

# REQUEST FOR PROPOSAL

#6787

FOR THE PURPOSE OF  
TRIAL COURT PARKING STRUCTURE REPAIRS 2014

FOR  
Washtenaw County  
Facilities Management

Issued By:

Washtenaw County Purchasing  
Administration Building  
220 N. Main Street  
Ann Arbor, MI 48104

Angela O. Perry  
Purchasing Manager  
(734) 222-6768



**Proposal Submitted by:**

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*Please type Bidder's Company Name & include as proposal cover*



## WASHTENAW COUNTY

### Finance Department

#### Purchasing Division

220 N. Main, Ann Arbor, MI 48104  
Phone (734) 222-6760, Fax (734) 222-6764  
[www.purchasing.ewashtenaw.org](http://www.purchasing.ewashtenaw.org)

## RFP #6787

June 11<sup>th</sup>, 2014

Washtenaw County Purchasing Division on behalf of Facilities Management is issuing a sealed RFP #6787 for the purpose of its TRIAL COURT parking structure repairs 2014, located at 101 E Huron Ann Arbor MI.

**Sealed Proposals:** Vendor will deliver one (1) **unbound original** and three (3) **bound copies each with the pricing page flagged** to the County location specified below. In addition, vendor will deliver an electronic copy on a USB drive, CD-RW, or DVD in pdf format to the location specified below:

**Washtenaw County  
Administration Building  
Purchasing Division  
220 N. Main Street Basement  
Ann Arbor, MI 48104**

**By Wednesday, July 9th, 2014 at 4:00 PM EST**

A **Mandatory Pre Bid meeting** will be held at the Washtenaw County Trial Court located at 101 E Huron Ann Arbor MI on **Thursday June 19<sup>th</sup>, 2014 at 10:00 AM.**

**Proposals received after the above cited time will be considered a late bid and are not acceptable unless waived by the Purchasing Manager.**

- The envelope must be clearly marked "**SEALED RFP 6787**".
- Please direct purchasing and procedural questions regarding this RFP to Angela Perry via e-mail only to [perrya@ewashtenaw.org](mailto:perrya@ewashtenaw.org)
- Please direct technical questions regarding this RFP to Dept contact via e-mail only to Nick Woods at [woodsn@ewashtenaw.org](mailto:woodsn@ewashtenaw.org) or Jason Fee at [feej@ewashtenaw.org](mailto:feej@ewashtenaw.org)

Thank you for your interest.

PROPOSAL INFORMATION

**I. PROPOSAL DEFINITIONS**

Definitions

“Bidder”	An individual or business submitting a bid to Washtenaw County
“Contractor/Vendor”	One who contracts to perform services in accordance with a subsequent contract
“Owner”	Washtenaw County in Michigan
“Facilities Management”	Washtenaw County Facilities Management

**II. TERMS**

A. Washtenaw County reserves the right to reject any and all proposals received as a result of this RFP. If a proposal is selected, it will be the most advantageous regarding price, quality of service, the CONTRACTORS qualifications and capabilities to provide the specified service, and other factors that the County may consider. The County does not intend to award a contract fully on the basis of any response made to the proposal; the County reserves the right to consider proposals for modifications at any time before a contract would be awarded, and negotiations would be undertaken with that CONTRACTOR whose proposal is deemed to best meet the County’s specifications and needs.

B. The County reserves the right to reject any or all bids, to waive or not waive informalities or irregularities in bids or bidding procedures, and to accept or further negotiate cost, terms, or conditions of any bid determined by the County to be in the best interests of the County even though not the lowest bid.

C. Proposals must be signed by an official authorized to bind the CONTRACTOR to its provisions for at least a period of 90 days. Failure of the successful bidder to accept the obligation of the contract may result in the cancellation of any award.

D. In the event it becomes necessary to revise any part of the RFP, addenda will be provided. Deadlines for submission of RFP’s may be adjusted to allow for revisions. To be considered, **one (1) original and three (3) copies** (one copy unbound) and an electronic version in pdf format, submitted on CD-RW, DVD or USB drive must be at the County as indicated on or before the date specified.

E. Proposals should be prepared simply and economically providing a straight-forward, concise description of the CONTRACTOR’S ability to meet the requirements of the RFP. Proposals shall be typewritten. No erasures are permitted. Mistakes may be crossed out and corrected and must be initialed in ink by the person signing the proposal.

F. In the event, the County receives two or more bids from responsive, responsible bidders, one or more of whom are Washtenaw County Contractors and the bids are substantially equal in price, quality and service, the County shall award the contract to the most responsive, responsible Washtenaw County Contractor. For purposes of this section, Washtenaw County Contractor means a company which has maintained its principal office in Washtenaw County for at least six (6) months. Maintaining a Washtenaw County P.O. Box, is not, in and of itself, sufficient to establish a company as a Washtenaw County Contractor. The County shall have sole discretion under this section to determine if a company qualifies as a Washtenaw County Contractor and if two or more bids are substantially equal.

G. The initial award of this contract shall be for a period of 1 year(s), with an option to renew an additional 1 year, pending agreement by both parties.

H. CONFLICT OF INTEREST. Contractor warrants that to the best of contractor's knowledge, there exists no actual or potential conflict between contractor and the County, and its Services under this request, and in the event of change in either contractor's private interests or Services under this request, contractor will inform the County regarding possible conflict of interest which may arise as a result of the change. Contractor also affirms that, to the best of contractor's knowledge, there exists no actual or potential conflict between a County employee and Contractor.

I. The bidder shall be responsible for all costs incurred in the development and submission of this response. Washtenaw County assumes no contractual obligation as a result of the issuance of this RFP, the preparation or submission of a response by a bidder, the evaluation of an accepted response, or the selection of finalists. All proposals, including attachments, supplementary materials, addenda, etc. shall become the property of Washtenaw County and will not be returned to the bidder.

**III. VENDOR SPECIFICATIONS**

The proposal shall include **all** of the following information. Failure to include all of the required information may result in disqualification of a Bidder.

- A. State the bidder's qualifications to provide the services required by Washtenaw County. Include years in business under your present company name, staff profile and experience.

(Attach as [Attachment B](#))

- B. List three (3) references from previous corporate or government customers purchasing similar services. Include business name, contact name and phone number.

(Attach as [Attachment C](#))

- C. Review contract provisions and insurance requirements. Note any limitations on any of the articles or providing insurance requirements as outlined in the contract provisions contained in Sample Contract.

(Attach as [Attachment D](#))

**IV. AWARD**

Award will be made to the lowest responsive, responsible bidder, with most relevant experience and best qualifications. However, the award may not be based solely on low bid alone.

**V. SCOPE OF WORK**

**A. GENERAL**

I. Purpose of Proposal:

(See ATTACHMENT A – Bid Specifications, provided by Testing Engineers and Consultants)

**VI. SAMPLE STANDARD PROVISIONS FOR CONTRACTS**

*If a contract is awarded, the selected contractor will be required to adhere to a set of general contract provisions which will become a part of any formal agreement. These provisions are general principles which apply to all contractors of service to Washtenaw County such as the following:*

SERVICE CONTRACT  
**(NAME OF CONTRACTOR)**

CR \_\_\_\_\_

AGREEMENT is made this \_\_\_\_\_ day of \_\_\_\_\_, 2013, by the COUNTY OF WASHTENAW, a municipal corporation, with offices located in the County Administration Building, 220 North Main Street, Ann Arbor, Michigan 48107 ("County") and **(NAME OF CONTRACTOR)** located at **(CONTRACTOR'S ADDRESS)** ("Contractor").

In consideration of the promises below, the parties mutually agree as follows:

ARTICLE I - SCOPE OF SERVICES

The Contractor will **(SPELL OUT SCOPE OF SERVICE)**

ARTICLE II - COMPENSATION

Upon completion of the above services and submission of invoices the County will pay the Contractor an amount not to exceed **(SPELL OUT DOLLAR AMOUNT)**.

ARTICLE III - REPORTING OF CONTRACTOR

Section 1 - The Contractor is to report to **(DEPARTMENT HEAD TITLE)** and will cooperate and confer with him/her as necessary to insure satisfactory work progress.

Section 2 - All reports, estimates, memoranda and documents submitted by the Contractor must be dated and bear the Contractor's name.

Section 3 - All reports made in connection with these services are subject to review and final approval by the County Administrator.

Section 4 - The County may review and inspect the Contractor's activities during the term of this contract.

Section 5 - When applicable, the Contractor will submit a final, written report to the County Administrator.

Section 6 - After reasonable notice to the Contractor, the County may review any of the Contractor's internal records, reports, or insurance policies.

ARTICLE IV - TERM

This contract begins on **(MONTH, DAY, YEAR)** and ends on **(MONTH, DAY, YEAR)**, with an option to extend an additional \_\_\_\_\_ year(s).

**ARTICLE V - PERSONNEL**

**Section 1** - The contractor will provide the required services and will not subcontract or assign the services without the County's written approval.

**Section 2** - The Contractor will not hire any County employee for any of the required services without the County's written approval.

**Section 3** - The parties agree that the Contractor is neither an employee nor an agent of the County for any purpose.

**Section 4** - The parties agree that all work done under this contract shall be completed in the United States and that none of the work will be partially or fully completed by either an offshore subcontractor or offshore business interest either owned or affiliated with the contractor. For purposes of this contract, the term, "offshore" refers to any area outside the contiguous United States, Alaska or Hawaii.

**ARTICLE VI - INDEMNIFICATION AGREEMENT**

The contractor will protect, defend and indemnify Washtenaw County, its officers, agents, servants, volunteers and employees from any and all liabilities, claims, liens, fines, demands and costs, including legal fees, of whatsoever kind and nature which may result in injury or death to any persons, including the Contractor's own employees, and for loss or damage to any property, including property owned or in the care, custody or control of Washtenaw County in connection with or in any way incident to or arising out of the occupancy, use, service, operations, performance or non-performance of work in connection with this contract resulting in whole or in part from negligent acts or omissions of contractor, any sub-contractor, or any employee, agent or representative of the contractor or any sub-contractor.

**ARTICLE VII - INSURANCE REQUIREMENTS**

The Contractor will maintain at its own expense during the term of this Contract, the following insurance:

1. Workers' Compensation Insurance with Michigan statutory limits and Employers Liability Insurance with a minimum limit of \$100,000 each accident for any employee.
2. Commercial General Liability Insurance with a combined single limit of \$1,000,000 each occurrence for bodily injury and property damage. The County shall be added as "additional insured" on general liability policy with respect to the services provided under this contract.
3. Automobile Liability Insurance covering all owned, hired and nonowned vehicles with Personal Protection Insurance and Property Protection Insurance to comply with the provisions of the Michigan No Fault Insurance Law, including residual liability insurance with a minimum combined single limit of \$1,000,000 each accident for bodily injury and property damage.



Insurance companies, named insureds and policy forms may be subject to the approval of the Washtenaw County Administrator, if requested by the County Administrator. Such approval shall not be unreasonably withheld. Insurance policies shall not contain endorsements or policy conditions which reduce coverage provided to Washtenaw County. Contractor shall be responsible to Washtenaw County or insurance companies insuring Washtenaw County for all costs resulting from both financially unsound insurance companies selected by Contractor and their inadequate insurance coverage. Contractor shall furnish the Washtenaw County Administrator with satisfactory certificates of insurance or a certified copy of the policy, if requested by the County Administrator.

No payments will be made to the Contractor until the current certificates of insurance have been received and approved by the Administrator. If the insurance as evidenced by the certificates furnished by the Contractor expires or is canceled during the term of the contract, services and related payments will be suspended. Contractor shall furnish the County Administrator's Office with certification of insurance evidencing such coverage and endorsements at least ten (10) working days prior to commencement of services under this contract. Certificates shall be addressed to the Washtenaw County c/o: **INSERT DEPARTMENT, & CR#** \_\_\_\_\_, P. O. Box 8645, Ann Arbor, MI, 48107, and shall provide for written notice to the Certificate holder of cancellation of coverage.

#### ARTICLE VIII - COMPLIANCE WITH LAWS AND REGULATIONS

The Contractor will comply with all federal, state and local regulations, including but not limited to all applicable OSHA/MIOSHA requirements and the Americans with Disabilities Act.

#### ARTICLE IX - INTEREST OF CONTRACTOR AND COUNTY

The Contractor promises that it has no interest which would conflict with the performance of services required by this contract. The Contractor also promises that, in the performance of this contract, no officer, agent, employee of the County of Washtenaw, or member of its governing bodies, may participate in any decision relating to this contract which affects his/her personal interest or the interest of any corporation, partnership or association in which he/she is directly or indirectly interested or has any personal or pecuniary interest. However, this paragraph does not apply if there has been compliance with the provisions of Section 3 of Act No. 317 of the Public Acts of 1968 and/or Section 30 of Act No. 156 of Public Acts of 1851, as amended by Act No. 51 of the Public Acts of 1978, whichever is applicable.

#### ARTICLE X - CONTINGENT FEES

The Contractor promises that it has not employed or retained any company or person, other than bona fide employees working solely for the Contractor, to solicit or secure this contract, and that it has not paid or agreed to pay any company or person, other than bona fide employees working solely for the Contractor, any fee, commission, percentage, brokerage fee, gifts or any other consideration contingent upon or resulting from the award or making of this contract. For breach of this promise, the County may cancel this contract without liability or, at its discretion, deduct the full amount of the fee, commission, percentage, brokerage fee, gift or contingent fee from the compensation due the Contractor.

#### ARTICLE XI - EQUAL EMPLOYMENT OPPORTUNITY

The Contractor will not discriminate against any employee or applicant for employment because of race, creed, color, sex, sexual orientation, national origin, physical handicap, age, height,

weight, marital status, veteran status, religion and political belief (except as it relates to a bona fide occupational qualification reasonably necessary to the normal operation of the business).

The Contractor will take affirmative action to eliminate discrimination based on sex, race, or a handicap in the hiring of applicant and the treatment of employees. Affirmative action will include, but not be limited to: Employment; upgrading, demotion or transfer; recruitment advertisement; layoff or termination; rates of pay or other forms of compensation; selection for training, including apprenticeship.

The Contractor agrees to post notices containing this policy against discrimination in conspicuous places available to applicants for employment and employees. All solicitations or advertisements for employees, placed by or on the behalf of the Contractor, will state that all qualified applicants will receive consideration for employment without regard to race, creed, color, sex, sexual orientation, national origin, physical handicap, age, height, weight, marital status, veteran status, religion and political belief.

#### ARTICLE XII - PREVAILING WAGE RATES

The Contractor agrees that all craftsmen, mechanics and laborers it employs to work on this project shall, at a minimum, receive the prevailing wages and fringe benefits of the Building Trade Department for corresponding classes of craftsmen, mechanics and laborers for the Washtenaw County area, as determined and published by the Davis-Bacon Division of the United States Department of Labor. Contractor agrees that all subcontracts entered into by the Contractor shall contain a similar provision covering any sub-contractor's employees who perform work on this project.

#### ARTICLE XIII - EQUAL ACCESS

The Contractor shall provide the services set forth in Article I without discrimination on the basis of race, color, religion, national origin, sex, sexual orientation, marital status, physical handicap, or age.

#### ARTICLE XIV - OWNERSHIP OF DOCUMENTS AND PUBLICATION

All documents developed as a result of this contract will be freely available to the public. None may be copyrighted by the Contractor. During the performance of the services, the Contractor will be responsible for any loss of or damage to the documents while they are in its possession and must restore the loss or damage at its expense. Any use of the information and results of this contract by the Contractor must reference the project sponsorship by the County. Any publication of the information or results must be co-authored by the County.

#### ARTICLE XV - ASSIGNS AND SUCCESSORS

This contract is binding on the County and the Contractor, their successors and assigns. Neither the County nor the Contractor will assign or transfer its interest in this contract without the written consent of the other.

#### ARTICLE XVI - TERMINATION OF CONTRACT

Section 1 - Termination without cause. Either party may terminate the contract by giving thirty (30) days written notice to the other party.

ARTICLE XVII - PAYROLL TAXES

The Contractor is responsible for all applicable state and federal social security benefits and unemployment taxes and agrees to indemnify and protect the County against such liability.

ARTICLE XVIII - PRACTICE AND ETHICS

The parties will conform to the code of ethics of their respective national professional associations.

ARTICLE XIX- CHANGES IN SCOPE OR SCHEDULE OF SERVICES

Changes mutually agreed upon by the County and the Contractor, will be incorporated into this contract by written amendments signed by both parties.

ARTICLE XX - CHOICE OF LAW AND FORUM

This contract is to be interpreted by the laws of Michigan. The parties agree that the proper forum for litigation arising out of this contract is in Washtenaw County, Michigan.

ARTICLE XXI - EXTENT OF CONTRACT

This contract represents the entire agreement between the parties and supersedes all prior representations, negotiations or agreements whether written or oral.

ARTICLE XXII – ELECTRONIC SIGNATURES

All parties to this contract agree that either electronic or handwritten signatures are acceptable to execute this agreement.

ATTESTED TO:

WASHTENAW COUNTY

By: \_\_\_\_\_  
Lawrence Kestenbaum (DATE)  
County Clerk/Register

By: \_\_\_\_\_  
Verna J. McDaniel (DATE)  
County Administrator

APPROVED AS TO CONTENT:

CONTRACTOR

By: \_\_\_\_\_  
David Shirley (DATE)

By: \_\_\_\_\_  
**(CONTRACTOR'S NAME)** (DATE)

APPROVED AS TO FORM:

By: \_\_\_\_\_  
Curtis N. Hedger (DATE)  
Office of Corporation Counsel

**SIGNATURE PAGE**

_____ Signature	_____ Company Name
_____ Print Name	_____ Company Address
_____ Title	_____ City, County, St. Zip
_____ Telephone #	_____ Fax #
_____ Federal Tax ID #	_____ Email Address for Purchase Orders

**The above individual is authorized to sign on behalf of company submitting proposal.**

Proposals must be signed by an official authorized to bind the provider to its provisions for at least a period of 90 days. Signature page must be signed, boxes checked below, and returned as part of vendor proposal.

By checking this box we hereby certify that we are a Washtenaw County company. If proven otherwise, company may be subject to Disbarment and/or Suspension of doing business with Washtenaw County.

By signing this bid submission, I certify that I and/or my corporation, company, limited liability company, business association, partnership, society, trust or any other non-governmental entity, organization or group is not an "Iran linked business" as defined by P.A. 517 of 2012 (MCLA 129.311 et seq)("Act").

I understand that under the Act, an "Iran linked business means an individual or one of the above-listed groups who engages in investment activities in the energy sector of Iran, including, but not limited to, providing oil or liquefied natural gas tankers or products used to construct or maintain pipelines used to transport oil or liquefied gas for Iran's energy sector or a financial institution extending credit to another person to engage in investment activities in Iran's energy sector.

I further understand that "investment activity" is defined by the Act as an individual or one of the above listed groups that invests \$20,000,000.00 or more in Iran's energy sector or a financial institution that extends credit to another person, if that person uses the credit to engage in "investment activity" in Iran's energy sector.

**FORM OF PROPOSAL – Attachment A**

**FOR:** Furnishing of all labor, materials, supervision, equipment, insurance, and all other items required for the concrete repairs and restoration at the Washtenaw County Trial Court Parking Structure and other related equipment (the “Work”), as more particularly defined in the following Documents.

\*\*\*\*\*

**1. BASE BID LUMP SUM**

The Supplier, by signage of Signature Page, hereby proposes and agrees to furnish all material, labor, equipment, tools and supervision and to furnish all services necessary to complete the Work required by the Construction Documents and specified by the engineering firm for the following Base Bid Lump Sum:

\_\_\_\_\_ (\$ \_\_\_\_\_ )  
Dollars

**BASE BID FORM**  
**(To be returned by Contractor)**

**2. BASE BID LUMP SUM (cont'd)**

In submitting this bid, the Bidder acknowledges that all Work Item quantities are estimates and that the Owner may increase or decrease these quantities at the unit prices stated. Owner may also exclude or eliminate any Work Item(s).

<b>W.I. NO.</b>	<b>DESCRIPTION</b>	<b>UNITS</b>	<b>ESTIMATED QUANTITY</b>	<b>UNIT PRICES</b>	<b>EXTENSION</b>
1.0	Mobilization	LS	LS	-----	
2.0	Concrete Deck Underside – Overhead Ceiling Delamination Repairs	SF	575		
3.0	Concrete Deck Underside – Overhead Beam Delamination Repairs	SF	25		
4.0	Basement Wall - Concrete Delamination Repairs	SF	225		
5.0	Basement Column - Concrete Delamination Repairs	SF	30		
6.0	Basement Area - Concrete Repair Surfaces Painting	SF	1100		
7.0	Topside – Concrete Deck Delamination Repairs	SF	200		
8.0	Topside – Concrete Walkway/Curbing/Equipment Pad Delamination Repairs	SF	50		
9.0	Topside – Traffic Coating Membrane Repairs	SF	1800		
10.0	Topside – Concrete Deck & Walkway/Curbing/Stair/Wall/ Equipment Pad – Crack Repairs	LF	110		
10.1	Topside - Concrete Deck & Walkway/Curbing/Equipment Pad – Joint Sealant Repairs	LF	850		
11.0	Topside - Coping Stone Repositioning Repairs	LF	15		
12.0	Topside - Coping Stone Mortar Joint & Crack Repairs	LF	290		
13.0	Topside - Wall Concrete Damage Repair & Repaint	SF	18		
14.0	Topside – Penetrating Sealer Application on Concrete Walkway/Curbing/Coping	SF	2400		

**RFP 6787 - TRIAL COURT PARKING STRUCTURE REPAIRS  
ANN ARBOR, MICHIGAN**

**JUNE 2014**

	Stone/Equipment Pad Surfaces				
15.0	Basement Floor Slab – Underside Void Space Grouting Repairs	CF	350 CF (700 SF area @ 6 in. average void thickness)		

**TOTAL BASE BID, LUMP SUM QUOTE, W.I. 1.0 THROUGH W.I. 15.0 ..... \$ \_\_\_\_\_**

W.I. = WORK ITEM

**ALTERNATES:**

NONE

**BASE BID FORM**  
(cont'd)

BIDDER'S COMPANY NAME \_\_\_\_\_

**WORK REFERENCES**

NAME OF COMPANY	LOCATION	NAME OF PERSON APPROVING WORK AND TELEPHONE NUMBER	TIME PERIOD OF PROJECT	NUMBER OF PERSONNEL ON PROJECT



**BASE BID FORM**  
(cont'd)

**PROPOSAL: TRIAL COURT PARKING STRUCTURE REPAIRS (To be returned by Contractors)**

**3. GENERAL INFORMATION**

In further description of this proposal, we desire to submit sheets marked as follows:

\_\_\_\_\_

Bidding under the name of: \_\_\_\_\_

Federal Employer Identification Number: \_\_\_\_\_

which is (check one of the following):

( ) Corporation, incorporated under the laws of the State of: \_\_\_\_\_

( ) Partnership, consisting of (list partners):

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

( ) Assumed Name (Register No.) \_\_\_\_\_

( ) Individual

**4. AUTHORIZED SIGNATURE**

Printed or typed signature: \_\_\_\_\_

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

Address: \_\_\_\_\_

City, State: \_\_\_\_\_

Telephone Number: \_\_\_\_\_

**BASE BID FORM**  
**(cont'd)**

When payment on such order or Contract is to be directed to the same company at an address different from above, please list the address to be used below:

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The contractor shall not assign this Contract without the approval of the Owner.

**5. SCHEDULE**

- A. **Mandatory** pre-bid meeting at the project site is scheduled for June 19<sup>th</sup>, 2014 at 10:00 AM at the Washtenaw County Trial Court Parking Structure, 101 E. Huron, Ann Arbor MI.
- B. Contractor's bid is due by or before **4:00 PM EST on Wednesday July 9<sup>th</sup>, 2014.**
- C. Contractor shall commence Work under the contract without delay no later than within one week upon award of contract from the Owner. The Contractor shall complete all contract Work no later than 60 calendar days from date of work commencement.

**6. GENERAL AGREEMENTS**

- A. The Bidder acknowledges that he has had the opportunity to examine the site and locality where the Work is to be performed and has become familiar with the legal requirements, laws, rules, regulations and conditions affecting the cost, progress and performance of the Work and has made such independent investigations as Bidder deemed necessary to prepare his bid. Further, Bidder hereby states that the Base Bid set forth in this Proposal is true and correct.
- B. The Bidder agrees that this bid shall not be withdrawn for a period of 30 calendar days after the scheduled closing time for receiving bids.
- C. The Bidder understands that the Owner will not be liable for any amount in excess of the lump sum Base Bid, except as expressly stated in written Change Orders duly executed and delivered by the Owner.
- D. The Bidder declares that in preparing this bid, he has assured himself of the availability of all labor, materials and products to both start the project and meet the substantial completion date.

**SECTION 01040**

**COORDINATION**

**1.01 PROJECT COORDINATION**

- A. It shall be the full responsibility of the Contractor to coordinate, schedule and expedite all phases of the Work and give sufficient notice of the expected Work schedule to the Owner and all trades so that they may have ample time to prepare for and perform their Work.
- B. Work shall be accomplished in a manner which will maintain vehicle and occupant traffic flow to both levels. A maximum of one-half of one level is allowed to be taken out of service for repair operations at any one time. Signs and barricades necessary to inform occupants and the public of closing and traffic flow modifications shall be provided by the Contractor. Sign wording and placement shall be approved by the Owner.
- C. The vehicle ramp and southwest corner stairway shall remain safe and available for use at all times.
- D. The main traffic lane connecting the vehicle ramp and the structure entrance/exit routes shall be maintained open at all times unless the Owner is notified and if properly coordinated and scheduled with the Owner.

**SECTION 01300**

**SUBMITTALS**

**1.01 CONSTRUCTION SCHEDULES**

- A. Within 7 days after execution of the agreement, prepare an estimated progress schedule in bar graph or CPM diagram form and submit it to the Owner and Engineer for review. Show the Work's estimated progress schedule. Update and submit monthly along with the Application for Payment. The Contractor shall consult with the Engineer as needed regarding the form or content of the schedule.
- B. The Contractor shall submit to the Engineer for verification and approval, copies of manufacturer's data and recommended installation procedures, directions, limitations for:

Joint Sealants  
Concrete Mixes  
Concrete Patching Materials  
Deck Surface Membrane Coating Products  
Paint Coatings  
Mortar

**1.02 PRODUCT DATA AND SAMPLES**

- A. Provide samples per the requirements of the General Conditions, the Supplementary Conditions, and any further requirements set forth herein.
- B. The Contractor shall receive, check, approve, and stamp all samples required by the Contract Documents before submitting to the Engineer for review. Allow ample time before same are required for the Work. Label each sample giving a complete description of the material, the intended use, the section number and paragraph which mentions it, and the name of the party submitting the sample.

**SECTION 01400**

**QUALITY CONTROL**

- 1.01** All non-permit related inspections and all initial material testing for this project shall be performed by Testing Engineers & Consultants, Inc. (TEC) and be paid for by the Owner. Any needed re-inspections or re-testing as a result of Work deficiencies shall be performed by TEC and paid for by the Contractor.
- 1.02** Coordinate and cooperate with TEC for all required tests. Notify TEC a minimum of two days prior to any needed inspections or material testing.
- 1.03** TEC will inspect at its discretion those areas to be repaired or renovated after preparatory Work has been completed and prior to any paint coating application or placement of any patching, sealing or other materials to insure all surfaces have been properly prepared. All concrete surfaces shall be inspected by TEC prior to application of any new paint coating system products.
- 1.04** A minimum of 48 hours notice of any required inspection shall be provided by the Contractor to allow scheduling of such inspections. Except in emergency situations, schedule such inspections when sufficient repair areas are prepared to effectively utilize TEC's time.

**CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS**

**1.01 STORAGE**

Limited storage may be available within the parking structure for overnight and weekend storage of Contractor's lock boxes and materials. The Contractor shall obtain approval of storage areas from the Owner.

**1.02 TEMPORARY UTILITIES**

**A. Temporary Electric**

The Contractor shall provide temporary power for use during repair Work. Temporary power service shall comply with current NEC and OSHA standards. The Contractor shall maintain these temporary services in good order throughout the project until the repair Work is complete. All extension cords shall be provided by the Contractor or Subcontractor requiring the power.

**B. Temporary Lighting**

The Contractor shall provide, maintain and pay for temporary lighting as required by the Project.

**C. Telephone Service**

The Contractor is responsible for all telephone related communications on this project.

**D. Temporary Water**

The Owner may provide and pay for a reasonable amount of water used for construction purposes provided it is not being wasted. The Contractor shall provide the Owner with written notification and proposed plan for use of water supply source(s) at this project. The Contractor shall provide and maintain necessary temporary connections to the source(s) of temporary supply and remove same upon completion of the Work. Contractor shall protect all water supply source connections during all water usage operations. All water supply usage shall be coordinated with Owner on a daily basis.

**SECTION 01500**

**CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS  
(cont'd)**

**1.02 TEMPORARY UTILITIES (cont'd)**

E. Temporary Sanitary Facilities

Contractor shall provide, pay for, and maintain sufficient and approved temporary toilets with weatherproof enclosures, all satisfactory to the local board of health and the Owner. Keep clean and sanitary at all times.

F. Temporary First Aid Facilities

The Contractor will be responsible for maintaining basic first aid facilities at the construction site.

G. Temporary Fire Protection

The Contractor will be responsible for maintaining fire protection measures for temporary office and at any locations where fire risk is increased due to Contractor's activities.

**1.03 BARRIERS**

The Contractor shall be responsible for supplying and maintaining construction related signage and traffic barriers. Signage and barriers shall be adequately sized and properly worded to be visible and understandable to motorists and pedestrians and shall be positioned and situated to provide proper safety for all vehicles and pedestrians.

**1.04 SECURITY**

The Contractor shall be responsible for the security of this project. It shall be his responsibility to construct and maintain any required pedestrian walkways, barricades, screens, railings and fences in strict accordance with all applicable codes for protection of pedestrians and parking structure users.

**1.05 TEMPORARY CONTROLS**

A. Noise Control

Comply with City and OSHA requirements.

**SECTION 01500**

**CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS  
(cont'd)**

**1.05 TEMPORARY CONTROLS (cont'd)**

**B. Dust Control**

Comply with City and OSHA requirements. All reasonable effort shall be made to contain dust within the actual Work area limits. Full height dustproof barriers shall be installed at area where Work is proceeding as needed to prevent dust from reaching structure occupants, vehicles within or near the structure or persons immediately outside of the structure. Owner reserves the right to require the Contractor, at no additional cost, to erect additional dustproof barriers at any location where Work is proceeding, if dust is not controlled to Owner's satisfaction.

**C. Debris Control**

Restrict all Work related debris to actual Work zones. Continually remove all construction debris from the Work areas on a daily basis. Do not allow any debris to accumulate within the structure from day to day.

**SECTION 01700**

**PROJECT CLOSEOUT**

**1.01 CLEANING**

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

B. At the completion of the Project, the Contractor shall restore or replace all property damaged by its Work and remove all concrete debris, formwork, sealant system debris, membrane spots, paint, soil, plaster, writing, droppings, or other foreign material, from all Work and Work surfaces. Remove all temporary protection from all Work.

**1.01.5 DRAWINGS**

Contractor shall prepare legible as-built drawings for all work areas showing all work types, actual quantities and locations. These drawings shall be submitted to both the Owner and Engineer for review.

## **1.02 WARRANTIES AND BONDS**

By the act of executing the Agreement for this Work, the Contractor accepts the following guarantee covering the Project:

Any materials, workmanship or equipment furnished as a part of this project which prove defective or fail to operate properly, within one (1) year of the date of acceptance of the Work required under this project, or as otherwise specified in these Contract Documents, (damage by wear and tear or violence or casualty not the fault of the Contractor excepted) shall be repaired and replaced by the Contractor promptly upon notification from the Owner and without cost to the Owner. Date of acceptance will be established by the Owner and Engineer upon finding all items of this Project substantially complete with respect to quality of workmanship and materials.

## **SECTION 02030**

### **SURFACE PREPARATION FOR NEW STRUCTURAL CONCRETE PATCHING**

#### **PART 1 – GENERAL**

##### **1.01 WORK INCLUDED**

This work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to locate and remove all deteriorated or otherwise unsound concrete or masonry and to prepare cavities created by said removal to receive new structural concrete patching material. Also included in this work is preparation of existing surface spalls and cavities to receive patching material.

##### **1.02 RELATED WORK**

The following sections are directly related to and shall be coordinated with surface preparation for patching:

1. 03710 Polymer Modified Mortar

##### **1.03 REFERENCES**



A. "Specifications for Structural Concrete for Buildings" (ACI 301-84) by American Concrete Institute, herein referred to as ACI 301, is included in total as specification for this project except as may otherwise be specified herein.

B. Comply with provisions of following codes, specifications and standards except where more stringent requirements are shown on drawings or specified herein:

1. "Guide for Repair of Concrete Bridge Superstructures" (ACI 546.1R-80), American Concrete Institute.

**PART 2 - PRODUCTS - NOT USED**

**SECTION 02030**

**SURFACE PREPARATION FOR PATCHING  
(cont'd)**

**PART 3 – EXECUTION**

**3.0.1 INSPECTION**

A. Vertical and Overhead Surfaces:

1. Locations of all deck underside ceiling, beam, wall and column concrete delamination repairs are shown on drawings. Contractor shall only repair indicated areas shown on repair plan drawings with any additional locations to be determined by Engineer.

2. Contractor shall only sound concrete or masonry surfaces that show evidence of cracking or debonding/delamination.

C. Deteriorated or Delaminated concrete or masonry surfaces, once located by Contractor, will be further examined and verified by Contractor and Engineer with contractor sounding to define delamination limits. These limits or boundaries, once defined, shall be marked.

D. Contractor shall locate delaminations or spalls by visual inspection and mark their boundaries after sounding surface.

E. Engineer shall be notified by Contractor and shall define and mark any additional unsound concrete or masonry areas for repair, if required. Contractor will not be paid for any additional repair quantities (more than original contract amount) unless Engineer is notified and verifies additional Work.

F. Areas to be removed shall be as straight and rectangular as practical to encompass repair and provide neat repair.

**3.0.2 PREPARATION**

A. Temporary shoring may be required at or near concrete deck, underside beam, or concrete wall areas where concrete or masonry repairs are specified. Contractor shall review all areas marked for removal and preparation and request clarification by the Engineer of any shoring requirements in questionable areas. Shoring must remain in place until all structural support element related repairs are fully completed and cured.

B. Delaminated, spalled and unsound concrete or masonry areas shall have their boundaries marked. All unsound concrete or masonry shall be removed from within marked

**SECTION 02030**

**SURFACE PREPARATION FOR PATCHING  
(cont'd)**

boundary. Unless approved by Engineer, chipping hammers less than 15 pounds shall be used to minimize damage to sound concrete. If delaminations exist beyond minimum removal depth, then removal shall continue until all unsound and delaminated concrete has been removed. Contractor shall immediately notify engineer if any non-indicated unsound floor, column or wall areas are encountered.

C. Where embedded reinforcement in vertical surfaces is exposed by concrete removal, extra caution shall be exercised to avoid damaging it during removal of additional unsound concrete. Contractor shall perform additional removal around and beyond perimeter of reinforcement for minimum of 3/4" along entire length affected at no cost to Owner.

D. For vertical surfaces, marked boundary to be saw cut to depth of 1/2" into existing concrete, measured from original surface. All edges shall be straight and patch areas shall be square or rectangular-shaped. Diamond blade saw suitable for cutting concrete is acceptable for performing this work. Edge cut at delamination boundary shall be dressed perpendicular to member face. It shall also be of uniform depth, for entire length of cut. Extra caution shall be exercised during saw cutting operations to avoid damaging existing reinforcement near surface of concrete.

**3.0.3 INSPECTION OF CAVITY SURFACES AND EXPOSED REINFORCING**

A. After removals are complete but prior to final cleaning, cavity surfaces and exposed reinforcement shall be inspected by Contractor and verified by Engineer for compliance with requirements of this Section. Where Engineer finds unsatisfactory cavity preparation, Engineer shall direct Contractor to perform additional removals. Engineer shall verify areas after additional removals.

B. Contractor shall inspect embedded reinforcement exposed within cavity for any defects due to corrosion or damage resulting from removal operations. Contractor shall notify Engineer of all defective and damaged reinforcement. Replacement of damaged reinforcement shall be performed according to this Section and as directed by Engineer.

**3.0.4 REINFORCEMENT IN VERTICAL CONCRETE REPAIR AREAS**

A. Any embedded rebar reinforcement exposed during surface preparation that has lost more than 20% of original cross-sectional area due to corrosion shall be considered

**SECTION 02030**

**SURFACE PREPARATION FOR PATCHING  
(cont'd)**

DEFECTIVE. Any exposed rebar reinforcement that has lost section to extent specified above as direct result of Contractor's removal operations shall be considered DAMAGED.

B. Supplement DEFECTIVE or DAMAGED embedded rebar reinforcement by addition of epoxy coated reinforcement of equal diameter with Class "C" minimum splice per ACI 318 beyond damaged portion of reinforcement. Secure new reinforcement to existing reinforcement with epoxy or plastic coated wire ties and/or approved anchors. Supplemental reinforcing bars shall be ASTM Grade 60 steel installed in accordance with Section 03200.

C. Loose rebar reinforcement exposed during surface preparation shall be securely anchored prior to concrete placement. Loose reinforcement shall be adequately secured by epoxy or plastic coated wire ties to bonded reinforcement or shall have drilled-in anchors installed to original deck. Engineer shall determine adequacy of wire ties and approve other anchoring devices prior to their use. Securing loose reinforcement is incidental to surface preparation and no extras will be allowed for this work.

**PART 3 – EXECUTION (cont'd)**

**3.0.4 REINFORCEMENT IN VERTICAL CONCRETE REPAIR AREAS (cont'd)**

D. Concrete or masonry shall be removed to provide minimum of 3/4 inch clearance on all sides of DEFECTIVE or DAMAGED exposed embedded rebar reinforcement.

E. Concrete removal and supplemental reinforcement required for repair of DAMAGED reinforcement shall be paid for by the Contractor.

**3.05 CLEANING OF REINFORCING WITHIN DELAMINATION AND SPALL CAVITIES**

A. All exposed steel shall be cleaned of rust to bare metal by sandblasting. Cleaning shall be completed immediately before patch placement to insure that base metal is not exposed to elements and further rusting for extended periods of time.

B. Paint exposed steel which has been sandblasted with the approved coating and protect from damage prior to and during structural patch placement.

**3.06 PREPARATION OF CAVITY FOR CONCRETE SLAB PLACEMENT**

A. Cavities will be examined prior to commencement of concrete placement operations. Sounding of surrounding surfaces shall be part of examination. Any additional delamination noted during sounding shall be removed as specified in this Section.

B. Cavities shall be air blasted prior to patching.

**SECTION 02070**

**SELECTIVE DEMOLITION**

**PART 1 – GENERAL**

**1.01 RELATED DOCUMENTS:**

1.01.01 Drawings and all other provisions of this Contract, including General Conditions and Division-1 apply to Work of this section.

**1.02 DESCRIPTION OF WORK:**

1.02.01 Extent of Selective Demolition Work is Indicated on Drawings or within specifications.

1.02.02 Types of Selective Demolition Work: Demolition requires the selective removal and subsequent off-site disposal of the following:

.01 Selective unsound portions of concrete slabs/deck, beams, walls, columns, traffic coating and sealant as indicated on Drawings and as required to accommodate the repairs.

1.02.03 Related Work specified elsewhere:

.01 Concrete restoration is included within the respective sections of specifications.

**1.03 SUBMITTALS:**

1.03.01 Schedule: Submit schedule indicating proposed methods and sequence of operations for selective demolition Work to Owner's Representative for review prior to commencement of Work. Include coordination for shut-off, capping, and continuation of utility services as required, together with details for dust and noise control protection.

.01 Provide detailed sequence of demolition and removal Work to ensure uninterrupted progress of Owner's on-site operations.

.02 Coordinate with Owner's continuing occupation of portions of existing parking structure and access needs to the ramp and stairwell.

**1.04 JOB CONDITIONS:**

1.04.01 Occupancy: Owner will be continuously occupying portions parking structure immediately adjacent to areas of selective demolition. Conduct selective demolition Work in manner that will minimize need for disruption of Owner's normal operations. Provide minimum of 72 hours advance notice to Owner of demolition activities which could possibly impact Owner's normal operations.

1.04.02 Condition of Structures: Owner assumes no responsibility for actual condition of items or structures to be demolished.

1.04.03 Partial Demolition and Removal: Items indicated to be removed but of salvageable value to Contractor may be removed from structure as Work progresses. Transport salvaged items from site as they are removed.

.01 Storage or sale of removed items on site will not be permitted.

1.04.04 Protections: Provide temporary barricades and other forms of protection as required to protect Owner's personnel and general public from injury due to selective demolition Work.

.01 Provide protective measures as required to provide free and safe passage of Owner's personnel and general public to and from occupied portions of the parking structure.

.02 Erect temporary covered passageways as required by authorities having jurisdiction.

.03 Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of structure or element to be demolished, and adjacent facilities or Work to remain.

.04 Protect from damage existing finish Work that is to remain in place and becomes exposed during demolition operations.

.05 Protect floors and walls with suitable coverings as necessary for proper protection.

**1.04 JOB CONDITIONS: (cont'd)**

.06 Construct temporary insulated solid dustproof partitions where required to separate areas where noisy or extensive dirt or dust operations are performed. Equip partitions with dustproof doors and security locks if required.

.07 Provide temporary weather protection as needed during interval between demolition and removal of existing construction, and installation of new construction to insure that no water leakage or damage occurs to structure or interior areas of existing parking structure.

.08 Remove protections and provide proper clean-up of all work related materials at completion of Work.

1.04.05 Damages: Promptly repair damages caused to adjacent facilities by demolition Work at no cost to Owner.

1.04.06 Traffic: Conduct selective demolition operations and debris removal in a manner to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.

.01 Do not close, block or otherwise obstruct streets, walks or other occupied or used facilities without written permission from the Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

1.04.07 Explosives: Use of explosives are not permitted.

1.04.08 Utility Services: Maintain existing utilities indicated to remain, keep in service, and protect against damage during demolition operations.

.01 Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.

1.04.09 Environmental Controls: Use water sprinkling, temporary enclosures, and other suitable methods to limit dust and dirt rising and scattering in air to lowest practical level. Comply with governing regulations pertaining to environmental protection.

.01 Do not use water when it may create hazardous or objectionable conditions such as ice, flooding and pollution.



**PART 2 - PRODUCTS – NOT USED**

**PART 3 - EXECUTION**

**3.01 INSPECTION**

3.01.01 Prior to commencement of selective demolition Work, inspect areas in which Work will be performed. Photograph existing conditions including structure surfaces, equipment or surrounding surfaces and properties which could be misconstrued as damage resulting from selective demolition Work; file photographic documentation with Owner's Representative prior to starting Work.

3.01.02 Investigate and test any and all materials and surfaces to be encountered during Work operations for hazardous material or chemical content. Notify Owner and Engineer of all findings and properly mitigate any determined hazardous conditions per all applicable health, safety and regulatory requirements. Do not proceed with any demolition activities until all hazardous material concerns are fully and properly addressed.

**3.02 PREPARATION:**

3.02.01 Provide interior and exterior shoring, bracing, or support to prevent movement, settlement or collapse of structures to be demolished and adjacent facilities to remain.

.01 Cease operations and notify the Owner's Representative immediately if safety of structure appears to be endangered. Take precautions to support structure until determination is made for continuing operations.

3.02.02 Cover and protect equipment and fixtures to remain from soiling or damage when demolition Work is performed in roofs or areas from which such items have not been removed.

3.02.03 Erect and maintain dustproof partitions and closures as required to prevent spread of dust or fumes to occupied portions of the parking structure.

**3.03 DEMOLITION:**

3.03.01 Perform selective demolition Work in a systematic manner. Use such methods as required to complete Work indicated on drawings in accordance with demolition schedule and governing noise, dust and hazardous material requirements and regulations.

**3.03 DEMOLITION: (cont'd)**

.01 Demolish concrete or other unsound/defective materials to be removed in small sections. Cut concrete at junctures with construction to remain using power-driven saw or hand tools.

.02 Locate demolition equipment throughout structure and promptly remove debris to avoid imposing excessive loads on supporting walls, floors or framing.

.03 Provide services for effective air and water pollution controls as required by local authorities having jurisdiction.

.04 Do not allow any materials which may clog the drainage system to enter the system at any point. Filter all contaminants from water entering the drain system during construction operations. Leave drain system in a clean condition.

3.03.02 If unanticipated mechanical, electrical or structural elements which conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit report to Owner's Representative in written, accurate detail. Pending receipt of directive from Owner's Representative, rearrange selective demolition schedule as necessary to continue overall job progress without delay.

**3.04 DISPOSAL OF DEMOLISHED MATERIALS:**

3.04.01 Remove debris, rubbish and other materials resulting from demolition operations from parking structure site. Transport and legally dispose of materials off site.

.01 If hazardous materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling and protection against exposure or environmental pollution.

**SECTION 03700**

**MICROSILICA CONCRETE**

**PART 3 – EXECUTION** (cont'd)

**3.05 CLEAN-UP AND REPAIR:**

3.05.01 Upon completion of demolition Work, remove tools, equipment and demolished materials from site. Remove protections and leave all areas broom clean.

3.05.02 Repair demolition performed in excess of that required. Return structures and surfaces to remain to condition existing prior to commencement of selective demolition Work. Repair adjacent construction or surfaces soiled or damaged by selective demolition Work.

**SECTION 03700**

**MICROSILICA CONCRETE**

**PART 1 - GENERAL**

**1.01 WORK INCLUDED**

A. In accordance with Contract Documents, provide all labor, materials and equipment necessary for production and installation of micro silica type concrete for new deck top surface patch repairs at deck topside surface delamination or deterioration distress locations shown on repair plan drawings.

**1.02 RELATED WORK**

A. The following Work is related to and shall be coordinated with placement of micro silica concrete and mortar:

1. 02030 Surface Preparation for Patching.
2. 03200 Concrete Reinforcement.
  3. 03370 Concrete Curing.
  4. 07100 Concrete Control Joint and Crack Sealant System.
  5. 07570 Membrane Coating System

**1.03 QUALITY ASSURANCE**

A. Work shall conform to requirements of ACI 301 and ACI 318, except where more stringent requirements are specified in this Section.

**SECTION 03700**

**MICROSILICA CONCRETE**

B. Contractor shall have at least three years previous experience installing Microsilica type Concrete Repair Toppings and shall have performed minimum of three projects of similar nature.

**1.4 SUBMITTALS**

- A. Make submittals in accordance with requirements of Division 0-1 of this Specification, and as herein specified.
- B. Contractor shall submit concrete mix design to Engineer minimum two weeks prior to placing concrete. Proportion mix designs as defined in ACI 301, Article 3.9. Include following information for each concrete mix design:

**SECTION 03700**

**MICROSILICA CONCRETE**  
**(cont'd)**

1. Method used to determine proposed mix design (per ACI 301, Article 3.9).
2. Gradation of fine and coarse aggregates: ASTM C33.

**PART 1 – GENERAL** (cont'd)

**1.04 SUBMITTALS** (cont'd)

3. Proportions of all ingredients including all admixtures added either at time of batching or at job site.
  4. Water-cement ratio 0.40 maximum.
  5. Slump: ASTM C143.
  6. Certification of chloride content of admixtures.
  7. Air content of freshly mixed concrete by pressure method, ASTM C231.
  8. Unit weight of concrete: ASTM C138.
  9. Compressive strength at 3 and 28 days.
  10. Water soluble chloride ion content of concrete per FHWA-RD-77-85.
- C. Contractor: At preconstruction meeting, submit procedures to protect fresh concrete from rain, hot and cold weather conditions and vehicular traffic as well as surface drying or cracking.

**1.5 TRANSPORTATION AND DISCHARGE**

- A. Concrete batched on-site shall be placed and finished within 30 minutes of adding water to mixture.
- B. Concrete batched off-site shall be placed and finished within 75 minutes of adding water to mixture.

**SECTION 03700**

**MICROSILICA CONCRETE**  
(cont'd)

**PART 2 – PRODUCTS**

**2.01 MATERIALS**

A. Aggregates (ACI 301, Article 2.4):

1. Normal weight concrete aggregates:

A. Coarse aggregate: Crushed and graded limestone or approved equivalent conforming to ASTM C33, Class Designation 4S.

B. Fine aggregate: Natural sand conforming to ASTM C33 and having preferred grading shown for normal weight aggregate in ACI 302.1R, Table 4.2.1.

2. Coarse aggregate: Nominal sizes indicated below, conforming to ASTM C33, Table 2:

a. 3/8 inch for patch cavities 1 to 1-1/2 inches deep.

b. 1/2 inch for patch cavities greater than 1-1/2 inches deep.

3. Chloride Ion Level: Chloride ion content of aggregates shall be tested by laboratory making trial mixes. Also, total water soluble chloride ion content of mix including all constituents shall not exceed 0.15% chloride ions by weight of cement. Test to determine chloride ion content shall conform to Federal Highway Administration Report No. FHWA-RD-77-85, "sampling and Testing for Chloride Ion in Concrete".

B. Cement (ACI 301, Article 2.1):

1. Portland cement, Type I, ASTM C150. Use one cement clinker source throughout project. No change in brand without prior written approval from Engineer.

C. Water (ACI 301, Article 2.3):

1. ASTM C94.

**SECTION 03700**

**MICROSILICA CONCRETE  
(cont'd)**

**PART 2 – PRODUCTS (cont'd)**

**2.01 MATERIALS (cont'd)**

D. Microsilica Additive:

1. "Force 10,000", W.R. Grace, Cambridge, MA.
2. "Rheomac SF 100, Master Builders, Inc, Cleveland, Ohio
3. Proposed Substitution: Contact Engineer.

E. Admixtures (ACI 301, Article 2.2):

1. Concrete supplier and manufacturer shall certify compatibility of all ingredients in each mix design.
2. Use admixtures in strict accordance with manufacturer's recommendations.
3. Prohibited Admixtures: Calcium chloride, thiocyanates or admixtures containing more than 0.5% chloride ions, by weight of admixture, are not permitted. Additionally, each admixture shall not contribute more than 5 ppm, by weight, of chloride ions total concrete constituents.
4. Air entraining admixtures, ASTM C260:
  - a. "Darex AEA", W.R. Grace.
  - b. "Micro Air", Master Builders.
  - c. Proposed Substitution: Contact Engineer.

F. Storage of Materials (ACI 301, Article 2.5).

**SECTION 03700**

**MICROSILICA CONCRETE**  
(cont'd)

**PART 2 – PRODUCTS (cont'd)**

**2.2 CONCRETE MIX DESIGN**

- A. Selection of concrete proportions shall be in accordance with ACI 301, Article 3.9. Before any concrete is placed for project, Contractor shall submit to engineer data for the proposed concrete mix design, including fine and coarse aggregate gradations, proportions of all ingredients, water/cement ratio, slump, air content, cylinder breaks and other required data specified in Section 2.01 for each different concrete type specified. Mix design shall meet following minimum requirements:

**2.3 MIX DESIGN REQUIREMENTS**

Compressive Strength	- 6,000 psi at 28-days, 3,000 psi at 3 days.
Water/Cement Ratio	- 0.30 to 0.40
Latex Content Sack	- Minimum 10% of cement content by weight.
Slump -	4" +/- 1".
Cement Content	- Minimum 611 pounds/cu. yd.
Air Content	- 4% - 8%.

- A. For concrete placed on ramps, slump may have to be adjusted downward to prevent concrete from running.
- B. Chloride Ion Level: See Section to 2.01.A.3.
- C. Bonding Agent: Bonding Agent shall consist of sand, cement, and micro silica in proportions similar to mortar in concrete with sufficient water to form stiff slurry.

**PART 3 – EXECUTION**

**3.1 PRODUCTION OF MORTAR OR CONCRETE**

- A. Production of micro silica mortar or concrete shall be in accordance with requirements of ACI 301, Chapter 7, except as otherwise specified herein.



**SECTION 03700**

**MICROSILICA CONCRETE**  
**(cont'd)**

**PART 3 – EXECUTION (cont'd)**

**3.1 PRODUCTION OF MORTAR OR CONCRETE (cont'd)**

B. Concrete or mortar, mixed at site, shall be proportioned by continuous mixer used in conjunction with volumetric proportioning. Volumetric batching/continuous mixers shall conform to ASTM C685. In addition, self-contained, mobile, continuous type mixing equipment shall comply with following:

1. Mixer shall be capable of producing batches of not less than 6 cubic yards.
2. Mixer shall be capable of positive measurement of cement being introduced into mix. Recording meter visible at all times and equipped with ticket printout shall indicate this quantity.
3. Mixer shall provide positive control of flow of water into mixing chamber. Water flow shall be indicated by flow meter and shall be readily adjustable to provide for minor variations in aggregate moisture.
4. Mixer shall be capable of being calibrated to automatically proportion and blend all components of indicated composition on continuous or intermittent basis, as required by finishing operation, and shall discharge mixed material through conventional chute into transporting device or directly in front of finishing machine. Sufficient mixing capacity or mixers shall be provided to permit intended pour to be placed without interruption.
5. Mixer shall be calibrated to accurately proportion specified mix. Yield is required to be within tolerance of 1.0 percent.

C. On-site mortar or concrete batching in mixer of at least 1/3 cubic yard capacity shall be permitted only with approval of Engineer. On-site concrete batching and mixing shall comply with requirements of ACI 301, Section 7.2.

**3.02 PREPARATION (ACI 301, ARTICLE 8.1)**

A. Cavity surfaces shall be clean and dry prior to commencement of patch or overlay installation. Preparation of surfaces to receive new concrete shall be in accordance with Section 02030.

**SECTION 03700**

**MICROSILICA CONCRETE**  
(cont'd)

**PART 3 – EXECUTION** (cont'd)

**3.02 PREPARATION (ACI 301, ARTICLE 8.1)** (cont'd)

B. Bonding Agent:

1. Bonding Agent shall be applied to clean dry concrete surface in uniform thickness of 1/16" to 1/8" over all surfaces to receive patching or overlay.
2. Grout shall not be allowed to dry or dust prior to placement of patch or overlay material. If concrete placement is delayed and the coating dries, cavity surface shall not be patched or overlaid until it has been recleaned and prepared as specified in Section 02030. Bonding Agent shall not be applied to more area than can be patched or overlaid within ½ hour by available manpower.

C. Surface finish used on flatwork to match existing surrounding surfaces.

**3.3 INSTALLATION**

A. Placing (ACI 301, Chapter 8):

1. Do not place concrete when temperature of surrounding patch area is less than 45 degrees F or when mix temperature is above 85 degrees F unless following conditions are met:
  - a. Place concrete only when temperature of surrounding air is expected to be above 40 degrees F and rising and expected to be above 45 degrees F for at least 24 hours.
  - b. When above conditions are not met, concrete may be placed only if insulation or heating enclosures are provided in accordance with ACI 306, "Recommended Practice for Cold Weather Concreting". Submit proposed protective measures in writing for Engineer's review prior to concrete placement.
  - c. If mix temperature exceeds 85 degrees F., requirements of ACI 305 "Hot Weather Concreting" shall be met.

**SECTION 03700**

**MICROSILICA CONCRETE  
(cont'd)**

**PART 3 – EXECUTION (cont'd)**

**3.03 INSTALLATION (cont'd)**

- d. Hot weather is defined as air temperature which exceeds 80 degrees F or any combination of high temperature, low humidity and high wind velocity which causes evaporation rates in excess of 0.10 pounds per square foot per hour as determined by ACI 305R, Figure 2.1.5.
- e. Cost for precautionary measures required by Engineer shall be borne by Contractor.
2. Concrete shall be manipulated and struck off slightly above final grade. Concrete shall then be consolidated and finished to final grade with internal and surface vibration devices. Proposed consolidation method shall be submitted for Engineer's review prior to concrete placement.
3. Fresh concrete 3 inches or more in thickness shall be vibrated internally in addition to surface vibration.
4. Concrete shall be deposited as close to its final position as possible. All concrete shall be placed in continuous operation and terminated only at bulkheads or designated control or construction joints.
5. On ramps with greater than 5 percent slope, all concreting shall begin at low point and end at high point. Contractor shall make any necessary adjustment to slump or equipment or provide wearing surface without any irregularities or roughness.

**SECTION 03700**

**MICROSILICA CONCRETE  
(cont'd)**

**PART 3 – EXECUTION (cont'd)**

**3.03 INSTALLATION (cont'd)**

B. Finishing (ACI 301, Chapters 10 and 11):

1. Flatwork (Broom Finish, ACI 301, 11.7.4):

- a. When tight and uniform concrete surface has been achieved by screeding and finishing operation, give slab surface light broom texture finish matching nearby existing slab surface conditions by properly drawing broom tool across fresh concrete surface.
- b. Finishing tolerance: ACI 301, Paragraph 11.9; Class B tolerance.
- c. Finish all concrete surfaces to proper elevations to insure that all surface moisture will drain freely to floor drains, and that no puddle areas exist. Contractor shall bear cost of any corrections to provide for positive drainage.

C. Joints in Concrete (ACI 301, Chapter 6):

1. Construction and control joints locations shall match existing joints prior to slab removal.

- a. Tool joints at time of finishing. Saw cut joints are prohibited.
- b. Coordinate configuration of tooled joints with control joint sealants.

**SECTION 03700**

**MICROSILICA CONCRETE  
(cont'd)**

**PART 3 – EXECUTION (cont'd)**

**3.03 INSTALLATION (cont'd)**

**D. Curing**

1. Microsilica mortar and concrete shall be cured according to micro silica manufacturer's recommendations and according to following minimum requirements:
  - a. Surface shall be covered with single layer of clean, wet burlap as soon as surface will support it without deformation. Cover burlap with continuous single thickness of polyethylene film for 24 hours.
  - b. After 24 hours remove polyethylene film and allow burlap to dry slowly for an additional 24 to 48 hours.
  - c. Remove burlap and allow concrete to air dry for an additional 48 hours.
  - d. Curing time shall be extended, as Engineer directs, when curing temperature falls below 50 degrees F.

**SECTION 03710**

**POLYMER MODIFIED MORTAR**

**PART 3 – EXECUTION** (cont'd)

**3.03 INSTALLATION** (cont'd)

- e. DO NOT ALLOW, FOOT, EQUIPMENT OR VEHICLE TRAFFIC ON OR NEAR COMPLETED DECK TOP SURFACE PATCH REPAIR WORK FOR A MINIMUM OF 3 DAYS FOLLOWING INSTALLATION.

**E. Repair of Defects (ACI 301, Chapter 9):**

1. Repair surface defects exceeding ¼ inch width or depth.
2. Submit samples of materials or relevant literature and test data on proprietary compounds and procedures used for adhesion or patching ingredients to Engineer for his review before patching concrete.
3. Receive written approval of Engineer of method and materials prior to making repairs to concrete.

**SECTION 03710**

**POLYMER MODIFIED MORTAR**

**PART 1 - GENERAL**

**1.01 WORK INCLUDED**

- 2 In accordance with Contract Documents, provide all labor, materials, supervision and incidentals necessary to prepare delaminated, spalled, deteriorated or otherwise damaged concrete surfaces and install structural concrete patching to overhead, horizontal or vertical surfaces to restore original support, integrity and appearance.

**1.02 RELATED WORK**

A. Following Work is directly related to and shall be coordinated with application of polymer modified mortar:

1. 02030 Surface Preparation for Patching.
  - F. 02070 Selective Demolition.

**SECTION 03710**

**POLYMER MODIFIED MORTAR**

**G.** Work Item Nos.2-4.5.

**1.03 QUALITY ASSURANCE**

- d. Work shall conform to requirements of ACI 301 as applicable except where more stringent requirements are shown on Drawings or specified in this Section.

**SECTION 03710**

**POLYMER MODIFIED MORTAR**

**PART 1 – GENERAL (cont'd)**

**1.04 REFERENCES**

- 4 “Specifications for Structural Concrete for Buildings” (ACI 301-84) by American Concrete Institute, herein referred to as ACI 301, is included in total as specification for this project except as may otherwise be specified herein.
- 5 Comply with provisions of following codes, specifications and standards except where more stringent requirements are shown on drawings or specified herein:
  - 5.3 “Building Code Requirements for Reinforced Concrete” ACI 318-83), American Concrete Institute, herein referred to as ACI 318.
  - 5.4 “Hot Weather Concreting” reported by ACI Committee 305 (ACI 305R-77).
  - 5.5 “Cold Weather Concreting” reported by ACI Committee 306 (ACI 306R-78).

C. Contractor shall have following ACI publications at project construction site at all times:

1. “Specifications for Structural Concrete for Buildings (ACI 301-84) with Selected ACI and ASTM References”, ACI field Reference Manual, SP15 (84).
2. “Hot Weather Concreting” reported by ACI Committee 305 (ACI 305R-77).
3. “cold Weather Concreting” reported by ACI Committee 306 (ACI 306R-78).

**1.05 SUBMITTALS**

C. Make submittals in accordance with Work Item requirements and this Section. Proposed material submittal required.

B. Contractor: At preconcrete meeting, submit procedures to protect fresh concrete repairs from damage due to drying, cracking, wet or severe weather conditions.



**SECTION 03710**

**POLYMER MODIFIED MORTAR**

**PART 2 – PRODUCTS**

**2.01 MATERIALS**

6. Approved structural mortar repair materials shall have minimum three day compressive strength of 3,000 psi and 5,000 psi at 28 days as certified by manufacturer.
7. Approved structural mortar materials for this Work are:
  - A. “EMACO R.310CI/R350CI, Master Builders, Inc., Cleveland, OH
  - B. “Sikatop 123 Plus”, Sika Corporation, Lyndhurst, NJ.
  - C. Other materials may be used only with Engineer’s approval.
8. Patch material extension aggregate for the structural mortar shall be sound non-absorbative crushed stone and meet structural mortar manufacturer’s requirements.
9. New mortar anchoring devices shall be stainless steel pins intended for this application with minimum 3/8 inch diameter and lengths to allow for secure substrate attachment and minimum 1.5 inch concrete cover.

**SECTION 03710**

**POLYMER MODIFIED MORTAR**

**PART 3 – EXECUTION**

**3. PREPARATION**

- D. Repair Preparations: Preparation of repair location and repair cavities to receive new structural repair mortar shall be in accordance with Section 02030, Section 02070 and manufacturer's instructions. Repair cavity surfaces shall be clean and prepared per repair mortar manufacturer's directions prior to commencement of structural patch installation.
- E. Anchoring: As needed, install new stainless steel anchors into sound concrete within concrete repair area cavity to provide for overall sound and permanently secure repair material installation.

**3.02 INSTALLATION**

- D. Bonding Agent:
  - 1. Apply bonding agent in strict accordance with manufacturer's recommendations.
  - 2. If bonding agent dries, cavity shall not be patch until it has been re-cleaned and prepared as specified in Section 02030. Bonding Agent shall not be applied to more cavities than can be patched within ¼ hour of available manpower.
- E. Placement: Patching materials shall be placed immediately following bonding grout application in strict accordance with manufacturer's instructions. Properly proportioned and mixed patch material shall be placed using trowels to consolidate patch such that no voids exist within new material and continuous contact with base concrete is achieved. Completed repair shall match profile and appearance of surrounding sound concrete. Shotcreting may also be an acceptable placement procedure for vertical and overhead repairs if an ACI certified nozzle-man performs the installation and proposed materials and procedures are submitted and approved by the Engineer.

**SECTION 03710**

**POLYMER MODIFIED MORTAR**

**PART 3 – EXECUTION (cont'd)**

**3.03 CURING**

- D. No traffic shall be allowed to drive on decks above freshly placed beam, column, wall or deck underside concrete patch repairs for minimum of 48 hours after patch placement and until new repair material has obtained a minimum strength level of 3,000 psi compression strength.
- E. After placement, cure mortar in strict accordance with manufacturer's recommendations. When ambient conditions may cause premature surface drying, provide continuous moist cure by misting, sprinkling, or use of absorptive mat or fabric covering kept continuously moist for period of time as required by manufacturer.

**3.04 FIELD QUALITY CONTROL (ACI 301, CHAPTER 16)**

**3 Acceptance of Structure (ACI 301, Chapter 18):**

- 1. Acceptance of completed concrete Work will be according to provisions of ACI 301, Chapter 18.
- 2. Concrete repair areas shall be sounded by Engineer and Contractor with hammer or rod after curing for 72 hours. Contractor shall repair all hollowness detected by removing and proper replacement of patch repair at no extra cost to Owner.
- 3. If cracks appear in patch area following installation for up to one year following repair work, patching repair shall be removed and replaced by Contractor at no extra cost to Owner.

**SECTION 03740**

**PENETRATING SEALER**

**PART 1 - GENERAL**

**1.01 RELATED DOCUMENTS**

Drawings and general provisions of the Contract, including General and Supplementary General Conditions and Division-1 Specifications sections apply to the work specified in this section.

## **1.02 RELATED WORK**

- A. Provide all labor, material, equipment, supervision, and incidentals necessary to prepare concrete surfaces and install concrete sealer product as required in accordance with manufacturer's recommendations and the Contract Documents.
- B. Install concrete sealer on all exposed concrete walkway and equipment pad surfaces along perimeter of topside level in areas shown on repair plan drawings.

## **PART 2 – MATERIALS AND EQUIPMENT**

### **2.01 ACCEPTABLE CONCRETE SURFACE SEALER MATERIALS**

- A. "Enviroseal 40" manufactured by BASF Corp., Shakopee, MN
- B. Proposed substitution: Contact Engineer for application.

### **2.02 EQUIPMENT**

- A. The sealer application equipment shall be a low pressure sprayer.

## **PART 3 – EXECUTION**

### **3.01 PREPARATION**

- A. Thoroughly clean the existing concrete surfaces with a medium pressure, waterblasting wand system to remove surface dirt, grit, oil, for any other surface contaminants. Maximum water pressure shall be 1,200 psi.

**PART 3 – EXECUTION (cont'd)**

**3.01 PREPARATION (cont'd)**

Contractor is responsible for necessary water supply. Coordination with the Owner for a building water supply may be possible. Contractor shall provide for the disposal of runoff water generated by the cleaning process. All preparation shall be in accordance with sealer manufacturer's instructions.

- B. Concrete surfaces shall be air dried for at least 72 hours at temperatures above 50°F before applying protective sealer.

**3.02 APPLICATION**

- A. Apply concrete sealer in strict accordance with manufacturer's specifications and recommendations.
- B. Apply the concrete sealer to the entire area of all specified concrete surfaces with a low pressure sprayer to ensure uniform application rate over the treated area.
- C. All concrete surfaces to be treated shall be dry and above 40°F during application and for at least 7 days following application of sealer.
- D. The entire surface shall be kept wet (saturated) with sealer by respraying, when and where necessary, with a minimum two coat application.
- E. Do not allow contact with glass or other finished non-concrete surfaces.
- F. Remove all discarded sealer material, rubbish, cans, and rags from the job site.
- G. Clean all surfaces affected by sealer material overspray and repair all damage caused by sealer material overspray to adjacent property at no cost to the Owner.

**SECTION 07100**

**JOINT AND CRACK SEALANT SYSTEMS**

**PART 1 - GENERAL**

**1.01 WORK INCLUDED**

- 5. Single installer shall be responsible for providing selective concrete deck, walkway slab, curbing, coping stone and equipment pad joint and crack repair

sealant systems designed to minimize occurrence of common sealant, joint and crack cavity related distress issues.

B. In accordance with Contract Documents, furnish all labor, materials, equipment, and supervision for installation of appropriate system shown and detailed on Drawings and described in this Section.

## **1.02 RELATED WORK**

4 Work in other Sections related to Sealant System:

- 4.2 03370 Concrete Curing.
- 4.3 03700 Microsilica Concrete.
- 4.4 07570 Membrane Coating System.
- 4.5 Work Item Nos.5.0-9.0.

B. All materials shall be compatible with materials of related Work with which they come into contact, and with materials covered by this Section.

## **1. QUALITY ASSURANCE**

A. Prequalification of Bidders:

- 1. With Bid, submit proposed Section 007100 qualifications for any subcontractor(s). Engineer shall notify General Contractor whether or not subcontractor(s) acceptable within ten working days of bid.

E. Prequalification Criteria, all in writing:

- a. Evidence of compliance with 1.03.C below, and with 1.01.A above.
- b. Evidence of acceptable previous work on similarly designed projects. If none, so state.

**PART 1 – GENERAL (cont'd)**

**4. QUALITY ASSURANCE (cont'd)**

**B. General**

- F. Provide certification, by each system manufacturer to engineer that system installer is an approved applicator.
- G. All Work under Section 07100 shall be performed by organizations which have successfully performed at least five verifiable years of installations similar to those involved in this contract. System installed shall submit listing of three or more prior installations in collate similar to that for this Project.
- H. Final selection of Section 07100 installer shall be subject to acceptance by Engineer. Engineer retains right to reject any installer.

**C. Concrete Deck and Walkway, Joint and Crack Sealant Systems**

- 1. Review all joint and crack repair details and sealant manufacturer instructions and details before construction.

**5. REFERENCES**

- 1. American Society of Testing and Materials (ASTM)
  - i. ASTM D2240, "Test for Indentation Hardness of Rubber and Plastics by Means of a Durometer".
  - ii. ASTM E119, "Fire Tests of Building Construction and Materials".

**1.05 SUBMITTALS**

- A. Make submittals in accordance with requirements of Division 1 and as specified in this Section.
- B. General
  - 1. Section 07100 contractor's experience record for past five years.
- C. Concrete Deck and Walkway, Joint and Crack Sealant Systems.
  - 1. Sealant Manufacturer data sheets and sealant details.



**1.06 DELIVERY, STORAGE AND HANDLING**

- 4 Deliver all materials to site in original, unopened containers, bearing following information.
  - 4.1 Name of project.
  - 4.2 Name of manufacturer.
  - 4.3 Date of preparation.
  - 4.4 Lot or batch number.
- 5 Store materials under cover and protect from weather. Replace packages or materials showing any signs of damage with new material at no additional cost to Owner.

**F. WARRANTY**

- 4 Article 1.07 applies to all materials covered in Section 07100.
- 5 System Manufacturer: Furnish Owner with written total responsibility guarantee that system will be free of defects, water penetration and chemical damage related to sealant system installation workmanship or material deficiency, consisting of:
  - 5.1 Any adhesive or cohesive failures.
  - 5.2 Abrasion or tear failure resulting from normal wear of traffic.
- 6 If material surface shows any of defects listed above or if water leakage through joint or crack is determined, supply labor and material to properly repair all defective areas.
- 7 Guarantee period shall be five (5) years commencing with date of acceptance of completed Work.
- 8 Perform any repair under this guarantee at no cost to Owner.
- 9 Before construction, provide Owner with sample of final guarantee. Actual final guarantee shall be provided by Contractor and Manufacturer.

**PART 2 – PRODUCTS**

**2. MATERIALS**

**A. Joint and Crack Sealant Systems**

- 9.1 Provide complete system of compatible materials designed by manufacturer to produce sealed waterproof joints as required and specified for all applicable Work Items on this project.
- 9.2 Compounds used for sealants shall not stain concrete or any surrounding surfaces. Aluminum pigmented compounds not acceptable.
- 9.3 Color of concrete related sealants shall match existing sealant (if present) or adjacent concrete surfaces if sealant is not present.
- 9.4 Sealant backing shall be properly sized undamaged polyethylene foam rod or as specified by sealant manufacturer for each application.
- 9.5 Bond breakers and fillers: as recommended by system manufacturer.
- 9.6 Primer: As recommended by sealant manufacturer, used in accordance with manufacturer's printed instructions.

**B. New Sealant for Concrete Deck, Walkway and Equipment Pad related Top Surface Control or Isolation Joints, and Random Deck/Walkway/Equipment Pad Top Surface Cracks. All New Sealant in connection with existing or new Deck Surface Membrane areas shall be as required or directed by membrane manufacturer.**

**3. Acceptable Sealants (unless specified otherwise by membrane coating mfr.):**

- a. DynaTred or Urexpan NR-200, Pecora Corporation, Harleysville, PA.
- b. Sonolastic SL 2, BASF Construction Chemicals, LLC – Building Systems, Shakopee, MN.
- c. Vulkem 45 or THC-900/901, Tremco Commercial Sealants and Waterproofing, Ohio.
- d. Proposed substitutions: Contact Engineer.

C. New Sealant for any Concrete Curbing, Wall, Stair, and Coping Stone related Joints and Cracks.

3 Acceptable Sealants

10. Dynatrol, Pecora Corporation, Harleysville, PA.

11. Sonolastic NP 2, BASF Construction Chemicals, LLC – Building Systems, Shakopee, MN.

12. Dymeric 240, Tremco Commercial Sealants and Water-proofing, Ohio.

13. Proposed substitutions: Contact Engineer.

**PART 3 – EXECUTION**

**3.01 INSPECTION**

11. General:

- A. Inspect surfaces to receive Work and report immediately in writing to Engineer any deficiencies in surface which render it unsuitable for proper execution of Work.
- B. Coordinate and verify that related Work meets following requirements.
  - A. Joint or crack edge and cavity surfaces are acceptable for joint or crack sealant system to be installed.
  - B. Any surface treatments to be applied on concrete surfaces are compatible with Work to be installed.
  - C. Concrete surfaces have or will have completed proper curing period for system selected.
  - D. In coordination with sealant manufacturer, 1) verify proper primer product and usage directions for all new sealant installation applications on this project and 2) verify proper sealant system installation instructions and adhesion performance for all applications on this project.

#### **4. PREPARATION**

##### **5.5.1.1.1.1 Concrete Joint Sealant Systems:**

5.5.1.1.1.1.1 Correct unsatisfactory conditions in a manner acceptable to installer before installing sealant system.

5.5.1.1.1.1.2 Remove existing joint sealant system materials. Grind joint edges smooth and straight as needed before sealing. All surfaces to receive sealant shall be dry and thoroughly cleaned of all loose particles, laitance, dirt, dust, oil, grease or other foreign matter. Obtain written approval of method from system manufacturer before beginning cleaning. Solvent wipe may be required for certain installations.

5.5.1.1.1.1.3 Check preparation of substrate for adhesion of sealant.

**5.5.1.1.1.1.4** Install backing rod per sealant manufacturer's directions with minimum 25% compression.

5.5.1.1.1.1.5 Prime and seal joints according to manufacturer's directions and protect from traffic and adverse weather conditions until sealant is fully cured.

5.5.1.1.1.1.6 Cease installation of sealants or do not install when adverse weather conditions are forecast or under adverse weather conditions, or when temperatures are outside of manufacturer's recommend limitations for installation or curing.

##### **5.5.1.1.1.2 Random Cracks**

5.5.1.1.1.2.1 If not already properly cut and prepared, neatly cut ½ inch wide by ½ inch deep "V" groove along the entire length of the identified crack. Remove existing failed sealant materials if already sealed.

5.5.1.1.1.2.2 Crack cavities shall be cleaned by air blasting.

5.5.1.1.1.2.3 Install properly sized backing rod into base of routed and prepared crack cavity with a minimum of 25% compression.

5.5.1.1.1.2.4 Install sealant in strict accordance with manufacturers' instruction and project details.

### **3.03 INSTALLATION/APPLICATION**

#### A. General:

- 5.1 Do all Work in strict accordance with manufacturer's written instructions and specifications including, but not limited to, condition and moisture content of substrate, atmospheric conditions (including relative humidity and temperature), coverages, thicknesses and texture, and as shown on Drawings.
- 5.2 Manufacturer's technical representative shall be available on site during installation.

#### B. Control Joint and Crack Sealant Systems:

1. Completely fill joint without sagging or smearing onto adjacent surfaces.
2. Fill horizontal joints slightly recessed to avoid any direct contact with wheel traffic.

## **SECTION 07570**

### **TRAFFIC-BEARING DECK WATERPROOFING SYSTEM**

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

##### **1.01 WORK**

In accordance with contract documents, furnish all labor, materials, equipment, supervision and incidentals necessary for preparation of exposed concrete repair surfaces and/or existing coating materials and installation of new heavy-duty traffic-bearing waterproofing membrane (re)coating system materials over prepared existing surfaces and materials at locations shown on repair plan drawings and as described in this Section and Work Item No.6.0 and 7.0 specifications.

#### 4 Related Work:

4.403370 Concrete Curing.

4.503700 Microsilica Concrete

4.607100 Concrete Joint and Crack Sealant System

#### 6 Description of System:

- 6.1 New deck recoating shall be a complete system of compatible materials to create a seamless waterproof membrane at concrete repair locations and over existing membrane system coating.
- 6.2 New deck recoating shall be designated for application on the specific type and application of deck indicated on the drawings and fully compatible with the existing membrane system.

**1.02 QUALITY ASSURANCE**

F. Applicator Qualifications: Applicators shall be approved as licensed applicators.

B. Requirements of Regulatory Agencies:

- 1. The deck coating system shall be rated Class A by Underwriters Laboratories (ASTM E108/UL 790). Containers to bear Underwriters Laboratories labels.
- 2. Materials used in the deck coating system shall meet existing solvent emission regulations (e.g. California Rule 66).

**SECTION 07570**

**TRAFFIC-BEARING DECK WATERPROOFING SYSTEM**  
**(cont'd)**

**PART 1 – GENERAL (cont'd)**

**1.03 SUBMITTALS**

- D. Product Data: Submit product literature with top coat color (matching current color) to be installed and installation instructions.
- E. License Certificate: Submit a currently dated Applicator's License Certificate issued by the manufacturer.

**4.6 PRODUCT DELIVERY STORAGE AND HANDLING**

- 6. Delivery: Coating system materials shall be delivered in original sealed containers, clearly marked with supplier's name, brand name and type of material. Containers to bear UL labels.
- B. Storage and Handling: Recommended material storage temperature is 75°F. Handle products to avoid damage to container. Do not store for long periods in direct sunlight.

**1.05 JOB CONDITIONS**

- G. Environmental Conditions:
- H. Do not proceed with application of recoat materials when deck temperature is less than 40°F.
- I. Do not apply materials unless surface to receive coating is clean and dry, or if precipitation is imminent.
- J. Safety and Health Conditions:
- K. During coating application, it is essential that maximum effort is made to protect the coating mechanic and others near the work place from breathing vapors and coming in contact of material with skin or eyes.

**SECTION 07570**

**TRAFFIC-BEARING DECK WATERPROOFING SYSTEM**  
**(cont'd)**

**PART 1 – GENERAL** (cont'd)

**4.7 JOB CONDITIONS** (cont'd)

- L. In confined areas, the best form of protection against organic solvents or other potentially sensitizing vapors is a fresh air supply. For maximum protection, it is recommended to use NIOSH/MESA approved self-contained breathing apparatus with a full face piece operated in a positive pressure mode.
- M. In unrestricted (open outdoor) areas, it is recommended to wear a suitable mask or respirator of a type approved by NIOSH/MESA.
- N. To prevent excessive skin contact with the material, it is recommended to use fabric coveralls and neoprene or other resistant gloves. To prevent eye contact, wear a full face mask or OSHA-approved protective goggles.
- O. Protection:
  - 1. Keep products away from heat, sparks, and flames. Do not allow use of spark producing equipment during application and until vapors are gone. Post "No Smoking" signs.
  - 2. The overspray and/or solvents from coatings can carry considerable distances and care should be taken to do the following:
    - a. Post warning signs a minimum of 100 feet from the work area.
    - b. Cover all intake vents near the work area.
    - c. Set up winds brakes when needed.
    - d. Minimize or exclude all personnel not directly involved with the coating application.
    - e. Have CO<sub>2</sub> or other dry chemical fire extinguishers available at the jobsite.
    - f. Provide adequate ventilation.



**SECTION 07570**

**TRAFFIC-BEARING DECK WATERPROOFING SYSTEM**  
(cont'd)

**PART 1 – GENERAL** (cont'd)

**4.8 JOB CONDITIONS** (cont'd)

3. After completion of application, do not allow traffic on coated surfaces for a period of at least 48 hours at 75°F and 50% R.H., or until completely cured.

4. Protect plants, vegetation and animals which might be affected by coating. Use drop cloths or masking as required.

**PART 2 – PRODUCTS**

**2.01 MATERIALS**

14. Vehicular Traffic Deck Coating Membrane System:

P. Sonoguard Heavy Duty by BASF Corp, Shakopee, MN.

Q. Pecora-Deck 800-Vehicular by Pecora Corporation, Harleysville, PA.

R. Iso-Flex 750 by Master Builders, Cleveland, OH.

S. Proposed Substitution: Contact Engineer.

**2.02 MATERIAL PERFORMANCE CRITERIA**

**10** Minimum Performance Requirements: The minimum performance requirements for the coating system to be used on this project are:

**2.02 MATERIAL PERFORMANCE CRITERIA** (cont'd)

**SECTION 07570**

**TRAFFIC-BEARING DECK WATERPROOFING SYSTEM**  
(cont'd)

**PERFORMANCE REQUIREMENTS OF CURED FILM**

<b>PHYSICAL PROPERTIES</b>	<b>RESULTS</b>	<b>TEST METHOD</b>
Tensile Strength, psi	2,500 psi	ASTM D412
Elongation at Break at 75°F, % minimum	450%	ASTM D412
Permanent set at break, % minimum	10%	ASTM D412
Hardness Shore "A"	78 to 87	ASTM D2240
Tear Resistance, lbs. per linear inch	250	ASTM D1004
Abrasion resistance at CS-17 wheels	15 mg. Loss	C501 Taber Abrasion 1000 Rev. with 1000 gm/wheel.
Adhesion to substrate, lbs./ln. minimum	30 lbs./in.	ASTM D903
Thermal shock	No loss of adhesion	Alternate Heat/Cold
Weathering Resistances	Slight Chalking	ASTM D822
Moisture Vapor Transmission	1.08 Perms at 36 mills	Procedure B
Resistance to water % change in weight	3%	ASTM D471
Fire resistance of system	Class A	ASTM E108

**SECTION 07570**

**TRAFFIC-BEARING DECK WATERPROOFING SYSTEM**  
**(cont'd)**

**PART 3 – EXECUTION**

**2. INSPECTION**

A. Concrete and existing membrane coating: Verify that the work done under other sections meets the following requirements:

12. That the concrete deck surface is free of ridges and sharp projections. If metal forms or decks are used they should be ventilated to permit adequate drying of concrete on exterior exposed deck.
13. That any concrete repairs have cured for a minimum of 28 days. (Minimum of 4,000 psi compressive strength). Water-cured treatment of concrete is preferred. The use of concrete curing agents, if any, require written approval by the membrane supplier.
14. That any existing membrane coating surfaces are sound and free of any debonded, loose or foreign materials.
15. That damaged areas of the concrete deck be restored to sound conditions and match adjacent areas. Use 100% solids epoxy and sand for filling and leveling.

**3. PREPARATION**

- F. All preparation shall be according to membrane manufacturer's new installation or recoating directions as applicable for each work location.
- G. Cleaning: All membrane or concrete surfaces contaminated with oil or grease shall be vigorously scrubbed with a power broom and a strong non-sudsing detergent. Thoroughly wash, clean and dry.
- H. Etching: Treat any bare concrete surfaces with maximum 10% solution of muriatic acid to remove laitance and impurities. After acid has stopped foaming or boiler, immediately rinse thoroughly with water. Thoroughly re-rinse to remove all remaining muriatic acid solution.

**SECTION 07570**

**TRAFFIC-BEARING DECK WATERPROOFING SYSTEM**  
**(cont'd)**

**PART 3 – EXECUTION**

**5.6 INSPECTION (cont'd)**

- I. Cracks and Cold Joints: Visible hairline cracks (up to 1/16" in width) in concrete and cold joints shall be cleaned, primed and treated with three liberal coats of polyurethane deck coating material. Large cracks (over 1/16" in width) shall be routed and sealed with specified sealant or other one-part moisture cured urethane sealant as recommended by manufacturer. Sealant shall be applied to inside are of crack only, not applied to deck surface. Detail sealed cracks with three coats of polyurethane deck coating material to yield a total thickness of 30 dry mills.
- J. Control Joints: Seal secondary control joints with specified sealant or other one-part moisture cured urethane sealant as recommended by manufacturer.
- F. Surface Condition: Surface shall be clean and dry prior to coating.

**5.7 APPLICATION**

- I. Application/installation shall be according to membrane manufacturer's directions for new installation or recoating work as applicable for each work location.
- J. Primer: Apply primer at a minimum rate of 1/3<sup>rd</sup> gallon per 100 square feet. Within 8 hours of application of primer, base coat must be applied. If base coat cannot be applied within 8 hours, reprime.
- K. Detail Work: Apply a 30 dry mil thickness of polyurethane coating material in three coats over cracks and a minimum distance of 2" on each side of any cracks or control joints. (As noted in 3.02C).
- L. Sheet Flashing: Install sheet flashing where indicated on the drawings after base coats have dried, and before top coats are applied.
- M. Base Coat: Apply 1-2/3 gallons per 100 square feet polyurethane coating material to deck surfaces in two coats to yield an average 20-day mils. Extend base coat over cracks and control joints which have received treatment. Supply base coat same day as prime coat.

**PART 3 – EXECUTION**

**3. APPLICATION (cont'd)**

N. Wearing Surface Coat: Apply in one coat, 2/3<sup>rd</sup> gallon per 100 square feet polyurethane coating material to yield an average of 8 dry mils and immediately broadcast properly graded, evenly distributed, hard (6.5+ Moh's scale) aggregate at the rate of 15 pounds per 100 square feet or as directed by manufacturer to provide a properly installed slip resistant coating surface. When dry, remove excess aggregate and recoat surface with one gallon per 100 square feet of polyurethane coating material to yield an average of 12 dry mils. Total system coating thickness averages 40 dry mils exclusive of aggregate.

G. Double-Texturing: For all heavy traffic areas such as ticket booths, ramps, turn areas, ramp aprons or in other areas subjected to high traffic abrasion, double-texturing is required. In such areas, apply double-texture as follows: after the coat to receive aggregate (the first wearing surface coat) has dried and loose aggregate has been removed, apply one gallon per 100 square feet of polyurethane coating material to yield an average of 12 dry mils and immediately broadcast additional aggregate at a rate of 10 pounds per 100 square feet. When dry, remove excess aggregate and recoat surface with one gallon of polyurethane coating material per 100 square feet to yield an average of 12 dry mils. Double-textured areas will yield an average of 52 dry mils, exclusive of aggregate.

Note: Thickness values of cured film are averages and can vary due to finish of surface.

**4. CLEANING**

A. Remove any coating smudges or dripping from adjacent or nearby surfaces. Remove debris resulting from completion of coating operation from the project site.

**SECTION 315100**

**CONCRETE UNDERSEALING AND VOID FILLING**

**PART 1 – GENERAL**

**1.01 DESCRIPTION**

A. NCFI 24-030 is a two-component, water blown, all PMDI-based, nominal 4 pcf density, polyurethane foam system designed for under-sealing and void filling when minimal lift is

required under concrete slab sections. The slow speed reactivity profile allows for excellent flow characteristics when used as an under-sealing and void fill material.

## **1.02 REFERENCES**

A. American Society for Testing and Materials (ASTM):

1. ASTM D 1662 - Standard Test Method for Apparent Density of Rigid Cellular Plastics.
2. ASTM D 1621 - Standard Test Method for Compressive Properties Of Rigid Cellular Plastics.
3. ASTM D 1623 - Standard Test Method for Tensile Properties of Rigid Cellular Plastics.
4. ASTM C 273 - Standard Test Method for Shear Strength of Rigid Cellular Plastics.
5. ASTM D 2842 – Standard Test Method for Water Absorption of Rigid Cellular Plastics.

## **1.03 SUBMITTALS**

A. Submit all technical literature covering the Polyurethane Foam System including complete manufacturer's specifications, recommendations and test data.

1. Provide Safety Data Sheets on any chemical products utilized during the work of this section.
2. Preparation instructions and recommendations.
3. Storage and handling requirements and recommendations.
4. Installation methods.
5. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

## **1.04 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing Polyurethane Foam Products and Systems of this section.
- B. Installer Qualifications: This system must be installed by a qualified spray polyurethane foam applicator who is familiar with the operation and maintenance of his equipment and who is familiar with the properties of the NCFI Spray System, which is being applied.

**1.05 MATERIAL DELIVERY, STORAGE, AND HANDLING**

- A. Materials shall be delivered in Manufacturers original containers clearly labeled with manufacturers name, product identification, safety information, net weight of contents and expiration date.
- B. Store products under cover in manufacturers unopened and labeled packaging until ready for installation.
- C. Store above 35°F. Prior to use, keep the temperature of the chemicals above 70°F (21.66°C) for several days. Cold chemicals can cause poor mixing, pump cavitations or other process problems due to higher viscosity at lower temperatures. Storage temperatures should not exceed 85°F. Do not store in direct sunlight. Keep drums tightly closed when not in use and under dry gas pressure of 2-3 psi after the have been opened. Cool storage of the resin extends shelf life. Exposure to temperatures above 85°F will shorten the expected shelf life. Under proper storage conditions, shelf life of the NCFI Spray System 24-030 is 6 months.
- D. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with the requirements of local authorities having jurisdiction.

## **1.06 PROJECT CONDITIONS**

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
- B. Protect workers as recommended by standards and manufacturer's recommendations.
- C. Proper disposal of waste materials and containers must be done in compliance with the manufacturers guidelines and/or federal, state and local regulatory agencies.
- D. Do not apply if the temperature is below 32°F or above 90°F unless the material manufacturer is consulted for recommendations.

## **PART 2 – PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Manufacturers of sprayed polyurethane foam system having Products considered acceptable for use:

1. NCFI Polyurethanes, which is located at: Mount Airy Industrial Park P. O. Box 1528 ; Mount Airy, NC 27030-1528; Toll Free Tel: 800-346-8229; Tel: 336-789-9161; Email: [request info \(emillie.lee@ncfi.net\)](mailto:emillie.lee@ncfi.net); Web: [www.ncfi.com](http://www.ncfi.com)

- B. Substitutions: Approved Equal

### **2.02 MATERIALS**

- A. POLYURETHANE FOAM: Two-Component Polyurethane cellular plastic foam, complying with the following methods and characteristics:



<b>PHYSICAL PROPERTIES</b>	<b>NCFI 24-030</b>	
<b>Typical In-Place Density</b>	4 pcf	ASTM D 1622
<b>Compressive Strength, parallel-to-rise</b>	67 psi	ASTM D 1621
<b>Tensile Strength, parallel-to-rise</b>	82 psi	ASTM D 623
<b>Shear Strength, parallel-to-rise</b>	46 psi	ASTM C 273
<b>Closed Cell Content</b>	>90%	NCFITM 300
<b>Water Absorbtion</b>	≤0.04 lbs/sq ft	ASTM D 2842
<b>Resistance to Solvents</b>	Excellent	
<b>Resistance to Mold and Mildew</b>	Excellent	
<b>Maximum Service Temperature</b>	200°F	

**\*The above values are average values obtained from laboratory experiments and should serve only as guide lines**

B. Material shall be hydro-insensitive in the material’s component reaction such that the injected product is not significantly compromised by soil moisture or free water under the pavement.

**2.03 EQUIPMENT**

A. A mobile pumping unit capable of injecting the high-density polyurethane material into the soils and/or beneath the structure to the depths required shall be used. The pumping unit shall be capable of controlling the rate of flow of material as required to place the polyurethane, fill voids, and to raise foundation elements in a controlled manner. The unit shall be equipped with a manufacturer’s certified flow meter to measure the amount of high-density polyurethane injected at each location. The certified flow meter shall have a digital output in both pounds and gallons.

B. Pneumatic or electric drills capable of efficiently drilling 5/8” diameter injection holes through the concrete without damaging the structural integrity of the existing concrete element(s) and capable of installing 1/2” injection probes to the required depths without damage shall be used.

C. Laser levels or dial indicator devices capable of monitoring movement at the surface of the concrete shall be used.

D. All necessary equipment and materials, including but not limited to; electric generators, compressors, heaters, hoses, containers, valves and gauges to efficiently conduct and control the work and minimize the impact to the existing structure shall be used.

**PART 3 – EXECUTION**

**3.01 PREPARATION**

A. Contractor shall provide a concrete profile from laser level measurements of each area where the concrete structures require attention. Each profile shall be accepted by the Engineer or by his representative prior to performing the work at the project location.

B. Contractor shall install injection points through a series of 5/8" holes drilled at approximately 4-6 foot spaced intervals through or adjacent to the concrete where indicated by the Engineer or contractor based on soil conditions.

### **3.02 APPLICATION**

A. Void filling /Slab leveling – As necessary, polyurethane material shall be injected through a series of 5/8" drilled holes until all known or encountered voids directly under the structural element are filled and the element has been leveled to the extent practical. The rate and of material injection shall be determined by the Contractor and the engineer based on site conditions.

B. Continuous laser level readings shall be in place and monitored by the Contractor during injection to determine sufficient material usage and soil treatment as indicated by any recordable movement in the ground surface or overlying structural element.

C. Polyurethane material shall not enter into gutters or closed drainage systems. Suitable means to restrict the infiltration of the residue into a closed drainage system shall be provided by the contractor.

D. Corrections to the grade of adjacent slabs, if necessary, or as determined the engineer, shall be made in accordance with this specification. All raised pavement shall match the existing grade of adjacent slabs to provide positive drainage.

E. All injection holes shall be filled with non-shrink hydraulic patching compound encompassing full pavement thickness.

**3.03 FIELD QUALITY CONTROL**

A. Conduct field inspections and testing in accordance with manufacturers and contractors instructions.

**3.04 SITE TOLERANCES**

A. Final elevations of slab/pavement area(s) shall be within 1/8 inch of initial documented elevations with no final elevations lower than initial documented elevations.

**3.05 CLEANING**

A. All drill tailings and excess polyurethane material and other debris shall be cleaned up at the end of each working day.

B. Polyurethane material shall be removed from non-prescribed surfaces without causing damage and disposed of according to federal, state and local regulations.

**WORK ITEMS**

**WORK ITEM SPECIFICATIONS**

The General Conditions as well as any Supplementary Conditions, Product Manufacturer's Requirements or other Specifications are to be included with these Specifications.

**DESCRIPTION**

**WI-1.0 MOBILIZATION**

**1.0.1 Scope of Work**

This Work consists of coordinating, scheduling, obtaining and assembling at the construction site all equipment, materials, permits, supplies, manpower and other essentials and incidentals necessary to perform all Work defined in this Contract.

**WI-2.0 CONCRETE DECK UNDERSIDE – OVERHEAD CEILING  
DELAMINATION REPAIRS**

**2.0.1 Scope of Work**

This Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to locate delaminated and unsound concrete at deck underside ceiling locations shown on repair plan drawings, provide any needed temporary structural shoring, remove all

unsound concrete, prepare exposed concrete repair cavities, prepare existing rebar and install structural concrete patching material to restore concrete deck underside ceiling section and surfaces to original condition, capacity, profile and appearance.

Refer to Detail Nos. 1 and 1A for ceiling repair requirements and typical conditions. Actual repair work quantity for this item shall not exceed base bid estimated quantity unless directed and authorized by Engineer or Owner. Coordinate with Engineer prior to and during this Work for possible additional Work locations.

## **2.0.2 Materials**

A. Structural concrete patching material shall be as specified in Section 03710.

B. Protective coating for exposed existing steel reinforcement shall be Sika Armatec 110 EpoCem or approved equivalent.

## **2.0.3 Procedure**

A. Contractor shall locate and mark all Work areas as specified in Section 02030.

B. Procedure for delaminated, spalled and unsound concrete removal shall be as specified in Sections 02030 and 02070. Provide properly designed and erected structural shoring as needed prior to demolition of any beam section concrete.

C. Engineer shall inspect all prepared repair cavities for proper conditions according to Section 02030.

D. All exposed reinforcement steel within repair cavities shall be cleaned to bare metal by sandblasting and protective coating applied per coating manufacturer's instructions. Contractor shall replace with matching new steel any existing reinforcement steel damaged by demolition operations in accordance with ICRI standards for this application. Engineer shall be notified if severely corroded reinforcement steel with greater than 25 percent section-loss is encountered.

E. Contractor shall prepare repair cavities for structural patching installation in accordance with Sections 02030 and 02070.

F. Contractor shall prepare and install structural repair patching and provide proper surface curing in accordance with Section 03710, details and material manufacturer's instructions. All new concrete repairs shall be fully bonded to sound substrate surfaces and installed with no voids with completed exposed surfaces matching profile and overall appearance of surrounding concrete surfaces.

and provide G. All temporary structural support shoring shall remain in place proper support until new repair materials have adequately cured as specified in section 03710.

**WI-3.0 CONCRETE DECK UNDERSIDE – OVERHEAD BEAM  
DELAMINATION REPAIRS**

**3.0.1 Scope of Work**

This Work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to locate delaminated and unsound concrete at deck underside beam locations shown on repair plan drawings, provide any needed temporary structural shoring, remove all unsound concrete, prepare exposed concrete repair cavities, prepare existing rebar and install structural concrete patching material to restore concrete beam section and surfaces to original condition, capacity, profile and appearance.

Refer to Detail Nos. 2 and 2A for typical beam repair location requirements and conditions. Actual repair work quantity for this item shall not exceed base bid estimated quantity unless directed and authorized by Engineer or Owner. Coordinate with Engineer prior to and during this Work for possible additional Work locations.

**3.0.2 Materials**

A. Structural concrete patching material shall be as specified in Section 03710.

B. Protective coating for exposed existing steel reinforcement shall be Sika Armatec 110 EpoCem or approved equivalent.

**3.0.3 Procedure**

A. Contractor shall locate and mark all Work areas as specified in Section 02030.

16. Procedure for delaminated, spalled and unsound concrete removal shall be as specified in Sections 02030 and 02070. Provide properly designed and erected structural shoring as needed prior to demolition of any beam section concrete.

C. Engineer shall inspect all repair cavities for proper conditions according to Section 02030.

D. All exposed reinforcement steel within repair cavities shall be cleaned to bare metal by sandblasting and protective coating applied per coating manufacturer's instructions. Contractor shall replace with matching new steel any existing reinforcement steel damaged by demolition operations in accordance with ICRI standards for this application. Engineer shall be notified if severely corroded reinforcement steel with greater than 25 percent section-loss is encountered.

E. Contractor shall prepare repair cavities for structural patching installation in accordance with Sections 02030 and 02070.

F. Contractor shall prepare and install structural repair patching and provide proper surface curing in accordance with Section 03710, details and material manufacturer's instructions. All new concrete repairs shall be fully bonded to sound substrate surfaces and installed with no voids with completed exposed surfaces matching profile and overall appearance of surrounding concrete surfaces.

G. All temporary structural support shoring shall remain in place and provide proper support until new repair materials have adequately cured as specified in section 03710.

#### **WI-4.0 BASEMENT WALL - CONCRETE DELAMINATION REPAIRS**

##### **4.0.1 Scope of Work**

This Work consists of furnishing all labor, materials, equipment, supervision and incidentals including any shoring necessary to locate and remove delaminated or otherwise unsound wall concrete, provide any needed structural shoring, prepare exposed concrete repair cavities and install structural concrete patching materials at wall repair locations shown on repair plan drawings to restore wall section and surfaces to original condition, capacity, profile and appearance.

Refer to Detail Nos. 3 and 3A for typical wall repair location requirements and conditions. Actual repair work quantity for this item shall not exceed base bid estimated quantity unless directed and authorized by Engineer or Owner. Coordinate with Engineer prior to and during this Work for possible additional Work locations.

##### **4.0.2 Materials**

K. Structural concrete patching material shall be as specified in Section 03710.

B. Protective coating for exposed existing steel reinforcement shall be Sika Armatec 110 EpoCem or approved equivalent.

##### **4.0.3 Procedure**

A. Contractor shall locate and mark all Work areas as specified in Section 02030.

B. Procedure for delaminated, spalled and unsound concrete removal shall be as specified in Sections 02030 and 02070. Provide properly designed and erected structural shoring as needed prior to demolition of any wall section concrete.

C. Engineer shall inspect all repair cavities for proper conditions according to Section 02030.

B. All steel exposed within repair cavities shall be cleaned to bare metal by sandblasting and protective coating applied per coating manufacturer's instructions. Contractor shall replace with matching new steel any existing reinforcement steel damaged by demolition operations in accordance with ICRI standards for this application. Engineer shall be notified if severely corroded reinforcement steel with greater than 25 percent section-loss is encountered.

E. Contractor shall prepare repair cavities for structural patching installation as specified in Sections 02030 and 02070.

F. Contractor shall install structural repair patching and provide proper surface curing in accordance with Section 03710, details and material manufacturer's instructions. All new concrete repairs shall be fully bonded to sound substrate surfaces and installed with no voids with completed exposed surfaces matching profile and overall appearance of surrounding concrete surfaces.

G. Any temporary structural support shoring shall remain in place and provide proper support until new repair materials have adequately cured as specified in section 03710.

## **WI-5.0 BASEMENT COLUMN - CONCRETE DELAMINATION REPAIRS**

### **5.0.1 Scope of Work**

This Work consists of furnishing all labor, materials, equipment, supervision and incidentals including any shoring necessary to locate and remove delaminated or otherwise unsound column concrete, provide any needed structural shoring, prepare exposed concrete repair cavities and install structural concrete patching materials at column locations shown on repair plan drawings to restore column section and surfaces to original condition, capacity, profile and appearance.

Refer to Detail Nos. 4, 4A and 4B for typical column repair location requirements and conditions. Actual repair work quantity for this item shall not exceed base bid estimated quantity unless directed and authorized by Engineer or Owner. Coordinate with Engineer prior to and during this Work for possible additional Work locations.

## **5.0.2 Materials**

L. Structural concrete patching material shall be as specified in Section 03710.

B. Protective coating for exposed existing steel reinforcement shall be Sika Armatec 110 EpoCem or approved equivalent.

## **5.0.3 Procedure**

A. Contractor shall locate and mark all Work areas as specified in Section 02030.

B. Procedure for delaminated, spalled and unsound concrete removal shall be as specified in Sections 02030 and 02070. Provide properly designed and erected structural shoring as needed prior to demolition of any column section concrete.

C. Engineer shall inspect all repair cavities for proper conditions according to Section 02030.

B. All steel exposed within repair cavities shall be cleaned to bare metal by sandblasting and protective coating applied per coating manufacturer's instructions. Contractor shall replace with matching new steel any existing reinforcement steel damaged by demolition operations in accordance with ICRI standards for this application. Engineer shall be notified if severely corroded reinforcement steel with greater than 25 percent section-loss is encountered.

E. Contractor shall prepare repair cavities for structural patching installation as specified in Sections 02030 and 02070.

F. Contractor shall install structural repair patching and provide proper surface curing in accordance with Section 03710, details and material manufacturer's instructions. All new concrete repairs shall be fully bonded to sound substrate surfaces and installed with no voids with completed exposed surfaces matching profile and overall appearance of surrounding concrete surfaces.

G. Any temporary structural support shoring shall remain in place and provide proper support until new repair materials have adequately cured as specified in section 03710.

## **WI-6.0 BASEMENT AREA - CONCRETE REPAIR SURFACES PAINTING**

### **6.0.1 SCOPE OF WORK**

This work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to prepare all current unpainted wall, column, beam and ceiling underside concrete



repair surfaces and apply new professional grade paint coating system to same. This work must be performed following completion of Work Item Nos. 2.0-5.0.

This Work Scope includes all basement area concrete restoration locations included in this contract as well as any and all existing unpainted basement area concrete wall, column, beam or ceiling underside repair surfaces.

### **6.0.2 MATERIALS**

15. New Primer product for all unpainted concrete repair surfaces shall be PPG Perma-Crete 4-2 High Build Acrylic Primer or approved equivalent.
16. New Finish Coat product for all unpainted concrete repair surfaces shall be PPG Pitt-Tech 90-374 series (gloss) or 90-474 series (satin) DTM industrial enamel or approved equivalent. Finish Coat color and sheen shall match existing surfaces color and sheen surrounding unpainted surfaces at each member type and location. Coordinate with Owner for proper color and sheen selection.

### **6.0.3 PROCEDURE**

- H. Coordinate with Owner prior to work activities involving this Work Item to allow for proper scheduling and closing to vehicles and unauthorized persons of work areas involved with this Work Item. Contractor shall provide proper protection of all surfaces specified and not specified for new paint coating per Section 02070 Protection provisions.
- I. Communicate and coordinate all surfaces prep and painting activities with paint coating manufacturer representative to verify proper methods and conditions. Paint coating manufacturer representative shall inspect as needed concrete surface prep, condition and paint application during work activities with written certification report to be submitted to Engineer.
- J. Upon completion of all basement area concrete ceiling underside, beam, wall and column related repair operations and minimum curing period per the paint manufacturer for same concrete restoration repairs, Contractor shall locate and prepare all unpainted concrete ceiling underside, beam, wall and column repair surfaces per the paint manufacturer's instructions including removal of any dirt, loose paint, rust, or any other detrimental surface substances from the exposed concrete repair surfaces and immediate surrounding painted surfaces at all specified new paint coating application locations. Special attention shall be directed at protection of surrounding surfaces and overall environment during all preparation and painting operations.

- K.** All nearby surrounding surfaces and overall environment shall be protected from concrete surface preparation related damage or unintended paint application.
- L.** Contractor shall apply specified new Primer product to all prepared unpainted concrete ceiling underside, beam, wall and column repair surface locations in accordance with paint manufacturer's and product directions with special attention to proper air and surface temperatures, dry film thickness and spread rate requirements. Primer application shall extend/lap onto surrounding prepared painted surfaces a minimum of two inches at all locations.
- M.** Contractor shall apply specified Finish/topcoat paint product to all prepared and primed concrete ceiling underside, beam, wall and column repair surface locations in accordance with paint manufacturer's and product directions with special attention to proper recoat timeframe, air and surface temperatures, film thickness and spread rate requirements. Two Finish paint coats are required. Finished painted surfaces shall be uniform in texture matching nearby existing painted surfaces with no "runs" or other defects.
- N.** Clean any and all nearby surfaces affected by surface preparation or painting operations to Owners satisfaction.

## **WI-7.0TOPSIDE – CONCRETE DECK DELAMINATION REPAIRS**

### **7.0.1 Scope of Work**

This Work consists of furnishing all labor materials, equipment, supervision and incidentals necessary to locate and selectively remove delaminated and (or) deteriorated deck topside concrete at locations shown on repair plan drawings, prepare cavities and install new concrete material to restore concrete deck to original sound condition and appearance. Preparation for and installation of new protective membrane (traffic topping) is also required where currently present. Refer to Detail No. 5.

New patch repair edge/perimeter joint prep and new sealant installation is required with this work to match existing conditions in some repair areas. Replacement with new of any current/existing deck concrete traffic coating or joint sealant materials, or deck surface restriping (where affected by repairs) connected with any repair location is considered incidental with this Work Item and shall be performed in accordance with the appropriate Work Item No.7.0, Work Item No. 9.0, Section 7100 and Section 7570 specifications and requirements. ALL TRAFFIC COATING REPLACEMENT, SEALANT INSTALLATION OR RE-STRIPING RELATED QUANTITIES AND PRICING ASSOCIATED WITH THIS WORK ITEM (6.0) SHALL BE INCLUDED WITH THE OVERALL PRICING OF THIS WORK ITEM ONLY. Coordinate with Engineer prior to and during this Work for possible additional Work locations.

Actual performed repair work quantity for this item shall not exceed base bid estimated quantity unless directed and authorized by Engineer or Owner.

### **7.0.2 Materials**

- 5 Deck top surface concrete delamination repair material shall be microsilica concrete as specified in Section 03700.
  - 6 Protective coating for exposed existing steel reinforcement shall be Sika Armatec 110 EpoCem or approved equivalent.
- C. Traffic-bearing membrane recoating system shall be as specified in Section 07570.

D. New sealant product shall be as specified in Section 07100.

D. Restriping paint shall be a premium quality quick dry spray enamel of same color(s) as existing striping and designed for this application. PPG 11-53 Series or approved equivalent.

### **7.0.3 Procedure**

- 6 Contractor shall coordinate directly with Engineer and Owner during locating and marking of all Work areas as specified in Section 02030. Engineer or Owner shall authorize all deck repair work locations and dimensions prior to any deck top surface concrete demolition work.
- 7 Procedure for deteriorated deck top surface concrete removal shall be as specified in Section 02030. Uniformly remove only debonded or otherwise deteriorated concrete within identified and marked boundaries of concrete removal areas without damage to surrounding concrete or underlying concrete. Poor condition concrete section removal depth varies but shall not extend to more than four inches deep unless authorized by Engineer.
- 8 Any existing steel exposed and to remain within removal cavities shall be cleaned to bare metal by sandblasting and epoxy coated as specified in Section 02030.
- 9 Properly clean all repair cavity surfaces by air blasting. Engineer shall inspect all work areas for proper conditions according to Section 02030.

- 10 Contractor shall prepare concrete removal cavities and areas for new repair concrete placement as specified in Section 02030.
- 11 Contractor shall properly install and cure new deck concrete patch repairs in accordance with Section 03700 of this Specification with perimeter edge and any existing interior joints prepared and joint sealant installed following minimum seven day concrete curing period. New concrete surface finish shall match surrounding concrete surfaces.
- 12 Following all concrete deck related repairs and minimum deck repair related concrete and sealant curing period required by new membrane coating manufacturer, Contractor shall prepare all exposed deck top surface concrete repair surfaces and immediately adjacent surrounding membrane surfaces at all deck top surface repair locations where existing membrane coating system was removed all per new traffic coating membrane manufacturer's instructions.
- 13 Contractor shall apply, protect and properly cure new traffic coating membrane system at all existing coated deck top surface concrete repair locations per membrane coating manufacturer's instructions and Work Item 7.0 requirements.
- 14 In all locations and areas where deck top surface repair locations Work affected and coincided with existing/current deck surface striping/markings, Contractor shall prepare and apply new restriping paint to match existing lines, markings and layout/pattern.

**WI-8.0 TOPSIDE - CONCRETE WALKWAY/CURBING/EQUIPMENT PAD  
DELAMINATION REPAIRS**

**8.0.1 SCOPE OF WORK**

This work consists of furnishing all labor, materials, equipment, supervision, and incidentals necessary to selectively locate, cut/demolish and remove damaged or otherwise unsound topside walkway, curbing or equipment pad related concrete, prepare removal cavities and install new concrete repair materials including any damaged or removed isolation/expansion joint or control joint sealant materials at locations shown on repair plan drawings to restore concrete section in repair locations to original sound condition and appearance. Refer to Detail No.7A for typical exposed concrete repair location conditions. Refer to Detail No.5 for additional requirements.

Concrete perimeter joint prep and new sealant installation is required with this work to match existing conditions in repair areas. Replacement with new of any existing control or isolation joint sealant connected with any repair location is considered incidental with this Work Item but shall be performed in accordance with the appropriate Work Item No.10.1 and Section 7100 requirements.

Contractor shall review all existing concrete repair locations and conditions with Engineer prior to work commencement to verify exact work locations, conditions and understanding of intended preparation and repair procedures for each work location. Partial-section patch repairs are anticipated by the Engineer for this work. Contractor shall notify Engineer if any full-depth deterioration and replacement is needed at any repair location. Coordinate with Engineer for possible additional work locations.

All payment for this work will be on a per unit replacement basis with partial depth repair measured and paid per actual measured repair surface area and full-depth repair measured and paid at two times (2X) actual measured repair surface area. Actual repair work quantity for this item shall not exceed base bid estimated quantity unless directed and authorized by Engineer or Owner.

### **8.0.2 MATERIALS**

- A. New partial depth concrete repair material shall be shall be BASF 10-61 Rapid Mortar or approved equivalent prepared, mixed and extended with durable sound crushed aggregate per manufacturer's instructions depending upon actual repair material application thickness.
- B. New full-depth concrete repair material shall be BASF 10-61 Rapid Mortar or approved equivalent prepared, mixed and extended with durable sound crushed aggregate per manufacturer's instructions depending upon actual repair material application thickness, or minimum 3,500 psi exterior rated concrete mix with a maximum water/cement ratio of 0.40 and air-entrainment content ranging from 5.0 percent to 8.0 percent.
- C. New joint sealant shall be as specified in section 07100.
- D. Isolation joint material shall be full-depth 1/2 inch wide closed-cell foam rubber or bitumen-treated fiber board.

### **8.0.3 PROCEDURE**

- A. Contractor shall coordinate with Engineer and locate all concrete walkway, curbing, and equipment pad repair work locations in areas shown on repair plan drawings. Repair method for each work location will be determined and confirmed by the Engineer and the Contractor.
- B. Contractor shall mark and prepare for selective demolition and removal of determined unsound or otherwise deficient concrete at all repair locations. Procedure for deficient concrete removal shall be as specified in Section 02030. Remove all determined deficient concrete and any severely corroded or otherwise severely damaged resteel within identified individual repair locations. Neat minimum 0.5 inch deep saw cutting of

existing concrete removal edge boundaries shall be performed as needed to allow for uniform square edge transitions from existing concrete to new concrete surfaces with any existing joints and detailing in removed concrete to be matched in new repair concrete.

- C. Any re-steel exposed within concrete slab-on-grade repair work area cavities shall be cleaned to bare metal by sandblasting and epoxy coated as specified in Section 02030.
- D. Prepare concrete removal work location cavities to receive new concrete material including any needed formwork, isolation, joint detailing or other items to provide for proper profile, positioning and alignment of new concrete to existing concrete including surrounding pavement and walkway surfaces. Remove all loose material and debris from concrete removal locations.
- E. Engineer shall inspect as needed prepared concrete repair work area conditions prior to new concrete installation for proper conditions according to Section 02030. Contact Engineer prior to initial new concrete slab-on-grade repair installation.
- F. Properly prepare, install, finish, cure and protect new concrete repair materials at all concrete repair work locations. New completed concrete repair surfaces to match nearby non-work area concrete surfaces profile and finish conditions.

G. Following minimum seven-day new concrete repair curing period, prepare for and install new joint sealant system materials at all removed sealant or otherwise deficient sealant locations in connection with this work per sealant manufacturer's instructions and section 07100.

## **WI-9.0 TOPSIDE - TRAFFIC COATING MEMBRANE REPAIRS**

### **9.0.1 Scope of Work**

This work consists of furnishing all labor, materials, equipment, supervision, and incidentals necessary to locate, prepare and install new traffic-bearing membrane recoating system at existing topside membrane coated deck surface locations shown on repair plan drawings as well as all existing membrane coated topside perimeter curbing, coping and stair related surfaces followed by restriping of membrane surface if existing surface was originally striped prior to work. Coordinate with Engineer for possible additional locations. All work locations and quantities connected with this Work Item are separate from work locations and quantities connected with Work Item No.7.0 (Topside – Concrete Deck Delamination Repairs). Refer to Detail Nos.8A, 8B and 8C for typical repair location conditions.

Actual repair work quantity for this item shall not exceed base bid estimated quantity unless directed and authorized by Engineer or Owner. Coordinate with Engineer prior to and during this Work for possible additional Work locations.

A. Allow for required curing period in any deck concrete repair or sealant replacement locations within required membrane recoat areas.

B. Remove all damaged and debonded existing membrane coating materials at all specified membrane repair locations. Prepare and prime any and all existing membrane area damaged membrane surfaces and any repair concrete surfaces according to membrane system manufacturer's directions. No debonded or otherwise damaged membrane is to remain.

C. Prepare and prime the entirety of the recoat area and any/all exposed concrete surfaces according to membrane system manufacturer's directions.

D. Install new membrane recoating system in prepared areas to match existing membrane in color, texture, and overall appearance. Minimum mil thickness of recoating shall meet or exceed existing/removed membrane thickness.

11 Restripe any affected parking stalls and ramp area markings to match existing.

### **9.0.2 Materials**

A. Traffic-bearing membrane recoating system shall be as specified in Section 07570.

B. New sealant product shall be as specified in Section 07100.

C. Restriping paint shall be a premium quality quick dry spray enamel of same color(s) as existing striping and designed for this application. PPG 11-53 Series or approved equivalent.

### **9.0.3 Procedure**

O. Prepare and prime all surfaces to receive new membrane (re)coating system in accordance with manufacturer's directions and Section 07570.

P. Properly detail any exposed cracks or defective sealant per traffic coating membrane manufacturer's instructions.

Q. Install and protect new membrane recoating system in accordance with manufacturer's instructions and Section 07570. New membrane coating shall extend a minimum of four (4) inches onto prepared surfaces of existing good condition membrane coating at all work locations.

R. Following proper new membrane repair materials cure time, restripe and mark recoated area surfaces to match original or existing surface markings where deck surface striping/markings were present.

**WI-10.0 TOPSIDE – CONCRETE DECK &  
WALKWAY/CURBING/STAIR/WALL/EQUIPMENT PAD - CRACK REPAIRS**

**10.0.1 Scope of Work**

This work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to locate existing slab-on-grade and deck top surface cracks at topside walkway, curbing, stair, wall and equipment pad locations shown on repair plan drawings, remove failed sealant if present, prepare crack line cavities by routing or cleaning as applicable and re-seal cracks. Refer to Detail Nos. 6 and 6A, 6B, 6C, 6D and 6E for typical crack repair location requirements and conditions.

Recoating with new traffic membrane of any crack repair locations in existing membrane coated areas is considered incidental with this work and specified per Work Item No. 9.0 requirements.

Actual repair work quantity for this item shall not exceed base bid estimated quantity unless directed and authorized by Engineer or Owner. Coordinate with Engineer prior to and during this Work for possible additional Work locations.

**10.0.2 Materials**

T. New backing materials shall be as specified in Section 07100.

U. New crack sealant material shall be as specified in Section 07100.

**10.0.3 Procedure**

D. Contractor shall examine surfaces and locations shown on drawings where apparent significant cracking or failed crack sealant is present. Contractor shall prepare crack and (or) failed crack sealant locations by routing and thorough cleaning with all failed sealant system materials removed as specified in Section 07100 and shown on Detail No.6.

5 Backing material shall be installed at base of crack as specified in Section 07100.



- 6 New Sealant shall be installed, tooled to a slight concave surface profile and protected until fully cured in strict compliance with sealant manufacturer's instructions and Detail No.6.

**WI-10.1 TOPSIDE – CONCRETE DECK & WALKWAY/CURBING/EQUIPMENT PAD - JOINT SEALANT REPAIRS**

**10.1.1 Scope of Work**

This work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to remove and replace all existing (and missing) control and isolation joint sealant system materials at all top-side perimeter concrete walkway, curbing, and equipment pad locations as well as failed or otherwise defective existing sealant system materials at topside deck cove joint sealant locations shown on repair plan drawing. Refer to Detail Nos.9A and 9B for typical repair location conditions.

Recoating of any joint sealant replacement in existing membrane coated areas is considered incidental with this work and specified per Work Item No. 9.0 requirements.

Actual repair work quantity for this item shall not exceed base bid estimated quantity unless directed and authorized by Engineer or Owner. Coordinate with Engineer prior to and during this Work for possible additional Work locations.

**10.1.2 Materials**

- V. New sealant backing materials shall be as specified in Section 07100.
- w. New sealant material shall be as specified in Section 07100.

**10.1.3 Procedure**

7. Completely remove all existing sealant and backing materials at specified locations. Air blast all joint cavities.
8. Install new backing and sealant materials according to manufacturer's instructions and Section 07100.
9. Protect new joint sealant surfaces from traffic or wet weather exposure until fully cured.

**WI-11.0 TOPSIDE - COPING STONE REPOSITIONING REPAIRS**

### **11.0.1 Scope of Work**

This work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to selectively remove, prepare and properly reinstall existing displaced topside wall coping stone units at locations shown on repair plan drawing. Refer to Detail No.10A for typical repair location conditions.

This work shall be done prior to Work Item No.10.1 operations involving walkway isolation joints in coping stone areas. Actual repair work quantity for this item shall not exceed base bid estimated quantity unless directed and authorized by Engineer or Owner. Coordinate with Engineer prior to and during this Work for possible additional Work locations.

### **11.0.2 Materials**

- A. New mortar material shall be Type N mortar cement matching existing mortar color and overall appearance in coping stone repositioning area(s) with new mortar proportions meeting ASTM C270 proportion specifications.
- X. Backing materials shall be as specified in Section 07100.
- Y. New sealant material shall be as specified in Section 07100.

### **11.0.3 Procedure**

- A. Contractor shall locate displaced topside wall coping stone locations shown on repair plan drawings.
- B. Carefully cut and remove existing mortar and/or sealant joint materials surrounding displaced coping stone units. Do not damage stone units or surrounding surfaces.
- C. Carefully remove and temporarily store displaced coping stone units. Remove all mortar and sealant materials from removed and adjacent stone unit surfaces in preparation for reinstallation.
- D. Carefully remove existing bedding mortar materials uncovered beneath removed coping stone units.
- E. Reinstall removed coping stone units with full new mortar bed and head joints. Rake top/outer surface of new head joint mortar to 0.50 inch below coping stone surfaces. Positioning, orientation and surface profile of reinstalled coping stone units shall align and match with remaining surrounding and nearby units.

10. Install new backing and sealant materials in reinstalled coping stone related raked head joint cavities according to manufacturer's instructions and Section 07100.
11. Protect all reinstalled coping stone related surfaces from damage or wet weather exposure until all mortar and sealant materials are fully cured.

## **WI-12.0 TOPSIDE - COPING STONE MORTAR JOINT & CRACK REPAIRS**

### **12.0.1 Scope of Work**

This work consists of furnishing all labor, materials, equipment, supervision and incidentals necessary to 1) locate existing failed or otherwise defective topside wall coping stone related mortar joints and crack locations and 2) remove defective joint cavity mortar and all existing failed sealant system materials if present 3) rout crack line cavities 4) clean all prepared mortar joint and crack cavities and 5) install new sealant system materials at all prepared wall coping stone related mortar joint and crack cavity locations. Refer to Detail Nos. 11A and 11B for typical repair location conditions.

Recoating of any joint or crack sealant involving this work in existing membrane coated areas is considered incidental with this work and specified per Work Item No. 9.0 requirements.

Actual repair work quantity for this item shall not exceed base bid estimated quantity unless directed and authorized by Engineer or Owner. Coordinate with Engineer prior to and during this Work for possible additional Work locations.

### **12.0.2 Materials**

- A. New sealant backing materials shall be as specified in Section 07100.
- B. New sealant material shall be as specified in Section 07100.

### **12.0.3 Procedure**

12. Contractor shall review with Engineer all work locations involving this Work Item prior to demolition operations.
13. Locate and remove existing defective wall coping stone joint or crack cavity mortar to a minimum of 0.50 inch below surface along with all failed joint or crack sealant and backing materials at all topside wall coping stone mortar joint or crack locations.
14. V-rout exposed all wall coping stone crack cavity lines to 0.50 inch wide by 0.50 inch deep.

15. Air-blast all joint and crack cavities.
16. Install new sealant backing and sealant materials in prepared joint and crack cavities according to manufacturer's instructions and Section 07100.
17. Protect new sealant surfaces from physical damage or wet weather exposure until fully cured.

**WI-13.0                      TOPSIDE - WALL CONCRETE DAMAGE REPAIRS & REPAINT**

**13.0.1                                      Scope of Work**

This Work consists of furnishing all labor, materials, equipment, supervision and incidentals including any shoring necessary to locate and remove delaminated or otherwise unsound wall concrete, provide any needed structural shoring, prepare exposed concrete repair cavities and install structural concrete patching materials at wall repair location(s) shown on repair plan drawings to restore wall section and surfaces to original condition, capacity, profile and appearance. Repainting of all wall repair area surfaces associated with this work is also required for this item.

Refer to Detail Nos. 12A for typical wall repair location conditions, repair type and requirements. Actual repair work quantity for this item shall not exceed base bid estimated quantity unless directed and authorized by Engineer or Owner. Coordinate with Engineer prior to and during this Work for possible additional Work locations.

**13.0.2      Materials**

A. Structural concrete patching material shall be as specified in Section 03710.

B. Protective coating for exposed existing steel reinforcement shall be Sika Armatec 110 EpoCem or approved equivalent.

C. New concrete repair surface primer and paint products shall be per Work Item No.6.0 with color to match existing surrounding concrete surfaces.

**13.0.3      Procedure**

A. Contractor shall locate and mark all Work areas as specified in Section 02030.

B. Procedure for delaminated, spalled and unsound concrete removal shall be as specified in Sections 02030 and 02070. Provide properly

designed and erected structural shoring as needed prior to demolition of any wall section concrete.

C. Engineer shall inspect all repair cavities for proper conditions according to Section 02030.

B. All steel exposed within repair cavities shall be cleaned to bare metal by sandblasting and protective coating applied per coating manufacturer's instructions. Contractor shall replace with matching new steel any existing reinforcement steel damaged by demolition operations in accordance with ICRI standards for this application. Engineer shall be notified if severely corroded reinforcement steel with greater than 25 percent section-loss is encountered.

E. Contractor shall prepare repair cavities for structural patching installation as specified in Sections 02030 and 02070.

F. Contractor shall install structural repair patching and provide proper surface curing in accordance with Section 03710, details and material manufacturer's instructions. All new concrete repairs shall be fully bonded to sound substrate surfaces and installed with no voids with completed exposed surfaces matching profile, dimensions and overall appearance of surrounding concrete surfaces.

G. Any temporary formwork or structural support shoring shall remain in place and provide proper support until new repair materials have adequately cured as specified in section 03710.

H. Contractor shall prepare and apply new primer and paint coating system to repair location related wall surfaces in accordance with Work Item No.6.0 procedure and requirements.

## **WI-14.0 TOPSIDE - PENETRATING SEALER APPLICATION ON CONCRETE WALKWAY/CURBING/COPING STONE/EQUIPMENT PAD SURFACES**

### **14.0.1 SCOPE OF WORK**

This work consists of furnishing all labor, materials, equipment, supervision, and incidentals necessary to prepare for and apply a penetrating sealer solution on all exposed topside deck perimeter concrete walkway, wall coping stone, electrical equipment pad and curbing surfaces in areas shown on plan drawing following completion of all topside concrete, mortar, sealant and membrane coating repair operations.

Actual repair work quantity for this item shall not exceed base bid estimated quantity unless directed and authorized by Engineer or Owner. Coordinate with Engineer prior to and during this Work for possible additional Work locations.

**14.0.2 MATERIALS**

F. Penetrating sealer shall be as specified in Section 03740.

**14.0.3 PROCEDURE**

G. Following the completion of Work Item Nos. 2.0 through 13.0 and minimum curing periods needed for all associated repair materials, the Contractor shall prepare all exposed topside perimeter walkway, curbing, coping stone and equipment pad surfaces to receive penetrating sealer application. This preparation shall be in accordance with sealer manufacturer instructions and Section 03740 of these specifications.

H. All non-masonry surfaces shall be protected from penetrating sealer overspray. Protective measures shall not damage or alter the appearance of any surfaces. Contractor shall protect all unintended sealer application surfaces including all vehicles, building surfaces ESPECIALLY WINDOWS/GLASS and pedestrians during sealer application.

I. Penetrating sealer shall be prepared and applied to all required masonry surfaces in accordance with manufacturer's instructions and Section 03740 of these specifications.

**WI-15.0 BASEMENT FLOOR SLAB – UNDERSIDE VOID SPACE GROUTING REPAIRS**

**15.0.1 SCOPE OF WORK**

This work consists of furnishing all labor, materials, equipment, supervision, and incidentals necessary to prepare for and completely fill with polyurethane foam grout all open void space directly below basement slab in area shown on basement plan drawing. Drilling and patching of filling/monitoring holes in basement slab concrete within specified area will be required for proper completion of this work. Refer to Detail No.13A for overview of basement slab surface area involved with this Work Item.

Reference section 315100 for work requirements. Havener Tech Company located at 433 Elmwood Road in Troy, MI is an approved experienced contractor capable of performing this work operation.

Grouting contractor shall document actual grout volume installed with verification by Engineer required. Actual repair work quantity for this item shall not exceed base bid estimated quantity unless directed and authorized by Engineer or Owner. Review by Owner and Engineer of all specified section 315100 submittals is required prior to any work operations involving this work item.

**15.0.2 MATERIALS**

- A. New polyurethane foam grout fill material shall be NCFI 24-030 as specified in Section 315100 or approved equivalent designed and intended for this application.
- B. New slab hole cavities patching product shall be non-shrink high-strength grout or as specified by grout manufacturer.

**15.0.3 PROCEDURE**

- A. Following the completion of all basement area Work Items, Contractor shall coordinate with Engineer and identify exact basement slab area boundaries specified for underside void filling operations.
- B. Contractor shall prepare for basement slab underside void filling operations in accordance with section 315100 including determination and documentation of initial (pre-work) basement slab surface elevations in specified work zone as well as proper layout and installation of injection points.
- C. Contractor shall install new grout fill material on the immediate underside of the basement floor slab within in the designated work zone in accordance with section 315100 to completely fill all current void spaces between underside of slab and top surface of subsoil.
- D. Contractor shall determine and document final basement slab surface elevations in specified work zone.
- E. Contractor shall perform injection point patching and clean-up operations per section 315100.