the General Supplemental Specifications in Section 1070, 3.05A.3 (Installation Floater).
ENGINEERING DEPARTMENT
CITY OF DES MOINES, IOWA

TECHNICAL SPECIFICATIONS
FOR

2020 PARKING GARAGE REPAIR PROGRAM
Activity ID No. 04-2020-009
GENERAL REQUIREMENTS

Section 01 10 00 Summary
Section 01 30 00 Administrative Requirements
Section 01 40 00 Quality Requirements
Section 01 50 00 Temporary Facilities and Controls
Section 01 60 00 Product Requirements & Substitution Request Form
Section 01 70 00 Close-out Requirements

TECHNICAL SPECIFICATIONS

Section 03 01 01 Surface Preparation for Patching
Section 03 01 05 Concrete Repair Materials
Section 03 38 00 Post-Tensioned Concrete Repairs
Section 03 31 10 Epoxy Related Work

Section 05 01 10 Steel Field Re-Coating

Section 07 18 00 Traffic Coatings
Section 07 92 00 Joint Sealants
Section 07 95 13 Expansion Joints

END OF SECTION
PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Access to site.
4. Coordination with occupants.
5. Work restrictions.

B. Related Requirements:

1. Division 01 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.2 PROJECT INFORMATION


1. Project Location: 7th & Center, 5th & Keo, and 4th & Grand, Des Moines, IA 50309

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and includes but is not limited to the following:

1. The improvement includes the repair of parking garages structural members to include concrete removal, reinforcing steel, concrete patching, structural concrete, expansion joint repair, traffic coating, roof cap, and concrete sealing.

B. Type of Contract.

1. Project will be constructed under a single prime contract.

1.4 CONSTRUCTION SCHEDULE

A. Before commencing work, submit an updated copy of Contractor's construction schedule showing the sequence, commencement and completion date.

1.5 ACCESS TO SITE

A. General: Contractor shall have limited use of project site for construction operations as indicated by requirements of this Section.

B. Use of Site: Limit use of project site to work in areas indicated. Do not disturb portions of project site beyond areas in which the Work is indicated.
1. Limits: Confining construction operations to parking garage area only. No more than 50 parking stalls in each parking garage can be closed for repair and staging operations at any given point in time.

2. Driveways, Walkways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner’s employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
   a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
   b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weather tight condition throughout construction period. Repair damage caused by construction operations.

1.6 COORDINATION WITH OCCUPANTS

A. Owner Occupancy: Owner will occupy the premises during entire construction period, with the exception of areas under construction. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the work so as not to interfere with Owner's operations. Maintain existing exits unless otherwise indicated.
   1. Maintain access to existing walkways, entrances, and other adjacent occupied or used facilities. Do not close or obstruct walkways, entrances, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
   2. Provide not less than 72 hours’ notice to Owner of activities that will affect Owner's operations.

1.7 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.
   1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.

B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 7:30 a.m. to 5:30 p.m., Monday through Friday, unless otherwise indicated.

C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
   1. Notify City Project Manager and Building Representative not less than three (3) days in advance of proposed utility interruptions.
   2. Obtain City Project Manager’s and Building Representative’s written permission before proceeding with utility interruptions.

D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
   1. Notify City Project Manager and Building Representative not less than three (3) days in advance of proposed disruptive operations.
   2. Obtain City Project Manager’s and Building Representative’s written permission before proceeding with disruptive operations.
E. Nonsmoking Building & Site: Smoking is not permitted within the building or on City property.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION
SECTION 01 30 00
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Administration of Contract: Provide administrative requirements for the proper coordination and completion of work including the following:
   1. Supervisory personnel.
   2. Preconstruction conference.
   3. Project meetings, minimum of two per month; prepare and distribute minutes.

B. Work Schedule: Submit progress schedule.

C. Submittal Schedule: Prepare submittal schedule; coordinate with progress schedule.

D. Schedule of Values: Submit schedule of values.

E. Emergency Contacts: Submit and post a list of emergency telephone numbers and address for individuals to be contacted in case of emergency.

F. Record Documents: Submit record drawings and specifications; to be maintained and annotated by Contractor as work progresses.

1.2 SUBMITTALS

A. Types of Submittals: Provide types of submittals listed in individual sections.
   1. Shop drawings, reviewed and annotated by the Contractor.
   2. Product data.
   3. Inspection and test reports.
   5. Closeout submittals - 2 copies.

B. Submittal Procedures: Comply with project format for submittals. Comply with submittal procedures established by Project Manager including Project Manager’s submittal and shop drawing stamp. Provide required resubmittals if original submittals are not approved. Provide distribution of approved copies including modifications after submittals have been approved.

C. Samples and Shop Drawings: Samples and shop drawings shall be prepared specifically for this project. Shop drawings shall include dimensions and details, including adjacent construction and related work. Note special coordination required. Note any deviations from requirements of the Contract Documents.

D. Warranties: Provide warranties as specified; warranties shall not limit length of time for remedy of damages Owner may have by legal statute. Contractor, supplier or installer responsible for performance of warranty shall sign warranties.

PART 2 PRODUCTS - Not Applicable To This Section

PART 3 EXECUTION - Not Applicable To This Section

END OF SECTION
SECTION 01 40 00
QUALITY REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Quality Monitoring: Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality. Perform quality control procedures and inspections during installation.

B. Standards: Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

C. Tolerances: Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate. Comply with manufacturers’ tolerances.

D. Reference Standards: For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

E. Manufacturer’s Field Services: When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to perform the following as applicable, and to initiate instructions when necessary.
   1. Observe site conditions.
   2. Conditions of surfaces and installation.
   3. Quality of workmanship.

PART 2 PRODUCTS - Not Applicable To This Section

PART 3 EXECUTION - Not Applicable To This Section

END OF SECTION
SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SUMMARY

A. Temporary Services: Provide temporary services and utilities, including payment of utility costs including the following.
   1. Telephone.
   2. Toilet facilities.

B. Construction Facilities: Provide construction facilities, including payment of utility costs including the following.
   1. Construction equipment.
   2. Enclosures.

C. Security and Protection: Provide security and protection requirements including the following.
   1. Fire extinguishers.
   2. Environmental protection.

D. Personnel Support: Provide personnel support facilities including the following.
   1. Sanitary facilities.
   2. Drinking water.
   3. Cleaning.

PART 2 PRODUCTS - Not Applicable To This Section

PART 3 EXECUTION - Not Applicable To This Section

END OF SECTION
SECTION 01 60 00
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Manufactures: Provide products from one manufacturer for each type or kind as applicable. Provide secondary materials as acceptable to manufacturers of primary materials.

B. Product Selection: Provide products selected or equal approved by Project Manager. Products submitted for substitution shall be submitted with complete documentation, and include construction costs of substitution including related work.

C. Substitutions: Request for substitution must be in writing seven days before bid opening. Conditions for substitution include:
   1. An 'or equal' phrase in the specifications.
   2. Specified material cannot be coordinated with other work.
   3. Specified material is not acceptable to authorities having jurisdiction.
   4. Substantial advantage is offered to the Owner in terms of cost, time, or other valuable consideration.

D. Substitution Requests:
   1. Substitutions shall be submitted seven days prior to bid opening.
   2. Substitution Request Form: use form provided at the end of this Section.
   3. Approval of shop drawings, product data, or samples containing substitutions is not an approval of a substitution.

PART 2 PRODUCTS - Not Applicable To This Section

PART 3 EXECUTION - Not Applicable To This Section

END OF SECTION
SECTION 01 60 00 -- SUBSTITUTION REQUEST FORM:

Project: 2020 Parking Garage Repair Program

Bid Date: April 7, 2020

We hereby submit for your consideration the following product instead of the specified item for the above project:

Drawings/Specifications:

Drawing Number: __________________________________________

Drawing Name: ____________________________________________

Spec Section/Name: ________________________________________

Paragraph: ________________________________________________

Specified Item: ____________________________________________

Proposed Substitution: ______________________________________

Attach complete information on changes to Drawings and/or Specifications which proposed substitution will require for its proper installation. Failure to fully complete this form is basis to not accept this Substitution Request.

Submit, with request, all necessary samples and substantiating data to prove equal quality and performance to that which is specified. Clearly mark manufacturer's literature to indicate equality in performance.

CERTIFICATION OF EQUAL PERFORMANCE AND ASSUMPTION OF LIABILITY FOR EQUAL PERFORMANCE

The undersigned states that the function, appearance, and quality are equivalent or superior to the specified item.

Submitted by:

Signature _________________________________________________

Title _____________________________________________________

Firm _____________________________________________________

Address __________________________________________________

Telephone ___________________________ E-mail ___________________ Date ________________

Signature shall be by person having authority to legally bind his firm to the above terms. Failure to provide legally binding signature will result in retraction of approval.

For Use by Owner's Representative or Owner:

☐ Accepted ☐ Accepted as Noted ☐ Not Accepted ☐ Received Too Late

By ______________________________________________________

Date ________________________________
Fill in blanks below:

A. Does the substitution affect dimensions shown on Drawings? Yes ________ No ________
   If yes, clearly indicate changes: ____________________________________________________________
   ____________________________________________________________

B. Will the undersigned pay for changes to the building design, including engineering and detailing costs caused by the request submission? Yes ________ No ________
   If no, fully explain: ____________________________________________________________
   ____________________________________________________________

C. What effect does substitution have on other Contracts or other trades?
   ____________________________________________________________
   ____________________________________________________________

D. What effect does substitution have on construction schedule?
   ____________________________________________________________
   ____________________________________________________________

E. Manufacturer’s warranties of the proposed and specified items are:
   _____ Same _____ Different (Explain on Attachment)

F. Reason for Request: ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________

G. Itemized comparison of specified item(s) with the proposed substitution.
   List significant variations:
   ____________________________________________________________
   ____________________________________________________________

H. Accurate cost data comparing proposed substitution with product specified:
   ____________________________________________________________
   ____________________________________________________________

I. Designation of maintenance services and sources:
   ____________________________________________________________

(ATTACH ADDITIONAL SHEETS IF REQUIRED)
SECTION 01 70 00
CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Substantial Completion: The following are prerequisites to substantial completion. Provide the following.
   1. Punch list prepared by Contractor and subcontractors as applicable.
   2. Supporting documentation.
   3. Warranties.
   4. Certifications.

B. As-Built Drawings: Provide a marked-up set of drawings including changes, which occurred during construction.

C. Project Closeout: Provide the following during project closeout.
   1. Submission of record documents.
   2. Submission of maintenance manuals.
   3. Training and turnover to Owner's personnel.
   4. Final cleaning and touch-up.
   5. Removal of temporary facilities.

D. Final Acceptance: Provide the following prerequisites to final acceptance.
   1. Final payment request.
   2. Completed punch list.
   3. Certification of Disadvantage Business Enterprise (DBE) Accomplishment

PART 2 PRODUCTS - Not Applicable To This Section

PART 3 EXECUTION - Not Applicable To This Section

END OF SECTION
SECTION 03 01 01 – SURFACE PREPARATION FOR PATCHING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the provisions of all labor, materials, supervision and incidentals required to locate and remove all delaminated and unsound concrete, including preparation of cavities created by removal to receive patching material and preparation of existing surface spalls to receive patching material.

B. Related Sections include the following:

1. Division 03 Section “Concrete Repair Materials.”

C. Contractor shall fully acquaint himself with the existing job site conditions and discuss the accessibility of the work areas with the Owner.

D. Provide barricades around the work area with appropriate signage to keep non-construction people from entering work area.

E. Contractor shall provide all traffic cones or barriers to direct traffic during the repair of the facility. This work shall be done in consultation with the Owner.

1.2 REFERENCES

A. Applicable Standards:

1. American Concrete Institute (ACI), latest version:
   a. ACI 301 Specifications for Structural Concrete
   b. ACI 546.1R Guide for Repair of Concrete Bridge Structures
   c. ACI 546R Concrete Repair Guide

2. International Concrete Repair Institute (ICRI):
   a. ICRI 310.1R Guide for Surface Preparation for the Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion
   b. ICRI 310.2R Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair
   c. ICRI 320.2R Guide for Selecting and Specifying Materials for Repair of Concrete Surfaces

PART 2 - PRODUCTS AND MANUFACTURERS

A. Cementitious epoxy coating for existing exposed non-prestressed steel reinforcement:
1. BASF: MasterEmaco P 124
2. Sika Chemical Corporation: Armatec 110 EpoCem
3. Euclid Chemical: Duralprep A.C.

PART 3 - EXECUTION

3.1 INSPECTION

A. Horizontal Surfaces
   1. Contractor shall sound all designated floor areas for delaminations.

B. Vertical and Overhead Surfaces
   1. Contractor shall sound only vertical and overhead surfaces in designated areas that show evidence of cracking and/or staining. Cracks, usually horizontal in orientation along beam faces, and vertical in orientation near column corners are indicators of delaminated concrete.

C. Delaminated areas: Once located by Contractor, Contractor shall further sound and mark them to define limits.

D. Spalls: Contractor shall locate spalls by visual inspection, and mark boundaries.

E. Engineer may mark additional unsound concrete for removal.

F. Areas to be removed shall be rectangular to provide adequate appearance.

G. Contractor shall locate and determine the depth of all embedded reinforcement, electrical conduit, post-tensioned tendons, in repair area and mark these locations for reference during concrete removal. Do not cut any embeds unless approved by Engineer.

3.2 ABRASIVE BLASTING

A. Necessary approvals shall be obtained by the Contractor from authorizing governmental or other agencies prior to abrasive-blasting. Abrasive-blasting operations shall comply with the requirements of OSHA and NIOSH (National Institute for Occupational Safety and Health) Standard PB-246-697.

3.3 RESURFACING PREPARATION

A. All delaminated, spalled and unsound concrete shall be removed from within marked boundary to minimum depth of 1/8 inch (3 mm) using 15 lb to 30 lb air hammers equipped with chisel point bits. When directed by Engineer, chipping hammers less than 15 lb shall be used to minimize damage to sound concrete. If delaminations exist beyond minimum removal depth, chipping shall continue until all unsound and delaminated concrete has been removed from cavity.
B. Where embedded reinforcement, anchorages, or electrical conduit is exposed by concrete removal, proceed with caution to avoid damaging it during removal of unsound concrete. If bond between exposed embedded reinforcement/anchorages and adjacent concrete is impaired by Contractor’s removal operation, Contractor shall perform concrete repair instead of concrete resurfacing along entire length affected at no cost to owner.

C. Large areas requiring the removal of a thin layer of concrete shall be treated with other methods such as hydro-demolition. Hydro-demolition pressure is limited to 8,000 psi unless otherwise approved by the Engineer. If this method is selected, Contractor shall perform abrasive water blasting mockup for hydro-demolition with the Engineer present. Mockups shall be reviewed by the Engineer and Contractor for the specified surface preparations profile. The approved hydro-demolition pressure shall not be exceeded. Perform hydro-demolition so that concrete is removed in thin layers not exceeding 1/8 inch per layer and in multiple passes to achieve the appropriate removal depth. Do not attempt to remove more than 1/8 inch thick concrete layers at a time. Excessive damage caused by hydro-demolition shall be repaired by the Contractor at no cost to the Owner.

D. If rust is present on embedded reinforcement where it enters sound concrete perform concrete repair instead of concrete resurfacing along the length of corroded reinforcement. Additional removal shall continue until non-rusted reinforcement is exposed, or may be terminated per Engineer’s instructions.

E. Edges of patch areas shall be dressed perpendicular to member face to eliminate feather edges. All edges shall be straight and resurfacing areas square or rectangular-shaped. Do not overcut patch corners during sawcutting, chipping, or grinding.

F. Contractor shall exercise extra caution during saw cutting to avoid damaging existing reinforcement particularly post-tensioned tendons, sheathing, electrical conduit and any other embedded items near surface of concrete. Any damage to existing embedded items shall be repaired by Contractor with Engineer’s approved methods at no additional cost to Owner.

3.4 REPAIR PREPARATION

A. Contractor shall review all marked removal and preparation areas and request clarification by Engineer of shoring requirements in questionable areas. Shores shall be in place prior to concrete removal and cavity preparation in any area requiring shores.

B. All delaminated, spalled and unsound concrete shall be removed from within marked boundary to minimum depth of 3/4 inch using 15 lb to 30 lb air hammers equipped with chisel point bits. When directed by Engineer, chipping hammers less than 15 lb shall be used to minimize damage to sound concrete. If delaminations exist beyond minimum removal depth, chipping shall continue until all unsound and delaminated concrete has been removed from cavity.

C. Where embedded reinforcement, anchorages, or electrical conduit is exposed by concrete removal, proceed with caution to avoid damaging it during removal of unsound concrete. If bond between exposed embedded reinforcement/anchorages and adjacent concrete is impaired by Contractor’s removal operation, Contractor shall perform additional removal around and beyond perimeter of reinforcement for minimum of 3/4 inch along entire length affected at no cost to owner.
D. Large areas requiring the removal of a thin layer of concrete shall be treated with other methods such as hydro-demolition. Hydro-demolition pressure is limited to 8,000 psi unless otherwise approved by the Engineer. If this method is selected, Contractor shall perform abrasive water blasting mockup for hydro-demolition with the Engineer present. Mockups shall be reviewed by the Engineer and Contractor for the specified surface preparations profile. The approved hydro-demolition pressure shall not be exceeded. Perform hydro-demolition so that concrete is removed in thin layers not exceeding 1/4 inch per layer and in multiple passes to achieve the appropriate removal depth. Do not attempt to remove more than 1/4 inch thick concrete layers at a time. Excessive damage caused by hydro-demolition shall be repaired by the Contractor at no cost to the Owner.

E. If rust is present on embedded reinforcement where it enters sound concrete, additional removal of concrete along and beneath reinforcement will be required. Additional removal shall continue until non-rusted reinforcement is exposed, or may be terminated per Engineer’s instructions.

F. Removal of concrete for repair requires saw cutting 3/4 inch into floor slab of the perimeter of the removal, unless a more stringent criteria applies. For vertical and overhead surfaces marked areas shall be saw-cut, ground, or chipped to depth of 1/2 inch to existing concrete, measured from original surface.

G. Edges of patch areas shall be dressed perpendicular to member face to eliminate feather edges. All edges shall be straight and patch areas square or rectangular-shaped. Do not overcut patch corners during sawcutting, chipping, or grinding.

H. Contractor shall exercise extra caution during saw cutting to avoid damaging existing reinforcement particularly post-tensioned tendons, sheathing, electrical conduit and any other embedded items near surface of concrete. Any damage to existing embedded items shall be repaired by Contractor with Engineer’s approved methods at no additional cost to Owner.

3.5 INSPECTION OF REPAIR PREPARATION

A. After removals are complete, but prior to final cleaning, cavity and exposed reinforcement shall be inspected by Contractor and subject to verification by Engineer for compliance with requirements of this Section.

B. Contractor shall inspect embedded reinforcement and conduits exposed within cavity for defects due to corrosion or damage resulting from removal operations. Contractor shall notify Engineer of all defective and damaged reinforcement or conduits. Replacement of damaged or defective reinforcement/conduits shall be performed in accordance to the requirements of this Section.

3.6 CLEANING OF REINFORCEMENT

A. All exposed reinforcing steel shall be cleaned and free of rust and other contaminants. Cleaning shall be accomplished by abrasive methods. Cleaning shall be completed immediately before patch placement to insure that base metal is not exposed to elements and further rusting for extended periods of time. Use powered wire brushes in locations where reinforcing steel cannot be cleaned by abrasive-blasting or water-blasting.
B. All exposed reinforcing steel shall be coated with a corrosion inhibiting product specified in Part 2 of this specification prior to mortar application. Protect prepared surfaces from damage prior to and during patch placement.

3.7 REINFORCEMENT IN REPAIR AREAS

A. All embedded reinforcement exposed during surface preparation that has lost more than 10% of original cross-sectional area due to corrosion shall be considered defective. Defective reinforcement shall be supplemented in accordance to Engineer’s instructions and shall be paid for by Owner.

B. Damaged reinforcement caused during removals made by Contractor shall be supplemented in accordance to Engineer’s instructions and shall be paid for by Contractor.

C. Supplement defective or damaged embedded reinforcement of equal diameter with a Class B splice in accordance to ACI–318 beyond damaged portion of reinforcement. Secure new reinforcement to existing reinforcement with approved anchors. Supplemental steel shall be A615 Grade 60 steel except where more stringent requirements apply in drawings and/or details.

D. Loose reinforcement exposed during surface preparation shall be securely anchored prior to patch placement. Loose reinforcement shall be adequately secured with wire ties to bonded reinforcement or with drilled-in anchors. Drilled-in anchors shall be TW-1400 anchors by ITW Ramset/Red Head, Tie-Wire Wedge-All anchors by Simpson Strong-Tie, or approved equal. Engineer will determine adequacy of wire ties and anchors. Securing loose reinforcement is incidental to surface preparation.

E. Minimum of 1-1/2 inch concrete cover shall be provided over all new/existing reinforcement except where more stringent requirements apply in drawings and/or details.

3.8 PREPARATION OF CAVITY FOR PATCH PLACEMENT

A. Cavities will be examined prior to commencement of patching operations. Sounding surface shall be part of examination. Delaminations noted during sounding shall be removed as specified in this Section.

B. All debris shall be removed from site prior to commencement of patching.

END OF SECTION 03 01 01
SECTION 03 01 05 – CONCRETE REPAIR MATERIALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the provisions of all labor, materials, supervision and incidentals required
   to prepare deteriorated or damaged concrete surfaces and install patching materials to restore
   original surface condition and integrity.

B. Contractor shall fully acquaint himself with the existing job site conditions and discuss the
   accessibility of the work areas with the Owner.

C. Contractor shall ensure that there is adequate ventilation in areas where repair work is being
   performed and that no work results in nauseating, annoying or toxic fumes and odors from
   entering occupied areas. Provide barricades around the work area with appropriate signage to
   keep non-construction people from entering work area.

D. Contractor shall provide all traffic cones or barriers to direct traffic during the repair of the
   facility. This work shall be done in consultation with the Owner.

1.3 REFERENCES

A. Applicable Standards:

1. American Concrete Institute (ACI), latest version:
   - ACI 301R Specifications for Structural Concrete
   - ACI 305R Hot Weather Concreting
   - ACI 306R Cold Weather Concreting
   - ACI 308R Guide to Curing Concrete
   - ACI 318R Building Code Requirements for Structural Concrete
   - ACI 548.1R Guide for Use of Polymers in Concrete

   - ASTM C109 Test Method for Compressive Strength of Hydraulic
     Cement Mortars
1.4 INFORMATION SUBMITTALS

A. Make submittals in accordance with requirements of Division 01 and as specified in this Section.

1.5 ACTION SUBMITTALS

A. Proposed Means and Methods:

1. Contractor shall submit procedures to protect fresh resurfacing, patches, and concrete from weather and traffic.

1.6 QUALITY ASSURANCE

A. Work shall conform to requirements of the American Concrete Institute (ACI) as applicable except where more stringent requirements are shown on Drawings or specified in this Section.

Qualifications

1. Manufacturer’s Qualifications: Companies furnishing the repair materials shall have a proven track record of at least five years. Furthermore, they shall have in existence a program of training, certifying, and supporting a nationally organized program of approved contractors. Evidence of this shall be made available to the Engineer/Owner upon request.

2. Contractor’s Qualifications: Contractor performing the work shall be an approved contractor by the manufacturer furnishing the repair materials, and shall have no less than five years of experience in the various types of work required in this project. Upon request by the Engineer, a notarized certification from the manufacturer attesting to the training shall be submitted to the Engineer/Owner.

3. Applicator’s Qualifications:

   a. Repair work shall only be performed by contractors who have successfully used this process on at least three similar structural repairs of equal scope which have performed successfully for a minimum period of five years.

   b. Only adequately trained and experienced personnel shall be used on the job.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR POLYMER MODIFIED CEMENTITIOUS MORTARS

A. Mortar used for bonding, patching, and resurfacing in exposed or exterior environmental conditions with large cyclic temperature changes shall have the following properties:

1. Mortar shall be non-sagging.
2. Acceptable materials shall have minimum 3-day compressive strength of 3,000 psi, and 5,000 psi at 28 days as certified by manufacturer.

2.2 CONCRETE REPAIR MATERIALS

A. Polymer Modified Mortar for Horizontal Repairs:
   1. MasterEmaco N 300 CI (formerly EMACO R300 CI), MasterEmaco T 310 CI (formerly EMACO R310 CI) by BASF
   2. Sika 222 with Latex R by Sika
   3. Eucrete Supremeby Euclid Chemical Company

B. Polymer Modified Mortar for Overhead/Vertical Repairs:
   1. MasterEmaco N 425 (formerly Gel Patch) by BASF
   2. SikaTop 123 Plusby Sika
   3. Sika 223 with Latex Rby Sika
   4. Verticoatby Euclid Chemical Company

C. Changes in products required to suit temperature and environmental conditions at the time of material application shall be specified as separate line items by the Contractor showing credit or additions to the price for the various tasks.

D. In using the above products, follow strictly the manufacturer's specifications and directions for mixing and application. Also read all label warnings by manufacturer. Make application in accordance with applicable safety laws.

PART 3 - EXECUTION

3.1 PATCHING WITH REPAIR MORTAR

A. Surface Preparation
   1. Concrete surface to which the mortar is to be applied shall be exposed parent concrete free of loose and unsound materials. Preparation of cavity to receive new mortar shall be in accordance to Section “Surface Preparation for Patching” and manufacturer’s instructions.

   2. Ensure that the surface and ambient temperature is at least 45°F and rising at the time of application.

B. Bonding Grout
   1. Apply grout in strict accordance with manufacturer’s recommendations. a bonding may

   2. If bonding grout dries, cavity shall not be patched until it has been re-cleaned and prepared as indicated in Section “Surface Preparation for Patching.” Grout shall not be applied to more cavities than can be patched within 15 min. by available manpower.
3. Patching materials shall be placed immediately following grout application in strict accordance with manufacturer's instructions.

C. Mortar Application

1. Condition polymer mortar material to 65°F-80°F (18°C-26°C) unless otherwise recommended by the manufacturer. Materials beyond this range of temperature shall not be used.

2. Mix the two components in a clean container free of contaminants as recommended by the manufacturer.

3. Thoroughly blend components and aggregates with portable mixers to a uniform and homogenous mixture. Small batches of one quart or less may be mixed by spatulas, palette knives or similar devices.

4. Mixing should be accomplished within three minutes when using Jiffy mixer or five minutes when mixed by hand.

5. Apply mortar by means suitable for the consistency of the mortar mix.

6. Use appropriate forms as required for retaining mortar if mixed to a flowable consistency.

7. Consolidate the mortar thoroughly to remove entrapped air.

8. Supplemental wire mesh shall be required for delamination and spall repairs greater than 2” in depth. Fresh bonding grout is required between successive lifts of patching material.

9. Finish surface of mortar to match the texture and contours of existing concrete.

3.2 CLEANUP

A. Protect surfaces surrounding the work areas against spillage.

B. Material spillage shall be cleaned before they set and become difficult to remove.

C. Cleanup all portions of the existing structure that are soiled or stained in the process of mortar repair work.

3.3 FIELD QUALITY CONTROL

1. Testing Agency:
   a. Independent testing laboratory employed by Owner and acceptable to Engineer.
   b. Testing Agency is responsible for conducting, monitoring, and reporting results of all tests required under this Section. Testing Agency has authority to reject mortar not meeting Specifications.
2. Sampling and testing of mortar and aggregate extended mortars shall be performed by ACI certified Concrete Field Technicians Grade I. Certification shall be no more than three years old.

3. Concrete Compressive Strength (Mold test cubes per ASTM C-109):
   a. Take minimum of 6 cubes (2”x2”) for each 10 ft³ or fraction of each repair mortar placed in any one day.
   b. Additional cubes shall be taken as directed by Engineer.
   c. Cover and protect molds from contact with water for the first 24-hrs. after molding.
   d. Follow ACI Specifications for storage and handling of specimens.
      1) Test 3 cubes at 7 days.
      2) Test 3 cubes at 14 days.
      3) Test 3 cubes at 28 days.

4. Aggregate-Extended Mortar Compressive Strength (Mold test cylinders per ASTM C-31 and perform compressive strength tests in accordance with ASTM C-39):
   a. Take minimum of 4 cylinders (6” diameter x12”) or 5 cylinders (4” diameter x8”) for each 27 ft³ or fraction of each aggregate extended repair mortar placed in any one day.
   b. Additional cylinders shall be taken as directed by Engineer.
   c. Cover and protect cylinders from contact with water for the first 24-hrs. after molding.
   d. Follow ACI Specifications for storage and handling of specimens.
   e. Aggregate Extended Mortar (f’c at 28-days acceptance).
      1) Test three (3) 4” diameter cylinder at 7 days.
      2) Test three (3) 4” diameter cylinders at 14 days.
      3) Test three (3) 4” diameter cylinders at 28 days.
      4) Hold one (1) 4” diameter cylinder for additional testing.

END OF SECTION 03 01 05
SECTION 03 38 00 – POST-TENSIONED CONCRETE REPAIRS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Related work in other Sections related to Post-tensioned Concrete include:

1. Division 03 Section “Concrete Repair Materials.”

1.2 SUMMARY

A. The post-tensioning supplier and installer shall furnish all labor, materials, services and equipment required to repair the post-tensioned structural system. The work shall include the following items:

1. Furnishing all post-tensioning materials including anchorages, wedges,
2. Placing of all items listed above.
3. Performing all post-tensioning operations including stressing, anchoring, trimming, encapsulating tendon anchors, and grouting pockets.
4. Cooperating with the Owner’s Testing Laboratory and Engineer of Record in their function of recording and reporting tendon elongation and tension applied to the prestressing steel.
5. Prepare complete shop drawings and field placing drawings that comply with the repair details as shown on the Repair Documents.

B. Tendons are unbonded as shown on the drawings.

1.3 REFERENCES

A. Applicable Standards:

1. American Concrete Institute (ACI):
   a. ACI 117 Specifications for Tolerances for Concrete Construction and Materials
   b. ACI 301 Specification for Structural Concrete
   c. ACI 318 Building Code Requirements for Structural Concrete and Commentary
   d. ACI 423.4R Corrosion and Repair of Unbonded Single Strand Tendons
2. Concrete Reinforcing Steel Institute (CRSI):
   a. CRSI MSP-2  Manual of Standard Practice

3. Post-Tensioning Institute (PTI):
   a. PTI TAB.1  Post-Tensioning Manual
   b. PTI M10.2  Specification for Unbonded Single Strand Tendons
   c. PTI M10.3  Field Procedures Manual for Unbonded Single Strand Tendons
   d. PTI CRT20 G1-1215 Manual for Certification of Plants Producing Unbonded Single Strand Tendons

4. International Concrete Repair Institute (ICRI):
   a. ICRI 320.6  Guide for Evaluation and Repair of Unbonded Post-Tensioned Concrete Structures


1.4 SYSTEM DESCRIPTION

A. Repair of unbonded post-tensioning system described herein is intended to perform without long-term corrosion or other distress in an aggressive environment as defined in the ACI 423.7. Post-tensioning strand, couplers, center-pull tension couplers, button-head to monostrand splice couplers, troubleshoot anchors, intermediate, and end anchorages shall be completely protected with a watertight, encapsulated system. Tendon sheathing and grease shall be as specified herein.

1.5 INFORMATION SUBMITTALS

A. Make submittals in accordance with requirements of Division 01 and as specified in this Section.

B. Manufacturer’s Data: Submit for review and approval.
   1. Sample hardware, including but not limited to: Anchorage system, coated strand, wedges, and other sub-assemblies required for complete installation including all
accessories required to complete the system. Submit valid Evaluation Service Report (ESR) from ICC Evaluation Service, Inc for each product.

2. Post-tensioning system brochures.

3. Complete post-tensioning procedure, including but not limited to: Stressing system, method of determining anchor force, method of determining tendon slack, and method of cutting off excess strand after anchorage.

4. Submit tendon manufacturer’s data that documents the wobble and curvature friction coefficients of the tendon being used for the repairs.

5. Mill Certificates: Submit certified mill reports of post-tensioning steel immediately upon shipment indicating compliance with specified requirements for all material that is to be delivered to the project.

6. Equipment Calibration: Submit certification of the calibration of all ram and gauge sets to the Engineer as specified herein.

7. Manufacturer’s Certificate: Certify that tendon strength characteristics meet or exceed specified requirements.

1.6 ACTION SUBMITTALS

A. Tendon Repair Shop Drawings/Field-Placing Drawings: Submit for review and approval. Drawings shall include but not be limited to the following:

1. Indicate layout, tendon sizes, tendon supports, location of tendon splices, accessories, clearances required for jack, and pressure plate stresses.

2. Value of the wobble and curvature coefficients and anchorage set to be used in the design to calculate the tendon elongation.

3. Details of anchorages, the positive connection between the anchorage and sheathing, pocket formers, couplers, and other related hardware.

4. Details of the method for sealing the anchorage recesses after the tendon stressing tails have been removed.

5. Clearance requirements for the hydraulic equipment and the dimensions of any stressing pockets required.

6. Samples of forms to be used for field record of stressing operations.

7. Type and thickness of post-tensioning sheathing.

8. Type and chemical analysis of P-T coating showing compliance with Table 1 of “ACI 423.7”.
9. Shop drawings shall be signed and sealed by a qualified professional engineer, licensed in the state of where the project is located who was in responsible charge of the drawing preparation.

B. Stressing Records: The contractor shall provide the appropriate cooperation and access to the Owner’s Testing Laboratory and/or Engineer of Record to allow them to measure, record, and clearly report the following information. In the absence of a Testing Laboratory representative, the post-tensioning installer shall measure, record, report and submit the information described below. Submit records to the Engineer for approval within 24 hours after stressing.

1. Floor and tendon identification numbers.
2. Calculated elongation and actual measured elongation for each jacking point, and totals for each tendon.
3. Stressing ram number, date of calibration, calibration chart, initial and final gauge load reading during stressing for each tendon.
4. Date of stressing operation and signature of the Contractor's stressing personnel and inspector witnessing the operation.
5. Range of allowable elongations for jacking force or a measure of the deviation of the measured elongations from the calculated elongations. Deviations that do not comply with the specified tolerances shall be noted for the Architect/Engineer to review.
6. Obvious irregularities or stress loss during anchoring procedures.
7. Required and actual concrete strength at time of jacking.

1.7 CLOSEOUT SUBMITTALS

A. Record Documentation: The Contractor shall provide record drawings to the Owner, in care of the Engineer, of tendon repairs performed including any approved changes from the contract documents. Form of record drawings may be legible marked-up prints of contract drawings, or separate drawings of same scale. Record drawings shall include actual locations of new tendons, new sheathing, tendon splices, and new anchorages; stressing sequence and tension loads established; and elongation of tendon.

1.8 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 318 and PTI Field Procedures Manual for Unbonded Tendons.

B. Qualifications: The supply and installation of post-tensioning shall be executed by organizations that have successfully performed major work of a nature similar to that involved in this project for a minimum of five (5) years and have successfully completed a minimum of five (5) similar projects in own name, unless this requirement is waived by the Engineer prior to Contract award. The Contractor shall submit supporting evidence acceptable to the Engineer that this qualification has been met. Post-tensioning shall be performed using methods and
related equipment that are in conformance with generally accepted systems of post-tensioning. Experienced individuals shall control and supervise all operations.

C. Fabrication Quality Assurance: The post-tensioning material shall be fabricated by a plant that is fully PTI-certified at the time of bidding, and that shall maintain this certification throughout the duration of this project as described in the Post-Tensioning Institute’s “Manual for Certification of Plants Producing Unbonded Single Strand Tendons." "Manual for Certification of Plants Producing Prestressed Concrete Strand."

D. Installer Quality Assurance: All installers of unbonded post-tensioned tendons shall be certified under the Post-Tensioning Institute’s “Post-tensioning Certification Program of Field Personnel for Unbonded Post-tensioning Installers”.

E. Inspection and Testing: Inspection and testing shall be provided in accordance with Quality Assurance Testing and Inspection During Construction section of this Specification.

F. Field Quality Control:

1. The Contractor shall maintain a consistent and good standard of workmanship. Check bulkheads, position of anchorages and tendon couplers, tendon chairing and tying, location, size and placement of reinforcement, and tendon quantity.

2. Prior to pouring concrete repair materials, an inspection of the tendons and mild reinforcing steel shall be made by the Engineer or Independent Testing Agency.

3. Inspection of stressing operations shall also be performed as directed by the Engineer.

4. The Contractor shall cooperate with the Owner’s Testing Laboratory and/or Engineer in their efforts to record tendon elongations. The Contractor shall keep a copy of the stressing records with the record drawings.

5. Submit certificates of all ram and gauge calibrations used on the project to the Engineer. Use of non-calibrated ram and gauge sets are not allowed on this project. If requested by the Engineer, Owner, or Field Inspector, the Contractor shall have the ram and gauge sets calibrated by an Independent Testing Agency, the cost of which shall be borne by the Contractor.

6. Satisfactorily protect all prestressing steel from all moisture and rust or other physical damage prior to placement and keep steel free from deleterious substances, such as chlorides, fluorides, sulfites and nitrates. Provide protection for exposed prestressing steel beyond ends of members to prevent deterioration by rust or corrosion.

7. Do not store post-tensioning strand in such a manner that it is in direct contact with soil or fresh concrete or exposed to rain, snow, de-icing salts or other corrosive elements. Protect plastic materials planned to be stored for more than one month from exposure to sunlight.

8. Damage to tendon sheathing in excess of 2% of its length shall be grounds for rejection of sheathing.
9. Contractor shall inspect tendon sheathing for damage and to verify watertight seal between sheathing and anchor. Repair all damaged sheathing.

1.9 PRE-CONSTRUCTION CONFERENCE

A. At least 15 days prior to post-tensioned concrete construction, the Contractor shall hold a meeting to review the procedures for performing safe and proper post-tensioned concrete repairs. Also review requirements for submittals, status of coordinating work and availability of materials, and provide safety plan for stressing operations. Establish work progress schedule and procedures for materials inspection, testing and certifications. If required by Owner, provide phasing plan for PT slab repairs.

B. The Contractor shall require responsible representatives of every party who is concerned with the post-tensioned concrete work to attend the conference, including but not limited to the following:

1. Contractor’s Superintendent
2. Laboratory responsible for field quality control
3. Post-Tensioning Supplier
4. Post-Tensioning Installer
5. Owner’s Representative
6. Engineer-of-Record

C. Minutes of the meeting shall be recorded, typed and printed by the Contractor and distributed to all parties concerned within 5 days of the meeting. One copy of the minutes shall be transmitted to the following for information purposes:

1. Owner’s Representative
2. Engineer-of-Record

D. The Contractor shall coordinate the scheduled date of the conference with the Engineer.

PART 2 - PRODUCTS

2.1 ANCHORAGES AND COUPLERS

A. Performance and Specification:

1. Anchoring hardware, shall be steel and shall meet the minimum requirements set forth in ACI 318, except as modified herein. The anchorage shall be capable of developing at least 95% of the minimum specified ultimate strength of the prestressing steel without exceeding anticipated set, and shall be capable of passing the static and dynamic tests as outlined in ACI 423.7. All anchorages, couplers, and miscellaneous hardware shall be the standard products as manufactured by the Post-Tensioning Supplier, unless certified test reports are submitted proving acceptable deviation, and shall be evaluated by the International Conference of Building Officials, or other agencies of equal stature, and the Engineer.
2. Anchors and couplers used shall include design features permitting a positive mechanical and watertight connection of the sheathing to the anchorage, and watertight closing of the wedge cavity, for stressing and non-stressing (fixed) anchorages. Friction connections between the anchor and the sheathing shall not be allowed.

3. All anchorages shall have the demonstrated ability to remain watertight when subjected to a hydrostatic pressure of 1.25 psi over a period of 24 hours.

4. Sleeves used to connect the sheathing to the anchorages shall meet the same requirements as the sheathing for durability during fabrication, transportation, handling, storage and installation and have a minimum thickness of 50 mils and have a positive mechanical connection to the anchors. The overlap between the end of the extruded sheathing and the end of the sleeve and seal shall be a minimum of 4 inches. The sleeve shall be translucent or have another method to verify both that the P-T coating material is free of voids and the proper overlap with the sheathing.

B. Size: Anchorages and distribution (bearing) plates shall be sized according to ACI 318 unless certified test reports are submitted proving acceptable deviation.

C. Seating loss: Maximum allowable anchor slip or seating loss shall be 1/4 inch.

2.2 CONCRETE REPAIR MATERIALS

A. The concrete repair material shall have a minimum 28-day strength not less than 3,000 psi at transfer of prestress force unless otherwise specified on the Contract Drawings. Components or admixtures with chloride, fluoride, sulphite or nitrate ions or any other substance deleterious to prestressing steel shall not be used.

2.3 TENDON SUPPORT SYSTEM

A. Slab Tendons: Support points shall consist of a bar support or positive attachment to existing slab reinforcement. Bar supports shall be plastic, plastic tipped, epoxy coated or stainless steel.

B. Beam Tendons: Supports shall consist of a bar support or reinforcing steel tied between stirrup legs, depending on the extent of beam repair.

PART 3 - EXECUTION

3.1 PREPARATION FOR POST-TENSIONED SLAB REPAIRS

A. Initial Survey: Locate all existing post-tensioning tendons in slabs in the areas to be repaired as indicated in the drawings or as determined by the Engineer. Use reliable non-destructive techniques, such as Ground Penetrating Radar scan survey to locate the tendons and mark them on site. Use permanent markers or similar (markings shall last throughout the entire construction). Refer to Section “Required information for Engineer’s evaluation of ground penetrating radar (GPR) results” for additional information.
B. Shoring: Do not start de-tensioning (if required) of post-tensioned members until after post-tensioned slab has been shored as determined by the Engineer. Shoring requirements are dependent on number of tendons being replaced, areas of slab affected, size and location of slab openings for repairs, etc., and will be determined by Engineer on a case by case basis. Contractor shall submit shoring drawings. Shoring drawings shall be signed and sealed by an Engineer licensed in the State where the project is located.

C. Concrete Removal: Perform slab openings at identified areas with tendon damage and at areas where new PT strand, couplers, and anchors are to be installed. Contractor shall not damage tendons and mild reinforcement during concrete removal. Concrete shall be removed by using lightweight pneumatic or electric impact breakers, or by electric hammers with auto-shut-off capability of power interruption when contacting grounded metal. Contractor shall exercise extreme caution when removing concrete near PT anchorages to prevent failure or blowout of the anchor. Concrete bearing against an anchor (V-shaped region in front of an anchor) shall not be removed.

D. De-tensioning (if required): Provide protection at both ends of PT slab tendons being de-tensioned to guard against popping out of end anchorages. The release of the tendon force shall be controlled and slow and may require the use of appropriate clamping or tendon locking hardware. De-tension tendons by heating the strands with a torch over a 18 inch length minimum before cutting through the tendon. Do not de-tension the strands by saw-cutting unless approved by the Engineer. Minimize damage to existing sheathing as much as possible.

E. Safety: The contractor shall take all necessary precautions to prevent workers and public access to areas where post-tensioned slabs are being de-tensioned. Contractor shall request Owner to close public access to those areas located along the full length of tendons being de-tensioned at the floors above and below before de-tensioning any strand. The contractor shall ensure that de-tensioning operations are performed safely.

3.2 POST-TENSIONING STEEL PLACEMENT

A. Profile: Restored post-tensioning tendons shall conform to the existing as-built profile and shall have a parabolic drape. Generally, low points of the tendons are at mid-span and high points are at a column or beam supports. Place the tendons normal to anchorage plates.

B. Interference: Where interference between existing slab reinforcement and new PT hardware occurs, contact the Engineer before attempting to cut reinforcement.

C. Tolerances: Firmly support tendons and anchorages to prevent displacement during subsequent operations. In no case shall tendons violate the absolute minimum cover stated in ACI 117. Horizontal sweeps shall have minimum radius of 480 strand diameters and shall not exceed a maximum slope of 1:6. Twisting or entwining of individual tendons within a bundle is not permitted.

D. Supports: Provide a sufficient number of horizontal and vertical positioning supports to firmly support tendons to prevent displacement during stressing operations. Show all support devices on the shop drawings. Tendons can be securely tied to existing reinforcement for support.

E. Welding: Welding of cross bars or any welding in the vicinity of the tendons is not allowed. Do not use post-tensioning tendons as an electrical ground for welding operations.
F. Sheathing

1. The sheathing (new and existing) shall be continuous and fully protect repaired tendons at splice locations and locations with new anchorages.

2. After tendon repairs and prior to concrete placement, inspect the sheathing on each tendon at exposed lengths to detect possible damage. Repair any detected tears or abrasions by procedures conforming to PTI M10.3. Refer to typical details for repair of tendon sheathing. The repair of sheathing shall prevent intrusion of cement paste or loss of coating. The repair of sheathing shall also be watertight and approved by the Engineer.

G. Encapsulation: Complete the encapsulation of the post-tensioning system the same day as the tendons are repaired.

3.3 NEW ANCHORAGES

A. Attachment

1. Attach new anchorages such that the anchor is perpendicular to the tendon axis.

2. Cover: Top, bottom, and edge concrete cover for anchorages shall be not less than the specified cover for reinforcement.

B. Bursting Reinforcement:

1. Provide and install bursting reinforcement behind new anchorages as required by repair details.

3.4 CONCRETE REPAIR MATERIAL PLACEMENT

A. Placement: Place the concrete repair material in conformance with the requirements of the Specifications. Do not place the concrete repair material until the Engineer, or Independent Testing Laboratory has inspected the placement of the mild steel reinforcement and tendons. Place the concrete in such a manner as to ensure that alignment of post-tensioning tendons remains unchanged. Make special provisions to ensure proper vibration of the concrete around the anchorage plates. Monitor the tendon positioning during the concrete placement.

3.5 STRESSING

A. Methods: Perform post-tensioning by methods and related equipment that are in conformance with generally accepted systems of post-tensioning. Stressing of repaired tendons is typically performed with a center-pull stressing coupler, or at a new or existing live PT anchor as shown in Construction Drawings. Variations of such generally accepted methods and equipment will be permitted with Engineer approval, provided equal results can be obtained.

B. Concrete Repair Material Strength: Do not begin the post-tensioning operations until tests or readings have indicated that the concrete repair material in the members has attained a compressive strength that is adequate for the requirements of the anchorages but not less than
3000 psi unless otherwise specified on the Contract Drawings. If an approved rapid mortar is used, it is acceptable to use data provided by manufacturer to determine age when mortar has achieved the required strength, but this age shall not be less than 24 hours unless otherwise approved by the Engineer.

C. Equipment: Stress all tendons by means of hydraulic rams, equipped with accurate reading hydraulic pressure gauges that have been individually calibrated with a particular ram to permit the stress in the prestressing steel to be computed at any time. A certified calibration curve shall accompany each ram and gauge set. Immediately recalibrate the ram and gauge set if inconsistencies between the measured elongation and the gauge reading occur.

D. Forces: Anchor the prestressing steel at an initial or anchor force that will result in the ultimate retention of the working or effective force shown on the original drawings (if available). Jacking forces shall be those indicated on the repair drawings. Required adjustments to the stressing operation may be recommended by the Engineer.

E. Elongations: Keep records of all tendon elongations as previously described in this Section. Agreement within 15% between the gauge reading and the measured elongation and between the measured and the calculated elongation after stressing will be considered satisfactory. Deviations greater than 15% will be reported to the Engineer prior to completing stressing operation. No tensioning will be permitted until it is demonstrated that the prestressing steel is reasonably free and unbonded in the enclosure. Evidence that the steel is unbonded will be considered satisfactory if inward movement of steel is observed at one end of the tendon when a nominal pull is applied to the steel at the other end. The Engineer may order a force/elongation check at any time. Do not cut off tendons until elongation records have been reviewed and approved in writing by the Engineer.

F. Stressing Sequence: If required, the stressing sequence shall be as shown on the repair drawings.

G. Safety: Precautions shall be taken to prevent workers from standing directly behind, above or in front of the stressing rams. Contractor shall barricade all areas of the structure in the vicinity of tendons before stressing any strand. The contractor shall ensure that stressing operations are performed safely.

3.6 GROUTING ANCHORAGE RECESSES

A. Cut the tendon tails within 24 hours after the stressing records have been approved. At slab ends or expansion joints, cut off the excess strand at least 1/2 inch inside the face of the finished concrete surface, and not more than 3/4 inch from the face of the anchorage. For stressing ends located at interior areas, cut off the excess strand as required to provide adequate concrete cover to the strand. Cutting may be done by means of oxyacetylene cutting, abrasive wheel, or hydraulic shears. Do not allow the wedges to become heated.

B. Coat the anchorage recesses with an approved bonding agent and fill flush with a non-shrink, non-stain, chloride free grout compatible for use with prestressing steel or approved equal in accordance with manufacturer’s recommendations. Do not allow contamination of the anchorage recess surface that reduces the bonding capacity of the non-shrink grout.
3.7 REQUIRED INFORMATION FOR ENGINEER’S EVALUATION OF GROUND PENETRATING RADAR (GPR) RESULTS

A. The following information shall be included in the GPR scan survey report done to locate PT tendons before repairing post-tensioned members:

1. Name of project, date and physical address of the project

2. Name of the Client

3. Objective of the project (purpose of scan)

4. Plan sheets depicting a global coordinate location system (X,Y) for the general area to be demolished and local coordinate system (x,y) for individual scanned areas including referenced points and the starting point (0,0)

5. Proper identification of building elements (slab, rebar, post-tensioned tendons, conduit, etc.) including the depth from the surface. The GPR scan shall clearly identify PT tendons and distinguish them from mild reinforcement.

6. In the field, on the surface of the members to be repaired, provide a schematic layout/marking of the GPR results with dimensions (slab locations, PT tendon locations, rebar locations, etc.). In repair areas, mark the locations of PT tendons, PT anchors, and mild reinforcement. Locations of electrical conduits shall be identified and marked.

3.8 INSTALLATION SUPERVISION

A. The duties of the post-tensioning installer’s supervisor shall include:

1. Ensure that de-tensioning operations are performed in accordance with the drawings and specifications, if required.

2. Check placement of tendon and repair hardware (couplers, new anchors, etc.) before and during pouring of concrete repair material. Be present during pours and check for tendons being moved out of position.

3. Mark tendons prior to stressing and verify with the Owner’s Testing Laboratory or Engineer that all initial marks are accurate.

4. Observe that tendon elongation measurements are made and recorded by Testing Laboratory or, in the absence of a Testing Laboratory representative, measure, record and report tendon elongations after stressing and submit copy of original to Engineer.

5. Compare results of actual tendon elongations with hydraulic ram gage reading and with calculated elongation.

6. Require checking of tendon force and/or elongation if requested by the Engineer.

7. Do not allow cutting off of tendons without the Engineer’s written approval.
3.9 QUALITY ASSURANCE TESTING AND INSPECTION DURING REPAIRS

A. Review of Contract Documents and Submittals:

1. The Testing Laboratory inspector shall review and become familiar with the Repair Documents and specifications in so far as they relate to post tensioning materials, installation, and stressing.

2. [The Owner’s Testing Laboratory or Engineer of Record] shall review the mill certificates for post-tensioning steel.

B. Field Inspection Requirements: The duties and responsibilities of [the inspector for the Owner’s Testing Laboratory or Engineer of Record] shall be as follows:

1. Check the general layout, number of strands, size, spacing, and profile of post tensioning steel for conformance to the shop drawings of the Prestress Supplier and/or to the Repair Documents.

2. Inspect 100% of end and intermediate anchorages and inserts required for stressing for proper size, type, and placement.

3. Inspect for any mild steel reinforcing reinforcement required by the Prestress Supplier or Engineer near stressing anchors.

4. Perform inspection during concrete placement to observe and report any damage or misalignment of post tensioning steel and embedded anchorages.

C. Inspection during Stressing Operation: [The Owner’s Testing Laboratory or Engineer of Record] shall be continuously present during the stressing operations and shall have the following responsibilities and duties.

1. Review current calibration data on the proposed stressing equipment.

2. Ascertain that the concrete compressive strength meets the minimum required strength prior to stressing by evaluating the compressive strength properties listed in the product data sheets of the concrete repair material used.

3. Check the stressing sequence, and verify the required post tensioning forces by observing and inspecting the stressing operation and recording the following information:
   a. Floor and tendon identification numbers.
   b. Actual measured elongation for each jacking point, and totals for each tendon compared with calculated elongation provided by Engineer.
   c. Range of allowable elongations for jacking force or a measure of the deviation of the measured elongations from the calculated elongations. Deviations that do not comply with the specified tolerances shall be noted for the Engineer to review.
   d. Stressing ram number, initial and final gauge load reading during stressing for each tendon.
   e. Obvious irregularities or stress loss during anchoring procedures.
   f. Date of stressing operation and signature of the Contractor’s stressing personnel and inspector witnessing the operation.
4. Inspect for spalled concrete, broken tendons or wires, anchorage slippage, or cracks in the concrete near anchors. Immediately notify the Engineer by telephone of any "blowouts" occurring after the stressing operation. Observe the repair of any cracked or spalled concrete as recommended by the Engineer.

END OF SECTION 03 38 00
SECTION 03 31 10 – EPOXY RELATED WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Related Sections include the following:

1. Division 3 Section “Surface Preparation for Patching.”
2. Division 3 Section “Concrete Repair Materials.”

1.2 SCOPE OF WORK

A. The following epoxy related work is shown on the drawings and in this project manual:

1. Crack locations and approximate lengths of cracks for epoxy injection work.
2. Epoxy mortar patch locations and approximate sizes.
3. Epoxy bonded steel plate locations.
4. Locations requiring epoxy bonder between fresh and hardened concrete.
5. Locations requiring bolts, dowels or reinforcing steel set in epoxy.
6. Locations requiring skid-resistant surface on concrete by the use of multi-component epoxy or non-epoxy systems.
7. Locations requiring epoxy penetrant sealer.
9. Locations requiring polymer modified cementitious mortar overlay system.
10. Locations requiring epoxy resin overlay system.

These drawings are for the Contractor's guidance only, and are to be considered as a minimum for pricing. Contractor shall not do any additional work beyond what is shown in the drawings without prior written approval of the Engineer.

B. Contractor shall fully acquaint himself with the existing job site conditions and discuss the accessibility of the work areas with the Owner.

C. Contractor shall ensure that there is adequate ventilation in areas where epoxy repair work is being performed and that no work results in nauseating, annoying or toxic fumes
and odors from entering occupied areas. Provide barricades around the work area with appropriate signage to keep non-construction people from entering work area.

D. Contractor shall provide all traffic cones or barriers to direct traffic during the repair of the parking garage. This work shall be done in consultation with the Owner.

E. During the course of construction, Engineer may require certain items to be repaired by methods involving epoxies. Repairs may include epoxy injection of cracks, epoxy or polymer mortar patching, epoxy grouted dowels or reinforcing steel, and bonding fresh concrete to hardened concrete. Such work shall be done by the Contractor in strict conformance to these specifications.

1.3 QUALITY ASSURANCE

A. Applicable Standards

1. American Society for Testing and Materials (ASTM)
   
   C881 Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete

2. American Concrete Institute (ACI)
   
   ACI 503 Use of Epoxy Compounds with Concrete
   
   ACI 503.1 Standard Specification for Bonding, Hardened Concrete, Steel, Wood, Brick, and Other Materials to Hardened Concrete with a Multi-Component Epoxy Adhesive
   
   ACI 503.2 Standard Specification for Bonding Plastic Concrete to Hardened Concrete with a Multi-Component Epoxy Adhesive
   
   ACI 503.3 Standard Specification for Producing a Skid-Resistant Surface on Concrete by the Use of Multi-Component Epoxy System
   
   ACI 503.4 Standard Specification for Repairing Concrete with Epoxy Mortars
   
   ACI 548.1R Guide For Use of Polymers in Concrete

B. Manufacturer's Qualifications: Companies furnishing the epoxy materials shall have a proven track record of at least five years. Furthermore, they shall have in existence a program of training, certifying and supporting a nationally organized program of approved contractors. Evidence of this shall be made available to the Engineer/Architect upon request.

C. Contractor's Qualifications: Contractor performing the work shall be an approved contractor by the manufacturer furnishing the epoxy materials, and shall have no less than five years experience in the various types of epoxy related work required in this project.
A notarized certification from the manufacturer attesting to the training shall be submitted to the Engineer/Architect along with the proposal to do the work.

D. Injection Equipment Requirements: Injection equipment used by the Contractor shall be from a manufacturer who has been producing such equipment for a minimum of five years. Such equipment shall have a record of satisfactorily proportioning, mixing, and dispensing of the injection resin being used.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR EPOXY MATERIALS

A. All epoxy material shall be new and manufactured within the shelf life limitations set forth by the manufacturer.

B. Epoxy shall be a two-part epoxy adhesive material, and shall be of epichlorohydrin/amine type. Polysulphide epoxies are not acceptable.

C. Epoxy used shall be insensitive to the presence of water and moisture, and shall be capable of application and of strength development even when applied to damp surfaces having a temperature of 40° or above.

D. Epoxy used shall develop a minimum strength of 2000 psi in tension and 4000 psi in compression at the end of seven days.

E. Epoxies used shall not deteriorate under approximately 200 freeze thaw cycles.

F. Epoxies used shall be 100% solids without solvents.

G. With the exception of epoxy penetrant sealers, epoxies used shall be 100% solids without solvents.

H. Bonding and strength characteristics of epoxies shall be stable when exposed to ultraviolet rays.

I. The viscosity of the epoxy used for injection work shall be low enough (about 300 cps at 77°F) to completely fill hairline cracks as small as 10 mils.

2.2 ADDITIONAL REQUIREMENTS FOR EPOXY MORTARS

A. Epoxy mortar used for bonding, patching, and resurfacing, shall have the following additional properties:

1. Epoxy mortar shall be non-sagging.

2. Sand used in preparing mortar shall be graded oven dry quartzite and furnished in bags.

3. The epoxy mortar patch material shall match the existing texture and color of exposed concrete without giving a blotchy appearance. A test patch shall be applied for approval prior to final acceptance of the mortar. Size of test patch

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shall be approximately equal to the size of the average mortar patch to be used on the project.

2.3 GENERAL REQUIREMENTS FOR HIGH MOLECULAR WEIGHT METHACRYLATE SELF-PENETRATING CONCRETE CRACK FILLER AND SEALER

A. Crack filler used shall be a synthesized methacrylate monomer having high molecular weight, low viscosity and low volatility with the following properties.

1. Viscosity shall be between 15 and 30 cps Brookfield LVT W/UL adapter 50 RPM at 77°F.

2. Density shall be a minimum of 8.5 pounds per gallon at 77°F.

3. Material shall not gel under 16 hours exposure to 205°F temperature.

4. Odor should be barely perceptible.

5. Material shall cure in less than 8 hours at 75° temperature when applied to a surface.

6. Resin used shall be free of wax additives.

2.4 PRODUCTS AND MANUFACTURERS

A. Epoxy Injection Work

1. BASF: MasterInject 1380 (formerly SCB Concrese 1380) or MasterInject 1500 (formerly Concrese Standard LVI)

2. Sika Corporation: Sikadur 35 Hi-Mod LV or Sikadur 52 Injection Resin

3. Euclid Chemical: Eucopxy Injection Resin or Dural 452 LV

B. Epoxy Mortar Patch

1. BASF: MasterInject 1500 (formerly Concrese Standard LVI)

2. Sika Corporation: Sikadur 31 Hi-Mod Gel or Sikadur 35 Hi-Mod

3. Euclid Chemical: Dural 452 LV

C. Epoxy for Bonding Steel Plates

1. BASF: MasterEmaco ADH 1490 (formerly Concrese 1490) or MasterEmaco ADH 327 (formerly Concrese Paste LPL)

2. Sika Corporation: Sikadur 31 Hi-Mod Gel

3. Euclid Chemical: Euco #452 Epoxy System

D. Epoxy for Bonding Fresh Concrete to Hardened Concrete
1. BASF: MasterEmaco ADH 326 (formerly Concreitive Liquid (LPL)), MasterEmaco ADH 327 (formerly Concreitive Paste (LPL))

2. Sika Corporation: Sikadur 32 Hi-Mod

3. Euclid Chemical: Dural LPL

E. Epoxy for Grouting Bolts, Dowels or Reinforcing Steel

1. BASF: MasterEmaco ADH 326 (formerly Concreitive Liquid (LPL)), MasterEmaco ADH 327 (formerly Concreitive Paste (LPL))

2. Sika Corporation: Sikadur 31 Hi-Mod Gel, (horizontal and overhead use); Sikadur 32 Hi-Mod or Sikadur 35 Hi-Mod (vertical downhand use).

3. Euclid Chemical: Euco #452 Epoxy System or Dural LPL

F. Epoxy for Skid-Resistant Surface

1. BASF: Masterseal 350 (formerly Traffic Guard EP-35)

2. Sika Corporation: Sikadur 22 Lo-Mod

3. Neogard: 70714/70715-01

G. Epoxy Penetrant Sealer

1. BASF: MasterEmaco P 160 (formerly Nitoprim 60)

2. Sika Corporation: Sikafloor 619

3. Euclid Chemical: Euco #512 VOX

H. Polymer Modified Cementitious Mortar Overlay System


I. Epoxy Resin Floor Overlay System

1. Sika Corporation: Sikafloor Merflex 90

J. High Molecular Weight Methacrylate Self-Penetrating Concrete Crack Filler

1. BASF: MasterSeal 630 (formerly Degadeck CSP)

2. Sika Corporation: Sika Pronto 19, Crack Healer/Penetrating Sealer

3. Euclid Chemical: Dural 335

Substitutions may be considered provided complete technical information and job references are furnished to the Engineer and approved prior to commencement of work.
Changes in products required to suit temperature and environmental conditions at the time of material application shall be specified as separate line items by the Contractor showing credit or additions to the price for the various tasks.

In using the above products, follow strictly the manufacturer's specifications and directions for mixing and application. Also heed all label warnings by manufacturer. Make application in accordance with applicable safety laws.

2.5 ABRASIVE MATERIAL FOR ABRASIVE BLASTING

A. Coal slag shall be used as the blast abrasive in abrasive blasting operations.

2.6 CORROSION INHIBITING PAINT

A. Z.R.C. Cold Galvanizing Compound manufactured by ZRC Chemical Products Company, Quincy, Massachusetts.

Substitutions may be considered provided complete technical information and job references are furnished to and approved by the Engineer prior to commencement of work.

2.7 SAND

A. Sand used for spreading over a surface application of the self-penetrating concrete crack filler and sealer using high molecular weight methacrylate shall be clean, washed, and dried silica sand free from all dust, dirt and organic materials.

1. Free moisture content of the sand shall be limited to a maximum of 0.25% by weight at time of application.

2. Sand used shall be oven-dried 20-40 graded quartz sand.

3. Sand used shall be uniformly graded with 100% passing the No. 10 sieve and retained on the No. 20 sieve.

4. Contractor shall submit samples of the sand to the Owner's Testing Laboratory for acceptance testing prior to commencing work. Do not change the source of material once the material source has been found to be acceptable.

2.8 JOINT FILLER MATERIAL

A. Filler material shall have a minimum Shore A hardness of 80, or Shore D hardness of 50, and shall conform to ASTM D2240-00.


2. Sika Chemical Corporation: Sikadur 51 NS/SL.

B. Filler material shall have a minimum Shore A hardness of 35 and shall conform to ASTM D2240-00.
1. Mameco International: Vulkem 245.

Substitutions may be considered provided complete technical information and job references are furnished and approved by the Engineer prior to commencement of work.

PART 3 - EXECUTION

3.1 EPOXY INJECTION

A. Applicator's Qualifications

1. Epoxy injection work shall only be performed by contractors who have successfully used this process on at least five similar structural repairs of 1000 linear feet or longer, and which have performed successfully for a minimum period of five years.

2. Only adequately trained epoxy injection applicators shall be used on the job. Furnish certificate of training prior to commencing work.

B. Preparation

1. Before proceeding, the space in the vicinity of the crack location receiving epoxy shall be swept and be in a generally clean condition to permit proper bonding of surface seal.

2. Cracks may be dry or damp, but free of standing water and frost.

3. Entry points shall be established judiciously at a distance along the seal so that epoxy penetrates the crack completely. Spacing of entry points, however, shall be no greater than the thickness of the concrete at that location. Tighter joints will require closer spacing of entry ports.

4. Adequate surface seal shall be applied to the face of the crack between the entry points. Use masking tape at the pre-established entry points to prevent the surface sealer from sealing the entry points. Alternatively, drill and port method may be used to establish entry points. Use only rotary-percussion type drills for drilling holes. Drills shall be fitted with bits having single tooth that produce large cuttings, and hollow stem drill rods that permit simultaneous blowing of compressed air providing immediate expulsion of the cuttings from the hole. Ensure that the drilling operation does not contaminate the cracks.

5. For through cracks, surface seal shall be applied to both faces. Provide entry ports on both faces staggered with each other when the cracked concrete element is greater than 8" thick. Injection of cracks from both faces shall also be necessary when the cracks are contaminated in concrete elements equal to or less than 8" thick.

6. Pre-sealing between ports may be done using a material meeting the requirements of these specifications.
7. Allow adequate time for the surface seal material to cure before proceeding with the injection.

C. Equipment for Injection

1. Pumps used for injection shall be a positive displacement type with interlock to provide positive ratio control in proper proportions. The pumps used shall be electrically or air powered, portable and shall provide an in-line mixing and metering system for the two-component epoxy. The pressure hoses and injection nozzle shall be of such a design as to allow proper mixing of the two components of the epoxy. Dwell time in mixing head shall not exceed ten seconds.

2. The injection equipment shall have automatic pressure control, and shall be capable of injection pressures up to 300 psi to ensure complete penetration of cracks. Equipment used shall also have the capability of presetting the pressures, and shall be equipped with manual pressure control override.

3. The presence of a stand-by injection unit shall be required.

D. Crack Cleaning

1. All cracks shall be cleaned and flushed with water, and checked for port-to-port transmission.

2. All cracks shall be cleaned and flushed with water, checked for port-to-port transmission. Cracks which are contaminated with algae shall be flushed with chlorinated water mixed with copper sulphate.

3. Blow the water out of the cracks using compressed air, and allow adequate time for drying before injecting with epoxy.

4. If in the process of water flushing the cracks, the Contractor notices rust particles being flushed out with the water, or if the water has rust stains, the Engineer shall be notified prior to doing any epoxy injection work. The Engineer will then evaluate the extent of corrosion in the embedded reinforcement, and make necessary adjustments in the repair procedure. The Engineer/Owner reserves the right to either issue a change order for any additional work involved or to delete those portions of the work which show evidence of corrosion of the reinforcing steel. When work is deleted, the Contractor shall give a credit to the Owner on the basis of unit prices quoted for the project.

5. When temperature is near the freezing point of water, ensure that the crack is free of ice before doing the injection work.

E. Epoxy Injection

1. Condition epoxy materials at temperature between 65°F-80°F unless otherwise recommended by the manufacturer. Epoxies beyond this range of temperature shall not be used. Do not store epoxy (even for a short period) in direct sunlight.
2. Epoxy adhesive shall be injected into the crack at the first lower entry port with sufficient pressure to advance the epoxy to the next adjacent port. The original port shall be sealed and entry shifted to the port in which the epoxy appears. This manner of port-to-port injection shall be continued until each joint has been injected for the entire length.

3. If port-to-port travel of epoxy is not achieved, the crack shall be identified, and the Engineer notified.

4. Samples of mixed material shall be injected into a paper cup every 60 minutes to test ratio mix. These samples shall be dated and numbered and left at the sampling location until reviewed by the testing laboratory.

5. Solvents shall not be used to thin epoxy introduced into the cracks.

F. Test Cores

1. A minimum of one test core shall be taken for every 100 feet of epoxy injection work. The total number of test cores taken shall not be less than three.

2. Cores shall be 2" to 4" in diameter, taken from locations marked by the Engineer. Before taking the cores from those locations, the Contractor shall use a magnetic reinforcing bar locator or employ other procedures to ensure that the core will not cut through any reinforcing steel. Should it be determined by the Contractor that the core location marked by the Engineer will cut through the reinforcing steel or prestressing tendons, the Contractor shall notify the Engineer for selecting alternate locations.

3. The cores shall be visually inspected for penetration of epoxy in the cracks. If the penetration is less than 95%, the repair work shall be considered unsatisfactory and unacceptable.

4. In addition to the visual inspection, one third of the cores or a minimum of three cores shall be tested under compression by an independent testing laboratory employed by the Owner. The epoxy injection work shall be considered acceptable if the concrete fails prior to adhesive failure.

5. If cores indicate either lack of penetration or deficiency in bond strength under compression test, the Contractor shall re-inject or perform other remedial work acceptable to the Engineer. Engineer then reserves the right to specify and request additional core samples for inspection and compression test by the testing laboratory, the cost of which shall be borne entirely by the Contractor.

6. All test cores shall be filled completely with polymer mortar to match color, finish, and texture of existing concrete. Mortar used shall comply with the requirements of these specifications.

G. Finishing
1. Allow epoxy adhesive in the cracks to cure before removing the surface seal. Ensure that there is no drainage of epoxy from the cracks due to premature removal of surface seal.

2. The surface of the crack herein treated shall be finished flush with the adjacent concrete surfaces and shall show no indentations or evidence of port fittings.

3. All work shall be performed and conducted in a neat, orderly manner. Clean-up whatever portions of the existing structure that get soiled or stained in the process of epoxy injection work.

3.2 EPOXY MORTAR

A. Applicator's Qualifications

1. Epoxy mortar repair work shall only be performed by contractors who have successfully used this process on at least three similar structural repairs of equal scope which have performed successfully for a minimum period of five years.

2. Only adequately trained and experienced personnel shall be used on the job.

B. Surface Preparation

1. Concrete surface to which the epoxy mortar is to be applied shall be exposed parent concrete free of loose and unsound materials. Surface preparation shall be done by abrasive blasting, waterblasting or as otherwise required by the manufacturer.

2. Necessary approvals shall be obtained by the Contractor from authorizing governmental or other agencies prior to abrasive blasting. Abrasive blasting operations shall comply with the requirements of OSHA and NIOSH (National Institute for Occupational Safety and Health) Standard PB-246-697.

3. Surfaces shall be free of any deleterious materials such as laitance, dust, dirt, and oil.

4. Any exposed reinforcing steel shall also be cleaned and be free of rust and other contaminants. Cleaning shall be accomplished by mechanical means. Use powered wire brushes in locations where reinforcing steel cannot be cleaned by abrasive-blasting or water-blasting. All exposed reinforcing steel shall be coated with a corrosion inhibiting product specified elsewhere in this specification prior to mortar application.

5. Prime the cleaned surface with primer as required by the manufacturer.

C. Concrete Surface Inspection

1. Ensure that the surface temperature is at least 40°F to permit wetting of concrete surface by epoxy coating.
2. The Contractor shall evaluate the moisture content of concrete surface receiving epoxy mortar. This shall be done by determining if moisture will collect at bond lines between concrete and epoxy mortar before epoxy has cured. Evaluate this by taping a piece of polyethylene sheet to the concrete. If moisture collects on underside of the polyethylene sheet before epoxy would cure, then allow concrete to dry sufficiently to prevent the possibility of moisture between old concrete and new epoxy.

D. Mortar Application

1. Condition epoxy compound components to a temperature between 65°-80°F unless otherwise recommended by the manufacturer. Epoxies beyond this range of temperature shall not be used.

2. Stir each of the two parts of epoxy separately before mixing. Then mix in a clean container free of contaminants.

3. Thoroughly blend epoxy components and sand with Jiffy mixers (made by The Jiffy Mixer Co., Irvine, California) to a uniform and homogenous mixture. Small batches of one quart or less may be mixed by spatulas, pallette knives or similar devices.

4. Mixing should be accomplished well within the pot life of epoxy (three minutes when using jiffy mixer or five minutes when mixed by hand) after allowing for time required for application.

5. Apply mortar by trowel or other means suitable for the consistency of the epoxy-sand mortar mix.

6. Build up the repair area in layers with mortar thicknesses within those specified by the manufacturer (1/4" maximum per layer).

7. Consolidate the mortar thoroughly to remove entrapped air.

8. Finish surface of mortar to match the texture and contours of existing concrete.

9. Allow mortar to cure in accordance to manufacturers recommendations.

E. Cleanup

1. Protect surfaces surrounding the work areas against spillage.

2. Epoxy and epoxy mortar spillages shall be cleaned before they set and become difficult to remove.

3. Cleanup all portions of the existing structure that are soiled or stained in the process of epoxy mortar repair work.

3.3 EPOXY BONDING OF STEEL PLATES

A. Applicator's Qualifications
1. Epoxy bonding of steel plates shall only be performed by contractors who have had successful experience in bonding plates to concrete for three projects of similar scope, or those who have had continuous five years of epoxy application experience.

2. Only adequately trained epoxy applicators shall be used on the job. Furnish certificates of training on request.

B. Surface Preparation

1. Remove loose concrete, debris, laitance, oil, grease and other contaminants from surface receiving epoxy. All surfaces must be free of protrusions and shall be clean, sound, and free of surface water.

2. Clean concrete surface by abrasive blasting prior to applying epoxy bonder. Abrasive blasting shall take place no more than one day prior to bonding of plates.

3. The Contractor shall obtain all necessary permits from all governmental, environmental and other agencies having jurisdiction over the area where the Abrasive blasting work is to be performed. Abrasive blasting operations shall comply with the requirements of OSHA and NIOSH (National Institute for Occupational Safety and Health) Standard PB-246-697.

4. Both exterior and interior faces of the steel plate shall be abrasive blasted no more than eight hours before the application of the bonder. If evidence of oxidation exists on the plate prior to the application of the bonder, the plate shall be relced. Blast-clean carbon steel surfaces, using Steel Structures Painting Council, Surface Preparation No. 6, to give a surface condition corresponding to ASa2, BSa2, CSa2 of SSPC Vis 1, depending on the initial surface condition of the steel surface. Prior to blast-cleaning, clean surfaces to conform to SSPC SP1, SP2, and SP3, as required.

5. Remove all abrasive from work area by vacuuming or other appropriate means. Remove blast cleaning residue with compressed air from an oil-and-water-free compressed air source from both concrete and steel surfaces prior to epoxy application.

6. Supply all necessary barriers to contain abrasive within the work area. The Contractor is responsible for all damage done to automobiles parked in the garage and surrounding areas as a result of abrasive blasting, as well as to the adjacent grounds and structures.

C. Protection of Concrete Member During Curing Period.

1. The Contractor shall keep all traffic off the plated member during the curing period.

2. The Contractor shall shore each member each side of each plate to the floor below during the curing period. Extent of shoring need not exceed each end and the one quarter points of the span. Shoring extent and method shall be submitted
to the Engineer for review and approval. Unnecessary traffic and vibration shall be kept off the member during the curing period.

D. Epoxy Application

1. Mix epoxy materials in a clean container free of contaminants.

2. Condition epoxy compound materials at a temperature between 65°-80°F unless otherwise recommended by the manufacturer. Epoxies beyond this range of temperature shall not be used.

3. Thoroughly blend epoxy components with mechanical mixers to a uniform and homogenous mixture. Small batches may be mixed by spatulas, pallette knives or similar devices.

4. Mixing shall be accomplished well within the pot life of the epoxy after allowing for time required for application.

5. Apply sufficient amounts of bonder to both concrete and steel surfaces (approximately 1/16") so that when the plate is clamped to the concrete, a small amount of excess bonder is forced out of the joint area evenly. If no bonder is squeezed out of the joint area, immediately remove the plate and apply more bonder and repress against the concrete surface. Wipe off excess epoxy immediately before it begins to harden.

6. Keep the plates clamped and the concrete member protected from vibration until the epoxy bonder has cured and set. No traffic or loading shall be permitted until the curing is complete.

7. Devices or procedures used for clamping shall provide a uniform pressure across the entire plate. Submit the proposed procedure for clamping the plates to the Engineer for approval prior to commencement of work.

E. Corrosion Protection of Steel Plates

1. All exterior surfaces of steel plates epoxy bonded to the concrete shall be protected from corrosion.

2. Apply the corrosion inhibiting paint by brush, roller or aerosol spray on all exposed metal surfaces including the edges. Minimum dry film thickness of the paint shall be 1.5-2.0 mils.

F. Cleanup

1. Protect surfaces surrounding the work areas against spillage.

2. Epoxy spillages shall be cleaned before they set and become difficult to remove.

3. Cleanup whatever portions of the existing structure that are soiled or stained in the process of epoxy bonding of plates.
4. Cleanup and remove paint from whatever portion of the structure that is stained by paint beyond the steel plates.

G. Testing

1. The Engineer or Testing Laboratory shall evaluate the bonding of steel plate to concrete by tapping the steel plate with a blunt metal instrument.

2. Detection of a hollow sound in any area shall be reason to suspect inadequate bonding. Contractor shall fill in these areas with epoxy by injection procedures approved by the Engineer or shall remove and rebond the plates as directed by the Engineer.

3.4 EPOXY BONDING OF FRESH (PLASTIC) CONCRETE TO HARDENED CONCRETE

A. Applicator's Qualifications

1. Epoxy bonding of fresh concrete to hardened concrete shall only be performed by contractors who have had successful experience in bonding concrete on a minimum of three projects of similar scope.

2. Only adequately trained epoxy applicators shall be used on the job. Furnish certificates of training on request.

B. Surface Preparation

1. Remove loose concrete, debris, laitance, oil, grease and other contaminants from surface receiving epoxy. All surfaces shall be clean, sound and free of surface water.

2. Clean concrete surface by abrasive blasting prior to applying epoxy bonder. Abrasive blasting shall take place no more than one day prior to bonding fresh concrete.

3. The Contractor shall obtain all necessary permits from all governmental, environmental, and other agencies having jurisdiction over the area where the abrasive blasting work is to be performed. Abrasive blasting operations shall comply with the requirements of OSHA and NIOSH (National Institute for Occupational Safety and Health) Standard PB-246-697.

4. Remove all abrasive from work area by vacuuming or other appropriate means. Remove blast cleaning residue with compressed air from an oil-and-water-free compressed air source prior to epoxy application.

5. Provide all necessary barriers to contain abrasive within the work area. The Contractor is responsible for all damage to property or injury to people as a result of sandblasting.

C. Epoxy Application
1. Condition epoxy compound materials at a temperature between 65°-80°F unless otherwise recommended by the manufacturer. Epoxies beyond this range of temperature shall not be used.

2. Mix epoxy materials in a clean container free of contaminants.

3. Thoroughly blend epoxy components with mechanical mixers to a uniform and homogenous mixture.

4. Mixing shall be accomplished well within the pot life of the epoxy after allowing for time required for application.

5. Apply epoxy adhesive to concrete surface by brush, roller, broom, squeegee, or spray equipment. The minimum average application thickness shall be between 15-18 mils for normal weight concrete. For lightweight concrete, use a second coat of epoxy bonder having a minimum average thickness of 15 mils. Application of epoxy shall be in strict accordance with manufacturer's instructions.

6. Do not apply epoxy bonder in rain or in the presence of standing water.

7. Do not let the epoxy adhesive reach the gel stage before pouring concrete. This can be determined by checking whether the adhesive is still tacky. If the adhesive loses its tack before plastic concrete is placed, remove the epoxy by abrasive blasting or other suitable means prior to reapplying the epoxy adhesive.

8. Production, placing, consolidation and curing of new concrete shall conform to ACI 301-99 and the project specifications.

D. Cleanup

1. Protect surfaces surrounding the work areas against spillage.

2. Epoxy spillages shall be cleaned before they set and become difficult to remove.

3. Cleanup whatever portions of the existing structure that are soiled or stained in the process of applying epoxy adhesive.

E. Testing

1. The Engineer or Testing Laboratory shall evaluate bonding of fresh concrete to existing concrete after the fresh concrete has sufficiently cured.

2. The evaluation shall be performed by sounding, using one of the following, or similar, methods:
   a. Tapping fresh concrete with a blunt metal instrument.
   b. Dragging a heavy steel chain across the surface (for horizontal surfaces only).
3. Detection of a hollow sound in any area shall be reason to suspect inadequate bonding, and Contractor shall then core each such area, as required by the Engineer, to determine bonding adequacy.

4. Coring shall be through the new concrete and into the existing concrete. Core diameter shall be 4" unless specified otherwise by the Engineer. Length of cores shall be twice the core diameter, or twice the thickness of new concrete, or as specified by the Engineer.

5. Cores will be visually inspected, and further testing may be required as determined by the Engineer.

6. The cost of any repairs or replacement, and any additional cores or other testing deemed necessary by the Engineer, shall be borne by the Contractor.

3.5 EPOXY GROUTED BOLTS, DOWELS OR REINFORCING STEEL

A. Applicator's Qualifications

1. Epoxy grouting of bolts, dowels or reinforcing steel shall only be performed by contractors who have had successful experience on a minimum of three projects of similar scope.

2. Only adequately trained epoxy applicators shall be used on the job. Furnish current certificate of training on request.

B. Surface Preparation

1. All bolts, dowels and reinforcing bars shall be abrasive blasted no more than eight hours before the grouting. If evidence of oxidation exists on the surface, the bolts, reinforcing bars and dowels shall be recleaned. Blast-clean surfaces using Steel Structures Painting Council, Surface Preparation No. 6, to give a surface condition corresponding to ASa2, BSa2, CSa2 of SSPC Vis 1, depending on the initial surface condition of the steel surface. Prior to blast-cleaning, clean surfaces to conform to SSPC SP1, SP2, and SP3, as required.

2. All holes shall be clean of dust, debris, and contaminants. Use compressed air from an oil-and-water-free compressed air source prior to epoxy application.

C. Drilling Holes for Embedment

1. Use only rotary-percussion type drills for drilling holes.

2. Drills shall be fitted with bits having single tooth that produce large cuttings, and hollow stem drill rods that permit simultaneous blowing of compressed air providing immediate expulsion of the cuttings from the hole.

3. Do not cut through any reinforcing steel unless indicated otherwise on the drawings. Use small diameter exploratory holes to detect presence of reinforcing steel prior to drilling holes for grouting.
4. Core drilling equipment, and electric impact hammers or other tools which do not provide for immediate expulsion of the drill cuttings shall not be used.

5. Unless noted otherwise on the drawings, depth of holes used for embedding the bolts, bars or dowels shall be at least ten times their diameter, but not less than 6".

6. Unless noted otherwise on the drawings, depth of hole used for embedding the bolts, bars or dowels shall be at least fifteen times their diameter.

7. Unless noted otherwise on the drawings, the center to center distance between the embedded bolts, bars or dowels shall be at least twelve times their diameter.

8. Unless noted otherwise on the drawings, the edge distance shall be at least six times the diameter of the bolt, bar or dowel.

9. Hole diameter shall normally be 1/4" larger than the outside diameter of the embedded item. In no case shall the hole diameter be 3/8" larger than the diameter of the embedded item.

D. Epoxy Application

1. Condition epoxy compound materials at a temperature between 65°-80°F unless otherwise recommended by the manufacturer. Epoxies beyond this range of temperature shall not be used.

2. Mix epoxy materials in a clean container free of contaminants.

3. Thoroughly blend epoxy components with mechanical mixers to a uniform and homogenous mixture. Mix small batches (up to 1 quart) by use of spatulas, pallette knives, or similar devices. Take care to use proper proportions of the epoxy components when using small batches.

4. Mixing shall be accomplished well within the pot life of the epoxy after allowing for time required for application.

5. Partially fill the hole with epoxy. Then insert the bolt, dowel or reinforcing bar into the hole such that the resin material oozes out around the embedded item, ensuring complete contact. Twist the bolt, dowel or bar slightly as it is inserted in the hole to ensure complete contact.

6. As an alternative to inserting the embedded item after the epoxy is poured in the hole, the bolt, dowel, or bar may be positioned in the hole and filled up with epoxy by hand caulking guns or injected with an in-head mixing equipment. In either case, the nozzle shall be provided with a hose or tube of sufficient length to reach the bottom of the hole being filled.

7. Where the holes are horizontal or overhead, the opening shall be covered by a masking or a duct tape. Make a split in the tape and insert the epoxy injection tube through the split. Fill hole completely with epoxy and then insert the embedded item through the split tape. Amount of epoxy should be such that a
small amount of material oozes through the split. Twist the bolt, dowel or bar slightly as it is inserted in the hole to ensure complete contact.

8. Do not apply epoxy in the rain or in the presence of standing water.

E. Cleanup

1. Protect surfaces surrounding the work area against spillage.

2. Epoxy oozed out from the holes and spillages shall be cleaned before they become difficult to remove.

3. Cleanup whatever portions of the existing structure are soiled or stained in the process of grouting the bolts, dowels or reinforcing bars.

F. Testing

1. The Owner's Testing Laboratory shall evaluate the effectiveness of grouting the bolts, dowels, or reinforcing bars by conducting field proof tests. The load test method shall be submitted to the Engineer for review and approval.

2. Field proof test 10% of the grouted bolts, dowels or bars, with a minimum of two tests.

**OR**

3. Field proof test 25% of the grouted bolts, dowels or bars.

**OR**

4. Field proof test 50% of the grouted bolts, dowels or bars.

5. The Engineer may elect to increase or decrease the number of tests depending upon the outcome of the tests.

6. The proof load shall be 85% of the theoretical ultimate strength of the bolt, dowel or bar or as otherwise determined by the Engineer. Any slip of the embedded bolt, dowel or bar within the epoxy grout material, or slip at the epoxy/concrete interface before the bolt, dowel or bar yields shall be considered to be a failure of the grouted item.

7. The cost of any repairs failing to meet the proof load and all additional tests deemed necessary by the Engineer shall be borne by the Contractor.

3.6 EPOXY FOR PRODUCING SKID RESISTANT SURFACE ON CONCRETE

A. Applicator's Qualifications

1. Work requiring epoxy application for producing skid resistant surfaces on concrete shall only be performed by contractors who have had successful experience in applying epoxy on at least three projects of similar scope.
2. Only adequately trained epoxy applicators shall be used on the job. Furnish certificates of training on request.

B. Surface Preparation

1. Remove loose concrete, debris, laitance, oil, grease and other contaminants from surface receiving epoxy. All surfaces shall be clean, sound, and free of surface water.

2. Clean concrete by mechanical abrasion such as abrasive blasting, scarifying, or waterblasting and as required by the manufacturer.

3. The Contractor shall obtain all necessary permits from all governmental, environmental and other agencies having jurisdiction over the area where the mechanical abrasion work is to be performed. Abrasive blasting operations shall comply with the requirements of OSHA and NIOSH (National Institute for Occupational Safety and Health) Standard PB-246-697.

4. Where abrasive blasting is used, all abrasive shall be removed from the work area by vacuuming or other appropriate means. Remove blast cleaning residue with compressed air from an oil-and-water-free compressed air source prior to epoxy application.

5. Provide all necessary barriers to contain the abrasive material within the work area. The Contractor is responsible for all damage to property or injury to people as a result of mechanical abrasion process.

C. Epoxy Application

1. Condition epoxy compound material to be at a temperature between 65°-80°F unless otherwise recommended by the manufacturer. Epoxies beyond this range of temperature shall not be used.

2. Stir each of the two parts of epoxy separately before mixing. Then mix the two parts in a clean container free of contaminants.

3. Thoroughly blend epoxy components with mechanical mixers to a uniform and homogenous mixture.

4. Mixing shall be accomplished well within the pot life of the epoxy after allowing for time required for application.

5. Apply epoxy adhesive to concrete surface by brush, roller, broom, squeegee, or spray equipment. The minimum average application thickness shall be between 50-70 mils. Application shall be in strict accordance to manufacturer's instructions.

D. Skid-Resistant Aggregate Application: Apply the skid-resistant aggregate while the epoxy coating is still fluid at the rate of 11-13 pounds per square yard. The aggregate shall be spread uniformly over the entire surface of the concrete.
E. Cleanup

1. Protect surfaces surrounding the work area against spillage.

2. Epoxy spillages shall be cleaned before they set and become difficult to remove.

3. Cleanup whatever portions of the existing structure that are soiled or stained in the process of applying epoxy adhesive.

F. Testing

1. The Testing Laboratory shall evaluate that the thickness of the epoxy adhesive and the amount of skid-resistant aggregate complies to the specifications.

2. The Testing Laboratory shall perform pullout tests on the cured skid-resistant surface. The rate of testing shall be one test for every 1000 square feet of surface area, with a minimum of three tests. The pullout strength (tested in accordance with Appendix A of ACI 503 R-93) shall be at least 100 psi. All failures shall be in the concrete. Any failure that occurs in the adhesive shall be cause for rejection of the coating application.

3. The cost of replacement and any retesting required by the Engineer shall be borne by the Contractor.

3.7 EPOXY PENETRANT SEALER

A. Applicator’s Qualifications

1. Work requiring epoxy penetrant sealer on concrete surfaces shall only be performed by contractors who have had successful experience in applying epoxy on at least three projects of similar scope.

2. Only adequately trained epoxy applicators shall be used on the job. Furnish certificates of training on request.

B. Surface Preparation

1. Remove loose concrete, debris, laitance, oil, grease and other contaminants from surface receiving epoxy. All surfaces shall be clean, sound, and free of surface water.

2. Clean concrete by mechanical abrasion such as abrasive blasting or waterblasting.

3. The Contractor shall obtain all necessary permits from all governmental, environmental and other agencies having jurisdiction over the area where the mechanical abrasion work is to be performed. Abrasive blasting operations shall comply with the requirements of OSHA and NIOSH (National Institute for Occupational Safety and Health) Standard PB-246-697.

4. Where abrasive blasting is used, all abrasive shall be removed from the work area by vacuuming or other appropriate means. Remove blast cleaning residue with
compressed air from an oil-and-water-free compressed air source prior to epoxy application.

5. Provide all necessary barriers to contain the abrasive material within the work area. The Contractor is responsible for all damage to property or injury to people as a result of mechanical abrasion process.

C. Epoxy Application

1. Temperature of the epoxy must be above 50°F for mixing.

2. Stir each of the two parts of epoxy separately before mixing. Then mix the two parts in a clean container free of contaminants.

3. Thoroughly blend epoxy components using a Jiffy mixer (made by the Jiffy Mixer Co., Irvine, California) powered by a low-speed (300-600 rpm) electric drill for at least three minutes.

4. When mixing has been completed, cover mixed epoxy penetrant sealer container and allow a reaction time as required by the manufacturer before applying.

5. Apply the epoxy penetrant sealer when the surface temperature of concrete is at least 40°F with brush, roller or spray equipment. All spray equipment must employ traps to prevent water and oil from contaminating the sealant. Two applications are required at the following rates:

   First application: 200-300 sqft/gallon
   Second application: 250-300 sqft/gallon

The second coat shall be applied as soon as the first coat is tack-free. If a surface film develops on the concrete, the application rate should be reduced. (Second coat is not needed with Sikagard 619 when applied at the rate of 300 sqft/gallon.

D. Cleanup

1. Protect surfaces surrounding the work area against spillage.

2. Epoxy spillages shall be cleaned before they set and become difficult to remove.

3. Cleanup whatever portions of the existing structure that are soiled or stained in the process of applying the epoxy penetrant sealer.

E. Testing: The Testing Laboratory shall monitor the rate of application of the epoxy penetrant sealer.

3.8 HIGH MOLECULAR WEIGHT METHACRYLATE SELF-PENETRATING CONCRETE CRACK FILLER AND SEALER

A. Applicator's Qualifications
1. Work requiring self-penetrating crack filler and sealer on concrete shall only be performed by contractors who have had successful experience in applying the methacrylate sealer on at least three projects of similar scope.

2. Only adequately trained applicators shall be used on the job. Furnish certificates of training on request.

B. Surface Preparation

1. Remove loose concrete, debris, laitance, oil, grease and other contaminants from surface and cracks receiving sealer. All surfaces shall be clean, sound, and free of surface moisture.

2. Clean concrete by mechanical abrasion such as abrasive blasting.

3. The Contractor shall obtain all necessary permits from all governmental, environmental and other agencies having jurisdiction over the area where the mechanical abrasion work is to be performed. Abrasive blasting operations shall comply with the requirements of OSHA and NIOSH (National Institute for Occupational Safety and Health) Standard PB-246-697.

4. Where abrasive blasting is used, all abrasive shall be removed from the work area by vacuuming or other appropriate means.

5. Remove blast cleaning residue with compressed air from an oil-and-water-free compressed air source prior to self-penetrating crack filler and sealer application. Surface receiving sealer shall be dry, and all cracks shall be free of standing water. Blow cracks clean with compressed air prior to sealer application.

6. All spalls in concrete in the area scheduled to receive the methacrylate sealer shall be repaired using polymer concrete mortar patch prior to sealer application.

7. Temporarily plug all existing drains with rubber plugs or other suitable material to prevent the sealer from getting into the drains.

8. Protect expansion joints from being covered by methacrylate material. All expansion joints which get accidentally covered with the sealer shall be cleaned immediately. All damaged joints shall be repaired or replaced as directed by the Engineer at no cost to the Owner.

C. Methacrylate Application

1. Do not schedule methacrylate sealer work if there is forecast of rain within twelve hours, or if the ambient temperature is expected to fall below 45°F temperature during application or within twelve hours after application of the sealer.

2. Stir each of the two parts of sealer separately before mixing. Then mix the two parts in a clean container free of contaminants.
3. Condition sealer materials at a temperature between 65°-80°F unless otherwise recommended by the manufacturer in writing. Methacrylate materials beyond this temperature range shall not be used.

4. Thoroughly blend the methacrylate components using a Jiffy mixer (made by the Jiffy Mixer Co., Irvine, California) powered by a low-speed (300-600 rpm) electric drill for five to seven minutes until the liquid clears.

5. Apply the material on horizontal surfaces with roller or squeegee at the rate of approximately 130 square feet per gallon. The concrete substrate must be at a temperature of at least 45°F. Material shall be allowed to pond over cracks. After penetration into the substrate and cracks, remove excess material.

6. Application of sealer shall proceed in an orderly manner in widths between 6 to 10 feet across the length of the work. Overlap shall be kept to a minimum with no overlap exceeding 6 inches.

7. Follow additional directions for surface preparation and application given in the manufacturer's printed technical specifications which are not included in these specifications. The Contractor shall have these specifications with him at the job site prior to start of the work.

8. Apply second coat of methacrylate sealer at the rate of 200 square feet per gallon in the same orderly manner as used for the first coat.

9. Spread sand by mechanical means over the surface treated by the methacrylate sealer at a rate of 0.50 pounds per square yard of surface area. Sand shall be broadcast within 15 to 35 minutes following the application of the sealer. Sand shall be spread over the width which coincides with the width of the methacrylate sealer. Sand spreader equipment used shall be operated at speeds which will eliminate sand drifts and spread the sand uniformly over the treated area. Excess sand shall be removed completely from the untreated area by brooming or other means prior to application of the methacrylate sealer.

10. Protect sand covered area by covering with a polyethylene sheet. No vehicular traffic shall be allowed on the surface until the methacrylate sealer has cured.

11. Remove all loose sand from the slab prior to opening the area for traffic.

D. Test Area

1. See the drawings for location and size of test area.

2. Contractor shall use the same workers, and materials for applying the methacrylate sealer and the sand to the test area as for the rest of the work. Method of surface preparation and application shall be in strict accordance to these specifications and the manufacturer's printed directions.

3. Contractor shall inform the Owner, Testing Laboratory, Engineer regarding the schedule for performing the work in the test area. It is mandatory that the
manufacturer's representative be also present during the application of the material in the test area.

4. The Testing Laboratory and the Contractor shall accurately record the quantity of material used and calculate the rate of coverage. Adjustments shall be made immediately, and the size of test area increased accordingly to apply material at the rate given in the specifications.

5. Provide a watertight dam around the test area capable of holding at least 3 inches of water for 48 hours. Fill with water and mark the level. Ensure that there is no leakage around the perimeter of the dam. Leave the water standing in the test area for 48 hours. Cover area with polyethylene sheet to prevent evaporation.

6. The Testing Laboratory shall measure water level after 48 hours, and also check soffit of slab under test area for evidence of leaks. If no leak is observed, the methacrylate sealer application shall be considered acceptable and the Contractor shall proceed with the work.

7. If leaks are observed, do not proceed with the rest of the work.

E. Cleanup

1. Protect surfaces surrounding the work area against spillage.

2. Sealer spillages shall be cleaned before they set and become difficult to remove.

3. Cleanup whatever portions of the existing structure that are soiled or stained in the process of applying the methacrylate sealer.

F. Testing: The Testing Laboratory shall perform the following work:

1. Check the materials to ensure that they conform to the specifications.

2. Review the storage facility and the temperature at which the material is stored.

3. Review the surface preparation to ensure that the surface is clean as required in the specifications.

4. Review mixing and application procedures.

5. Test sand to ensure that it complies with the specifications.

6. Review procedures for application of sand to ensure that the rate of coverage is in accordance to the specifications.

3.9 POLYMER MODIFIED CEMENTITIOUS MORTAR OVERLAY SYSTEM

A. Applicator's Qualifications

1. Mortar overlay system work shall only be performed by contractors who have successfully used this process on at least three similar structural repairs of equal scope which have performed successfully for a minimum period of five years.
2. Only adequately trained and experienced personnel shall be used on the job.

B. Surface Preparation

1. Concrete surface to which the mortar is to be applied shall be exposed parent concrete free of loose and unsound materials. Surface preparation shall be done by using a scabbler. Obtain a surface profile having a minimum amplitude of ± 1/16".

2. Surface shall then be swept clean or vacuumed to clear off debris and dust.

3. Wash surface with water and brush with hard broom to remove all contaminants and oil drippings. Oil and grease spots shall be removed by using a detergent, and then scrubbing with a power brush or a hard broom. Remove all residue by washing and brushing with water.

4. Surface then shall be wet vacuumed to remove excess water.

5. Surface to be prepared shall be wetted prior to and during scarification by a scabbler to minimize the creation of dust.

6. Provide adequate barricades around the work area to prevent injury to people around the work area from flying debris.

7. Ensure that all edges, corners, areas adjacent to columns, walls and doors are satisfactorily prepared as described above. Use small pneumatic bush-hammer or single-head scabbler for preparing such areas.

8. Any exposed reinforcing steel shall also be cleaned and free of rust and other contaminants. Cleaning shall be accomplished by mechanical means. Use powered wire brushes or abrasive-blasting. All exposed reinforcing steel shall be coated with a corrosion inhibiting product specified elsewhere in this specification prior to mortar application.

C. Concrete Surface Inspection

1. Ensure that the surface and ambient temperature is at least 45°F and rising at the time of application.

2. Inspect surface for loose aggregate and concrete particles. Remove all loose concrete.

3. Inspect surface for cracks. All cracks shall be rebonded prior to application of the overlay system.

D. Crack Repair

1. Rebond cracks using epoxy injection procedures given elsewhere in these specifications.

** OR **
2. Rebond cracks using self-penetrating concrete crack filler and sealer using high molecular weight methacrylates. Procedures for filling cracks are given elsewhere in these specifications.

** OR **

3. Rebond cracks using both epoxy injection and self-penetrating concrete crack filler and sealer using high molecular weight methacrylate procedures. See drawings for areas requiring the different methods of repair.

E. Mortar Application

1. Condition polymer mortar material to 65°F-80°F unless otherwise recommended by the manufacturer. Materials beyond this range of temperature shall not be used.

2. Mix the two components in a clean mortar mixer free of contaminants as recommended by the manufacturer.

3. Thoroughly blend components and aggregates with Jeffy mixers (made by The Jeffy Mixer Co., Irvine, California) to a uniform and homogenous mixture.

4. Mixing should be accomplished within three minutes when using Jiffy mixer.

5. Dampen the surface of concrete receiving the mortar by a portable sprayer just prior to mortar application. The surface shall be saturated surface dry with no standing water.

6. Set the screed to the proper overlay thickness. See drawings for required overlay thickness. Contractor shall use only power vibrating screeds with metal edges to obtain a smooth wet finish.

7. Spread mortar uniformly on the damp surface by broom. Scrub into substrate filling all pores and voids.

8. Consolidate the mortar thoroughly to remove entrapped air.

9. After screeding, wait for a few minutes as recommended by the manufacturer such that the mortar has a desired stiffness. Wait time depends on the ambient temperature and temperature of the applied material. Then finish by power trowel. Small, difficult to reach areas may be finished by hand troweling. Use water from a portable sprayer during the troweling process.

** OR **

10. After screeding, wait for a few minutes as recommended by the manufacturer such that the mortar has a desired stiffness. Wait time depends on the ambient temperature and temperature of the applied material. Then apply a broom finish on the surface parallel to the direction of flow of traffic.

F. Compressive Strength Test Cubes
1. The Testing Laboratory retained by the Owner shall take a minimum of one set of four cube compressive strength test samples to be tested in accordance with ASTM C-109-99 (modified) for every 10 cubic feet of mortar used in overlay or part thereof in a day's work.

2. Test one cube after 24 hours, second cube after 72 hours (3 days), third cube after 14 days, and fourth cube after 28 days.

G. Joints in Overlay System

1. All joints in the original surface or floor shall be reproduced in the overlay. Provide any additional joints shown in the drawings.

2. Joints in the overlay shall be produced by saw-cutting.
   a. Make saw cut as soon as overlay is able to support weight of workers and sawing equipment without damage to finish surface of overlay.
   b. All joints shall be continuous across the overlay. Do not offset or stagger joints.
   c. Width of saw cut shall be 1/4". Saw cut shall be made through the full thickness of the overlay.

H. Joint Filler Material

1. Joint filler material shall be scheduled to be applied in the last week of the construction work.

2. Joint filler material shall be applied immediately after the sawcut is made. However, a week prior to completion of the entire work, reinspect the joints. Repair and refill any joints that show gaps or tears.

3. Clean joint thoroughly prior to filling the joint. There shall be no water in the joint at the time of filler application.

4. Fill joint with filler material having a Shore A hardness of 80.

** OR **

5. Fill joint with filler material having a Shore A hardness of 35.

6. Condition the joint material at a temperature between 65°-80°F unless otherwise recommended by the manufacturer. Joint material beyond this range shall not be used.

7. Follow strictly the manufacturer's recommended procedures for applying the joint filler.

I. CURING
1. Cure finished surface by applying a fine mist spray of water over the finished surface. Alternatively, cover with wet burlap. Solvent type curing compounds shall not be used on the overlay system.

2. Curing shall start immediately after the finishing work is completed.

3. Overlay shall be maintained in a moist condition for a minimum of 24 hours.

4. Overlay shall be maintained in a moist condition for a minimum of 72 hours.

5. Protect overlay work from rain and freezing conditions. Contractor shall ensure that the overlay is protected by proper insulation in the event freezing conditions are expected during the curing period.

J. CLEANUP

1. Protect surfaces surrounding the work areas against spillage.

2. Mortar and joint filler material spillage shall be cleaned before they set and become difficult to remove.

3. Cleanup all portions of the existing structure that are soiled or stained in the process of mortar repair work.

K. OVERLAY SERVICE

1. Protect overlay from foot and vehicular traffic as well as equipment loads during the curing period, or until the overlay mortar has attained a compressive strength of 4,000 psi.

2. Strength shall be determined from cube compressive strength tests performed in accordance to ASTM C-109-99 (Modified).

3.10 EPOXY RESIN FLOOR OVERLAY SYSTEM

A. Applicator's Qualifications

1. Work requiring epoxy resin floor overlay system on concrete shall only be performed by contractors who have had successful experience in applying epoxy overlay systems on at least three projects of similar scope which have performed successfully for a minimum period of five years.

2. Only adequately trained epoxy applicators shall be used on the job. Furnish certificates of training on request.

B. Surface Preparation

1. Remove loose concrete, debris, laitance, oil, grease and other contaminants from surface receiving epoxy. All surfaces shall be clean, sound, and free of surface water.
2. Clean concrete by mechanical abrasion such as abrasive blasting, shotblasting, scarifying, waterblasting or as required by the manufacturer. Remove all projections and rough spots to achieve a level clean surface.

3. The Contractor shall obtain all necessary permits from all governmental, environmental and other agencies having jurisdiction over the area where the mechanical abrasion work is to be performed. Abrasive blasting operations shall comply with the requirements of OSHA and NIOSH (National Institute for Occupational Safety and Health) Standard PB-246-697.

4. Where abrasive blasting is used, all abrasive shall be removed from the work area by vacuuming or other appropriate means. Remove blast cleaning residue with compressed air from an oil-and-water-free compressed air source prior to epoxy application.

5. Provide all necessary barriers to contain the abrasive material within the work area. The Contractor is responsible for all damage to property or injury to people as a result of mechanical abrasion process. Wet surface during the surface preparation process to minimize the creation of dust. Alternatively, use equipment designed to perform abrasive blasting and vacuuming operations simultaneously which eliminates dust.

6. Any exposed reinforcing steel shall also be cleaned and free of rust and other contaminants. Cleaning shall be accomplished by mechanical means. Use powered wire brushes or abrasive-blasting. All exposed reinforcing steel shall be coated with a corrosion inhibiting product specified elsewhere in this specification prior to epoxy application.

C. Concrete Surface Inspection

1. Ensure that the surface and ambient temperature is at least 45°F and rising at the time of application.

2. Inspect surface for loose aggregate and concrete particles. Remove all loose concrete.

3. Inspect surface for cracks. All cracks shall be rebonded prior to application of the overlay system.

D. Crack Repair

1. Rebond cracks using epoxy injection procedures given elsewhere in these specifications.

** OR **

2. Rebond cracks using self-penetrating concrete crack filler and sealer using high molecular weight methacrylates. Procedures for filling cracks are given elsewhere in these specifications.

** OR **
3. Rebond cracks using both epoxy injection and self-penetrating concrete crack filler and sealer using high molecular weight methacrylate procedures. See drawings for areas requiring the different methods of repair.

E. Epoxy Primer Application

1. Condition epoxy compound material to be at a temperature between 65°-80°F unless otherwise recommended by the manufacturer. Epoxies beyond this range of temperature shall not be used.

2. Stir each of the two parts of epoxy separately before mixing. Then mix the two parts in a clean container free of contaminants.

3. Thoroughly blend epoxy components for 3 minutes with mechanical mixers having a speed of 400-600 rpm to a uniform and homogenous mixture.

4. Mixing shall be accomplished well within the pot life of the epoxy after allowing for time required for application.

5. Apply epoxy adhesive to concrete surface by brush, roller, broom, or squeegee. The minimum average application thickness shall be between 150-250 square feet per gallon. Application shall be in strict accordance to manufacturer's instructions.

F. Epoxy Mortar Application

1. Mix epoxy in the same manner as described above for epoxy primer.

2. While mixing the epoxy components, slowly add 5 parts by loose volume of oven-dried quartz sand to 1 part of the mixed epoxy material, and mix until uniform in consistency.

3. Place epoxy mortar before primer becomes tack free.

4. Place epoxy mortar with trowel. Compact and trowel with vibrating screed having metal edges. Set the screed for proper overlay thickness. See drawings for areas requiring overlay and overlay thickness required.

5. Finish overlay surface with finishing trowel or other mechanical means.

6. Allow epoxy mortar to cure in accordance to manufacturer's recommendations.

G. Compressive Strength Tests

1. The Testing Laboratory retained by the Owner shall take a minimum of one set of four cube compressive strength test samples to be tested in accordance with ASTM C-109-99 (Modified) for every 1000 square feet of epoxy overlay work or part thereof in a day's work.

2. Test one cube after 24 hours, second cube after 72 hours (3 days), third cube after 7 days, and fourth cube after 28 days.
H. Seal Coat: Allow the overlay system to reach sufficient cure so as not to be damaged by foot traffic (minimum compressive strength 2,000 psi). Then apply a top seal coat of neat epoxy over the epoxy mortar overlay by means of a roller or flat squeegee. Method of mixing the seal coat epoxy resin and its rate of application shall be the same as that of the epoxy primer.

I. Joints in Overlay System

1. All joints in the original surface or floor shall be reproduced in the overlay. Provide any additional joints shown in the drawings.

2. Joints in the overlay shall be produced by saw-cutting.
   a. Make saw cut as soon as overlay is able to support weight of workers and sawing equipment without damage to finish surface of overlay.
   b. All joints shall be continuous across the overlay. Do not offset or stagger joints.
   c. Width of saw cut shall be 1/4". Saw cut shall be made through the full thickness of the overlay.

J. Joint Filler Material

1. Joint filler material shall be scheduled to be applied in the last week of the construction work.

2. Joint filler material shall be applied immediately after the sawcut is made. However, a week prior to completion of the entire work, reinspect the joints. Repair and refill any joints that show gaps or tears.

3. Clean joint thoroughly prior to filling the joint. There shall be no water in the joint at the time of filler application.

4. Fill joint with filler material having a Shore A hardness of 80.

** OR **

5. Fill joint with filler material having a Shore A hardness of 35.

6. Condition the joint material at a temperature between 65°-80°F unless otherwise recommended by the manufacturer. Joint material beyond this range shall not be used.

7. Follow strictly the manufacturer's recommended procedures for applying the joint filler.

K. Testing

1. The Testing Laboratory shall evaluate that the rate of coverage of the epoxy adhesive and the thickness of the overlay complies to the specifications.
2. The Testing Laboratory shall perform pullout tests on the cured overlay surface prior to applying the seal coat. The rate of testing shall be one test for every 1000 square feet of surface area, with a minimum of three tests. The pullout strength (tested in accordance with Appendix A of ACI 503 R-93) shall be at least 100 psi. All failures shall be in the concrete. Any failure that occurs in the adhesive shall be cause for rejection of the overlay system.

3. The cost of replacement and any retesting required by the Engineer shall be borne by the Contractor.

4. Repair all tested areas in the same manner as the overlay system application.

L. Cleanup

1. Protect surfaces surrounding the work area against spillage.

2. Epoxy spillages shall be cleaned before they set and become difficult to remove.

3. Cleanup whatever portions of the existing structure that are soiled or stained in the process of applying epoxy adhesive.

END OF SECTION 033110
SECTION 05 01 10– STEEL FIELD RE-COATING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

A. Furnish all labor, materials, services, equipment and appliances required in conjunction with or related to the re-coating of concealed structural steel lintels.

B. Furnish all labor, materials, services, equipment and appliances required in conjunction with or related to the re-coating of exposed structural steel architectural features.

1.3 QUALITY ASSURANCE

The Contractor is responsible for quality control, including workmanship and materials furnished by his subcontractors and suppliers.

A. Codes and Standards: Comply with provisions of following, except as otherwise indicated. Certain sections in this specification contain requirements that are more restrictive and/or different than contained in the standards listed. In such cases, the requirements of this specification shall control.


1.4 SUBMITTALS

A. Product Data: Submit producer's or manufacturer's specifications and installation instructions for following products; include laboratory test reports and other data to show compliance with specifications (including the specified standards):

1. Structural steel protective paint system, including primer, intermediate, and finish products.

B. Qualification Data:

1. Submit qualification data for firms and persons specified in Article 1.04 “Qualifications” to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of engineers and owners, and other information specified.
1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to site at such intervals to ensure uninterrupted progress of work.

B. Furnish all fuel, maintenance, and equipment required for hoisting and placement of materials under this contract.

PART 2- PRODUCTS

2.1 PRODUCTS, MANUFACTURERS, AND SUBSTITUTIONS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified.

2. Products: Subject to compliance with requirements, provide one of the products specified.

B. Refer to Division 01 60 00 for substitution requirements.

2.2 MATERIALS

A. Exposed Structural Steel Features

1. Approved Products:


      Primer Coat: Series 27 F. C. Typosy Polyamide Epoxy
      Intermediate Coat: Series 66 Hi-Build Epoxide
      Finish Coat: Series 73 Endurashield

2.3 SURFACE PREPARATION

A. Specification: Surface preparation, paint, and painting practices shall conform to the "Steel Structures Painting Manual", Volumes 1 and 2, as published by the Society for Protective Coatings (formerly the Steel Structures Painting Council (SSPC)).

Unless recommended otherwise by primer manufacturer, minimum level of clean for existing steel surfaces shall be SSPC-SP 6/NACE No. 3, “Commercial Blast Cleaning”.

B. Surface Preparation and Coating Coordination:

1. Surface Preparation: Prepare the surface of all structural steel specified to be field painted as required by the paint manufacturer or the Society for Protective Coatings specifications, followed by a high pressure water wash at all areas with
a minimum 3000 – 5000 lbs. psi at the tip at a rate of 3 – 5 gallons per minute, utilizing an orbital tip. Finish with a clean water rinse.

2. Primer Coat: Apply a test patch to confirm compatibility of primer with existing coating systems prior to applying primer to all cleaned surfaces. Allow primer to dry one week before testing adhesion.

Immediately after surface preparation, apply primer to all structural steel specified to be field primed in strict accordance with manufacturer’s instructions and the Society for Protective Coatings specifications. Apply paint at a rate to conform to the manufacturer’s written instructions to achieve minimum dry film thickness given above. Use coating methods that result in full coverage of joints, corners, edges, welds, and all exposed surfaces.

3. Intermediate Coat: Coordinate primer coat requirements with intermediate coat requirements, including minimum cure time and any between-coat surface preparation. The primer coat selected must be compatible with any specified intermediate and/or finish coats.

4. Finish Coat: Coordinate intermediate coat requirements with finish coat requirements, including minimum cure time and any between-coat surface preparation. The intermediate coat selected must be compatible with any specified finish coats.

Where structural steel is exposed, the finish coat color shall be per Owner’s selection from coating manufacturer’s standard colors.

PART 3 - EXECUTION

3.1 APPLICATION

A. Steel Field Re-coating:

1. Steel surfaces to be coated shall be clean, i.e. devoid of grease, oil, mill scale, oxidation, loosely adherent rust, paint, etc.
2. Clean steel surfaces as specified above.
3. Mix different coatings per manufacturer’s directions.
4. Use air spray, 1/4-inch synthetic woven nap rollers, or high quality natural bristle brushes to apply coatings.
5. Prepare surfaces and apply specified primer paint. Apply coating by brush or spray at sufficient wet film thickness to achieve a minimum dry film build as given above, using manufacturer’s recoat time directions.
6. Apply intermediate coat (if specified) at sufficient wet film thickness to achieve a minimum dry film build as given above.
7. Apply specified finish coat. Apply coating by brush or spray at sufficient wet film thickness to achieve a minimum dry film build as given above.
8. The Contractor shall ensure that, at the substantial completion of the project, all structural steel required to be painted shall have all necessary steel surfaces painted (including touch-up painting as required) to prevent corrosion bleeding.
B. Clean Up: Clean up all debris caused by the Work of this Section, keeping the premises neat and clean at all times.

END OF SECTION 05 01 10
SECTION 07 18 00 – TRAFFIC COATINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes traffic coatings for the following applications:

1. Vehicular traffic.

B. Contractor shall fully acquaint himself with the existing job site conditions and discuss the accessibility of the work areas with the Owner.

C. Contractor shall provide all traffic cones, barriers, signage, flagmen, and any other traffic control devices required to direct traffic during the surface preparation and installation of the traffic coating. This work shall be done in consultation with the Owner.

D. Contractor shall implement necessary containment measures to prevent damage from:

1. Surface preparation, including but not limited to, grinding, scraping, shot blasting, resurfacing, and concrete repair;

2. Overspray, from mixing of materials, roller mist, striping, and other airborne materials that could damage adjacent property, and/or vehicles on remaining on the parking garage.

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. ASTM C 957 Standard Specification for High-Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane With Integral Wearing Surface


5. ASTM D 4258 Standard Practice for Surface Cleaning Concrete for Coating

6. ASTM D 4259 Standard Practice for Abrading Concrete

B. International Concrete Repair Institute (ICRI)

1. ICRI 310 Selecting and Specifying Concrete Surface Preparation
1.4 INFORMATION SUBMITTALS

A. Make submittals in accordance with requirements of Division 01 and as specified in this Section.

B. Product Data: For each component in the selected system and any accessory products selected for use in performing the specified work.

C. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors, textures, and patterns available for each type of product indicated.

D. Samples for Verification: For each type of traffic coating required, prepared on rigid backing and of same thickness and material indicated for the Work.
   1. Provide one 1-foot by 1-foot stepped samples on backing large enough to illustrate build-up of traffic coatings for each duty grade to be applied.

E. Material Test Reports: From a qualified independent testing agency indicating and interpreting test results for compliance of traffic coatings with requirements, based on comprehensive testing of current product formulations within the last three years including the following information:
   1. Static coefficient of friction shall meet minimum requirements of American with Disabilities Act (ADA)
   2. Flash point of each component 200 °F (93°C) maximum.

F. Material Certificates: Signed by manufacturer certifying that traffic coatings comply with requirements, based on comprehensive testing of current product formulations within the last three years.

G. Maintenance Data: To include in maintenance manuals specified in Division 01. Identify substrates and types of traffic coatings applied. Include recommendations for periodic inspections, cleaning, care, maintenance, and repair of traffic coatings.

H. Certification that products and installation comply with applicable EPA, OSHA, and VOC requirements regarding health and safety hazards.

I. Quality Control Procedures: Traffic coating manufacturer shall submit written quality control plan to Engineer for acceptance 30 days prior to construction for application procedures which specifically address the following items:
   1. Surface preparation acceptance criteria.
   2. Crack detailing recommendations.
   3. Method of application of coats.
   4. Primer type and application rate.
   5. For each coat, wet mils required to obtain specified dry thickness. Traffic coating system dry mil thickness excluding aggregate.
   6. Number and type of coats.
7. Quality control plan for assured specified uniform traffic coating thickness that employs grid system of sufficiently small size to designate coverage area. Average specified wet mil thickness of not less than 90% of average acceptable thickness.
8. Type, gradation and aggregate loading required for each coat.
9. Maximum and minimum allowable times between coats.
10. Temperature, humidity and other weather constraints. Specify substrate moisture testing criteria.
11. Final cure time before resumption of parking and/or paint striping.


1.5 ACTION SUBMITTALS

A. Shop Drawings: Show extent of each traffic coating. Include details for treating substrate joints and cracks, flashings, deck penetrations, termination conditions, and other defects on concrete surface. [Include layout of traffic striping and markings.]

B. Provide plan for each Phase of the work, noting extents of work area for each Phase, and temporary traffic flow during the work.


D. Proposed method and details for treatment of cracks.

1.6 QUALITY ASSURANCE

A. Installer (Applicator) Qualifications: An experienced applicator who has specialized in installing work similar in material, design, and extent to that indicated for this Project and who is certified by manufacturer.

1. Certification: Written approval or license of applicator by traffic coating manufacturer. Show evidence of minimum 10 projects completed by applicator over previous 5 years using submitted system.

B. Source Limitations: As follows:

1. Use traffic coatings of a single manufacturer.

2. Obtain primary traffic coating materials, including primers, from traffic coating manufacturer. Obtain secondary materials including aggregates, sheet flashings, joint sealants, and substrate repair materials of type and from source recommended by traffic coating manufacturer.

C. Fire-Test-Response Characteristics: For traffic coatings as follows:

1. Fire-response testing was performed by UL, ITS, or another independent testing and inspecting agency that is acceptable to authorities having jurisdiction and that performs testing and follow-up services.
2. Provide materials identical to those of traffic coatings tested according to ASTM E 108 for deck type and slopes indicated and that comply with requirements for roof-covering Class indicated.

D. Mockups: Engineer will select one representative surface for each traffic coating and each substrate to receive traffic coatings. Apply each coating to at least 200 square feet (18.6 square meter) of each substrate to demonstrate surface preparation, joint and crack treatment, thickness, texture, color, and standard of workmanship.

1. Remove and reapply mockups until they are approved by Owner, Engineer and Manufacturer.

2. Keep approved mockups undisturbed during construction as a standard for judging completed traffic coatings. Undamaged mockups may be incorporated into the Work.

3. Before installing traffic coatings, meet with representatives of authorities having jurisdiction, manufacturer's technical representative, Owner, Engineer, consultants, independent testing agency, and other concerned entities. Review requirements for traffic coatings. Notify participants at least seven days before conference.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages and containers with seals unbroken and bearing manufacturer's labels showing the following information:

1. Manufacturer’s brand name.
2. Type of material.
3. Directions for storage.
4. Date of manufacture and shelf life.
5. Lot or batch number.
6. Mixing and application instructions.
7. Color.

B. Store materials in a clean, dry location protected from exposure to direct sunlight. In storage areas, maintain environmental conditions within range recommended in writing by manufacturer.

1.8 PROJECT CONDITIONS

A. Environmental Limitations: Apply traffic coatings within the range of ambient and substrate temperatures recommended in writing by manufacturer. Do not apply traffic coatings to damp or wet substrates, when temperatures are below 40°F (4°C) for a period of 24 hours, when relative humidity exceeds 85%, or when temperatures are less than 5°F (3°C) above dew point. In addition, do not apply the traffic coating when substrate temperature approaches the critical temperature that will create out gassing. Consult traffic coating manufacturer for special instructions during cold and hot weather installations.
1. Do not apply traffic coatings in snow, rain, fog, or mist, or when such weather conditions are imminent during the application and curing period. Apply only when frost-free conditions occur throughout the depth of the substrate.

1.9 WARRANTY

A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Special Warranty: Written warranty, signed by traffic coating manufacturer agreeing to repair or replace traffic coatings that do not comply with requirements or that deteriorate during the specified warranty period. Warranty does not include deterioration or failure of traffic coating due to unusual weather phenomena, failure of prepared and treated substrate, formation of new substrate cracks exceeding 1/16 inch (1.5 mm) in width, fire, vandalism, or abuse by snowplow, maintenance equipment, and truck traffic.

1. Deterioration of traffic coatings includes, but is not limited to, the following:

   a. Adhesive or cohesive failures.
   b. Abrasion or tearing failures.
   c. Surface crazing or spalling.
   d. Intrusion of water, oils, gasoline, grease, salt, deicer chemicals, or acids into deck substrate.
   e. Abrasion or tear failure resulting from normal traffic use.
   f. Corrosion staining from the aggregate.

C. Warranty Period: Five years from date of acceptance of work, jointly executed by Manufacturer and Applicator.

D. If material surface shows any of defects listed above, supply labor and material to repair all defective areas and to repaint all damaged line stripes.

E. Perform any repair under this guarantee at no cost to Owner.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

A. Physical Requirements: Provide traffic coatings complying with ASTM C 957.

B. Material Compatibility: Provide joint sealants, primers; base, intermediate, and top coats; and miscellaneous materials that are compatible with one another and with substrate under conditions of service and application, as demonstrated by the manufacturer based on testing and field experience.

C. Primer: Required. Manufacturer's standard factory-formulated primer recommended for substrate and conditions indicated.
D. Recoating Complete System: Provide complete traffic coating system with all the components specified, including all waterproofing and wearing courses.

E. Recoating Partial System: Provide Intermediate and top coat layers for the specified system. Locally repair basecoat where required.

2.2 HEAVY DUTY POLYURETHANE TRAFFIC COATING SYSTEM

A. Additional Requirements

1. Total System shall be 52 Dry Mils (1321 microns) Minimum
2. Verify material coverage with product manufacturer taking into consideration the aggregate type, substrate and environmental conditions
3. Color to be selected by Owner representative

B. Acceptable Systems

1. BASF: MasterSeal Traffic 2500 Heavy Duty Traffic System
   a. Primer: MasterSeal P 255
   b. Basecoat: Masterseal M 265
   c. Intermediate Coating: MasterSeal TC 275
   d. Top Coat: Masterseal TC 295

2. Sika: Sikalastic 720/745 AL Heavy Vehicular Traffic System
   a. Primer: Sikalastic FTP
   b. Basecoat: Sikalastic 720 Urethane
   c. Intermediate Coating: Sikalastic 745 AL
   d. Top Coat: Sikalastic 745 AL

3. Neogard: Auto-Gard FC Heavy Duty System
   a. Primer: 7780/7781
   b. Basecoat: FC7500/FC7960
   c. Intermediate Coating: FC7510/FC7961
   d. Top Coat: FC7540/FC7964

2.3 ACCESSORY MATERIALS

A. Aggregates

1. Rounded, washed, clean, and dry 12/20 grade sand free of Iron ore or metal fragments and with +6.5 on Mohs scale. Approved aggregate shall be:
PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Applicator present, for compliance with requirements and for other conditions affecting performance of traffic coatings. All high points, holes, aggregate popouts, ridges, rough surfaces and other miscellaneous defects shall be corrected as acceptable to Engineer prior to installation of traffic coating system at no additional cost to the Owner.

1. Verify compatibility with and suitability of substrates.

2. Begin coating application only after minimum concrete curing and drying period recommended by traffic coating manufacturer has passed, after unsatisfactory conditions have been corrected, and after surfaces are dry.

3. Verify that substrates are visibly dry and free of moisture. Test for moisture by plastic sheet method according to ASTM D 4263 at every 2500 square feet (230 square meter) of surface area and provide report to Engineer unless manufacturer requires more stringent requirements.

4. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Clean and prepare substrates according to manufacturer's written recommendations to produce clean, dust-free, dry substrate for traffic coating application.

B. Mask adjoining surfaces not receiving traffic coatings, deck drains, and other deck substrate penetrations to prevent spillage, leaking, and migration of coatings. [Remove expansion joint cover plates and doorway thresholds where possible prior to coating application.]

C. Concrete Substrates:

1. Typical System Preparation: Mechanically abrade concrete surfaces to a uniform CSP-4 profile according to ASTM D 4259. Do not acid etch.

2. Remove grease, oil, paints, and other penetrating contaminants from concrete.

3. Remove concrete fins, ridges, and other projections.

4. Remove laitance, glaze, efflorescence, curing compounds, concrete hardeners, form-release agents, and other incompatible materials that might affect coating adhesion by shotblasting.

5. Remove remaining loose material to provide a sound surface, and clean surfaces according to ASTM D 4258.

6. Resurface where required shall include a step by step procedure recommended by Manufacturer and approved by Engineer.
3.3 TERMINATIONS AND PENETRATIONS

A. Prepare vertical and horizontal surfaces at terminations and penetrations through traffic coatings and at expansion joints, drains, and sleeves according to ASTM C 1127 and manufacturer's written recommendations.

B. Provide sealant cants at penetrations and at reinforced and non-reinforced deck-to-wall butt joints.

C. Terminate edges of deck-to-deck expansion joints with preparatory base-coat strip.

D. Install sheet flashings at deck-to-wall expansion and dynamic joints, and bond to deck and wall substrates according to manufacturer's written recommendations.

3.4 JOINT AND CRACK TREATMENT

A. Prepare, treat, rout, and fill joints and all random cracks in substrates according to ASTM C 1127 and traffic coating manufacturer's written recommendations. Before coating surfaces, remove dust and dirt from joints and cracks according to ASTM D 4258.


2. All random cracks on concrete surface less than 1/32 inch (0.8 mm) wide shall receive detail coat unless a more stringent treatment is required by manufacturer.

3. Rout and seal random cracks, construction joints and control joints prior to installation of primer and base coat.

4. Mask off adjoining surfaces not to receive traffic coating and mask off drains to prevent spillage and migration of liquid materials outside coating area. Provide neat lines at terminations.

B. Crack preparation including installation of joint sealant material, where required, is incidental to traffic coating work and shall be installed flush with adjacent surfaces.

3.5 TRAFFIC COATING APPLICATION

A. Apply traffic coating material according to ASTM C 1127 and manufacturer's written recommendation. Utilize a Jiffy paddle for mixing each of the coats and mix it at the rate recommended by Manufacturer. Do not introduce air into the product during the mixing process.

1. Start traffic coating application in presence of manufacturer's technical representative.

2. Verify that wet film thickness of each component coat complies with traffic coating requirements. Coating applications that are too thick shall be recoated with the correct mil thickness and sand aggregate broadcasted in accordance to the specified system at no cost to the Owner.
3. Apply traffic coatings to prepared wall terminations and vertical surfaces to height indicated and omit aggregate on vertical surfaces.

4. Installation shall include the following steps:
   a. Existing Coating Removal
   b. Surface preparation
   c. Resurfacing (if applicable)
   d. Crack detail
   e. Prime coat
   f. Base coat
   g. Aggregate coat
   h. Aggregate
   i. Top Coat
   j. Aggregate

5. Install a trial section of traffic coating system for each duty grade specified. Do not proceed with further installation until trial section is accepted in writing by Engineer. Remove and replace rejected trial sections with acceptable application.

6. All adjacent vertical surfaces shall be coated with traffic coating minimum 4 inches (100 mm) above coated horizontal areas or as otherwise indicated on the drawing details. Requirement includes, but is not limited to columns, walls, pipes, curbs, (full height of vertical faces of all curbs including top of curbs) and islands.

   B. Apply traffic paint for striping and other markings with mechanical equipment to produce uniform straight edges. Apply at manufacturer's recommended rates for a 15 mil (381 microns) minimum wet film thickness.

   1. Paint shall be applied in two minimum two coats unless the manufacture has more stringent requirements.

3.6 CURING AND PROTECTING

   A. Cure traffic coatings according to manufacturer's written recommendations. Prevent contamination and damage during application and curing stages.

   B. Mask off adjoining surfaces not to receive traffic coating and mask off drains to prevent spillage and migration of liquid materials outside membrane area. Provide neat/straight lines at termination of traffic coating.

   C. Protect traffic coatings from damage and wear during remainder of construction period.

   D. All debris shall be removed from site prior to commencement of coating installation. Contractor shall clean the traffic coating membrane in case it gets dirty as a result of any additional repair work.
3.7 FIELD QUALITY CONTROL

A. Responsibilities

1. Manufacturer’s Responsibility: Manufacturer’s field representation shall be responsible for periodically performing quality control reviews when required by Part 1 “Quality Assurance” in the Specification Section.

2. Contractor’s Responsibility: Contractor is responsible for performing continuous field quality control during the progress of work.

B. Minimum Quality Control Requirements

1. The Contractor shall perform all manufacturer’s recommended and required field quality control procedures to ensure proper preparation and application of the coating system.

2. The Contractor shall coordinate with the Manufacturer to ensure the manufacturer provides a qualified representative on site for the duration of the work.

3. The Contractor shall employ surface profile comparators in general conformance with ICRI 310 “Selecting and Specifying Concrete Surface Preparation” to verify the required surface profile has been achieved for all concrete surfaces to receive traffic coating.

4. The Contractor shall employ environmental and substrate monitoring of temperature, dew point temperature, and relative humidity during mixing and application of the coatings.

5. The Contractor shall establish a uniformly gridded area to monitor application rate.

6. The Contractor shall employ wet mil gage testing in general conformance with ASTM D 4414 Method A during initial application each day for each coat, except aggregate extended coats, to establish application rate for monitoring purposes.
   a. Where the substrate roughness changes, based on ICRI CSP values additional wet mil testing shall be performed to establish local application rates for monitoring purposes.

C. The Contractor shall monitor application rate utilizing the gridded area to ensure proper coating thickness application.

3.8 FIELD QUALITY ASSURANCE

A. Responsibilities

1. Owner’s Responsibility
   a. Owner shall retain the Testing Agency under separate contract in accordance with the referenced building code for the project.
   b. Cost associated with retesting shall be paid for by the Owner.
   c. Testing Agency shall be an agency acceptable to the Owner and Engineer.
2. Contractor’s Responsibility
   
a. It is the Contractors responsibility to request and schedule all testing required by this Section.

b. Schedule all testing with the Owner’s Testing Agency at least 7 days prior to performing the work.

c. Notify Owner and Engineer of work schedule at least 7 days in advance.

d. When the Testing Agency reports testing or inspection results that are not in conformance with the project requirements or manufacturer’s requirements the Engineer and Owner reserve the right to amend the rate of testing, amend the rate of inspections, request additional testing, and request additional inspections.
   
1) Contractor shall reimburse the Owner for the cost of all re-testing, re-inspection, additional testing, and additional inspections.

2) The cost of repair, rework, and/or replacement shall be shall be borne by the Contractor.

3. Testing Agency’s Responsibility
   
a. Testing Agency is responsible for conducting, monitoring, and reporting results of all tests required under this Section.

b. Testing Agency has authority to reject materials and work not meeting Specifications.

B. Inspections

1. Testing Agency shall periodically inspect on site materials for general conformance to the project documents and manufacturer’s instructions.

2. Testing Agency shall periodically inspect prepared and cleaned surfaces that are ready for coating application. Note areas that do not meet the surface preparations requirements of the project documents.

3. Testing Agency shall employ coverage rate calculations to monitor coating mil thickness during application of each layer. The Contractor shall establish a uniformly gridded area of application and provide the square footage of each area to the Testing Agency. The Contractor shall measure the volume in gallons of coating material applied within each uniformly gridded area and provide the number of gallons applied to the Testing Agency. Calculation of mil thickness shall be as follows:

   a. Manufacturer’s required dry mil thickness for each layer equals coating percent solids by volume from manufacturers published test data for each layer times 1600 square feet times measured number of gallons applied within the gridded area per uniformly gridded area of application. When the manufacturer does not specify a dry mil thickness requirement then the percent solids by volume shall be taken as 100% and the required wet mil thickness shall be used.
b. The calculated mil thickness shall be within 10% of the required mil thickness specified by the manufacturer’s data for each layer of the specified coating system.

C. Testing

1. Testing Agency shall at the direction of the Engineer sample materials delivered to Project site. Samples shall be identified, sealed, and certified in presence of Contractor. Testing Agency shall perform tests for characteristics specified, using applicable referenced testing procedures or, if not referenced, using tests cited in manufacturer’s product data.

2. Testing Agency shall employ wet mil gage testing to monitor wet mil application thickness of each layer of the coating system, except aggregate extended coats, at one spot per every 2000 square feet in conformance with ASTM D 4414 Method A. Perform no less than three reading per spot, discarding any unusually high or low gage readings. Average of the acceptable gage readings shall be recorded as the spot measurement.

3. Testing Agency shall perform three adhesion tests for every 25,000 square feet of coating installed per ASTM D 7234. Acceptable tensile stress criterion is 200 psi for each test. Report individual readings and mode of failure to Engineer. Contractor shall repair test areas per manufacturer’s instructions at no additional cost to Owner. Contractor to coordinate location of testing with Testing Agency and Owner.

END OF SECTION 07 18 00
SECTION 07 92 00 – JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the provisions of all labor, materials, supervision and incidentals required to install joint sealants and associated materials.

B. Contractor shall fully acquaint himself with the existing job site conditions and discuss the accessibility of the work areas with the Owner.

C. Contractor shall ensure that there is adequate ventilation in areas where repair work is being performed and that no work results in nauseating, annoying or toxic fumes and odors from entering occupied areas. Provide barricades around the work area with appropriate signage to keep non-construction people from entering work area.

D. Contractor shall provide all traffic cones or barriers to direct traffic during the repair of the facility. This work shall be done in consultation with the Owner.

1.3 REFERENCES

A. Applicable Standards:


1.4 INFORMATION SUBMITTALS

A. Make submittals in accordance with requirements of Division 01 and as specified in this Section.

B. Product Data: Product data sheets, Material Safety Data Sheets/Safety Data Sheets (MSDS/SDS), and installation instructions for each product proposed for use on the project.

C. Material Certificates: Where product data does not indicated material compatibility of independent products that form a system assembly; provide a written statement of material compatibility from the system assembly manufacturer. System assembly shall include:

1. Substrate Cleaning Solvents
2. Backer Materials
3. Primers
4. Sealant Materials

D. Environmental Certification:

1. Certification that products and installation comply with applicable EPA, OSHA, and VOC requirements regarding health and safety hazards.
2. Certification that products and installation comply with applicable CEPA, CCOHS, and VOC requirements regarding health and safety hazards.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project Site in original unopened containers, or bundles with labels informing about manufacturer, product name and designation, color, expiration period for use, pot life, curing time and mixing instructions for multicomponent materials.

B. Store and handle materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.6 PROJECT CONDITIONS

A. Environmental Conditions: Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturers.
2. When joint substrates are wet due to rain, frost, condensation or other causes.
3. Joint Width Conditions: Do not proceed with installation of joint sealants when joint widths are less than allowed by sealant manufacturer for application indicated.

1.7 QUALITY ASSURANCE

A. Single Source Responsibility for Joint Sealant Materials: Obtain joint sealant materials from a single manufacturer for each different product required. Provide one year warranty on installation and materials.

B. Contractor's Qualifications: Contractor performing the work shall be an approved contractor by the manufacturer furnishing the materials, and shall have no less than three years experience in related work required in this project. Upon request by the Engineer, a notarized certification from the manufacturer attesting to the training shall be submitted to the Engineer/Owner.
PART 2 - PRODUCTS

2.1 JOINT SEALANTS

A. General requirements for traffic grade Polyurethane Sealants

1. Primer: Provide type recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealant-substrate and field tests.

2. Self-leveling polyurethane sealants require tooling in accordance with project details.

3. Compounds used for sealants shall not stain concrete or masonry. Aluminum pigmented compounds not acceptable.

4. The color of sealants shall match adjacent surfaces.

B. Polyurethane Sealant For Horizontal, Non-Cove Joints: Two-component, non-sagging, polyurethane based, elastomeric sealant meeting the requirements of ASTM C920, Type M, Grade P, Class 25, Use T.

1. BASF Construction Chemicals
   a. Primer: MasterSeal P 173
   b. Sealant: MasterSeal SL 2

2. Sika Corporation
   a. Primer: Sikaflex 260, 429 or 449
   b. Sealant: Sikaflex-2c NS TG

C. Polyurethane Sealant For Vertical Joints And Cove Joints: Two-component, non-sagging, polyurethane based, elastomeric sealant meeting the requirements of ASTM C920, Type M, Grade NS, Class 25 Use T.

1. BASF Construction Chemicals
   a. Primer: MasterSeal P 173
   b. Sealant: MasterSeal NP 2

2. Sika Corporation
   a. Primer: Sikaflex 260, 429 or 449
   b. Sealant: Sikaflex-2c NS

2.2 ACCESSORY PRODUCTS

A. Cleaners for Nonporous Surfaces: Provide non-staining, chemical cleaner of type acceptable to manufacturer of sealant and sealant backing materials which are not harmful to substrates and adjacent nonporous materials.
B. Backer Materials

1. General: Provide sealant backings of material and type which are non-staining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

2. Plastic Foam Joint-Fillers: Preformed, compressible, resilient, non-waxing, non-extruding strips of plastic foam of material indicated below, and of size, shape and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

3. Backer Rod: Non-gassing, closed-cell polyethylene foam, unless otherwise indicated, subject to approval of sealant manufacturer.

4. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing bond between sealant and joint filler or other materials at back surface of joint. Provide self-adhesive taper where applicable.

C. Masking Tape: Provide non-staining, non-absorbent type compatible with joint sealants and to surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Require installer to inspect joints indicated to receive joint sealants for compliance with requirements for joint configuration, installation tolerances and other conditions affecting joint sealant performance. Obtain installer's written report listing any condition detrimental to performance of joint sealant work. Do not allow joint sealant work to proceed until unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturers and the following requirements:

1. Remove all foreign material from joint substrates which could interfere with adhesion of joint sealant, including dust; paint, except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer; oil; grease; waterproofing; water repellents; water; surface dirt and frost.

2. Clean concrete, substrate surfaces, by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.

3. Remove laitance from concrete.
B. Joint Priming: Prime all joint substrates where indicated or where recommended by joint sealant manufacturer based on preconstruction joint sealant-substrate tests or prior experience. Apply primers to areas of joint sealant bond. Do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces which otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint sealant manufacturers' printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.

B. Elastomeric Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:

1. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths which allow optimum sealant movement capability.

2. Do not leave gaps between ends of joint-fillers.

3. Do not stretch, twist, puncture or tear joint-fillers.

4. Remove absorbent joint-fillers which have become wet prior to sealant application and replace with dry material.

5. Install bond breaker tape between sealants and joint-fillers, compression seals or back of joint where required to prevent third-side adhesion of sealant to back of joint.

D. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration and providing uniform, cross-sectional shapes and depths relative to joint widths which allow optimum sealant movement capability. Do not smear sealant onto adjacent surfaces.

E. Tooling of Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants in concave joint configuration per ASTM C 1193, unless otherwise indicated to form smooth, uniform beads of configuration indicated, to eliminate air pockets and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents which discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
3.4 PROTECTION AND CLEANING

A. Protect joint sealants during and after curing period from contact with contaminating substances or from damage resulting from construction operations. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately and reseal joints with new materials to produce sealant installations with repaired areas indistinguishable from original work.

B. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by the manufacturer of the sealants and of the products used in the joints.

END OF SECTION 07 92 00
SECTION 07 95 13 – EXPANSION JOINTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Contractor shall fully acquaint himself with the existing job site conditions and discuss the accessibility of the work areas with the Owner.

B. Contractor shall provide all traffic cones or barriers to direct traffic during the repair of the facility. This work shall be done in consultation with the Owner.

1.3 SUBMITTALS

A. Product Data: For each product indicated.

B. An expansion joint system is detailed on Drawings. Shop drawings shall include temperature adjustment table with expansion joint opening calculated at 10°F increments. Shop drawing submittal shall show that proposed joint system is of similar gland configuration, capable of equal individual and combined movements in each direction when installed at designated temperature shown on drawings.

C. Where installation temperature is other than specified temperature, submittal shall include calculations showing joint is capable of movement within design temperature range (supplied by Engineer) for “other” temperature, and that design and installation follow manufacturer’s recommendations. Design temperature range is -30°F to +130°F. Material samples.

D. Installation plans and large scale details. Show all conditions including, but not limited to, splices, terminations, and change in section or alignment.

E. Field samples of premolded joint sealant. Width, thickness and durometer hardness of sealant shall be checked by Testing Agency. Upward buckling caused by joint gap closure shall be limited to a maximum of ¼ inch per ADA Guidelines.

F. Other information required to define joint placement or installation.

H. Quality Assurance – Contractor setting expansion joint opening will require a temperature adjustment table to properly size joint gap at time of concrete pour or precast erection.

I. Caution – The expansion joint movement capability and the actual joint gap movement may not coincide if Quality Assurance measure not followed.

J. Submit test reports from accredited laboratory attesting to joint systems’ movement capability and ADA compliance.

K. Submit three copies of System Maintenance Manual.

1.4 QUALITY ASSURANCE

A. Manufacturer/Applicator: Review and approve all details before construction. Confirm in writing to Engineer/Architect.

B. Applicator: Coordinate services with related Work including layout of joint system and approval of methods for providing joints.

C. Applicator: Inspect site to insure proper joint configuration in field.

D. Testing Agency at owner’s expense shall check Shore A hardness in accordance with ASTM D2240 and ensure the limited upward buckling of \( \frac{1}{4} \) inch or less.

E. Manufacturer: Provide qualified representative for periodic inspection of Work.

F. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings."

1. Manufacturer: Provide qualified representative on site for duration of work.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages and containers with seals unbroken and bearing manufacturer's labels showing the following information:

1. Manufacturer's brand name.
2. Type of material.
3. Directions for storage.
4. Date of manufacture and shelf life.
5. Lot or batch number.
6. Mixing and application instructions.
7. Color.

B. Store materials in a clean, dry location protected from exposure to direct sunlight. In storage areas, maintain environmental conditions within range recommended in writing by manufacturer.

1.6 PROJECT CONDITIONS
A. Environmental Limitations: Install expansion joint systems within the range of ambient and substrate temperatures recommended in writing by manufacturer.

1.7 WARRANTY

A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

1. Special Warranty: Written warranty, signed by expansion joint manufacturer agreeing to repair or replace expansion joint systems that do not comply with requirements or that deteriorate during the specified warranty period.

B. Warranty Period: Five years from date of acceptance of work, jointly executed by Manufacturer and Applicator.

C. If material surface shows any of defects listed above, supply labor and material to repair all defective areas and to repaint all damaged line stripes.

D. Perform any repair under this guarantee at no cost to Owner. Revise subparagraph below to suit Project

E. Snowplows, vandalism, abnormally abrasive maintenance equipment, and studded snow tires are not normal traffic use and are exempted from warranty.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General:


2. Surfaces accessible to pedestrian traffic: anti-slip construction.

3. Material shall be applied in lengths no shorter than 20 ft, with no joints in the drive aisle.

B. Elastomeric concrete edged, extruded rubber expansion joint sealant system. Acceptable systems:

1. Wabo®Crete II Membrane System—ME Series by Watson Bowman - BASF
2. Thermaflex Membrane/Nosing System, Type TCR Series by Emseal
3. ZB Series by Construction Specialties

PART 3 - EXECUTION

3.1 EXAMINATION
A. Inspect surfaces to receive Work and report immediately in writing to Engineer any deficiencies in surface which render it unsuitable for proper execution of Work.

B. Coordinate and verify that related Work meets following requirements:
   1. Concrete surfaces are finished as acceptable for system to be installed.
   2. Curing compounds used on concrete surfaces are compatible with Work to be installed.
   3. Concrete surfaces have completed proper curing period for system selected.
   4. Joint Sealants are compatible with traffic toppings.

C. Acid etching: Prohibited.

D. All openings to occupied space shall be sealed to prevent cleaning materials, solvents and fumes from infiltration. All protective measures and/or ventilating systems required to prevent infiltration are incidental to this Work.

3.2 PREPARATION

A. General Contractor: Correct unsatisfactory conditions in manner acceptable to installer before installing expansion joint system. All honeycombs and air voids in blockouts shall be patched as acceptable to Engineer prior to installation of Expansion Joint Sealant system.

B. Coordinate expansion joint system with other related Work before installation of expansion joint.

C. Check adhesion to substrates and recommend appropriate preparatory measures.

D. Proceed with expansion joint system only after unsatisfactory conditions have been corrected in manner acceptable to installer and product manufacturer.

E. Clean joints thoroughly in accordance with manufacturer's instructions to remove all laitance, unsound concrete and curing compounds which may interfere with adhesion.

F. Cease installation of expansion joints under adverse weather conditions, or when temperatures are outside manufacturer's recommended limitations for installation.

G. Prepare for installation of extruded expansion joint systems in accordance with manufacturer's recommendations.

H. Cease installation if expansion joint blockouts and/or openings exhibit cracked edges, voids or spalls. Repair with accepted material prior to installation of expansion joint.

I. Check elevations on each side of expansion joint gap utilizing metal straight edge to ensure flush slab-to-slab transition. Present discrepancies to Engineer/Architect.

J. Check anticipated or actual minimum and maximum joint openings with Engineer. Compare to manufacturer’s movement specifications and make joint sizing recommendations.
3.3 INSTALLATION

A. During months when historic mean daily temperature at Project is 20° F. or more colder than annual mean daily temperature, premolded sealant shall be installed on temporary basis to prevent hot weather buckling. Permanent installation shall be done in summer when Engineer/Architect directs.

B. Install extruded expansion joint system in accordance with manufacturer's instructions.

C. Areas adjacent to the joint must be masked with tape to assure clean joint lines.

D. In-place testing: Prior to opening to traffic, test joint seal for leaks with maintained continuously wet for 12 hrs. Repair leaks revealed by examination of seal underside. Repeat test and repairs until all leaks stopped for full 12 hrs.

3.4 CLEANING

A. Clean off excess material and material smears adjacent to joints as work progresses using methods and materials approved by manufacturers.

3.5 PROTECTION

A. Protect the Expansion Joint System during construction. Heavy construction vehicles will not be permitted to cross the joint without specific and written permission by the Engineer. Subsequent damage to the expansion joint system shall be repaired at the contractor’s expense.

END OF SECTION 07 95 13
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 Contractor 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 Constructio 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’s 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, 3.06 ENDORSEMENT NAMING JURISDICTION AS AN ADDITIONAL INSURED / CANCELLATION AND MATERIAL CHANGE/ GOVERNMENTAL IMMUNITIES
ENDORSEMENT: Replace first sentence under E. with the following: If allowed, as specified in Section 1070, 3.02 Insurance Requirements A., all liability policies purchased in the Jurisdiction’s name shall include a Governmental Immunities Endorsement, pursuant to Iowa Code Section 670.4, which endorsement shall include the following provisions:
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.

   A. 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.
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.

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.

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.

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.

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.

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

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

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.

B. REINFORCEMENT: Add the following second sentence: All reinforcement for cast-in-place structures shall be epoxy coated.

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 BOLTSAND 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.”
LID SHALL BE USED FOR TYPE E, TYPE F, AND TYPE G APPLICATIONS AS REFERENCED BY SUDAS FIGURE 6010.602.

RAISED LETTERS FLUSH WITH TOP SURFACE

IT IS IN OUR HANDS

PROTECT OUR WATER

RAISED LETTERS FLUSH WITH TOP SURFACE

LETTERED "USA" OR "MADE IN USA"

PICKHOLES

MATERIAL: CAST GRAY IRON ASTM A-48, CLASS 350
FINISH: NO PAINT

TITLE:
STORM SEWER LID
FOR THE CITY OF DES MOINES, IOWA