

**BOSTON PUBLIC HEALTH COMMISSION**

Administration and Finance



Request for Proposals

Northampton Square Parking Garage Structural Repairs

NHS-020-23

3/26/23

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**FIRST LEVEL STRUCTURAL REPAIRS AT THE  
35 NORTHAMPTON STREET PARKING GARAGE  
35 NORTHAMPTON STREET  
BOSTON, MASSACHUSETTS 02118  
GALE JN 838800**

**TABLE OF CONTENTS**

Project Title Page  
Table of Contents  
Request for Proposal Timeline

**BIDDING REQUIREMENTS**

Bid Form

**DIVISION 01 – GENERAL REQUIREMENTS**

01 11 00 – Summary of Work  
01 22 00 – Unit Prices  
01 33 00 – Shop Drawings and Submittals  
01 70 00 – Project Close-Out

**TECHNICAL SPECIFICATIONS**

**DIVISION 2 – NOT USED**

**DIVISION 3 – CONCRETE**

03 01 30 – Maintenance of Cast-in-Place Concrete

**DIVISION 4 THROUGH 6 – NOT USED**

**DIVISION 7 – THERMAL AND MOISTURE PROTECTION**

07 18 16 – Vehicular Traffic Coating  
07 92 00 – Joint Sealants

**DIVISION 8 THROUGH 31 – NOT USED**

**DIVISION 32 – PAVEMENT MARKINGS**

32 17 23 – Pavement Markings

**DIVISION 33 THROUGH 49 – NOT USED**

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**TABLE OF CONTENTS**

**CONTRACT DRAWINGS**

Sheet G001 – Cover Sheet  
Sheet S001 – Technical Notes  
Sheet S101 – First Level Plans  
Sheet S102 – Second Level Plans  
Sheet S201 – North Elevation  
Sheet S202 – South Elevation  
Sheet S501 – Structural Details  
Sheet S502 – Traffic Coating Details

<b>Request for Proposal Timeline</b>	
3/26/23	Publication of Request for Proposal (RFP) printed in The Boston Globe
3/27/23	RFP and instructions available online at <a href="http://www.bphc.org">www.bphc.org</a> at 10:00 AM
4/10/23	<p>Bidder's walkthrough mandatory - it will be held as an opportunity to raise concerns regarding specifications, requirements, and terms of this solicitation.</p> <p style="text-align: center;">Conference to be held at: 35 Northampton Square Garage 1<sup>st</sup> Level 35 Northampton St, Boston, MA 02118 11:00am</p> <p>Failure to raise concerns over any issues without visiting the site will not be considered in any protest filed regarding such items that were known as of the walkthrough.</p>
4/18/23	<p>Questions are due in writing by 2:00 PM to:</p> <p style="text-align: center;"><a href="mailto:sbarry@bphc.org">sbarry@bphc.org</a> Subject: <b>NHS-020-23 Garage Structural Repairs</b></p> <p style="text-align: center;"><b>(NB - Questions received after this deadline will not be answered)</b></p>
4/21/23	<u><a href="#">Responses to questions will be emailed to all interested parties by 5:00pm on this day</a></u>
4/24/23	<p>Bid due by 2:30PM – Submit (2) original bids (do not bind) and PDF file of bid on a USB flash drive. Bid documents must be submitted in separate sealed envelope or box addressed to:</p> <p style="text-align: center;">Boston Public Health Commission Property Office 205 River St., 2nd Floor Mattapan, MA 02126 Attention: Steven Barry, Project Manager</p> <p>Clearly mark each envelope or box:</p> <ol style="list-style-type: none"> <li>1. Organization Name and Address</li> <li>2. NHS-020-23 Northampton Square Parking Garage Structural Repairs</li> </ol>
4/28/23	<p>Notification of Decision</p> <p>Note: This is the desired date for notification of award to bidder(s) however, BPHC has the discretion to extend this date without notice. BPHC reserves the right to accept or reject any or all bids. BPHC anticipates submitting a Notice of Award to the selected bidder(s) by email or address provided in the RFP responses. The contract(s) will be awarded to the lowest responsible and responsive bidder(s) meeting all requirements. The lowest responsible and responsive bidder shall mean the bidder that best meets the requirements set forth in this solicitation and offers the lowest cost. The contract(s) resulting from this RFP shall be in effect when all necessary contract documentation is fully executed by BPHC and awarded vendor(s).</p>

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**FIRST LEVEL STRUCTURAL REPAIRS AT THE  
35 NORTHAMPTON STREET PARKING GARAGE  
BOSTON, MA**

**BID FORM**

Date\_\_\_\_\_

To: Boston Public Health Commission,

A. The undersigned (hereinafter called the Contractor) proposes to furnish all labor, equipment and materials required for the **FIRST LEVEL STRUCTURAL REPAIRS AT THE 35 NORTHAMPTON STREET PARKING GARAGE, BOSTON, MASSACHUSETTS**, in accordance with the accompanying Plans and Specifications prepared by Gale Associates, Inc., of Weymouth, Massachusetts, for the amounts listed in Item C below, subject to additions and deductions in accordance with the terms of the Specifications. It being understood that Boston Public Health Commission (hereinafter called the Owner) will be the sole judge as to acceptance of Bids and award of the Contract.

B. This bid includes addenda:

<u>Number</u>	<u>Date</u>
_____	_____
_____	_____

C. A detailed schedule of values will be required by the successful contractor at the time of the award. Refer to the Summary of Work specification sections for descriptions of the Bid Category scopes of work, including, but not limited to the following:

1. Deep Spall Repair
2. Shallow Spall Repair
3. Delaminated Concrete Repair
4. Concrete Reinforcement
5. Concrete Crack Repairs
6. Galvanic Anodes
7. Joint Sealant Repair
8. Traffic Coating Repair
9. Traffic Markings

D. 35 Northampton Street Parking Garage Bid Matrix

The intent of the bid matrix presented below is for the Contractor to provide separate pricing, as applicable, to perform all scopes of work for the 35 Northampton Parking Garage.

		<b>Amount</b>
<b>1.</b>	<b>35 Northampton Street Parking Garage</b>	
	<b>Base Bid</b>	\$

E. Schedule of Unit Prices:

The unit prices listed below are above and beyond those shown on the Contract Drawings and shall be included by the Contractor under the Base Bid Scope of Work. Each unit price will appear on the Contractor's Schedule of Values and will be tabulated as part of the final contract amount.

**35 Northampton Street Parking Garage Unit Price Matrix**

No.	Section	Item	Estimated Quantity	Unit of Measure	Unit Price Dollars/Cents Added or Deducted	Total Amount Dollars/Cents
1	03 01 30	Wearing Surface Deep Spall Repair	30	Square Feet	\$	\$
2	03 01 30	Wearing Surface Shallow Spall Repair	30	Square Feet	\$	\$
3	03 01 30	Overhead Deep Spall Repair	50	Square Feet	\$	\$
4	03 01 30	Concrete Reinforcement	50	Linear Feet	\$	\$
5	03 01 30	Galvanic Anodes	20	Each	\$	\$
6	03 01 30	Paint Concrete Repairs	25	Square Feet	\$	\$
7	03 64 00	Pressure Injection at T-Beam Stems	30	Linear Feet	\$	\$
8	07 18 00	Install New Traffic Coating	100	Square Feet	\$	\$
9	07 92 00	Remove and Replace Existing Joint Sealant	200	Linear Feet	\$	\$
10	32 17 23	Install Traffic Marking Paint	50	Linear Feet	\$	\$
Sub-Total to be Carried Under Base Bid Amount:						\$



- F. Bidder proposes to provide all labor and materials, and to complete the work as specified in the Contract Documents, and as is reasonably expected due to the existing conditions and required construction within the completion time specified in this General Bid Form after receipt of written Notice to Proceed.
- G. The undersigned hereby certifies that he is able to furnish labor that can work in harmony with all other elements of the labor employed, or to be employed on the work, and that he will comply fully with all laws and regulations.
- H. The undersigned further certifies under the penalties of perjury that this bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this subsection the work "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity.

\_\_\_\_\_

Company Name

\_\_\_\_\_

\_\_\_\_\_

Address

By: \_\_\_\_\_  
(Name of Authorized Signature)

Title: \_\_\_\_\_

Signature: \_\_\_\_\_

NOTE: Form shall be sealed if Bidder is a Corporation.

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**SUMMARY OF WORK**

**SECTION 01 11 00**

**PART 1 - GENERAL**

**1.1 PROJECT DESCRIPTION**

The scope of work includes, but is not limited to, the following items:

- A. The Base Bid shall include all labor, equipment, materials, and accessories necessary to perform all renovations associated with the 35 Northampton Street Parking Garage Repairs at 35 Northampton Street, in accordance with the Contract Documents.
- B. Supply all shoring and protection necessary to protect the building areas, building systems, and landscape areas.
- C. Locate, mark, and document reinforcing steel and other structural embedded items within the garage structure at all intended repair locations where drilling, cutting, or coring is required.
- D. Provide all lifts, staging, and temporary tie-off as required to complete the work.
- E. Provide all necessary surface preparation, climate control, curing, and temporary protection.
- F. Repair concrete spalls where designated on the Contract Drawings. Additional repairs approved by the Owner will be compensated on a Unit Price basis. Refer to Section 01 22 00 – UNIT PRICES for additional information.
- G. Remove loose and delaminated concrete at locations designated as “Delaminated Concrete” on Contract Drawings. Following removal of loose concrete, perform concrete spall repairs as indicated on the Contract Drawings.
- H. Provide and install supplemental reinforcement at locations designated on the Contract Drawings.
- I. Clean and prepare existing concrete surfaces.
- J. Pressure-inject cracks with chemical grout as indicated on the Contract Drawings.
- K. Remove all injection ports, hardware, grout, capseals, dirt and staining, and fill holes with repair mortar.
- L. Supply all necessary chutes, disposal facilities, transportation and labor necessary to dispose of all demolished materials, dirt, and debris off-site in a legal dumping area. The Contractor shall obtain all permits necessary to transport and dispose of all materials, rubbish and debris.

- M. Clean and restore all areas affected by the work.

## 1.2 PROJECT CONDITIONS

- A. The Contractor will be responsible for providing pipe staging and general access up to the work locations.
- B. Adequate number of skilled workers who are trained and experienced in the necessary crafts and are completely familiar with the specified requirements and the methods needed for proper performance of the work of each trade shall be provided.
- C. The Owner's Representative shall review the Contractor's work schedule submittal prior to the start of any work. After defining the locations of the work progress, the Owner shall arrange to control occupancy in the building area affected. It shall be the responsibility of the Contractor to inform the Owner's Representative if their work locations(s) for each day is different from the schedule and to update any changes into the schedule.
- D. The Contractor shall provide a full-time project superintendent to coordinate the daily construction, daily clean-up and discuss procedures with the building tenants.
- E. The Contractor shall supply, install and maintain all barriers, overhead protection, warning lines, lighting and personnel required to segregate the work area(s) and to prevent damage to the buildings, their occupants, adjacent buildings and surrounding landscaped and paved areas. Refer to Contract Drawings for minimum overhead protection locations. All applicable OSHA and D.L.I. requirements shall be observed by the Contractor.
- F. The Building and site will be occupied and in use during construction. The Contractor shall take all necessary precautions to create as little disturbance or disruption to the building and their occupants as possible during the course of the work. No loud noise, radios, etc. will be allowed on the job site.
- G. Remove rubbish and debris from the project site daily; do not allow accumulations inside or outside the buildings.
- H. The Contractor shall provide protection of entrance ways, site work, plantings, landscaping, building surfaces, adjacent roof areas and buildings as well as site areas not included in the construction and similar items to protect from damage. Items damaged as a result of the work shall be repaired or replaced by the Contractor to the satisfaction of and at no additional cost to the Owner.
- I. Schedule and execute all work without exposing the interior of the building to the effects of inclement weather. Protect the building, their contents and occupants against such risks, and repair/replace all work-related damage to the satisfaction of the Owner.

- J. The Contractor shall be responsible for submitting all required permits. This shall include, but not be limited to, building, fire, dumping and sidewalk permits. The Contractor shall be responsible for all police and fire details as required to properly complete the work.
- K. The Owner requires the Contractor(s) to conform to all requirements of this specification as well as those of the system manufacturer.
- L. All materials and workmanship shall be of the best construction practice. Refer to the requirements of the manufacturer and these specifications for handling and installation of all materials.
- M. Supply all labor, equipment, tools, appliances, shoring, supports or other items required to properly support, elevate and protect fixtures, equipment, and facilities affected by the work and to properly install the work.

### 1.3 PRECONSTRUCTION CONFERENCE

- A. A Preconstruction Conference will be held with the Owner, Engineer, Contractor and all involved trades to discuss all aspects of the project. The Contractor's foreman or field representative will attend this Conference. The Conference will not be held until all shop drawings and submittals have been received and reviewed by the Owner and the Engineer.

### 1.4 CONSTRUCTION SCHEDULE

- A. The Owner shall review the Contractor's Construction Schedule prior to the start of any work. After defining the location(s) of the work progress, the Owner shall notify the building occupants within the work area to allow for the proper coordination of the work. It shall be the responsibility of the Contractor to supply the Owner with written notice, 72 hours in advance, if his work location(s) for a workday differs from the schedule. The Contractor shall submit the original schedule in accordance with Section 01 33 00 - SHOP DRAWINGS AND SUBMITTALS and shall update his Construction Schedule and submit a copy each week to the Owner for review.
- B. The Contractor shall provide a site plan and/or elevation drawings noting the work locations so that the Owner can provide a visual representation of the proposed work areas to the building occupants at each of the construction meetings.
- C. Areas of the buildings contained in this contract are sensitive to noise and disruption. The Contractor shall coordinate construction in these areas to minimize disturbance. The Contractor must notify the Owner in advance for review of any construction work that will cause excessive noise.

1.5 DIMENSIONS AND QUANTITIES

- A. All dimensions and quantities shall be field verified by the Contractor. The Contract Documents have been compiled from various sources and may not reflect the actual field conditions at the time of construction.
- B. The Contractor is cautioned to take all necessary precautions and make all necessary investigations to properly supply, fabricate and install the proposed work.
- C. The Owner will not consider unfamiliarity with the project as a basis for any additional compensation.
- D. The general nature, quantity and distribution of the various work items are shown on the Contract Drawings. Only those unforeseen items which have been approved by the Owner will be performed under the unit price scope of work.

1.6 GUARANTEES

- A. Contractor Guarantee: Upon completion of the work, and prior to final payment, the Contractor shall submit a Guarantee of his work to be free from defect in materials and workmanship. This Guarantee shall be for a period of two (2) years and shall be signed by a Principal of the Contractor's firm and sealed if a corporation.
- B. Additional Guarantees: Refer to specific technical sections for other guarantees required for this project.

1.7 INDEMNIFICATIONS, WAIVER OF LIENS AND PREVAILING WAGE

- A. Beginning with the second Application for Payment and thereafter, the Contractor, Subcontractors, Sub-subcontractors, and suppliers, shall submit an Indemnification and Waiver of Liens for the construction period covered by the previous application.
- B. The Contractor shall submit certification regarding payment of prevailing wage rates directly to the Owner will all requests for payment.

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION – NOT USED

END OF SECTION

**UNIT PRICES**

**SECTION 01 22 00**

**PART 1 - GENERAL**

1.1 **GENERAL PROVISIONS**

- A. Examine all other Sections of the Specifications for requirements that affect work of this Section whether or not such work is specifically mentioned in this Section.
- B. Coordinate work with that of all other trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

1.2 **DESCRIPTION OF WORK**

This Section contains instructions and references other Contract Documents that relate to Unit Prices. The Owner may elect certain aspects of the work, whose quantities cannot be determined at this time, to be performed or deleted by the Contractor. If such work items are elected, the Contract price will be adjusted by the Unit Price amount shown for each item in the Bid Forms.

- A. A Unit Price is an amount proposed by Bidders and stated on the Bid Form as a price per unit of measurement for materials or services that will be added to or deducted from the Contract Sum by Change Order in the event the estimated quantities of Work required by the Contract Documents are increased or decreased.
- B. The Bidders shall submit with their Bids, prices for the performance of Unit Price work. The scope of the Unit Price work is defined within this section.
- C. The successful Bidder shall coordinate related work and modify or adjust adjacent work as necessary to ensure that work affected by each Unit Price Item is complete and fully integrated into the project.
- D. The specific quantities of Unit Price Work included in the Base Bid are provided herein. This applies to items whose exact quantities are unknown but are anticipated to exist.
- E. The quantities of Unit Price Work listed in this Section and the bid and contract forms are in addition to the quantities shown on the Contract Drawings (if any).
- F. The Unit Prices requested herein shall include a pro-rata share of all costs for materials, labor, equipment costs, overhead, profit, and applicable taxes.

- G. Where not otherwise specified, Unit Prices cover net costs and credits to the Owner for executing authorized changes in the Work. No separate adjustments are made for labor, materials, transportation, handling, storage, overhead, profit, or other related work expenses.
- H. If unit price quantities vary greater than twenty (20) percent above the amounts carried in the Base Bid, the Owner reserves the right to re-negotiate lower unit price costs. The Contractor will be required to notify the Owner once they approach this limit as the work progresses.

### 1.3 SCOPE OF WORK

- A. The Unit Prices for items of Work, as set forth in the Schedule of Unit Prices, shall be used to determine adjustments to the Contract Amount when changes in the Work involving said items are made in accordance with the Contract Documents.
- B. Materials, methods of installation, and definitions of terms set forth under the various Unit Price items in the Schedule of Unit prices shall be as indicated in the Contract Documents.
- C. The successful Bidder shall coordinate related work and modify or adjust adjacent work as necessary to ensure that work affected by each Unit Price Item is complete and fully integrated into the project.

### 1.4 APPLICABILITY OF UNIT PRICES

- A. Prior to commencing removal or replacement of materials set forth in the schedule of Unit Prices, the Contractor shall notify the Owner in sufficient time to permit proper inspection and measurements to be taken. Only quantities that have been approved in writing by the Owner will be considered in the determination of adjustments to the Contract Sum.
- B. Unit Price Work includes providing and installing all accessories and appurtenant work necessary to properly execute the Unit Price Work.
- C. Performance of work not required by the Contract Documents, or which is not authorized by Change Order or Field Order, whether or not such work is set forth hereunder as a Unit Price item, shall not be considered cause for extra payment. The Contractor will be held fully responsible for such unauthorized work, including the performance of all corrective measures required by the Owner.

### 1.5 VERIFICATION OF UNIT PRICE QUANTITIES

The following minimum procedures must be included by the Contractor for each of the indicated unit repair items for the duration of the project:



- A. Measurement and Payment: Refer to individual Specification Sections for work that requires establishment of unit prices and estimated quantities. Methods of measurement and payment for unit prices and estimated quantities are as follows:
1. For work covered by scheduled quantities, notify the Owner and Engineer a minimum of 24 hours in advance of the performance of such work.
  2. Document such work in writing, identifying type of work, quantity and location of work. Submit documentation on Contractor's letterhead.
  3. All documentation of work covered by scheduled quantities will be subject to verification and approval by the Owner and Engineer.
  4. In order to be considered for payment, documentation for work covered by scheduled quantities shall be submitted within one month of performance of such work. Requests for payment of such work submitted more than one month after the work has been performed will not be accepted.
  5. Only documentation signed and verified by the Contractor, Trade, and the Owner's Representative will be considered valid. Documentation not signed by all these parties will be considered invalid.
- B. The Contractor shall contact the Owner and Engineer if a Unit Price quantity is anticipated to be reached prior to exceeding that quantity. No additional costs will be awarded to the Contractor for additional Unit Price Work without written approval from the Owner and/or Engineer.
- C. The Contractor must provide safe, adequate, and ample access to the Owner and Engineer for verification of the Unit Price Work throughout the course of construction.
- D. The Contractor is required to track, and record actual placed and completed Unit Price Work throughout the course of construction and submit a breakdown to the Owner and Engineer on a weekly basis or as requested. The breakdown shall include the following for each Unit Price item:
1. Completed quantity to date.
  2. Remaining quantity to date
  3. Percentage of total quantity remaining

#### 1.6 UNIT PRICE SCHEDULE

The following unit prices as defined in the specifications are designated for items of work on the basis of unknown quantities or quantities estimated by the Engineer. These unit prices will be used to add or to deduct from the dollar amounts shown, depending on whether the actual amount is greater or less than the estimated amount.

The unit prices listed below are above and beyond that shown on the Contract Drawings and shall be included by the Contractor under the appropriate Base Bid Scope of Work. The Contractor's Schedule of Values will carry each item under the bid amount selected for this project. Should the unit price work not be performed on this project, the total amount, or remaining amount if portions of unit price work are performed, shall be credited to the Owner.

First Level Structural Repairs at the  
35 Northampton Street Parking Garage  
Boston, MA  
Gale JN 838800

Unit Prices

Base Bid:

No.	Section	Item	Quantity Carried	Unit of Measure	Unit Price Dollars/Cents	Total Amount Dollars/Cents
1	03 01 30	Wearing Surface Deep Spall Repair	30	Square Feet	\$	\$
2	03 01 30	Wearing Surface Shallow Spall Repair	30	Square Feet	\$	\$
3	03 01 30	Overhead Deep Spall Repair	50	Square Feet	\$	\$
4	03 01 30	Concrete Reinforcement	50	Linear Feet	\$	\$
5	03 01 30	Galvanic Anodes	20	Each	\$	\$
6	03 01 30	Paint Concrete Repairs	25	Square Feet	\$	\$
7	03 64 00	Pressure Injection at T-Beam Stems	30	Linear Feet	\$	\$
8	07 18 00	Install New Traffic Coating	100	Square Feet	\$	\$
9	07 92 00	Remove and Replace Existing Joint Sealant	200	Linear Feet	\$	\$
10	32 17 23	Install Traffic Marking Paint	50	Linear Feet	\$	\$
Sub-Total to be Carried Under Base Bid Amount:						\$

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

END OF SECTION

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## **SHOP DRAWINGS AND SUBMITTALS**

### **SECTION 01 33 00**

#### **PART 1 - GENERAL**

##### **1.1 SCOPE**

- A. The following submittals will be required of all construction materials and systems:
1. List of materials stating manufacturer's name and address, as well as material trade name and manufacturer's designation.
  2. Shop Drawings.
  3. Samples.
  4. Catalog Data.
  5. Manufacturer's Instructions.
  6. Sheet Metal Mock-ups
  7. Construction Photographs
  8. Contractor's Schedule as it affects the contracted completion date and sequence of construction.
  9. Material Safety Data Sheets (MSDS).

##### **1.2 TIME OF SUBMITTALS**

The following submittals are required during the various phases of the Contract. Each submittal item shall have the technical section and paragraph number clearly indicated. All submittal items without the proper designations will be returned and will not be reviewed.

- A. Contract Submissions: After the successful Bidder has received the Notice to Proceed or Letter of Intent to Enter the Contract, the Bidder shall, within ten (10) working days, provide four (4) copies of the following submittals to the Engineer:
1. Complete Materials List.
  2. Manufacturer's Technical Literature as selected.
  3. Manufacturer's Instructions.
  4. Catalog Data ("SPEC-DATA" Sheets).
  5. Material Safety Data Sheets (MSDS).
  6. Samples of all materials of construction, including caulking, sealers, fasteners, sheet metal and slate shingles.
  7. Shop Drawings.
  8. Construction Schedule as submitted during bid stage, updated if necessary.
  9. List of proposed storage facilities and their location(s).
  10. Proposed location(s) of dumpsters.
  11. Schedule of Values; broken down by labor and materials for each trade and including unit price items.
  12. List of all suppliers, manufacturers and sub-contractor who are to provide services and or materials for this project (to be updated with each requisition).
  13. Certificate of Dumping Facilities.
  14. Disposal Plan.
  15. Temporary protection plan and containment plan.

- B. Weekly Submissions: At the end of each weekly period during construction, the Contractor shall submit an updated construction schedule which will show the status of the work with respect to the schedule and anticipated completion date. A list of all completed work is also required.
- C. Prior to start of construction, the Contractor is to provide the Owner with copies of all building, fire and dumping permits, etc.

### 1.3 SHOP DRAWINGS

- A. Original Submittal: One (1) reproducible copy and three (3) prints of all shop drawings shall be submitted for approval within five (5) days of Award of Contract.
- B. Shop drawings for all aspects of this project shall be submitted. The shop drawings shall include existing conditions, all applicable dimensions, new products to be installed, locations, etc.
- C. Resubmittal: When a resubmittal is required, the original transparency so indicating will be returned to the Contractor. After revision of the original, one (1) new reproducible and one (1) print shall be submitted for review.
- D. Review: The above procedure shall be repeated until approval is obtained. The original reproducible copy of the reviewed shop drawing will be returned to the Contractor, at which time the Contractor shall make prints in sufficient numbers for the Engineer (four copies), as well as sufficient copies for his use.
- E. Shop drawings of an engineering nature shall be sent directly to the Engineer for review, with a copy of the transmittal and one (1) print sent to the Owner.
- F. Transmittal: All reproducibles shall be transmitted rolled in mailing tubes and not folded.

### 1.4 RECORD DRAWINGS

- A. The Contractor shall provide a copy of all Contract Drawings showing as-built conditions and any Contract changes to the Owner at the completion of the project.

### 1.5 SAMPLES

- A. Original Submittal: Four (4) samples, unless otherwise specified, of each item for which samples are required shall be furnished for approval. Approval shall be obtained prior to ordering and delivery of the materials to the project site. Such samples shall be representative of the actual material proposed for use in the project and of sufficient size to demonstrate design, color, texture and finish when these attributes will be exposed to view in the finished work.
- B. Resubmittal: All rejected samples will be returned upon request, and any or all resubmittals shall consist of four (4) new samples.

- C. Review: Upon approval by the Engineer, one sample so noted will be returned and the remainder will be retained by the Engineer until completion of the work. When requested, all approved samples will be returned for installation, provided their identity is maintained in an approved manner until final acceptance of the project.
- D. Important specific samples are specified in Technical Sections of the Specifications. The Contractor is cautioned to quickly provide specified samples.
- E. Each submittal item shall have the technical section and paragraph number clearly indicated. All submittal items without the proper designations will be returned and will not be reviewed.

#### 1.6 CATALOG DATA

- A. Submittals: Four (4) copies of catalog data are required for the original submittal and each subsequent resubmittal along with shop drawings. Following review, one (1) copy will be returned with its status noted. If approved, such additional copies may be requested by the Engineer and shall be furnished without additional cost.
- B. Data: Each submittal shall have all pertinent data contained therein that is applicable to the item submitted for review, adequately and permanently designated.

#### 1.7 MANUFACTURER'S INSTRUCTIONS

- A. Where in these Specifications an item is called for to be installed in accordance with the manufacturer's directions, requirements, specifications or recommendations, the Contractor shall furnish the Engineer with two (2) printed copies of said directions, requirements, specifications or recommendations, before the item is installed.

#### 1.8 CERTIFICATES AND GUARANTEES

- A. Certificates of performance, treatment and conformance to specified standards shall be submitted prior to initiating work on the project.
- B. Copies of all guarantees required on the project shall be submitted for review and acceptance as to form.

#### 1.9 IDENTIFICATION

- A. Data: All submittals for review shall have the following identification data, as applicable, contained thereon or permanently adhered thereto:
  - 1. Project name and location.
  - 2. Engineer's name.
  - 3. Subcontractor's, Vendor's and/or Manufacturer's name and address.
  - 4. Product Identification. (It is important that the specific product intended for use is indicated on manufacturer's literature).
  - 5. Shop drawing title, drawing number, revision number and date of drawing and revision.

6. Applicable Contract Drawings and Specification Section numbers.
- B. Catalog Data: Each separate catalog, brochure or single page submitted shall have the identification required hereinbefore.
1. Catalogs or brochures submitted containing multiple items for approval need the identification on the exterior and on each specific item clearly circled, flagged or otherwise identified.
  2. In the event that one or more of the multiple items are not approved in any submittal, the additional copies required will not be requested until all items are approved.
- C. Space: Vacant space approximately three and one-half inches high by five inches wide shall be provided adjacent to the identification data to receive the Engineer's status stamp.

#### 1.10 CONTRACTOR'S RESPONSIBILITY

- A. Representation: By his submittal of any shop drawing or catalog data, the Contractor thereby represents that he has determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data, or will do so, and that he has checked and coordinated each item with other applicable approved shop drawings and the Contract requirements. Certification shall appear on each shop drawing stating that the Contractor has made this check. All drawings without this certification will be returned without examination.
- B. Deviations: Changes on the submitted shop drawings that deviate from the Design Drawings must be brought to the Owner's and Engineer's attention in writing prior to review. Changes must be clearly visible on the shop drawings in the form of written notation, ballooning or highlighting the intended change. A written description for the proposed change must also be included and submitted on company letterhead. Changes to drawings and details not submitted in accordance with these requirements will not be recognized as an approved deviation from the Design of Record. Construction repairs, renovations or replacements required as a result of shop drawing and submittal deviations that are not documented in accordance with these requirements are subject to removal and/or replacement by the Contractor, at the sole cost of the Contractor.
- C. Prohibitions: No portion of the work requiring a shop drawing, sample or catalog data shall be started, nor shall any materials be fabricated or installed, prior to the approval of such item.
- D. Review: Project work, materials, fabrication and installation shall conform with approved shop drawings, applicable samples and catalog data.
- E. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Designer's receipt of submittal.



1. Initial Review: Allow **15** calendar days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The Engineer will advise the Contractor when a submittal being processed must be delayed for coordination.
2. Concurrent Review: Where concurrent review of submittals by the Engineer's consultants, or other parties is required, allow **15** calendar days for initial review of each submittal.
3. Direct Transmittal to Consultant: Where the Contract Documents indicate that submittals may be transmitted directly to Engineer's consultants, provide duplicate copy of the transmittal to the Engineer. The submittal will be returned to Engineer before being returned to Contractor.
4. If intermediate submittal is necessary, process it in same manner as initial submittal.
5. Allow **15** calendar days for processing each re-submittal.
6. No extension of the Contract Time will be authorized because of failure to transmit submittals in advance of the Work to permit processing.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

END OF SECTION

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First Level Structural Repairs at the  
35 Northampton Street Parking Garage  
Boston, MA  
Gale JN 838800

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**PROJECT CLOSE-OUT**

**SECTION 01 70 00**

**PART 1 – GENERAL**

When the project is established to be substantially complete, preparations will be made to close out the project. The preparations are as follows:

**1.1 PUNCH LIST**

- A. After the project is determined to be substantially complete, a representative of the Owner will tour the project and compile a "punch list" of minor unsatisfactory conditions. A copy of this list will be sent to the Contractor, and he shall then correct the unsatisfactory conditions. When all items on the list have been corrected, the Contractor shall notify the Owner's representative and a re-inspection will be made by that representative.
- B. Minor "punch list" items shall be only those items which have been installed and are functional, requiring cosmetic repair or cleaning which do not affect the integrity of the system. Any work specified within the Contract Documents which has not been performed or has been performed in a non-conforming manner to the Contract Documents shall not be defined as minor "punch list" items and must be performed or corrected as appropriate in order to achieve substantial completion.
- C. Should additional reinspections be required due to punch list items which are reported to be complete but are not completed or improperly completed, the costs of these reinspections will be assessed to the Contractor.

**1.2 MANUFACTURER'S INSPECTION**

- A. After the re-inspection by the Owner's representative, the material manufacturer's representative, if applicable, will be required to tour the site. The representative shall determine if the materials have been installed as required by the manufacturer.
- B. Any items the representatives determine were not so installed shall be reinstalled so as to comply with the manufacturer's intended use. The manufacturer shall forward a copy of the list of all items determined to be not installed as intended by the manufacturer to the Engineer. Final issuance of the Contractor's payment will not be released until the manufacturer's inspection letter has been forwarded to the Engineer.
- C. Costs associated with all manufacturer inspections shall be the responsibility of the Contractor.

1.3 GUARANTEES

- A. The Contractor will be required to provide lien releases for his work. The Contractor shall then forward his guarantee covering the construction to the Owner and provide one (1) copy for the Engineer.

1.4 RETAINAGE RELEASE

- A. When all guarantees, certifications and requested lien releases have been received, the Owner shall release to the Contractor the project retainage and any other monies retained by the Owner to guarantee project completion.

1.5 DOCUMENTS REQUIRED FROM THE CONTRACTOR PRIOR TO FINAL PAYMENT

Documents will be submitted to the Engineer in triplicate, each set in individual binders for submission to Boston Public Health Commission. These items include, but are not limited to, the following:

- A. All applicable manufacturer's warranties.
- B. Contractor's two (2) year guarantee.
- C. Executed Punch List Inspection letter.
- D. Operation and Maintenance Manuals
- E. Executed Building Permits
- F. Consent of Surety Company to Final Payment.
- G. Contractor's Affidavit of Release of Liens.
- H. Contractor's Affidavit of Payment of Debts and Claims.
- I. Final Application and Certificate for Payment.
- J. Completed waste shipment records and dumping manifests.
- K. As Built Drawings.
- L. List of all materials for the project.
- M. Other documents which may be specifically required by Boston Public Health Commission or the Engineer.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

END OF SECTION

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**MAINTENANCE OF CAST-IN-PLACE CONCRETE**

**SECTION 03 01 30**

**PART 1 - GENERAL**

**1.1 GENERAL PROVISIONS**

- A. The General Conditions and all parts of the Bid and Contract Documents are made part of this Section as if fully repeated herein.
- B. Refer to Division 1 for additional information.

**1.2 RELATED WORK SPECIFIED ELSEWHERE**

Related Work: Coordinate the work in this Section with that of the Sections listed below for the proper completion of the Project.

- A. Section 01 22 00 – Unit Prices
- B. Section 07 18 16 – Vehicular Traffic Coating
- C. Section 07 92 00 – Joint Sealants

**1.3 DESCRIPTION OF WORK**

In general, the Contractor shall supply all labor, equipment, staging, temporary protection, tools and appliances necessary for the proper completion of the work in this Section, as required in the Project Specifications and in accordance with good construction practice. All concrete repairs shall be completed as part of the scope of work. The work under this Section generally includes the following:

- A. Remove loose and delaminated concrete where indicated on the Contract Drawings. Following removal of loose concrete, perform concrete spall repairs.
- B. Repair spalled concrete where indicated on the Contract Drawings.
- C. Repair cracked concrete via pressure injection where indicated on the Contract Drawings.
- D. Locate, mark and document reinforcing steel and other structural embedded items within repair locations where drilling or cutting is required.
- E. Provide all lifts, staging and temporary tie-off as required to complete the work.
- F. Provide all necessary surface preparation, climate control, curing and temporary protection.

- G. The underside of all concrete repair areas located between Grid Lines 8 and 12 shall be prepared and painted to match the existing adjacent columns, inverted t-beams and t-beams.
- H. Clean and restore all areas affected by the work.

#### 1.4 DIMENSIONS AND QUANTITIES

All dimensions and quantities shall be determined or verified by the Contractor. Quantities to be carried under the base bid work have been shown on the Contract Drawings. Additional quantities have been carried under each item as Unit Price scopes of work. Refer to Section 01 22 00 Unit Prices for additional information. The Contract Drawings have been compiled from various sources and may not reflect the actual condition at the moment of construction. The Contractor is cautioned to take all precautions and make all investigations necessary to install the proposed work. The Owner will not consider unfamiliarity with the job conditions as a basis for additional compensation.

#### 1.5 SUBMITTALS

- A. Refer to Section 01 33 00 – SHOP DRAWINGS AND SUBMITTALS for submittal provisions and procedures.
- B. Submit technical data sheets for all products specified in Part 2 of this Section. Data sheets shall provide sufficient information to verify compliance with the specifications. Indicate intended location of use on each data sheet.
- C. Submit Safety Data Sheet (SDS) for all products specified in Part 2 of this Section.
- D. Submit associated equipment and materials list, including, but not limited to, surface preparation equipment and methods used, pinning and mesh hardware, injection apparatus, primers, bonding agents, etc.
- E. Submit means and methods proposed for curing and protecting all repairs, and for masking surrounding surfaces and protecting public from work areas, etc.

#### 1.6 JOB CONDITIONS

- A. The garage will be occupied during the construction. The Contractor shall provide all protection, barriers, and guards necessary to segregate his work area from pedestrian and vehicular traffic.
- B. The Contractor shall supply, install and maintain all shoring, supports, barriers, protection, warning lines, lighting and personnel required to support the garage, fixtures and facilities affected by the Work and segregate the work area(s) from pedestrian or vehicular traffic, as well as to prevent damage to the garage, occupants and the surrounding landscaped and paved areas.

- C. Materials which have a temperature other than the application temperatures of the manufacturer shall not be applied. Comply with manufacturer's written instructions for substrate temperature, ambient temperature, moisture and other conditions affecting concrete repairs.
- D. Coordinate the work in this Section with the work by other trades to ensure the orderly progress of the Work.
- E. Under no circumstances shall the Contractor remove existing materials and systems in an uncontrolled manner. Machinery or devices used shall be manufactured for this purpose. Property areas and occupying cars shall be protected from airborne debris.
- F. The Contractor shall take all necessary precautions to avoid damaging reinforcing steel while performing garage repairs. The Contractor is to utilize services of a professional Ground Penetrating Radar (GPR) Inspection company and locate all concrete embedded items. In no instance shall reinforcing steel or other embedded items be drilled through, damaged, or modified in any way as a result of this project.
- G. During surface preparation operations, the Contractor is responsible for the containment of all dust, dirt, debris, overspray and run-off resulting from the Work. The Contractor shall collect and contain all materials and repair any resulting damage to adjacent surfaces, site fixtures, personal property, or adjacent repairs. Specific attention is drawn to the use of chemicals, cleaners and pieces of demolished concrete.

#### 1.7 TEST AREAS

- A. Before full-scale work is commenced, execute the following work for trial work areas to be reviewed by the Manufacturer's Field Representative as to surface preparation and material mixing and application acceptability.
  - 1. Two (2) deep concrete spall repairs (minimum 1 s.f. each), including cleaning and coating of existing rebar (if applicable).
  - 2. Two (2) concrete crack repairs via pressure injection (minimum 1 l.f. each).
- B. Repairs shall conform to the Contract Documents and manufacturer's instructions and once accepted shall become a standard for all subsequent work.
- C. Trial areas shall be repeated until acceptable results are obtained, and the accepted areas shall be a standard for all subsequent work. Construction of test areas shall be in conformance with all Contract Documents and shall use only submitted materials. After curing, the test areas shall be viewed, sampled, and/or removed as directed by the Manufacturer's Field Representative to establish to his satisfaction the actual performance of the installed materials. Evidence of improper or unsatisfactory performance shall be grounds for rejection of any or all of the submitted or applied materials.

## 1.8 REFERENCES

- A. The Codes and Standards specified herein are based in the English (U.S. Customary) system. Substitution of SI Metric equivalents is not acceptable.
- B. "Standard Specifications for Structural Concrete" (ACI 301) by American Concrete Institute, herein referred to as ACI 301, is included in total as specification for this structure except where more stringent requirements are shown on Contract Drawings or specified herein.
- C. Comply with provisions of following codes, specifications, and standards except where more stringent requirements are shown on Contract Drawings or specified herein:
  - 1. "Building Code Requirements for Reinforced Concrete" (ACI 318). American Concrete Institute, herein referred to as ACI 318.
  - 2. "Causes, Evaluation, and Repair of Cracks in Concrete Structures" (ACI 224, 112), American Concrete Institute.
  - 3. "Standard Specification for Bonding Hardened Concrete, Steel, Wood, Brick, and Other Materials to Hardened Concrete with a Multi-Component Epoxy Adhesive" (ACI 503.1), American Concrete Institute.
  - 4. "Hot Weather Concreting," reported by ACI Committee 305 (ACI 305R).
  - 5. "Cold Weather Concreting" reported by ACI Committee 306 (ACI 306R).
  - 6. ICRI: International Concrete Repair Institute.
  - 7. CRSI: Concrete Reinforcing Steel Institute.
  - 8. SSPC: Steel Structures Painting Council (The Society for Protective Coatings).
  - 9. AASHTO: American Association of State Highway and Transportation Officials.
  - 10. ASTM: American Society of Testing and Materials.

## 1.9 QUALITY ASSURANCE

- A. Contractor must coordinate site visits with appropriate manufacturer's field representative to view surface preparations, material mixing, application procedures, and curing operations for each different material. Refer to Part 1.7 "TEST AREAS."

## 1.10 UNIT PRICES

The Contractor shall carry the units outlined in Section 01 22 00 – UNIT PRICES under their contract amount in the event that additional deteriorated concrete is encountered after removal of delaminated concrete. Concrete repair work shall be brought to the Owner/Engineer's attention and shall be either added or deducted based on the unit costs.



#### 1.11 CLEAN-UP

- A. Site clean-up shall be complete and performed daily to the satisfaction of the Owner.
- B. All garage surfaces shall be cleaned of all trash, debris and dirt caused by, or associated with, the Work.
- C. All trash and debris shall be completely removed from the Site daily during the Work and at the completion of the Work. All debris shall be legally disposed of off-site.

#### 1.12 GUARANTEES

Upon completion of the work and prior to final payment, the Contractor shall submit a guarantee of his work as free from defect in materials and workmanship. The guarantee shall be for a period of two (2) years. The guarantee shall be signed by an officer of the Contractor's firm and sealed if a corporation.

### PART 2 - MATERIALS

#### 2.1 CONCRETE REPAIR MORTAR

- A. Repair mortar for partial-depth spall repair shall be a high performance, rapid setting, non-sag, early strength gaining, low resistivity cementitious, patching material for vertical and overhead repairs such as:
  - 1. SikaRepair 223, as manufactured by Sika Corporation
  - 2. Eucrete, as manufactured by Euclid Chemical
  - 3. Eucrepair CP (pumpable), as manufactured by Euclid Chemical
- B. Repair mortar for partial-depth spall repairs shall be a high performance, rapid setting, non-sag, early strength gaining, low resistivity cementitious, patching material for wearing surface repairs such as:
  - 1. SikaQuick 1000, as manufactured by Sika Corporation
  - 2. Eucospeed, as manufactured by Euclid Chemical
  - 3. MasterEmaco T 1061, as manufactured by Master Builders Solutions
- C. Repair mortar for full-depth spall repairs shall be a high performance, rapid setting, non-sag, early strength gaining, low resistivity cementitious, patching material for wearing surface repairs such as:
  - 1. SikaQuick 2500, as manufactured by Sika Corporation
  - 2. EucoRepair SCC Fast, as manufactured by Euclid Chemical
  - 3. MasterEmaco T 1060EX, as manufactured by Master Builders Solutions

## 2.2 MORTAR BONDING AGENT/REINFORCING PROTECTION

- A. Bonding agent for application onto prepared spall repair substrates as well as anti-corrosion coating for cleaned steel reinforcement shall be installed per repair mortar manufacturer's written recommendations.
- B. Structural adhesive for embedded reinforcing bar dowels shall be:
  - 1. Sikadur 31 HI-MOD as manufactured by Sika Corporation
  - 2. HIT HY-200, as manufactured by Hilti
  - 3. SET-3G, as manufactured by Simpson Strong Tie

## 2.3 CONCRETE REINFORCEMENT

- A. Reinforcing Bars:

Where corroded steel reinforcing bars are encountered at spall locations, they shall be supplemented with additional reinforcing bars of equal size as the damaged bar. For the purpose of estimating, the contractor shall include #5 epoxy coated mild steel reinforcing bars. Material should be as follows:

- 1. Deformed billet steel: ASTM A615, Grade 60.
- 2. Bend test: Meet 90° bend test at 60° F minimum temperature around a 10-bar diameter bend without cracking.
- B. Tie wire:
  - 1. Annealed Steel – Federal Specification QQ-W-461, 16 gage minimum.
- C. Bar Supports:
  - 1. Conform to "Bar Support Specifications", CRSI Manual of Standard Practice, Class B – Pregalvanized cold-drawn wire.
- D. Fabrication in accordance with CRSI Manual of Standard Practice.

## 2.4 PRESSURE INJECTION

- A. Cracks through existing concrete tee stems shall be epoxy injected. Injection grout shall be a high-strength, high-modulus and low-viscosity as required such as
  - 1. Sikadur 35 Hi-Mod LV as manufactured by Sika Corporation, Inc,
  - 2. CI-SLV as manufactured by Simpson Strong-Tie
  - 3. MasterInject 1380 as manufactured by Master Builders Solutions
  - 4. or Engineer approved equal.
- B. Injection ports shall be as recommended by the inject grout manufacturer.
- C. Cleaner for use in removing residual grout prior to material cure shall be a non-flammable solvent for dissolving liquid polyurethane.

## 2.5 GALVANIC ANODES

- A. Galvanic anodes shall be discrete, zinc based sacrificial anodes, placed inside and around perimeter of repair area. Anodes shall be:

1. PatchGuard as manufactured by Concrete Preservation Technologies
2. Sika Ferrogard 670, as manufactured by Sika Corporation
3. Sentinel Silver, as manufactured by Euclid

## 2.6 PAINT AND ACCESSORIES

- A. Manufacturer's Names:
  1. Sherwin-Williams Co. (Sherwin Williams)
  2. Rust-Oleum Industrial Coatings
  3. or approved equal.
- B. Material Combability: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- C. Material Quality: Provide manufacture's best-quality material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identifications will not be acceptable.
- D. Colors: Coordinate with other Sections where color matching is required. Match existing or adjacent materials as indicated, or as selected by the Owner from the Manufacturer's full range of colors.

## 2.7 ACCESSORY MATERIALS

- A. Polyethylene for curing patches shall be 6-mil polyethylene plastic sheet, or Engineer approved equal.

## PART 3 - EXECUTION

### 3.1 GENERAL WORKMANSHIP

- A. Do not deliver to Site or install any material or system that has not been approved. Materials installed without approval may be required to be removed at no additional cost to the Owner.
- B. Comply with the manufacturer's written instructions and these Specifications for all renovations and associated work.
- C. Partial or unmarked cans or rolls of materials cannot be used.
- D. Verify that all surfaces have been demolished to the specified depth and surface profile, and thoroughly cleaned for the areas to receive repairs.

- E. Provide all devices and protection (including heaters, dehumidification, ventilation, etc.) necessary to maintain areas and surfaces at the proper temperature, humidity, and surface moisture content for the curing of repair mortar, epoxy, and other materials.
- F. No concrete repair work shall be executed when the temperature in the work areas has dropped below 50 degrees Fahrenheit, unless heated. Consult the manufacturers of the materials for proper application and storage procedures.
- G. Prior to commencing with the repair work, the Contractor is required to perform GPR (ground penetrating radar with 1.6 ghz ultra-wide band) scanning in combination with radio detection apparatus capable of 60-cycle and electrical current detection as a minimum. In no case, shall the existing reinforcing steel or any other embedded items be damaged, cut or modified as a result of the work.

### 3.2 CONCRETE SPALL REPAIRS

- A. Remove areas of spalled, delaminating, cracked, loose or otherwise unsuitable concrete from the substrate surface. Define all repair areas with 1/4" deep saw cut. Undercut or "key" in spall repair edges on at least two (2) opposite sides to mechanically retain the repair. Cuts shall not overlap at corners.
- B. Using hand and electric power tools (15 lb. Maximum chipping hammers) remove all areas of deteriorated, delaminating, de-bonded, spalled or otherwise damaged concrete from existing surfaces, as required to install the new work. Sound concrete areas adjacent to cracks to determine additional spall areas. Removal of deteriorated concrete and surface preparation shall be completed as recommended by the patching mortar manufacturer and as outlined within these specifications.
- C. Prepare the surface of the existing concrete to receive the repair mortar and/or bonding agent. Provide a 1/8" minimum aggressive surface profile with fractured aggregate (ICRI-CSP 8 or CSP 9). Tool marks should be visible. Examine substrate for cracks and treat with specified crack repair procedure.
- D. Completely remove all dust, grease, and other impurities via high-pressure water wash, combined with wire brushes, chipping, grinding, or other methods as required to achieve acceptable bonding surfaces. Dampen the existing surface area with clean potable water, to obtain saturated-surface-dry (SSD) conditions.
- E. Apply coating/bonding agent to all substrate surfaces and reinforcing steel as recommended by the repair mortar manufacturer. Provide one (1) coat on concrete substrates and two (2) coats on all steel items. Slurry scrub repair mortar into prepared damp substrates.
- F. Install repair mortar to properly prepared areas within a time period to achieve a "wet-on-wet" mortar application. Mix repair mortar in accordance with the material manufacturer's instructions. Utilize the manufacturer's recommended mix rates.

- G. Finish the repairs flush with the existing surfaces. Insure that the surface, texture, and profile is roughed and textured match surrounding concrete and to achieve proper mechanical bond with the later applied coating primer. Do not feather edge repairs, but install in ¼" minimum applications, or as otherwise limited by each materials manufacturer's limitations.
- H. Clean uncured materials off of undesired areas with a moist sponge or cloth immediately after application.
- I. Provide for proper cure of patch as recommended by the repair material manufacturer. At a minimum, curing shall consist of continuous polyethylene sheet, duct taped to the adjacent surfaces. Curing materials shall remain in place for the minimum manufacturer's specified time based upon surface and ambient temperatures and humidity.

### 3.3 CRACK REPAIRS VIA PRESSURE INJECTION

- A. Placement procedure:
  - 1. Widen crack as required by continuous sawcut by routing. Clean out cut joint to remove dust from the widen crack.
  - 2. Spacing of the injection ports are required based on the depth and width of crack. Do not space ports greater than 6" apart, or D/2.
  - 3. Mask edges of crack to control the width of applied capseal.
  - 4. Apply epoxy cap seal continuously along crack and around ports. Clear ports to ensure epoxy has not blocked passage.
  - 5. After cap seal cure, use high-pressure injection equipment to inject appropriate viscosity epoxy into ports. Injection of epoxy shall start at the bottom port, filling full depth of crack. Do not move to the next port until epoxy begins to flow from adjacent port, thus indicating travel. Extend epoxy with sand if required as specified.
  - 6. After entire crack is filled and epoxy cured. Refer ports and grind cap seal flush.

### 3.4 PAINTING CONCRETE COMPONENTS

- A. All concrete repair areas that are installed between Grid Lines 8 and 12 shall be painted to match the adjacent existing columns, inverted t-beams and t-beams.
- B. Provide all temporary protection required to paint the repair areas.
- C. Prepare all surfaces to be painted by cleaning free from debris. Apply primer as recommended by the manufacturer.
- D. Apply one (1) coat of paint to all the surfaces to be painted, follow all paint manufacturers requirements and recommendations. Inspect first coat of paint for defects or areas of unadhered paint. Prepare any paint defect areas and recoat prior to installing the final coat of paint (2<sup>nd</sup> coat).

3.5 CLEAN-UP

- A. Prior to acceptance of the repair work covered in this section, the Contractor shall perform a thorough clean-up of the work site, building surfaces, landscaping, etc. Any items damaged shall be repaired or replaced to the satisfaction of and at no additional cost to the Owner.

END OF SECTION

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## **VEHICULAR TRAFFIC COATING**

### **SECTION 07 18 16**

#### **PART 1 - GENERAL**

##### **1.1 GENERAL PROVISIONS**

- A. The General Conditions, and all parts of the Bid and Contract Documents are made part of this Section as if fully repeated herein.
- B. Refer to Division 1 for additional information.

##### **1.2 RELATED WORK SPECIFIED ELSEWHERE**

- A. Provide a polyurethane traffic coating system as specified and as indicated on the Contract Drawings.
- B. Related Work: The following items are not included in this Section and are specified under the designated Sections:
  - 1. Section 03 01 30 – Maintenance of Cast-in-Place Concrete
  - 2. Section 07 92 00 – Joint Sealants
  - 3. Section 32 17 23 – Pavement Markings

##### **1.3 PERFORMANCE REQUIREMENTS**

- A. Cold fluid applied polyurethane waterproofing system is intended to perform as a continuous barrier against liquid water and to flash or discharge to the incidental water. Membrane system shall accommodate movements of Building materials as required with accessory sealant materials at such locations, changes in substrate, perimeter conditions and penetrations.
- B. Installed waterproofing membrane system shall not permit the passage of water and will withstand the anticipated traffic wear exposures in accordance with the most current revision of ASTM C957, High-Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane with Integral Wearing Surface.
- C. Intent is to bridge and seal the following air and water leakage pathways and gaps:
  - 1. Connections of the walls to the deck.
  - 2. Piping, conduit, duct and similar penetrations.
  - 3. All other air leakage and water intrusion pathways to garage deck structural slab.

#### 1.4 SCOPE OF WORK

In general, the Contractor shall supply all labor, equipment, staging, temporary protection, tools and appliances necessary for the proper completion of the work in this Section, as required in the Project Specifications and in accordance with good construction practice. All vehicular traffic coatings shall be completed as part of the scope of work. The work under this Section generally includes the following:

- A. Remove existing coating from the garage floor slab and leading edge. All existing coating remnants, loose concrete, existing sealants, etc. shall be fully removed down to bare, open capillary concrete.
- B. Perform a minimum of two (2) alternating direction passes of shot-blasting to concrete and masonry surfaces to achieve ICRI-CSP 5 surface profile.
- C. Coordinate repairs to the garage floor slab and leading edge with Section 03 01 30 – Maintenance of Cast-In-Place Concrete.
- D. Install new traffic coating system as detailed on the Contract Drawings and specified herein.
- E. Coordinate installation of all sealant joints scheduled to be placed with the traffic coating system indicated in Section 07 92 00 – Joint Sealant.
- F. Clean all areas affected by the work.
- G. Contact, coordinate and pay for coating manufacturer's field representative site services to include review and reporting for each phase of the coating work, including mock-ups.
- H. Provide a laser survey after entire removal of existing waterproofing coating representing all existing concrete surface discrepancies including dips, swales, inconsistent slopes, etc. and intended resolution to maintain a positive pitch-to-drain to alleviate ponding on the new waterproofing coating.
- I. Provide a final condition laser surface survey of new coating system representing positive pitch-to-drain confirming the absence of ponding.

#### 1.5 SUBMITTALS

- A. Submittals shall be made in accordance with the General Conditions and Section 01 33 00 – Shop Drawings and Submittals.
- B. The Contractor shall submit the following items with their submittal package:
  - 1. Materials list of items proposed to be provided under this Section.
  - 2. Product data for specified materials.
  - 3. Safety Data Sheets (SDS) for all components.
  - 4. Name and Contact information for manufacturer's technical field representative.



5. Drawings or catalog illustrations in sufficient detail to show installation and interface of the work of this Section with the work of adjacent trades.
6. Manufacturer's current recommended installation procedures.
7. Coating samples to replicate actual specified materials, including each layer, aggregate, topping and project specific thicknesses.
8. Manufacturer's technical representative field reports.
9. Contractor's proposed weekly phasing, schedule, and photographs.
10. Contractor's proposed means and methods, including apparatus, equipment and protective measures for removal of existing coatings and surface preparation of concrete.

#### 1.6 MOCK-UPS

- A. Provide field mock-ups in place to verify selections made under sample submittals and to demonstrate aesthetic effects and qualities of materials and execution. Mock-ups shall be performed prior to the commencement of the full scope of work and shall be reviewed by the Owner, Engineer and Manufacturer's field representative. The following mock-ups shall be performed:
  1. Concrete surface preparation and installation of full coating system in accordance with the Contract Documents over a five (5) square foot area. Each mock-up shall include a different aggregate grit size as specified herein:
    - a. 20 grit (as specified)
    - b. 24 grit (as specified)
- B. After complete placement of mock-ups and Owner, Engineer and Manufacturer representative review, the mock-ups shall be fully removed, and the concrete prepared for placement of full coating system.

#### 1.7 CONTRACTOR QUALIFICATIONS

- A. Contractor and his installer(s) shall have satisfactorily completed a program of instruction in proper methods of preparation of the substrate, patching of spalled and delaminated areas, crack and joint repair and traffic coating installation. The applicator shall have in writing, a certificate of approval from the manufacturer.
- B. Contractor shall have a minimum of five (5) years' experience installing this type of surfacing in similar size projects. Contractor shall submit minimum five (5) prior project references, including contact information.

#### 1.8 QUALITY ASSURANCE

- A. The Contractor must coordinate and pay for all manufacturers' site visits to review construction. At a minimum, the manufacturer's representative shall be on site for the following reviews:
  1. Pre-construction meeting.
  2. Concrete surface preparation prior to installation of primer and first coat.

3. First day of waterproofing installation. Representative shall be allowed to review installation of each layer of waterproofing including all layers of wear coat. Broadcast of specified pigmented power tread into grout layer and topping layer must also be reviewed. Representative shall perform adhesion and film thickness tests at a minimum frequency of one (1) per every 100 sq. ft.
  4. Review material storage, mixing, surface preparation, application, curing and temporary protection for each material type or component.
  5. Minimum two (2) site visits per week during installation.
  6. Periodic testing of material thickness for each layer, to confirm conformance to manufacturer's written technical data and these Contract Documents.
- B. For each site visit, the manufacturer's representative shall provide a written field report indicating areas reviewed, procedures used, recommendations made, incorrect installations, corrective actions and photographic documentation. The written field report must include date, time, complete list of personnel on site, areas reviewed with sketch plan identification; placed with photo documents on manufacturer's company letterhead.
- C. The Contractor must submit the manufacturer's reports within two (2) days after the respective site visit.
- D. In all cases and all phases of this project, the Contractor must strictly adhere to the coating manufacturer's current technical specifications and instructions.
- E. Waterproofing Terminology: Refer to ASTM D1079 and the glossary of the National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual for definitions of waterproofing terms related to this section.

#### 1.9 PRE-INSTALLATION CONFERENCE

- A. Prior to scheduled commencement of installation and associated work, conduct a meeting at the Project Site with the installer, Engineer, Owner, manufacturer's representative and any other persons directly involved with the performance of the Work. The Contractor shall record conference discussions and to include decisions and agreements reached and furnish copies of recorded discussions to each attending party within five (5) business days. The main purpose of this meeting is to review foreseeable methods and procedures related to the Work.

#### 1.10 REGULATORY REQUIREMENTS

- A. Applicable Regulations: Comply with Local, State and Federal codes and requirements of authorities having jurisdiction. Do not exceed VOC regulations as established by the State in which they are being installed, including total VOC content, in grams per liter, for all system components (i.e., primers, adhesives, coatings, and similar items).

1.11 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the Project Site in the manufacturer's unopened containers with all labels intact and legible at time of use. Handle and store materials in accordance with manufacturer's recommendations with proper precautions to ensure fitness of material when installed.

1.12 CLEAN-UP

- A. Site clean-up shall be complete and performed daily to the satisfaction of the Owner.
- B. All Building surfaces (interior and exterior), landscape and parking areas shall be cleaned of all trash, debris and dirt caused by, or associated with the Work.
- C. All trash and debris shall be completely removed from the site daily during the Work and at the completion of the Work. All debris shall be legally disposed of off-site.

1.13 WARRANTY

- A. Contractor shall submit a two (2) year, limited warranty against improper workmanship and defective materials (from date of substantial completion as designated by formal written document submitted by the Contractor).

PART 2 - PRODUCTS

2.1 TRAFFIC COATINGS

- A. Vehicular traffic coating shall be a two-component, fast curing, elastomeric polyurethane base coat such as:
  1. Sikalastic 720/745 manufactured by Sika Corporation
  2. MasterSeal Vehicular Traffic 2530 manufactured by Master Builders Solutions (BASF)
  3. Henry Dundeq System as manufactured by Henry Company

<b>System Layer</b>	<b>Sika</b>	<b>BASF</b>	<b>Henry</b>	<b>Dry Thickness</b>
<b>Primer</b>	SikaFloor FTP Or Sikalastic MT	MasterSeal P 255	ST Primer Or GC Epoxy Primer	- (negligible)
<b>Detail Coat</b>	720 Detail Coat	MasterSeal M 265	Dundeq GP Flexcoat	- (cracks/joints)
<b>Base Coat</b>	720 Base Coat	MasterSeal M 265	Dundeq GP Flexcoat	23 mils

<b>Binder Coat I</b>	Sikadur 22 Lo-Mod + Aggregate to Refusal	MasterSeal 350 + Aggregate to Refusal	GP Wearcoat	16 mils
<b>Binder Coat II</b>	Sikadur 22 Lo-Mod + Aggregate to Refusal	MasterSeal 350 + Aggregate to Refusal	GP Wearcoat	16 mils
<b>Topcoat</b>	745 AL Topcoat	MasterSeal TC 295	GP Topcoat	16 mils

Total Dry  
Thickness:            71 mils  
(minimum)

- B. Applied Total Dry Film Thickness Exclusive of Aggregate:
1. Heavy Vehicular Traffic: 71 mils (minimum).
- C. Aggregate: Aggregate shall be supplied in pre-packaged bags and free of metallic or other impurities.
- D. Base and Top Coats: Physical properties complying with the following.
- |    |   |                  |                  |
|----|---|------------------|------------------|
|    | 1. Traffic Coating  | Base Coat        | Topcoat          |
| 2. | Pot Life  | 10-15 minutes    | 20-30 minutes    |
| 3. | Total Volume Solids (ASTM D2697)  | 95%              | 100%             |
| 4. | VOC Content (ASTM D2369)  | 59 g/l           | 0 g/l            |
| 5. | Tensile Strength (ASTM D412)  | 500 +/- 100 psi  | 3200 +/- 300 psi |
| 6. | Elongation at Break (ASTM D412)   | 800 +/- 50%      | 450 +/- 50%      |
| 7. | Tear Resistance (Die C, ASTM D624)  | 300 +/- 25 pli   | 350 +/- 50 pli   |
| 8. | Hardness (ASTM D2240)   | 80 +/- 5 Shore A | 85 +/- 5 Shore A |
| 9. | Tests were performed with material and curing conditions at 75°F and 50% relative humidity. |                  |                  |
- E. Color to be selected by Owner.

## 2.2 AGGREGATE

- A. Aggregate for vehicular traffic coating system shall be 20 - 24 grit as follows:
1. Aluminum oxide broadcast to refusal; or
  2. Silicon Carbide broadcast to refusal
- B. Contractor must submit samples of each aggregate type of final material texture, color, etc. to the Owner and Engineer for review and approval.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that surfaces and conditions are ready to accept the work of this Section. Notify the Engineer in writing of any discrepancies. Commencement of the work in an area shall mean Contractor's acceptance of the substrate.

### 3.2 PREPARATION

- A. Substrates shall be clean, dry, sound and free of surface contaminants, with an open capillary concrete surface. Remove all traces of dust, laitance, grease, oils, curing compounds, form release agents and foreign particles by mechanical means, such as milling, scarifying, or shotblasting, as acceptable to the Engineer. Blow surface free of dust using oil-free compressed air line-equipped with an oil trap. All projections, depressions and rough spots shall be dressed off to achieve a level surface prior to the application.
- B. Concrete shall be cleaned and prepared to achieve a laitance and contaminant free, open textured surface by blast cleaning or equivalent mechanical means (ICRI CSP 3 or 4 Surface Profile).
- C. Metal shall be thoroughly cleaned by grinding or blast cleaning.

### 3.3 PRIMING

- A. Concrete (<4% moisture content by weight, measured with Tramex Concrete Moisture Encounter Meter):
  - 1. For systems requiring primer, apply water-based epoxy primer at 300 sf/gal. with a flat squeegee or roller and work well into the substrate to insure adequate penetration and sealing. Puddles are to be avoided.
  - 2. Refer to data sheet for more detailed information, or consult Manufacturer's Representative for other primer options.
  - 3. Premix both components.
  - 4. Add the 1 gallon of Part "A" to the 1.25 gallons of Part "B" in the short filled Part "B" pail. Mix thoroughly with a mechanical mixer (Jiffy) for 3 minutes.
  - 5. Slowly add 1.25 gallons of potable water to the mixture under agitation.
  - 6. Mix for an additional 2 minutes until the mixture is fully dispersed.
  - 7. Fully dispersed material will appear as light green in color.
  - 8. Allow primer to cure a minimum of 3-4 hours at 70°F and 50% RH or until tack free before applying base coat.
- B. Concrete (4% to 6% moisture content by weight, measured with Tramex Concrete Moisture Encounter Meter):
  - 1. For concrete substrates with 5% maximum moisture content by weight, apply 100% solids epoxy primer at 175 sf/gal. with a flat squeegee or roller and work well into the substrate to ensure adequate penetration and sealing. Puddles are to be avoided.

2. For concrete substrates with >5% up to 6% maximum moisture content by weight, apply a second coat of the 100% solids epoxy primer at 175 sf/gal.
3. Refer to data sheet for more detailed information, or consult Sika for other primer options.
4. Premix both components.
5. Add the 1.5 gallon of 100% solids epoxy primer, Part "B" to the 3 gallons of Part "A" in the short filled Part "A" pail. Mix thoroughly with a mechanical mixer (Jiffy) for 3 minutes.
6. Allow primer to cure a minimum of 12 hours at 70°F and 50% RH or until tack free before applying second primer or base coat.

C. Metal: Consult manufacturer for selection of primer.

### 3.4 DETAILING

- A. Non-Structural Cracks up to 1/16 inch wide (maximum): Apply a detail coat at 23 mils wet, 4 inches wide, centered over the crack. Allow to become tack free before overcoating.
- B. Cracks and Joints over 1/16 inch up to 1 inch: Rout and seal with sealant and allow to skin over and cure. Apply a detail coat at 23 mils wet, 4 inches wide, centered over crack. Allow to become tack free before overcoating.
- C. Joints over 1 inch: Treat as expansion joints and brought up through the Traffic Coating System and sealed with sealant.

### 3.5 BASE COAT

- A. Base Coat:
  1. Premix Base Part A and Part B using a mechanical mixer (Jiffy) at slow speeds to obtain uniform color, making sure to scrape the solids from the bottom and sides of the pails. Do not break down kits into smaller quantities; portions are premeasured.
  2. Pour Part B into Part A slowly and while mixing and scrape the sides of the container. Mix the combined materials thoroughly until a homogenous mixture and uniform color is obtained (typically 3 minutes). Use care not to allow the entrapment of air into the mixture.
  3. Apply at the recommended coverage rate of 23 mils wet, using a 3/16" notched squeegee or trowel and backroll using a phenolic resin core roller. Extend base coat over entire area including previously detailed cracks and control joints.
  4. Allow coating to cure a minimum of 3-4 hours at 70°F and 50% RH; base coat must be tack free before overcoating.

### 3.6 BINDER COAT

- A. Epoxy Binder Coat:

1. Premix Part "A" and Part "B" using a mechanical mixer (Jiffy) at slow speeds to obtain uniform color, making sure to scrape the solids from the bottom and sides of the pails. Do not break down kits into smaller quantities; portions are premeasured.
2. Pour Part B into Part A slowly and while mixing and scrape the sides of the container. Mix the combined materials thoroughly until a homogenous mixture and uniform color is obtained (typically 3 minutes). Use care not to allow the entrapment of air into the mixture.
3. Apply at the required application rate using a 3/16" or 1/4" notched squeegee and backroll using a phenolic resin core roller. Application rate is 16 mils wet for heavy-duty vehicular traffic applications.
4. Apply aggregate 1 into wet coating. Slowly broadcast so the aggregate falls vertically into the binder making several passes, allow the binder to bleed through the sand before making the next pass. Cover completely before binder becomes tack free. Allow coating to cure a minimum required time as recommended by the manufacturer or until tack free between coats. Remove all loose aggregate before Binder Coat II.

B. Epoxy Binder Coat II:

1. Premix Part "A" and Part "B" using a mechanical mixer (Jiffy) at slow speeds to obtain uniform color, making sure to scrape the solids from the bottom and sides of the pails. Do not break down kits into smaller quantities; portions are premeasured.
2. Pour Part B into Part A slowly and while mixing and scrape the sides of the container. Mix the combined materials thoroughly until a homogenous mixture and uniform color is obtained (typically 3 minutes). Use care not to allow the entrapment of air into the mixture.
3. Apply at the required application rate using a 3/16" or 1/4" notched squeegee and backroll using a phenolic resin core roller. Application rate is 16 mils wet for heavy-duty vehicular traffic applications.
4. Apply aggregate 1 into the wet coating. Slowly broadcast so the aggregate falls vertically into the binder making several passes, allow the binder to bleed through the sand before making the next pass. Cover completely before binder becomes tack free. Allow coating to cure a minimum required time as recommended by the manufacturer or until tack free between coats. Remove all loose aggregate before top coating or opening to traffic. Allow a minimum of 32 hours before opening to vehicular traffic.

3.7 TOPCOAT

A. Topcoat:

1. Premix Topcoat Part A and Part B using a mechanical mixer (Jiffy) at slow speeds to obtain uniform color, making sure to scrape the solids from the bottom and sides of the pails. Do not break down kits into smaller quantities; portions are premeasured.

2. Pour Part B into Part A slowly and while mixing and scrape the sides of the container. Mix the combined materials thoroughly until a homogenous mixture and uniform color is obtained (typically 3 minutes). Use care not to allow the entrapment of air into the mixture.
3. For heavy vehicular traffic applications only, apply at 14 mils wet, using a 3/16" notched squeegee and backroll using a phenolic resin core roller. Apply aggregate evenly seeded and distributed at 10-15 lbs. per 100 sf into the wet coating. Allow coating to cure a minimum of 3-4 hours at 70 degrees F and 50% RH or until tack free between coats.

### 3.8 CLEANING

- A. Remove uncured materials from tools or other surfaces with an approved solvent. Remove cured materials can by mechanical means.
- B. Remove any material spatters and other material that is not where it is specified to be applied. Remove masking and covers, taking care not to contaminate surrounding areas.
- C. Repair any damage that should arise from either the application effort or from the clean-up effort.
- D. Leave finished work and work area in a neat, clean condition without evidence of spillovers onto adjacent areas.

END OF SECTION

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**JOINT SEALANTS**

**SECTION 07 92 00**

**PART 1 – GENERAL**

**1.1 GENERAL PROVISIONS**

- A. The General Conditions and all parts of the Bid and Contract Documents are made part of this Section as if fully repeated herein.
- B. Refer to Division 1 for additional information.

**1.2 RELATED WORK SPECIFIED ELSEWHERE**

- A. Related Work: The following items are not included in this Section and are specified under the designated Sections:
  - 1. Section 03 01 30 – Maintenance of Cast-in-Place Concrete
  - 2. Section 07 18 06 – Vehicular Traffic Coatings

**1.3 SCOPE OF WORK**

In general, the Contractor shall supply all labor, materials, equipment, temporary protection and heating, tools and appliances necessary for the proper completion of the work in this Section, as required in the specification and in accordance with good construction practice. The work under this Section generally includes the following:

- A. Install sealant at all concrete control/ construction joints in the concrete underneath the floor coating and as indicated on the Contract Drawings.
- B. Clean and restore all areas affected by the work.

**1.4 JOB CONDITIONS**

- A. The Contractor shall supply, install and maintain all shoring, supports, barriers, protection, temporary heat, warning lines, lighting and personnel required to support the structure, fixtures and facilities affected by his work and segregate the work area(s) from pedestrian or vehicular traffic, as well as to prevent damage to the Building, occupants and the surrounding landscaped and paved areas.
- B. Coordinate the work in this section with the work by other trades to ensure the orderly progress of the Work.
- C. Materials which have a temperature other than the application temperatures of the manufacturer shall not be applied.
- D. The Contractor shall utilize skilled and experienced specialty workers to install the work. Experienced trade workers shall be utilized for all aspects of the work.

- E. During removal operations, the Contractor is responsible for the containment of all dust, dirt, debris, overspray and run-off resulting from the work. The Contractor shall collect and contain all materials and repair any resulting damage to adjacent surfaces, site fixtures or personal property. Specific attention is drawn to the use of chemicals and cleaners.
- F. The Contractor shall provide all masking and protection for adjacent areas and promptly clean any spills or stains from new or existing construction.
- G. The general nature, quantity and surface area of the various work items are shown on the Contract Drawings.

#### 1.5 DIMENSIONS AND QUANTITIES

- A. All dimensions and quantities shall be determined or verified by the Contractor. The Contract Drawings have been compiled from various sources and may not reflect the actual condition at the moment of construction. The Contractor is cautioned to take all precautions and make all investigations necessary to install the proposed Work. The Owner will not consider unfamiliarity with the job conditions as a basis for additional compensation.

#### 1.6 SUBMITTALS

- A. Refer to Section 01 33 00 – Shop Drawings and Submittals for submittal provisions and procedures.
- B. Manufacturers' literature, Specifications and Color Charts shall be submitted for the following materials:
  - 1. Sealants
- C. Contractors proposed means and methods for joint substrate grinding, solvent cleaning and removal of all residual existing materials.

#### 1.7 REFERENCE STANDARDS

- A. ASTM C719 Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle)
- B. ASTM C920 Specification for Elastomeric Joint Sealants
- C. ASTM C1330 Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants

#### 1.8 MOCK-UPS

- A. Before commencing full scale work, install a minimum five (5) linear feet of each type of sealant and sealant configuration, at all sealants joint locations referenced in the scope of work. Sealant installation shall conform to the Contract Documents and once accepted shall become a standard for all subsequent work on the Project.

- B. After curing for seven (7) days, the test areas shall be viewed, sampled and/or removed as directed by the Owner to establish to his satisfaction the actual performance of the installed materials. Evidence of improper or unsatisfactory performance shall be grounds for rejection of any or all of the submitted materials.
- C. Random test cuts will be performed by the sealant manufacturer's technical representative through the construction operations to confirm the work practices. The Contractor will be required to repair each test cut location at no additional cost to the Owner.

#### 1.9 QUALITY ASSURANCE

- A. Field-Adhesion Testing: Prior to commencement of full-scale Work, Contractor shall coordinate sealant manufacturer's technical representative to be on site to perform the following adhesion tests in accordance with ASTM C1521 on the installed mock-ups:
  - 1. Conduct tests for each type of sealant and joint substrate, with and without primer.
  - 2. Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Use alternate materials or modify installation procedures, or both, for sealants that fail to adhere to substrates.
  - 3. Tests on mock-ups shall be repeated until satisfactory results are achieved.
- B. Random test cuts will be performed by the sealant manufacturer's technical representative through the construction operations to confirm the work practices. The Contractor will be required to repair each test cut location at no additional cost to the Owner. Submit results to Engineer for review.

#### 1.10 CLEAN-UP

- A. Site clean-up shall be complete and performed daily to the satisfaction of the Owner.
- B. All building (interior and exterior), landscape and parking areas shall be cleaned of all trash, debris and dirt caused by, or associated with, the Work.
- C. All trash and debris shall be completely removed from the Site daily during the Work and at the completion of the Work. All debris shall be legally disposed of off-site.

#### 1.11 WARRANTY

- A. Material Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components that fail in materials or workmanship. The warranty shall be for a period of five (5) years.

## PART 2 – MATERIALS

### 2.1 SEALANTS

- A. Control Joints:
  - 1. Sealant for use to fill prepared control joints under and in contact with waterproofing base layer (primer) shall be a solvent-free, moisture-tolerant, flexible epoxy control joint sealer and adhesive, either non-sagging or self-leveling as required such as
    - a. Sikadur 51 as manufactured by Sika Corporation, Inc.
    - b. MasterSeal NP 2 as manufactured by Master Builders Solution.
    - c. Vulkem 45 SSL as manufactured by Tremco
    - d. or Engineer approved equal.
- B. Color(s) shall be selected by the Owner from the approved manufacturer's color chart. The Owner may require a minimum of a two (2) sealant colors to be installed at each new sealant joint type. The Contractor will include multiple colors in the Bid.

### 2.2 SEALANT ACCESSORIES

- A. Primer shall be non-staining type as manufactured or recommended by the sealant manufacturer for each substrate.
- B. Joint cleaner shall be non-corrosive and non-staining as recommended by the sealant manufacturer. Cleaner shall be totally compatible with the sealant for each substrate.
- C. Masking material shall be commercially available masking tape of appropriate width or other material recommended by the sealant manufacturer. Self-adhesive masking materials shall be of low tack and completely strippable, leaving no adhesive residue behind when removed.

## PART 3 – EXECUTION

### 3.1 GENERAL WORKMANSHIP

- A. Do not leave any partially completed sections exposed to the elements overnight. Provide all devices (including heaters and insulation) necessary to maintain areas at the correct temperature and humidity for proper curing.
- B. Keep covers tightly sealed on all evaporative products to prevent premature curing.
- C. During the removal of any existing component, the Contractor shall report to the Owner and Engineer any areas of damaged, deteriorated or otherwise unsuitable substrates uncovered during the Work. Do not cover unacceptable areas until reviewed by the Owner and Engineer. Provide temporary protection to the area in question.

- D. Comply with the manufacturer's written instructions and these Specifications pertaining to sealant installation.

### 3.2 JOINT PREPARATION

- A. Ensure all work occurring at sealant joint locations has been completed prior to the start of sealant installation. Coordinate work with Section 03 01 30 – Maintenance of Cast-in-Place Concrete.
- B. Clean all substrates to receive the joint sealants using the manufacturers recommended cleaners and surface preparation techniques. The removal and cleaning of sealants and adhesives shall be as specified herein and in accordance with the sealant manufacturer's written recommendations.
- C. Clean each previously prepared bonding surface with applications of the manufacturers recommended solvent and clean white rags. Apply solvent by brush and wipe surfaces clean. Repeat a minimum of two (2) times, more often if necessary.
- D. Joint primer shall be applied to all properly prepared, cleaned and dry substrates. Primer shall be recommended and approved by the sealant manufacturer for each substrate and shall be completely compatible with the existing materials and proposed sealants and accessories.
- E. Primer shall be applied and allowed to dry prior to the application of joint backer, bond breaker or sealant.

### 3.3 SEALANT

- A. Precondition sealants to a temperature between 60 and 75 degrees F or as required by the manufacturer. Apply sealant to clean dry surfaces only when the ambient temperature is between 60 and 85 degrees F.
- B. All sealants shall be applied to clean, dry joints by knife, trowel, manual or air pressure caulking guns using proper nozzle sizes.
- C. Sealant shall be forced into the joint to completely fill the void and achieve full "wet out" of the bonding surfaces. Force sealant into the joint and against the sides of the joint. Avoid pulling sealant from sides.
- D. Tool sealant immediately to assure full adhesion. Sealant shall be dry tooled to be straight, uniform, smooth and neatly finished to the profiles detailed and to shed water. No soaps, wetting or slicking agents will be allowed.

3.4 CLEAN-UP

- A. Prior to acceptance of the sealant work covered in this Section, the Contractor shall perform a thorough clean-up of the Work site, Building surfaces, landscaping, etc. Any plantings or other items damaged shall be repaired or replaced to the satisfaction of and at no additional cost to the Owner.

END OF SECTION

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**PAVEMENT MARKINGS**

**SECTION 32 17 23**

**PART I - GENERAL**

**1.1 GENERAL PROVISIONS**

- A. The General Conditions and all parts of the Bid and Contract Documents are made part of this Section as if fully repeated herein.
- B. Refer to Division 1 for additional information.

**1.2 RELATED WORK SPECIFIED ELSEWHERE**

- A. Section 07 18 16 – Vehicular Traffic Coatings

**1.3 SCOPE OF WORK**

In general, the General Contractor shall supply all labor, materials, equipment, temporary protection and heating, tools and appliances necessary for the proper completion of the work in this Section, as required in the Specifications and in accordance with good construction practice. The work under this Section generally includes the following:

- A. Prior to removal of existing waterproofing and concrete repair work, Contractor shall field measure and provide fully dimensioned as-built drawings indicating layout of parking spaces, no-parking zones, directional arrows, etc.
- B. After complete cure of new waterproofing system, apply traffic marking paint to match original configuration. Use stencils as required to provide straight, consistent traffic markings.

**1.4 REFERENCES**

- A. AASHTO Standard Specifications for Transportation Materials and Methods of Sampling and Testing, 1986 Edition, as amended.
- B. Massachusetts Highway Department "Standard Specifications for Highways and Bridges", Latest Edition.

**1.5 JOB CONDITIONS**

- A. The Contractor shall supply, install and maintain all shoring, supports, barriers, protection, warning lines, lighting and personnel required to support the structure, fixtures and facilities affected by his work and segregate the work area(s) from pedestrian or vehicular traffic, as well as to prevent damage to the Building, occupants and the surrounding landscaped and paved areas.
- B. Coordinate the work in this Section with the work by other trades to ensure the orderly progress of the Work.

- C. Materials which have a temperature other than the application temperatures recommended by the manufacturer shall not be applied.

#### 1.6 SUBMITTALS

- A. Submittals shall be made in accordance with the General Conditions and Section 01 30 00 – Shop Drawings and Submittals.
- B. The Contractor shall submit the following items with their submittal package.
  - 1. Product data for specified materials.
  - 2. Material safety data sheets for all components

#### 1.7 QUALITY ASSURANCE

- A. A minimum of two (2) test strips shall be installed prior to full-scale application of the pavement marking paint. The test strips should be allowed to fully cure before the adhesion test is performed. Adhesion tests shall be performed by material manufacturer representative or approved testing agency. Contractor to coordinate with material manufacturer.
- B. Prior to Contractor ordering or purchasing pavement marking paint, the Contractor must submit the traffic coating manufacturer's letter of approval to indicate compliance of all materials.

### PART 2 - MATERIALS

#### 2.1 PAVEMENT MARKING

- A. Pavement marking paint shall be a premium quality waterborne acrylic alkyd traffic marking paint such as:
  - 1. Pro-Park Waterborne Traffic Marking Paint as manufactured by Sherwin Williams
  - 2. 1472 Waterborne Traffic Marking Paint as manufactured by Kelly-Moore Paints
  - 3. or approved equal.
- B. Marking paint color (s) to be selected by Owner.

#### 2.2 APPLICATION REQUIREMENTS

- A. No thinners shall be used for the above listed pavement marking applications except in accordance with the manufacturer's specifications and at the direction of the Engineer.
- B. Minimum finished paint thickness shall be 15 mils.



## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Traffic system topcoat shall be allowed to cure a minimum of 48 hours prior to application of pavement marking test strips.
- B. All surfaces shall be cleaned to be free from dirt, debris, oils, foreign materials, etc. within the areas to be painted.
- C. Application of markings shall not proceed until final authorization is received from Engineer and traffic system manufacturer.

### 3.2 INSTALLATION

- A. All concrete repair areas shall be repainted to match the original markings.
- B. Painting shall be in accordance with Section 860 of the Massachusetts Highway Department "Standard Specifications for Highway and Bridges", Latest Edition.
- C. No paint or pavement marking material shall be heated above the temperature marked on the container.
- D. All painting shall be performed in a neat and workmanlike manner.
- E. Lines shall be sharp and clear with no feathered edging or fogging.
- F. If for any reason material is spilled or tracked on areas not being painted or any markings applied by Contractor, in Engineer's judgment, are not acceptable, then the Contractor shall remove such material by a method that shall not damage the new waterproofing surface and is acceptable to Engineer, clean and prepare the surface for a reapplication of markings, and reapply the markings as directed without additional compensation for the corrective work.

### 3.3 PROTECTION

- A. Markings shall remain protected until sufficiently dry to bear traffic.
- B. Precautions shall be taken to prevent tracking by tires of the striping equipment.

END OF SECTION

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