CONTRACT DOCUMENTS
FOR
ANN ARBOR DDA
PARKING STRUCTURES RESTORATION 2021

Date: May 20, 2021

ANN ARBOR DOWNTOWN DEVELOPMENT AUTHORITY
150 South Fifth Avenue, Suite 301
Ann Arbor, Michigan 48104
PROJECT MANUAL
FOR:
Ann Arbor DDA
Parking Structures Restoration 2021

Ann Arbor, Michigan

BY: WGI, Inc.
5136 Lovers Lane
Kalamazoo, MI 49002

WGI PROJECT NO. 24205511.01

DATE: May 20, 2021
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END OF SECTION 00 0110
SECTION 00 1116 - INVITATION TO BID

1.1 Project Information

A. Notice to Bidders: Qualified bidders are invited to submit bids for Project as described in this Document according to the Instructions to Bidders.


1. Project Location: Ann Arbor, Michigan.

C. Owner: Ann Arbor Downtown Develop Authority
   150 South Fifth Street, Suite 301
   Ann Arbor, MI 48104.

   1. Owner's Representative: Ms. Jada Hahlbrock, Manager of Parking Services

D. Engineer: WGI, Inc. is the lead designer, references to "Architect" within the project specifications will generally refer to WGI, Inc.

E. Project Description: Project primarily consists of concrete repairs and waterproofing at the Fourth & Washington, Fourth & William, and Ann Ashley Parking Structures. Project work is shown on the drawings, and includes, but is not limited to:

   1. Horizontal, vertical, and overhead concrete repairs
   2. Masonry repairs
   3. Joint sealant replacement and installation
   4. Expansion joint repair
   5. Installation of deck coating recoat and epoxy broadcast systems
   6. Staining of concrete and masonry surfaces
   7. Painting of metal surfaces
   8. Plumbing repairs
   9. Miscellaneous electrical repairs
  10. Paint pavement markings

F. Construction Contract: Bids will be received for the following Work:

   1. General Contract (all trades).

1.2 Bid Submittal and Opening

A. Owner will receive electronic bids until the bid time and date at the e-mail addresses indicated below. Owner will consider bids prepared in compliance with the Instructions to Bidders issued by Owner, and delivered as follows:

   1. Bid Due Date: June 10, 2021
   2. Bid Time: 10:00 a.m., local time.
   3. E-mails: Jada Hahlbrock
      Ann Arbor Downtown Development Authority
      JHahlbrock@a2dda.org
      And
B. The Owner reserves the right to reject any or all Bids and to waive any informality of irregularity in the Bidding. The Owner also reserves the right to delete any item or portion of the work.

1.3 Bid Security

A. Bid security shall be submitted with each bid in the amount of 5 percent of the bid amount. No bids may be withdrawn for a period of 60 days after opening of bids. Owner reserves the right to reject any and all bids and to waive informalities and irregularities.

1.4 Prebid Conference

A. A virtual prebid conference for all bidders will be held at 9:00 AM (local time) on May 25, 2021 via Zoom video/audio conferencing. Prospective bidders are required to attend.

1. Join from PC, Mac, iOS or Android: https://wginc.zoom.us/j/94285699580?from=addon

2. Join from Telephone: +1 312 626 6799 or +1 929 436 2866 or +1 346 248 7799

Meeting ID: 942 8569 9580

1.5 Documents

A. Contract documents are available electronically to all prospective bidders at the following websites.

1. MITN Purchasing Group
   https://www.bidnetdirect.com/mitn/

2. Ann Arbor Downtown Develop Authority
   https://www.a2dda.org/current-projects/

1.6 Time of Completion and Liquidated Damages

A. Bidders shall begin the Work on receipt of the Notice to Proceed and shall complete the Work within the Contract Time. Work is subject to liquidated damages.

1.7 Bidder’s Qualifications

A. Bidders must have experience with similar work, and must meet qualifications identified.

B. Bidders must be properly licensed under the laws governing their respective trades and be able to obtain insurance and bonds required for the Work. A Performance Bond, a separate Labor and Material Payment Bond, and Insurance in a form acceptable to Owner will be required of the successful Bidder.

END OF SECTION 00 1116
SECTION 00 2513 - PREBID MEETINGS

1.1 Prebid Meeting

A. Architect will conduct a virtual Prebid meeting as indicated below:

1. Meeting Date: May 25, 2021.
2. Meeting Time: 9:00 a.m., local time.
3. Zoom Video/Audio Conferencing:
   a. Join from PC, Mac, iOS or Android: https://wginc.zoom.us/j/94285699580?from=addon
   b. Join from Telephone: +1 312 626 6799 or +1 929 436 2866 or +1 346 248 7799
      Meeting ID: 942 8569 9580

B. Attendance:

1. Prime Bidders: Attendance at Prebid meeting is mandatory.
2. Subcontractors: Attendance at Prebid meeting is recommended.
3. Notice: Bids will only be accepted from prime bidders represented on Prebid Meeting
   sign-in sheet (virtual).

C. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes to
   attendees. Minutes of meeting are issued as Available Information and do not constitute a
   modification to the Procurement and Contracting Documents. Modifications to the Procurement
   and Contracting Documents are issued by written Addendum only.

1. Sign-in Sheet: Minutes will include list of meeting attendees.

END OF SECTION 00 2513
SECTION 00 5200 – AGREEMENT FORMS

PART 1 - GENERAL

1.1 Description

A. A written Agreement will be executed on the City of Ann Arbor Downtown Development Contract. Included within this section is the following:

- Instructions to Bidders IB-1 to IB-2
- Proposal P-1 to P-3
- Bid Form BF-1 to BF-11
- Contract C-1 to C-9
- Contractor Declaration CD-1
- Contractor Affidavit CA-1
- Standard Specifications SS-1

PART 2 - PRODUCTS

2.1 Not Used.

PART 3 - EXECUTION

3.1 Not Used.

END OF SECTION 00 5200
INSTRUCTIONS TO BIDDERS

General

Work to be done under this Contract is generally described through the detailed specifications and must be completed fully in accordance with the contract documents. All work to be done under this Contract is located in or near the City of Ann Arbor.

The DDA shall make available to all prospective Bidders, prior to receipt of the Bids, access to the area in which the work is to be performed. Advance notice should be given to the Administering Department in cases where access to the site must be arranged by the DDA.

Any proposal that does not conform fully to these instructions may be rejected.

Proposals

Proposals must be submitted on the "Proposal Forms" and "Bid Forms" provided, with each blank properly filled in. Electronic proposals will be received via e-mail by the City of Ann Arbor DDA and WGI, Inc. at the time stipulated in the Advertisement.

The DDA intends to award a Contract to the lowest responsible Bidder. The DDA may also utilize discounts offered in the Bid Forms, if any, to determine the lowest responsible Bidder, so that the lowest total cost is achieved for the DDA. For unit price bids, the contract will be awarded based upon the lump sum and unit prices stated by the bidder for the work items specified in the bid documents, with consideration given to any alternates selected by the DDA. If the DDA determines that the unit price for any item is materially different for the work item bid than either other bidders or the general market, the DDA, in its sole discretion, in addition to any other right it may have, may reject the bid as not responsible or non-conforming.

The acceptability of major subcontractors will be considered in determining if a Bidder is responsible. In comparing proposals, the DDA will give consideration to alternate proposals for items listed in the forms, or other alternates which the Bidder may wish to submit, but preference will be given to Base Bid Proposals.

The DDA reserves the right to accept any Bid, to reject any or all Bids, to waive irregularities and/or informalities in any Bid, and to make the award in any manner the DDA believes to be in its best interest.
Bid Security

Each proposal must be accompanied by a certified check, or Bid Bond by a surety licensed and authorized to do business within the State of Michigan, in the amount of 5% of the total of the bid price.

Withdrawal of Bids

After the time of opening, no Bid may be withdrawn for the period of days specified in the Advertisement.

Contract Time

Time is of the essence in the performance of the work under this Contract. The available time for work under this Contract is indicated in Section II of the Contract. If these time requirements cannot be met, or if schedule improvements can be provided, the Bidder must stipulate on Bid Form Section 3 - Time Alternate its schedule for performance of the work. Consideration will be given to time in evaluating bids.

Liquidated Damages

A liquidated damages clause, as given in the Contract, provides that the Contractor shall pay the DDA as liquidated damages, and not as a penalty, a sum certain per day for each and every day that the Contractor may be in default of completion of the specified work, within the time(s) stated in the Contract, or written extensions.

Liquidated damages clauses, as given in the General Conditions, provide further that the DDA shall be entitled to impose and recover liquidated damages for breach of the obligations under Chapter 112 of the City Code.

The liquidated damages are for the non-quantifiable aspects of any of the previously identified events and do not cover actual damages that can be shown or quantified nor are they intended to preclude recovery of actual damages in addition to the recovery of liquidated damages.

Wage Requirements

Section 4, beginning at page GC-1, outlines the requirements for payment of prevailing wages or of a living wages to employees providing service to the City under this contract. The successful bidder must comply with all applicable requirements and may be required to provide documentary proof of compliance.

Major Subcontractors

The Bidder shall identify each major subcontractor it expects to engage for this Contract if the work to be subcontracted is 15% or more of the bid sum or over $50,000, whichever is less. The Bidder also shall identify the work to be subcontracted to each major subcontractor.
City of Ann Arbor DDA  
150 South Fifth Avenue, Suite 301  
Ann Arbor, Michigan 48104

Ladies and Gentlemen:

The undersigned, as Bidder, declares that this Bid is made in good faith, without fraud or collusion with any person or persons bidding on the same Contract; that this Bidder has carefully read and examined the bid documents, including Advertisement, Notice of Pre-Bid Conference, Instructions to Bidders, Proposal, Bid Forms, Contract, Bond Forms, General Conditions, Standard Specifications, Detailed Specifications, all Addenda, and the Plans and understands them. The Bidder declares that it conducted a full investigation at the site and of the work proposed and is fully informed as to the nature of the work and the conditions relating to the work's performance. The Bidder also declares that it has extensive experience in successfully completing projects similar to this one.

The Bidder acknowledges that it has not received or relied upon any representations or warrants of any nature whatsoever from the DDA, its agents or employees, and that this Bid is based solely upon the Bidder's own independent business judgment.

The undersigned proposes to perform all work shown on the plans or described in the bid documents, including any addenda issued, and to furnish all necessary machinery, tools, apparatus, and other means of construction to do all the work, furnish all the materials, and complete the work in strict accordance with all terms of the Contract of which this proposal is one part.

In accordance with these bid documents, and Addenda numbered ________, the undersigned, as Bidder, proposes to perform at the sites in and/or around Ann Arbor, Michigan, all the work included herein for the amounts set forth in the Bid Forms.

The Bidder declares that it has become fully familiar with the liquidated damage clauses for completion times and for compliance with City Code Chapter 112, understands and agrees that the liquidated damages are for the non-quantifiable aspects of non-compliance and do not cover actual damages that may be shown and agrees that if awarded the Contract, all liquidated damage clauses form part of the Contract.

The Bidder declares that it has become fully familiar with the provisions of Chapter 14, (Prevailing wages) and Chapter 23 (Living Wage) of the Code of the City of Ann Arbor and that it understands and agrees to comply, to the extent applicable to employees providing services to the City under this Contract, with the wage and reporting requirements stated in the City Code provisions cited. Bidder further agrees that the cited provisions of Chapter 14 and Chapter 23 form a part of this Contract.

The Bidder encloses a certified check or Bid Bond in the amount of 5% of the total of the Bid Price. The Bidder agrees both to contract for the work and to furnish the necessary Bonds and insurance
documentation within 10 days after being notified of the acceptance of the Bid.

If this Bid is accepted by the DDA and the Bidder fails to contract and furnish the required Bonds and insurance documentation within 10 days after being notified of the acceptance of this Bid, then the Bidder shall be considered to have abandoned the Contract and the certified check or Bid Bond accompanying this Proposal shall become due and payable to the DDA.

If the Bidder enters into the Contract in accordance with this Proposal, or if this Proposal is rejected, then the accompanying check or Bid Bond shall be returned to the Bidder.

In submitting this Bid, it is understood that the right is reserved by the DDA to accept any Bid, to reject any or all Bids, to waive irregularities and/or informalities in any Bid, and to make the award in any manner the DDA believes to be in its best interest.

SIGNED THIS _______________ DAY OF ____________, 2021.

_________________________________
Bidder’s Name

_________________________________
Official Address

_________________________________
Authorized Signature of Bidder

_________________________________
Telephone Number

(Print Name of Signer Above)
LEGAL STATUS OF BIDDER

(The Bidder shall fill out the appropriate form and strike out the other two.)

Bidder declares that it is:

* A corporation organized and doing business under the laws of the state of ________________, for whom ________________________________, bearing the office title of ________________, whose signature is affixed to this proposal, is authorized to execute contracts.

* A partnership, list all members and the street and mailing address of each:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Also identify the County and State where partnership papers are filed:

County of ____________, State of ________________________________

* An individual, whose signature with address, is affixed to this proposal: __________

(initial here)
## Base Bid

### BASE BID - FOURTH & WASHINGTON

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<th>Work Item No.</th>
<th>Work Item Description</th>
<th>Ref. Spec. or Detail</th>
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<th>Quantity</th>
<th>Unit Cost</th>
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<td>Re-anchor Pipe Guard</td>
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<td>EA.</td>
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### Division 7 (Fourth & Washington)

| A7.1 | Rout & Seal Cracks at Slab | 7, 8/SR511 | L.F. | 600 | $ | $ |
| A7.2 | Remove & Replace Control Joint Sealant | 1, 2/SR511 | L.F. | 4,600 | $ | $ |
| A7.3 | Remove & Replace Cove Joint Sealant | 3, 4/SR511 | L.F. | 1,300 | $ | $ |
| A7.4 | Remove & Replace Joint Sealant (Silicone) | 5/SR511 | L.F. | 100 | $ | $ |
| A7.5 | Install Control Joint Sealant (Silicone) | 9/SR511 | L.F. | 280 | $ | $ |
| A7.6 | Install Cove Joint Sealant (Silicone) | 10/SR511 | L.F. | 150 | $ | $ |
| A7.7 | Install Wall Sealant (Silicone) | 6/SR511 | L.F. | 20 | $ | $ |
| A7.8 | Deck Coating - Recoat System (Urethane) | 11-14/SR511 | S.F. | 7,700 | $ | $ |
| A7.9 | Deck Coating - Full System (Urethane) at Conc. Repair | 11-14/SR511 | S.F. | 30 | $ | $ |
| A7.10 | Deck Coating Repair - Full System (Urethane) | 14/SR511 | S.F. | 300 | $ | $ |
| A7.11 | Deck Coating - Recoat System (Epoxy) | 11-14/SR511 | S.F. | 7,800 | $ | $ |
| A7.12 | Deck Coating - Full System (Epoxy) at Conc. Repair | 11-14/SR511 | S.F. | 10 | $ | $ |

### Division 9 (Fourth & Washington)

| A9.1 | Clean & Re-stain Walls/Columns at Roof Level | 09 9100 | L.S. | 1 | n/a | $ |

### Division 22 (Fourth & Washington)

| A22.1 | Remove & Replace Storm Piping | G002 | L.F. | 10 | $ | $ |

### Division 32 (Fourth & Washington)

| A32.1 | Paint Pavement Markings | 32 1723 | L.S. | 1 | n/a | $ |

**Total Base Bid - Fourth & Washington** $
### BASE BID - FOURTH & WILLIAM

<table>
<thead>
<tr>
<th>Work Item No.</th>
<th>Work Item Description</th>
<th>Ref. Spec. or Detail</th>
<th>Units</th>
<th>Total Bid Quantity</th>
<th>Unit Cost</th>
<th>Total Cost</th>
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<td><strong>Division 0 &amp; 1 (Fourth &amp; William)</strong></td>
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<td>B1.1</td>
<td>Contractor Mobilization</td>
<td>Div. 0 &amp; 1</td>
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<td>$</td>
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<tr>
<td>B1.2</td>
<td>Contractor General Requirements</td>
<td>Div. 0 &amp; 1</td>
<td>L.S.</td>
<td>1</td>
<td>n/a</td>
<td>$</td>
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<tr>
<td><strong>Division 3 (Fourth &amp; William)</strong></td>
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<tr>
<td>B3.1</td>
<td>Top of Slab Repair</td>
<td>2/SR501</td>
<td>S.F.</td>
<td>300</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>B3.2</td>
<td>Full Depth Slab Repair</td>
<td>3/SR501</td>
<td>S.F.</td>
<td>20</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>B3.3</td>
<td>Full Depth Slab Repair (Pan/Joist)</td>
<td>5/SR501</td>
<td>S.F.</td>
<td>20</td>
<td>$</td>
<td>$</td>
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<tr>
<td>B3.4</td>
<td>Ceiling Repair</td>
<td>4/SR501</td>
<td>S.F.</td>
<td>130</td>
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<tr>
<td>B3.5</td>
<td>Joist Repair</td>
<td>6/SR501</td>
<td>L.F.</td>
<td>150</td>
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<tr>
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<td>90</td>
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<td>B3.7</td>
<td>Column Repair</td>
<td>12/SR501</td>
<td>S.F.</td>
<td>20</td>
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<td>$</td>
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<td>B3.8</td>
<td>Wall Repair</td>
<td>13/SR501</td>
<td>S.F.</td>
<td>30</td>
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<td><strong>Division 4 (Fourth &amp; William)</strong></td>
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<tr>
<td>B4.1</td>
<td>Brick Repair</td>
<td>04 0100</td>
<td>S.F.</td>
<td>20</td>
<td>$</td>
<td>$</td>
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<tr>
<td>B4.2</td>
<td>Re-Point Deteriorated Mortar Joints (Brick)</td>
<td>17/SR501</td>
<td>L.F.</td>
<td>80</td>
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<td>$</td>
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<tr>
<td>B4.3</td>
<td>Re-Point Deteriorated Mortar Joints (CMU)</td>
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<td>B5.1</td>
<td>Railing Post Repair</td>
<td>5/SR502</td>
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<tr>
<td>B7.1</td>
<td>Rout &amp; Seal Cracks at Slab</td>
<td>7, 8/SR511</td>
<td>L.F.</td>
<td>2,500</td>
<td>$</td>
<td>$</td>
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<tr>
<td>B7.2</td>
<td>Rout &amp; Seal Cracks at Masonry</td>
<td>19/SR511</td>
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<tr>
<td>B7.3</td>
<td>Remove &amp; Replace Control Joint Sealant</td>
<td>1, 2/SR511</td>
<td>L.F.</td>
<td>8,100</td>
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</table>
## B7.4 Remove & Replace Cove Joint Sealant

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<th>Total</th>
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<tbody>
<tr>
<td>Remove &amp; Replace</td>
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<td>3,4/SR511</td>
<td>3,600</td>
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## B7.5 Remove & Replace Expansion Joint Sealant (Silicone)

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<th>Labor</th>
<th>Material</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remove &amp; Replace</td>
<td>L.F.</td>
<td>5/SR511</td>
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## B7.6 Expansion Joint Nosing Repair (Strip Seal)

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<tbody>
<tr>
<td>Expansion Joint</td>
<td>L.F.</td>
<td>15/SR511</td>
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## B7.7 Install Epoxy Broadcast System

<table>
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<th>Total</th>
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</thead>
<tbody>
<tr>
<td>Install Epoxy Broadcast</td>
<td>S.F.</td>
<td>07 1800</td>
<td>300</td>
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## B7.8 Deck Coating - Recoat System (Epoxy)

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<tr>
<td>Deck Coating</td>
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<td>11-14/SR511</td>
<td>79,500</td>
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## B7.9 Deck Coating - Full System (Epoxy) at Conc. Repairs

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<th>Material</th>
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<tbody>
<tr>
<td>Deck Coating</td>
<td>S.F.</td>
<td>11-14/SR511</td>
<td>210</td>
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## B7.10 Remove & Replace Metal-to-Brick Sealant

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<tbody>
<tr>
<td>Remove &amp; Replace</td>
<td>L.F.</td>
<td>22/SR511</td>
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## B7.11 Install Wet Sealant at Mullions

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<th>Labor</th>
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</thead>
<tbody>
<tr>
<td>Install Wet Sealant</td>
<td>L.S.</td>
<td>22, 21/SR511</td>
<td>1</td>
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## B7.12 Install Flashing at Glass Windbreak

<table>
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<tbody>
<tr>
<td>Install Flashing at Glass Windbreak</td>
<td>EA.</td>
<td>8/SR502</td>
<td>5</td>
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### Division 8 (Fourth & William)

## B9.1 Window Gasket Repair

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<tbody>
<tr>
<td>Window Gasket Repair</td>
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<td>3</td>
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### Division 9 (Fourth & William)

## B9.1 Clean & Paint Railing at Level 1 - NW Stair

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<th>Material</th>
<th>Total</th>
</tr>
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<tbody>
<tr>
<td>Clean &amp; Paint Railing</td>
<td>L.S.</td>
<td>09 9100</td>
<td>1</td>
<td>n/a</td>
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## B9.2 Clean & Paint Steel Lintel

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<tbody>
<tr>
<td>Clean &amp; Paint Steel Lintel</td>
<td>EA.</td>
<td>09 9100</td>
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## B9.3 Clean & Paint Steel Bracing

<table>
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<tbody>
<tr>
<td>Clean &amp; Paint Steel Bracing</td>
<td>EA.</td>
<td>09 9100</td>
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## B9.4 Clean & Paint Bollard Base Plates

<table>
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<th>Description</th>
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<tbody>
<tr>
<td>Clean &amp; Paint Bollard Base Plates</td>
<td>EA.</td>
<td>09 9100</td>
<td>4</td>
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## B9.5 Clean & Paint Steel Canopy

<table>
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<th>Total</th>
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<tbody>
<tr>
<td>Clean &amp; Paint Steel Canopy</td>
<td>L.S.</td>
<td>09 9100</td>
<td>1</td>
<td>n/a</td>
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### Division 22 (Fourth & William)

## B22.1 Remove & Replace Storm Piping

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<tbody>
<tr>
<td>Remove &amp; Replace Storm Piping</td>
<td>L.F.</td>
<td>G002</td>
<td>20</td>
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## B22.2 Remove & Replace Floor Drain Grate (12-inch)

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<th>Description</th>
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<th>Material</th>
<th>Total</th>
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<tr>
<td>Remove &amp; Replace Floor Drain Grate (12-inch)</td>
<td>EA.</td>
<td>G002</td>
<td>6</td>
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## B22.3 Remove & Replace Floor Drain Grate (4-1/2-inch)

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<th>Material</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>Remove &amp; Replace Floor Drain Grate (4-1/2-inch)</td>
<td>EA.</td>
<td>G002</td>
<td>2</td>
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### Division 32 (Fourth & William)

## B32.1 Paint Pavement Markings

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<tr>
<td>Paint Pavement Markings</td>
<td>L.S.</td>
<td>32 1723</td>
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## Total Base Bid - Fourth & William

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BF - 4
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<th>Work Item No.</th>
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<th>Ref. Spec. or Detail</th>
<th>Units</th>
<th>Quantity</th>
<th>Unit Cost</th>
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<tbody>
<tr>
<td>C1.1</td>
<td>Contractor Mobilization</td>
<td>Div. 0 &amp; 1</td>
<td>L.S.</td>
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<td>n/a</td>
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<td>C1.2</td>
<td>Contractor General Requirements</td>
<td>Div. 0 &amp; 1</td>
<td>L.S.</td>
<td>1</td>
<td>n/a</td>
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<tr>
<td>C3.1</td>
<td>Slab-on-Grade Repair</td>
<td>2/SR501 SIM</td>
<td>S.F.</td>
<td>10</td>
<td>$</td>
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<td>C3.2</td>
<td>Topping Repair</td>
<td>7/SR501</td>
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<td>190</td>
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<td>C3.3</td>
<td>Full Depth Slab Repair</td>
<td>9/SR501</td>
<td>S.F.</td>
<td>30</td>
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<tr>
<td>C3.4</td>
<td>Shear Connector Repair</td>
<td>10/SR501</td>
<td>E.A.</td>
<td>5</td>
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<td>C3.5</td>
<td>Install Concrete Overlay</td>
<td>1/SR502</td>
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<tr>
<td>C3.6</td>
<td>Tee Flange Repair (Ceiling)</td>
<td>8/SR501</td>
<td>S.F.</td>
<td>250</td>
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<td>C3.7</td>
<td>Tee Stem Repair</td>
<td>15/SR501</td>
<td>S.F.</td>
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<td>C3.8</td>
<td>Beam Repair</td>
<td>14/SR501</td>
<td>S.F.</td>
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<td>C3.9</td>
<td>Column Repair</td>
<td>11/SR501</td>
<td>S.F.</td>
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<td>Haunch Repair</td>
<td>11/SR501</td>
<td>S.F.</td>
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<td>C3.11</td>
<td>Wall Repair</td>
<td>13/SR501</td>
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<td>Lift Pocket Repair</td>
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<td>Curb Repair</td>
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<td>Stair Tread Repair</td>
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<td>Stair Slab Edge Repair</td>
<td>4/SR502 SIM</td>
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<td>C4.1</td>
<td>Brick Repair</td>
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<td>Code</td>
<td>Description</td>
<td>Location</td>
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<td>Quantity</td>
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<td>C4.2</td>
<td>Re-point Deteriorated Mortar Joints</td>
<td>15/SR501</td>
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**Division 7 (Ann Ashley)**

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<th>Rate</th>
<th>Amount</th>
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<tbody>
<tr>
<td>C7.1</td>
<td>Rout &amp; Seal Cracks at Slab</td>
<td>7, 8/SR511</td>
<td>L.F.</td>
<td>100</td>
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<td>$</td>
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<td>C7.2</td>
<td>Remove &amp; Replace Control Joint Sealant</td>
<td>1, 2/SR511</td>
<td>L.F.</td>
<td>7,800</td>
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<td>C7.3</td>
<td>Remove &amp; Replace Cove Joint Sealant</td>
<td>3, 4/SR511</td>
<td>L.F.</td>
<td>1,900</td>
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<td>C7.4</td>
<td>Remove &amp; Replace Joint Sealant (Silicone)</td>
<td>5/SR511</td>
<td>L.F.</td>
<td>80</td>
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<tr>
<td>C7.5</td>
<td>Expansion Joint Nosing Repair (Strip Seal)</td>
<td>16/SR511</td>
<td>L.F.</td>
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<tr>
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<td>Expansion Joint Nosing Repair (Ribbon Seal)</td>
<td>18/SR511</td>
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<td>Remove &amp; Replace Expansion Joint (Strip Seal)</td>
<td>15/SR511</td>
<td>L.F.</td>
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<td>$</td>
<td>$</td>
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<tr>
<td>C7.8</td>
<td>Remove &amp; Replace Expansion Joints (Ribbon Seal)</td>
<td>17/SR511</td>
<td>L.F.</td>
<td>20</td>
<td>$</td>
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<tr>
<td>C7.9</td>
<td>Install Epoxy Broadcast System</td>
<td>07 1800</td>
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<td>530</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>C7.10</td>
<td>Deck Coating - Recoat (Urethane)</td>
<td>11-14/SR511</td>
<td>S.F.</td>
<td>20,300</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>C7.11</td>
<td>Deck Coating - Full System (Urethane) at Conc. Repair</td>
<td>11-14/SR511</td>
<td>S.F.</td>
<td>50</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>C7.12</td>
<td>Deck Coating - Full System (Epoxy) at Conc. Repair</td>
<td>11-14/SR511</td>
<td>S.F.</td>
<td>10</td>
<td>$</td>
<td>$</td>
</tr>
</tbody>
</table>

**Division 9 (Ann Ashley)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Location</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>C9.1</td>
<td>Clean &amp; Paint Precast Connections</td>
<td>09 9100</td>
<td>L.S.</td>
<td>100</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>C9.2</td>
<td>Install Elastomeric Coating at Shear Walls/Columns (Roof Level)</td>
<td>09 9700</td>
<td>S.F.</td>
<td>530</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>C9.3</td>
<td>Install Elastomeric Coating at Columns (Level 3)</td>
<td>09 9700</td>
<td>S.F.</td>
<td>250</td>
<td>$</td>
<td>$</td>
</tr>
</tbody>
</table>

**Division 32 (Ann Ashley)**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Location</th>
<th>Unit</th>
<th>Quantity</th>
<th>Rate</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>C32.1</td>
<td>Paint Pavement Markings</td>
<td>32 1723</td>
<td>L.S.</td>
<td>1</td>
<td>n/a</td>
<td>$</td>
</tr>
</tbody>
</table>

**Total Base Bid - Ann Ashley** $
1. Bidder will complete the work for the following price as outlined in these documents, complete as specified, using equipment and materials only of the type and manufacturers where specifically named:

   **Total Base Bid – Fourth & Washington** $_______________________________

   **Total Base Bid – Fourth & William** $_______________________________

   **Total Base Bid – Ann Ashley** $_______________________________

   **Grand Total Base Bid – All Parking Structures** $_______________________________

2. Description of Abbreviations:
   a. L.F. = Lineal Feet
   b. S.F. = Square Feet
   c. L.S. = Lump Sum
   d. EA. = Each
   e. N.A. = Not Applicable

3. Total contract price shall include the summation of lump sum items, plus the summation of unit prices multiplied by the estimated quantities listed above.

4. Contractor shall submit a lump sum Contract price for all work included in the Drawings and Specifications except as modified herein. Costs for sealants and deck coating indicated in details should not be included in lump sum cost, unless noted. Lump sum price shall include all costs to provide, install, and/or repair work items including, but not limited to, labor, material, equipment, supervision, overhead, profits, etc. Specific lump sum work is described below:
   a. Project mobilization shall include General Contractor and Subcontractor mobilization costs. Include permits, temporary offices, etc. Provide itemized breakdown.
   b. Project General Requirements and all miscellaneous costs associated with completion of work in accordance with the Construction Documents. This shall include, but not be limited to, shoring, barricades, cleanup, dust and fume control, layout, equipment, waste disposal, documentation, obstruction removal and replacement, etc.

5. Provide unit prices for items listed above. These items shall be included in the total contract price. Unit prices shall include all costs to provide, install, and/or repair work item including, but not limited to, labor, materials, equipment, supervision, overhead, profits, etc.
   a. Quantities beyond those estimated shall be paid at the stated unit price, quantities less than estimated will be deducted from the Contract. Quantities may be distributed throughout the project, not necessarily in a single location.
   b. All prices to include demolition, unless noted.

6. The quantities appearing in the preceding Schedule are approximate. Payment to the Contractor will be made only for the actual quantities of Work performed and accepted in accordance with the contract unit prices. Any item and/or section within the Work may be deleted by the Owner.
   a. Refer to Drawings and Specifications for other Work required as part of this Contract but not listed in the above schedule.
7. The terms used in this Contract which are defined in the General Conditions of the Contract included as part of the Contract Documents have the meanings assigned to them in the General Conditions.
   a. The quantities appearing in the preceding Schedule have been measured or estimated by the Supervising Professional. Contractor may rely upon these quantities in preparation of their pricing.
   b. Note that the items provided in the above list do not represent all of the General Requirement Work required by this Contractor.
BID FORM

Section 2 - Material and Equipment Alternates

The Base Bid proposal price shall include materials and equipment selected from the designated items and manufacturers listed in the bidding documents. This is done to establish uniformity in bidding and to establish standards of quality for the items named.

If the Contractor wishes to quote alternate items for consideration by the DDA, it may do so under this Section. A complete description of the item and the proposed price differential must be provided. Unless approved at the time of award, substitutions where items are specifically named will be considered only as a negotiated change in Contract Sum.

If the Bidder does not suggest any material or equipment alternate, the Bidder MUST complete the following statement:

For the work outlined in this request for bid, the bidder does NOT propose any material or equipment alternate under the contract.

________________________________________
Signature of Authorized Representative of Bidder
BID FORM

Section 3 - Time Alternate

If the Bidder takes exception to the time stipulated in Article II of the Contract, Duration, page C-1, it is requested to stipulate below its proposed time for performance of the work. Consideration will be given to time in evaluating bids.

If the Bidder does not suggest any time alternate, the Bidder **MUST** complete the following statement:

For the work outlined in this request for bid, the bidder does NOT propose any time alternate under the contract.

__________________________
Signature of Authorized Representative of Bidder
BID FORM

Section 4 - Major Subcontractors

For purposes of this contract, a Subcontractor is anyone (other than the Contractor) who performs work (other than or in addition to the furnishing of materials, plans or equipment) at or about the construction site, directly or indirectly for or on behalf of the Contractor (and whether or not in privity of contract with the Contractor), but shall not include any individual who furnishes merely the individual’s own personal labor or services.

For the work outlined in these documents the Bidder expects to engage the following major subcontractors to perform the work identified:

<table>
<thead>
<tr>
<th>Subcontractor (Name and Address)</th>
<th>Work</th>
<th>Amount</th>
</tr>
</thead>
</table>

If the Bidder does not expect to engage any major subcontractor, the Bidder **MUST** complete the following statement:

For the work outlined in this request for bid, the bidder does **NOT** expect to engage any major subcontractor to perform work under the contract.

________________________________________
Signature of Authorized Representative of Bidder
CITY OF ANN ARBOR DOWNTOWN DEVELOPMENT SERVICE AGREEMENT

SERVICE AGREEMENT BETWEEN

The City of Ann Arbor Downtown Development Authority, a Michigan municipal corporation, having its offices at 150 S Fifth Avenue, Suite 301, Ann Arbor, Michigan 48104 (“DDA”) and a Type of Business agree as follows on this day of __________, 2021.

Address

The Contractor agrees to provide services to the DDA under the following terms and conditions:

I. DEFINITIONS

Ann Arbor Downtown Development Authority, also referred to as the DDA or the Owner.

Contract Administrator means the DDA representative authorized by the Ann Arbor Downtown Development Authority to act on the behalf of the Ann Arbor Downtown Development Authority.

Supervising Professional as defined in the General Conditions shall mean the Contract Administrator.

Design Professional means WGI Inc. (WGI). WGI is the lead designer, references to “Architect” or “Engineer” within the project specifications will generally refer WGI or a consultant to WGI.


II. DURATION

This Agreement shall become effective on __________, 2021, and shall remain in effect until satisfactory performance of all services or __________, whichever occurs first, unless terminated for breach or as provided in this agreement.

A. Successful bidder shall begin the Work on receipt of the Notice to Proceed and shall complete the Work within the Contract Time.

B. The entire work for this Contract shall be completed within the time period shown below. Shorter completion times for certain portions of the work are specified in the Detailed Specifications.

1. Anticipated Contract Notice to Proceed: July 1, 2021 (Subject to DDA Approval)
2. Construction: July 5, 2021 thru November 5, 2021

C. Failure to complete all the work within the time specified above, including any extension granted in writing by the Supervising Professional, shall obligate the
Contractor to pay the DDA, as liquidated damages and not as a penalty, an amount equal to $500.00 for each calendar day of delay in the completion of all the work. If any liquidated damages are unpaid by the Contractor, the DDA shall be entitled to deduct these unpaid liquidated damages from the monies due the Contractor.

The liquidated damages are for the non-quantifiable aspects of any of the previously identified events and do not cover actual damages that can be shown or quantified nor are they intended to preclude recovery of actual damages in addition to the recovery of liquidated damages.

Liquidated damages under this section are in addition to any liquidated damages due under Section 19 of the General Conditions.

III. SERVICES

A. General Scope: The Contractor agrees to furnish all of the materials, equipment and labor necessary; and to abide by all the duties and responsibilities applicable to it for the Project in accordance with the requirements and provisions of the following documents, including all written modifications incorporated into any of the documents, which are incorporated as part of this Contract:

1. Contract and Exhibits
2. Construction Documents, dated ________________
3. Bid No. and Addenda (if applicable)
4. Bid Proposal of Contractor, dated ________________

The contract documents are complementary and what is called for by any one shall be binding. The intention of the documents is to include all labor and materials, equipment and transportation necessary for the proper execution of the Project. Materials or work described in words that so applied have a well-known technical or trade meaning have the meaning of those recognized standards.

In case of a conflict among the contract documents listed above in any requirement(s), the requirement(s) of the document listed first shall prevail over any conflicting requirement(s) of a document listed later.

B. Quality of Services: The Contractor’s standard of service under this agreement shall be of the level of quality performed by businesses regularly rendering this type of service. Determination of acceptable quality shall be made solely by the Contract Administrator.

C. Compliance with Applicable Law: The Contractor shall perform its services under this Agreement in compliance with all statutory, regulatory and contractual requirements now or hereafter in effect as may be applicable to the rights and obligations set forth in the Agreement.

D. Location: The Contractor shall provide all of these services at the locations specified.

E. Reports/Surveys: The Contractor may rely upon the accuracy of reports and surveys provided to it by the DDA except when defects should have been apparent to a reasonably competent contractor or when it has actual notice of any defects in the reports and surveys.

IV. RELATIONSHIP OF PARTIES
A. The parties to this agreement agree that it is not a contract of employment but is a contract to accomplish a specific result. Contractor is an independent contractor performing services for the DDA. Nothing contained in this agreement shall be deemed to constitute any other relationship between the DDA and the Contractor.

B. The Contractor certifies that it has no personal or financial interest in the project other than the fee it is to receive under this agreement. The Contractor further certifies that it shall not acquire any such interest, direct or indirect, which would conflict in any manner with the performance of services under this agreement. Further Contractor agrees and certifies that it does not and will not employ or engage any person with a personal or financial interest in this agreement.

C. Contractor does not have any authority to execute any contract or agreement on behalf of the DDA, and is not granted any authority to assume or create any obligation or liability on the DDA’s behalf, or to bind the DDA in any way.

D. Contractor certifies that it is not, and shall not become, overdue or in default to the City of Ann Arbor for any contract, debt, or any other obligation to the City including real or personal property taxes. The DDA shall have the right to set off any such debt against compensation awarded for services under this agreement.

V. COMPENSATION OF CONTRACTOR

The Contractor shall be paid on the basis of the bid price in the manner set forth in the Bid. The total fee to be paid the Contractor for the services shall not exceed ________________ ($________). Payment shall be made within 30 days of acceptance of the work by the Contract Administrator. It is understood and agreed between the parties that the compensation stated above is inclusive of any and all remuneration to which the Contractor may be entitled.

VI. INSURANCE; INDEMNIFICATION

A. The Contractor shall procure and maintain during the life of this Contract, including the guarantee period and during any warranty work, such insurance policies, including those set forth below, as will protect itself, the DDA, Republic Parking System, and the Design Professional from all claims for bodily injuries, death or property damage which may arise under this Contract; whether the acts were made by the Contractor or by any subcontractor or anyone employed by them directly or indirectly. The insurance coverage afforded by the contractor to the DDA and the Design Professional shall be primary and not excess or contributory to any insurance the DDA or Design Professional may have on its own. The following insurance policies are required:

1. Worker's Compensation Insurance in accordance with all applicable state and federal statutes. Further, Employers Liability Coverage shall be obtained in the following minimum amounts:

   Bodily Injury by Accident - $500,000 each accident
   Bodily Injury by Disease - $500,000 each employee
   Bodily Injury by Disease - $500,000 each policy limit

2. Commercial General Liability Insurance equivalent to, as a minimum, Insurance Services Office form CG 00 01 07 98. The City of Ann Arbor, the
Ann Arbor DDA, Republic Parking System, and the Design Professional shall be named as an additional insured. There shall be no added exclusions or limiting endorsements including, but not limited to: Products and Completed Operations, Explosion, Collapse and Underground coverage or Pollution. Further, the following minimum limits of liability are required:

$2,000,000 Each occurrence as respect Bodily Injury Liability or Property Damage Liability, or both combined.

$4,000,000 Per Job General Aggregate

$2,000,000 Personal and Advertising Injury

$4,000,000 Products and Completed Operations Aggregate

3. Motor Vehicle Liability Insurance, including Michigan No-Fault Coverages, equivalent to, as a minimum, Insurance Services Office form CA 00 01 07 97. The City of Ann Arbor, the Ann Arbor DDA, Republic Parking System, and the Design Professional shall be named as an additional insured. There shall be no added exclusions or limiting endorsements. Coverage shall include all owned vehicles, all non-owned vehicles and all hired vehicles. Further, the limits of liability shall be $1,000,000 for each occurrence as respects Bodily Injury Liability or Property Damage Liability, or both combined.

4. Umbrella/Excess Liability Insurance shall be provided to apply excess of the Commercial General Liability, Employers Liability and the Motor Vehicle coverage enumerated above, for each occurrence and for aggregate in the amount of $1,000,000.

B. Insurance required under VI.A.2 and A.3 of this Contract shall be considered primary as respects any other valid or collectible insurance that the DDA or the City of Ann Arbor may possess, including any self-insured retentions the DDA or City of Ann Arbor may have; and any other insurance the DDA or the City of Ann Arbor does possess shall be considered excess insurance only and shall not be required to contribute with this insurance. Further, the Contractor agrees to waive any right of recovery by its insurer against the DDA or the City of Ann Arbor.

C. In the case of all Contracts involving on-site work, the Contractor shall provide to the DDA before the commencement of any work under this Contract documentation demonstrating it has obtained the above mentioned policies. Documentation must provide and demonstrate an unconditional 30 day written notice of cancellation in favor of the DDA. Further, the documentation must explicitly state the following: (a) the policy number; name of insurance company; name and address of the agent or authorized representative; name and address of insured; project name; policy expiration date; and specific coverage amounts; (b) any deductibles or self-insured retentions which shall be approved by the City, in its sole discretion; (c) that the policy conforms to the requirements specified. An original certificate of insurance may be provided as an initial indication of the required insurance, provided that no later than 21 calendar days after commencement of any work the Contractor supplies a copy of the endorsements required on the policies. Upon request, the Contractor shall provide within 30 days a copy of the policy(ies) to the DDA. If any of the above
coverages expire by their terms during the term of this Contract, the Contractor shall deliver proof of renewal and/or new policies to the DDA at least ten days prior to the expiration date.

D. Any insurance provider of Contractor shall be admitted and authorized to do business in the State of Michigan and shall carry and maintain a minimum rating assigned by A.M. Best & Company’s Key Rating Guide of “A-” Overall and a minimum Financial Size Category of “V”. Insurance policies and certificates issued by non-admitted insurance companies are not acceptable unless approved in writing by the DDA.

E. To the fullest extent permitted by law, Contractor shall indemnify, defend and hold harmless the City of Ann Arbor, Republic Parking System, the Design Professional, and the DDA its officers, employees and agents harmless from all suits, claims, judgments and expenses including attorney’s fees resulting or alleged to result, in whole or in part, from any act or omission, which is in any way connected or associated with this contract, by the Contractor or anyone acting on the Contractor’s behalf under this contract. Contractor shall not be responsible to indemnify the DDA for losses or damages caused by or resulting from the DDA’s sole negligence.

VII. COMPLIANCE REQUIREMENTS

A. Nondiscrimination. The Consultant agrees to comply and to require its subcontractor to comply, with the nondiscrimination provisions of Section 209 of the Elliot-Larsen Civil Rights Act MCL 37.2209). The Contractor further agrees to comply with the nondiscrimination provisions of Chapter 112 of the Ann Arbor City Code and to assure that applicants are employed and that employees are treated during employment in a manner which provides equal employment opportunity

B. Wages: Under this Contract, the Contractor shall conform to Chapter 14 of Title I of the Code of the City of Ann Arbor as amended; which in part states “...that all craftsmen, mechanics and laborers employed directly on the site in connection with said improvements, including said employees of subcontractors, shall receive the prevailing wage for the corresponding classes of craftsmen, mechanics and laborers, as determined by statistics for the Ann Arbor area compiled by the United States Department of Labor. At the request of the City, any contractor or subcontractor shall provide satisfactory proof of compliance with the contract provisions required by the Section.” Where the Contract and the Ann Arbor City Ordinance are silent as to definitions of terms required in determining contract compliance with regard to prevailing wages, the definitions provided in the Davis-Bacon Act as amended (40 U.S.C. 278-a to 276-a-7) for the terms shall be used.

Further, to the extent that any employees of the Contractor providing services under this contract are not part of the class of craftsmen, mechanics and laborers who receive a prevailing wage in conformance with Section 1:319 of Chapter 14 of Title I of the Code of the City of Ann Arbor, the Contractor agrees to conform to Chapter 23, Living Wage, of Title I of the Code of the City of Ann Arbor, as amended. The Contractor agrees to pay those employees providing Services to the City under this Agreement a “living wage,” as defined in Section 1:815 of the Ann Arbor City Code; to post a notice approved by the City of the applicability of Chapter 23 in every location in which regular or contract employees providing
services under this agreement are working; to maintain records of compliance; if requested by the City, to provide documentation to verify compliance; to take no action that would reduce the compensation, wages, fringe benefits, or leave available to any employee or person contracted for employment in order to pay the living wage required by Section 1:815; and otherwise to comply with the requirements of Chapter 23.

VIII. WARRANTIES BY CONTRACTOR

A. The Contractor warrants that the quality of its services under this agreement shall conform to the level of quality performed by businesses regularly rendering this type of service. The Contractor warrants that the work performed shall be free of defects and guaranteed for a period of one year.

B. The Contractor warrants that it has all the skills and experience necessary to perform the services it is to provide pursuant to this agreement. Further that it has available, or will engage, at its own expense, sufficient trained employees or subcontractors to provide the services specified in this Agreement.

C. The Contractor warrants that it is not, and shall not become overdue or in default to the City of Ann Arbor for any contract, debt, or any other obligation to the City of Ann Arbor including real and personal property taxes.

IX. TERMINATION OF AGREEMENT; RIGHTS ON TERMINATION

A. This agreement may be terminated by either party in the case of a breach of this agreement by the other party, if the breaching party has not corrected the breach within 15 days after notice of termination is given in conformance with the terms of this agreement. Breach under this terms of this Agreement shall include but not be limited to the failure to deliver service on time, poor quality materials or workmanship, failure to follow specifications identified in Article III above, or the unauthorized substitution of articles other than those quoted and specified in the bid documents.

B. The DDA may terminate this Agreement, on at least ten (10) days advance notice, for any reason, including convenience, without incurring any penalty, expense or liability to the Contractor except the obligation to pay for services actually performed under the Agreement.

C. Contractor acknowledges that, if this Agreement extends for several fiscal years, continuation of this Agreement is subject to appropriation of funds for this Project. If funds to enable the DDA to effect continued payment under this Agreement are not appropriated or otherwise made available, the DDA shall have the right to terminate this Agreement without penalty at the end of the last period for which funds have been appropriated or otherwise made available by giving written notice of termination to the Contractor. The Contract Administrator shall give the Contractor written notice of such non-appropriation within thirty (30) days after it receives notice of such non-appropriation.

D. The remedies provided in this Agreement will be cumulative, and the assertion by a party of any right or remedy will not preclude the assertion by such party of any other rights or the seeking of any other remedies.

X. OBLIGATIONS OF THE DDA
XII. **ASSIGNMENT**

A. The Contractor shall not subcontract or assign any portion of the services without prior written consent to such action by the DDA. Notwithstanding any consent by the DDA to any assignment, Contractor shall at all times remain bound to all warranties, certifications, indemnifications, promises and performances, however described, as are required of it under the Agreement unless specifically released from the requirement, in writing, by the DDA.

B. The Contractor shall retain the right to pledge payment(s) due and payable under the agreement to third parties.

XII. **NOTICE**

All notices and submissions required under this Agreement shall be delivered to the respective party in the manner described herein to the address stated in this Agreement or such other address as either party may designate by prior written notice to the other.

Notices given under this Agreement shall be in writing and shall be personally delivered, sent by next day express delivery service, certified mail, or first class U.S. mail postage prepaid, and addressed to the person listed below. Notice will be deemed given on the date when one of the following first occur: (1) the date of actual receipt; (2) the next business day when notice is sent next day express delivery service or personal delivery; or (3) three days after mailing first class or certified U.S. mail.

If Notice is sent to the CONTRACTOR, it shall be addressed and sent to:

If Notice is sent to the DDA, it shall be addressed and sent to:

Ann Arbor DDA  
150 S Fifth Avenue,  
Suite 301  
Ann Arbor, MI 48107-8647  
Attn: Ms. Jada Hahlbrock, Manager of Parking Services

XIII. **SEVERABILITY OF PROVISIONS**

Whenever possible, each provision of this agreement will be interpreted in a manner as to be effective and valid under applicable law. However, if any provision of this agreement or the application of any provision to any party or circumstance will be prohibited by or invalid under applicable law, that provision will be ineffective to the extent of the prohibition or invalidity without invalidating the remainder of the provisions of this agreement or the application of the provision to other parties or other circumstances.
XIV. **CHOICE OF LAW**

This agreement shall be construed, governed, and enforced in accordance with the laws of the State of Michigan. By executing this agreement, the Contractor and the DDA agree to venue in a court of appropriate jurisdiction sitting within Washtenaw County for purposes of any action arising under this agreement. The parties stipulate that the venues referenced in this Agreement are convenient and waive any claim of non-convenience.

XV. **EXTENT OF AGREEMENT**

This agreement represents the entire understanding between the DDA and the Contractor and it supersedes all prior representations or agreements whether written or oral. Neither party has relied on any prior representations in entering into this agreement.

This agreement may be altered, amended or modified only by written amendment signed by the Contractor and the DDA.
FOR CONTRACTOR

By __________________________
Authorized Representative

FOR THE CITY OF ANN ARBOR DDA

By __________________________ Jessica A.S. Letaw, DDA Board Chair

By __________________________ Maura Thomson, Interim DDA Director
CONTRACTOR'S DECLARATION

I hereby declare that I have not, during the period _____________, 20__, to _____________, 20__, performed any work, furnished any materials, sustained any loss, damage or delay, or otherwise done anything in addition to the regular items (or executed change orders) set forth in the Contract titled ____________________________, for which I shall ask, demand, sue for, or claim compensation or extension of time from the DDA, except as I hereby make claim for additional compensation or extension of time as set forth on the attached itemized statement. I further declare that I have paid all payroll obligations related to this Contract that have become due during the above period and that all invoices related to this Contract received more than 30 days prior to this declaration have been paid in full except as listed below.

There is/is not (Contractor please circle one and strike one as appropriate) an itemized statement attached regarding a request for additional compensation or extension of time.

__________________________________________  ____________________________
Contractor                                         Date

By:  __________________________________________
     (Signature)

Its:  __________________________________________
     (Title of Office)

Past due invoices, if any, are listed below.
CONTRACTOR'S AFFIDAVIT

The undersigned Contractor, ________________________________, represents that on _______, 20___, it was awarded a contract by the Ann Arbor Downtown Development Authority, Michigan to _____________________ under the terms and conditions of a Contract titled ________________________.

The Contractor represents that all work has now been accomplished and the Contract is complete.

The Contractor warrants and certifies that all of its indebtedness arising by reason of the Contract has been fully paid or satisfactorily secured; and that all claims from subcontractors and others for labor and material used in accomplishing the project, as well as all other claims arising from the performance of the Contract, have been fully paid or satisfactorily settled. The Contractor agrees that, if any claim should hereafter arise, it shall assume responsibility for it immediately upon request to do so by the Ann Arbor Downtown Development Authority.

The Contractor, for valuable consideration received, does further waive, release and relinquish any and all claims or right of lien which the Contractor now has or may acquire upon the subject premises for labor and material used in the project owned by the Ann Arbor Downtown Development Authority.

This affidavit is freely and voluntarily given with full knowledge of the facts.

__________________________________
Contractor
By:________________________________
    (Signature)
Its: ________________________________
    (Title of Office)

Subscribed and sworn to before me, on this _____ day of _________, 20___
________________________, ____________ County, Michigan
Notary Public
My commission expires on:
STANDARD SPECIFICATIONS

All work under this contract shall be performed in accordance with the City of Ann Arbor, Public Services Department Standard Specifications in effect at the date of availability of the contract documents stipulated in the Advertisement. All work under this Contract which is not included in these Standard Specifications, or which is performed using modifications to these Standard Specifications, shall be performed in accordance with the Detailed Specifications included in these contract documents.

A copy of the Public Services Department Standard Specifications may be purchased from the Project Management Division, (Fourth Floor, City Hall, Ann Arbor, Michigan), for $35.00 per copy. In addition, a copy of these Standard Specifications is available for public viewing at the same office, for review Monday through Friday between the hours of 8:30 a.m. and 4:00 p.m.
SECTION 00 6113 – PERFORMANCE AND PAYMENT BOND FORM

PART 1 - GENERAL

1.1 Description

A. The successful Bidder will be required to furnish bonds, in form and substance satisfactory to the Owner, covering faithful performance of the Contract and payment of obligations arising thereunder.

B. Performance Bond and Payment Bond shall be executed on standard AIA Document A312 in accordance with the General and Supplementary Conditions.

PART 2 - PRODUCTS

2.1 Not Used.

PART 3 - EXECUTION

3.1 Not Used.

END OF SECTION 00 6113
SECTION 00 7200 – GENERAL CONDITIONS

PART 1 - GENERAL

1.1 Description

A. The Ann Arbor Downtown Development Authority General Conditions of the Contract for Construction GC-1 to GC-14 included within this document are hereby made a part of the Contract Documents.

PART 2 - PRODUCTS

2.1 Not Used.

PART 3 - EXECUTION

3.1 Not Used.

END OF SECTION 00 7200
GENERAL CONDITIONS

Section 1 - Execution, Correlation and Intent of Documents

The contract documents shall be signed in 2 copies by the DDA and the Contractor.

The contract documents are complementary and what is called for by any one shall be binding. The intention of the documents is to include all labor and materials, equipment and transportation necessary for the proper execution of the work. Materials or work described in words which so applied, have a well-known technical or trade meaning have the meaning of those recognized standards.

In case of a conflict among the contract documents listed below in any requirement(s), the requirement(s) of the document listed first shall prevail over any conflicting requirement(s) of a document listed later.


Section 2 - Order of Completion

The Contractor shall submit with each invoice, and at other times reasonably requested by the Supervising Professional, schedules showing the order in which the Contractor proposes to carry on the work. They shall include the dates at which the Contractor will start the several parts of the work, the estimated dates of completion of the several parts, and important milestones within the several parts.

Section 3 - Familiarity with Work

The Bidder or its representative shall make personal investigations of the site of the work and of existing structures and shall determine to its own satisfaction the conditions to be encountered, the nature of the ground, the difficulties involved, and all other factors affecting the work proposed under this Contract. The Bidder to whom this Contract is awarded will not be entitled to any additional compensation unless conditions are clearly different from those which could reasonably have been anticipated by a person making diligent and thorough investigation of the site.

The Bidder shall immediately notify the DDA upon discovery, and in every case prior to submitting its Bid, of every error or omission in the bidding documents that would be identified by a reasonably competent, diligent Bidder. In no case will a Bidder be allowed the benefit of extra compensation or time to complete the work under this Contract for extra expenses or time spent as a result of the error or omission.

Section 4 - Wage Requirements

Refer to Section VII of the Contract.
Section 5- Non-Discrimination

Refer to Section VII of the Contract.

Section 6 - Materials, Appliances, Employees

Unless otherwise stipulated, the Contractor shall provide and pay for all materials, labor, water, tools, equipment, light, power, transportation, and other facilities necessary or used for the execution and completion of the work. Unless otherwise specified, all materials incorporated in the permanent work shall be new, and both workmanship and materials shall be of the highest quality. The Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials.

The Contractor shall at all times enforce strict discipline and good order among its employees, and shall seek to avoid employing on the work any unfit person or anyone not skilled in the work assigned.

Adequate sanitary facilities shall be provided by the Contractor.

Section 7 - Qualifications for Employment

The Contractor shall employ competent laborers and mechanics for the work under this Contract. For work performed under this Contract, employment preference shall be given to qualified local residents.

Section 8 - Royalties and Patents

The Contractor shall pay all royalties and license fees. It shall defend all suits or claims for infringements of any patent rights and shall hold the DDA harmless from loss on account of infringement except that the DDA shall be responsible for all infringement loss when a particular process or the product of a particular manufacturer or manufacturers is specified, unless the DDA has notified the Contractor prior to the signing of the Contract that the particular process or product is patented or is believed to be patented.

Section 9 - Permits and Regulations

The Contractor must secure and pay for all permits, permit or plan review fees and licenses necessary for the prosecution of the work. These include but are not limited to City building permits, right-of-way permits, lane closure permits, right-of-way occupancy permits, and the like. The DDA shall secure and pay for easements shown on the plans unless otherwise specified.

The Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the work as drawn and specified. If the Contractor observes that the contract documents are at variance with those requirements, it shall promptly notify the Supervising Professional in writing, and any necessary changes shall be adjusted as provided in the Contract for changes in the work.
The Contractor is responsible for the means, methods, sequences, techniques and procedures of construction and safety programs associated with the work contemplated by this contract. The Contractor, its agents or sub-contractors, shall comply with the "General Rules and Regulations for the Construction Industry" as published by the Construction Safety Commission of the State of Michigan and to all other local, State and National laws, ordinances, rules and regulations pertaining to safety of persons and property.

The Contractor shall take all necessary and reasonable precautions to protect the safety of the public. It shall continuously maintain adequate protection of all work from damage, and shall take all necessary and reasonable precautions to adequately protect all public and private property from injury or loss arising in connection with this Contract. It shall make good any damage, injury or loss to its work and to public and private property resulting from lack of reasonable protective precautions, except as may be due to errors in the contract documents, or caused by agents or employees of the DDA. The Contractor shall obtain and maintain sufficient insurance to cover damage to any City property at the site by any cause.

In an emergency affecting the safety of life, or the work, or of adjoining property, the Contractor is, without special instructions or authorization from the Supervising Professional, permitted to act at its discretion to prevent the threatened loss or injury. It shall also so act, without appeal, if authorized or instructed by the Supervising Professional.

Any compensation claimed by the Contractor for emergency work shall be determined by agreement or in accordance with the terms of Claims for Extra Cost - Section 15.

Section 11 - Inspection of Work

The DDA shall provide sufficient competent personnel for the inspection of the work.

The Supervising Professional shall at all times have access to the work whenever it is in preparation or progress, and the Contractor shall provide proper facilities for access and for inspection.

If the specifications, the Supervising Professional's instructions, laws, ordinances, or any public authority require any work to be specially tested or approved, the Contractor shall give the Supervising Professional timely notice of its readiness for inspection, and if the inspection is by an authority other than the Supervising Professional, of the date fixed for the inspection. Inspections by the Supervising Professional shall be made promptly, and where practicable at the source of supply. If any work should be covered up without approval or consent of the Supervising Professional, it must, if required by the Supervising Professional, be uncovered for examination and properly restored at the Contractor's expense.

Re-examination of any work may be ordered by the Supervising Professional, and, if so ordered, the work must be uncovered by the Contractor. If the work is found to be in accordance with the contract documents, the DDA shall pay the cost of re-examination and replacement. If the work is not in accordance with the contract documents, the Contractor shall pay the cost.
Section 12 - Superintendence

The Contractor shall keep on the work site, during its progress, a competent superintendent and any necessary assistants, all satisfactory to the Supervising Professional. The superintendent will be responsible to perform all on-site project management for the Contractor. The superintendent shall be experienced in the work required for this Contract. The superintendent shall represent the Contractor and all direction given to the superintendent shall be binding as if given to the Contractor. Important directions shall immediately be confirmed in writing to the Contractor. Other directions will be confirmed on written request. The Contractor shall give efficient superintendence to the work, using its best skill and attention.

Section 13 - Changes in the Work

The DDA may make changes to the quantities of work within the general scope of the Contract at any time by a written order and without notice to the sureties. If the changes add to or deduct from the extent of the work, the Contract Sum shall be adjusted accordingly. All the changes shall be executed under the conditions of the original Contract except that any claim for extension of time caused by the change shall be adjusted at the time of ordering the change.

In giving instructions, the Supervising Professional shall have authority to make minor changes in the work not involving extra cost and not inconsistent with the purposes of the work, but otherwise, except in an emergency endangering life or property, no extra work or change shall be made unless in pursuance of a written order by the Supervising Professional, and no claim for an addition to the Contract Sum shall be valid unless the additional work was ordered in writing.

The Contractor shall proceed with the work as changed and the value of the work shall be determined as provided in Claims for Extra Cost - Section 15.

Section 14 - Extension of Time

Extension of time stipulated in the Contract for completion of the work will be made if and as the Supervising Professional may deem proper under any of the following circumstances:

1. When work under an extra work order is added to the work under this Contract;
2. When the work is suspended as provided in Section 20;
3. When the work of the Contractor is delayed on account of conditions which could not have been foreseen, or which were beyond the control of the Contractor, and which were not the result of its fault or negligence;
4. Delays in the progress of the work caused by any act or neglect of the DDA or of its employees or by other Contractors employed by the DDA;
5. Delay due to an act of Government;
6. Delay by the Supervising Professional in the furnishing of plans and necessary information;
7. Other cause which in the opinion of the Supervising Professional entitles the Contractor to an extension of time.

The Contractor shall notify the Supervising Professional within 7 days of an occurrence or
conditions which, in the Contractor's opinion, entitle it to an extension of time. The notice shall be in writing and submitted in ample time to permit full investigation and evaluation of the Contractor's claim. The Supervising Professional shall acknowledge receipt of the Contractor's notice within 7 days of its receipt. Failure to timely provide the written notice shall constitute a waiver by the Contractor of any claim.

In situations where an extension of time in contract completion is appropriate under this or any other section of the contract, the Contractor understands and agrees that the only available adjustment for events that cause any delays in contract completion shall be extension of the required time for contract completion and that there shall be no adjustments in the money due the Contractor on account of the delay.

Section 15 - Claims for Extra Cost

If the Contractor claims that any instructions by drawings or other media issued after the date of the Contract involved extra cost under this Contract, it shall give the Supervising Professional written notice within 7 days after the receipt of the instructions, and in any event before proceeding to execute the work, except in emergency endangering life or property. The procedure shall then be as provided for Changes in the Work-Section 13. No claim shall be valid unless so made.

If the Supervising Professional orders, in writing, the performance of any work not covered by the contract documents, and for which no item of work is provided in the Contract, and for which no unit price or lump sum basis can be agreed upon, then the extra work shall be done on a Cost-Plus-Percentage basis of payment as follows:

1. The Contractor shall be reimbursed for all reasonable costs incurred in doing the work, and shall receive an additional payment of 15% of all the reasonable costs to cover both its indirect overhead costs and profit;

2. The term "Cost" shall cover all payroll charges for employees and supervision required under the specific order, together with all worker's compensation, Social Security, pension and retirement allowances and social insurance, or other regular payroll charges on same; the cost of all material and supplies required of either temporary or permanent character; rental of all power-driven equipment at agreed upon rates, together with cost of fuel and supply charges for the equipment; and any costs incurred by the Contractor as a direct result of executing the order, if approved by the Supervising Professional;

3. If the extra is performed under subcontract, the subcontractor shall be allowed to compute its charges as described above. The Contractor shall be permitted to add an additional charge of 5% percent to that of the subcontractor for the Contractor's supervision and contractual responsibility;

4. The quantities and items of work done each day shall be submitted to the Supervising Professional in a satisfactory form on the succeeding day, and shall be approved by the Supervising Professional and the Contractor or adjusted at once;
(5) Payments of all charges for work under this Section in any one month, shall be made along with normal progress payments. Retainage shall be in accordance with Progress Payments-Section 16.

No additional compensation will be provided for additional equipment, materials, personnel, overtime or special charges required to perform the work within the time requirements of the Contract.

When extra work is required and no suitable price for machinery and equipment can be determined in accordance with this Section, the hourly rate paid shall be 1/40 of the basic weekly rate listed in the Rental Rate Blue Book published by Dataquest Incorporated and applicable to the time period the equipment was first used for the extra work. The hourly rate will be deemed to include all costs of operation such as bucket or blade, fuel, maintenance, "regional factors", insurance, taxes, and the like, but not the costs of the operator.

Section 16 - Progress Payments

The Contractor shall submit each month, or at longer intervals, if it so desires, an invoice covering work performed for which it believes payment, under the Contract terms, is due. The submission shall be to the City’s Finance Department - Accounting Division. The Supervising Professional will, within 10 days following submission of the invoice, prepare a certificate for payment for the work in an amount to be determined by the Supervising Professional as fairly representing the acceptable work performed during the period covered by the Contractor's invoice. To insure the proper performance of this Contract, the DDA will retain a percentage of the estimate in accordance with Act 524, Public Acts of 1980. The DDA will then, following the receipt of the Supervising Professional's Certificate, make payment to the Contractor as soon as feasible, which is anticipated will be within 15 days.

An allowance may be made in progress payments if substantial quantities of permanent material have been delivered to the site but not incorporated in the completed work if the Contractor, in the opinion of the Supervising Professional, is diligently pursuing the work under this Contract. Such materials shall be properly stored and adequately protected. Allowance in the estimate shall be at the invoice price value of the items. Notwithstanding any payment of any allowance, all risk of loss due to vandalism or any damages to the stored materials remains with the Contractor.

In the case of Contracts which include only the Furnishing and Delivering of Equipment, the payments shall be; 60% of the Contract Sum upon the delivery of all equipment to be furnished, or in the case of delivery of a usable portion of the equipment in advance of the total equipment delivery, 60% of the estimated value of the portion of the equipment may be paid upon its delivery in advance of the time of the remainder of the equipment to be furnished; 30% of the Contract Sum upon completion of erection of all equipment furnished, but not later than 60 days after the date of delivery of all of the equipment to be furnished; and payment of the final 10% on final completion of erection, testing and acceptance of all the equipment to be furnished; but not later than 180 days after the date of delivery of all of the equipment to be furnished, unless testing has been completed and shows the equipment to be unacceptable.

With each invoice for periodic payment, the Contractor shall enclose a Contractor's Declaration - Section 43, and an updated project schedule per Order of Completion - Section 2. Contractor’s Declaration is included as specification section CD-1
Section 17 - Deductions for Uncorrected Work

If the Supervising Professional decides it is inexpedient to correct work that has been damaged or that was not done in accordance with the Contract, an equitable deduction from the Contract price shall be made.

Section 18 - Correction of Work Before Final Payment

The Contractor shall promptly remove from the premises all materials condemned by the Supervising Professional as failing to meet Contract requirements, whether incorporated in the work or not, and the Contractor shall promptly replace and re-execute the work in accordance with the Contract and without expense to the DDA and shall bear the expense of making good all work of other contractors destroyed or damaged by the removal or replacement.

If the Contractor does not remove the condemned work and materials within 10 days after written notice, the DDA may remove them and, if the removed material has value, may store the material at the expense of the Contractor. If the Contractor does not pay the expense of the removal within 10 days thereafter, the DDA may, upon 10 days written notice, sell the removed materials at auction or private sale and shall pay to the Contractor the net proceeds, after deducting all costs and expenses that should have been borne by the Contractor. If the removed material has no value, the Contractor must pay the DDA the expenses for disposal within 10 days of invoice for the disposal costs.

The inspection or lack of inspection of any material or work pertaining to this Contract shall not relieve the Contractor of its obligation to fulfill this Contract and defective work shall be made good. Unsuitable materials may be rejected by the Supervising Professional notwithstanding that the work and materials have been previously overlooked by the Supervising Professional and accepted or estimated for payment or paid for. If the work or any part shall be found defective at any time before the final acceptance of the whole work, the Contractor shall forthwith make good the defect in a manner satisfactory to the Supervising Professional. The judgment and the decision of the Supervising Professional as to whether the materials supplied and the work done under this Contract comply with the requirements of the Contract shall be conclusive and final.

Section 19 - Acceptance and Final Payment

Upon receipt of written notice that the work is ready for final inspection and acceptance, the Supervising Professional will promptly make the inspection. When the Supervising Professional finds the work acceptable under the Contract and the Contract fully performed, the Supervising Professional will promptly sign and issue a final certificate stating that the work required by this Contract has been completed and is accepted by the DDA under the terms and conditions of the Contract. The entire balance found to be due the Contractor, including the retained percentage, shall be paid to the Contractor by the DDA within 30 days after the date of the final certificate.

Before issuance of final certificates, the Contractor shall file with the DDA:

(1) The consent of the surety to payment of the final estimate;
(2) The Contractor's Affidavit in the form required by Section 44. Contractor’s Affidavit is included as specification section CA-1

In case the Affidavit or consent is not furnished, the DDA may retain out of any amount due the Contractor, sums sufficient to cover all lienable claims.

The making and acceptance of the final payment shall constitute a waiver of all claims by the DDA.
except those arising from:

(1) unsettled liens;
(2) faulty work appearing within 12 months after final payment;
(3) hidden defects in meeting the requirements of the plans and specifications;
(4) manufacturer's guarantees.

It shall also constitute a waiver of all claims by the Contractor, except those previously made and still unsettled.

Section 20 - Suspension of Work

The DDA may at any time suspend the work, or any part by giving 5 days notice to the Contractor in writing. The work shall be resumed by the Contractor within 10 days after the date fixed in the written notice from the DDA to the Contractor to do so. The DDA shall reimburse the Contractor for expense incurred by the Contractor in connection with the work under this Contract as a result of the suspension.

If the work, or any part, shall be stopped by the notice in writing, and if the DDA does not give notice in writing to the Contractor to resume work at a date within 90 days of the date fixed in the written notice to suspend, then the Contractor may abandon that portion of the work suspended and will be entitled to the estimates and payments for all work done on the portions abandoned, if any, plus 10% of the value of the work abandoned, to compensate for loss of overhead, plant expense, and anticipated profit.

Section 21 - Delays and The DDA’s Right to Terminate Contract

If the Contractor refuses or fails to prosecute the work, or any separate part of it, with the diligence required to insure completion, ready for operation, within the allowable number of consecutive calendar days specified plus extensions, or fails to complete the work within the required time, the DDA may, by written notice to the Contractor, terminate its right to proceed with the work or any part of the work as to which there has been delay. After providing the notice the DDA may take over the work and prosecute it to completion, by contract or otherwise, and the Contractor and its sureties shall be liable to the DDA for any excess cost to the DDA. If the Contractor's right to proceed is terminated, the DDA may take possession of and utilize in completing the work, any materials, appliances and plant as may be on the site of the work and useful for completing the work. The right of the Contractor to proceed shall not be terminated or the Contractor charged with liquidated damages where an extension of time is granted under Extension of Time - Section 14.

If the Contractor is adjudged a bankrupt, or if it makes a general assignment for the benefit of creditors, or if a receiver is appointed on account of its insolvency, or if it persistently or repeatedly refuses or fails except in cases for which extension of time is provided, to supply enough properly skilled workers or proper materials, or if it fails to make prompt payments to subcontractors or for material or labor, or persistently disregards laws, ordinances or the instructions of the Supervising Professional, or otherwise is guilty of a substantial violation of any provision of the Contract, then the DDA, upon the certificate of the Supervising Professional that sufficient cause exists to justify such action, may, without prejudice to any other right or remedy and after giving the Contractor 3 days written notice, terminate this Contract. The DDA may then take possession of the premises and of all materials, tools and appliances thereon and without prejudice to any other remedy it may have, make good the deficiencies or finish the work by whatever method it may deem expedient, and deduct the cost from the payment due the Contractor. The Contractor shall not be entitled to receive any further payment until the work is finished. If the expense of finishing the work, including compensation for additional managerial and administrative services exceeds the unpaid balance of
the Contract Sum, the Contractor and its surety are liable to the DDA for any excess cost incurred. The expense incurred by the DDA, and the damage incurred through the Contractor's default, shall be certified by the Supervising Professional.

Section 22 - Contractor's Right to Terminate Contract

If the work should be stopped under an order of any court, or other public authority, for a period of 3 months, through no act or fault of the Contractor or of anyone employed by it, then the Contractor may, upon 7 days written notice to the DDA, terminate this Contract and recover from the DDA payment for all acceptable work executed plus reasonable profit.

Section 23 – DDA’s Right To Do Work

If the Contractor should neglect to prosecute the work properly or fail to perform any provision of this Contract, the DDA, 3 days after giving written notice to the Contractor and its surety may, without prejudice to any other remedy the DDA may have, make good the deficiencies and may deduct the cost from the payment due to the Contractor.

Section 24 - Removal of Equipment and Supplies

In case of termination of this Contract before completion, from any or no cause, the Contractor, if notified to do so by the DDA, shall promptly remove any part or all of its equipment and supplies from the property of the DDA, failing which the DDA shall have the right to remove the equipment and supplies at the expense of the Contractor.

The removed equipment and supplies may be stored by the DDA and, if all costs of removal and storage are not paid by the Contractor within 10 days of invoicing, the DDA upon 10 days written notice may sell the equipment and supplies at auction or private sale, and shall pay the Contractor the net proceeds after deducting all costs and expenses that should have been borne by the Contractor and after deducting all amounts claimed due by any lien holder of the equipment or supplies.

Section 25 - Responsibility for Work and Warranties

The Contractor assumes full responsibility for any and all materials and equipment used in the construction of the work and may not make claims against the DDA for damages to materials and equipment from any cause except negligence or willful act of the DDA. Until its final acceptance, the Contractor shall be responsible for damage to or destruction of the project (except for any part covered by Partial Completion and Acceptance - Section 26). The Contractor shall make good all work damaged or destroyed before acceptance. All risk of loss remains with the Contractor until final acceptance of the work (Section 19) or partial acceptance (Section 26). The Contractor is advised to investigate obtaining its own builders risk insurance.

The Contractor shall guarantee the quality of the work for a period of one year. The Contractor shall also unconditionally guarantee the quality of all equipment and materials that are furnished and installed under the contract for a period of one year. At the end of one year after the Contractor's receipt of final payment, the complete work, including equipment and materials furnished and installed under the contract, shall be inspected by the Contractor and the Supervising Professional. Any defects shall be corrected by the Contractor at its expense as soon as practicable but in all cases within 60 days. Any defects that are identified prior to the end of one year shall also be inspected by the Contractor and the Supervising Professional and shall be corrected by the Contractor at its expense as soon as practicable but in all cases within 60 days.
The Contractor shall assign all manufacturer or material supplier warranties to the DDA prior to final payment. The assignment shall not relieve the Contractor of its obligations under this paragraph to correct defects.

Section 26 - Partial Completion and Acceptance

If at any time prior to the issuance of the final certificate referred to in Acceptance and Final Payment - Section 19, any portion of the permanent construction has been satisfactorily completed, and if the Supervising Professional determines that portion of the permanent construction is not required for the operations of the Contractor but is needed by the DDA, the Supervising Professional shall issue to the Contractor a certificate of partial completion, and immediately the DDA may take over and use the portion of the permanent construction described in the certificate, and exclude the Contractor from that portion.

The issuance of a certificate of partial completion shall not constitute an extension of the Contractor's time to complete the portion of the permanent construction to which it relates if the Contractor has failed to complete it in accordance with the terms of this Contract. The issuance of the certificate shall not release the Contractor or its sureties from any obligations under this Contract including bonds.

If prior use increases the cost of, or delays the work, the Contractor shall be entitled to extra compensation, or extension of time, or both, as the Supervising Professional may determine.

Section 27 - Payments Withheld Prior to Final Acceptance of Work

The DDA may withhold or, on account of subsequently discovered evidence, nullify the whole or part of any certificate to the extent reasonably appropriate to protect the DDA from loss on account of:

1. Defective work not remedied;

2. Claims filed or reasonable evidence indicating probable filing of claims by other parties against the Contractor;

3. Failure of the Contractor to make payments properly to subcontractors or for material or labor;

4. Damage to another Contractor.

When the above grounds are removed or the Contractor provides a Surety Bond satisfactory to the DDA, which will protect the DDA in the amount withheld, payment shall be made for amounts withheld under this section.

Section 28 - Contractor's Insurance

A. The Contractor shall procure and maintain during the life of this Contract, including the guarantee period and during any warranty work, such insurance policies, including those set forth below, as will protect itself, the DDA, Republic Parking System, and the Design Professional from all claims for bodily injuries, death or property damage which may arise
under this Contract; whether the acts were made by the Contractor or by any subcontractor or anyone employed by them directly or indirectly. The following insurance policies are required:

1. Worker's Compensation Insurance in accordance with all applicable state and federal statutes. Further, Employers Liability Coverage shall be obtained in the following minimum amounts:

   Bodily Injury by Accident - $500,000 each accident
   Bodily Injury by Disease - $500,000 each employee
   Bodily Injury by Disease - $500,000 each policy limit

2. Commercial General Liability Insurance equivalent to, as a minimum, Insurance Services Office form CG 00 01 07 98. The City of Ann Arbor, the Ann Arbor Downtown Development Authority, Republic Parking System, and the Design Professional shall be named as an additional insured. There shall be no added exclusions or limiting endorsements including, but not limited to: Products and Completed Operations, Explosion, Collapse and Underground coverage or Pollution. Further, the following minimum limits of liability are required:

   $2,000,000 Each occurrence as respect Bodily Injury Liability or Property Damage Liability, or both combined.
   $4,000,000 Per Job General Aggregate
   $2,000,000 Personal and Advertising Injury
   $4,000,000 Products and Completed Operations Aggregate

3. Motor Vehicle Liability Insurance, including Michigan No-Fault Coverages, equivalent to, as a minimum, Insurance Services Office form CA 00 01 07 97. The City of Ann Arbor, the Ann Arbor Downtown Development Authority, Republic Parking System, and the Design Professional shall be named as an additional insured. There shall be no added exclusions or limiting endorsements. Coverage shall include all owned vehicles, all non-owned vehicles and all hired vehicles. Further, the limits of liability shall be $1,000,000 for each occurrence as respects Bodily Injury Liability or Property Damage Liability, or both combined.

4. Umbrella/Excess Liability Insurance shall be provided to apply excess of the Commercial General Liability, Employers Liability and the Motor Vehicle coverage enumerated above, for each occurrence and for aggregate in the amount of $1,000,000.

B. Insurance required under Section A.2 and A.3 of this Contract shall be considered primary as respects any other valid or collectible insurance that the DDA may possess, including any self-insured retentions the DDA may have; and any other insurance the DDA does possess shall be considered excess insurance only and shall not be required to contribute with this insurance. Further, the Contractor agrees to waive any right of recovery by its insurer against the DDA.

C. In the case of all Contracts involving on-site work, the Contractor shall provide to the DDA before the commencement of any work under this Contract documentation demonstrating it has obtained the above mentioned policies. Documentation must provide and demonstrate an unconditional 30 day written notice of cancellation in favor of the Ann Arbor Downtown
Development Authority. Further, the documentation must explicitly state the following: (a) the policy number; name of insurance company; name and address of the agent or authorized representative; name and address of insured; project name; policy expiration date; and specific coverage amounts; (b) any deductibles or self-insured retentions which shall be approved by the DDA, in its sole discretion; (c) that the policy conforms to the requirements specified. An original certificate of insurance may be provided as an initial indication of the required insurance, provided that no later than 21 calendar days after commencement of any work the Contractor supplies a copy of the endorsements required on the policies. Upon request, the Contractor shall provide within 30 days a copy of the policy(ies) to the DDA. If any of the above coverages expire by their terms during the term of this Contract, the Contractor shall deliver proof of renewal and/or new policies to the Administering Department at least ten days prior to the expiration date.

D. Any Insurance provider of Contractor shall be admitted and authorized to do business in the State of Michigan and shall carry and maintain a minimum rating assigned by A.M. Best & Company’s Key Rating Guide of “A-“ Overall and a minimum Financial Size Category of “V”. Insurance policies and certificates issued by non-admitted insurance companies are not acceptable unless approved in writing by the DDA.

Section 29 - Surety Bonds

Bonds will be required from the successful bidder as follows:

1. A Performance Bond to the Ann Arbor Downtown Development Authority for the amount of the bid(s) accepted.
2. A Labor and Material Bond to the Ann Arbor Downtown Development Authority for the amount of the bid(s) accepted.

Bonds shall be executed on forms supplied by the DDA in a manner and by a Surety Company satisfactory to the DDA’s Attorney.

Section 30 - Damage Claims

The Contractor shall be held responsible for all damages to property of the DDA or others, caused by or resulting from the negligence of the Contractor, its employees, or agents during the progress of or connected with the prosecution of the work, whether within the limits of the work or elsewhere. The Contractor must restore all property injured including sidewalks, curbing, sodding, pipes, conduit, sewers or other public or private property to not less than its original condition with new work.

Section 31 - Refusal to Obey Instructions

If the Contractor refuses to obey the instructions of the Supervising Professional, the Supervising Professional shall withdraw inspection from the work, and no payments will be made for work performed thereafter nor may work be performed thereafter until the Supervising Professional shall have again authorized the work to proceed.

Section 32 - Assignment

Neither party to the Contract shall assign the Contract without the written consent of the other. The Contractor may assign any monies due to it to a third party acceptable to the DDA.
Section 33 - Rights of Various Interests

Whenever work being done by the DDA/City forces or by other contractors is contiguous to work covered by this Contract, the respective rights of the various interests involved shall be established by the Supervising Professional, to secure the completion of the various portions of the work in general harmony.

The Contractor is responsible to coordinate all aspects of the work, including coordination of, and with, utility companies and other contractors whose work impacts this project.

Section 34 - Subcontracts

The Contractor shall not award any work to any subcontractor without prior written approval of the DDA. The approval will not be given until the Contractor submits to the DDA a written statement concerning the proposed award to the subcontractor. The statement shall contain all information the DDA may require.

The Contractor shall be as fully responsible to the DDA for the acts and omissions of its subcontractors, and of persons either directly or indirectly employed by them, as it is for the acts and omissions of persons directly employed by it.

The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind subcontractors to the Contractor by the terms of the General Conditions and all other contract documents applicable to the work of the subcontractors and to give the Contractor the same power to terminate any subcontract that the DDA may exercise over the Contractor under any provision of the contract documents.

Nothing contained in the contract documents shall create any contractual relation between any subcontractor and the DDA.

Section 35 - Supervising Professional's Status

The Supervising Professional has the right to inspect any or all work. The Supervising Professional has authority to stop the work whenever stoppage may be appropriate to insure the proper execution of the Contract. The Supervising Professional has the authority to reject all work and materials which do not conform to the Contract and to decide questions which arise in the execution of the work.

The Supervising Professional shall make all measurements and determinations of quantities. Those measurements and determinations are final and conclusive between the parties.

Section 36 - Supervising Professional's Decisions

The Supervising Professional shall, within a reasonable time after their presentation to the Supervising Professional, make decisions in writing on all claims of the DDA or the Contractor and on all other matters relating to the execution and progress of the work or the interpretation of the contract documents.
Section 37 - Storing Materials and Supplies

Materials and supplies may be stored at the site of the work at locations agreeable to the DDA unless specific exception is listed elsewhere in these documents. Ample way for foot traffic and drainage must be provided, and gutters must, at all times, be kept free from obstruction. Traffic on streets shall be interfered with as little as possible. The Contractor may not enter or occupy with agents, employees, tools, or material any private property without first obtaining written permission from its owner. A copy of the permission shall be furnished to the Supervising Professional.

Section 38 - Lands for Work

The Contractor shall provide, at its own expense and without liability to the DDA, any additional land and access that may be required for temporary construction facilities or for storage of materials.

Section 39 - Cleaning Up

The Contractor shall, as directed by the Supervising Professional, remove at its own expense from the DDA’s property and from all public and private property all temporary structures, rubbish and waste materials resulting from its operations unless otherwise specifically approved, in writing, by the Supervising Professional.

Section 40 - Salvage

The Supervising Professional may designate for salvage any materials from existing structures or underground services. Materials so designated remain DDA property and shall be transported or stored at a location as the Supervising Professional may direct.

Section 41 - Night, Saturday or Sunday Work

No night or Sunday work (without prior written DDA approval) will be permitted except in the case of an emergency and then only to the extent absolutely necessary. The DDA may allow night work which, in the opinion of the Supervising Professional, can be satisfactorily performed at night. Night work is any work between 8:00 p.m. and 7:00 a.m. No Saturday work will be permitted unless the Contractor gives the Supervising Professional at least 48 hours but not more than 5 days notice of the Contractor's intention to work the upcoming Saturday.

Section 42 - Sales Taxes

Under State law the DDA is exempt from the assessment of State Sales Tax on its direct purchases. Contractors who acquire materials, equipment, supplies, etc. for incorporation in DDA projects are not likewise exempt. State Law shall prevail. The Bidder shall familiarize itself with the State Law and prepare its Bid accordingly. No extra payment will be allowed under this Contract for failure of the Contractor to make proper allowance in this bid for taxes it must pay.

Note: Section 43 Contractor’s Declaration is included as section CD-1, and Section 44 Contractor’s Affidavit is included as section CA-1
SECTION 00 7300 – SUPPLEMENTARY CONDITIONS

PART 1 – GENERAL

1.1 Description

A. The following supplements shall modify, change, delete from or add to and shall take precedence over the General Conditions of the Contract for Construction. Where any portion of the General Conditions of the Contract for Construction is modified or any Paragraph, Subparagraph, or Clause thereof is modified or deleted by these supplements, the unaltered provisions of that Article, Paragraph, Subparagraph, or Clause shall remain in effect.

B. Definitions

1. Ann Arbor Downtown Development Authority, also referred to as the DDA or the Owner.
2. Design Professional or Architect: WGI, Inc. is the lead designer; references to “Architect” or “Engineer” within the project specifications will generally refer to WGI, Inc. or a consultant to WGI, Inc.
3. Contract Administrator means the DDA representative authorized by the Ann Arbor Downtown Development Authority to act on the behalf of the Ann Arbor Downtown Development Authority.
4. Supervising Professional as defined in the General Conditions shall mean the Contract Administrator.
5. Miscellaneous Definitions:
   a. “Provide” means to furnish, fabricate, complete, deliver, install and erect, including all labor, materials, equipment, apparatus, appurtenances, and expenses necessary to complete in place, ready for operation and use.
   b. “As shown,” “as detailed,” “as indicated” or words of similar import mean as shown, as detailed, or as indicated in the Documents.
   c. “As selected,” “as approved,” “as accepted” or words of similar import mean as selected by, as approved by, or as accepted by the Engineer.
   d. “Shall” means mandatory.
   e. “As required” means as prescribed by the Contract Documents.
   f. “As necessary” means essential to the completion of the Work.

B. The Specifications are separated into various Sections and Divisions in general accordance with the format established by the Construction Specifications Institute. No responsibility is assumed by the Owner nor the Architect for omissions or duplications by the Contractor in the completion of the Contract due to any alleged error in the arrangement of the material in the Specifications nor shall any such segregation of portions of the Work operate to make the Architect an arbiter in defining limits to the agreements between the Contractor and his Subcontractors or suppliers.
1. Work lists, if any, in the Specification Sections have been included as optional aids to the Contractor and not as limits or mandatory distributions of the work of the various trades involved in the Project. Because of the nature of the construction process, work may be found to be described in one Section and listed in another. All work indicated or described in the Specifications is required regardless of its distribution. When items are stated as "included," the words "but not limited to" shall be assumed as implied. The final correlation of work lists is the responsibility of the Contractor.
2. The Specifications are of the abbreviated type and may include incomplete sentences. Omissions or phrases such as “The Contractor shall” or “complying with the
requirements of" are intentional. Omitted words or phrases shall be supplied by inference in the same manner as they are when a "note" occurs on the Drawings. Words in the singular shall include the plural wherever applicable, or the context so indicates.

C. Contractor

1. The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract. The Contractor shall review any specified or recommended construction or installation procedure, including those recommended by manufacturers, and shall advise the Architect: (1) if, in the Contractor's opinion, the procedure deviates from good construction practice; or (2) if following the procedure will affect any warranties, including the Contractor's general warranty; or (3) of any objections the Contractor may have to the procedure; or (4) if the Contractor proposes any alternative procedure which the Contractor is willing to warrant.

2. The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

3. Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

4. Except in the case of minor changes in the Work authorized by the Architect, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

D. Contractor Schedule

1. The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals not less than monthly as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work. The Owner's or Architect's silence with respect to a submitted construction schedule that exceeds time limits current under the Contract Documents shall not relieve the Contractor of its obligation to meet those time limits. The Owner's or Architect's silence shall not make the Owner or Architect liable for any Contractor damages incurred because of increased construction time or not meeting those time limits.

2. The Contractor shall prepare a submittal schedule, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, and shall submit the schedule(s) for the Architect's approval. The Architect's approval shall not unreasonably be delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

E. Shop Drawings & Coordination Drawings
1. Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work. The Contractor shall not submit any shop drawing that is merely a tracing or other copy of any of the Contract Documents. Each shop drawing shall be prepared by the Contractor, or a subcontractor or supplier of the Contractor and shall be submitted according to the project specifications.

2. Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. Their purpose is to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

3. The Contractor shall review for compliance with the Contract Documents, approve and submit to the Architect Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors.

4. By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

5. The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect.

6. The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect's approval thereof.

7. The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such written notice, the Architect's approval of a resubmission shall not apply to such revisions.

8. Coordination Drawings. The Construction Drawings indicate the desired arrangement and approximate location for conduit, piping, and duct work, and other items of equipment. The Contractor shall issue coordination drawings to ensure that the Work is constructed in a manner to avoid obstructions, preserve head room, keep openings and other passageways clear, overcome interference with structural conditions, and coordinate with other trades. The Contractor shall provide coordination drawings for all mechanical, electrical, telecommunications, data, fire protection, and any other building systems. The Contractor is entitled to use the Architect's electronic documents as backgrounds in preparing these drawings. The Contractor shall be
responsible for proper installation and coordination of equipment in the space available.

F. Administration of the Contract

1. The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

2. The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work is in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

3. On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and report to the Owner (1) known deviations from the Contract Documents and from the most recent construction schedule submitted by the Contractor, and (2) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

4. Except as otherwise provided in the Contract Documents, the Owner and Contractor shall endeavor to communicate with each other through the Architect about matters arising out of or relating to the Contract. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner. Any direct communications between any of the Owner, Architect, and Contractor that affect the performance or administration of the Contract shall be made or confirmed in writing by the Contractor. Any such communications that represent a modification to the Contract requirements shall be documented as required by the Contract Documents.

5. The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.

6. The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for
substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect’s review of the Contractor’s submittals shall not relieve the Contractor of its obligations. The Architect’s review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect’s approval of a specific item shall not indicate approval of an assembly of which the item is a component.

7. The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion; receive and forward to the Owner, for the Owner’s review and records, written warranties and related documents required by the Contract and assembled by the Contractor.

8. Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions rendered in good faith.

9. The Architect will review and respond to requests for information about the Contract Documents. The Architect’s response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

G. Section 13 – Changes in the Work

1. Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Section and elsewhere in the Contract Documents.

2. A Change Order shall be based upon agreement among the Owner, Contractor and Architect; a Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor; an order for a minor change in the Work may be issued by the Architect alone.

3. Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work.

4. A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

   a. A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

   b. If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:
i. Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation. The lump sum proposal shall be itemized for the various components of the Work, segregated by labor, materials, equipment, in a detailed format identifying unit quantities and unit prices, satisfactory to Owner. The Contractor will provide its itemized lump sum proposal and similar proposals for any Subcontractors and Sub-subcontractors;

ii. Unit prices stated in the Contract Documents or subsequently agreed upon;

c. Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect, in writing, of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

d. A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

e. Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order.

f. When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

5. If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

H. Section 16 – Progress Payments

1. Except with the Owner’s prior approval, payments to the Contractor shall be subject to retention of not less than ten percent (10%).

I. Section 21 – Contractor’s Insurance

1. Insurance requirements identified in the Contract supersede the General Conditions insurance requirements.

2. The Contractor’s insurance shall protect the Contractor and Owner from claims which may arise out of or result from the Contractor’s operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable.

3. The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Owner, the Architect and the Architect's Consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent
acts or omissions during the Contractor’s operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor’s negligent acts or omissions during the Contractor’s completed operations.

4. PROPERTY INSURANCE - Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder’s risk “all-risk” or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall not include coverage of losses of property other than the Project. 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 payment has been made or until no person or entity other than the Owner has an insurable interest in the property required to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

a. Property insurance shall be on an “all-risk” or equivalent policy form and shall include insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect’s and Contractor’s services and expenses required as a result of such insured loss.

b. If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor shall then effect insurance that will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner.

c. If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles. The Contractor shall pay such deductibles to the extent such costs were caused by the Contractor or any person or entity performing or supplying any portions of the Work.

d. Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

PART 2 – PRODUCTS

2.1 Not used

PART 3 – EXECUTION

3.1 Not used
PART 1 - GENERAL

1.1 Related Documents
A. The Conditions of the Contract for Construction and the General Requirements of Division 1 of these Specifications apply to the Work in this Section.

1.2 Description of the Work
A. The Work contemplated by the Contract Documents includes the Work of all trades required and all the labor, equipment, materials, and supervision necessary and incidental to the restoration of the Ann Arbor DDA Parking Structures.
B. Work will be performed at locations within the parking structure as shown on the Drawings.
C. Main items of the Work required in these areas are described in the Drawings and Specifications.
D. It shall be understood that where additional Work is described, but not specifically located and/or shown on the Drawings, the Contractor shall be responsible for locating and marking areas to be repaired.

1.3 Work by Others
A. The Owner may have other Work occurring within or adjacent to the Parking Structure at the same time as this Project. This Contractor shall cooperate at all times with the Owner to ensure that all Work proceeds without delay to scheduled completion.

1.4 Work Sequence
A. Prior to commencement of Work, Contractor shall meet with Owner and Engineer to establish sequence and schedule of Work.
B. Contractor shall notify Owner at least 24 hour prior to beginning any demolition or abrasive blasting operations.
C. Contractor shall remove all broken concrete and debris from areas exposed to public view and dispose of same.
D. Contractor shall remove dust and air transported abrasive from the remainder of the facility at the conclusion of abrasive blasting or demolition operations.

1.5 Project Meetings
A. Refer to Section 01 3100 - Project Management and Coordination.
1.6 Contractor Log

A. Contractor shall furnish and maintain one (1) log book at the Project site. Enter into this log each day:
   1. Weather conditions and temperature
   2. General progress of the Project
   3. Materials received
   4. Amount of materials placed
   5. Tests made
   6. Inspections made by other authorities
   7. All visitors to the Project site
   8. Unresolved problems

B. Submit for record one copy of the log to the Engineer weekly. Refer to the following page for sample log sheet indicating minimum requirements.

1.7 Examination of Site

A. The contractor shall visit the site of the Work, compare the Drawings and Specifications and other Contact Documents with existing conditions, including other’s work, if any, being performed. Failure to visit the site shall in no way relieve the Contractor from the necessity of furnishing of materials or performing any work that may be required to complete the work in accordance with the Contract Documents.

1.8 Verification of Existing Dimensions

A. Where the installation of new construction is dependent on existing dimensions, the Contractor requiring shall be responsible for the verification of existing dimensions prior to the construction or fabrication of materials.

PART 2 - PRODUCTS

2.1 Not used.

PART 3 - EXECUTION

3.1 Not used.

END OF SECTION 01 1000
CONTRACTOR’S LOG

Date: __________________________ Weather Conditions
Job Location: ____________________
General Contractor: ________________

Weather Conditions:

- Time: ______ Temp: ______
- Wind: 0-5 mph 5-10 mph 10-up
- Humidity: Low - Med - High
- Sky: Clear - Hazy - Overcast - Rain

No. of Workers on Site: _____________
Sub-Contractors on Site: _____________

Work Performed

Inspections, Tests Performed

Unresolved Problems

Materials Received

Change Orders Received

Visitors Representing

CC To: ___________________________ Signed: ___________________________
SECTION 01 2900 – PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 Related Documents
   A. The General Conditions of the Contract for Construction and the General Requirements of Division I of these Specifications apply to the Work in this Section.

1.2 Project Pricing
   A. Bidder shall complete the Bid Form, including all requested information.
   B. Project pricing is a combination of lump sum work items and unit price work items.

1.3 Unit Prices
   A. Bidders shall submit unit prices for each unit price item listed in the Bid Form. The amount of each unit price shall be stipulated in the space provided in the Bid Form.

1.4 Lump Sum Prices
   A. Bidder shall submit lump sum prices for each lump sum item listed in the Bid Form. The amount of each lump sum price shall be stipulated in the space provided in the Bid Form.

1.5 Unit Price Quantity Measurement
   A. The Owner reserves the right to reject the Contractor's measurement of work-in-place that involves use of established unit prices, and to have this Work measured by an independent surveyor acceptable to the Contractor at the Owner's expense.
   B. Contractor shall maintain plan drawings locating all unit price repairs performed. Location and size of patches, overlays, etc. must be located on clean drawings. Separate drawings shall be maintained for each level and ceiling plan. Contractor shall submit copy of drawing identifying current quantities with each payment request. Work being invoiced must be properly identified. These drawings shall be incorporated into "Record Drawings" set required per Division 1.
   C. Quantity measurements shall be performed as described in Specification or shown on Drawings.

1.6 Application for Payment
   A. The form of Application for Payment shall be notarized AIA Document G702, "Application and Certification for Payment," supported by AIA Document G703, Continuation Sheet.
B. Complete every entry on the form, including notarization and execution by person authorized to sign legal documents on behalf of the Owner. Incomplete applications will be returned without action.
   1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions have been made.
   2. Include amount of change orders issued prior to the last day of construction period covered by the application.

C. Submit three (3) executed copies of each Application for Payment to the Engineer. One copy shall be complete, including waivers of lien and similar attachments, when required.

D. Administrative actions and submittals that must precede or coincide with submittal of the first Application for Payment include the following:
   1. List of subcontractors
   2. List of principal suppliers and fabricators
   3. Schedule of Values
   4. Contractor's Construction Schedule (preliminary, if not final)
   5. Schedule of principal products
   6. Submittal Schedule (preliminary, if not final)
   7. List of Contractor's staff assignments
   8. List of Contractor's principal consultants
   9. Copies of permits
   10. Copies of authorizations and licenses from governing authorities for performance of the Work
   11. Initial progress report
   12. Certificates of insurance and insurance policies
   13. Performance and payment bonds (if required)
   14. Data needed to acquire Owner's insurance

E. Administrative actions and submittals which must precede or coincide with submittal of the final payment Application for Payment include the following:
   1. Completion of Project closeout requirements
   2. Completion of items specified for completion after Substantial Completion
   3. Assurance that unsettled claims will be settled
   4. Assurance that Work not complete and accepted will be completed without undue delay
   5. Transmittal of required Project construction records to Owner
   6. Proof that taxes, fees and similar obligations have been paid
   7. Removal of temporary facilities and services
   8. Removal of surplus materials, rubbish and similar elements
   9. Warranties

1.7 Waivers of Mechanics Lien

A. With each Application for Payment submit waivers of mechanics liens from subcontractors or sub-subcontractors and suppliers for the construction period covered by the previous application.

B. Submit partial waivers on each item for the amount requested, prior to deduction for retainage, on each item.

C. When an application shows completion of an item, submit final or full waivers.

D. The Owner reserves the right to designate which entities involved in the Work must submit waivers.
E. Submit waivers of lien on forms, and executed in a manner acceptable to the Owner.

PART 2 - PRODUCTS

2.1 Not used.

PART 3 - EXECUTION

3.1 Not used.

END OF SECTION 01 2900
PART 1 - GENERAL

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

1.2 SUMMARY
A. Section includes requirements for the submittal schedule, construction schedule, and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
B. Related Requirements:
   1. Submittals required for action and informational purposes are specified elsewhere.
C. Submittals not requested from the Contractor will be returned stamped "No Architect/Engineer's Action Required."

1.3 DEFINITIONS
A. Action Submittals: Written and graphic information and physical samples that require Engineer's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
B. Informational Submittals: Written and graphic information and physical samples that do not require Engineer's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals." Informational submittals may also be referred to as submittals "for record."
C. File Transfer Protocol (FTP): Communications protocol that enables transfer of files to and from another computer over a network and that serves as the basis for standard Internet protocols. An FTP site is a portion of a network located outside of network firewalls within which internal and external users are able to access files.

1.4 ACTION SUBMITTALS
A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, testing, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Engineer and additional time for handling and reviewing submittals required by those corrections.
1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
2. List and identify those submittals required early because of long lead time for manufacture or fabrication.
3. Submit concurrently with the first complete submittal of Contractor's construction schedule.
   a. Submit revised submittal schedule regularly to reflect changes in current status and timing for submittals.
4. Format: Arrange the following information in a tabular format:
   a. Scheduled date for first submittal.
   b. Specification Section number and title.
   c. Submittal category: Action; informational.
   d. Name of subcontractor.
   e. Description of the Work covered.
   f. Scheduled date for Engineer's final release or approval.
   g. Scheduled date of fabrication.
   h. Scheduled dates for purchasing.
   i. Scheduled dates for installation.
   j. Activity or event number

1.5 INFORMATIONAL SUBMITTALS

A. Contractor's Construction Schedule: Prepare and submit within 10 days after the execution of the Contract an estimated construction progress schedule in bar chart form. Extend schedule from date established for the execution of the Contract to date of final completion.
   1. Prepare a list of all activities required to complete the work. Identify critical path activities. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates.
   2. Each activity in schedule shall contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, total float in calendar days, sequence requirements, and relationship of each activity in relation to other activities.
   3. Coordinate construction schedule with the schedule of values, submittal schedule, progress reports, payment requests, and other required schedules and reports.
   4. Schedule shall include provisions for submittal review time, resubmittal review time, procurement time, material cure time, adverse weather, and constraints and work restrictions in the Contract Documents.
   5. Schedules for restoration work shall indicate the areas to be closed during each phase of construction and shall indicate the proposed traffic flow for each phase.

1.6 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
   1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
   2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
   3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
4. All submittals shall be received in an orderly sequence and sufficiently in advance of
collection requirements to allow time for checking, resubmitting and rechecking.
5. Coordinate transmittal of different types of submittals for related parts of the Work so
processing will not be delayed because of need to review submittals concurrently for
coordination.

   a. Engineer reserves the right to withhold action on a submittal requiring coordination
      with other submittals until related submittals are received.

B. Processing Time: Allow time for submittal review, including time for resubmittals, as follows.
   Time for review shall commence on Engineer's receipt of submittal. No extension of the
   Contract Time will be authorized because of failure to transmit submittals enough in advance of
   the Work to permit processing, including resubmittals.
   1. Submittal Review: Allow 10 working days for review of each submittal. Allow additional
time if coordination with subsequent submittals is required. Engineer will advise
   Contractor when a submittal being processed must be delayed for coordination.

C. Submittal Format:
   1. Contractor may elect to provide submittals by paper submittals or electronic
      submittals. Format selected shall be used for entire project duration.
   2. For projects where electronic submittals are provided, a corresponding paper submittal
      may also be required where indicated.
   3. For projects where paper submittals are provided, Engineer may not return paper copies
      of submittals and return submittals electronically.

D. Paper Submittals: Place a permanent label or title block on each submittal item for identification.
   1. Indicate name of firm or entity that prepared each submittal on label or title block.
   2. Provide a space approximately 6 by 8 inches on label or beside title block to record
      Contractor's review and approval markings and action taken by Engineer.
   3. Include the following information for processing and recording action taken:
      a. Project name.
      b. Date.
      c. Name of Engineer.
      d. Name of Construction Manager.
      e. Name of Contractor.
      f. Name of subcontractor.
      g. Name of supplier.
      h. Name of manufacturer.
      i. Submittal number or other unique identifier, including revision identifier.
         1) Submittal number shall use Specification Section number followed by a
dash and then a sequential number (e.g., 03300-01). Resubmittals shall
         include an alphabetic suffix after another dash (e.g., 03300-01-A).
      j. Number and title of appropriate Specification Section.
      k. Drawing number and detail references, as appropriate.
      l. Location(s) where product is to be installed, as appropriate.
      m. Other necessary identification.

4. Transmittal for Paper Submittals: Assemble each submittal individually and appropriately
   for transmittal and handling. Transmit each submittal using a transmittal form. Engineer
   will return without review submittals received from sources other than Contractor.

   a. Transmittal Form for Paper Submittals: Use transmittal form acceptable to
      Engineer and Owner, containing the following information:

      1) Project name.
2) Date.
3) Destination (To:).
4) Source (From:).
5) Name and address of Engineer.
6) Name of Construction Manager.
7) Name of Contractor.
8) Name of firm or entity that prepared submittal.
9) Names of subcontractor, manufacturer, and supplier.
10) Category and type of submittal.
11) Submittal purpose and description.
12) Specification Section number and title.
13) Specification paragraph number or drawing designation and generic name for each of multiple items.
14) Drawing number and detail references, as appropriate.
15) Indication of full or partial submittal.
16) Transmittal number.
17) Submittal and transmittal distribution record.
18) Remarks.
19) Signature of transmitter.

E. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:

1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.
   a. File name shall use project identifier and Specification Section number followed by a dash and then a sequential number (e.g., AADDA-03300-01). Resubmittals shall include an alphabetic suffix after another dash (e.g., AADDA-03300-01-A).
3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Engineer.
4. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Engineer and Owner, containing the following information:
   a. Project name.
   b. Date.
   c. Name and address of Engineer.
   d. Name of Contractor.
   e. Name of firm or entity that prepared submittal.
   f. Names of subcontractor, manufacturer, and supplier.
   g. Category and type of submittal.
   h. Submittal purpose and description.
   i. Specification Section number and title.
   j. Specification paragraph number or drawing designation and generic name for each of multiple items.
   k. Drawing number and detail references, as appropriate.
   l. Location(s) where product is to be installed, as appropriate.
   m. Related physical samples submitted directly.
   n. Indication of full or partial submittal.
   o. Transmittal number.
   p. Submittal and transmittal distribution record.
   q. Remarks.
   r. Other necessary identification.
5. Metadata: Include the following information as keywords in the electronic submittal file metadata:
   a. Project name.
   b. Number and title of appropriate Specification Section.
   c. Manufacturer name.
   d. Product name.

F. Options: Identify options requiring selection by Engineer.

G. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Engineer on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.

H. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
   1. Note date and content of previous submittal.
   2. Note date and content of revision in label or title block and clearly indicate extent of revision. Clearly indicate all changes that have been made by clouding and use of revision number in a triangular symbol.
   3. Resubmit submittals until they are marked with approval notation from Engineer's action stamp.

I. Distribution: Furnish final submittals to Engineer, Owner, manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, testing agencies, and others as necessary for performance of construction activities. Show distribution on transmittal forms. Format and quantities of final submittals shall be coordinated with each recipient.

J. Review of resubmittals by the Engineer shall be limited to required corrections only, and the Contractor by resubmitting shall represent that the resubmittals contain no other alternations, additions or deletions. If additional changes have been made, same shall be specifically noted and described on the resubmittal.

K. Use for Construction: Retain complete copies of submittals on Project site available for review. Use only final action submittals that are marked with approval notation from Engineer’s action stamp. Contractor shall provide “Issued for Construction for Field Use” drawings as required for all field construction activities which shall be based on and referenced to final action submittals marked with approval notation from Engineer’s action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
   1. Submit electronic submittals via email as PDF electronic files.

   a. If electronic file size of submittal exceeds email size limits of either Contractor or Engineer, Contractor shall post to Project Web Site and notify Engineer via email that submittal has been posted.
b. Engineer will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.

2. Action Submittals: If paper copies are submitted or required, Submit three paper copies of each submittal unless otherwise indicated. Engineer will return two copies.

3. Informational Submittals: If paper copies are submitted or required, Submit two paper copies of each submittal unless otherwise indicated. Engineer will not return copies.

4. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.

2. Mark each copy of each submittal to show which products and options are applicable.

3. Modify standard drawings to delete information which is not applicable to project.

4. Show dimensions and clearances.

5. Supplement standard information to provide additional information applicable to project.

6. Include the following information, as applicable:
   a. Manufacturer's catalog cuts.
   b. Manufacturer's product specifications.
   c. Standard color charts.
   d. Statement of compliance with specified referenced standards.
   e. Testing by recognized testing agency.
   f. Application of testing agency labels and seals.
   g. Notation of coordination requirements.
   h. Availability and delivery time information.

7. Submit Product Data before or concurrent with Samples.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
   a. Identification of products.
   b. Schedules.
   c. Compliance with specified standards.
   d. Notation of coordination requirements.
   e. Notation of dimensions established by field measurement.
   f. Relationship and attachment to adjoining construction clearly indicated.
   g. Highlight with notation, encircle, or otherwise indicate deviations from Contract Documents.
   h. Seal and signature of professional engineer if specified.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches, but no larger than 30 by 42 inches.

D. Samples: Submit Physical Samples for review and approval of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.

2. Identification: Attach label on unexposed side of Samples that includes the following:
   a. Generic description of Sample.
   b. Product name and name of manufacturer.
   c. Sample source.
   d. Number and title of applicable Specification Section.
e. Specification paragraph number and generic name of each item.

3. For projects where electronic submittals are required, provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.

4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
   a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
   b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

5. The Engineer shall review and approve Contractor submittals such as schedules, products, materials, samples, and shop drawings for the limited purpose of conformance with the design concept and the information expressed in the Contract Documents.

6. The Engineer shall not be responsible for any deviations from the Contract Documents not brought to the attention of the Engineer in writing by the Contractor.

7. The Engineer shall not be required to review partial submittals or those for which submissions or correlated items have not been received. However, review of a specific item shall not indicate that the Engineer has reviewed the entire assembly of which the item is a component.

8. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
   a. Number of Samples: Submit one full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Engineer will return submittal with options selected.

E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
   1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
   2. Manufacturer and product name, and model number if applicable.
   3. Number and name of room or space.
   4. Location within room or space.

F. Contractor's Construction Schedule:
   1. Contractor’s Construction Schedule Updates: At bi-weekly intervals, update schedule to reflect actual construction progress and activities. Issue schedule before each regularly scheduled progress meeting. Issue schedule concurrently with each payment request.
      a. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
      b. Include a report with updated schedule that indicates every change, including, but not limited to, changes in critical path, activities, durations, and total float or slack time.
      c. As the Work progresses, indicate final completion percentage for each activity.
   2. Recovery Schedule: When periodic updates indicates the Work is [14] or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished.
   3. Distribution: Distribute copies of schedule to Engineer, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
a. When revisions are made, distribute updated schedules to the same parties. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

G. Application for Payment and Schedule of Values: Comply with requirements specified in Section 01 2900 "Payment Procedures"

1. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Section 01 4100 "Testing Laboratory."

2. Promptly submit a written report of each test and inspection for record required of the Contractor, PDF file and one (1) copy each to the Engineer and Owner. Each report shall include:

a. Date issued
b. Project title and number
c. Testing laboratory name, address, and telephone number
d. Name and signature of laboratory inspector
e. Date and time of sampling or inspection
f. Record of temperature and weather conditions
g. Date of test
h. Identification of product and Specification Section
i. Location of sample or test in the Project
j. Type of inspection or test
k. Results of tests and compliance with Contract Documents
l. Interpretation of test results, when requested by the Engineer.

H. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 01 7700 "Closeout Procedures"

I. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of Engineers and owners, and other information specified.

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

K. Installer Certificates: Submit written statements on manufacturer’s letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

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

M. Product Certificates: Submit written statements on manufacturer’s letterhead certifying that product complies with requirements in the Contract Documents.

N. Material Certificates: Submit written statements on manufacturer’s letterhead certifying that material complies with requirements in the Contract Documents.

O. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency’s standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
P. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

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

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

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

T. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

U. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW AND RESPONSIBILITIES

A. The submittals are not to be considered a part of the Contract Documents.

B. Submittals shall demonstrate the Contractor understands and has interpreted the intent of the design as detailed and specified in the Contract Documents. The Contractor shall check and approve submittals for accuracy or completeness of details, such as quantities, dimensions, weights or gauges, fabrication processes, construction precautions and verification of field dimensions or conditions. The Contractor's responsibility for errors and omissions in submittals is not relieved by Engineer's review of submittals.

C. All submittals to the Engineer shall be routed through the Contractor and bear the Contractor's Approval Stamp certifying they have been reviewed, checked, and approved for compliance with the Contract Documents. All submittals to the Engineer that are without this stamp of approval or that contain obvious errors or have not been checked or have been checked
superficially will be returned unchecked and unstamped by the Engineer for resubmission by the Contractor.

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

D. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Engineer.

E. Project Closeout and Maintenance Material Submittals: See requirements in Section 01 7700 "Closeout Procedures"

3.2 ENGINEER’S ACTION

A. The Engineer shall review and approve or take other appropriate action on the Contractor's submittals, such as shop drawings, product data, samples and other data, which the Contractor is required to submit, but only for the limited purpose of checking for conformance with the design concept and the information shown in the Construction Documents. This review shall not include review of the accuracy or completeness of details, such as quantities, dimensions, weights or gauges, fabrication processes, construction means or methods, coordination of the work with other trades or construction safety precautions, all of which are the sole responsibility of the Contractor. Review of a specific item shall not indicate that the Engineer has reviewed the entire assembly of which the item is a component. The Engineer shall not be responsible for any deviations from the Construction Documents not brought to the attention of the Engineer in writing by the Contractor. The Engineer shall not be required to review partial submissions or those for which submissions of correlated items have not been received.

B. Action Submittals: Engineer will review each submittal, make marks to indicate corrections or revisions required, and return it. Engineer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action, as follows:

1. The "actions taken" appearing on the Engineer's Approval Stamp shall be defined as follows:

   a. "No Exceptions Taken" – Fabrication and/or installation may be undertaken. Acceptance does not authorize changes to the Contract Sum or Contract Time unless stated in separate letter or Change Order.

   b. "Exceptions Noted (No Resubmit)" – Fabrication and/or installation may be undertaken. Exceptions as noted are to be incorporated. Acceptance does not authorize changes to the Contract Sum or Contract Time unless stated in separate letter or Change Order.

   c. "Resubmit with Corrections" – Fabrication and/or installation MAY NOT be undertaken until exceptions as noted are incorporated and resubmitted for approval. Revision does not authorize changes to the Contract Sum or Contract Time.

   d. "Not Reviewed (Filed For Record)" – Submittal not requested from the Contractor and was not reviewed.

   e. "Rejected" – Fabrication and/or installation MAY NOT be undertaken. Submittal is too incomplete or does not meet Contract Documents. Resubmit for approval.
C. Informational (or For Record) Submittals: Engineer will review each submittal for conformance with submittal requirements only and not its content. Engineer will not return the submittal, or will return it if it does not comply with requirements. Engineer will forward each submittal to appropriate party.

D. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Engineer.

E. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

F. Submittals not required by the Contract Documents may be returned by the Engineer without action.

END OF SECTION 01 3300
### WGI, INC.
**CONTRACTOR SUBMITTAL REVIEW LABEL**

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**Contractor's Approval Stamp**

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**WGI MICHIGAN, INC.**  
**PROJECT NO. 24205511.01**  
**SUBMITTAL PROCEDURES**  
**01 3300 - 12**
PART 1 - GENERAL

1.1 Related Documents
   
   A. Conditions of Contract for Construction and General Requirements of Division 1 of these Specifications apply to Work of this Section.
   
   B. All testing of concrete will conform to requirements of ACI 301-16, Standard Specifications for Structural Concrete and ACI 311.5-04, Guide for Concrete Plant Inspection and Testing of Ready-Mixed Concrete. Specific project requirements or modifications are specified herein.

1.2 Work Included
   
   A. Owner will employ and pay for services of an Independent Testing Laboratory approved by Engineer to perform testing as specified in this Section.
   
   B. Contractor shall pay for all re-tests and related engineering services which indicate that initial tested items are not in accordance with Contract Documents, and for additional tests that are for his convenience.

1.3 Related Work
   
   A. Following Work is related to this Section:
      
      1. Cast-In-Place Concrete Section 03 3000

1.4 Quality Control (ACI 301 1.6) Additional requirements are as follows:
   
   A. Laboratory will meet requirements of ASTM C 1077.
   
   B. Laboratory will have been inspected by an independent agency such as Cement and Concrete Reference Laboratory CCRL or AASHTO Material Reference Laboratory AMRL.
   
   C. Laboratory will meet "Recommended Requirements for Independent Laboratory Qualification," published by American Council of Independent Laboratories.
   
   D. Laboratory will be authorized to operate in state in which Project is located.
   
   E. An ACI certified Concrete Laboratory Testing Technician - Grade II will be responsible for concrete testing services.
   
   F. An ACI certified Concrete Field Testing Technician - Grade I will be responsible for field testing services.
   
   G. Employment of Laboratory will in no way relieve Contractor's obligations to perform Work of Contract.
1.5 Laboratory Responsibilities (ACI 301 1.6.4) Additional requirements are as follows:

A. Laboratory will cooperate with Engineer, Contractor, and Subcontractors in order to provide qualified personnel upon due notice.

B. All testing will be performed in a timely manner to prevent installation (or to allow for removal) of non-conforming material.

C. All tests will be reported in writing to Contractor, Subcontractor, Supplier, Installer, etc., Engineer, and Owner. Written reports of test results will be delivered to above parties within 48 hours of testing or by FAX if immediately requested. Each report will include, as a minimum, following:
   1. Report number
   2. Date issued
   3. Project title and number
   4. Name of Contractor and Subcontractor if applicable
   5. Supplier
   6. Testing Laboratory name, address, and telephone number
   7. Name and signature of Laboratory Field Technician
   8. Date and time of sampling or inspection
   9. Record of temperature and weather conditions
   10. Date of test
   11. Identification of product and Specification Section
   12. Location of sample or test in Project
   13. Type of inspection or test
   14. Results of tests and compliance with Contract Documents
   15. Interpretation of test results when requested by Engineer

1.6 Submittals

A. Upon request for review and approval certification and qualifications of Laboratory and Laboratory field Technicians.

B. Upon request for record testing procedures and apparatus.

1.7 Specific Tests, Inspections and Methods Required

A. Cast-In-Place Concrete (ACI 301 1.6.4 and ACI 311.5R-1.3, 2.4): Comply also with testing requirements established in governing building codes. Additional requirements are specified as follows:

      a. Laboratory will have a compression machine capable of breaking 6" X 12" cylinders of 10,000 psi or be prepared to test 4" X 8" cylinders in accordance with ASTM standards.
      b. Take a minimum of six cylinders for each 50 cubic yards, or fraction thereof, of each mix design of concrete placed in any one day.
      c. Compression test sample size will be 6" x 12" cylinders except that 4" x 8" cylinders may be used for silica fume concrete.
      d. Compression tests
         1) Test 2 cylinders at 7 days.
         2) Test 2 cylinders at 28 days.
         3) Hold 2 cylinders in reserve for use as the Engineer directs.
2. Slump Test
   a. Conduct one slump test per batch at the point of placement ASTM C 143.
      1) When water reducing admixtures or high range water reducing admixtures are added at job site, test concrete slump prior to addition of admixtures.

3. Air Content Testing
   a. Sample and test each batch of air entrained concrete delivered to project ASTM C 173 or ASTM C 231 and ASTM C 138.

4. Ambient Air Temperature and Composite Concrete Sample Temperature.
   a. Record temperatures for each batch of concrete ASTM C 1064.

5. Corrosion Inhibitor Testing
   Concrete Producer shall have corrosion inhibitor Manufacturer/Supplier perform following:
   a. Install a visual reference (such as a bottle or other approved device) for dispensing Calcium Nitrite corrosion inhibitor. Visual reference shall be accessible to Independent Testing Laboratory, Manufacturer/Supplier’s Representative, and Engineer.
   b. Calibrate dispensing system at initial equipment installation and annually thereafter. Install tamper proof seals after each calibration of system.

Concrete plant operator shall perform following:
   a. Verify contents of visual reference (such as a bottle or other approved device) prior to discharge of product for each batch. If visual reference does not indicate specified amount of corrosion inhibitor, concrete plant operator shall stop production and notify corrosion inhibitor Manufacturer/Supplier immediately.

Independent Testing Laboratory shall perform following:
   a. Prior to and after each pour, take volume readings of corrosion inhibitor tank, correlate to size of pour, and report results to Engineer, corrosion inhibitor Manufacturer/Supplier, and concrete supplier. Volume used should be within +/- 10% of specified amount.
   b. Test plastic corrosion inhibitor concrete for presence of corrosion inhibitor in accordance with test method indicated in Appendix A. Test each concrete sample used for concrete compression test cylinders at rate of one test for each 50 cubic yards, or fraction thereof, of each mix design of concrete placed in any one day.

6. Submit for record field test reports including following information ACI 311.5R 2.5:
   a. Project information as specified herein
   b. Design mix number
   c. Design strength
   d. Cement content
   e. Water content
   f. Coarse aggregate lbs/yd
   g. Fine aggregate lbs/yd
   h. Admixtures
   i. Truck number and/or ticket number
   j. Drum rotation revolution
   k. Cubic yards
   l. W/C ratio
   m. Batch time
   n. Discharge start time
   o. Empty time
   p. Sample time
   q. Slump
r. Air content
s. Air temperature and concrete temperature
t. Location of placement and location of sample batch

7. Submit for record laboratory test results including following information in addition to information cited under field tests.
   a. Cylinder identification
   b. Date tested, concrete age
   c. Total load
   d. Compressive strength
   e. Type of fracture
   f. Method of curing
   g. Weight of cylinder

PART 2 - PRODUCTS

2.1 Not used.

PART 3 - EXECUTION

3.1 Not used.

END OF SECTION 01 4100
Appendix A

Test method for Calcium Nitrite presence in plastic concrete.

Scope:

This method of test is used to determine presence of calcium nitrite in plastic concrete state. A freshly mixed concrete sample shall be tested. Quantofix test strips, for high range nitrite, manufactured by Gallard-Schlesinger Industries, Inc. of Carle Place, New York or equivalent, shall be used.

A. Apparatus

1. Quantofix Test Strips for high range nitrite #91322
   a. CTL Scientific (888) 686-3454
2. 10cc disposable syringes with Leur-Lok tip #309604
   a. Care Express (800) 339-3880
3. Disposable Filters 25mm/.45 micron #SLHAM3355
   a. Millipore (800) 645-5476
4. Wide-mouth Container
5. Clean Measuring Cup

B. Procedure

1. Add field concrete to pre-measured 2 liters of water in a wide mouth container. Use water in the container to rinse out measuring cup.
2. Shake container 2-5 minutes until contents are well mixed. As indicated in Column 2 of following Table, stated quantity of concrete, in millimeters, should be obtained in container.
3. Using syringe, uptake approximately 10 ml of extraction water from container. Attach a disposable filter to end of syringe.
4. Filter the extraction water into a clean cup.
5. Dip test strip into clear, filtered extraction water and compare color to chart on side of test strip container.
6. Use following chart to determine amount of concrete to be extracted, and expected readings on test strips:
<table>
<thead>
<tr>
<th>Amount of Calcium Nitrate Added, liter/cu. Meters</th>
<th>Volume of Concrete to be Extracted, milliliters</th>
<th>Expected Reading on Test Strip</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.9</td>
<td>225</td>
<td>0.3</td>
</tr>
<tr>
<td>12.4</td>
<td>180</td>
<td>0.3</td>
</tr>
<tr>
<td>14.8</td>
<td>150</td>
<td>0.3</td>
</tr>
<tr>
<td>17.3</td>
<td>130</td>
<td>0.3</td>
</tr>
<tr>
<td>19.8</td>
<td>225</td>
<td>0.6</td>
</tr>
<tr>
<td>22.3</td>
<td>200</td>
<td>0.6</td>
</tr>
<tr>
<td>24.8</td>
<td>180</td>
<td>0.6</td>
</tr>
</tbody>
</table>

Notes:
Column 1 indicates amount of calcium nitrite, in liters, that has been added to a cubic meter of concrete. Column 2 indicates amount of concrete that should remain in container after shaking. Column 3 is test strip reading that will correspond to indicated quantity of calcium nitrite.
SECTION 01 5526 – TEMPORARY TRAFFIC CONTROL

PART 1 - GENERAL

1.1 Related Documents
   A. The Conditions of the Contract for Construction and the General Requirements of Division I of these specifications apply to the Work in this Section.

1.2 Traffic Control
   A. Within 15 days after execution of the Contract, determine the vehicle and pedestrian traffic flow and the signage for each phase of construction to maintain the traffic flow throughout the parking structure.
   B. Provide and maintain all drive lanes, entrances, exits, and safeguards required or necessary to the progress of the Work, and effectively control such traffic in a manner to provide minimum hazard to the Work and all persons.
   C. Route all construction equipment, trucks, and similar vehicles via existing public streets to and from the structure as approved by the governing authorities and the Owner.
   D. Maintain constant access for police, fire, and ambulance service.
   E. Provide and maintain for proper control of traffic and safety of all concerned, including all necessary barricades, suitable and sufficient lights, reflectors and danger signals, warning and closure signs and directional signs.
   F. Indicate by day and by night all restricted and dangerous conditions existing on or adjacent to the structure. Illuminate at night all barricades and danger signals, warning signs and obstructions. Keep all lights burning from sunset until sunrise.
   G. Vehicle and pedestrian traffic flow inside and outside of the structure shall be maintained to provide easy entry and exit from the structure and to all parking areas.

1.3 Signage
   A. Provide and maintain traffic signs through the duration of the Project to assist in traffic direction.
   B. Provide signs necessary to inform visitors and employees of closings and traffic flow modifications, both inside and outside of the structure. Sign wording, appearance and placement shall be approved by Owner.
   C. Work will not be permitted to proceed until required signage is in place.

1.4 Reference Standards
   A. Comply with the following reference standard; except where more stringent requirements are indicated on the Drawings or specified herein:
1. Federal Highway Administration.
   a. Part VI Standards and Guides for Traffic Controls for Street and Highway
      Construction, Maintenance, Utility and Incident Management Operations. Part VI

PART 2 - PRODUCTS

2.1 Frames may be new or used, wood or metal, in sound condition and structurally adequate.

2.2 Signs shall be a minimum of half-inch exterior grade plywood.

2.3 Lettering shall be a minimum height of four inches and stenciled.

2.4 Paint shall be exterior quality and the color of the lettering shall be black on a highway orange
    background.

PART 3 - EXECUTION

3.1 Install at a height of optimum visibility, on frames or attached to structural surfaces.

3.2 Relocate support signs as required by progress of the Work.

3.3 Maintain signs and supports in a neat, clean condition; repair damages to support or sign.

3.4 Remove signs, framing and supports at completion of Project.

END OF SECTION 01 5526
PART 1 - GENERAL

1.1 Related Documents

A. The Conditions of the Contract for Construction and the General Requirements of Division I of these specifications apply to the Work in this Section.

1.2 Barricades

A. Provide and maintain suitable barricades as required to prevent public entry, and to protect the Work, existing facilities, trees and plants from construction operations; remove when no longer needed, or at completion of Work. Barricades shall conform to city and state laws, ordinances, permit requirements.

B. The Contractor shall provide and maintain all necessary barricades for safe conduct of his work, or as required by federal, state or local laws or ordinances and in accordance with OSHA requirements and other requirements of this Specification.

C. Provide and maintain suitable barricades as required for protection of open excavations and post with warning lights.

1.3 Enclosures

A. Enclosures shall be sufficient to prevent entrance/exit or infiltration of rain, water, wind or other elements, and which will prevent undue heat loss from within an enclosed area.

B. Provide adequate ventilation and protection to provide construction personnel with safe working environment.

C. Prevent hazardous accumulations of dusts, fumes, mists, vapors, or gases in areas occupied during construction. Provide local exhaust ventilation to prevent harmful dispersal of hazardous substances into atmosphere of occupied areas. Dispose in manner that will not result in harmful exposure to person. Ventilate storage spaces containing hazardous or volatile materials.

D. Contractor shall submit to the Owner, for approval, proposed methods used to contain dust and fumes in work area.

E. Contractor shall be responsible for any damage to vehicles due to the construction.

1.4 Construction/Maintenance

A. Contractor shall be responsible for design, construction and maintenance of all barricades and enclosures.

PART 2 - PRODUCTS
2.1 Materials may be new or used, suitable for intended purpose.

PART 3 - EXECUTION

3.1 Installation

A. Install barricades and enclosures of a neat and reasonable uniform appearance, structurally adequate for the required purposes.

B. Maintain barricades and enclosures during entire construction period. Relocate barricades and enclosures as required with progress of construction.

3.2 Removal

A. Completely remove barricades and enclosures when construction has progressed to the point that they are no longer needed.

B. Clean and repair damage caused by installation of barricades and enclosures.

END OF SECTION 01 5600
PART 1 - GENERAL

1.1 Related Documents
   A. The Conditions of the Contract for Construction and the General Requirements of Division 1 of these Specifications apply to the Work in this Section.

1.2 Material and Equipment
   A. Comply with the applicable specifications and standards.
   B. Comply with size, make, type, and quality specified.
   C. Manufactured and fabricated products
      1. Design, fabricate, and assemble consistent with the current engineering and shop practices.
      2. Manufacture like parts of duplicate units to standard sizes and gauges, to be interchangeable.
      3. Two or more items of the same kind shall be identical, by the same manufacturer.
   D. Do not use material or equipment for any purpose other than that for which it is designed or specified.

1.3 Manufacturer's Instructions
   A. When Contract Documents require that installation of work shall comply with manufacturer’s printed instructions, obtain and distribute copies of such instructions to parties involved in the installation, including two copies to the Engineer. Maintain one set of complete instructions at the job site during installation and until completion.
   B. Handle, install, connect, clean, condition, and adjust products in strict accord with such instructions and in compliance with specified requirements.
      1. Should job conditions or specified requirements conflict with manufacturer’s instructions, consult with the Engineer for further instructions.
      2. Do not proceed with work without clear instructions.

1.4 Transportation and Handling
   A. Arrange deliveries of products in accordance with construction schedules, coordinate to avoid conflict with Work and conditions at the site.
      1. Deliver products in undamaged condition, in manufacturer’s original containers or packaging, with identifying labels intact and legible.
      2. Immediately on delivery, inspect shipments to assure compliance with requirements of Contract Documents and approved submittals and that products are properly protected and undamaged.
B. Provide equipment and personnel to handle products by methods to prevent soiling or damage to products or packaging.

1.5 Storage and Protection

A. Store products in accord with manufacturer's instructions and as required by the technical specification, with seals and labels intact and legible.
   1. Store products subject to damage by the elements in weather tight enclosures.
   2. Maintain temperature and humidity within the ranges required by manufacturer’s instructions.

B. Exterior storage
   1. Store fabricated products above the ground on blocking skids, prevent soiling or staining. Cover products which are subject to deterioration with impervious sheet coverings, provide adequate ventilation to avoid condensation.
   2. Store loose granular materials in a well drained area on solid surfaces to prevent mixing with foreign matter.

C. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored products to assure that products are maintained under specified conditions, and free from damage or deterioration.

D. Protection after installation
   1. Provide substantial coverings as necessary to protect installed products from damage from weather, traffic and subsequent construction operations. Remove when no longer needed.

PART 2 - PRODUCTS

2.1 Not used.

PART 3 - EXECUTION

3.1 Not used.

END OF SECTION 01 6000
PART 1 - GENERAL

1.1 Related Documents
A. The Conditions of the Contract for Construction and the General Requirements of Division 1 of these specifications apply to the Work in this Section.

1.2 Work Included
A. Facilities, equipment and labor for cleaning and waste disposal during construction and for final cleaning.

1.3 Responsibilities
A. Contractor and each subcontractor and installer is responsible for specific cleaning operations of his work to the extent specified in the appropriate Specification Sections.
B. Employ workmen or professional cleaners experienced in the specific cleaning operations.

1.4 Cleanup
A. Conduct clean up and disposal operations to comply with applicable anti-pollution laws and local ordinances.
   1. Burning or burying of waste materials on the project site is not permitted.
   2. Disposal of volatile fluids and wastes in storm or sanitary sewers, or into streams or waterways, is not permitted.

PART 2 - PRODUCTS

2.1 Cleaning Materials
A. Use cleaning materials for surfaces as recommended by Manufacturer.

PART 3 - EXECUTION

3.1 Cleanup
A. At the time each work task is completed, clean the area involved to a condition suitable for occupancy and restore minor or superficial damage. Replace units and elements which are damaged beyond successful repair.
B. Oversee cleaning and ensure that building, grounds, and public properties are maintained free from accumulation of waste materials and rubbish.
C. Take measures to prevent spread of trash, debris, cartons, packaging or other waste materials on or off the project site by wind.

D. Sprinkle dusty debris with water.

E. At reasonable intervals during progress of work, clean up site and access and dispose of waste materials, rubbish and debris.

F. Clean adjacent and nearby streets of dirt occasioned by construction operations; frequency and methods as required by governing authority.

G. Clean all surfaces of concrete paste.

3.2 Disposal

A. Each Contractor or Subcontractor, in addition to the responsibilities set forth in the General Conditions, shall at all times keep the premises free from accumulation of waste materials or rubbish caused by the Work or his employees.

B. Establish and enforce a daily system for collecting and disposing of waste materials from construction areas and elsewhere at the project site. Provide suitable trash containers at a central collection point on the site. Provide chutes or other suitable means for removing trash safely and cleanly from elevated portions of the work.

C. Contractor and each Subcontractor and Installer is responsible for cleaning and removal of his trash and debris to the collection point.

D. Do not hold collected materials at the site for periods of more than seven days. Handle hazardous, dangerous or unsanitary wastes separately from other waste materials, by containerizing properly. Dispose of each category of waste material in a lawful manner. Comply with federal, state, and local regulations for removal of combustible waste material and debris.

E. Concrete debris shall be removed from the site and legally disposed of by concrete installer.

3.3 Project Closeout

A. At the completion of the Project, the Contractor shall restore or replace all property damaged by his Work.

B. Final cleaning shall include, as a minimum:
   1. Remove grease, paint, dust, soil, stains, labels, fingerprints, writing, and other foreign materials from sight-exposed interior and exterior finished surfaces.
   2. Clean all hardware.
   3. Clean all plumbing fixtures.
   4. Clean all lighting fixtures.
   5. Repair, patch and touch up marred surfaces to specified finish to match adjacent surfaces.
   6. Clean all maintenance, storage and mechanical rooms in parking structure.
   7. Water blast floor surfaces at all Levels of Work performed.

END OF SECTION 01 7423
PART 1 - GENERAL

1.1 Related Documents

A. The Conditions of the Contract for Construction and the General Requirements of Division I of these Specifications apply to the Work in this Section.

1.2 Cleaning and Closeout

A. Refer to Section 01 7423 Final Cleaning for final cleaning of jobsite.

B. A punch list consisting of copies of the plans showing locations of unacceptable items and an attached explanation of the nature of the unacceptable work shall be delivered to the Contractor after substantial completion of the Project.

C. The Contractor shall submit "Record Drawings" after substantial completion of the project. The "Record Drawings" shall include, but not be limited to, the copies of the Drawings incorporating all changes and bulletins (enclosed in clouds), all shop drawings incorporating all changes (enclosed in clouds), and all approved submittals. Any dimensions beyond the tolerances of those established by nationally recognized standards for the specific CSI division or section applicable shall be included on the record drawings.

D. Record Drawings shall also include location and size of all concrete patches and cracks.

E. Closeout submittals include, but are not limited to, the following:
   1. Project record documents
   2. Operation and maintenance data
   3. Maintenance manuals
   4. Extra stock
   5. Certificate of Inspection
   6. Warranties

F. Evidence of payments and release of liens:
   2. Contractor's Affidavit of Release of Liens: AIA G706A, with:
      a. Consent of Surety to Final Payment: AIA G707
      b. Contractor's release of waivers of lien for subcontractors, suppliers and others with lien rights against property of Owner, together with list of those parties.

1.3 Project Record Documents

A. Maintain at Project site, one copy of:
   1. Contract Drawings (blueline prints)
   2. Project Manual, including agenda
   3. Approved Shop Drawings
   4. Change Orders and Field Change Authorization
   5. Other modifications to Contract
   6. Field test records
B. Store documents in temporary field office apart from documents used for construction. Provide files and racks for storage of documents.

C. Maintain documents in clean, dry, legible conditions; do not use record documents for construction purposes.

D. Make documents available at all times for inspection by Engineer and Owner.

E. Contract Drawings: Legibly mark using a red pencil for all graphic work and red ink for all written work to record actual construction:
   1. Field changes of dimension and detail.
   2. Changes not made by change order and field change authorization.
   3. Details not on original Contract Drawings.

F. Specifications and Addenda: markup each Section to record:
   1. Manufacturer, trade name, catalog number and supplier of each product and item of equipment actually installed.
   2. Change made by change order, field change authorization and notice of clarification.
   3. Other matters not originally specified.

G. Shop Drawings: Maintain as record documents; legibly annotate Shop Drawings to record changes made after approval.

H. At completion of Project, deliver Record Documents to Engineer.

1.4 Warranties and Bonds

A. The act of the Contractor in executing the Agreement for this Work shall be considered as his acceptance of the following guarantee covering the Project:
   1. Any materials, workmanship or equipment furnished as a part of this Project which prove defective or fail to operate properly, within one (1) year, or as otherwise specified in the Contract Documents, of the date of acceptance of the Work required under this (or substantial completion of the) Project (damage by wear and tear, violence or casualty not the fault of the Contractor excepted), shall be repaired and replaced by the Contractor promptly upon notification from the Owner and without cost to the Owner.
   2. This guarantee provision shall apply regardless of whether or not such defective workmanship, materials or equipment are listed in the final punch list. Date of acceptance (or substantial completion) will be established by the Owner and Engineer upon finding all items of this Project substantially complete as to quality of workmanship and materials.
   3. Contractor shall provide warranty commencing on the date of Project acceptance. Completion of various Project phases shall not initiate commencement of warranty in these specific areas. A single Project warranty date, at Project acceptance, will constitute commencement of warranty.

   NOTE: Some areas of Project may be open to vehicular traffic and subject to wear (i.e. coatings, sealants, expansion joints) prior to commencement of warranty.

PART 2 - PRODUCTS

2.1 Not used.
PART 3 - EXECUTION

3.1 Not used.

END OF SECTION 01 7700
SECTION 02 4119 – SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 Related Documents

A. The Conditions of the Contract for Construction and the General Requirements of Division 1 of these Specifications apply to the Work in this Section.

1.2 Work Included

A. The Work of this Section shall include furnishing all labor, materials, equipment, and supervision to demolish, haul, and dispose of concrete in accordance with the Drawings and as specified herein.

1. Concrete delaminations to the depth as indicated on the Drawings.
2. Stair and landing removal as indicated on the Drawings.

1.3 Related Work

A. The following Work is related to this Section:

1. Concrete Repair  Section 03 0130
2. Concrete Formwork  Section 03 1100
3. Concrete Reinforcement  Section 03 2000
4. Cast-in-Place Concrete  Section 03 3000

1.4 Quality Control

A. After demolition is complete but prior to final cleaning, the cavities and all exposed reinforcement shall be reviewed by the Engineer. The review shall include sounding the exposed concrete to determine completeness of delamination removals, examination of dressed edges to verify depth and vertical edge of cut, and uniformity of excavation to insure compliance with minimum limits specified.

B. The Engineer shall review all reinforcement exposed within the cavities for corrosion or damage resulting from Contractor's removal operations. Replacement of defective or damaged reinforcement bars shall be performed in accordance with Section 03 2000, Concrete Reinforcement.

1.5 Safety

A. Locate electrical conduits prior to concrete demolition or saw cutting. Contractor shall take all necessary precautions to prevent damage to the conduit. Contractor is solely responsible for training and monitoring his work force concerning the safety procedures that should be employed in the execution of this work. Contractor shall repair, at no cost to the Owner, all damage caused by his work. Contractor shall coordinate with Owner to shut off power if repairs are located near conduit.
1.6 Submittals
   A. Submit for review and approval prior to beginning Work a copy of the proposed restoration sequencing plan.
   B. Submit for record types of equipment proposed for use.
   C. Submit proposed demolition plan for the Fourth & Washington Parking Structure stairs.

1.7 Basis of payment
   A. Demolition cost to be included in repair costs, unless otherwise noted.

PART 2 - PRODUCTS

2.1 Not Used

PART 3 - EXECUTION

3.1 Inspection
   A. Examine areas and conditions under which the Work is to occur. Notify the Engineer immediately in writing as required in the General Conditions of any conditions detrimental to the proper and timely completion of this Work.

3.2 General
   A. Review with the Owner and Engineer the types of equipment proposed for use.
   B. Conduct demolition operations to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks or other occupied or used facilities without permission from authorities having jurisdiction.
   C. Protect Owner's property which is to remain including: facades, signs, windows, doors, plantings, elevators, parking equipment, electrical and mechanical lines and fixtures.
   D. Protect adjoining properties, public thoroughfares, sidewalks and utilities from damage due to this operation.
   E. Take adequate precautions and provide protection as required to prevent damage to remaining existing elements of the parking structure and all adjoining building elements, and all vehicles using the facility.
   F. At no cost to the Owner, promptly repair damage to adjacent facilities resulting from demolition operations.
   G. Clean adjacent facilities of dust, dirt and debris resulting from demolition operations.
H. Authority for performing necessary work on public and private property adjoining Owner's property shall be obtained by the Contractor.

I. Take adequate precautions to prevent unauthorized personnel from entering the job site.

J. Remove all temporary protection and devices when no longer needed and when directed by the Owner.

3.3 Delaminated Concrete Surface Preparation

A. Location and Marking of Work Areas
   1. Locate floor slab delaminations by sounding the surface with a hammer or rod, or dragging a chain. The Contractor shall sound all floor slabs. Delaminated areas once located by the Contractor will be further sounded to define their limits. These limits or "boundaries" shall be marked with chalk or paint.
   2. Beam, wall, column, and ceiling delaminations shall be located by sounding the appropriate member with a hammer or rod. Cracks, usually horizontal in orientation along beam faces and vertical in orientation near corners of columns, are reliable indicators of delaminated concrete. Delaminated areas once located by the Contractor will be further sounded to define their limits. These limits or "boundaries" shall be marked with chalk or paint.
   3. Prior to concrete removal locate reinforcing bars and electrical conduits in the vicinity of the repairs. Take the necessary precautions to prevent damage to reinforcement and electrical conduits.

B. Concrete Removal and Surface Preparation
   1. All concrete shall be removed from within the marked boundary to a minimum depth as indicated on the Drawings using 15 to 30 pound chipping hammers equipped with chisel point bits. Larger chipping hammers with a maximum stroke of 4 inches shall not be used without approval from the Engineer. If delaminations exist beyond the minimum removal depth, then chipping shall continue until all unsound and delaminated concrete has been removed from the cavity.
   2. Where reinforcing bars are exposed by concrete removal, extra caution shall be exercised to avoid damaging them during removal of additional unsound concrete. The minimum depth of concrete removal around and beyond the perimeter of the bar for the entire exposed length shall be as indicated on the Drawings.
   3. If rust is present on reinforcing bars where they enter sound concrete, then additional removal of concrete along the reinforcement is required. Such additional removal shall continue until grey reinforcement is exposed. If rust persists beyond the removal limits, the Engineer shall be advised and will direct further removals.
   4. Delaminated, spalled and unsound concrete shall have their marked boundaries sawcut to a depth as indicated on the Drawings. All edges shall be straight and patch areas polygon shaped. A diamond blade saw or grinder with abrasive disk suitable for cutting concrete is acceptable for performing this work. The edge cut at the delamination boundary shall be dressed perpendicular to the member face. It shall also be of uniform depth for the entire length of the cut.

C. Preparation of Concrete Bonding Surface
   1. Abrasive blast or high-pressure waterblast all exposed concrete surfaces to remove laitance and any foreign material that may impair bonding prior to concrete placement.
D. Cleaning and Securing of Reinforcing
   1. Refer to Section 03 2000, Concrete Reinforcement. Existing reinforcing and miscellaneous metals shall be cleaned of rust and laitance to near white metal.

E. Final Preparation
   1. Air blasting is required as a final step to remove dust and debris.

3.4 Disposal
   A. Remove and properly dispose of concrete and debris from areas exposed to public view on a daily basis.

END OF SECTION 02 4119
PART 1 - GENERAL

1.1 Related Documents

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

1.2 Work Included

A. The Work of this Section shall include providing and installing concrete patching materials, as indicated on the Drawings and as herein specified.

1.3 Related Work

A. Related work specified elsewhere:

1. Section 02 4119 Selective Demolition
2. Section 03 1500 Concrete Accessories
3. Section 03 2000 Concrete Reinforcement
4. Section 03 3000 Cast-In-Place Concrete
5. Section 07 1800 Traffic Coatings
6. Section 07 9200 Joint Sealants
7. Section 07 9500 Expansion Joint Sealant Systems

1.4 Reference Standards

A. Comply with the following reference Standards; except where more stringent requirements are indicated on the Drawings or specified herein:

1. American Concrete Institute (ACI)
   b. ACI 201.2R Guide to Durable Concrete.
   c. ACI 222R Corrosion of Metals in Concrete.
   d. ACI-301 Specifications for Structural Concrete for Buildings.
   e. ACI-302.1R Guide for Concrete Floor and Slab Construction.
   f. ACI 304R Guide for Measuring, Mixing, Transporting and Placing Concrete.
   g. ACI 305R Hot Weather Concreting.
   h. ACI 306R Cold Weather Concreting.
   i. ACI 306.1 Standard Specification for Cold Weather Concreting.
   j. ACI 318 Building Code Requirements for Structural Concrete and Commentary.
   k. ACI 347R Guide to Formwork for Concrete.

2. International Concrete Repair Institute (ICRI)
   a. ICRI Concrete Repair terminology
   b. ICRI Technical Guideline No. 320.2R “Guide for Selecting and Specifying Materials for Repair of Concrete Surfaces”.
c. ICRI Technical Guideline No. 320.1R “Guide for Surface Preparation for the Repair of Deteriorated Concrete from Reinforcing Steel Corrosion”.

1.5 Quality Control

A. The patched areas shall be sounded with a hammer 7 days after placement. Repair all detected hollowness by removing and replacing the patch or affected area at no extra cost to the Owner.

B. If shrinkage cracks appear in the repair material within 72 hours after placement, the repairs shall be considered defective, and shall be removed and replaced at no extra cost to the Owner.

C. Plan drawings shall be maintained locating all repairs performed under this Section. Location and size of patches, overlays, etc. must be located on clean drawings. Separate drawings shall be maintained for each Level and Ceiling plan. These drawings shall be incorporated into record set required per Division 1.

D. The Contractor, or Restoration Subcontractors, shall have not less than two (2) years experience in the field of structural concrete restoration work.

1.6 Environmental Requirements

A. Cold weather concreting: In accordance with ACI 306.1 or as specified herein.

B. Hot weather concreting: In accordance with ACI 305 or as specified herein.

C. Inclement Weather:
   1. Unless adequate protection is provided, concrete shall not be placed during rain, sleet or snow.
   2. Rain water shall not be allowed to increase the mixing water nor to damage the surface finish.

1.7 Submittals

A. Submit for record the Manufacturer's Spec Data Sheets and Safety Data Sheets.

B. Submit for record upon request, a written description of the Contractor’s concrete repair ability, including equipment, facilities, personnel, and a list of similar completed projects.

1.8 Transportation and Handling

A. Store materials on platforms off ground, protected from the elements.

B. Handle and store aggregates in a manner to prevent intrusion of foreign material. Protect all material until used.

C. Material which has deteriorated or which has been damaged shall not be used.

1.9 Basis of Payment
PART 2 - PRODUCTS

2.1 Repair Mortar – Overlay

A. Repair mortar to be traffic bearing, polymer modified, cementitious, type and thickness to meet conditions as indicated on the Drawings.

B. For deeper patches add aggregate per Manufacturer’s recommendation.

C. Trowel Applied - Acceptable repair mortar for concrete overlay is:
   1. Sikatop 122 Plus, Sika Corp., Lyndhurst, NJ.
   2. Or Approved Equivalent

2.2 Horizontal Repair Mortar (Corrosion Inhibitor)

A. Repair mortar to be traffic bearing, polymer modified with corrosion inhibitor, cementitious, type and thickness to meet conditions as indicated on the Drawings.

B. For deeper patches add aggregate per Manufacturer’s recommendation.

C. Acceptable repair mortar with corrosion inhibitor for patching horizontal surfaces is:
   1. Sikatop 111 Plus or Sikacrete 211 SCC Plus, Sika Corp., Lyndhurst, NJ.
   2. MasterEmaco S 466Cl or S 477CI, BASF, Shakopee, MN.
   3. Eucocrete Supreme, Euclid Chemical Co., Cleveland, OH
   4. Planitop 15 or FD, Mapei, Deerfield Beach, FL
   5. Meadow-Crete GPS, W.R. Meadows, Inc., Hampshire, IL
   6. Or Approved Equivalent

2.3 Vertical/Overhead Repair Mortar (Corrosion Inhibitor)

A. Repair mortar to be polymer modified cementitious, with corrosion inhibitor, type and thickness to meet conditions as indicated on the Drawings.

B. Trowel Applied - Acceptable repair mortar with corrosion inhibitor for patching vertical surfaces is:
   1. MasterEmaco S 488Cl, BASF, Shakopee, MN.
   2. Sikatop 122 Plus or 123 Plus, Sika Corp., Lyndhurst, NJ.
   3. Verticoat Supreme, Euclid Chemical Co., Cleveland, OH
   4. Planitop 23, or X, Mapei, Deerfield Beach, FL
   5. Meadow-Crete GPS, W.R. Meadows, Inc., Hampshire, IL
6. Or Approved Equivalent

C. Form and Pour - Acceptable repair mortar with corrosion inhibitor for patching vertical surfaces is:

1. MasterEmaco S 466CI or S 477CI, BASF, Shakopee, MN.
2. Sikatop 111 Plus or Sikacrete 211 SCC Plus, Sika Corp., Lyndhurst, NJ
3. Eucocrete Supreme, Euclid Chemical Co., Cleveland, OH
4. Planitop 15 or FD, Mapei, Deerfield Beach, FL
5. Or Approved Equivalent

PART 3 - EXECUTION

3.1 Inspection

A. Before commencing work, examine all adjoining work on which this work is dependent and report in writing to the Engineer any condition which prevents Contractor from performing the work. Starting work constitutes acceptance of adjoining work.

3.2 Surface Preparation

A. Refer to Section 02 4119, Selective Demolition

3.3 Existing Reinforcement

A. Refer to Section 03 2000, Concrete Reinforcement

3.4 Placing Concrete Patching Materials

A. The mixing and installing of the concrete patching materials and the priming of the existing concrete surface shall be in accordance with the Manufacturer's recommendations.

B. Concrete patching materials shall be cured according to the Manufacturer's recommendations.

END OF SECTION 03 0130
SECTION 03 1100 - CONCRETE FORMWORK

PART 1 - GENERAL

1.1 Related Documents

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

B. The latest editions of ACI 301, “Standard Specification for Structural Concrete” and ACI 117 Standard Specifications for Tolerances for Concrete Construction and Materials are hereby a part of this Section. Specific project requirements or modifications are specified herein.

1.2 Work Included

A. Work of this Section shall include design, material, delivery, labor, equipment, and supervision to install formwork and shoring systems for cast-in-place concrete as indicated on Drawings and as specified herein.

1.3 Related Work

A. Related Work specified elsewhere:

1. Section 03 0130 Concrete Repair
2. Section 03 1500 Concrete Accessories
3. Section 03 2000 Concrete Reinforcement
4. Section 03 3000 Cast-In-Place Concrete

1.4 Reference Standards

A. Comply with following reference standards, except where more stringent requirements are indicated on Drawings or specified herein:

1. American Concrete Institute (ACI):
   b. ACI SP-4, Formwork for Concrete, latest edition.
   c. As indicated in Section 03 3000 “Cast-In-Place Concrete”

2. American Welding Society (AWS):

3. American Iron and Steel Institute (AISI):
   a. AISI Cold-Formed Steel Design Manual, latest edition.

4. Occupational Health and Safety Administration (OSHA):
   a. Safety Standards, latest revisions.

1.5 Performance and Design Requirements (ACI 301, 2.2.2) Additional requirements:
A. Formwork to be readily removable without impact, shock, or damage to cast-in-place concrete surfaces, structure, or adjacent materials.

B. Shoring shall be secured against horizontal movement by bracing in both longitudinal and transverse directions. Shoring shall be braced at intermediate levels when more than twelve (12) feet high.

C. Provide shoring so loads from construction above will transfer directly. Space shoring in such a manner that no floor or member will be excessively loaded or will induce tensile stress in concrete members where no reinforcing steel is provided.

1.6 Quality Control

A. Formwork materials and installation work may be reviewed by the Engineer at any time during the progress of the Work. Allow free access to facilities for this purpose.

1.7 Submittals (ACI 301 2.1.2)

A. For record formwork product data including facing materials.

B. For record formwork release agent product data.

1.8 Transportation and Handling

A. Store all formwork materials clear of ground, protected, so as to preclude damage.

1.9 Basis of Payment

A. Formwork and shoring are to be included in cost of concrete placement and demolition.

PART 2 - PRODUCTS

2.1 Materials (ACI 301 2.2.1) Additional requirements as follows:

A. Form-facing materials (ACI 301 2.2.1.1)

1. Formwork for exposed finish concrete to provide smooth form finish.

a. Unless otherwise indicated, construct with plywood, metal, metal-framed plywood faced, or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system indicated on Drawings. Provide formwork material with sufficient thickness to withstand pressure of newly-placed concrete without bow or deflection.

2. Formwork for unexposed finish concrete to provide rough form finish.

a. Construct with plywood, lumber, metal, and other acceptable material. Provide lumber dressed on at least two edges and one side for tight fit.
2.2 Formwork Accessories (ACI 301 2.2.1.2) Additional requirements as follows:

A. Ties exposed to view or exposed to weather:
   1. Ties shall be one of following:
      a. stainless steel AISI 302/304 or
      b. “snap off” type or
      c. removable.
   2. “Snap off” metal ties shall have cones and be designed to break back to allow a minimum 1-1/2 inch cover over ends or portions of ties remaining.
   3. “Snap off” area shall not leave a hole larger than one inch diameter in concrete surface.

B. Ties used in areas which will not be exposed to view or are below grade shall be commercially manufactured with no minimum requirements regarding stainless steel/“snap-off”/removeability.

2.3 Form Release Agent (ACI 301 2.2.1.3) Additional requirements as follows:

A. Form release agent shall be non-toxic, VOC compliant, environmentally safe compatible with formwork material and shall not dust, contribute to bug holes nor adversely affect concrete surfaces, and shall not impair subsequent treatment of concrete surface.

2.4 Shores

A. Shores shall consist of wood or steel posts.

PART 3 - EXECUTION

3.1 Inspection

A. Inspect area to receive Work and report immediately in writing to Engineer, as required in General Conditions, any unacceptable conditions.

3.2 Formwork Fabrication and Manufacture (ACI 301 2.2.3) Additional requirements as follows:

A. Kerf wood inserts for forming keyways, reglets, recesses, etc., to prevent swelling and assure ease of removal.

B. Bevel reentrant corners or edges of formed joints as indicated on Drawings.

3.3 Construction and Erection of Formwork (ACI 301 2.3.1) Additional requirements as follows:

A. Set edge forms or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in finished surface. Provide and secure units sufficiently strong to support types of screed strips by use of strike-off templates or accepted compacting type screeds.
B. Form joints in all exposed concrete surfaces shall be securely taped or sealed by approved means to prevent leakage and loss of paste during placement of concrete.

C. All wood forms for columns shall be securely tied together with adjustable steel clamps, spaced so as to insure an absolute rigid form in conformance with printed tables of the clamp Manufacturer.

D. Formwork openings at expansion joints may need to be adjusted in order to produce cured concrete expansion joint width as indicated on the Drawings.

E. Re-tighten forms immediately after concrete placement as required to eliminate mortar leaks.

F. Do not thin form release agent.

G. If steel forms are used, form release agent shall be non-staining rust preventative.

3.4 Tolerances (ACI 301 2.3.1.2) Additional requirements as follows:

A. Construct formwork to provide completed concrete surfaces complying with tolerances specified in ACI 117, Sections 3 and 4.

B. Check lines and levels of completed formwork for all exposed columns, spandrels, etc. before concrete is placed.

C. Make corrections or adjustments to formwork that will be required to correct any deviation which exceeds specified tolerances.

D. Check formwork during concrete placement to ensure that forms, shores, falsework, ties, and other features have not been disturbed by concrete placement methods or equipment.

E. The offset between adjacent formwork facing material shall not exceed ACI 117 Class A 1/8 inch.

3.5 Installation of Reinforcement

A. Refer to Section 03 2000, Concrete Reinforcement.

3.6 Removal of Formwork (ACI 301 2.3.2) Additional requirements as follows:

A. Formwork removal shall be coordinated with curing requirements as specified in Section 03 3000 Cast-In-Place Concrete.

B. Formwork including shores for structural members ie. piers, columns, walls, beams, and slabs shall remain in place until minimum formwork removal strength is obtained as specified on Drawings.

C. Formwork removal strength will be verified by field-cured test cylinders in accordance with ACI 301 2.3.4.1 or 2.3.4.2.

D. In no case shall formwork and shoring removal from horizontal members be before concrete strength is at least 70 percent of specified design strength or approved by Engineer.
3.7 **Re-Use of Forms**

A. Clean and repair surfaces of forms to be re-used. Remove fins and laitance, and tighten forms to close joints. Align and secure joints to avoid offsets. Split, frayed, delaminated or otherwise damaged form facing material shall not be acceptable for exposed surfaces.

B. Apply new form-release agent as specified.

C. Do not use "patched" forms for exposed concrete surfaces, unless approved by Engineer.

END OF SECTION 03 1100
SECTION 03 1500 - CONCRETE ACCESSORIES

PART 1 - GENERAL

1.1 Related Documents

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

1.2 Work Included

A. Work of this Section shall include all materials, equipment, labor, and supervision to furnish and
   install all concrete accessories as herein specified and as indicated on Drawings.

1.3 Related Work

A. Related work specified elsewhere:
   1. Section 03 0130 Concrete Repair
   2. Section 03 1100 Concrete Formwork
   3. Section 03 2000 Concrete Reinforcement
   4. Section 03 3000 Cast-In-Place Concrete

1.4 Reference Standards

A. Comply with following reference standards, except where more stringent requirements are
   indicated on Drawings or specified herein:
   1. American Concrete Institute (ACI)
      a. Editions as indicated in Section 03 3000, Cast-In-Place Concrete.
   2. American Welding Society (AWS), latest editions
      a. AWS D 1.1 Structural Welding Code - Steel
      b. AWS D 1.4 Structural Welding Code - Reinforcing Steel
      c. AWS D 1.6 Structural Welding Code - Stainless Steel
   3. Prestressed Concrete Institute (PCI)
      a. As specified herein

1.5 Transportation and Handling

A. Deliver concrete accessories to site bundled or packaged, tagged and marked indicating
   product, size, Manufacturer and other identifying information.

B. Store materials at site in such a way to maintain them dry, undamaged and clean.
1.6 **Submittals**
   A. For review and approval concrete accessory Manufacturer's product literature.

1.7 **Basis of Payment**
   A. Concrete accessories are incidental to cost of concrete and repair items.

**PART 2 - PRODUCTS**

2.1 **Miscellaneous Steel Shapes, Plates, and Bars**
   A. W-Shapes: ASTM A 992.
   B. Channels, Angles: ASTM A 36.
   C. Plates and Bars: ASTM A 36.
   D. All materials to be hot-dip galvanized ASTM A 123 after assembly, or stainless steel ASTM A 666, Type 304L as noted on Drawings.
   E. All welds shall be E70XX low-hydrogen electrodes. Stainless steel electrodes to be Type 308L or 347.

2.2 **Adhesive Anchors**
   A. Provide sizes and types as indicated on Drawings.
   B. All threaded rods and associated hardware to be Type 303/304 stainless steel.
   C. Injection gel to be two-component epoxy ASTM C 881.
   D. Stainless steel screens as indicated on Drawings or as recommended by Manufacturer.
   E. Installation per Manufacturer’s recommendations.
   F. Acceptable materials are:
      1. HY 200, Hilti, Inc.
      2. PE 1000+, Powers Fasteners Inc.
      3. Set-XP, Simpson Strong-Tie Anchor Systems
      4. or Approved Equivalent.

**PART 3 - EXECUTION**

3.1 **Inspection**
   A. Inspect area to receive Work and report immediately in writing to Engineer, as required in General Conditions, any unacceptable conditions.
3.2 Installation

A. Minimum cover requirements for reinforcing shall apply to all embedded items unless indicated otherwise on Drawings.

B. Use suitable templates to accurately set and support bolts, inserts, sleeves, or other embedded items against displacement.

END OF SECTION 03 1500
SECTION 03 2000 - CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.1 Related Documents
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
B. ACI 301 Standard Specifications for Structural Concrete and ACI 117 Standard Specifications for Tolerances for Concrete Construction and Materials are hereby a part of this Section. Specific project requirements or modifications are specified herein.

1.2 Work Included
A. Work of this Section shall include materials, fabrication, delivery, and installation of reinforcement for cast-in-place concrete.
B. Field epoxy coating of exposed reinforcement in concrete cavities.

1.3 Related Work
A. Related work specified elsewhere:
   1. Section 03 0130 Concrete Repair
   2. Section 03 1100 Concrete Formwork
   3. Section 03 1500 Concrete Accessories
   4. Section 03 3000 Cast-in-Place Concrete

1.4 Reference Standards
A. Comply with following reference standards, except where more stringent requirements are indicated on Drawings or specified herein.
   1. American Concrete Institute (ACI)
      a. As indicated in Section 03 3000, Cast-In-Place Concrete and as specified herein.
   2. American Welding Society (AWS)
      a. Placing Reinforcing Bars
      b. Reinforcement Anchorages and Splices
      c. Fabrication of Epoxy-Coated Rebar
      d. Field Handling Techniques for Epoxy-Coated Rebar at the Job Site
      e. Manual of Standard Practice
b. Structural Detailing Manual

a. As specified herein.

1.5 Quality Control

A. Materials and installed Work may be reviewed by Engineer at any time during progress of Work. Allow free access to facilities for this purpose. Provide 48 hours notice to inspect completed reinforcing prior to placement of concrete.

B. If in opinion of Engineer, cross-sectional area loss of bars is greater than 15 percent, Contractor shall splice as directed by Engineer. Minimal splice lap shall be as indicated on Drawings.

1.6 Submittals (ACI 301 3.1.1) Additional requirements as follows:

A. For review and approval, Safety Data Sheets and Manufacturer’s Spec Data Sheets for field-applied epoxy coating.

1.7 Transportation and Handling (ACI 301 3.12) Additional requirements as follows:

A. Store reinforcement on supports above ground level. Protect from weather.

B. Epoxy-coated reinforcement

1. Comply with requirements of ASTM D 3963/D 3963M-96 Fabrication and Jobsite Handling of Epoxy-Coated Reinforcing Steel Bars and CRSI Field Handling Techniques for Epoxy-Coated Rebar at the Job Site.

C. If reinforcement is to be stored on site for more than 1 month before placement, cover reinforcement with opaque polyethylene sheeting, properly secured. Do not store reinforcement at job site unprotected over winter.

1.8 Basis of Payment

A. Reinforcement is to be included in cost of concrete placement.

B. Cleaning and coating of existing reinforcement shall be incidental to cost of concrete demolition and replacement.

PART 2 - PRODUCTS

2.1 Materials (ACI 301 3.2.1) Additional requirements as follows:

A. Reinforcement

1. ASTM A615, grade 60, unless noted.

B. Epoxy-Coated Reinforcement
1. ASTM A775.

C. Welded Wire Fabric Reinforcement (rolls not accepted)
   1. ASTM A884, epoxy-coated welded wire reinforcement.

D. Wire Reinforcement Supports (ACI 301 3.2.1.8)
   1. Provide CRSI Class 1-A epoxy, vinyl, or plastic-coated bright basic wire bar supports for epoxy reinforcement in contact with formwork, including bolsters, chairs, spacers and other devices for spacing, supporting, and fastening reinforcing bars in place.

E. Tie Wire
   1. Tie wire shall be plastic or vinyl coated for all epoxy coated reinforcement, and post-tensioning tendons.

F. Field-Applied Epoxy Modified Coating
   1. Field-applied epoxy modified coating with Anti-Corrosion Agent (two coats at 10 mils) for existing reinforcement and miscellaneous metals embedded in concrete.
   2. Acceptable field applied epoxy modified coatings are:
      a. Sika Armatec 110 Epo Cem, Sika Corporation.
      b. MasterEmaco P 124, BASF, Shakopee, MN.
      c. Mapei Mapefer 1k, Mapei, Deerfield Beach, FL
      d. Dualprep A.C., Euclid Chemical Company, Cleveland, OH.

G. Field-Applied Cold Galvanizing
   1. Acceptable Cold Galvanizing compounds are:
      a. Z.R.C. Cold Galvanizing Compound, ZRC Worldwide, Marshfield, MA.
      b. or Approved Equivalent.
   2. Note: Cold galvanizing is not a substitute for epoxy coating. Use only where indicated on Drawings and Specifications.

PART 3 - EXECUTION

3.1 Inspection
   A. Inspect area to receive Work and report immediately in writing to Engineer, as required in General Conditions, any unacceptable conditions.

3.2 Fabrication
   A. Fabrication tolerances shall be in accordance with ACI 117 2.1.

3.3 Placement (ACI 301 3.3.2) Additional requirements as follows:
A. Tolerances (ACI 301 3.3.2.1)
   1. Comply with Concrete Reinforcing Steel Institute's recommended practice for Placing Reinforcing Bars, for details and methods of reinforcement placement and supports, and as herein specified.

B. Reinforcement supports (ACI 301 3.3.2.4)
   1. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces so that concrete cover for tie wire matches cover for reinforcement.
   2. Supports for bars shall be placed at 4'-0" maximum spacing. Supports shall be placed a maximum of 6 inches from ends of the reinforcement.

C. Welded wire reinforcement (ACI 301 3.3.2.5)
   1. Install in lengths as long as practical. Offset end laps in adjacent widths to prevent continuous laps in either direction.
   2. Supports for welded wire fabric shall be placed at 2'-0" maximum spacing.

3.4 Existing Reinforcement

A. Existing reinforcement and miscellaneous metal to remain shall be cleaned of rust and laitance to Near White Metal and field epoxy coated in accordance with epoxy coating Manufacturer's recommendations.

B. Loose reinforcement bars shall be secured by either tying to bonded reinforcement or drilling supplemental anchors and installing tie downs. Lead anchors are not permitted.

C. Field-applied epoxy cure time must be extended as directed by Engineer during cold weather application.

D. Field-applied epoxy must be properly cured in a non "tacky" condition prior to concrete placement.

E. Remove epoxy spillage from adjacent concrete surfaces.

END OF SECTION 03 2000
PART 1 - GENERAL

1.1 Related Documents

A. Conditions of Contract for Construction and General Requirements of Division 1 of these Specifications apply to Work in this Section.

B. ACI 301, Specifications for Structural Concrete and ACI 117 Standard Specifications for Tolerances for Concrete Construction and Materials are hereby a part of this Section. Specific project requirements or modifications are specified herein.

1.2 Work Included

A. Work in this Section shall include all equipment, materials, labor, and supervision to install cast-in-place concrete as indicated on Drawings and as specified herein.

B. Remove and reinstall all electrical conduit, mechanical conductors, light fixtures, mechanical equipment, signs, etc. necessary for proper completion of repairs.

C. Concrete repair materials.

1.3 Related Work

A. Work related to this Section:

1. Concrete Repair Section 03 0130
2. Concrete Formwork Section 03 1100
3. Concrete Accessories Section 03 1500
4. Concrete Reinforcement Section 03 2000
5. Traffic Coatings Section 07 1800
6. Joint Sealants Section 07 9200
7. Expansion Joint Sealant Systems Section 07 9500

1.4 Reference Standards and Cited Publication. (ACI 301 1.3) Additional standards as follows:

A. American Concrete Institute (ACI)

1. ACI 201.2R Guide to Durable Concrete.
2. ACI 222R Corrosion of Metals in Concrete.
3. ACI 211.1 Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.
4. ACI 212.4R Guide for the Use of High-Range Water Reducing Admixtures (Superplasticizers) in Concrete.
5. ACI 221.R State-of-the-Art Report on Alkali – Aggregate Reactivity
6. ACI-302.1R Guide for Concrete Floor and Slab Construction.
8. ACI 305R Hot Weather Concreting.
10. ACI 308 Standard Practice for Curing Concrete.
11. ACI 311.5R Guide for Concrete Plaint Inspection and Field Testing of Ready-Mixed Concrete.
12. ACI-318 Building Code Requirements for Structural Concrete.
14. ACI 515.1R Guide to the Use of Waterproofing, Dampproofing, Protective and Decorative Barrier Systems for Concrete.
15. ACI SP 66 Detailing Manual.
16. ACI Concrete Craftsman Series.
17. ACI CP-10 Craftsman Workbook for ACI Certification of Concrete Flatwork Technician Finisher.

B. Federal Highway Administration
   1. FHWA-RD-77-85, Sampling and Testing for Chloride Ion in Concrete.

C. American Association of State Highway Transportation Officials (AASHTO)
   1. AASHTO T 260, Method of Sampling and Testing for Total Chloride Ion in Concrete and Concrete Raw Materials.
   2. AASHTO T 318, Standard Method of Test for Water Content of Freshly Mixed Concrete Using Microwave Oven Drying.

D. American Society of Testing Materials (ASTM)
   1. As specified herein.

1.5 Quality Assurance (ACI 301 1.6) Additional requirements as follows:

A. General (ACI 301 1.6.1)
   1. Perform all Work in strict accordance with laws and regulations of applicable Building Codes and with all other authorities having jurisdiction, that take precedence over requirements of this Specification, except where requirements of Specifications are more exacting or stringent, they shall govern.

B. Testing responsibilities of Contractor (ACI 301 1.6.3).
   1. Provide Owner's Testing Laboratory, for their review, proposed mix designs, including samples for tests of:
      a. Air content.
      b. Chloride permeability.
      c. Plastic and hardened concrete corrosion inhibitors.
   2. Advise Owner's Testing Laboratory minimum of 48 hours in advance of operations.
   3. Report any testing irregularities to Engineer.
   4. Patch holes resulting from concrete coring, matching adjacent areas.
   5. If, at any time during construction, it is desired to deviate from approved mix designs, Contractor's Testing Laboratory shall modify mix design, subject to Engineer's approval.

C. Admixture Manufacturer shall make available a qualified Manufacturer's Representative to assist Contractor and Engineer as specified in this Section.

D. Corrosion Inhibitor Dispensing Requirements:
   1. Ready-Mix Supplier shall have corrosion inhibitor Manufacturer's Representative perform following:
      a. Install "low level pump cutoff device" in dedicated calcium nitrite corrosion inhibitor tank. Devices shall shut off dispenser pump in event of insufficient product.
b. Install visual reference (such as bottle or other approved device) for dispensing Calcium Nitrite corrosion inhibitor. Visual reference shall be accessible to Owner's Testing Laboratory, Manufacturer's Representative, and Engineer.

c. Calibrate dispensing system at initial equipment installation and annually thereafter. Install tamperproof seals after each calibration of system.

2. Ready-Mix Supplier shall perform following:
   a. Verify contents of visual reference prior to discharge of product for each batch. If visual reference does not indicate specified amount of corrosion inhibitor, Ready-Mix Supplier shall stop production and notify corrosion inhibitor Manufacturer/Supplier immediately.

3. Owner's Testing Laboratory shall perform following:
   a. Prior to and after each pour, take volume readings of corrosion inhibitor tank, correlate to size of pour, and report results to Engineer, Manufacturer/Supplier, and Ready-Mix Supplier. Volume used shall be within +/- 10% of specified amount.

E. Admixtures shall be from single manufacturer, where possible. A letter shall be issued from several manufacturers certifying compatibility with all ingredients in the proposed mix design.

F. A minimum of one concrete finishing crew member shall be an ACI Certified Concrete Flatwork Finisher or equivalent for all slabs on grade and supported slabs. Equivalent finisher certification programs shall include both written and performance examinations. Certified finisher shall have input to crew's placement and finishing procedures regarding application of ACI Standards for quality flatwork. Contractor shall designate a certified finisher in advance of operations and warrant continued participation. Applicable standards are contained in ACI "Concrete Craftsmen Series."

G. Nondestructive tests will not be permitted to determine in-place strength.

H. Contractor, or Restoration Subcontractors, shall have not less than two (2) years experience in the field of structural concrete restoration work.

I. Repaired areas shall be sounding by Contractor with a chain drag or hammer seven (7) days after concrete placement. Contractor shall repair all hollowness detected by removing and replacing patch or affected area at no extra cost to Owner.

J. Maintain plan drawing locating all concrete repairs performed under this Section. Location and size of patches, overlays, etc. must be located on clean drawing. Separate drawing shall be maintained for each Level and ceiling plan.

1.6 Submittals (ACI 301 Submittals Checklist) Additional Submittal requirements as follows:

A. For review and approval mix designs on each class of concrete a minimum of three (3) weeks prior to placing concrete. Mix designs shall be prepared in accordance with ACI 301. Proportions shall be in accordance with ACI 211.1. Use attached "Concrete Mix Design Submittal Form" at end of this Section and also provide all material data identified in "Required Attachments" for the concrete mix design submittal.

B. All submitted material data shall be representative of concrete to be supplied and shall be current to the Work (i.e. tested within past 3 months of award date of contract).

C. For review and approval a warrant of design mix(s), stating that they are totally representative of concrete(s) to be supplied and that they meet requirements of Contract Documents.
D. For review and approval new design mixes when any change in materials are required or necessary.

E. For record upon request concrete delivery tickets.

F. For review and approval all materials and methods for concrete curing.

G. For review and approval prior to making structural repairs to concrete, patching materials to be used and method of application.

H. For record upon request, a written description of Contractor's concrete repair ability, including equipment, facilities, personnel, and a list of similar completed projects.

I. For review and approval of bonding grout mix design.

1.7 Materials Storage and Handling (ACI 301 4.1.4) Additional requirements as follows:

A. Store materials on platforms off ground; protect stored cement against elements. Handle and store aggregates separately in a manner to prevent intrusion of foreign material. Protect all material until used. Any materials which have deteriorated or have been damaged shall not be used.

1.8 Basis of Payment

A. All patching quantities shall be measured on a square foot basis; estimated depth of patch as indicated on Drawings.

B. Submit copy of drawings identifying current quantities with each payment request. Work being invoiced must be properly identified. These drawings shall be incorporated into record set required per Division 1.

PART 2 - PRODUCTS

2.1 Products (ACI 301 4.2) Additional requirements as follows:

A. Cementitious Material (ACI 301 4.2.1.1)

B. Aggregates (ACI 301 4.2.1.2)

1. Aggregates shall have a total water soluble chloride ion content below 0.02 percent by weight of aggregate, unless a higher limit is approved by Engineer by adding corrosion inhibitor to mixture to offset additional chloride ion.

2. Coarse aggregate shall consist of gravel, crushed gravel, crushed stone, or other approved inert materials of similar characteristics, meeting ASTM C 33 class designation as follows:
   a. All members; Class 5S.

3. Acceptance of aggregate for freeze thaw characteristics shall be based on past performance in concrete under similar conditions (freeze thaw, road salts) over five winters or when concrete is tested in accordance with ASTM Standard C 666.

4. Acceptance of aggregate for shrinkage characteristics shall be based on its past performance in concrete under similar conditions, or when concrete is tested in accordance with ASTM C 157 and ASTM C 469.
5. Acceptance of aggregate for alkali-aggregate reactivity (AAR) or Alkali-carbonate reactivity (ACR) shall be based on past performance in concrete under similar conditions, or when the aggregates are examined by petrographic examination ASTM C 295, and/or rock cylinder test ASTM C 586, and/or prism test ASTM C 1105 and/or tested in accordance with one or more of ASTM Standards C 1260, C 1293 or C 1567.

C. Admixtures (ACI 301 4.2.1.4)
   1. Admixtures shall be used to provide proper workability, finishability, and setting times at low water-cementitious ratios and to increase compressive strength, of concrete as approved by Engineer.
   2. Use approved admixtures and dosage rates as necessary unless indicated otherwise on Drawings. Use in strict accordance with Manufacturer's recommendations. Admixtures shall be added at separate intervals or locations of mix cycle.
   3. Air entraining admixtures: specific admixture to be selected by Admixture Representative and approved by Engineer.
      a. ASTM C 260
      b. Acceptable materials are:
         1) Sika AIR Series, AEA-14 or AEA-15, Sika Corp.
         2) Darex or Daravair Series, GCP Applied Technologies
         3) MB or Micro-Air Series, BASF Admixtures
         4) AEA, Air Mix or Eucon Air Series, Euclid Chemical Company
         5) Catexol Series, Axim Italcementi Group
         6) or Approved Equivalent.
   4. Chemical Admixtures: specific admixture to be selected by Admixture Representative and approved by Engineer.
      a. Water reducing admixtures
         1) ASTM C 494, Type A
         2) Acceptable materials are:
            a) Plastocrete, Sika Corp.
            b) WRDA or ADVA Series, GCP Applied Technologies
            c) Pozzolith Series, BASF Admixtures
            d) Eucon Series, Euclid Chemical Company
            e) Catexol Series, Axim Italcementi Group
            f) or Approved Equivalent.
         b. Midrange water reducing admixture conventional slump concrete 6” – 8”.
            1) ASTM C 494, Type A.
            2) Use shall not change the requirement of:
               a) Water/cementitious ratio
               b) Concrete strength
               c) Air content
               d) Specification for placing, finishing, and curing
            3) Acceptable materials are:
               a) Sikament AFM or Sikament 686, (Sikament Series), Sika Corp.
               b) Darcem, MIRA, or ADVA Series, GCP Applied Technologies
               c) Polyheed Series, BASF Admixtures
               d) Eucon Series, Euclid Chemical Co.
               e) Catexol Series, Axim Italcementi Group
      c. High range water reducing admixture 6” – 10” slump concrete.
         1) ASTM C 494, Type F or G
         2) Use shall not change requirement of:
            a) Water/cementitious ratio
            b) Concrete strength
            c) Air content
            d) Specification for placing, finishing, and curing
         3) Acceptable materials are:
            a) Sikament AFM or Sikament 686, (Visocrete Series), Sika Corp.
b) ADVA or Daracem Series, GCP Applied Technologies  
c) Glenium Series or Rheobuild 1000 or 716, BASF Admixtures  
d) Eucon or Plastol Series, Euclid Chemical Company.  
e) Catexol Series, Axim Italcementi Group

   1) ASTM C 1017 Type I or II  
   2) Use shall not change requirements of:  
      a) Concrete strength  
      b) Air content  
      c) Specification for placing, finishing and curing  
   3) Acceptable materials  
      a) Sikament 300 or 686, (Visocrete Series), Sika Corp.  
      b) ADVA or Daracem Series, GCP Applied Technologies  
      c) Glenium Series, BASF Admixtures  
      d) Plastol Series, Euclid Chemical Company.  
      e) Catexol Series, Axim Italcementi Group  
      f) or Approved Equivalent.

e. Non-corrosive non-chloride accelerator:  
   1) ASTM C 494, Type C or E  
   2) Admixture shall not contain more chloride ions than are present in municipal drinking water. Admixture Manufacturer must have long-term non-corrosive test data from an independent testing laboratory (of at least a year's duration) using an acceptable accelerated corrosion test method such as that using electrical potential measures.  
   3) Acceptable materials are:  
      a) Plastocrete 161 FL or Sikaset NC, (SikaSet Series), Sika Corp.  
      b) Daraset Series, Lubricon NCA, DCI, or Polarset, GCP Applied Technologies  
      c) Pozzutec Series, BASF Admixtures  
      d) Accelguard Series, Euclid Chemical Co.  
      e) Catexol 2000RHE, Axim Italcementi Group

f. Calcium Nitrite-Based Corrosion Inhibitor  
   1) ASTM C 494 Type C  
   2) Acceptable materials are:  
      a) Sika CNI, Sika Corp.  
      b) DCI or DCI-S Corrosion Inhibitor, GCP Applied Technologies  
      c) Rheocrete CNI, BASF Admixtures  
      d) Catexol 1000 CN-CI, Axim Italcementi Group  
      e) Eucon CIA, Euclid Chemical Company

D. Mineral Admixtures  
   1. Fly ash:  
      a. Fly ash, if used, shall not exceed 25 percent by weight of total cementitious material weight in mix design. Fly ash shall conform to ASTM C 618, including optional requirements on available alkalis, Class C or F, sampling and testing per ASTM C 311. Loss of ignition (carbon content) shall be limited to 4 percent.  
      b. Use of fly ash shall not alter specified levels of air entrainment nor reduce strength requirements for any mix.

   2. Silica Fume:  
      a. Silica fume shall conform to ASTM C 1240 requirements as a liquid slurry or dry densified.  
      b. Acceptable materials are:  
         1) Sikacrete 950 DP, Sika Corp.  
         2) Force 10,000 or Force 10,000-D, GCP Applied Technologies  
         3) Rheomac SF100, BASF Admixtures
4) Eucon MSA, Euclid Chemical Company
5) Catexol SF-D, Axim Italcementi Group
6) or Approved Equivalent.
c. Self disintegrating bags designed to be disposable in batch are prohibited.

E. Ground Granulated Blast-Furnace Slag (GGBS):
1. Ground Granulated Blast-Furnace Slag, if used, shall not exceed 40 percent by weight of total cementitious material in mix design.
2. Ground Granulated Blast-Furnace Slag shall conform to ASTM C 989, Grade 100 or higher.

F. Maximum percent of Total Cementitious Materials:
1. Where both flyash and slag are used in a mix design their total shall not exceed 35 percent by weight of the total cementitious material in the mix design for slabs and 50% for formed members.
2. Where flyash, slab and silica fume are all used a single mix design total shall not exceed 42 percent by weight of the total cementitious material in the mix design.

G. Fibrous Concrete Reinforcement – Plastic Crack Control
1. 100% virgin polypropylene (Collated fibrillated monofilament materials): Dosage rate 1.5#/cu. yard of concrete minimum, containing at least 3 million individual fibers.
2. 100% virgin polypropylene (Fibrillated microfilament materials): Dosage rate 1.0 #/cu. yard of concrete minimum, containing at least 25 million individual fibers. Minimum length shall be 0.75 in.
3. Meet minimum plastic shrinkage crack reduction of 70% when tested in accordance with ICBO ES, Appendix B(7-92)
5. Acceptable materials are:
a. Gilco, Grace Fibers or Grace Micro Fibers, GCP Applied Technologies
b. Fibermesh Inforce e3 or Stealth e3, FibreMesh Co., Chattanooga, TN
c. Forta Fiber-CFP, Forta Corp., Grove City, PA
d. Axim Fibrasol F, Axim Concrete Technologies
e. Fiberstrand, The Euclid Chemical Company
f. Sika Fiber, Sika Corp.
g. or Approved Equivalent.

2.2 Performance and Design Requirements (ACI 301 4.2.2) Additional requirements are as follows:

A. Coarse Aggregate: - (ACI 301 4.2.2.3)
1. Maximum aggregate size and ASTM C 33 gradation requirements (4.2.2.3):
a. All members 3/4 inch, size 67.

B. Air content – (ACI 301 4.2.2.4)
1. As specified on Drawings.
2. Plastic air test shall be performed by pressure method, ASTM C 231 or volumetric method, ASTM C 173. Verify air content with unit weight test.

C. Admixtures – (ACI 301 4.2.2.5)
1. Prohibited Admixtures: Calcium chloride, thiocyanates or admixtures containing more than 0.05% chloride ions by weight of cement are not permitted. No admixture shall cause an increase in shrinkage when tested in accordance with ASTM C 157.
D. Chloride-ion Concentration – (ACI 301 4.2.2.6)
   1. Total soluble chloride-ion content by weight of cement and of concrete shall be provided
      (for prestressed concrete, floor topping on precast). Total soluble chloride ion content of
      concrete shall be tested in accordance with AASHTO Method T260 for each proposed
      mix design. Percent by weight of cement of total soluble chloride ion content shall be
      below limits specified on Drawings. This includes contributions from all ingredients.
      Alternately, water soluble chloride ion content shall be tested in accordance with ASTM C
      1218. Percent by weight of cement of water soluble chloride ion content shall be below
      limits specified on Drawings. This includes contributions from all ingredients. If specified
      limits are exceeded, additional testing for water soluble chloride ion content shall be
      performed using Soxhlet method in accordance with ACI 222.1. In event that any
      concrete mix has water soluble chloride ion content in excess of specified limits for that
      mix, appropriate amounts of calcium nitrite shall be added to offset its effects. Ready-Mix
      Supplier shall provide laboratory test results indicating amount of excess chloride ion
      content in concrete mixture contributed by aggregates. For each pound of chloride ion in
      excess of amount allowed, mix shall contain calcium nitrite (30% +/- 2%, solids content)
      on a one-to-one basis (one gallon of calcium nitrite for one pound of excess chloride ion).
      Maximum of 1.5 lbs. of chloride ion per cubic yard may be offset in this manner.
      a. Water soluble chloride ion content of mix including all constituents shall
         not exceed limits as indicated on Drawings, unless a higher limit is approved by Engineer and
         corrosion are inhibitors added to mixture to offset additional chloride.
      b. If specified level of water soluble chloride ion content cannot be maintained,
         appropriate level of calcium nitrite admixture shall be added to mix in accordance
         with above at no additional cost to Owner.

E. Mix Designs with Silica Fume
   1. Additional Mix Design Requirements:
      a. Ready-Mix Supplier and Owner Testing Laboratory shall independently perform air
         content tests of silica fume mix design in accordance with ASTM C 231 or ASTM C
         173. Verify air content with unit weight test.

F. Mix Designs with Corrosion Inhibitor
   1. Additional Mix Design Requirements
      a. Ready-Mix Supplier and Owner’s Testing Laboratory shall independently perform
         air content testing of mix design in accordance with ASTM C 231 or ASTM C
         173.
      b. Corrosion inhibitor Supplier and Owner’s Testing Laboratory shall independently
         perform plastic concrete corrosion inhibitor testing of mix design in accordance
         with test method for Calcium Nitrite Presence in Plastic Concrete indicated in
         Appendix A of Specification Section 01 4100.

G. Strength and Water-Cementitious material ratio – ACI 301 4.2.2.9
   1. As scheduled on Drawings.
   2. Weight of fly ash, silica fume and GGBS additives shall be included with weight of
      cement to determine water-cementitious materials ratio.

2.3 Measuring, Batching, and Mixing (ACI 301 4.3.1) Additional requirements as follows:

A. Ready Mix Concrete
   1. Furnish delivery ticket with each load of concrete delivered. In addition to requirements of
      ASTM C 94 Section 16, provide following information on delivery tickets:
      a. Type of aggregate
      b. Total water content
      c. Air Entrainment
      d. Slump
      e. Silica fume (if used) admixture content per cubic yard of concrete
f. Fly ash (if used) content per cubic yard of concrete  
g. GGBS (if used) content per cubic yard of concrete  
h. Water-cementitious materials ratio  
i. Corrosion inhibitor  
j. High Range Water reducing admixture  
k. Fibrous concrete reinforcement  

B. Slump adjustment (ACI 301 4.3.2.1)  
   1. ASTM C 143. Contractor will provide slump guidelines adhering to strength and water/cementitious ratio requirements. Mix design shall provide water slump for concrete and after addition of superplasticizers.  
   2. Water is not to be added at site to meet specified slump, unless specifically indicated as being withheld on concrete batch ticket and approved by Engineer.  
   3. High range water reducing admixtures (superplasticizers), if added at batch plant, may be redosed at job site. Manufacturers should provide a redosage chart for this purpose. If superplasticizers are added at batch plant, concrete delivery time, placement, and finishing procedures shall account for limited time affect. If superplasticizer is added at site after verification of initial slump, concrete shall be completely retested after proper mixing. All concrete containing superplasticizer shall have a maximum nine (9) inch slump unless otherwise approved by Engineer.  

C. Time of Discharge (ACI 301 4.3.2.2)  
   1. All concrete trucks shall not have concrete build-up on drum or have worn fins. Engineer may require inspections to verify conformance to NRMCA Quality Control Manual, Section 3.  
   2. Time of discharge after batching shall not exceed 90 minutes or after drum has revolved 300 revolutions unless otherwise approve by Engineer.  

D. Air content tests shall be taken of concrete at point of discharge unless otherwise approved by Engineer.  

E. Silica Fume Concrete - Additional Mixing Requirements  
   1. Sequence and method of charging mixer, transportation, discharging and placement of silica fume concrete shall be reviewed with silica fume Manufacturer’s Representative.  
   2. For all types of mixing equipment, mix times shall be increased by 40% over minimum mix time required to achieve mix uniformity as defined by ASTM C 94.  
   3. For truck-mixed and central mixed silica fume concrete, maximum allowable batch size shall be 80% of maximum as called out by ASTM C 94.  

F. Fibrous Concrete Reinforcement - Additional mixing requirements  
   1. Fibers shall be added at a maximum rate of 4 lbs per cubic yard of concrete as indicated on Drawings, Specification, or as approved by Engineer in accordance with Manufacturer’s recommendations and within time and location of initial concrete batching as specified in ASTM C 94.  

G. Prepackaged Materials Used in Concrete (ACI 301 4.3.1.3)  
   1. Mixing and installing of concrete patching materials and priming of existing concrete surface shall be in accordance with Manufacturer’s recommendations.  
   2. Site mixing operation shall be approved by Manufacturer and produce sufficient concrete so that placement and finishing operation can proceed at a steady pace.  

PART 3 - EXECUTION
3.1  **General (ACI 301 5.1) Additional requirements as follows:**

A. Placement notification (ACI 301 5.1.2.2.b) notify Owner's Testing Laboratory and Engineer 48 hours in advance of concrete operations.

B. Before placement of concrete, formwork shall have been completed, foreign material shall have been removed, reinforcement shall have been secured in place, and entire preparation shall have been reviewed by Engineer.

3.2  **Materials (ACI 301 5.2.1) Additional requirements as follows:**

A. Curing compounds
   1. Curing Compounds (ACI 301 5.2.1.1)
      a. Acceptable only for use on vertical and overhead repairs.
      b. Curing and Sealing Compound (A.I.M. Regulations – VOC Compliant, 700 g/l):
         Liquid type membrane-forming curing compound, clear styrene acrylate type, complying with ASTM C 1315, Type I, Class B, 25% solids content minimum.
            1) Moisture loss shall be not more than 0.30 Kg/m² when applied at 300 square feet/gallon.
            2) Application rate per ASTM C 1315.
            3) Manufacturer’s certification is required.
            4) Acceptable materials are:
               a) “Super Diamond Clear or Super Diamond Clear AC” by The Euclid Chemical Company
               b) "Masterseal 30" by BASF
               c) "Kure N Seal 30" by Sonneborn

B. Waterproof Sheet Materials – (ACI 301 5.2.1.2)
   1. Acceptable materials are:
      a. Waterproof paper over burlap.
      b. White polyethylene film over burlap.
      c. White polyethylene-coated burlap.

C. Evaporation Retarder
   1. Acceptable materials are:
      a. Sika Film, Sika Corporation
      b. Confilm, BASF Ad mixtures
      c. Eucobar, Euclid Chemical Company
      d. E-Con, L & M Construction Chemicals, Inc.
      e. or Approved Equivalent.

3.3  **Preparation (ACI 301 5.3.1) Additional requirements as follows:**

A. Before placement of repair material pre-dampen surfaces of cavities. Surfaces shall have no standing water during the concrete pour.

B. Coordinate Work with other trades to allow reasonable time to set sleeves, inserts and other accessories.

C. Conveying Equipment (ACI 301 5.3.2.3)
   1. Pump hoses shall be supported independently and not laid on reinforcement.

D. Consolidating (ACI 301 5.3.2.5)
1. Vibrators must not be allowed to touch reinforcement embedded in partially set concrete. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer and at least 6" into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix.

E. Bonding Grout
1. All concrete bonding surfaces must be abrasive blasted to a clean sound substrate prior to concrete placement.
2. Bonding grout shall be pneumatically (brush) applied to existing concrete bonding surface immediately prior to concrete placement. Bonding grout shall be applied evenly to a uniform minimum thickness of 1/16 inch to 1/8 inch throughout. Grout shall not be allowed to dry or dust prior to placement of repair material.
3. Provide one (1) shop vacuum capable of removing water from repair cavity prior to bonding grout application.

F. If construction joints are permitted, new concrete placement shall not be until contact surface of concrete in place has been swept with a stiff brush or scraped to remove laitance and roughened. One hour prior to concrete placement, pre-wet bonding surface or soil with a uniform spray application of water. Surface shall be maintained in a damp condition, puddles shall be blown clean. Bonding surface shall then be coated with a thin layer of bonding grout immediately prior to placement of concrete. Bonding grout shall be worked into bonding surfaces with stiff brooms or brushes.

3.4 Placement of Concrete (ACI 301 5.3.2) Additional requirements as follows:

A. Cold Weather (ACI 306.1, ACI 301 5.3.2.1.b)
1. Record air temperature no less than twice per 24 hour period.
2. Cast expendable thermostats or thermo-couplers in concrete at rate of at least one per 100 cubic yards of concrete placed for supported structure. Monitor internal temperature of concrete at twelve hour maximum intervals throughout curing process.
3. Record temperature of concrete for each batch as delivered.
4. Mix water, sand, and aggregate may be warmed so that no frozen lumps of ice, snow, or aggregate will survive mixing but do not overheat ingredient to cause flash setting of concrete or loss of entrained air.
5. Specified non-corrosive accelerator may be used.
6. Do not place concrete unless air temperature is at least 20 degrees F and rising.
7. Use evaporation retarder or water fog after finishing to assure that plastic shrinkage cracking of concrete surface does not occur.
8. Cure shall consist of visqueen and insulated blankets placed on slab as soon as possible after concrete will support them without deformation.
9. Do not wet cure concrete placed under cold weather conditions.
10. Curing of supported slabs (continuous presence of visqueen and blankets) shall be maintained no less than 10 days.

B. Hot Weather (ACI 305, ACI 301 5.3.2.1.c)
1. Temperature of concrete as delivered shall not exceed 90°F, unless approved by Engineer.
2. Forms, reinforcing, and air shall be cooled by water fog spraying immediately before placing concrete.
3. Protect flatwork during finishing operations as follows:
a. Immediately following screeding, apply an evaporator retarding agent in accordance with recommendations of Manufacturer. Additional applications of evaporation retarding agent may be required.
b. Continuous fog spray of air above slab between finishing operations.
c. Cover concrete with an approved moisture-retaining cover as soon as concrete will support it without deformation. Keep mats constantly wet for 7 days minimum. Leave mats in place for 3 additional days after discontinuing wetting process.

C. Wet Weather (ACI 301 5.3.2.1a).

D. Grout used to prime concrete pump and pump line shall not be placed into Work.

E. During periods of setting, no materials shall be placed and no loads imposed in any manner on slabs. Plank runways for accommodation of workmen or for other traffic shall be supported by blocking.

F. Construction Joints and Other Bonded Joints (ACI 301 5.3.2.6)
   1. Construction of control and isolation joints shall be as located and detailed on Drawings.
   2. Coordinate configuration of tooled joints with joint sealant Manufacturer. Refer to Section 07 9200, Joint Sealants.
   3. Tool slab joints at time of finishing. Saw cutting is not allowed.
   4. Maximum variation between slab surfaces at joints shall not exceed 1/16 inch.
   5. Concrete patches shall be edged to match existing condition (beam and column chamfers, etc.), unless noted.
   6. Bulkheads to limit each pour to predetermined construction joints, shall be set normal and vertical to section to be poured, and shall be left in place until concrete has sufficiently set. Care shall be used when removing bulkheads to prevent spalling of concrete surface. Any concrete passing through bulkhead shall be removed before adjacent pour is made.
   7. Construction or control joints passing through patches shall be tooled through patch for continuity.

3.5 Finishing Formed Surfaces (ACI 301 5.3.3) Additional requirements as follows:

A. Rough – form finish (ACI 301 5.3.3.3.a)
   1. All concealed concrete (i.e. behind masonry, below grade, abutting another structure), may have a “rough form finish.”

B. Smooth – formed finish (ACI 5.3.3.3.b)
   1. All concrete surfaces exposed to public view, both inside and outside structure shall have a “smooth form finish.”

3.6 Finishing Unformed Surfaces (ACI 301 5.3.4) Additional requirements as follows:

A. General
   1. Spraying of water directly on concrete surfaces is NOT allowed.
   2. Use rigid screed rails, wet screeding not accepted.

B. Float Finish (ACI 5.3.4.2.b):
   1. Flat work in parking and drive areas.
      a. Begin bull floating immediately after screeding of concrete.
      b. When bleed water has left surface, begin final “float finish” operation.

C. Broom or Belt Finish (ACI 301 5.3.4.2.d)
1. Slab areas to receive a deck coating shall have a “light broom finish,” or as recommended and approved by coating Manufacturer and Engineer. Slab areas not receiving a deck coating shall have a medium broom finish. Ridges shall not exceed 1/8 inch in height. Engineer shall be notified to observe and approve final finish texture.

2. Provide "light broom finish" at stair treads, and a "light broom finish" for stair landings. Texture shall be approved by Engineer.

3. No refloating or finishing is required after brooming.

D. Measuring Tolerances for Slabs (ACI 301 5.3)

1. Parking and drive areas finishing tolerance - During “float finish” operation planeness of surface shall be checked per ACI 117 4.5.7 Classification Straightedged. All high spots shall be cut down and all low spots filled during finish operation.

2. Stair Towers - Finishing tolerance - During finishing operation, planeness of surface shall be checked per ACI 117 4.5.7, Classification Straightedged.

3. Finish all concrete slabs to proper elevations to ensure that all surface moisture will drain freely to floor drains that no puddle areas exist. Provide positive drainage and maintain headroom clearances as indicated on Drawings. Notify Engineer of grades or clearances which do not allow headroom so adjustments can be made. Contractor shall bear cost of any corrections to provide for positive drainage.

E. Additional Finishing Requirements as follows:

1. Finish concrete using procedures to preclude plastic and drying shrinkage cracking. Note the use of low water/cementitious ratio concrete and silica fume and GGBS will essentially eliminate bleed water.

2. Fog misting air above flat work is recommended. Free standing water is not allowed. No spraying of water directly on flat work will be allowed.

3. Fog misting is not to be used to apply water to surface of concrete to facilitate lubrication for finishing purposes.

4. Fogging is required when conditions of hot weather concrete exist per “Hot Weather Concreting” as specified herein. Fogging shall continue after finishing operation until moisture retaining cover is placed over concrete.

5. Finish concrete to texture matching approved sample or as required by the deck coating manufacturer.

3.7 Curing and Protection (ACI 301 5.3.6) Additional requirements as follows:

A. General

1. Curing shall maintain moisture content and temperature to insure strength gain and prevent undesirable cracking, dusting, scaling and crazing.

2. Additional precautions may need to be taken to prevent excessive slab moisture loss resulting in plastic shrinkage when any combination of air temperature, concrete temperature, relative humidity and/or wind velocity which causes a rate of evaporation in excess of 0.2 pounds per square feet per hour as determined by ACI 308, Figure 1.

B. Unformed concrete surfaces: (ACI 301 5.3.6.2)

1. Curing of supported slabs shall be as ACI 301 5.3.6.4.d, “Application of sheet materials conforming to ASTM C 171. Application of curing compounds is not allowed.

2. For silica fume concrete mixes, curing procedures shall also be in accordance with requirements of silica fume admixture Manufacturer.

3. As a minimum or as recommended by Manufacturer, surfaces of concrete patches shall be protected with a moisture retaining cover, wet burlap as soon as surface will support it without deformation. Maintain burlap in a continuous saturated condition for three days.

4. During curing period repairs shall be protected from traffic. Slab demolition from above or below shall be halted.
5. Prior to reopening repairs to traffic and loading, confirm that the repair concrete has attained a minimum compressive strength of 70 percent of specified 28 day strength. Confirmation is to be made by field cylinder, cured adjacent to, and in a manner similar to the repairs.

C. Formed Concrete Surfaces (ACI 301 5.3.6.3)

1. Curing of formed surfaces upon early removal of forms shall be in accordance with ACI 301 5.3.6.4, Preservation of Moisture.

3.8 Repair of Surface Defects (ACI 301 5.3.7) Additional requirements as follows:

A. Match color and texture of concrete to be repaired.

B. Repair all cracks in supported concrete floor slabs and curbs by routing and sealing or epoxy injection subject to approval of Engineer.

C. Fill all air pockets and holes over 1/2 inch in diameter with a sand-cement paste. Grind smooth all form offsets or fins over 1/8 inch.

D. Remove stains, efflorescence, rust, grease and oils, form release agents, dirt, surface deposits, etc.

E. Low spots, creating puddles and bird baths which impede drainage shall be corrected by smoothing out broom lines, and grinding a drainage path (max 1/4" depth), or by patching with a specified polymer repair material.

F. High spots impeding drainage in slabs shall be corrected by grinding and re-texturing, subject to approval of Engineer.

G. Honeycombed and other defective concrete shall be patched with an approved material.

H. If shrinkage cracks appear in patch material prior to completion of initial 72-hour curing period, patch material shall be considered defective, and it shall be removed and replaced at no extra cost.

3.9 Acceptance of Structure (ACI 301 1.7)

END OF SECTION 03 3000
CONCRETE MIX DESIGN SUBMITTAL FORM

Project: ___________________________ City: ___________________________
General Contractor: ___________________________ Mix Design # ___________________________
Use (Describe): ___________________________

DESIGN MIX INFORMATION:

Field Test Results (Standard Deviation Analysis): ____________
or Trial Mix Test Data: ____________

Specified Design Characteristics:
Strength _____ psi (28 day); Density: _____ pcf;
Maximum Slump _____ in.; Maximum w/cm _____
Air: ____% specified.

Cementitious Materials:

<table>
<thead>
<tr>
<th>Type</th>
<th>(Product Mfr. (Source))</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cement:</td>
<td>___________________________</td>
</tr>
<tr>
<td>Fly ash:</td>
<td>___________________________</td>
</tr>
<tr>
<td>Other:</td>
<td>___________________________</td>
</tr>
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</table>

Aggregates:

<table>
<thead>
<tr>
<th>Type</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coarse:</td>
<td>___________________________</td>
</tr>
<tr>
<td>Fine:</td>
<td>___________________________</td>
</tr>
</tbody>
</table>

Admixtures:

- Air Entraining Admixture (A.E.A.):
- Water Reducing Admixture (W.R.):
  - Accelerator:
  - Silica Fume:
  - Calcium Nitrite-Based Corrosion Inhibitor:
  - Shrinkage Reducing Admixture
  - Fibrous Reinforcement:
  - Latex Emulsion:
  - Other:
### FINAL MIX DESIGN DATA:

<table>
<thead>
<tr>
<th>Mix PROPORTIONS</th>
<th>WEIGHT ABSOLUTE VOL.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(lbs)</td>
</tr>
<tr>
<td></td>
<td>(cu. ft.)</td>
</tr>
</tbody>
</table>

- **Cement:** __________  __________
- **Coarse Aggregate:** __________  __________
- **Fine Aggregate:** __________  __________
- **Water:** __________  __________
- **Entrained Air:** __________  __________
- **Other:** __________  __________

### RATIOS

- **Fine Agg.:** _______ lb  ____ %
- **Total Agg.:** _______ lb

Fly ash to cementitious materials ratio: __________
Silica fume to cementitious materials ratio: __________
Water to cementitious ratio: __________

### SPECIFIC GRAVITIES

- **Fine Agg:** __________
- **Coarse Agg:** __________
- **Other:** __________

### ADMIXTURES (dosage rate 0Z per 100 lb/cement or 0Z per/yd)

- **A.E.A.**  __________
- **W.R.**  __________
- **HRWR**  __________
- **Accelerator**  __________
- **Silica Fume**  __________
- **Calcium Nitrite-Based Corrosion Inhibitor**  __________
- **Fibrous Reinforcement**  __________
- **Latex Emulsion**  __________
- **Shrinkage Reducer**  __________
- **Other**  __________

*NOTE: Include dosage rate schedule and correlation between dosage of chloride inhibitor and chlorides present in concrete.*
Mix # ___________________________        Job Name ___________________________

**PLASTIC CONCRETE**

Initial Slump = _____ in.        Air Content = _____ %
Final Slump = _____ in.        Unit Dry Wt. = _____ pcf
Unit Wet Wt. = _____ pcf

**STANDARD DEVIATION ANALYSIS** (from experience records):

Number of Test Cylinders Evaluated: ________    Standard Deviation: ________

\[ f'cr = f'c + 1.34s \text{ or } f'cr = f'c + 2.33s - 500 \text{ for 5000 psi or less} \]
\[ f'cr = f'c + 1.34s \text{ or } f'cr = 0.90 f'c + 2.33s \text{ for higher strengths} \]

(Refer to ACI 301 for increased deviation factor when less than 30 tests are available.)

**LABORATORY TEST DATA (Hardened Concrete):**

<table>
<thead>
<tr>
<th>Age (days)</th>
<th>Mix #1 (comp. str.)</th>
<th>Mix #2 (comp. str.)</th>
<th>Mix #3 (comp. str.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
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<tr>
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</tbody>
</table>

28-day average compressive strength: ____________ psi

Mix design proportioned to achieve \( f'cr = f'c + 1200 \) psi for 5000 psi or less. OR \( 1.10 f'c + 700 \) psi for strengths higher than 5000 psi at 28 days.

Remarks:

________________________________________________________________________

________________________________________________________________________

NOTE: Fill in all blank spaces. Use -0- (Zero) or N.A. (Not Applicable) where appropriate. See “Design and Control of Concrete Mixtures: 13th Edition” by Portland Cement Association, for assistance in completing this form.
Mix # ______________________ Job Name ______________________

REQUIRED ATTACHMENTS:

___________ Concrete compressive strength data used for standard deviation calculations

___________ Cement mill test reports

___________ Mill test reports of fly ash chemical and physical analysis and certification of compliance with ASTM C 618 Class C or F

___________ Certification of silica fume with ASTM C 1240

___________ Coarse aggregate gradation, deleterious substances and physical property report (ASTM C 33, class designation)

___________ Coarse aggregate soundness test reports (ASTM C 88)

___________ Certification aggregate are uniform in quality, gradation, colors and quantity

___________ Fine aggregate gradation, deleterious substances and physical property report (ASTM C 33)

___________ Admixture compatibility certification letter

___________ Admixture Manufacturer’s “Product Data Sheets” and “Safety Data Sheets”

___________ Admixture Manufacturer’s certification of conformance with appropriate ASTM standards

___________ Certification of acceptability of coarse and fine aggregate for ASR and ACR performance

___________ Certification and test results of water soluble chloride ion content FHWA RD-77 or AASHTO T 260-84

___________ Air content tests of freshly mixed concrete in accordance with ASTM C 231 or ASTM C 173

___________ Corrosion inhibitor testing of plastic concrete Test Method for Calcium Nitrite Presence in Plastic Concrete (Specification Section 01 4100, Appendix A)
Submitted by Ready-Mix Supplier:

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SECTION 04 0100 – MASONRY RESTORATION AND CLEANING

PART 1 - GENERAL

1.1 Related Documents
   A. The Conditions of the Contract for Construction and the General Requirements of Division 1 of these Specifications apply to the Work in this Section.

1.2 Work Included
   A. The Work of this Section shall include providing all labor, materials, equipment, and supervision to rebuild and to clean, repair, repoint, and seal the masonry walls as indicated on the Drawings.

1.3 Related Work
   A. The following Work is related to this Section:
      1. Joint Sealants Section 07 9200

1.4 Reference Standards
   A. Comply with the following reference standards except where more stringent requirements are shown on the Drawings or specified:

1.5 Quality Control
   A. All masonry work shall be performed by a mason experienced in the class of required work. Workmanship shall be of the highest quality.

1.6 Submittals
   A. Submit for record Manufacturer's Spec Data Sheets and Safety Data Sheets for each product indicated including recommendations for their application and use. Include test reports and certifications substantiating that products comply with local, state, and federal environmental and worker's safety laws and regulations.

   B. Submit for record written program of procedures to be used in complying with this specification, including written description of cleaning methods, working pressures, materials and equipment proposed.

   C. Submit for record disposal plan including location of acceptable disposal site; and detailed description of methods to be employed to control pollution.
1.7 **Samples**
   A. Submit upon request for review and approval, samples of masonry units.

1.8 **Transportation and Handling**
   A. Store masonry units on wood skids or pallets. Distribute weight of masonry units evenly to prevent breakage or cracking. Protect stored masonry units from weather with waterproof, non-staining covers or enclosures, but allowing for circulation of air.
   B. Protect mortar materials and masonry accessories from weather, moisture and contamination with earth and other foreign materials.

**PART 2 - MATERIALS**

2.1 **Masonry**
   A. Reuse existing masonry units which have been removed from the walls due to construction operations.
   B. Whenever masonry units are not sufficient, either in supply or quality, Contractor shall furnish new masonry units matching existing.

2.2 **Mortar**
   A. Type N, ASTM C270, proportion specification.
   B. Obtain mortar ingredients of uniform quality and color:
      1. Cement: Non-staining grey or white (as appropriate) Portland Cement, ASTM C150, Type I or II.
      2. Sand: ASTM C144, clean, fine, sharp sand to match the color of sand in the original mortar.
      3. Hydrated lime: ASTM C207, Type S.
      4. Water: Clean, potable, and free of oils, acids, alkalis, salts, organic materials, or other substances that may be deleterious to the performance of the masonry.
      5. Mortar Coloring Pigment: Pure ground mineral oxides, non-fading and alkali proof, to match existing mortar color as closely as possible. Not to exceed 10 percent of the weight of the mortar.
   C. Manufactured masonry cement meeting the above requirements may be used.
   D. Contractor shall match existing color of mortar. Color to be modified in accordance with manufacturer’s recommendations.

2.3 **Cleaning Materials**
   A. Cleaning compounds shall not contain acids, nor cause scratching of surface, or staining.

2.4 **Sealants**
A. See Section 07 9200 Joint Sealants

PART 3 - EXECUTION

3.1 Inspection

A. Inspect area to receive the work and report immediately in writing to the Engineer, as required in the General Conditions, any unacceptable conditions. Do not proceed with work until unsatisfactory conditions have been corrected in an acceptable manner. Commencement of work implies acceptance of related work.

3.2 Preparation

A. Protect persons, motor vehicles, surrounding surfaces of building whose masonry surfaces are being restored, building site and surrounding buildings from injury resulting from masonry restoration work.

B. Erect additional temporary protection as required over pedestrian walkways and at points of entrance and exit for persons and vehicles which must remain in operation during course of masonry restoration work. Refer to Section 01 5600, Temporary Barriers and Enclosures.

C. Remove temporarily, if required, or protect signage, electrical fixtures, electrical outlets, etc. from wall surfaces. Reinstall removed items at completion of construction.

D. Remove all loose and unsound mortar and loose masonry units from existing walls.

E. Clean existing masonry wall surfaces and mortar joints free of dust, dirt or other foreign materials prior to installation of new masonry.

3.3 Masonry Replacement

A. Use care to remove damaged masonry units.

B. Do not remove existing masonry in quantities that could potentially weaken the structural integrity of the wall. Install shoring whenever masonry removal exceeds 36 inches. For sections exceeding 5 feet continuous contractor shall provide submittal/written procedure indicating his proposed stabilization method and sequence.

C. Any damage caused to masonry sections or areas not scheduled for removal and replacement by the Contractor’s failure to properly stabilize undisturbed sections shall be repaired at no additional cost to the owner.

D. Remove masonry units by sawcutting through the mortar in the joints surrounding the masonry units in question.
   1. Masonry shall be removed in a sawtooth pattern.
   2. All existing mortar on adjacent masonry units that are to remain in place shall be removed and the surfaces prepared for placement of new mortar and masonry units.
   3. Care should be taken not to damage surrounding masonry, windows, etc. Any damage to surrounding materials will be repaired by the Contractor at no cost to the Owner.
   4. Weather protection shall be installed to protect the open cavity from water damage when removal cavity is left open over night or when it may rain.
E. Handle masonry units in a manner to prevent chipping, breakage, soiling or other damage. Do not use pinch or wrecking bars without protecting edges of masonry with wood or other rigid materials.

F. Where possible, use full-size units without cutting.

G. Cut masonry units, as required, to provide accurate fit and to maintain plane of existing masonry. Cut masonry units with motor-driven saws to provide clean, sharp, un-chipped edges.
1. Cut units as required to provide a continuous pattern and to fit adjoining construction.
2. Install cut units with cut surfaces and, where possible, cut edges concealed.

H. Pre-wet all masonry prior to placement to prevent improper cure of the mortar.

I. Install replacement masonry plumb, level, and true to line and all corners. Verify all angles are square. Use block lines whenever possible. If use of a line pin is required, rake out the hole within the mortar joint and re-point with mortar during subsequent work.

J. Provide uniform distribution of size and shape of masonry units to match existing.

K. Match existing patterns, bonds, and/or special details accurately.

L. Set all masonry in full bed of mortar. Do not set additional courses of masonry until mortar in courses below is set sufficiently to maintain alignment and prevent extrusion.

M. Completely fill all head joints of replacement masonry with mortar.

N. Tool mortar joints to match profile of existing mortar joints, unless otherwise indicated, when thumbprint-hard. Remove excess mortar from edge of joint by brushing.

O. Allow mortar droppings on masonry units to dry, remove with trowel followed by bristled brush.

3.4 Re-pointing Existing Masonry

A. Remove deteriorated mortar in masonry joints back to a uniform depth of ¾ inch, or until sound, unweathered mortar is reached. Remove mortar the entire width of the joint.

B. Cut back existing mortar joints to form right angles, square, at terminations with toothing chisel or pointer’s grinder to expose masonry for contact with pointing mortar.

C. Do not damage masonry units during removal of mortar.

D. Brush, vacuum, or flush joints to remove dirt and loose debris.

E. Pre-hydrate repointing mortar to reduce excessive shrinkage.
1. Thoroughly mix all dry ingredients.
2. Add only enough water to the dry mix to produce a damp, workable consistency that will retain its shape when formed into a ball.
3. Allow repointing mortar to stand in dampened condition for approximately 1 hour.

F. Add additional water to pre-hydrated mortar to maintain workable consistency.

G. Wet mortar joints to a saturated, surface dry condition prior to installation of new mortar.
H. Pack repointing mortar into joints in layers not greater than ¼ inch until a uniform depth is formed. Compact each layer thoroughly and allow it to become thumbprint-hard before applying next layer.

I. Tool joints to match profile of existing mortar joints, unless otherwise indicated, when thumbprint-hard. Remove excess mortar from edge of joint by brushing.

J. Cure mortar by maintaining in a damp condition for not less than 72 hours.

3.5 Environmental Requirements

A. Cold/Hot Weather Procedures: Comply with ACI 530/530.1-13 and the following.

B. Cold Weather Procedure:
   1. Do not install masonry when the air temperature is below 45 deg. F, unless it is rising, and at no time when the air temperature is below 40 deg. F, except with written permission of the Engineer/Architect.
   2. When the air temperature is between 40 deg. F and 32 deg. F, and masonry installation is authorized, heat mortar sand or mixing water at time of mixing to produce mortar temperatures between 70 deg. F and 120 deg. F.
   3. Do not lay masonry units which have a surface temperature of 20 deg. F or less.
   4. Maintain air temperature above 40 deg. F on both sides of masonry for at least 72 hours after installation.

C. Hot Weather Procedure:
   1. Protect masonry installation from direct exposure to sun and wind when the air temperature is 95 deg. F or greater in the shade with a relative humidity less than 50 percent.
   2. Maintain temperature of mortar and grout below 120 deg. F.
   3. Retemper with cool water to maintain mortar consistency.
   4. Use mortar within 2 hours of initial mixing.

3.6 Protection

A. Protect partially completed masonry repairs against weather when work is not in progress. Cover top of walls with strong waterproof, non-staining membrane extending at least 2 feet down both sides of walls and anchor securely in place.

3.7 Masonry Cleaning

A. Perform masonry repairs, including but not limited to replacement and/or repointing, before cleaning.

B. Allow all mortar and sealant to thoroughly cure before cleaning.

C. Protect all surrounding surfaces. Prevent chemical cleaning solutions from coming into contact with pedestrians, motor vehicles, landscaping, buildings, and other surfaces which can be injured by such contact.

D. Do not clean masonry during winds of sufficient force to spread cleaning solutions to unprotected surfaces.
E. Tools and cleaning solutions used shall not cause scratching of the masonry surface or staining. Cleaning solutions used shall not damage plantings.

F. Clean a test panel, 4 feet by 4 feet in area, on each type of masonry surface before beginning cleaning operations to determine exact cleaning procedures and the effectiveness of the cleaning solution(s). Allow test panels to thoroughly dry, 3 days minimum, to make available to Engineer for review and approval.

G. After approval of cleaning procedure, clean all masonry of stains, mortar, dirt, efflorescence, organic growth, etc. Use least aggressive method necessary to remove deposits and growth:

1. Begin cleaning operations by dry brushing with a stiff fiber bristle brush.
2. Clean exposed surfaces by low-pressure water blasting, maximum 400 pounds per square inch pressure at the nozzle. Use a rotating nozzle or a device for aerating the water stream to reduce the force. Supplement water blasting with fiber bristle brushing.
3. If required, supplement the low-pressure water blasting and scrubbing with approved cleaning solutions:
   a. Comprehensively pre-soak the surface of the masonry with clean water.
   b. Apply approved diluted cleaning solution to masonry surfaces with a low-pressure spray, 50 pounds per square inch pressure at the nozzle, roller, or brush per manufacturer’s instructions.
   c. Allow cleaning solution to dry per manufacturer’s instructions. Use fiber bristle brush and/or reapply as required to obtain desired appearance.
   d. Rinse thoroughly in a systematic manner from top to bottom by low-pressure water blasting, maximum 500 pounds per square inch pressure and 40 degree fan tip at the nozzle. Continue rinsing until release of suds stops.
   e. Keep surfaces immediately below the masonry surface being cleaned wet and rinsed free of run-off and residues.

H. Dispose of run-off from cleaning operations by legal means and in a manner which prevents soil erosion, undermining of paving foundations, damage to landscaping, and water penetration into building interiors.

3.8 Clean-up

A. Protect finished work from stains.

B. Protect storage, construction and mixing areas, as well as surrounding surfaces and leave them clean. Clean all stains or dirt on surrounding surfaces resulting from the implemented repairs to the satisfaction of the Owner at no additional cost.

C. Remove and replace all damaged materials to the satisfaction of the Owner at no additional cost.

END OF SECTION 04 0100
SECTION 05 5700 – MISCELLANEOUS METALS

PART 1 - GENERAL

1.1 Related Documents
A. Conditions of Contract for Construction and General Requirements of Division 1 of these Specifications apply to Work in this Section.

1.2 Work Included
A. Work of this Section shall include all labor, materials, equipment, and supervision necessary to complete installation of miscellaneous metals as indicated on Drawings and listed below:

1. Railing post repairs at Fourth & William.

1.3 Related Work
A. Following Work is related to this Section:

1. Selective Demolition Section 02 4119
2. Concrete Repair Section 03 0130
3. Concrete Reinforcement Section 03 2000
4. Cast-In-Place Concrete Section 03 3000

1.4 Design

1.5 Reference Standards
A. Comply with provisions of following codes and standards, latest editions except where more stringent requirements are indicated on Drawings or Specifications.

1. American Institute Steel Construction

2. American Iron and Steel Institute
   a. AISI Specifications for the Design of Cold-Formed Steel Structural Members.

3. American Welding Society
   a. AWS D 1.1 Structural Welding Code - Steel.
b. AWS D 1.3 Structural Welding Code - Sheet Steel.
c. AWS D 1.6 Structural Welding Code - Stainless Steel.

4. Steel Structures Painting Council (SSPC)
   a. Steel Structures Painting Council Manual, Volume I, Good Painting Practices
   b. Steel Structures Painting Council Manual, Volume II, Systems and Specifications

5. American Concrete Institute.
   a. ACI 301, Standard Specification for Structural Concrete.

6. American Society Testing Materials
   a. As specified herein.

1.6 Quality Control
   A. Use welders with current AWS certifications for required welding Work.

1.7 Submittals
   A. For review and approval detailed shop drawings indicating all information necessary for fabrication and erection of miscellaneous metals. Include following:
      1. Material data
      2. Erection marks and location
      3. Dimensions and weight of member(s)
      4. Shop and field connections
      5. Erection details
      6. Paint Primer
   B. For review and approval AWS welder certification.

1.8 Transportation and Handling
   A. Deliver all miscellaneous metals to Project site and handle and store in such a manner as not to damage or distort material.
   B. Handle so as not to damage coating system.
   C. Replace damaged material at no additional expense to Owner.

PART 2 - PRODUCTS

2.1 Steel Plates, Shapes, and Bars
   A. W-Shapes: ASTM A 992.
   B. Channels, Angles: ASTM A 36.
C. Plates and Bars: ASTM A 36.

2.2 Steel Tubing

A. Cold Formed - ASTM A 500, Grade B
B. Hot Formed - ASTM A 501

2.3 Galvanizing

A. Provide a zinc coating for those items as indicated on Drawings or specified herein to be galvanized; comply with following:
   1. Iron and Steel Hardware: ASTM A 153.
   2. Rolled, pressed and forged steel shapes, plates, bars and strip 1/8 inch thick and heavier: ASTM A 123. (1.25 oz./sq. ft. min.)
   3. Assembled Steel Products: ASTM A 386. (1.25 oz./sq. ft. min.)

2.4 Final Coating Systems-Refer to Painting, Section 09 9100

A. Final coating system shall be same Manufacturer as for primer.

PART 3 - EXECUTION

3.1 Inspection

A. Inspect area to receive Work and report immediately in writing to Engineer, as required in General Conditions, any unacceptable conditions. Do not proceed with Work until unsatisfactory conditions have been corrected in an acceptable manner. Commencement of erection implies acceptance of related Work.

B. Take field measurements prior to preparation of Shop Drawings and fabrication, wherever possible, but do not delay job progress by waiting for field measurements. Make an allowance for trimming and fitting where the taking of field measurements before fabrication might delay either completion of the miscellaneous metals work in particular or Substantial Completion of the Work in general.

3.2 Fabrication

A. Preassemble miscellaneous metal items in the fabricating shop to the greatest extent possible to minimize field splicing and assembly. Disassemble units only to the extent necessary because of shipping and handling limitations. Clearly mark the units for later reassembly and coordinated installation. Field cutting of miscellaneous metal items not allowed. Field punched holes in metal items for purposes of attachment or other reasons is not allowed.

B. All steel miscellaneous metals shall be hot dip galvanized unless noted.

C. Weld all shop connections unless indicated or specified otherwise.
D. Weld corners and seams continuously and in accordance with requirements of AWS Code.

E. Grind exposed welds smooth and flush to match and blend with adjoining surfaces.

F. Work to be performed only by welders qualified in accordance with requirements of AWS Code.

G. Fabricate Work exposed to view true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 1/32 inch, unless otherwise indicated on Drawings.

H. Cut, reinforce, drill and tap miscellaneous metal as may be required to receive finish hardware and similar items of Work.

I. Fabricate miscellaneous metal to sizes, shapes and profiles and of dimensions to receive adjacent Work.

3.3 Installation – General

A. Install manufactured items in strict accordance with Manufacturer’s current written instructions.

B. Set all Work accurately to lines and levels, plumb and secure.

C. Install members, bolts, anchors, etc. to be covered, inserted or built-in as Work progresses.

D. Provide anchorage devices and fasteners where necessary for securing miscellaneous metal items to in-place construction.

E. Provide all other Work as indicated on Drawings or necessary to complete miscellaneous metal Work.

F. Fit exposed connections accurately together to form tight hairline joints. Weld connections which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations.

G. Grind exposed joints smooth and touch-up shop paint coat. Do not weld, cut or abrade surfaces of exterior units which have been hot-dip galvanized after fabrication, and are intended for bolted or screwed field connections.

H. Perform cutting, drilling and fitting required for installation. Set Work accurately in location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels.

I. Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of welds made, and methods used in correcting welding Work.

3.4 Field Painting

A. Damaged galvanized surfaces apply zinc coating by metalizing spray to clean and dry surfaces.

1. Apply zinc alloy repair compound according to Manufacturer’s instructions.

B. Final Coating System: Refer to Painting, Section 09 9100
3.5 Cleanup

A. Remove all dirt, tags, and foreign materials from miscellaneous metals.

END OF SECTION 05 5700
SECTION 07 1800 – TRAFFIC COATINGS

PART 1 - GENERAL

1.1 Related Documents
   A. Conditions of Contract for Construction and General Requirements of Division 1 of these Specifications apply to Work in this Section.

1.2 Work Included
   A. Work of this Section shall include furnishing all labor, materials, equipment and supervision to install a deck coating system, including surface preparation and crack and joint detailing.
   B. Deck coating Installer shall be specifically responsible for providing all preparation Work and joint sealants specified in Section 07 9200, Joint Sealants.

1.3 Related Work
   A. Following Work is related to this Section:
      1. Concrete Repair Section 03 0130
      2. Cast-in-Place Concrete Section 03 3000
      3. Joint Sealants Section 07 9200
      4. Pavement Markings Section 32 1723

1.4 Quality Control
   A. General
      1. Deck coating Installer shall be approved by deck coating Manufacturer.
      2. Installer shall have a minimum of five (5) years experience in application of one of the approved deck coating systems and have experience with five projects in size of 50,000 SF or greater.
      3. Installer and Manufacturer shall review slope of slabs and condition of surfaces prior to bidding.
      4. Manufacturer shall make available a qualified Manufacturer’s Representative to assist the Installer and Engineer as specified herein. Representative shall be experienced in placement of deck coating systems. As a minimum, Representative shall be on site to review following procedures:
         a. Surface preparation.
         b. Installation of deck coating from primer to top coat for first level or first phase.
      5. A preconstruction/preapplication meeting shall be held to discuss detailing, surface preparation, application techniques and procedures, phasing and scheduling. Foreman and lead laborer for Installer will be required to attend meeting along with Contractor, Manufacturer’s Representative and Engineer.
B. Testing Requirements

1. Installer shall check deck coating wet film thickness and record test results by taking five wet film readings within a 1 SF area. Wet film thickness testing shall be completed a minimum of once per every 5,000 SF of deck coating placed or per individual section placed per day. Average film thickness shall be at or above wet film thickness equivalent of specified dry film thickness.

2. Manufacturer’s Representative shall perform dry film thickness tests and record test results for base coat and total system. For each 25,000 SF area, three readings shall be taken in a single 100 SF area. Average dry film thickness shall be at or above Manufacturer’s calculated average dry film thickness for total system based on specified dry film thickness plus aggregate.

3. Manufacturer and Installer in presence of Engineer shall perform adhesive pull-off strength testing on base membrane and completed system in accordance with ASTM D 4541 Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers. Testing is to be performed every 50,000 SF. For each 50,000 SF area, three tests shall be taken in a single 100 SF area. This testing can be performed in conjunction with dry film thickness testing. All test results shall be greater than 100 psi.

4. If thickness and pull-off strength testing do not meet above requirements, corrective action will be required and more frequent testing will be required on remainder of project as directed by Engineer.

5. Test damage is to be repaired by Installer per Manufacturer’s recommendations.

1.5 Submittals

A. Action Submittals

1. System Description: Submit complete description of proposed traffic coating system including materials, surface preparation, joint treatments, terminations, and cure times. Include aggregate materials and repair materials for pitting, bug holes, popouts, and shallow scaling.

2. Product Data: For each type of product, including installation instructions.
   a. Traffic Coating System
   b. Substrate Repair Material
   c. Primer
   d. Base Coat
   e. Intermediate Coat (grit coat)
   f. Top Coat
   g. Aggregate

3. Shop Drawings: For traffic coatings.
   a. Include details for treating substrate joints and cracks, flashings, deck penetrations, and other termination conditions.
   b. Include proposed plan for grid layout to install each coat. Include quantities of materials, square footages, and yield calculations.

4. Sample Warranty: Submit sample warranty for approval prior to application.

B. Informational Submittals

1. Qualification Data:
a. For Installer including projects, size, location, owner, and contact, engineer/architect and contact for projects that traffic coating system has been applied.
b. Certification that Manufacturer has approved Installer.
c. For Manufacturer’s Representative.

2. Certificates: For each type of traffic coating.
   a. Certification that the traffic coating system is compatible with all products in Divisions 3 and 7 to which it will come in contact.
   b. Certification of Manufacturer’s approval of surface preparation.
   c. Certification of Manufacturer’s project review and that traffic coating installation is in accordance with written recommendations.
   d. Written certification that recoat system is compatible with existing system.

3. Field quality-control reports:
   a. Results of slab moisture testing completed in accordance with ASTM D 4263 Standard Test Method for Indicating Moisture in Concrete by Plastic Sheet Method.
   b. Results of dry and wet film thickness testing and adhesive testing. Include date, weather, and other pertinent information.

4. Applicator’s Manual: For each type of traffic coating.

5. Safety Data Sheets: For each product, solvent, or related chemicals to be used and certification that materials conform to local, state, and federal environmental and worker's safety laws and regulations.

6. Maintenance Data: Manufacturer’s “Snow Removal Guideline” stating procedures the City is to follow during snow removal from traffic coated slabs.

7. Copies of purchase order and invoices indicating quantities and dates of material purchased.

1.6 Environmental Requirements

A. Manufacturer and Installer are required to confirm that all deck coating materials used in accordance with this Section conform to local, state, and federal environmental and workers' safety laws and regulations.

1. VOC content of materials shall not exceed limits per Environmental Protection Agency Natural Volatile Organic Compound Emission Standards for Architectural Coatings (40CFR59).

B. Installer is solely responsible for fume control and shall take all necessary precautions against injury to personnel or adjacent building occupants during application. As a minimum, Installer shall take the following precautions:

1. Provide and maintain barricades.
2. Locate and protect building air intakes during application.
3. Follow all state, federal, and local safety regulations.
4. Follow all Manufacturers’ safety requirements.
5. Dispose empty containers immediately and properly.
6. Use protective equipment.
7. Ensure Work area is well vented to outside.

1.7 Transportation and Handling
A. Deliver all materials to site in original, unopened containers, bearing following information:

1. Name of product
2. Name of Manufacturer
3. Date of Manufacturer
4. Lot or batch number
5. UL Labels

B. Store materials under cover, protected from weather, within Manufacturer's recommended temperatures ranges.

C. Replace containers or materials showing any signs of damage with new material at no additional cost to Owner.

D. At no time shall weight of stored material placed on a slab area exceed 30 PSF or 2,000 lbs. over 20 square inches.

1.8 Warranty

A. Provide to Owner a Warranty by Installer and Manufacturer that deck coating system will be free of defects, water penetration, and chemical damage related to system design, workmanship or material deficiency, consisting of, but not limited to:

1. Surface crazing of other weathering deficiency (including ultraviolet light exposure).
2. Abrasion or tear failure resulting from normal traffic use.
3. Tear failure resulting from new or existing cracks in substrate not exceeding 1/16 inch in width.
4. Debonding from substrate or delaminating between layers.
5. Defective installation.
6. Debonding or damage of repair material used for filling in pitting, bug holes, popouts, and shallow scaling with concrete or deck coating material.

B. Installer and Manufacturer will warrant and provide at no charge to Owner materials and labor needed to properly repair or replace product and replace parking stripes within duration of Warranty. In event of either party's non-performance, full burden and responsibility for any Warranty repair shall fall upon remaining party.

C. Vandalism, abrasive maintenance equipment, and construction traffic are not normal traffic use and are exempt from Warranty.

D. Normal traffic is considered to include snow removal equipment with rubber tipped blades as described in National Parking Association publication, "Parking Garage Maintenance Manual".

E. New concrete may experience shrinkage. Installer shall provide system suitable for such application. Warranty shall cover deck coating damage due to new concrete slab cracking not exceeding 1/16 inch.

F. Recoat systems are applied over existing systems. Installer shall provide system suitable for such application. Warranty shall cover recoat system.

1.9 Warranty Duration
A. Bid price shall include a five (5) year Warranty commencing with date of project acceptance in accordance General Conditions.

B. Although completed areas of facility may be reopened to traffic and parking, commencement of Warranty period will not occur prior to acceptance of entire project.

C. A single Warranty commencement date will apply to all waterproofing.

1.10 Basis of Payment

A. Deck coating preparation and application will be paid on a unit price or lump sum basis. Refer to Bid Form.

B. Detail coats over cracks, construction joints, cove joints, etc. are to be incidental to deck coating cost.

PART 2 - PRODUCTS

2.1 Deck Coating - General

A. Deck coating system shall be a fluid applied, waterproof, traffic bearing elastomeric membrane capable of preventing penetration of concrete by water, gasoline, oils, greases, salts, deicer chemicals, battery acids and radiator coolants.

B. Color of deck coating shall be gray with Owner selecting shade of gray from standard color chart submittal.

C. Material to fill in pitting, bug holes, popouts, and shallow scaling shall be in accordance with Manufacturer's written recommendations.

D. Same Manufacturer's deck coating system shall be used throughout.

E. Deck coating thicknesses specified herein are minimum dry film thicknesses and do not include the aggregate. Specified thicknesses may vary from Manufacturer's literature. A coat may have to be installed in more than one layer to achieve minimum thickness or on ramps a slope grade version of deck coating material shall be used. Install each coat in accordance with Manufacturer's recommended yield for required thickness.

F. Thinner or solvent shall not be added to deck coating materials.

G. All deck coating shall utilize a UV stable topcoat.

H. Top coat shall be seeded with aggregate and back rolled.

2.2 Recoat System (Urethane)

A. Provide a heavy duty urethane recoat system as indicated on Drawings.

B. Approved heavy duty urethane solvent-free recoat systems are:
1. Iso-Flex 760 U-HL HVT, LymTal International, Inc., Orion, MI. Primer, grit coat at 25 mils and top coat at 18 mils.
2. Auto-Gard FC, Neogard Corp., Dallas, TX. Primer, grit coat at 25 mils and top coat at 18 mils.
4. SikaLastic 720/745, Sika Corporation, Lyndhurst, NJ. Primer, grit coat at 25 mils, top coat at 18 mils.
5. Vulkem 350 or 360NF/950NF/951NF, Tremco, Cleveland, OH. Primer, grit coat at 25 mils, top coat at 18 mils.
6. Qualideck, APT, Harmony, PA. Primer, grit coat at 25 mils, top coat at 18 mils.

2.3 Recoat System (Epoxy)

A. Provide a heavy duty epoxy recoat system as indicated on Drawings.

B. Approved heavy duty epoxy solvent-free recoat systems are:

1. Iso-Flex 760 EU HL (extreme duty), LymTal International, Inc., Orion, MI. Epoxy grit coat at 25 mils, and top coat at 18 mils.
6. Flexdeck System, RPM Company, Cleveland, OH. Epoxy grit coat at 25 mils, and top coat at 18 mils.
7. SikaDur 22 Lo-Mod/SikaLastic 745, Sika Corporation, Lyndhurst, NJ. Epoxy grit coat at 25 mils, and top coat at 18 mils.
8. Qualideck with Qualipur 552 E as epoxy grit coat, APT, Harmony, PA. Epoxy grit coat at 25 mils, and top coat at 18 mils.

2.4 Deck Coating Full System (Urethane)

A. Provide a heavy duty urethane deck coating system as indicated on Drawings.

B. Approved heavy duty urethane solvent-free deck coating systems are:

1. Iso-Flex 760U-HL HVT, LymTal International, Inc., Orion, MI. Primer, base coat at 25 mils, grit coat at 25 mils, and top coat at 18 mils.
2. Auto-Gard FC, Neogard Corporation, Dallas, TX. Primer, base coat at 25 mils, grit coat at 25 mils, and top coat at 18 mils.
5. Vulkem 360NF/950NF/951NF, Tremco, Cleveland, OH. Primer, base coat at 25 mils, 2 grit coats at 25 mils, top coat at 18 mils.
2.5 Deck Coating Full System (Epoxy)

A. Provide a heavy duty epoxy deck coating system as indicated on Drawings.

B. Approved heavy duty epoxy solvent free deck coating systems are:

1. Iso-Flex 760 EU HL (extreme duty), LymTal International, Inc., Orion, MI. Primer, base coat at 25 mils, epoxy grit coat at 25 mils, and a top coat at 18 mils.
2. Auto-Gard E Severe Duty, Neogard Corp., Dallas, TX. Primer, base coat at 25 mils, epoxy grit coat at 25 mils, and a top coat at 18 mils.
6. Flexdeck System, RPM Company, Cleveland, OH. Primer, base coat at 25 mils, epoxy grit coat at 25 mils, and a top coat at 18 mils.
7. Sikalastic 720/Sikadur 22 Lo-Mod, Sika Corporation, Lyndhurst, NJ. Primer, base coat at 25 mils, epoxy grit coat at 25 mils, and a top coat at 18 mils.
8. Qualideck with Qualipur 552 E as epoxy grit coat, APT, Harmony, PA. Primer, base coat at 25 mils, epoxy grit coat at 25 mils, and a top coat at 18 mils.

2.6 Deck Coating Base Coat for Repairs (Recoat Areas)

A. Provide primer and urethane base coat as needed where existing coating is damaged or worn down to the concrete in areas designated for deck coating recoat.

B. Primer and base coat shall be from same manufacturer as deck coating recoat system and shall be one of the products specified in paragraphs 2.4 or 2.5 of this section.

C. Dry film thickness of basecoat shall be 25 mils.

2.7 Deck Coating Aggregate

A. Approved aggregates for heavy duty deck coating systems shall be a size of 12/20 and approved by coating manufacturer.

2.8 Epoxy Broadcast System

A. Provide an epoxy broadcast system as indicated on Drawings.

B. Approved epoxy broadcast systems are:

1. Unitex Pro-Poxy Type III DOT, Dayton Superior Corp., Miamisburg, OH. Wear course at 40 sf/gal, Top coat at 60 sf/gal.

PART 3 - EXECUTION

3.1 General
A. Inspect surfaces to receive Work and report immediately in writing to Engineer as required in General Conditions any deficiencies in surface which render it unsuitable for proper execution of this Work. Do not proceed with Work until unsatisfactory conditions have been corrected in an acceptable manner in accordance with Engineer.

B. Coordinate and verify that related Work meets following requirements:
   1. Concrete surfaces are finished, cleaned and prepped, and have completed required curing period.
   2. Previous surface treatments have been removed or are compatible with the systems to be installed.
   3. Systems selected for use are compatible with each other.
   4. All concrete repairs are completed.
   5. Sealant installation may occur several months prior to deck coating. Installer to repair damaged or defective sealants prior to deck coating installation.

3.2 Preparation

A. Remove all oil, grease spots, and contaminates in accordance with Manufacturer's recommendations.

B. Remove all existing striping.

C. Shotblast all concrete surfaces to receive deck coating. Shotblast equipment performance requirements are as follows:
   1. Equipment shall be capable of traveling at a constant speed to provide uniform profile. Speed and size of equipment and size of steel shot shall be selected to provide desired preparation without causing unnecessary damage to concrete surface.
   2. Equipment shall vacuum up, or otherwise retain all dirt, dust, and debris from blasting operation.
   3. Areas inaccessible to shotblaster (i.e. vertical surfaces, against walls, columns, stairways, etc.) are to be abrasive blasted or abraded to same performance.
   4. For bare concrete surfaces, shotblasted surface must be clean with a profile in which a minimum 1/16 inch of existing concrete surface is removed. Fine aggregates must be exposed; however, coarse aggregate must not be exposed. All laitance must be removed. Surface profile to match ICRI CSP5 in accordance with ICRI Guideline No. 03732, Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays.
   5. Remove debris immediately after surface preparation. Debris includes, but is not limited to, shot, aggregate and dust. Debris shall be placed in a covered dumpster or a covered area where it will not be rebroadcast by wind or weather.

D. Metal surfaces that are to be deck coated shall be abrasive blasted to near white metal, SSPC SP10 in accordance with Steel Structures Painting Council Painting Manual. Rust inhibitive primer shall be installed in accordance with Manufacturer's recommendations within 8 hours of abrasive blasting.

E. Rout and seal cracks greater than 15 mils in accordance with Section 07 9200, Joint Sealants or as required by the Manufacturer. Cracks, coves, terminations and all unusual situations shall be detailed per Manufacturer's recommendations.

F. Installer shall be responsible for repair or replacement of all materials damaged by surface preparation operations.
G. Surfaces shall be air blown with sufficient pressure to remove excess dirt, dust and debris, and to assure that concrete is clean prior to application of deck coating.

H. After shotblasting and abrasive blasting and prior to first coat of deck coating, pitting, bug holes, popouts, and shallow scaling shall be prepared in accordance with Manufacturer’s recommendations. As a minimum, a thin epoxy mortar shall be used to fill voids.

3.3 Additional Preparation Requirements – Reccoat System

A. Prepare existing coating system in accordance with Manufacturer’s written recommendations. As a minimum:

1. Remove existing coating that is debonded or damaged.
2. Identify and repair all concrete damage prior to installation.
3. Remove and replace failed crack and construction joint sealants prior to installation.
4. Clean existing coating by power washing with Manufacturer’s approved detergent, using stiff brooms to clean surface, and removing grease with Manufacturer’s approved chemical cleaner.
5. Shotblast existing coating system.
6. Remove any additional damaged or debonded existing coating after shotblasting.
7. Sensitize existing coating in accordance with Manufacturer’s recommendations.

3.4 Installation/Application

A. Do all Work in strict accordance with Manufacturer’s written instructions and specifications and as indicated herein.

B. Do not apply deck coating materials until concrete has been air dried at temperatures at or above 40 degrees F. for at least 28 days after curing period specified in Section 03 3000, Cast-In-Place Concrete, Section 03 0130, Concrete Repair, or as otherwise approved by Manufacturer.

C. Concrete shall be dry prior to application of deck coating. Installer shall perform slab moisture testing in accordance with ASTM D 4263 Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method. Testing must be performed in at least 1 location for every 10,000SF of coating. Use of heat lamps for performing tests may be required in areas not exposed to sunlight.

D. Do not apply deck coating material until concrete and air temperature is at or above 40 degrees F. Provide appropriate enclosures and necessary heating for application. Air temperatures directly below and above the slab being coated must be maintained at a minimum of 45 degrees F up to 48 hours prior to coating and at 45 degrees F for a minimum of 72 hours after coating, or as required for full curing of material. Provide high/low thermometers within Work area. As a minimum, provide two thermometers directly below slab and two directly above slab being coated.

E. All deck coating shall maintain straight edges at terminations.

F. Surfaces to be deck coated shall be divided into areas in accordance with the Manufacturer’s recommended yield for the specified thickness and for specific container size of material. Area is to be divided by keel marks, or another Engineer approved method.
G. All sealants to be provided adequate cure time, minimum 8 hours, to be tack free prior to deck coating. All construction joints, control joints, joints at perimeter of patches, cold joints and cracks (sealed and unsealed) shall receive a detail coat, minimum of 4 inches wide. Detail coat shall be same thickness as base coat unless Manufacturer's requirements are stricter. Detail coat shall cure a minimum of 12 hours prior to base coating.

H. Extend deck coating up vertical surfaces as indicated on Drawings.

I. Incorporate aggregate until refusal. Aggregate until refusal will result in a surface that is tan in color. Additional aggregate may have to be added after first pass. Seed topcoat with aggregate and backroll.

J. Complete all Work under this Section before painting line stripes.

3.5 Additional Installation Requirements – Recoil Systems

A. Where base concrete is exposed provide primer and base coat.

B. Use primer over entire area as required by Manufacturer.

C. Apply recoat system over all areas as specified.

3.6 Additional Installation Requirements – Epoxy Broadcast Systems

A. Wear Course: Apply neat epoxy at 40 sf/gal and immediately broadcast aggregate to refusal. Remove excess aggregate when system is tack-free.

B. Top Coat: After wear course has cured and all excess aggregate has been removed, apply neat epoxy at 60 sf/gal. Immediately broadcast aggregate to refusal. Allow system to cure and remove all excess aggregate.

3.7 Damage and Repairs

A. Any necessary repairs for deck coating resulting from dry film testing are to be repaired by Installer.

B. Pinholing of deck coating will be cause for rejection. Installer shall repair and take necessary steps to prevent pinholing to occur at no additional expense to Owner.

3.8 Cleanup

A. Remove all excess primer, sealant, deck coating, and masking materials from structure.

END OF SECTION 07 1800
SECTION 07 6200 – SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 Related Documents
   A. The Conditions of the Contract for Construction and the General Requirements of Division 1 of these Specifications apply to the Work in this Section.

1.2 Work Included
   A. The Work of this Section includes furnishing all labor, materials, equipment, and supervision to install all items listed, but not limited to:
      2. All required fasteners and accessories for the above.

1.3 Related Work
   A. Related Work specified elsewhere:
      1. Joint Sealants Section 07 9200

1.4 Reference Standards
   A. Comply with the following reference standards except where more stringent requirements are indicated on the Drawings or as specified herein.

1.5 Submittals
   A. Submit for review and approval shop drawings indicating details of typical and non-typical conditions, typical formed configurations, seams, joints, thickness and gages of metal, dimensions, types, methods, and spacing of anchors for each item shown and required by conditions.

   Submit for record statement that metal complies with reference standards.

PART 2 - PRODUCTS

2.1 Metal Components
A. All metal components shall be 18-gauge, prefinished commercial quality hot dipped galvanized steel (AISI G90).

B. Texture to be smooth.

C. Manufacture shall be approved by Engineer.

PART 3 - EXECUTION

3.1 Inspection

A. Inspect area to receive the Work and report immediately in writing to the Architect, as required in the General Conditions, any unacceptable conditions.

B. Examine all surfaces to receive the metal flashings and trim. Verify all dimensions and conditions of in-place and subsequent construction. Installation of metal flashing and trim shall constitute acceptance of the existing conditions.

3.2 Fabrication

A. Fabricate and assemble units in the shop to the extent feasible. Use manufacturer's approved sealant at all joints. See Section 07 9200 - Joint Sealants.

B. All exposed edges shall be hemmed, bent back 1/2 inch to unexposed side.

3.3 Installation

A. Surfaces to which sheet metal is to be applied shall be smooth, sound, clean, dry and free from defects that might affect the application.

B. Furnish and install sheet metal work to provide weatherproof installations warranted against leaks and weather damage through severe temperature and weather conditions.

1. Overlap seams in direction of water flow.

C. Furnish edge strips and cleats where sheet metal extends over edges and where necessary to secure sheet metal work.

D. Ensure that sheet metal work presents a finished appearance which is neat, uniform and possessing aesthetic characteristics of good architectural sheet metal work.

E. Provide all miscellaneous sheet metal work not specifically assigned to other trades. Furnish miscellaneous sheet metal work, accessories, or other items essential to completeness of all sheet metal installation.

F. Install flashing and sheet metal in accordance with the manufacturer's installation instructions and the applicable details in the SMACNA Architectural Sheet Metal Manual and NRCA Roofing and Waterproofing Manual.

G. Erect all fabrications plumb, level and in line securely anchored and properly related to other parts of the work.
H. Protect metal surfaces which are to be in contact with dissimilar metals, with wood or other absorptive material, with roofing felt, building paper, or a coat of bituminous paint specified to prevent galvanic or corrosive action. Protection shall not extend onto exposed surfaces.

3.4 Cleaning

A. Remove all scraps and dirt immediately upon completion of work.

B. Clean exposed metal surfaces, removing substances which might cause corrosion of metal, or deterioration of finishes.

C. Protection: Provide procedures for surveillance and protection of flashings and sheet metal work during construction, to ensure that work will be without damage or deterioration, other than natural weathering, at time of substantial completion.

END OF SECTION 07 6200
SECTION 07 9200 – JOINT SEALANTS

PART 1 - GENERAL

1.1 Related Documents
   A. Conditions of Contract for Construction and General Requirements of Division 1 of these Specifications apply to Work in this Section.

1.2 Work Included
   A. Work of this Section shall include furnishing all labor, materials, equipment, and supervision to install joint sealants, including surface preparation.
   B. Work included by joint sealant Installer shall include deck coatings specified in Section 07 1800, Traffic Coatings.

1.3 Related Work
   A. Following Work is related to this Section:
      1. Cast-in-Place Concrete Section 03 3000
      2. Traffic Coatings Section 07 1800
      3. Sheet Metal Flashing & Trim Section 07 6200
      4. Expansion Joint Sealant Systems Section 07 9500
      5. Pavement Markings Section 32 1723

1.4 Quality Control
   A. General
      1. Joint sealant Installer shall be approved by joint sealant Manufacturer.
      2. Joint sealant Installer shall have a minimum of five (5) years experience in application of one of approved joint sealant systems and have experience for a project in size of 5,000 LF or greater.
      3. Manufacturer shall make available a qualified Representative to assist Installer and Engineer as specified herein. Representative shall be experienced in placement of sealant material.
   B. Sealant Test Cuts:
      1. Installer to perform adhesion test in presence of Engineer at rate of one test per 500 lineal feet of joint. Adhesion test to be performed a minimum of 7 days after installation. Location of the sealant test cuts will be determined by the Engineer. Procedure per Manufacturer’s standard or as follows:
         a. Make a knife cut from one side of the joint to the other.
         b. Make two cuts approximately two inches long at the sides of the joint, meeting the first cut at the top of the two-inch cuts.
         c. Grasp the two-inch piece of joint sealant and try to pull the uncut sealant out of
the joint.
d. If adhesion is adequate, the joint sealant should tear cohesively in itself or be very difficult to adhesively remove from the surface.
e. Joint sealant shall be replaced by re-applying sealant in the same manner it was originally installed at no additional cost to the Owner.

C. Evaluation of Sealant Test Cuts:

1. Performance criteria for each Test Cut:
   a. Preparation (The joint within the substrate has been cleaned, primed, backed and filled.)
   b. Sealant profile (The sealant maintains prescribed dimensions.)
   c. Cure
   d. Adhesion
2. Test Cuts that do not meet the performance criteria will be noted to be defective and to have failed.
3. Contractor to remove and replace defective sealant at no additional cost to Owner.

1.5 Submittals

A. Action Submittals:

1. Manufacturer’s Spec Data Sheets of each product to be used.
2. Complete description of the joint sealant system including primer, sealant material, and backer rods or bond breakers. Also indicate placement and installation procedures along with material working requirements, shelf life, and performance data.
3. Qualifications of Manufacturer’s representative.
4. Qualification statement of Installer stating projects, size and location.
5. Sample Warranty prior to application.

B. Informational Submittals:

1. Sequence of sealant placement in structure. The sealant installation shall be coordinated to allow required minimum concrete cure times.
2. Safety Data Sheets of each product, solvent, or related chemicals to be used and certification that materials conform to local, state and federal environmental and worker’s safety laws and regulations.
3. Certification that joint sealant system is compatible with all products in Divisions 3, 7, and 9 to which it will come in contact.

1.6 Environmental Requirements

A. Manufacturer and Installer are required to confirm that all materials used in accordance with this Section conform to local, state, and federal environmental and workers’ safety laws and regulations.

1. VOC content of materials shall not exceed the limits per Environmental Protection Agency National Volatile Organic Compound Emission Standards for Architectural Coatings (40CFR59).

1.7 Transportation and Handling
A. Deliver all materials to site in original, unopened containers, bearing following information:

1. Name of product
2. Name of Manufacturer
3. Date of manufacture
4. Lot or batch number
5. UL labels

B. Store materials under cover and protected from weather, within Manufacturer's recommended temperature ranges.

C. Replace packages or materials indicating any signs of damage with new material at no additional cost to Owner.

D. At no time shall the weight of stored material placed on a slab area exceed 30 PSF or 2,000 lbs. over 20 square inches.

1.8 Warranty

A. Provide to Owner a Warranty by Installer and Manufacturer that joint sealant system will be free of defects, water penetration, and chemical damage related to design, workmanship, or material deficiency, consisting of, but not limited to:

1. Surface crazing or other weathering deficiency.
2. Abrasion or tear failure resulting from normal traffic use.
3. Tear failure resulting from anticipated movement.
4. Debonding from substrate or delaminating between layers.
5. Defective installation.

B. Installer and Manufacturer will warrant and provide at no charge to Owner materials and labor needed to properly repair or replace product and replace parking stripes within duration of Warranty. In event of either party's non-performance, full burden and responsibility for any Warranty repair shall fall upon remaining party.

C. Horizontal Traffic Bearing Applications: Normal traffic is considered to include snow removal equipment with rubber tipped blades as described in the National Parking Association publication, Parking Garage Maintenance Manual.

D. Vandalism, abrasive maintenance equipment, and construction traffic are not normal traffic use and are exempt from Warranty.

1.9 Warranty Duration – Polyurethane & Traffic Bearing Silicone Sealant

A. Bid price shall include a five (5) year Warranty commencing with date of project acceptance in accordance with General Conditions.

B. Although completed areas of facility may be opened to traffic and parking, commencement of Warranty period will not occur prior to acceptance of entire project.

C. A single Warranty commencement date will apply to all waterproofing.

1.10 Warranty Duration – Non-Traffic Bearing Silicone Sealant
A. The bid price shall include a ten (10) year Warranty commencing with date of project acceptance in accordance with General Conditions.

B. A single Warranty commencement date will apply to all waterproofing.

1.11 Basis of Payment

A. Cove sealants, crack sealants, construction joint sealants, and precast joint sealants will be paid on a unit price or lump sum basis. Refer to Bid Form.

B. Joint widening or other necessary modifications shall be incidental to system cost.

PART 2 - PRODUCTS

2.1 Joint Sealant System - Polyurethane

A. Horizontal Joint Sealant (except cove joints)

1. Traffic-bearing, multi-component, self-leveling or non-sag unmodified polyurethane sealant, gray in color unless noted otherwise, containing no coal tar, asphalt, or other adulterants and conforming to ASTM C 920, Standard Specification for Elastomeric Joint Sealants, Type M, Grade P or NS, Class 25, use T and Federal Specification TT-S-00227, Type I or II, Class A.

2. On slopes greater than 2%, slope grade versions of specified self-leveling sealants or non-sag sealants, as specified for vertical and cove joint sealants, are to be used per Manufacturer's recommendations.

3. Approved Horizontal Joint Sealants are:

   a. Iso-Flex 880GB or 881, LymTal International, Inc., Orion, MI.
   b. Urexpam NR-200 or Dynatrex, Pecora Corp., Harleysville, PA.
   c. Sikaflex - 2c NS/SL, Sika Corp., Lyndhurst, NJ.
   d. MasterSeal SL2, Sonneborn Building Products, BASF Building Systems, Shakopee, MN.
   e. THC 900 or THC 901, Tremco Inc., Cleveland, OH.
   f. Vulkem 445SSL, Tremco Inc., Cleveland, OH.

B. Vertical and Cove Joint Sealants

1. Multi-component, non-sag unmodified polyurethane sealant, gray in color unless otherwise noted, containing no coal tar, asphalt, or other adulterants and conforming to ASTM C 920, Type M, Grade NS, Class 25, use NT and Federal Specification TT-S-00227E, Type II, Class A.

2. Approved Vertical and Cove Joint Sealants are:

   b. Dynatrol II, Pecora Corp., Harleysville, PA.
   c. Sikaflex - 2c NS, Sika Corp., Lyndhurst, NJ.
   d. MasterSeal NP2, Sonneborn Building Products, BASF Building Systems, Shakopee, MN.
   e. Dymeric 240 FC, Tremco Inc., Cleveland, OH.
2.2 Joint Sealant System - Silicone

A. Horizontal Joint Sealant (except cove joints) - Non-Traffic-Bearing
   1. Non-traffic-bearing, single-component self-leveling silicone sealant, gray in color unless otherwise noted.
   2. Approved Horizontal Joint Sealants are:
      a. Dow SL Parking Structure Sealant, Dow Corning Corp., Midland, MI.
      b. Dow FC Parking Structure Sealant (fast cure), Dow Corning Corp., Midland, MI.
      c. Spectrem 900-SL, Tremco Inc. Cleveland, OH.
      d. Sikasil 728 SL, Sika Corp, Lyndhurst, NJ.
      e. Sikasil 728 RC, Sika Corp, Lyndhurst, NJ.
      f. 311-NS, Pecora Corp., Harleysville, PA

B. Horizontal-Traffic-Bearing, and Vertical and Cove Joint Sealant
   1. Traffic-bearing, single-component, non-sag silicone sealant, gray in color unless otherwise noted.
   2. Approved Horizontal-Traffic bearing, and Vertical and Cove Joint Sealants are:
      a. Dow NS Parking Structure Sealant, Dow Corning Corp., Midland, MI.
      b. Spectrem 800, Tremco Inc. Cleveland, OH.
      c. Sikasil 728 NS, Sika Corp, Lyndhurst, NJ.
      d. 310-SL, Pecora Corp., Harleysville, PA

2.3 Joint Sealant System (Curtain Wall) – Silicone

A. Joint sealant for glass-to-metal and metal-to-concrete/brick joints at stair tower curtain walls and windbreaks:
   1. Approved Silicone Joint Sealants are:
      a. Dow Corning 790, Dow Corning Corp., Midland, MI.
      b. Spectrum 1, Tremco Inc. Cleveland, OH.
      c. Sikasil WS-295, Sika Corp, Lyndhurst, NJ
      d. Pecora 864 NST, Pecora Corp., Harleysville, PA
   2. Submit manufacturer’s standard colors to Owner for selection.

2.4 Backer Rod

A. Backer rod diameter shall be as recommended by Manufacturer for joint sizes indicated on Drawings.

B. Backer rod shall be extruded round, closed cell or bi-cellular, low-density polyethylene or polyolefin foam material with a skin-like outer texture.

C. Approved closed cell backer rods are:
   1. Mile High Foam Backer Rod, Backer Rod Manufacturing, Inc., Denver, CO.
   2. ITP Standard Backer Rod Insulation, Industrial Thermo Polymers Limited, Buffalo, NY.
   3. HBR, Nomaco, Inc., Zebulon, NC.
   4. MasterSeal 920 Closed-Cell Backer-Rod, BASF Building Systems, Shakopee, MN.

D. Approved bi-cellular backer rods are:
   1. ITP Soft-Type Backer Rod, Industrial Thermo Polymers Limited, Buffalo, NY.
PART 3 - EXECUTION

3.1 Inspection

A. Inspect surfaces to receive Work and report immediately in writing to Engineer as required in General Conditions any deficiencies in surface which render it unsuitable for proper execution of this Work. Do not proceed with Work until unsatisfactory conditions have been corrected in an acceptable manner. Commencement of Work implies acceptance of related Work.

3.2 General

A. Coordinate and verify that related Work meets following requirements.
   1. Concrete surfaces are finished, cleaned and prepped, as specified by Manufacturer for system to be installed.
   2. Curing compounds used on concrete surfaces are compatible with Work to be installed.
   3. Systems selected for use are compatible with each other.

B. Installer shall take necessary precautions against injury to personnel or adjacent building occupants during installation of joint sealants. Installer personnel shall use protective equipment and area shall be well vented to outside.

3.3 Preparation

A. Grind joint edges smooth and straight prior to installation.

B. All surfaces that are to receive joint sealant shall be dry and thoroughly cleaned by mechanical means of all loose particles, existing joint sealant, laitance, dirt, dust, oil, grease or other foreign matter. Mechanical methods, such as grinding or sandblasting, shall be used to clean joint surfaces to sound, virgin concrete.

C. Check preparation of substrate to ensure adhesion of joint sealant.

D. Correct unsatisfactory conditions in a manner acceptable to Manufacturer and Engineer before installation of joint sealant system.

E. Rout cracks with a grinding tool to produce the profile indicated on Drawings. Crack must be centered in the routed notch.

3.4 Installation/Application

A. Do all Work in strict accordance with Manufacturer’s written instructions and specifications and as indicated on Drawings.

B. Do not apply joint sealant system until concrete has been air dried at temperatures at or above 40 degrees F. for at least 28 days after curing period specified in Section 03 3000, Cast-In-Place Concrete, Section 03 0130, Concrete Repair, or as otherwise approved by Manufacturer.
C. Install bond breaker or backer rod as indicated on Drawings.

D. Prime all masonry and concrete joints.

E. Completely fill joint with sealant, without sagging or smearing onto adjacent surfaces.

F. In areas not receiving deck coating, fill horizontal joints and cracks until slightly recessed to avoid direct contact with wheel traffic.

G. Cease installation under adverse weather conditions, or when temperatures are below 40 degrees F or below or above Manufacturer's recommended limitations.

H. Protect joint sealant as required until sealant is fully cured.

3.5 Cleanup

A. Remove all excess primer, sealant, and masking materials from structure.

END OF SECTION 07 9200
PART 1 - GENERAL

1.1 Related Documents
   A. Conditions of Contract for Construction and General Requirements of Division 1 of these Specifications apply to Work in this Section.

1.2 Work Included
   A. Work of this Section shall include furnishing all labor, materials, equipment, and supervision to install expansion joint systems.

1.3 Related Work
   A. Following Work is related to this Section:
      1. Cast-in-Place Concrete Section 03 3000
      2. Traffic Coatings Section 07 1800
      3. Joint Sealants Section 07 9200

1.4 Quality Control
   A. General
      1. Expansion joint system Installer shall be approved by expansion joint Manufacturer. Installer shall be a licensed Installer, factory trained and certified in proper installation.
      2. Existing expansion joints shall be repaired in accordance with the Drawings and Manufacturer's recommendations. The new materials to be used shall be compatible with existing and approved by the Manufacturer.

1.5 Submittals
   A. For review and approval Manufacturer's Spec Data Sheets of each product to be used.
   B. For record Safety Data Sheets of each product, solvent, or related chemicals to be used, and certification that materials conform to local, state, and federal environmental and worker's safety laws and regulations.
   C. For review and approval prior to installation proposed Warranty.

1.6 Environmental Requirements
   A. Manufacturer and Installer are required to confirm that all materials used in accordance with this Section conform to local, state, and federal environmental and workers' safety laws and regulations.

1.7 Transportation and Handling
A. Deliver all materials to site in original, unopened containers, bearing following information:
   1. Name of product
   2. Name of Manufacturer
   3. Date of manufacture
   4. Lot or batch number
   5. UL labels

B. Store materials under cover and protected from weather, within Manufacturer’s recommended temperature ranges, as a minimum above 40 degrees F.

C. Replace packages or materials indicating any signs of damage with new material at no additional cost to Owner.

D. At no time shall weight of stored material placed on a slab area exceed design loads.

1.8 Warranty

A. Provide to Owner a Warranty from Installer and Manufacturer that expansion joint system will be free of leaks and defects related to design, workmanship, or material deficiency for duration of Warranty.

B. Installer and Manufacturer will warrant and provide at no charge to Owner materials and labor needed to properly repair or replace product within duration of Warranty. In event of either party’s non-performance, full burden and responsibility for any Warranty repair shall fall upon remaining party.

C. Vandalism, abrasive maintenance equipment, and construction traffic are not normal traffic use and are exempt from Warranty.

D. Normal traffic is considered to include snow removal equipment with rubber-tipped blades as described in the National Parking Association publication, “Parking Garage Maintenance Manual.”

1.9 Warranty Duration

A. Bid price shall include a five (5) year Warranty commencing with date of project acceptance in accordance with Section 00 7200, General Conditions, and Section 01 7700, Closeout Procedures.

B. Although completed areas of facility may be opened to traffic and parking, commencement of Warranty period will not occur prior to acceptance of entire project.

C. A single Warranty commencement date will apply to all waterproofing.

1.10 Basis of Payment

A. Expansion joint preparation and installation will be paid on a unit price or lump sum basis. Refer to Bid Form.

B. Joint widening, filler material or other necessary modifications shall be incidental to system cost.
PART 2 - PRODUCTS

2.1 Expansion Joints – General

A. All expansion joint systems and glands to accept pedestrian traffic shall comply with Americans with Disabilities Act guidelines.

B. For each type of expansion joint, the same Manufacturer’s system shall be used throughout.

C. Design of expansion joint system shall be for a maximum ambient temperature range of –30 degrees F to +120 degrees F.

2.2 Expansion Joint System for Vehicular Traffic - Multicell Gland/Ambient Cured Nosing (Strip Seal)

A. Expansion Joint System shall be capable of bearing vehicular traffic while maintaining a watertight seal. Expansion joint shall be capable of cyclic movement expected at joint without overstress in gland or nosing material.

B. Elastomeric membrane shall be a multicell extruded shape gland with integral perforated side flanges made from Santoprene thermoplastic rubber.

C. Nosing material shall be ambient cured, elastomeric, 100% solids, two-component urethane resin plus sand mixture.

D. Provide preformed or fabricated wall mount plates with appropriate anchors and sealants.

E. Approved Elastomeric Membrane with Ambient Cured Urethane Nosing Expansion Joint System for Vehicular Traffic are:

   1. Thermaflex TCR Membrane Nosing System, Emseal Joint Systems, LTD, Westborough, MA.
   5. MM Lokcrete Membrane Expansion Joint System, MM Systems Corp., Pendergrass, GA.
   6. Vulkem WF Vehicular Expansion Joint System, RPM Co., Cleveland, OH.

2.3 Expansion Joint Nosing – Strip Seal

A. Nosing material shall be ambient cured, elastomeric, 100% solids, two-component urethane resin plus sand mixture.

B. Approved Strip Seal Expansion Joint Nosing materials are:

   1. Emcrete, Emseal Joint Systems, LTD, Westborough, MA.
   3. Iso-Flex 900, LymTal International, Inc., Orion, MI.
   5. LokCrete, MM Systems Corp., Pendergrass, GA.
   6. Vulkem WF1600, RPM Co., Cleveland, OH.
2.4 Expansion Joint System for Pedestrian (or Vehicular) Traffic – Premolded Urethane (Ribbon Seal)

A. Premolded Urethane System shall consist of two-part urethane cured to standard dimensions under factory-controlled climatic conditions, textured or serrated, and grey in color unless otherwise noted, with urethane nosing including traffic plates, primers, bedding and bond breakers as recommended by Manufacturers.

B. System exposed to vehicular or pedestrian traffic shall include new aluminum support plate of width and thickness per Manufacturer.

C. Manufacturer’s premolded system model number shall be as indicated on Drawings.

D. Approved Textured Premolded Urethane Systems are:
   1. Iso-Flex Factory Molded Textured Expansion Joint Sealing System, LymTal International, Inc., Orion MI.
   2. WaboUreFlex System, Watson Bowman Acme Corp., Amherst, NY.
   3. Or approved equivalent.

2.5 Expansion Joint Nosing – Ribbon Seal

A. Approved Ribbon Seal Expansion Joint Nosing materials are:
   1. Iso-Flex 980, LymTal International, Inc., Orion, MI.
   3. Or approved equivalent.

PART 3 - EXECUTION

3.1 General

A. Inspect surfaces to receive Work and report immediately in writing to Engineer as required in General Conditions any deficiencies in surface which render it unsuitable for proper execution of this Work. Do not proceed with Work until unsatisfactory conditions have been corrected in an acceptable manner. Commencement of Work implies acceptance of related Work.

B. Verify following requirements.
   1. Concrete surfaces are finished, cleaned, and prepared, as specified by Manufacturer.
   2. Curing compounds used are compatible or have been removed.
   3. Concrete surfaces have completed proper curing period.
   4. Systems are compatible with each other.

C. Installer shall take necessary precautions to protect building occupants during installation.

D. Installer personnel shall use protective equipment and area shall be well vented to outside.

E. Prior to ordering material, Contractor shall remove existing joint system to measure size of gap and review this information with Manufacturer and Engineer to determine the proper gland size. Joints shall be temporarily covered if located in pedestrian area until new system is installed.
3.2 Preparation

A. Grind joint edges smooth and straight prior to installation.

B. Abrasive blast expansion joint blockout to receive bonded nosing material. Remove all contaminates, including laitance. Expose fine aggregate, however, do not expose coarse aggregate.

C. All surfaces shall be dry and thoroughly cleaned of all loose particles, laitance, dirt, dust, oil, grease, or other foreign matter.

D. Expansion joint blockouts requiring widening or other necessary modifications shall be incidental to system cost.

E. Actual field conditions of existing expansion joint blockouts may be deeper and wider than proposed new expansion joint system as detailed on Drawings. Blockout size may not be reduced by patching, shimming, etc. When existing blockout is larger additional nosing material shall be used. When blockout size is smaller it shall be made larger by sawcutting.

3.3 Installation

A. Do all Work in strict accordance with Manufacturer's written instructions and specifications and as indicated on Drawings.

B. Do not install expansion joint systems until concrete has been air dried at temperatures at or above 45 degrees F. for at least 28 days after the curing period specified in Section 03 3000, Cast-In-Place Concrete, Section 03 0130, Concrete Repair, or as otherwise acceptable by Manufacturer. Blockouts requiring use of patching compounds must be cured for seventy-two hours prior to installation.

C. Cease installation of expansion joints under adverse weather conditions, or when temperatures are below or above Manufacturer's recommended limitations for installation.

D. Mask adjacent concrete and gland surfaces to provide neat, workmanlike appearance.

E. Membrane seal or gland shall be unpacked and laid in a relaxed position to relieve any temporary coiling from shipment prior to installation.

F. Ambient temperatures shall not be lower than 40 degrees F during installation.

G. All terminations of joints shall have a minimum upturn of six inches.

3.4 Additional Installation Requirements – Multicell Glands (Strip Seal)

A. Field splicing of glands shall be by heat method and only by prior approval of Manufacturer and Engineer.

B. Glands shall be mitered, spliced and terminated as indicated on Drawings. Directional change miters such as 90 degree corners, tees, and crosses shall be provided with factory heat-welded splices. Straight butt splice connections shall be allowed on site following Manufacturer’s written instructions utilizing specialty heat fusing equipment or Manufacturer’s specialty splicing adhesive.

C. Maximum horizontal and vertical alignment tolerance of nosings and glands shall be 1/16 inch.
3.5 **Additional Installation Requirements – Strip Seal Nosing**
   A. Maximum horizontal and vertical alignment tolerance of nosings and glands shall be 1/16 inch.

3.6 **Additional Installation Requirements – Premolded Urethane Systems (Ribbon Seal)**
   A. Wipe aluminum plates with solvent to remove any dirt or oil.
   B. Prime blockout ledge and apply bedding material on each side of gap.
   C. On one side of gap lay a precut piece of polyethylene onto fresh bedding to act as a bond breaker with aluminum plate.
   D. Install aluminum plates, primer side down. Leave 1/8” to 1/4” gap between each section of plate
   E. Tape visqueen over entire top face of aluminum plates to act as a bond breaker with premolded urethane gland.
   F. Install premolded urethane gland using primer and nosing material.
   G. All butt joints must be precut at a 90-degree angle and filled with sealant.

3.7 **Additional Installation Requirements – Ribbon Seal Nosing**
   A. Prime blockout ledge.
   B. Install primer and nosing material.

3.8 **Cleanup**
   A. Remove all excess primer, nosing material, and masking materials, and dispose of in a proper manner.

END OF SECTION 07 9500
SECTION 09 9100 – PAINTING

PART 1 - GENERAL

1.1 Related Documents
   A. The Conditions of the Contract for Construction and the General Requirements of Division 1 of these specifications apply to the Work in this Section.

1.2 Work Included
   A. The Work of this Section shall include furnishing all permits, labor, materials, equipment, and services to prepare and paint and/or stain as indicated on the Drawings.
      2. Cleaning and painting steel precast connections at Ann Ashley.
      4. Staining concrete and masonry repairs to match existing.

1.3 Related Work
   A. The following Work is related to this Section:
      1. Concrete Repair Section 03 0130
      2. Cast-in-Place Concrete Section 03 3000
      3. Masonry Restoration & Cleaning Section 04 0100
      4. Miscellaneous Metals Section 05 5700

1.4 Reference Standards
   A. Comply with the requirements of the current edition of the specifications or standard listed, except where more stringent requirements are indicated on the Drawings or specified herein:
      1. Steel Structures Painting Council (SSPC), Volume I, Good Painting Practices and Volume II, Systems and Specifications
      2. Local, state, or federal laws and regulations governing Volatile Organic Compounds (VOC) in paint or paint products.

1.5 Quality Control
   A. Provide coating systems produced by the same Manufacturer.
   B. Membrane wet film thickness shall be checked by making a test consisting of five wet film readings within a one square foot area. The average film thickness shall be within 10 percent minus or 30 percent plus of the Manufacturer’s recommended average wet film thickness. No individual reading shall be more than 50 percent plus or minus of the manufacturer's recommended wet film thickness. The number of wet film thickness tests for each coat shall be as follows:
1. Steel: Two tests for every 500 sf
2. Steel Handrails: One test for every flight of stairs
3. Steel beams/Columns: One test for each beam or column
4. Concrete and Masonry: Two tests for every 500 sf
5. If thickness check fails the above requirements, more frequent testing will be required as directed by the Engineer.

C. All coating systems to be applied over an existing paint system shall be tested for adhesion using a cross hatch adhesion test in accordance with ASTM D3359, Method B, not less than a 4B rating or Elcometer adhesion testing in accordance with ASTM D4541 not less than 1000 psi pull, average of three tests.

D. Manufacturer shall review locations where there is an existing paint/stain system to determine if their system is compatible with the existing system.

1.6 Submittals

A. Submit for review and approval Manufacturer's Spec Data Sheets for paint systems; including primer, intermediate, and final coats.

B. Submit for record Safety Data Sheets for all materials used.

C. Submit for record complete preparation and painting procedure to be followed. As a minimum, the following items must be included:
   1. Surface preparation
   2. Paint mixing and application
   3. Inspection criteria
   4. Paint characteristics
   5. Dust and fume control
   6. Storage and handling
   7. Repair to paint system
   8. Paint curing
   9. Compatibility of all components

D. Submit for record certification of compliance with local and federal guidelines governing paint application.

E. Submit for review and approval Manufacturer's standard color chart.

1.7 Environmental Requirements

A. Manufacturer and Contractor are required to confirm that all materials used in accordance with this Section conform to local, state, and federal environmental and workers' safety laws and regulations.

B. It shall be the sole responsibility of the Contractor to provide any and all necessary containment to protect on site and adjoining property from damage during cleaning and coating operations.

C. It shall also be the sole responsibility of the Contractor to meet all regulations regarding air quality emission standards, OSHA, NFPA, EPA and other governing law set by local, state and federal agencies.
1.8 **Transportation and Handling**

A. Deliver all materials to site in original, unopened containers designated by the Contractor.

B. Store materials under cover and protected from the weather. Replace packages of materials showing any signs of damage with new material at no additional cost to Owner.

C. Mix and prepare coatings only in areas designated by the Contractor for that purpose.

D. Provide clean cans and buckets required for mixing coatings and for receiving rags and other waste materials associated with painting. Clean buckets regularly. At the close of each day’s work remove used rags and other waste materials associated with painting.

E. Take precautions to prevent fire in or around coatings materials. Provide and maintain hand fire extinguisher near storage and mixing area.

1.9 **Basis of Payment**

A. Pay unit cost for painting is unit price or lump sum. The unit price or lump sum price shall include all costs associated with painting, including but not limited to preparation, disposal, etc. Refer to Bid Form.

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**PART 2 - PRODUCTS**

2.1 **Concrete/Masonry Stain System**

A. Provide paint system consisting of two coats of a (white) water-based penetrating stain in accordance with Manufacturers recommendations.

B. Approved stain systems are as follows:

   1. CanyonTone Stain, United Coatings (GAF)
   2. H & C COLORTOP Water-Based Solid Color Concrete Stain, H&C Products Group (Sherwin Williams).
   3. Series 617 Conformal Stain WB, Tnemec Industrial Coatings
   4. Or Approved Equivalent

2.2 **Concrete/Masonry Paint System**

A. Provide paint system designed for concrete applications consisting of a primer and urethane finish coat.

B. Primer and finish coat shall be from same Manufacturer.

C. Color of finish coat shall match existing.

D. Approved paint systems are as follows:

   1. Carboline Company Paint System
      a. Primer: As recommended by Manufacturer.
b. Finish Coat: Carbothane 134 HS. One coat to a dry mil thickness 2-3 mils.

2. PPG Industries Paint System
   a. Primer: As recommended by Manufacturer.
   b. Finish Coat: 95-800 Series-Pitthane Acrylic Urethane (One coat to a dry mil thickness 1.5-2 mils).

3. Tnemec Paint System
   a. Primer: As recommended by Manufacturer.
   b. Finish Coat: Endura-Shield 73 Series. One coat to a dry mil thickness 2 mils.

4. Sherwin Williams Paint System
   a. Primer: As recommended by Manufacturer.
   b. Finish Coat: Pro Industrial Urethane Alkyd Enamel. One coat to dry mil thickness 2 mils.

5. Or Approved Equivalent

2.3 Steel Paint System – Structural Steel

   A. Provide paint system consisting of zinc prime coat, epoxy intermediate coat, and urethane finish coat.

   B. Prime coat, intermediate coat, and finish coat shall be from same Manufacturer. Color of each paint coat shall be different.

   C. Color of finish coat shall match existing.

   D. Approved paint systems are as follows:

   1. Carboline System
      a. Primer: Carbozinc 621
      b. Epoxy: Carboguard 893
      c. Urethane: Carbothane 134 HS

   2. PPG Industries System
      a. Primer: Aquapon 97-670 Series
      b. Epoxy: Amerlock 2
      c. Urethane: Amershield or 97-800 Series Pitthane Acrylic

   3. Tnemec System
      a. Primer: Tneme-Zinc Series 90-97
      b. Epoxy: Series 66 Hi-Build Epoxoline
      c. Urethane: Endura-Shield 73 Series

   4. Sherwin Williams System
      a. Primer: Zinc Clad IV
b. Epoxy: Pro Industrial High Performance Epoxy B67-200 Series

c. Urethane: Pro Industrial Urethane Alkyd Enamel B54-150 Series

5. Or Approved Equivalent

2.4 Steel Paint System – Handrails and Railings

A. Provide coating system consisting of zinc prime coat and urethane finish coat 2-3 mils dry film thickness all in accordance with Manufacturer’s recommendations.

B. Prime coat and finish coat shall be from same Manufacturer. Color of each paint coat shall be different.

C. Prime coat is only required at bare steel.

D. Approved paint systems are as follows:

1. PPG Industries System
   a. Zinc Primer: Aquapon 97-670 Series
   b. Urethane: 95-812 Series Pitthane Ultra

2. Or Approved Equivalent

PART 3 - EXECUTION

3.1 General

A. Inspect surfaces to which paint will be applied and report immediately in writing to the Engineer as required in the General Conditions any conditions detrimental to the proper execution of this work.

B. Do not proceed until unsatisfactory conditions are acceptably remedied. Commencement of work implies acceptance of related work.

C. No coating system shall be applied without the approval of the Engineer as to the proposed method of the surface preparation.

D. Before commencing work, make certain that the surface is in proper condition to receive coating system, that surfaces are clean, dry, smooth, and at proper temperature as recommended by Manufacturer.

E. Provide adequate ventilation to remove fumes to a safe location and to confine and control fumes so that life or property is not endangered.

F. Protect all adjacent surfaces, vehicles and equipment from overspray.

G. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer’s written instructions.

H. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
3.2 Preparation

A. Mask all boundaries to provide straight edges.
B. Do not intermix materials of different character or different Manufacturer.
C. Do not thin material except as recommended by Manufacturer.
D. Remove hardware, covers, plates, signs, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.
E. Preparation of corroded metal surfaces:
1. Corroded steel shall be abrasive blast cleaned in accordance with Steel Structures Painting Council surface preparation SSPG SP10 - White Metal. Provide a blast profile as recommended by the paint manufacturer. The Contractor shall measure the blast profile using Testex Replica Tape.
2. After blasting and before painting, the surface shall be brushed with clean brushes made of fiber or bristle, or cleaned by vacuum, removing all traces of blast products from the surface as well as corners and pockets.
3. The blast cleaning operations shall be done in such a manner that no damage is done to partially or entirely completed portions of the work.
4. Dry blast cleaning operations shall not be conducted on surfaces that will be wet after blasting and before painting or when the surfaces are less than 5 degrees F. above the dew point, or when the relative humidity of the air is greater than 85 percent, unless a water-tolerating inhibitive treatment or coating will be applied before rusting occurs.
5. Apply primer within 8 hours of surface preparation.
F. Preparation of non-corroded metal surfaces:
1. Remove all loose paint.
2. Surfaces shall be cleaned, dry, and free of all contaminants such as dirt, dust, laitance, grease, and other contaminants that would interfere with the adhesion of the specified coating system.
G. Preparation of Handrails and Railings
1. Surfaces shall be cleaned, dry, and free of all contaminants such as dirt, dust, laitance, grease, and other contaminants that would interfere with the adhesion of the specified coating system.
2. Sand or abrasive blast existing painted surfaces to blend transition areas that are chipped and to roughen surface to promote proper adhesion of the specified coating system.
H. Preparation of coated and uncoated concrete and masonry surfaces:
1. Surfaces shall be cleaned by power washing and shall be, dry, and free of all contaminants such as dirt, dust, laitance, grease, previously applied coatings and other contaminants that would interfere with the adhesion of the specified coating system. Care should be taken that masonry and mortar joints not be damaged during cleaning operations. Any damage shall be repaired before proceeding with coating operations.
2. Properly prepared surfaces shall be dry prior to coating.
3. New concrete/masonry shall cure for minimum of 28 days prior to coating, or as required by Manufacturer.

4. Determine alkalinity and moisture content of surfaces to be coated by performing appropriate tests. If surfaces are found to be unsuitable for painting, correct this condition prior to painting. Do not paint surfaces with moisture contents exceeding Manufacturer's limits.

I. Preparation of coated and uncoated masonry surfaces.

1. Surfaces shall be cleaned, dry, and free of all contaminants such as dirt, dust, laitance, grease, previously applied coatings and other contaminants that would interfere with the adhesion of the specified coating system. Care should be taken that masonry and mortar joints not be damaged during cleaning operations. Any damage shall be repaired before proceeding with coating operations.

2. Properly prepared surfaces shall be dry prior to coating.

3. New masonry shall cure for minimum of 28 days prior to coating, or as required by Manufacturer.

3.3 Application

A. Work shall be done by skilled craftsmen who are qualified to perform the required work and shall be done in a manner comparable to the best standards of practice found in that trade. All material shall be evenly applied so as to be free from sags, runs, crawls, wrinkles, holidays, or any other application defects. All brushed coats shall be of the proper consistency and properly brushed out so as to show the minimum of brush marks. When finished and dried, brush strokes shall appear in the vertical direction only, and there shall be no curved brush marks showing. All coats shall be thoroughly dry before the succeeding coat is applied.

B. In applying coatings by spray gun, the material shall be applied in a wet coating that remains glossy wet for at least twenty seconds after application. Spraying shall be done in the crisscross lap method of spraying, striking first in one direction and shortly thereafter spraying across this same section at right angles to the first set of passes, so as to provide a continuous wet film of the finish coat.

C. Coating systems shall be applied in accordance with the Manufacturer's printed instructions for that particular coating.

D. Where more than two coats are specified, each subsequent coat shall be of sufficient color difference that holidays, skips, thin spots, etc. can be easily be seen in contrast with the preceding coat.

E. The base coating shall be applied within eight hours after the final abrasive blasting.

3.4 Repair

A. Paint damage is to be repaired by the re-application of the paint system in accordance with the Manufacturer's recommendations.

B. Apply additional coats if the coating does not completely hide the undercoat.

END OF SECTION 09 9100
SECTION 09 9700 – SPECIAL COATINGS

PART 1 - GENERAL

1.1 Related Documents
   A. The Conditions of the Contract for Construction and the General Requirements of Division 1 of these specifications apply to the Work in this Section.

1.2 Work Included
   A. The Work of this Section shall include furnishing all labor, materials, equipment, and supervision to install a coating system, including surface preparation and crack and joint detailing, in accordance with the Drawings and Specifications.

1.3 Related Work
   A. The following Work is related to this Section:
      1. Concrete Repair Section 03 0130
      2. Joint Sealants Section 07 9200

1.4 Quality Control
   A. General
      1. The coating Installer shall be approved by the coating Manufacturer.
      2. Installer shall have a minimum of three (3) years experience in the application of one of the approved coating systems and have experience for a project in size of 5,000 SF or greater.
      3. Determine alkalinity and moisture content of surfaces to be coated by performing appropriate tests. If surfaces are found to be unsuitable for coating, correct this condition prior to painting. Do not coat surfaces with moisture contents exceeding Manufacturer’s limits.
      4. Provide coating system produced by the same Manufacturer.
      5. The Manufacturer shall make available a qualified Manufacturer’s Representative to assist the Installer and Engineer as specified herein. The Representative shall be experienced in the placement of their coating system.
      6. Comply with the requirements of the current edition of the specifications or standard listed, except where more stringent requirements are indicated on the Drawings or specified herein:
   B. Testing Requirements
      1. Installer shall check coating wet film thickness by taking five wet film readings within a 1 SF area. The average film thickness shall be at or above the specified average wet film thickness. No individual reading shall be more than 50 percent plus or minus of the
specified average wet film thickness. The number of wet film thickness tests for each coat shall be as follows:

a. Concrete and Masonry: Two tests for every 500 sf
b. If thickness check fails the above requirements, more frequent testing will be required as directed by the Engineer.

1.5 Submittals

A. Submit for record certification that the coating system is compatible with all of the products in Divisions 3 and 7 to which it will come in contact.

B. Submit for review and approval a complete description of the coating system proposed, including the materials, surface preparation, and cure times, including repair materials for pitting, bug holes, popouts, and cure times.

C. Submit for review and approval Manufacturer's Spec Data Sheets of each product to be used.

D. Submit for record Data Sheets of each product, solvent, or related chemicals to be used and certification that the materials conform to local, state, and federal environmental and worker's safety laws and regulations.

E. Submit for review and approval standard color chart.

F. Submit sample Warranty.

G. Upon request, submit for review and approval qualifications of the Manufacturer's Representative.

H. Upon request, submit for record wet film thickness test results. Include date, weather, and other pertinent information.

I. Submit for record alkalinity and moisture content testing results.

J. Submit for record Manufacturer's written approval of surface preparation.

K. Submit for record written certification that the recoat system is compatible with the existing system.

1.6 Samples

A. Submit for review and approval sample color chips for each coating system color.

1.7 Environmental Requirements

A. Manufacturer and Installer are required to confirm that all coating materials used in accordance with this Section conform to local, state, and federal environmental and workers' safety laws and regulations.

1. VOC content of materials shall not exceed the limits per Environmental Protection Agency Natural Volatile Organic Compound Emission Standards for Architectural Coatings (40CFR59).
B. The Installer is solely responsible for fume control and shall take all necessary precautions against injury to personnel or adjacent building occupants during application. As a minimum, Installer shall take the following precautions:
   1. Provide and maintain barricades.
   2. Locate and protect building air intakes during application.
   3. Follow all state, federal, and local safety regulations.
   4. Follow all Manufacturers’ safety requirements.
   5. Dispose empty containers immediately and properly.
   6. Use protective equipment.
   7. Ensure work area is well vented to the outside.

1.8 Transportation and Handling

A. Deliver all materials to site in original, unopened containers, bearing the following information:
   1. Name of product
   2. Name of Manufacturer
   3. Date of Manufacturer
   4. Lot or batch number

B. Store materials under cover, protected from the weather, within the Manufacturer’s recommended temperatures ranges. As a minimum above 40 degrees F.

C. Replace containers or materials showing any signs of damage with new material at no additional cost to the Owner.

D. At no time shall the weight of stored material placed on a slab area exceed 30 PSF or 2,000 lbs. over 20 square inches.

1.9 Warranty

A. Provide to the Owner a warranty by Installer and Manufacturer that the coating system will be free of defects, water penetration, and chemical damage related to system design, workmanship or material deficiency, consisting of, but not limited to:
   1. Surface crazing of other weathering deficiency (including ultraviolet light exposure).
   2. Abrasion or tear failure resulting from normal traffic use.
   3. Tear failure resulting from anticipated movement.
   4. Debonding from the substrate or delaminating between layers.
   5. Defective installation.
   6. Debonding or damage of repair material used for filling in pitting, bug holes, and popouts with the concrete or coating material.

B. Installer and Manufacturer will warrant and provide at no charge to the Owner materials and labor needed to properly repair or replace the product within the duration of the Warranty. In the event of either party’s non-performance, the full burden and responsibility for any Warranty repair shall fall upon the remaining party.

C. New concrete may experience shrinkage. Installer shall provide system suitable for such application. Warranty shall cover coating damage due to new concrete cracking.

D. When coating systems are applied over existing systems. Installer shall provide system suitable for such application. Warranty shall cover entire system including existing and new coating system.
1.10 Warranty Duration

A. The bid price shall include a ten (10) year Warranty commencing with the date of project acceptance in accordance with Section 00 7200, General Conditions, and Section 01 7700, Closeout Procedures.

B. Although completed areas of the facility may be reopened for use, the commencement of the Warranty period will not occur prior to acceptance of the entire project.

1.11 Basis of Payment

A. Coating preparation and application will be paid on a unit price or lump sum basis. Refer to Bid Form.

B. Detail over cracks, construction joints, cove joints, etc., and filling pitting, bugholes, and popouts are to be incidental to coating cost. This includes any routing and sealing or filling cracks in substrate.

PART 2 - PRODUCTS

2.1 Elastomeric Acrylic Coating Systems (concrete, masonry, or brick)

A. Coating shall be an elastomeric acrylic coating of a texture and color approved by the Owner.

B. Approved elastomeric acrylic coatings are as follows:
   1. MasterProtect EL 750, BASF, Shakopee, MN.
   2. Neoflex, Neogard Corporation, Dallas, TX.
   3. Sikagard 550W Elastocolor, Sika Corporation, Lyndhurst, NJ.
   4. Or approved equivalent.

C. Apply primer and two (2) coats for a total of 18 dry mils thickness.

PART 3 - EXECUTION

3.1 General

A. Inspect surfaces to which coating system will be applied and report immediately in writing to the Engineer as required in the General Conditions any conditions detrimental to the proper execution of this work. Do not proceed until unsatisfactory conditions are acceptably remedied. Commencement of work implies acceptance of related work.

B. No coating system shall be applied without the approval of the Engineer as to the proposed method of the surface preparation.

C. Before commencing work, make certain that the surface is in proper condition to receive coating system, that surfaces are clean, dry, smooth, and at proper temperature as recommended by Manufacturer.
D. Provide adequate ventilation to remove fumes to a safe location and to confine and control fumes so that life or property is not endangered.

E. Protect all adjacent surfaces, vehicles and equipment from over-spray.

3.2 Preparation

A. Mask all boundaries to provide straight edges.

B. Do not thin material except as recommended by Manufacturer.

C. All hairline, static, and dynamic cracks shall be cleaned and treated according to Manufacturer’s recommendations prior to application of elastomeric coatings. All cracks greater than 1/16 inch in width area to be routed and sealed with Manufacturer’s approved sealant.

D. Preparation of coated and uncoated concrete surfaces:
   1. Surfaces shall be cleaned, dry, and free of all contaminants such as dirt, dust, laitance, grease, previously applied coatings and other contaminants that would interfere with the adhesion of the specified coating system. As a minimum, existing substrate is to be waterblasted, minimum 2000 psi.
   2. Properly prepared surfaces shall be dry prior to coating.
   3. New concrete shall cure for minimum of 28 days prior to coating, or as required by Manufacturer.
   4. Repair delaminated concrete prior to coating.

3.3 Application

A. Work shall be done by skilled craftsmen who are qualified to perform the required work and shall be done in a manner comparable to the best standards of practice found in that trade. All material shall be evenly applied so as to be free from sags, runs, crawls, wrinkles, holidays, or any other application defects. All brushed coats shall be of the proper consistency and properly brushed out so as to show the minimum of brush marks. When finished and dried, brush strokes shall appear in the vertical direction only, and there shall be no curved brush marks showing. All coats shall be thoroughly dry before the succeeding coat is applied.

B. Apply primer as recommended by Manufacturer.

C. In applying coating by spray gun, the material shall be applied in a wet coating that remains glossy wet for at least twenty seconds after application. Spraying shall be done in the crisscross lap method of spraying, striking first in one direction and shortly thereafter spraying across this same section at right angles to the first set of passes, so as to provide a continuous wet film of the finish coat.

D. Coating to be applied in two coats.

E. If more than two coats are specified, each subsequent coat shall be of sufficient color difference that holidays, skips, thin spots, etc. can easily be seen in contrast with the preceding coat.

F. Ambient and substrate temperatures shall be greater than 45 degrees F prior to application.

G. Do not apply if rain is expected within 24 hours of application.
3.4 Repair

A. Coating damage is to be repaired by the re-application of the coating system in accordance with the Manufacturer's recommendations.

B. Apply additional coats if the coating does not completely hide the undercoat.

END OF SECTION 09 9700
SECTION 32 1723 – PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 Related Documents
A. The Conditions of the Contract for Construction and the General Requirements of Division 1 of these Specifications apply to the Work in this Section.

1.2 Work Included
A. The Work of this Section includes furnishing all material, labor, equipment and services to paint the following items of the types, patterns, sizes and colors as indicated on the Drawings.
   1. Parking stripes
   2. Traffic arrows
   3. Walkway stripes
   4. Curbs
   5. Text
   6. ADA accessible space logo

1.3 Related Work
A. The following Work is related to this Section:
   1. Submittal Procedures Section 01 3300
   2. Concrete Repairs Section 03 0130
   3. Cast-in-Place Concrete Section 03 3000
   4. Traffic Coatings Section 07 1800

1.4 Submittals
A. Action Submittals
   1. Manufacturer’s Spec Data Sheets of each product to be used.

B. Informational Submittals
   1. Safety Data Sheets of each product, solvent, or related chemicals to be used, and certification that the materials conform to local, state, and federal environmental and worker’s safety laws and regulations.
   2. Standard color chip for each color.

1.5 Environmental Requirements
A. Manufacturer and Installer are required to confirm that all materials used in accordance with this Section conform to local, state, and federal environmental and workers’ safety laws and regulations.
   1. VOC content of materials shall not exceed the limits per Environmental Protection Agency National Volatile Organic Compound Emission Standards for Architectural Coatings (40CFR59).

B. The Installer is solely responsible for fume control and shall take all necessary precautions against injury to personnel or adjacent building occupants during application. As a minimum, Installer shall take the following precautions:
1. Provide and maintain barricades.
2. Locate and protect building air intakes during application.
3. Follow all state, federal, and local safety regulations.
4. Follow all Manufacturers’ safety requirements.
5. Dispose empty containers immediately and properly.
6. Use protective equipment.
7. Ensure work area is well vented to the exterior.

1.6 Transportation and Handling

A. Deliver all materials to site in original, unopened containers bearing the following information:
   1. Name of Product
   2. Name of Manufacturer
   3. Date of Manufacture
   4. Lot or Batch Number

B. Store materials under cover and protected from the weather.

C. Replace containers showing any signs of damage with new material at no additional cost to Owner.

D. Mix and prepare coatings only in areas designated by the Contractor for that purpose.

E. Take precautions to prevent fire in or around coatings materials. Provide and maintain hand fire extinguisher near storage and mixing area.

F. At no time shall the weight of the stored material placed on a slab area exceed 30 PSF or 2,000 lbs. over 20 square inches.

1.7 Basis of Payment

A. Pavement marking preparation and application will be paid on a lump sum basis. Refer to Bid Form.

PART 2 - PRODUCTS

2.1 Pavement Markings – Alkyd

A. All materials shall meet Federal Specification TT-P-115F

B. Provide pavement markings as indicated on the Drawings.

C. Approved alkyd pavement markings are:
      a. A300 White
      b. A303 Lead-Free Yellow
      c. A302 Red
      d. A305 Black
      e. Handicap Blue Use A300 White as base and tint
   2. Alkyd Zone Marking Paint, ICI Paints, Cleveland, Ohio.
      a. 22694/22693 White
      b. 20086/20126 Lead-Free Yellow
PART 3 - EXECUTION

3.1 Inspection

A. Inspect surfaces to which paint will be applied and report immediately in writing to the Engineer as required in the General Conditions any conditions detrimental to the proper execution of this work.

B. Do not proceed until unsatisfactory conditions are acceptably remedied. Commencement of work implies acceptance of related work.

3.2 Preparation

A. Before commencing work, make certain that surfaces are thoroughly cleaned, dry, and in sound condition. The cleaning of concrete floor surfaces shall meet the requirements of ASTM Designation: D 4258 for Water Cleaning and Detergent Water Cleaning.

B. Any existing paint stripes shall be removed by grinding or scarifying so that no visible paint stripe remains.

C. Do not paint any surface that is wet or damp.

D. Remove all oil, dust, grease, dirt, and other foreign material to ensure adequate adhesion.

E. Lay out all striping on each level, using dimensions indicated on the Drawings. Report any discrepancies, interferences or changes in striping due to field conditions to the Engineer prior to painting. Paint Contractor shall be required to remove paint, repair surface and repaint stripes not applied in strict accordance with the Drawings.

F. Verify compatibility with concrete sealer, joint sealant, traffic bearing membrane, and all other surface treatments as specified in Division 7.

3.3 Mixing

A. Do not mix different types of materials or materials from different Manufacturers.

B. Do not thin material except as recommended by Manufacturer for spray application.

C. Mix paint thoroughly by boxing, stirring or power agitation before use.

3.4 Application

A. Apply painting and finishing materials in accordance with the Manufacturer’s directions. Use techniques best suited for the material and surfaces to which applied. Apply at 15 mils wet thickness.
B. Do not apply paint when the air and/or surface temperature is below 50 degrees F, when relative humidity exceeds 85%, when rain is threatening or late in the evening when dew might form before drying.

3.5 Cleaning

A. Immediately upon completion of work, clean up all paint spots, remove excess materials and equipment, and repair all paint damage to other finishes.

END OF SECTION 32 1723