

City of Auburn, Maine

"Maine's City of Opportunity"



CONTRACT DOCUMENTS

FOR

2015 Central Fire Headquarters Elevated Slab Repairs AUBURN, MAINE

May 26, 2015

Jill Eastman, *Finance Director*
Dan Goyette, P.E., *City Engineer*
Derek Boulanger, *Purchasing Agent*

City of Auburn, Maine

"Maine's City of Opportunity"

Office of Finance

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City of Auburn, Maine

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Office of Finance

Dear Bidder:

The City of Auburn is accepting written proposals for the **2015 Central Fire Headquarters Elevated Slab Repairs**. The City reserves the right to accept or reject any or all proposals in whole or in part and to waive any informality the City may determine necessary. The City also reserves to itself the exclusive right to accept any proposal when it is deemed by the City to be in its best interest. The City of Auburn is governed by Title 1 M.R.S.A. § 401-410, otherwise known as the Freedom of Information Act, which considers bid specifications as public documents. In awarding any proposal, the City may consider, but not be limited to, any of the following factors: Bidder qualifications, price, experience, financial standing with the City, warranties, references, bonding, delivery date, and service of Bidder. Vendors/Contractors shall be current on all amounts due to the City of Auburn prior to the City entering into any contract agreement. All proposals must include FOB to Auburn, Maine unless otherwise specified.

Proposals will not receive consideration unless submitted in accordance with the following instructions to bidders. Please mark sealed envelopes plainly with: **Company Name, "2015 Central Fire Headquarters Elevated Slab Repairs #2015-032"**.

Bid packages will be available beginning on Thursday, May 28, 2015. A mandatory Pre-Bid Meeting will be at the Central Fire Station on Minot Ave on June 2, 2015, at 10:00am. Documents can be obtained at the Finance Department on the first floor of Auburn Hall at 60 Court Street. Questions regarding this Request for Bids should be directed to Josh Martin-McNaughton, Becker Structural Engineers, Inc. at (207) 879-1838, ext. 138. jmartinmcnaughton@beckerstructural.com

Please submit your proposal to the City of Auburn by 2:00 p.m. **Thursday, June 11, 2015**. Proposals must be delivered to **Derek Boulanger, 60 Court Street, Auburn, Maine 04210** on or before the date and time appointed. No proposals will be accepted after the time and date listed above. Proposals will be opened in the Finance Department at 2:00 p.m. on that date.

Sincerely,

Derek Boulanger
Facilities Manager /Purchasing Agent

60 Court Street • Auburn, ME 04210
(207) 333-6600 Voice • (207) 333-6601 Automated • (207) 333-6620 Fax
www.auburnmaine.gov

SCOPE OF WORK

The following scope of work is being proposed for the 2015 Central Fire Headquarters Elevated Slab Repairs for the City of Auburn. The scope of work is a brief overview of the expected extent of work included in this contract. This is only a proposed scope with associated estimated quantities. Items may be added or deleted as work progresses or to meet the available funding for this work.

Elevated Slab Repairs

- Concrete deck repairs.
- Crack chase.
- Column repairs.
- Overhead concrete repairs.
- Post tensioning repair.
- Traffic membrane.
- Floor drain and leader installation.

TIME FRAME: All work to be completed 12 weeks from notice to proceed.

Liquidated damages in the amount of \$500/calendar day shall be imposed for work not completed beyond the project deadline.

CONDITIONS AND INSTRUCTIONS TO BIDDERS

1. Bidders shall use the enclosed bid form for quotations. Whenever, in bid forms, an article is defined by using a trade name or catalog number, the term "or approved equal", if not inserted, shall be implied.
2. Submit a separate unit price for each item unless otherwise specified in the bid request. Award will be made on a basis of each item, or as a group, whichever is in the best interest of the City. Prices stated are to be "delivered to destination".
3. Bid proposals must be completed in full, in ink and must be signed by firm official. Bid proposal **must be notarized** prior to bid being sealed and may be disqualified if not notarized. Bids may be withdrawn prior to the time set for the official opening
4. Bids will be opened publicly. Bidders or representatives may be present at bid opening.
5. Awards will be made to the lowest responsible bidder, considering the quality of the materials, date of delivery, cost which meets specification and is in the best interest to the City of Auburn.
6. All transportation charges, including expense for freight, transfer express, mail, etc. shall be prepaid and be at the expense of the vendor unless otherwise specified in the bid.
7. The terms and cash discounts shall be specified. Time, in connection with discount offered, will be computed from date of delivery at destination after final inspection and acceptance or from date of correct invoice, whichever is later.
8. The City is exempt from payment of Federal Excise Taxes on the articles not for resale, Federal Transportation Tax on all shipments and Maine Sales Tax and Use Taxes. Please quote less these taxes. Upon application, exemption certificate will be furnished with the Purchase Order when required.
9. No contract may be assigned without the written consent of the Finance Director or her designate. The contract shall not be considered valid until a purchase order has been issued to the successful bidder.
10. Please state "2015 Central Fire Headquarters Elevated Slab Repairs– Bid # 2015-032", on submitted, sealed envelope.
11. The City of Auburn reserves the right to waive any formality and technicality in bids whichever is deemed best for the interest of the City of Auburn.
12. A bid bond in the amount of 5% of the total bid amount will be required with the submitted bid. This contract also requires a payment and performance bond.

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13. Any addenda shall be signed and submitted with the bid.
14. Retainage in the amount of 10% shall be held from each payment and shall be release upon final acceptance of the project.
15. All work shall be completed 12 weeks from notice to proceed. Liquidated damages of \$500/calendar day will be assessed on uncompleted work.

GENERAL CONDITIONS

1. Equal Employment Opportunity

The City of Auburn is an Equal Opportunity Employer and shall not discriminate against an applicant for employment, and employee or a citizen because of race, color, sex, marital status, physical and/or mental handicap, religion, age, ancestry or natural origin, unless based upon a bona-fide occupation qualification. Vendors and contractor or their agents doing business with the City shall not violate the above clause or the Civil Rights Acts of 1964. Violations by vendors shall be reviewed on a case-by-case basis and may mean an automatic breach of contract or service to the City of Auburn.

2. Save Harmless

The Bidder agrees to protect and save harmless the owner from all costs, expenses or damages that may arise out of alleged infringement of patents of materials used.

3. Subcontracting

The Bidder shall not subcontract any part of the work or materials or assign any monies due it without first obtaining the written consent of the municipality. Neither party shall assign or transfer its interest in the contract without the written consent of the other party.

4. Warranty

The Bidder warrants that all work will be of good quality and free from faults and defects, and in conformance with the specifications. All work not so conforming to these standards may be considered defective. The Bidder agrees to be responsible for the acts and omissions of all of its employees and all subcontractors, their agents and employees, and all other persons performing any of the work under a contract with the Bidder. Provide a Warranty Period of 5 (five) years.

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BID PROPOSAL FORM

Due: Thursday June 11, 2015

To: City of Auburn
Derek Boulanger,
Facilities Manager/ Purchasing Agent
60 Court Street
Auburn, ME 04210

The undersigned individual/firm/business guarantees this price for Sixty days (60) from the bid due date. The undersigned submits this proposal without collusion with any other person, individual, or firm or agency. The undersigned ensures the authority to act on behalf of the corporation, partnership or individual they represent; and has read and agreed to all of the terms, requests, or conditions written herein by the City of Auburn, Maine. By signing this bid form, the firm listed below hereby affirms that its bid meets the minimum specifications and standards as listed above.

Signature _____ Name (print) _____

Title _____ Company _____

Address _____

Telephone No. _____ Fax No. _____

Email Address: _____ Addendum Noted: _____

STATE OF MAINE
_____, SS.

Date: _____

Personally appeared _____ and acknowledged the foregoing instrument to be his/her free act and deed in his/her capacity and the free act and deed of said company.

Notary Public _____

Print Name _____

Commission Expires _____

BID FORM

A. GENERAL CONDITONS: For all Work other than the Unit Price Work listed in sections B (Including but not limited to all mobilization/demobilization, required permits, temporary shoring, temporary enclosures and protection, ventilation, temporary traffic control, signage, heat and utilities, etc.), a Lump Sum of:

_____ \$
 (words) (numerals)

B. UNIT PRICE WORK (see table below)

UNIT PRICE WORK

ITEM	DESCRIPTION	UNIT	QNTY	UNIT COST	TOTAL COST
1	Crack chase repair	lf	275		
2	Concrete deck repair	sf	100		
3	Base of column repair	sf	20		
4	Overhead concrete repair	sf	10		
5	Overhead strand post tensioning	bundle	1		
6	Traffic membrane application	sf	5200		
7	Floor drain, leader and connections	ea	5		
	Unit Price Total				

C. TOTAL ESTIMATED BID AMOUNT OF (Items A + B):

_____ \$
 (words) (numerals)

Company Name: _____
 Signed by: _____
 Title: _____
 Print Name: _____
 Address: _____
 Tel. # _____ Fax # _____
 Date: _____

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The following unit prices are required for the Owner to evaluate additions to or deductions from the work:

ITEM	DESCRIPTION	UNIT	Addition Unit Price	Deduction Unit Price
1	Crack chase repair	lf		
2	Concrete deck repair	sf		
3	Base of column repair	sf		
4	Overhead concrete repair	sf		
5	Traffic membrane application	sf		
6	Floor drain and leader	ea		

SPECIAL PROVISIONS

1 Work Hours

No work shall proceed on this project prior to the hour of 7:00 A.M. or after 7:00 P.M. (prevailing time) on any working day unless the City has granted prior approval. Work performed outside of this time needs to be approved by the City of Auburn. The definition of work for this specification shall include starting or moving of equipment, machinery, or materials. Any day worked for four hours or more will be considered a full working day.

2 Notifications

Notifications shall be sufficiently in advance of any construction affecting the Fire Department and Dispatch Center.

Close coordination with the City of Auburn, Fire Department and Dispatch Center is required. Notify all parties 48 hours in advance if there is to be any disruption to their service.

3 Materials

Materials shall meet the requirements specified for the various subsections of the Specifications. Equals shall be approved only prior to the bid opening.

4 Occupational Safety and Health

The Contractor is hereby advised that all work to be furnished to the City shall be performed with equipment, methods, and use of personnel in conformance with the pertinent Occupational Safety and Health Act requirements of the State of Maine and with the regulations for construction as specified by the Department of Labor and Occupational Safety and Health Administration (OSHA) as currently amended.

5 Pre-Construction Conference

A conference will be held at 60 Court Street, Auburn, Maine within ten (10) days after the awarding of the contract. At this time, the contractor will be required to submit a graphically illustrated schedule and a plan showing project activities. City officials and representatives of the various utility companies involved in the project will be present at this meeting.

It is the purpose of this meeting to inform the various agencies of the proposed work schedule, and to give them the opportunity of discussing any difficulties and of offering suggestions to the Contractor concerning his proposed schedule in order that full cooperation may be reached.

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6 Schedule of Operations

The above-mentioned schedule of operations shall consist of a bar chart detailing the activities included in the contract. Although a bar chart is acceptable as a minimum, more complex and detailed schedules (i.e., flow charts, critical paths, etc.) are encouraged and will be accepted by the City. Updates will be required.

7 Traffic Control

Contractor shall provide traffic controls as required.

8 Limitation of Operations

The Contractor shall conduct the work at all times in such a manner and in such sequence as will assure the least interference with the Fire Department and Dispatch Operations. The Contractor shall not open up work to the prejudice or detriment of work already started. The Engineer may require the Contractor to finish a section on which work is in progress before work is started on any additional sections, if finishing such section is essential to public convenience.

9 Questions Regarding Plans and Documents

Questions from prospective bidders relative to this Contract shall be submitted no later than five days before bid opening and directed to:

Josh Martin-McNaughton, P.E.
Becker Structural Engineers, Inc.
75 York St
Portland ME 04106
207.879.1838 ext. 138
jmartinmcnaughton@beckerstructural.com

10 Waste Materials

All waste material shall be removed from the site and the area left clean upon completion of work. Any equipment or structures damaged by the Contractor shall be repaired or replaced at no additional cost to the City.

11 Quality Assurance

The Contractor shall be responsible at all times for maintaining top quality assurance during performance of his work.

12 Bids

No bids shall be withdrawn within a period of sixty - (60) - days after the opening of the bids.

BID BOND

KNOW ALL BY THESE PRESENTS, that we, the undersigned, _____ as Principal, and _____ as Surety, are hereby held and firmly bound unto _____ as OWNER in the penal sum of _____ for payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors and assigns.

Signed, this _____ day of _____, 2012.

The Condition of the above obligation is such that whereas the principal has submitted to _____ a certain BID,

attached hereto and hereby made a part hereof to enter into a contract in writing, for the _____

NOW, THEREFORE,

(a) If said BID shall be rejected, or

(b) If said BID shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with said BID) and shall furnish a BOND for his faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said BID,

then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for all and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of time within which the OWNER may accept such BID; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

Principal (L.S)

Surety

By: _____

IMPORTANT - Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the project is located.

SAMPLE AGREEMENT

THIS AGREEMENT is made this ### day of Month Year, by and between the CITY OF AUBURN, a municipal corporation existing under the laws of the State of Maine and located in the County of Androscoggin, State of Maine (hereinafter "CITY"), Company Name, Address, EIN, (hereinafter "CONTRACTOR"),

WITNESSETH:

In consideration of the mutual covenants and conditions contained herein, the CITY and the CONTRACTOR agree as follows:

SPECIFICATIONS:

1. The CONTRACTOR shall furnish all of the material and perform all of the work shown on the drawings and described in the specifications entitled: Bid # XXXXX Bid Title which are attached hereto and made a part hereof, and the CONTRACTOR covenants that it shall do everything required by this Agreement, the Special Provisions of the Agreement, the Invitation to Bid and the Specifications in return for payment as provided herein.

COMPLETION DATE:

2. The work to be performed under this Agreement shall be commenced by Month day, year and fully completed on or before Month day, year.

CONTRACT PRICE:

3. The CITY shall pay the CONTRACTOR for the performance of the Agreement the sum of \$XXX

PERFORMANCE BOND:

4. If required by the City, the CONTRACTOR shall furnish to the CITY at the time of the execution of this Agreement a performance bond and a labor and material payment bond each in the amount of \$Dollar amount or N/A (whichever applies) executed by a surety company satisfactory to the CITY, guaranteeing the performance and payment by the CONTRACTOR. Yes, Required (Initials: ____) No, Waived (Initials ____)

GUARANTEE:

5. The CONTRACTOR shall guarantee his work against any defects in workmanship and materials for a period of one year from the date of the CITY's written acceptance of the project.

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PERMITS AND LICENSES:

6. Permits and licenses necessary for the prosecution of the work shall be secured and paid by the CONTRACTOR.

CITY'S RIGHT TO TERMINATE CONTRACT:

7. If the CONTRACTOR should be adjudged a bankrupt, or if it should make a general assignment for the benefit of creditors, or if a receiver should be appointed on account of its insolvency, or if it should persistently or repeatedly refuse or should fail, except in cases for which extension of time is provided, to supply enough properly skilled workmen or proper materials, or if it should fail to make prompt payment to subcontractors or for material or labor, or persistently disregard laws, and ordinances, or otherwise be guilty of a substantial violation of any provision of the Agreement, then the CITY when sufficient cause exists to justify such action, may, without prejudice to any other right or remedy and after giving the CONTRACTOR, and his surety, seven (7) days written notice, terminate the employment of the CONTRACTOR and take possession of the premises and of all materials, tools and appliances thereon and finish the work by whatever method it may deem expedient. In such case the CONTRACTOR shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the Agreement price shall exceed the expense of the finishing the work, including compensation for additional architectural, managerial and administrative services, such excess shall be paid to the CONTRACTOR. If such expense shall exceed such unpaid balance, the CONTRACTOR shall pay the difference to the CITY.

CONTRACTOR'S LIABILITY INSURANCE:

8. The CONTRACTOR shall not commence work under this Agreement until he has obtained all insurance required under this paragraph and such insurance has been approved by the CITY, nor shall the CONTRACTOR allow any subcontractor to commence work on his subcontract until all similar insurance required of subcontractor has been so obtained and approved. It is a requirement that the CITY be named as an Additional Insured on the General Liability and Automobile Liability policies.

Commercial General Liability to include products and completed operations, and blanket contractual. The limits of liability shall be as follows:

Bodily Injury and Property Damage	\$1,000,000
Personal Injury and Advertising Injury	\$1,000,000
Per Project Aggregate	\$1,000,000
General Aggregate	\$2,000,000
Products and Completed Operations Aggregate	\$2,000,000
Medical Payments	\$10,000

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(b) Business Automobile Liability

The CONTRACTOR shall maintain and cause all sub-contractors and lower tier contractors to maintain business automobile liability insurance covering all owned, non-owned, leased, rented or hired automobiles (symbol 1). The limits of liability shall be as follows:

Bodily Injury and Property Damage	\$1,000,000
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Automobile physical damage coverage shall be at the option of the CONTRACTOR, all sub-contractors and lower tier contractors. The CITY shall not be liable for physical loss or damage to any owned, non-owned, leased, rented or hired automobile.

Workers' Compensation Insurance

The CONTRACTOR shall maintain and cause all sub-contractors and lower tier contractor's to maintain Workers' Compensation and Employers Liability in accordance with the laws and regulations of the State of Maine. The limits of liability provided shall be as follows:

Coverage A:	Statutory
Coverage B:	\$100,000/\$500,000/\$100,000

Professional Liability

If the CONTRACTOR is an Architect, Engineer or Surveyor, they shall maintain a policy of insurance to pay on their behalf whatever amounts that may become legally required to pay on account of an error, omission or negligent act.

Limits of Liability shall be as follows:

\$1,000,000 per occurrence and in the aggregate site specific.

It is a requirement that this policy be maintained for a period of three (3) years following completion of the project.

Certificates of Insurance of the types and in the amounts required shall be delivered to the CITY prior to the commencement of any work by the CONTRACTOR, subcontractor or lower tier contractor or any person or entity working at the direction or under control of the CONTRACTOR. The CONTRACTOR shall assume the obligation and responsibility to confirm insurance coverage for all sub-contractors or lower tier contractors who will participate in the project.

The Certificate of Insurance and the policies of insurance shall include a sixty (60) day notice to the CITY of cancellation, non-renewal or material change in coverage or form.

The CONTRACTOR and his surety shall indemnify and save harmless the CITY, his officers and employees from all suits, actions or claims of any character brought because of any injuries

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or damage received or sustained by any person, persons or property on account of the operations of the said CONTRACTOR; or on account of or in consequence of any neglect in safeguarding the work; or through use of unacceptable materials in construction of the work; or because of any act or omission, neglect, or misconduct of said CONTRACTOR; or because of any claims or amounts recovered from any infringements or patent trademark, or copyright; or from any claims or amounts arising or recovered under the "Workmen's Compensation Act" or of any other law, ordinance, order or decree; and so much of the money due to the said CONTRACTOR under and by virtue of his/her contract as shall be considered necessary by the CITY for such purpose, may be retained; or in case no money is due, his surety may be held until such suit or suits, action or actions, claim or claims, for injuries or damages as aforesaid shall have been settled and suitable evidence to that effect furnished to the CITY.

Waiver of Subrogation

Payment of any claim or suit including any expenses incurred in connection therewith by the CITY, or any insurance company on behalf of the CITY shall not constitute a waiver of subrogation against the CONTRACTOR, sub-contractors or any lower tier contractor in the event that such claim or suit was caused by or contributed to as a result of the negligent acts of the CONTRACTOR, any sub-contractors or lower tier contractors.

Construction Agreement

The CONTRACTOR shall and does hereby agree to indemnify, save harmless and defend the CITY from the payment of any sum or sums of money to any person whomsoever on account of claims or suits growing out of injuries to persons, including death, or damages to property, caused by the CONTRACTOR, his employees, agents or sub-contractors or in any way attributable to the performance and execution of the work herein contracted for, including (but without limiting the generality of the foregoing), all claims for service, labor performed, materials furnished, provisions and suppliers, injuries to persons or damage to property, liens, garnishments, attachments, claims, suits, costs, attorney's fees, costs of investigation and defense. It is the intention of this paragraph to hold the CONTRACTOR responsible for the payment of any and all claims, suits, or liens, of any nature character in any way attributable to or asserted against the CITY, or the CITY and the CONTRACTOR, which the City may be required to pay. In the event the liability of the CONTRACTOR shall arise by reason of the sole negligence of the CITY and/or the sole negligence of the CITY's agents, servants or employees, then and only then, the CONTRACTOR shall not be liable under the provisions of this paragraph.

DAMAGES:

9. The CONTRACTOR shall defend, indemnify and save harmless the CITY and all persons acting for or in behalf of it against all claims for injuries (including death), loss or damage, arising out of the performance out this contract.

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LIENS:

10. Neither the final payment nor any part of the retained percentage shall become due until the CONTRACTOR, if required, shall deliver to the CITY a complete release of all liens arising out of the Agreement, or receipts in full in lieu thereof and, if required in either case, an affidavit that so far as it has knowledge or information the releases and receipts include all the labor and material for which a lien could be filed; but the CONTRACTOR may, if any SUB-CONTRACTOR refuses to furnish a release or receipt in full, furnish a bond satisfactory to the CITY to indemnify it against any lien. If any lien remains unsatisfied after all payment are made, the CONTRACTOR shall refund to the CITY all moneys that the latter may be compelled to pay in discharging such a lien, including all costs and a reasonable attorney's fee.

ASSIGNMENT:

11. Neither party to the Agreement shall assign the Agreement or sublet it as a whole without the written consent of the other, nor shall the CONTRACTOR assign any moneys due or to become due to it hereunder, without the previous written consent of the CITY.

SUBCONTRACTS:

12. The CONTRACTOR shall not sublet any part of this Agreement without the written permission of the CITY. The CONTRACTOR agrees that it is as fully responsible to the CITY for the acts and omissions of its SUB-CONTRACTORS and of persons either directly or indirectly employed by them, as it is for the acts and omissions of persons directly employed by it.

USE OF PREMISES:

13. The CONTRACTOR shall confine its apparatus, the storage of materials and operations of its workers to limits indicated by law, ordinance and permits and shall not otherwise unreasonably encumber the premises with its materials. If any part of the project is completed and ready for use, the CITY may, by written and mutual consent, without prejudice to any of its rights or the rights of the CONTRACTOR, enter in and make use of such completed parts of the project. Such use or occupancy shall in no case be construed as an acceptance of any work or materials.

CLEANING UP:

14. The CONTRACTOR shall at all times keep the premises free from accumulation of waste materials or rubbish caused by its employees or work, and at the completion of the work it shall remove all its rubbish from and about the project, and all its tools, scaffolding and surplus materials and shall leave its work "broom-clean" or its equivalent, unless more exactly specified. In case of dispute, the CITY may remove the rubbish and charge the cost to the CONTRACTOR.

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PAYMENTS:

15. Unless otherwise agreed to, the CITY shall make payments on account of the Agreement as follows:

Within 30 days, as invoices are submitted for work completed to the satisfaction of the CITY.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement on the day and year first above written.

BY: _____ BY: _____
Witness Finance Director

BY: _____ BY: _____
Witness Contractor

DIVISION 1
GENERAL REQUIREMENTS

SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

- A. The CONDITIONS OF THE CONTRACT, all Drawings, and all Sections of Division 1 are hereby made a part of this Section.

1.02 WORK INCLUDED

- A. This Section specifies administrative and procedural requirements for submittals required for performance of work, including:

- 1. Product data

- B. Administrative Submittals: Refer to requirements specified in other Division 1 Specification Sections, and other Contract Documents, for administrative submittals, including:

- 1. Permits

- 2. Applications for payment

- 3. Performance and payment bonds (where required).

- 4. Insurance certificates

- 5. List of subcontractors

1.03 RELATED REQUIREMENTS

- A. Examine Contract Documents for requirements that affect Work of this Section. Other Specification Sections that directly relate to Work of this Section include, but are not limited to:

- 1. Traffic Membranes: SECTION 07180

- 2. Joint Sealant: SECTION 07920

- 3. Post Tension Cables 32300

- 4. Concrete Repair: SECTION 03310

1.04 SUBMITTAL PROCEDURES

- A. Coordination of Submittals: Coordinate timing of submittals with construction activities. Transmit submittals well enough in advance of performance of work to avoid delays. Coordinate submittals of related elements of work.
1. Engineer may reject, or withhold action on submittals requiring coordination with other submittals until related submittals are received.
- B. Processing of Submittals: Allow sufficient review time to ensure installation will not be delayed because of time required to process submittals. Minimum processing times are as follows:
1. Review by Engineer: Allow ten (10) business days for review and processing.
 2. No extension of Contract Time will be authorized due to failure to transmit submittals sufficiently in advance of scheduled performance of work.
- C. Contractors Preparation of Submittals: Place permanent label or title block on each submittal for identification. Indicate Project Name, Engineer's Project Number, Specification Section number and title, date of submittal, name and address of Engineer, name and address of Contractor, name and address of subcontractor and/or supplier, name of manufacturer, Drawing number and detail reference.
1. Contractor's Review and Action Stamp: Provide suitable space on label or title block for Contractor's review and action stamp. Stamp and sign each submittal to show Contractor's review and approval prior to transmittal to Engineer. Submittals not signed and stamped by Contractor will be returned without action.
 2. Engineer's Review and Action Stamp: Provide minimum 6 in. x 4 in. space on drawing for Engineer's review and action stamp. Deliver submittals to Engineer at address listed on cover of Project Manual.
 3. Modify and customize submittals as required to show interface with adjacent work and attachment to building.
- D. Transmittal of Submittals: Transmit each item with transmittal form. Identify Project, Contractor, subcontractor, major supplier; identify pertinent Drawing sheet and detail number and Specification section number, as appropriate, on transmittal form.
1. Source: Submittals received from sources other than Contractor will be returned without action.

2. Deviations from Contract Documents: When products, materials or systems submitted deviate from Contract Documents, record deviations clearly on transmittal form, or separate attached sheet.
 3. If deviation includes design and/or material change, this shall be accompanied by design calculations stamped by a registered professional Engineer or additional time and fee (payable by Contractor) will be required for submittal review.
- E. Before submitting each Shop Drawing or Sample, Contractor shall have determined and verified:
1. All field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with the respect thereto;
 - a. the suitability of all materials with respect to the intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work;
 - b. all information relative to the Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto; and
 - c. shall also have reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.
- F. Each Submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review an approval of that submittal.
- G. With each Submittal, Contractor shall give Engineer specific written notice of any variations, that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawing's or Sample Submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.
- H. After Engineer reviews submittal, revise and resubmit as required. Identify recipients to promptly report inability to comply with provisions.
- I. Distribute copies of reviewed submittals to concerned persons. Instruct recipients to promptly report inability to comply with provisions.

1.05 SUBMITAL SCHEDULE

A. Not required for this project.

1.06 SHOP DRAWINGS

A. Not required for this project.

1.07 PRODUCT DATA

A. Definition: Product data includes manufacturer's standard published literature, such as installation instructions, catalog cuts and color charts. When product data must be prepared specifically because standard published data is not suitable for use, submit as shop drawing.

B. Preparation: Mark each copy of product data to show applicable choices and options. Where published product data includes information on several products and choices, mark copies to clearly indicate information applicable to this Project.

C. Do not submit product data until compliance with requirements of Contract Documents has been confirmed.

D. Submittal Quantities: Submit product data in following quantities:

1. Submit three copies for review. One copy will be returned to Contractor for printing and distribution. Multiple copies will not be marked by Engineer.

E. Installer Copy: Verify that installer of work possesses a current copy of Engineer approved product data prior to installation.

1.08 ENGINEER'S ACTION

A. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

B. Engineer's review and approval shall not relieve the Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with all requirements of this section, the general and supplementary conditions of the Contract and the Engineer has given approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of paragraph 1.04.

1.09 DISTRIBUTION BY CONTRACTOR

- A. Distribution: When submittal is marked “APPROVED” or “APPROVED AS NOTED”, make prints and copies and distribute to subcontractors, suppliers, fabricators, and other parties requiring information from submittal for proper coordination and performance of work. Print copies of shop drawings from approved reproducible only.

END OF SECTION

SECTION 01500

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

- A. Drawings, Contract Conditions, and other Technical Specifications Sections apply to work of this Section insofar as applicable.

1.02 WORK INCLUDED

- A. This Section specifies construction facilities and temporary controls, including, but not limiting to:
 - 1. Temporary restrictions on construction activity.
 - 2. Temporary utilities.
 - 3. Temporary construction and support facilities.
 - 4. Temporary signage.
 - 5. Security and protection facilities.
- B. Contractor shall pay for all costs related to temporary facilities and utility service including but not limited to temporary heat, water and power, if required.

1.03 RELATED REQUIREMENTS

- A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to work of this Section include, but are not limited to:
 - 1. CONTRACT AGREEMENT.
 - 2. Section 01300: SUBMITTALS

1.04 SUBMITTALS

- A. Schedule: Submit a schedule indicating implementation and termination of each temporary utility within fifteen days of date established for Commencement of the Work.

1.05 QUALITY ASSURANCE

- A. Comply with requirements of authorities having jurisdiction, codes, utility companies, OSHA, and industry standards including, but not limiting to:
 - 1. NFPA 241.
 - 2. NFPA 70.
 - 3. ANSI A10.
 - 4. NECA NJG-6.
- B. Electric Service: Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with NFPA 70.
- C. Inspections: Arrange for authorities having jurisdiction to inspect temporary utilities prior to use. Obtain required certifications and permits.

1.06 PROJECT CONDITIONS

- A. Conditions of Use: Maintain temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload temporary facilities. Do not allow hazardous, dangerous, or unsanitary conditions to develop on site.

PART 2 PRODUCTS

2.01 MATERIALS, GENERAL

- A. Materials may be new or used, but must be adequate in capacity for the required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards.
- B. Lumber and Plywood:
 - 1. Signs and Directory Boards: Provide exterior grade, Medium Density Overlay (MDO) plywood, conforming to USDC PS1, of size and thickness indicated.
 - 2. Fences, Vision Barriers, and Safety Barriers: Provide exterior grade, C-D veneered plywood.

2.02 TEMPORARY UTILITIES

- A. Scope: Temporary utility work includes, but is not limited to:
 - 1. Electric power

2. Telephone Service.

B. Temporary Electric Power and Light:

1. Power is currently available in the garage and can be used. Not all outlets are currently operational and may not provide easy access to all areas of work. Additional power may be required and should be provided by the contractor.
2. Provide generator to run any large equipment.

C. Telephone Service: Provide cell phone contact for project superintendent and project manager for this project.

2.03 TEMPORARY CONSTRUCTION AND SUPPORT FACILITIES

A. Scope: Temporary construction and support facilities include, without limitation:

1. Temporary enclosures.
2. Construction aids.
3. Waste disposal services.
4. Water control.
5. Rodent and pest control.
6. Pollution and dust control.

B. Temporary Ventilation: Provide temporary ventilation required to maintain adequate environmental conditions to facilitate progress of work, to meet manufacturers' specified minimum installation conditions, and to protect materials and finishes from damage due to temperature and humidity.

1. Ventilate enclosed areas for curing of installed materials, to disperse humidity, and to prevent hazardous accumulations of dust, fumes, vapors and gases.
2. Pay costs of installation, maintenance, operation, removal, and fuel consumed.

C. Contractor's Field Offices and Sheds: Prior to installation of offices and sheds, consult with Engineer and Owner on location, access, and related facilities.

D. Sanitary Facilities: Toilet facilities within the building will be available.

1. Maintain washrooms in clean and sanitary condition.

- E. Temporary Enclosures: Provide temporary weathertight enclosures of exterior walls as Work progresses. Design and construct temporary enclosures to provide acceptable working conditions, to provide weather protection for materials, to allow effective temporary heating, and to prevent entry of unauthorized persons.
 - 1. Provide temporary exterior doors with self-closing hardware and padlocks.
 - 2. Design enclosures to be removable to allow handling of materials.
- F. Construction Aids: Provide construction aids and equipment required by personnel to facilitate execution of the work; scaffolds, staging, ladders, stairs, ramps, runways, platforms, railings, hoists, cranes, chutes, and other such facilities and equipment.
 - 1. Refer to respective sections for particular requirements for each trade.
 - 2. When permanent stair framing is in place, provide temporary treads, platforms, and railings, for use by construction personnel.
- G. Waste Disposal: Maintain all areas under Contractor's control free of debris. Initiate and maintain a specific program to prevent accumulation of debris at construction area, storage and parking areas, or along access roads.
 - 1. Provide containers for deposit of debris.
 - 2. Schedule daily collection and weekly disposal of debris.
 - 3. Provide additional collections and disposals of debris whenever the weekly schedule is inadequate to prevent accumulation.
- H. Water Control: Provide methods to control surface water to prevent damage to Project, site, and adjoining properties.
- I. Dispose of drainage water in a manner to prevent flooding, erosion, or other damage to any portion of the site or to adjoining areas and properties.
- J. Pollution Control: Provide methods, means, and facilities required to prevent contamination of soil, water, or atmosphere by the discharge of noxious substances from construction operations. Provide equipment and personnel, perform emergency measures required to contain any spillage and to remove contaminated soils or liquids.
 - 1. Take special measures to prevent harmful substances from entering public waters.
 - 2. Prevent disposal of wastes, effluents, chemicals, or other such substances in sanitary or storm sewers.

3. Provide systems for control of atmospheric pollutants.
4. Prevent toxic concentrations of chemicals.
5. Prevent harmful dispersal of pollutants to atmosphere.

K. Dust Control: Provide positive methods and apply dust control materials to minimize raising dust from construction/demolition operations. Provide positive means to prevent air-borne dust from dispersing into the atmosphere.

2.04 TEMPORARY SIGNAGE

A. Scope: Temporary signage includes, but is not limited to:

1. Traffic.
2. Pedestrian.
3. Means of Egress.
4. Other signage as required in the Contract Documents or required by the owner.

B. Sign Structure and Framing: New or used, wood or metal, in sound condition structurally adequate to work and suitable for specified finish.

C. Rough Hardware: Galvanized steel or cadmium plated.

D. Paint: Exterior quality.

2.05 SECURITY AND PROTECTION FACILITIES

A. Scope: Security and protection facilities includes, but is not limited to:

1. Temporary fire protection.
2. Barricades, warning signs, lights.
3. Temporary access routes.
4. Security procedures.

- B. Temporary Fire Protection: Provide and maintain suitable fire protection equipment and services. Establish procedures for fire protection for welding and other potentially hazardous construction operations. Ascertain and comply with requirements of Project insurance carrier, City of Auburn Fire Department and the State of Maine Fire Marshal. Permanent fire protection system may be activated to meet these requirements. Replace fusible ink heads and other expended or discharged components at time of Substantial Completion.
 - 1. Locate temporary portable fire extinguishers in convenient locations, not less than one extinguisher per floor.
 - 2. Store combustible materials in containers in fire-safe locations.
 - 3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways, and other access routes.
- C. Barricades, Warning Signs, and Lights: Provide and maintain barricades, warning signs, warning lights, railings, walkways, and the like. Paint signs and barricades with appropriate colors, graphics, and warnings to inform public and job-site personnel of hazards.

PART 3 EXECUTION

3.01 MAINTENANCE, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. Limit waste and abuse.
- B. Maintenance: Maintain temporary facilities in operating conditions; repair damages immediately upon discovery. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour per day basis.
- C. Termination and Removal: Unless otherwise requested by Engineer, remove each temporary facilities when no longer useful, or when replaced by permanent facility. Clean and renovate permanent facilities that have been used during construction period.

END OF SECTION

SECTION 01600

MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.01 GENERAL REQUIREMENTS

- A. The CONTRACT AGREEMENT, all Drawings, and all Sections of Division 1 are hereby made a part of this Section.

1.02 WORK INCLUDED

- A. This Section specifies administrative and procedural requirements for materials and equipment used for the Project.

1.03 RELATED REQUIREMENTS

- A. Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to work of this Section include, but are not limited to:

1. CONTRACT AGREEMENT.
2. Traffic Membranes: SECTION 07180
3. Joint Sealant: SECTION 07920
4. Concrete Repair: SECTION 03310

1.04 MATERIAL AND EQUIPMENT INCORPORATED INTO THE WORK.

- A. Conform to applicable specifications and standards.
- B. Comply with size, make, type and quality specified, or as specifically approved in writing by the Engineer.
- C. Manufactured and Fabricated Products:
 1. Design, fabricate and assemble in accordance with the best engineering and shop practices.
 2. Manufacture like parts of duplicate units to standard size and gages, to be interchangeable.
 3. Two or more items of the same kind shall be identical, by the same manufacturer.

4. Products shall be suitable for service conditions.
 - D. Do not use material or equipment for any purpose other than that for which it is designed or is specified.
- 1.05 WORKMANSHIP
- A. Comply with industry standards except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.
 - B. Perform work by persons qualified to produce workmanship of specified quality.
 - C. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.
- 1.06 MANUFACTURERS' INSTRUCTIONS:
- A. When work is specified to comply with manufacturers' instructions, submit copies of said instructions, as specified in Section 01300, SUBMITTALS, distribute copies to persons involved, and maintain one set in field office.
 - B. Perform work in accordance with details of instructions and specified requirements. Should a conflict exist between Specifications and manufacturer's instructions, consult with Engineer.
- 1.07 TRANSPORTATION AND HANDLING
- A. Arrange deliveries of products in accordance with construction schedules, coordinate to avoid conflict with work and conditions at the site.
 - B. Transport Products by methods to avoid Product damage; deliver in undamaged condition in manufacturer's unopened containers or packaging, dry.
 - C. Provide equipment and personnel to handle Products by methods to prevent soiling or damage.
 - D. Promptly inspect shipments to assure that Products comply with requirements, quantities are correct, and products are undamaged.
- 1.08 STORAGE AND PROTECTION
- A. Store Products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive Products in weather-tight enclosures; maintain within temperature and humidity ranges required by manufacturer's instructions.

- B. For exterior storage of fabricated Products, place on sloped supports above ground. Cover Products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.
- C. Store loose granular materials on solid surfaces in a well-drained area; prevent mixing with foreign matter.
- D. Arrange storage to provide access for inspection. Periodically inspect to assure Products are undamaged and are maintained under required conditions.
- E. Note limited storage areas provided for this project.

1.09 MATERIAL SUBSTITUTIONS

- A. Where products or materials are specified by manufacturer's name, trade name or catalog reference, the words "or approved equal" shall be understood to follow unless there is a statement specifically indicating that no substitution will be allowed. An item shall be considered equal to the item so named or described if in the opinion of the Engineer,
 - 1. It is at least equal in quality, durability, appearance, strength and design; including compliance with applicable specifications and compatibility with physical space allocations provided for the item;
 - 2. It performs at least equally the function imposed by the general design for the work;
 - 3. It conforms substantially, even with deviations to the detailed requirements for the item as indicated by the specifications.
 - 4. Contractor supplies a list of reference projects (2 min.) where they have successfully used this product.
- B. Where two or more products or materials are specified, the choice of these shall be optional with the Contractor.
- C. Material substitutions shall be listed in bid document. Material substitutions will be approved after contract has been awarded.
- D. Request constitutes a representation that the Contractor:
 - 1. Has investigated proposed Product and determined that it meets or exceeds, in all respects, specified Product;
 - 2. Will provide the same warranty for substitution as for specified Product;
 - 3. Will coordinate installation and make other changes which may be required for Work to be complete in all respects; and

4. Waives claims for additional costs which may subsequently become apparent.
- E. Substitutions will not be considered when they are indicated or implied on Shop Drawing or Product Data submittals without separate written request on the form included at the end of this Section, or when acceptance will require substantial revision of Contract Documents.
- F. The Engineer will determine acceptability of proposed substitution, and will notify Contractor of acceptance or rejection in writing within a reasonable time.
- G. Any additional costs, or any loss or damage arising from the substitution of any materials, equipment or execution of work for those originally specified shall be borne by the Contractor, notwithstanding approval or acceptance of such substitution by the Engineer, unless such substitution was made at the written request or direction of the Engineer.

1.10 EQUIPMENT

- A. Contractor shall provide all necessary equipment to complete the Work.

END OF SECTION

**SECTION 01710
CLEANING**

PART 1 GENERAL

1.01 DESCRIPTION

- A. Work included: Throughout the construction period, maintain the buildings and site in a standard of cleanliness as described in this Section.
- B. Provide waste storage containers.
- C. This is an operating fire station and 911 call center and every effort must be made to maintain the critical functions of this facility.
- D. Related work: In addition to standards described in this Section, comply with requirements for cleaning as described in pertinent other Sections of these Specifications.

1.02 QUALITY ASSURANCE

- A. Conduct inspections to verify that requirements for cleanliness are being met.

PART 2 – PRODUCTS

2.01 CLEANING MATERIALS AND EQUIPMENT

- A. Provide required personnel, equipment, and materials needed to maintain the specified standard of cleanliness.

2.02 COMPATIBILITY

- A. Use only the cleaning materials and equipment that are compatible with the surface being cleaned, as recommended by the manufacturer of the material.

2.03 WASTE STORAGE CONTAINER

- A. The Contractor is responsible for providing a suitable waste storage container of sufficient size or numbers for the temporary storage of wastes generated by the work of this Section and other Sections of these Specifications.
- B. The Contractor is responsible for the proper and timely transfer of stored wastes to a proper off-site disposal.
- C. Demolition debris shall not be stored on the garage deck.

3.01 PROGRESS CLEANING

A. General:

1. Retain stored items in an orderly arrangement, in designated areas allowing maximum access, not impeding traffic or drainage, and providing required protection of materials.
2. Do not allow accumulation of scrap, debris, waste material, and other items not required for construction of this work, except in proper waste container(s).
3. Provide adequate storage for all debris and trash awaiting removal from the job site, observing requirements for fire protection and protection of the ecology.
4. Waste containers shall be emptied, off site, a minimum of once per week.

B. Site:

1. Continuously inspect the site and pick up all scrap, debris, and waste material. Remove such items to the container(s) designated for their storage.
2. Daily and more often if necessary, inspect all arrangements of construction materials stored on the site. Restack, organize neatly, tidy or otherwise service arrangements to meet requirements of subparagraph 3.01-A-1 above.

C. Building:

1. Daily, and more often if necessary, inspect and pick up all scrap, debris, and waste material. Remove such items to the container(s) designated for their storage.
2. As required preparatory to installation of succeeding materials, clean the surfaces to the degree of cleanliness recommended by the manufacturer of the succeeding material, using equipment and materials required to achieve the necessary cleanliness.

3.02 FINAL CLEANING

A. Prior to completion of the work, remove from the job site all tools, surplus materials, equipment, scrap, debris, and waste. Conduct final progress cleaning as described in Article 3.01 above.

B. Site:

1. Broom clean paved areas used by construction.

2. Rake grass and garden areas to remove construction debris.
3. Completely remove resultant debris.

C. Building:

1. Exterior:

- a. Visually inspect exterior building surfaces and remove all traces of soil, waste materials, smudges, and other foreign matter caused by the work.
- b. Remove all traces of splashed materials from adjacent surfaces.

2. Interior:

- a. Visually inspect interior of building and remove all traces of soil, waste material, smudges, and other foreign matter caused by the work.
- b. Remove all unused construction material.
- c. Remove all temporary protection and shoring.
- d. Wash down all decks.

END OF SECTION

DIVISION 2
DEMOLITION

SECTION 02070

SELECTIVE DEMOLITION

PART 1 GENERAL

1.01 DESCRIPTION

- A. Work included: Remove existing joint sealant, damaged concrete, deteriorated paint, and any other material as directed.
 - 1. Removal of materials and debris includes proper site storage and off-site disposal.
- B. Should contractor discover, upon removal of damaged concrete, damage or deterioration of the embedded structural steel connections or reinforcement, they shall, immediately and prior to performing any repairs to these surfaces, inform the Engineer of encountered conditions. The Engineer will promptly review these conditions. As appropriate, the Engineer will provide the contractor with recommendations for repair of these conditions as described on the plans and in the specifications.
- C. Conform to all Federal, State and local safety requirements.

1.02 SUBMITTALS

- A. Request for Engineer's consent:
 - 1. Should conditions of the work, or schedule, indicate a required change of materials or methods for cutting and patching, so notify the Engineer and secure their written permission and the required Change Order prior to proceeding.

PART 2 PRODUCTS

2.01 TOOLS AND EQUIPMENT

- A. Provide the adequate tools and equipment necessary to carry out the work of this Section.
- B. Do not use tools, products and/or equipment which could damage the portions of the building which are to remain.
- C. Operations within the building are sensitive to noise and tools. Equipment should be selected based on minimizing disruptions.

PART 3 EXECUTION

3.01 SURFACE CONDITIONS

A. Inspections:

1. Inspect existing conditions, including elements subject to movement or damage during cutting and patching.
2. After uncovering the work, inspect conditions affecting installation of new work.
3. Visually examine all areas of the project to determine actual conditions

B. Discrepancies:

1. If uncovered conditions are not as indicated, immediately notify the Engineer and secure needed directions prior to proceeding.
2. Do not proceed until written directions are obtained from the Engineer.

3.02 PREPARATION PRIOR TO CUTTING

A. Provide required protection including, but not necessarily limited to, shoring, bracing and support to maintain structural integrity of the work and existing members.

B. Contractor shall construct barriers and other methods of protecting people and property prior to demolition.

1. Barriers and other methods shall be constructed in a manner that is acceptable to the Owner and the Building Inspector.

C. Barriers and other methods shall be maintained throughout construction.

1. As a minimum, all portions of deck areas where demolition or construction is taking place shall be completely closed to public access.

3.03 PERFORMANCE

A. Perform required cutting and patching as required under other Sections of these Specifications.

1. Perform cutting and demolition by methods which will prevent damage

END OF SECTION

DIVISION 3

CONCRETE

SECTION 03230

POST TENSION CABLES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. The drawings, contract and other Division 1 specification sections apply to work of this section.
- B. Examine all other sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

1.02 SUMMARY

- A. This Section includes furnishing all labor, tools, materials, equipment and services necessary to properly install embedded galvanic anodes.
- B. This section specifies furnishing, installing and stressing tendons in post tensioned building framing members as shown on the Drawings and described herein.

1.03 RELATED SECTIONS

- A. Section 01300 SUBMITTALS
- B. Section 01500 CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS
- C. Section 01710 CLEANING
- D. Section 03310 CONCRETE REPAIR

1.04 REFERENCES

- A. Codes and Standards: Comply with requirements of Post-Tensioning Manual, most recent edition, except where more stringent requirements are specified.
- B. ACI Guideline No. 222 – Corrosion of Metals in Concrete

- C. ICRI Guideline 310.1R-2008 Guide for Surface Preparation for the Repair of Deteriorated Concrete resulting from Reinforcing Steel Corrosion
- D. ACI/ICRI Concrete Repair Manual

1.05 SUBMITTALS

- A. Unless otherwise specified, submittals required in this section shall be submitted for review. Submittals shall be prepared and submitted in accordance with Section 01300.
- B. All submittals shall be reviewed and returned within 10 working days.
- C. Incomplete submittals will not be reviewed.
- D. Submittals not reviewed by the Contractor prior to submission to the Engineer will not be reviewed. Include on the submittal statement or stamp of approval by Contractor, representing that the Contractor has seen and examined the submittal and that all requirements listed in this Section and Section 01300 have been complied with.
- E. Engineer will review submittals a maximum of two review cycles as part of their normal services. **If submittals are incomplete or otherwise unacceptable and re-submitted, General Contractor shall compensate the Owner for additional review cycles.**
- F. Product Data: Submit producers or manufacturer's specifications and installation instructions for the following products. Include laboratory test reports and other data to show compliance with specifications (including specified standards).
 - 1. Stressing procedures and jacking forces to result in the final effective forces.
 - 2. Provide the following information:
 - a. Name and certifications of installer and inspector.
 - b. Jack and gage calibration certification.
 - c. Jack and gage Serial or identification number.
 - d. Gage pressure to achieve required stressing force per supplied calibration chart.
 - e. Calculated strand elongation and actual elongations.
 - f. Actual gage pressure.
- G. Hardware and accessory data sheets.

1.06 QUALITY ASSURANCE

- A. Fabricator Qualifications: Firm experienced in producing post tension strand fabrications similar to those indicated for this Project with a record of successful in-service performance, and with sufficient production capacity to produce required units without delaying the Work.
- B. Installation shall be performed by PTI certified installer or qualified technician with (3) three years' experience of (5) five project of similar size and scope.
- C. Proper calibrated stressing equipment shall be supplied for the particular application and/or barrier cable system that are necessary to perform the work.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products in original sealed factory packaging bearing identification of product, manufacturer, and batch number. Provide Material Safety Data Sheets for each product.
- B. Store product in location protected from freezing, damage, construction activity, precipitation, and direct sunlight, in strict accordance with manufacturer's recommendations.
- C. Handle all products with appropriate precautions and care as stated on Material Safety Data Sheet.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Post-Tensioning Steel:
 - 1. Conform to ASTM A416, Grade (270K) Low Relaxation strand, with anchorages developing at least 95 percent of the minimum specified ultimate strength of the prestressing steel.
 - 2. Provide low relaxation strand with a mill applied continuous permanent physical marking to permit field identification.
 - 3. Package material at the source in a manner that prevents physical damage to strand during transportation and protects material from deleterious corrosion during transit and storage.
- B. Post-tensioning materials comply with Post-Tensioning Manual Guide Specifications.
- C. Anchorages and Couplings:

1. Design tendon anchorages and coupling to develop static and dynamic strength requirements of Section 3.1.6(a) and Section 3.1.8 (1) and (2) of Post-Tensioning Manual Guide Specifications for Post-Tensioning Materials. Castings shall be nonporous and free of sand, blowholes, voids, and other defects.
 2. Average compressive concrete bearing stress of anchorages shall not exceed limits set forth in Section 3.1.7 of Post-Tensioning Manual Guide Specifications for Post-Tensioning Materials.
 3. For wedge type anchorages, design wedge grippers to preclude premature failure of prestressing steel due to notch or pinching effects under static and/or dynamic test load conditions stipulated under Paragraph 1 for both stress relieved and low relaxation prestressing steel materials.
 4. Use couplings only at locations specifically indicated on contract documents or as approved.
 5. Coat couplings with the same corrosion preventive coating used on strand and enclose in sleeves.
 6. Anchorages shall include design features permitting a watertight connection of sheathing to anchorage, and watertight closing of wedge cavity, for stressing and nonstressing (fixed) anchorages. Design intermediate stressing anchorages to permit complete watertight encapsulation of prestressing tendons.
 7. Anchorages for unbonded slab tendons shall receive an epoxy corrosion protective coating. Correct field damage to coating by field touch-up of coating surface.
- D. Corrosion Preventive Coating of Unbonded Tendons:
1. Corrosion preventive coating material shall have following properties:
 - a. Provide corrosion protection to prestressing steel.
 - b. Provide lubrication between strand and sheathing.
 - c. Resist flow from sheathing within anticipated temperature range of exposure.
 - d. Provide a continuous nonbrittle film at lowest anticipated temperature of exposure.
 - e. Be chemically stable and nonreactive with the prestressing steel, sheathing material, and concrete.
 2. Film shall be an organic coating with appropriate polar, moisture displacing, and corrosion preventive additives.
 3. Minimum weight of coating material on prestressing strand shall be not less than 1.1 kg (2.5 pounds) of coating material per 30 m (100 feet) of 13 mm (0.5 inch) diameter strand, and 1.3 kg (3.0 pounds) of coating material per 30 m (100 ft.) of 15 mm (0.6 inch) diameter strand. Amount of coating material used shall be sufficient to ensure essentially complete filling of annular space between strand and sheathing. Extend coating over entire tendon length.

4. Provide test results in accordance with Table I for corrosion preventative coating material.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Reference Spec Section 02070 Selective Demolition and 03310 Concrete Repair for removal and preparation of concrete surfaces.
- B. Do not expose tendons to excessive temperatures, welding sparks or electric ground currents.
- C. For wedge type anchorages, seat fixed end wedges, with a load of not more than 80 percent of minimum ultimate tensile strength of tendon. Seating load shall be sufficient to ensure adequate capacity of non-stressing anchorages.
- D. Minimum concrete cover for splices chucks and dog bone shall not be less than minimum cover to reinforcement at other locations in structure.

3.02 STRESSING

- A. After deteriorated concrete has been removed and tendons have been prepared, stress tendons by means of hydraulic jacks equipped with calibrated pressure gauges with an accuracy of 1 percent of scale range to permit the stress in tendons to be computed at any time. Equip hydraulic stressing rams used to stress unbonded single strand tendons with stressing grippers that will not notch strand more severely than normal anchoring wedges. Notify Resident Engineer 48 hours before any stressing operation that takes place.
 1. Conduct stressing operation as recommended by manufacturer of stressing tendons and in conformance with approved shop drawings.
 2. Keep records of elongation and of tension applied to each tendon and submit four copies to Engineer promptly upon the completion of post-tensioning of each member. Make elongation measurements at each stressing location to verify that effective force has been properly achieved. Measured elongations shall agree with calculated elongations within ± 5 percent. Resolve discrepancies exceeding ± 5 percent with Engineer. At time of stressing first member of each type, check stresses in individual tendons to establish a post-tensioning procedure producing uniform results.
 3. Complete stressing records during the tensioning operation, with following data recorded as a minimum:
 - a. Tendon mark or identification.
 - b. Required elongation.
 - c. Gauge pressure to achieve required elongation.
 - d. Actual elongation achieved.
 - e. Actual gauge pressure.

- f. Date of stressing operation.
 - g. Signature of stressing operator or inspector.
 - h. Serial or identification number of jacking equipment. Stressing records shall then be turned over to the Government and professional engineer of record for verification and approval.
4. Obtain written permission of Engineer before cutting tendons or capping post-tensioned anchorages.
- B. In no case shall tendons be anchored at stresses above 80 percent of specified tensile strength of tendon.
 - C. Do not do any welding around tendons.
 - D. Take reasonable care to prevent damage to tendons. In event that a single wire in multiple wire strands is broken, replacement will not be required providing total loss caused by broken strand is less than 2 percent of total prestress in the member. Contractor shall replace tendon at no additional cost to the City in event prestress loss through breakage is greater than 2 percent.

3.03 FINISHING

- A. Trimming of excess tendon length: As soon as possible after tendon tensioning and satisfactory check of elongation by Resident Engineer, cut excess tendon length. Tendon length protruding beyond wedges after cutting shall be between 20 mm (0.75) and 30 mm (1.25 inches).
- B. Tendons may not be cut by means of oxyacetylene cutting. Abrasive wheel or hydraulic shears are acceptable means of cutting tendons.
- C. Complete overhead concrete repair area. Under no circumstances shall grout or mortar used for pocket filling contain chlorides or other chemicals known to be deleterious to prestressing steel.
- D. Coat exposed strand and wedge areas with tendon coating material comparable to that used over length of the tendon and a watertight cap shall be applied over the coated area.

END OF SECTION

SECTION 03310

CONCRETE REPAIR

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. The drawings, the contract and other Division 1 Specification sections apply to work of this section.
- B. Examine all other sections of the Specifications for requirements that affect work of this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

1.02 DESCRIPTION OF WORK:

- A. Work included: Provide labor, materials, and equipment necessary to complete the work of this Section and, without limiting the generality thereof:
 - 1. Repair of top surface of slab.
 - 2. Repair underside of deck.
 - 3. Column repairs.

1.03 RELATED WORK:

- A. Post Tension Cables: Section 03230
- B. Joint Sealant: Section 07900
- C. Traffic Membranes: Section 07180

1.04 QUALITY ASSURANCE:

- A. Codes and Standards: Comply with provisions of the latest edition of the following except where more stringent requirements are shown or specified:
 - 1. ACI 362.1 "Guide for the Design of Durable Parking Structures."
 - 2. ACI 546 "Concrete Repair Guide."
 - 3. ICRI Technical Guideline No. 03731 "Guide for Selecting Application Methods for the Repair of Concrete Surfaces."

4. ICRI Technical Guideline No. 03730 “Guide for Surface Preparation for the Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion”
 5. ICRI Technical Guideline No. 03732 “Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays.”
 6. “Code of Federal Regulations, Part 1926” per the Occupational Safety and Health Administration (OSHA), Department of Labor (Latest Revision).
- B. Materials and installed work may require testing and retesting, as directed by the Engineer, at any time during progress of work. Allow free access to material stockpiles and facilities. Tests not specifically indicated to be done at Owner's expense, including retesting of rejected materials and installed work, shall be done at Contractor's expense.

1.05 SUBMITTALS

- A. Unless otherwise specified, submittals required in this section shall be submitted for review. Submittals shall be prepared and submitted in accordance with Division 1.
- B. All submittals shall be reviewed and returned to the Contractor within 10 working days.
- C. **Incomplete submittals will not be reviewed.**
- D. Submittals not reviewed by the General Contractor prior to submission to the Engineer will not be reviewed. Include on the submittal statement or stamp of approval by Contractor, representing that the Contractor has seen and examined the submittal and that all requirements listed in this Section and Division 1 have been complied with.
- E. Engineer will review submittals a maximum of two review cycles as part of their normal services. If submittals are incomplete or otherwise unacceptable and re-submitted, General Contractor shall compensate the owner for Engineer’s for additional review(s) cycles.
- F. Product Data: Submit producer’s or manufacturer’s specifications and installation instructions for the following products. Include laboratory test reports and other data to show compliance with specifications (including specified standards).
 1. One Component, Early Strength Gaining, Cementitious Repair Material .
 2. Admixtures.

3. Primers/Bonding Agents.

G. Contraction/Construction Joints: Reference Section 07920.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to site in manufacturer's original unopened containers and packaging bearing labels as to type and names of products and manufacturers.
- B. Deliver and store restoration material in manufacturer's original, unopened containers with the grade, batch and production data shown on the container or packaging.
- C. Protect restoration material during storage and construction from rain, ground water, and other sources of moisture and from staining or intermixture with soils or other types of material.
- D. Protect grout, mortar and other materials from deterioration by moisture and temperature. Store in a dry location or in waterproof containers. Keep containers tightly closed and away from open flames. Protect liquid components from freezing. Comply with manufacturer's recommendations for minimum and maximum temperature requirements for storage.
- E. Damaged Material: Remove any damaged or contaminated materials from job site immediately, including materials in broken packages or packages containing water marks or other evidence of damage, unless Engineer specifically authorizes correction and use on project.

1.07 PROTECTION/SITE CONDITIONS:

- A. Protect pedestrians, vehicles, building site and surrounding buildings from injury resulting from concrete restoration work.
- B. Clean surfaces only when air temperatures are above 40 degrees F and will remain so until concrete has cured.
- C. Do not perform any repair work if precipitation is expected. In case of unexpected precipitation, work shall cease and all uncured material shall be adequately protected with an impermeable polyethylene sheet.
- D. Do not perform any patching unless the air temperatures are between 40 degrees F and 86 degrees F and will remain a minimum of 40 degrees F for at least 48 hours after completion of work.

- E. If the ambient or subsurface temperature is expected to rise above 86 degrees F during curing then the hot weather requirements of ACI 305R hot weather concreting shall be followed.
- F. If the ambient or subsurface temperature is expected to fall below 40 degrees F during curing then the cold weather requirements of ACI 306R cold weather concreting shall be followed.
- G. Prevent patching materials from staining the face of other surfaces to be exposed to view. Immediately remove all patching materials that come into contact with such surfaces.
- H. Do not apply any material to frozen surfaces.
- I. If materials are installed and cured in temperatures outside of the range noted above or per the manufacturer's recommendations. Written approval and modified installation instructions must be provided from the manufacturer and submitted for record to the Engineer. This installation shall not void the warranty.

PART 2 PRODUCTS

2.01 FORM MATERIALS:

- A. Forms for Exposed Finish Concrete: Unless otherwise indicated, construct formwork for exposed concrete surfaces with plywood, metal, metal-framed plywood faced or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings. Provide form material with sufficient thickness to withstand pressure of newly-placed concrete without bow or deflection.
- B. Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces.

2.02 REINFORCING MATERIALS:

- A. Reinforcing Bars: ASTM A 615, Grade 60, deformed and ASTM A 706, Grade 60, deformed, weldable.
- B. Welded Wire Fabric: ASTM A 185, welded steel wire fabric. Provide welded wire fabric in flat sheets.

- C. Supports for Reinforcement: Provide supports for reinforcement including bolsters, chairs, spacers, and other devices for spacing, supporting and fastening reinforcing bars and welded wire fabric in place. Use plastic or wire bar type supports complying with CRSI recommendations, unless otherwise specified. **Wood, concrete block, clay brick and other unspecified devices are not acceptable.**
- 2.03 REPAIR MATERIALS:
- A. All concrete repair materials shall be compatible with each other and with existing concrete. If possible all primers, repair material, and other products should be from the same manufacturer.
- B. All materials shall be compatible with chloride contents of 1.0 lbs/cy or greater.
- C. All pre-mixed concrete repair products shall be one-component cementitious products specifically noted for use in parking structures with a corrosion inhibitor.
- D. All materials shall be resistant to stresses resulting from automobile traffic and freeze/thaw cycles, de-icing salts, continuous presence of moisture, and a temperature range of -30 to 100 degrees F.
- E. For small repairs areas, prepackaged bag mix is approved as follows:
1. One-component, early strength gaining cementitious repair material with the following properties:
 - a. Minimum 28 day compressive strength: 5000 psi.
 - b. **Maximum water cement ratio: 0.40**
 2. Product shall be recommended for vertical application in garages in ACI Exposure Zone III. (Reference ACI 362 – latest edition.
 3. Manufacturers:
 - a. Sika
 - b. BASF
 - c. Mapei
 - d. Approved equal (must be submitted with bid)
- 2.04 RELATED MATERIALS:
- A. Moisture-Retaining Cover: One of the following, complying with ANSI/ASTM C 171.

1. Waterproof paper.
 2. Polyethylene film.
 3. Polyethylene-coated burlap.
- B. Liquid Membrane-Forming Curing Compound: Not permitted.
- C. Slab Joint Filler: Multi-component polyurethane sealant (self-leveling type).
Reference Section 07920.

2.05 CONCRETE MIXING:

- A. Mixing shall be in strict conformance with manufacturer's recommendations.

PART 3 EXECUTION

3.01 FORMS:

- A. Design, erect, support, brace and maintain formwork to support vertical and lateral loads that might be applied until such loads can be supported by concrete structure. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation and position.
- B. Design, construct, erect, maintain, and remove forms for cast-in-place concrete work in compliance with ACI 347.
- C. Design formwork to be readily removable without impact, shock or damage to existing and new concrete surfaces and adjacent materials.
- D. Chamfer exposed corners and edges as indicated or to match existing, using wood, metal, PVC or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.
- E. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt or other debris just before concrete is placed. Retighten forms and bracing after concrete placement as required to eliminate mortar leaks and maintain proper alignment.

3.02 PLACING REINFORCEMENT:

- A. Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars", for details and methods of reinforcement placement and supports, and as herein specified.
 - 1. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials which reduce or destroy bond with concrete.
 - 2. Accurately position, support and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers and hangers, as required.
 - 3. Install welded wire fabric in flat sheets in as long lengths as practicable. Lap adjoining pieces at least two full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.

3.03 PREPARATION OF FORM SURFACES

- A. Prior to repairing, all surfaces must be prepared in accordance with this section of the specification and the manufacturers recommendations.
- B. Sawcut perimeter of damage area to a depth of 1/2" +/- (unless note otherwise on Drawings). Do not cut reinforcement. Remove, by hand, a section to confirm depth of reinforcement and adjust depth as required. Do not overcut perimeter at corners.
- C. The removal of all unsound concrete, using lightweight demolition hammers, not to exceed **15 pounds is recommended** with 30 pound max. All removals to be performed with ICRI Guidelines, which shall be a part of these specifications, with regard to removal geometry, exposure, undercutting and cleaning of embedded reinforcement, and conditioning of edges and surfaces. **Damage caused as a result of using larger hammers will be repaired at the Contractors expense.**
- D. Steel reinforcement shall be thoroughly prepared by mechanical cleaning to remove all traces of rust.
- E. Pressure wash all surfaces, including reinforcement using 3000 to 4000 psi water blast, as required to remove all dust and dirt. The surface shall be saturate surface dry (SSD) with no standing water during application

- F. The result of this preparation shall render an exposed aggregate surface with a minimum surface profile of +/- 1/8". The surface shall be clean, meaning having complete exposure of sound original material without any deposits of contaminants, foreign matter or loose material, which could affect the bond or long term durability of the surface and the repair material.

3.04 INSPECTION:

- A. Inspect all concrete surfaces prior to application of primers/adhesives to insure proper preparation and surface drying.
- B. Conform to all manufacturers' preparation instructions.
- C. Inspect reinforcement for section loss at locations of deterioration. If loss exceeds 25% notify Engineer prior to proceeding with the repair.

3.05 PRIMING OF REINFORCING STEEL

- A. Any reinforcement exposed in the course of removing unsound materials shall be cleaned and prepared in accordance with the above specifications.
- B. All exposed reinforcement shall be primed with an approved bonding agent compatible with the repair materials. Coat all exposed surfaces in accordance with the manufacturer's instructions. Care must be taken to create a continuous coating on the full surface, including the underside of the undercut reinforcement. Observe manufacturer's minimum and maximum timing window for repair after application of primer.
- C. Primer shall have corrosion inhibiting properties.

3.06 CONCRETE REPAIR

- A. Following preparation, as specified above, contractor shall maintain work area in a clean condition, including materials, equipment and workers' footwear, to avoid tracking in of contaminants, dirt, dust, mud or other materials which may interfere with adhesion and durability of repairs.
- B. Prior to installation, all repair areas shall be kept continuously wet for at least 20 minutes prior to application of patching compound. Before placing repair material, excess water shall be blown, vacuumed or otherwise removed from the surface, leaving the surface damp or saturated/surface dry.
- C. Vigorously brush apply a thin primer coat of acrylic latex bonding agent with added 10% neat Type 1 portland cement into all cavity surfaces. Unless noted otherwise in manufacturer's installation instructions. All primers shall be compatible with repair material.
- D. Within specified time frame of primer application, mix and place repair compound in accordance with manufacturer's instructions.
- E. Mix the precisely measured quantity of water specified by the manufacturer with full bags of repair compound only. Mix using slow speed drill (450 rpm maximum) with mud or paddle mixer. Motorized mortar mixers may be used for mixing larger quantities. Mix to a uniform consistency, free of lumps or dry material. Do not whip air into the mix. Do not overmix.
- F. When placing the repair material, care shall be taken to assure that all corners and gaps under reinforcing steel and entire cavity profile is completely filled and properly compacted to prevent formation of voids or unbonded areas. "Work" the material into corners and gaps, and onto cavity sidewalls using pressure on the trowel to assure good contact between patch and substrates.
- G. Patches deeper than 1" (25 mm) may be extended by coarse aggregate addition. 20 pounds of clean, washed, 3/8" pea stone suitable in composition and surface profile for use as a concrete aggregate, may be added to each 50 pound bag of patching compound.
- H. Do not re-temper material which has begun to set. Discard any unused material after 20 minutes. Do not excessively wet repair surfaces after placement or as an aid to trowelling. Limit surface water addition to light misting and do not wet or rework repeatedly.
- I. Observe the curing requirements for each day's working conditions, as specified herein. Do not open to traffic or expose to weather until adequate strength has been reached, as affected by working and curing conditions.

J. Finish: Provide finish to match existing or as required for membrane application.

3.07 CRACK REPAIR:

A. Preparation:

1. Remove all existing joint sealant.
2. Center routed groove on crack.
3. Remove all loose and deteriorated material.
4. All joint wall surfaces must be clean, sound, and frost free. Joint walls must be free of oils, grease, curing compound residues, and any other foreign matter that might prevent bond. This should be accomplished by blast cleaning or equivalent mechanical means.
5. Conform to all manufacturers' preparation requirements.

B. Sealant Installation:

1. Sealant shall conform to specification Section 07900; Joint Sealant.
2. Install as per manufacturer's requirements.
3. Install sealant evenly and recess 1/8" below surface. DO NOT OVERFILL JOINT.

3.08 MONOLITHIC REPAIR FINISHES:

- A. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as hereinafter specified, and slab surfaces which are to be covered with membrane or elastic waterproofing, and as otherwise indicated.
- B. Trowel Finish: Apply trowel finish to monolithic slab surfaces indicated, including slab surfaces to be covered with carpet, resilient flooring, paint or other thin-film finish coating system.
- C. Slab finishes for floor coverings not indicated shall be coordinated with the Engineer prior to slab placement.

3.09 CONCRETE CURING AND PROTECTION:

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with the requirements of ACI 306 as herein specified.
- B. Curing Methods: Perform curing of concrete by moist curing, by moisture-retaining cover curing. **Slab repairs shall be cured by moist curing methods for a minimum of 3 days.**
- C. Protection From Mechanical Injury: During the curing period, the concrete shall be protected from damaging mechanical disturbances, such as load stresses, heavy shock, and excessive vibration. All finished concrete surfaces shall be protected from damage by construction equipment, materials, or methods, by application of curing procedures, and by rain or running water. Self-supporting structures shall not be loaded in such a way as to overstress the concrete.

3.10 QUALITY CONTROL TESTING DURING CONSTRUCTION:

- A. Engineer shall verify reinforcement, including slab reinforcement (WWF or reinforcing bar).

3.11 CLEANING:

- A. Clean off excess material adjacent to work in progress by methods and with cleaning materials approved by manufacturer of patch materials.

END OF SECTION

SECTION 03320

EMBEDDED GALVANIC ANODES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. The drawings and general conditions of the contract apply to work of this section.
- B. Examine all other sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

1.02 SUMMARY

- A. This Section includes furnishing all labor, tools, materials, equipment and services necessary to properly install embedded galvanic anodes.
- B. Embedded galvanic anodes are designed to provide localized corrosion protection. When placed at the appropriate spacing along the perimeter of concrete patches or along the interface between new/existing concrete, the anodes mitigate active corrosion and the formation of new corrosion sites in the adjacent existing concrete.

1.03 RELATED SECTIONS

- A. Section 01300 SUBMITTALS
- B. Section 01500 CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS
- C. Section 01710 CLEANING
- D. Section 03230 POST TENSION CABLE
- E. Section 03310 CONCRETE REPAIR

1.04 REFERENCES

- A. ACI Guideline No. 222 – Corrosion of Metals in Concrete

- B. ACI Repair Application Procedure (RAP) Bulletin 8 – Installation of Embedded Galvanic Anodes (2010)
- C. ICRI Guideline 310.1R-2008 Guide for Surface Preparation for the Repair of Deteriorated Concrete resulting from Reinforcing Steel Corrosion
- D. ASTM A615/A615M Standard Specification for Deformed and Plain Billet-Steel Bar for Concrete Reinforcement
- E. ASTM B418-12 – Standard Specification for Cast and Wrought Galvanic Zinc Anodes
- F. ACI/ICRI Concrete Repair Manual

1.05 SUBMITTALS

- A. Unless otherwise specified, submittals required in this section shall be submitted for review. Submittals shall be prepared and submitted in accordance with Section 01300.
- B. All submittals shall be reviewed and returned within 10 working days.
- C. Incomplete submittals will not be reviewed.
- D. Submittals not reviewed by the Contractor prior to submission to the Engineer will not be reviewed. Include on the submittal statement or stamp of approval by Contractor, representing that the Contractor has seen and examined the submittal and that all requirements listed in this Section and Section 01300 have been complied with.
- E. Engineer will review submittals a maximum of two review cycles as part of their normal services. **If submittals are incomplete or otherwise unacceptable and re-submitted, General Contractor shall compensate the Owner for additional review cycles.**
- F. Product Data: Submit manufacturer's specifications and installation instructions for the following products. Include laboratory test reports and other data to show compliance with specifications (including specified standards).
 - 1. Material substitutions may be submitted for Engineer and Owner approval.

1.06 QUALITY ASSURANCE

- A. Contractor qualifications: Qualified to perform work specified by reason of experience or training provided by product manufacturer.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products in original sealed factory packaging bearing identification of product, manufacturer, and batch number. Provide Material Safety Data Sheets for each product.
- B. Store product in location protected from freezing, damage, construction activity, precipitation, and direct sunlight, in strict accordance with manufacturer's recommendations.
- C. Handle all products with appropriate precautions and care as stated on Material Safety Data Sheet.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Approved Galvanic Anode Manufacturers:
 - 1. Sika
 - 2. BASF
 - 3. Euclid Chemical
 - 4. Vector Corrosion Technologies
- B. Galvanic Anode with the following properties:
 - 1. Minimum of 100 grams of zinc in compliance with ASTM B6 Special High Grade cast around a pair of steel wires.
 - 2. For use as corrosion control and corrosion prevention.
 - 3. The zinc anode is alkali-activated with an alkaline cementitious shell with a pH of 14 or greater
 - 4. Contain no added constituents corrosive to reinforcing steel or detrimental to concrete, e.g. chloride, bromide, sulfate, etc.
 - 5. Documented test results from field installations showing that the anodes have achieved a minimum of 10 years in service.
 - 6. Anode units shall be supplied with solid zinc core (ASTM B418) cast around uncoated, non-galvanized, non-spliced steel tie wires for wrapping around the

reinforcing steel and twisting to provide a durable steel to steel connection between the tie wire and the reinforcing steel

C. Repair Material:

1. Repair mortars, concrete and bonding agents shall be Portland cement based materials with suitable electrical conductivity less than 15,000 ohm-cm. Non-conductive repair materials such as epoxy, urethane or magnesium phosphate shall not be permitted. Anodes used with high resistance repair material shall be embedded in repair material approved by the anode manufacturer to create a conductive bridge to the substrate prior to repair material installation.

PART 3 EXECUTION

3.01 CONCRETE REMOVAL

- A. Reference Spec Section 02070 Selective Demolition and 03310 Concrete Repair for removal and preparation of concrete surfaces.

3.02 CLEANING AND REPAIR OF REINFORCING STEEL

- A. Reference Spec 03310 Concrete Repair for cleaning and preparation of reinforcing in conjunction with the requirements below.
- B. Clean exposed reinforcing steel of rust, mortar, etc. to provide sufficient electrical connection and mechanical bond.
- C. Secure loose reinforcing steel by tying tightly to other bars with steel tie wire.
- D. Verify electrical continuity of all reinforcing steel, including supplemental steel, as per Section 3.4.
- E. If significant reduction in the cross section of the reinforcing steel has occurred, replace or install supplemental reinforcement as directed by the Engineer.

3.03 GALVAIC ANODE INSTALLATION

- A. Install anode units and repair material immediately following preparation and cleaning of the steel reinforcement.
- B. Place anodes as close as practical to edge of repair area while providing sufficient clearance for anode to be completely surrounded by repair material.
- C. Galvanic anodes shall be installed along the perimeter of the repair at a maximum spacing of 24 in. At larger repair areas greater than 50 square feet galvanic anodes should be installed in a grid patten throughout the entire repair

and attached to steel reinforcement where it penetrates exist concrete in the field of the repair area.

- D. Place the galvanic anodes as close as possible to the patch edge while still providing sufficient clearance between anodes and substrate to allow the repair material to fully encase the anode with a minimum concrete or mortar cover over the anode of 1 in. If necessary, increase the size of the repair cavity to accommodate the anodes.
 - 1. Place the anode such that it fits along a single bar or at the intersection between two bars and secure to each clean bar.
 - 2. If less than 1 in. of concrete cover is expected, place anode beneath the bar and secure to clean reinforcing steel.
- E. The tie wires shall be wrapped around the cleaned reinforcing steel at least one full turn in opposite directions and then twisted tight to create a secure electrical connection and allow no anode movement during concrete placement.
- F. If repair materials with resistivity greater than 15,000 ohm-cm are to be used or if the resistivity is unknown, pack an approved mortar between the anode and the substrate concrete to create a conductive grout bridge ensuring no voids exist.

3.04 ELECTRICAL CONTINUITY

- A. Confirm electrical connection between anode tie wire and reinforcing steel by measuring DC resistance (ohm Ω) or DC potential (mV) with a multi-meter.
- B. Electrical connection is acceptable if the DC resistance measured with the multi-meter is 1 Ω or less or the DC potential is 1 mV or less.
- C. Confirm electrical continuity of the exposed reinforcing steel within the repair area. If necessary, electrical continuity shall be established by tying discontinuous steel to continuous steel using steel tie wire.

END OF SECTION

DIVISION 7

THERMAL AND MOISTURE PROTECTION

SECTION 07180

TRAFFIC MEMBRANES

PART 1 GENERAL

1.01 SUMMARY

- A. The drawings and general conditions of the contract apply to work of this section.
- B. Examine all other sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.
- C. Coordinate work with that of all trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.
- D. The work described in this section will proceed while fire station operations continue. Contact information for City of Auburn/Fire Station will be provided after the award of the contract.
- E. Contractor to provide all traffic barriers signage, and traffic flagging personnel as required to maintain safe operation during construction.
- F. Contractor's Use of Premises: During construction, Contractor shall have restricted use of the fire station as discussed during the pre-construction walk through and describe within the specifications. Contractor's use of premises is limited only by Owner's right to perform work or employ other contractors on these premises.

1.02 DESCRIPTION OF WORK

- A. Furnish all the labor, materials, equipment, and incidentals necessary to install traffic membranes with NEOGARD AUTO-GARD E. This work shall include a five (5) year material and labor warranty.
- B. All existing coating that is loose or not fully adhered shall be completely removed to concrete.
- C. The traffic membrane system shall be a complete system of compatible materials supplied by NEOGARD[®] to create a seamless waterproof membrane.

1.03 RELATED SECTIONS

- A. Section 01300 SUBMITTALS
- B. Section 01500 CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS
- C. Section 01710 CLEANING
- D. Section 03310 CONCRETE REPAIR
- E. Section 07920 JOINT SEALANT

1.04 SUBMITTALS

- A. Unless otherwise specified, submittals required in this section shall be submitted for review. Submittals shall be prepared and submitted in accordance with Section 01300.
- B. All submittals shall be reviewed and returned within 10 working days.
- C. Incomplete submittals will not be reviewed.
- D. Submittals not reviewed by the Contractor prior to submission to the Engineer will not be reviewed. Include on the submittal statement or stamp of approval by Contractor, representing that the Contractor has seen and examined the submittal and that all requirements listed in this Section and Section 01300 have been complied with.
- E. Engineer will review submittals a maximum of two review cycles as part of their normal services. **If submittals are incomplete or otherwise unacceptable and re-submitted, General Contractor shall compensate the Owner for additional review cycles.**
- F. Product Data: Submit manufacturer's specifications and installation instructions for the following products. Include laboratory test reports and other data to show compliance with specifications (including specified standards).
 - 1. NEOGARD AUTO-GARD E® Traffic-Bearing Membrane System.
 - 2. Warranty
 - 3. Applicator's qualifications: Submit list of a minimum of 3 similar projects completed within the last 5 years.
 - 4. Applicator's Approval: Submit letter from NEOGARD® Division of JONES-BLAIR® stating applicator is approved to install vehicular traffic coating system specified in full compliance with the material warranty.

5. Material substitutions may be submitted for Engineer and Owner approval.

1.05 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of the following, except as otherwise indicated:
 1. ICRI Guidelines No. 03732 “Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays.”
 2. “Code of Federal Regulations, Part 1926” per the Occupational Safety and Health Administration (OSHA), Department of Labor (Latest Revision).
 3. ACI 308: Standard Practice for Curing Concrete
 4. Neogard Construction Products, “Recoat Guidelines Standard & Fast-Cure Coating Systems”, www.neogard.com.
- B. Manufacturer qualifications: Auto-Gard E[®] as supplied by NEOGARD[®] is approved for use on this project.
- C. Contractor qualifications: Qualified to perform work specified by reason of experience or training provided by product manufacturer.
- D. Mockup: Provide mockup of at least 25 square feet to include surface preparation/profile, for each condition and allow for evaluation of slip resistance of Traffic Deck Coating System and adhesion test in accordance with ASTM D4541. Follow all manufacturer instructions for small batches.
 1. Install mockup with specified coating types and with other components noted.
 2. Locate where directed by Engineer or Owner.
 3. Mockup may remain as part of Work if acceptable to Engineer and Owner.
- E. Notify manufacturer's authorized representative at least two weeks before start of work. Schedule minimum of 2 job site inspections by manufacturer's authorized representative, first scheduled before application of product to review surface preparation for each condition. Second, to review application/installation of membrane systems at each condition. **Application of elastomeric Traffic Deck Coating System without prior review by manufacturer shall not void the warranty provided to the Owner.**

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products in original sealed factory packaging bearing identification of product, manufacturer, and batch number. Provide Material Safety Data Sheets for each product.
- B. Store product in location protected from freezing, damage, construction activity, precipitation, and direct sunlight, in strict accordance with manufacturer's recommendations.
- C. Handle all products with appropriate precautions and care as stated on Material Safety Data Sheet.

1.07 PROJECT CONDITIONS

- A. Do not use products under conditions of precipitation or freezing weather or when such conditions are imminent. Use appropriate measures for protection and supplementary heating to ensure proper drying and curing conditions in accordance with manufacturer's recommendations if application during inclement weather occurs.
- B. Ensure substrate is clean and dry prior to application.
- C. Do not proceed with application of materials when deck temperature is less than 40 degrees F unless approved in writing by the manufacturer.
- D. Protect all adjacent work from contamination due to mixing, handling, and application of preparation and repair products and Traffic Deck Coating System.
- E. Conform to all the manufacturer's recommendations regarding project/surface conditions.

1.08 WARRANTY

- A. System Manufacturer: Furnish Owner with written membrane warranty that system will be free of defects, water penetration and chemical damage related to system design, labor/workmanship or material deficiency.
- B. If material surface shows any of defects listed above, supply labor material to repair all defective areas and to repaint all damaged line stripes.
- C. Warranty period shall be 5 yrs commencing with date of acceptable Work.
- D. Perform any repair under this warranty at no cost to Owner.

- E. Before Construction, provide Owner with sample of final warranty. Warranty shall be provided by manufacturer.
- F. Vandalism and abnormally abrasive maintenance equipment are exempted from warranty.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. The only acceptable manufacturer and supplier allowed under this section is NEOGARD® Division of JONES-BLAIR® Company, P.O. Box 35286, Dallas, TX 75235, Toll Free (800) 321-6588, Fax (214) 357-7532, www.neogard.com.

2.02 PERFORMANCE CRITERIA

- A. Compliance: ASTM C957
- B. Physical properties of cured vehicular traffic coating system used on this project are:

PERFORMANCE REQUIREMENTS OF CURED FILM			
PHYSICAL PROPERTIES	TEST METHOD	BASE COAT	TOPCOAT
Tensile Strength	ASTM D412	1,500 psi	2,200-5,000 psi
Elongation	ASTM D412	500%	80-350%
Permanent Set	ASTM D412	<20%	<20%
Tear Resistance	ASTM D1004	150 pli	165-400 pli
Water Resistance	ASTM D471	1% @ 7 days	<=3% @ 7 days
MVT @ 20 mils	ASTM E96	5 English	0.4-1.5 English
Taber Abrasion (cs17), max	ASTM D4060	5 mg/1,000 rev	30 mg/1,000 rev
Shore A	ASTM D2240	74-79	84-94
Adhesion	ASTM D4541	400 psi	400 psi
Weathering Resistance	ASTM D822	N/A	Slight Chalk
Thermal Shock	Alternate Heat/Cold	No Loss of Adhesion	No Loss of Adhesion
"Standard Specifications for High Solids Content, Cold- Applied Elastomeric Waterproofing Membrane with Integral Wearing Surface"	ASTM C957	System Exceeds Requirements	

2.03 MATERIALS

- A. Vehicular Traffic Coating Material

1. Primer: Concrete and metal primers as required by NEOGARD®.
 2. Flashing Tape: 86218 flashing tape (ETERNABOND™ WebSeal™) or approved equal having a minimum thickness of 30 mils.
 3. Liquid Flashing: FC7500/FC7960 or FC7520/FC7962 polyurethane coating.
 4. Reinforcing Fabric: 86220 reinforcing fabric (Tietex T-272).
 5. Aggregate: 7992U silica (quartz) sand or other aggregate approved by NEOGARD®.
 6. Elastomeric Base Coat: FC7500/FC7960 polyurethane coating, gray in color.
 7. Elastomeric Wear Coat: 70714/70715-09 epoxy coating.
 8. Elastomeric Topcoat for Non-UV Exposure (Interior or Covered Use Only): 70714/70715-09 series epoxy coating.
 9. Elastomeric Topcoat for UV Exposure (Exterior/Interior Use): FC7540/7964 series polyurethane coating.
 10. Sealant: Polyurethane sealant approved by NEOGARD®.
- B. Allow the owner to choose color from manufacturer standard colors.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Inspect all areas involved in work to establish extent of work, access and need for protection of surrounding construction.
- B. Protect all surroundings from Primers, Patching Repair Compounds and Finish products and to include, but not be limited to, windows, roofs, walkways, drives, automobiles, and landscaping.
- C. Existing Concrete Decks: Verify that the work done under other sections meets the following requirements:
 1. That the concrete deck surface is free of ridges and sharp projections.
 2. That the concrete was cured for a minimum of 28 days. (Minimum of 5,000 psi compressive strength). Water-cured treatment of concrete is preferred. The use of concrete curing agents require written approval by NEOGARD®.
 3. That the concrete was finished by a power or hand steel trowel followed by soft hair broom to obtain light texture or “sidewalk” finish.
 4. That damaged areas of the concrete deck be restored to match adjacent areas.

D. Existing Coatings.

1. Review all existing areas of membrane and ensure that all loose/deteriorated areas are completely removed to concrete. **Any existing coating left in place, to be coated over, must be fully adhered to the substrate.**

3.02 SITE VERIFICATIONS OF CONDITIONS

- A. Conduct all pre-application inspections of site verification with authorized Manufacturer's Representative.
- B. Inspect all joints to ensure there is no deteriorated sealant, adhesion loss or non-elastomeric caulks installed in joints. Repair all deficient sealant.
- C. Inspect all through deck penetrations, including electrical, lighting, signage, plumbing, HVAC, fire sprinkler piping for watertight seal. Repair all deficiencies.

3.03 SURFACE PREPARATION:

A. NEW & EXISTING CONCRETE SURFACES:

1. Cleaning: 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. Areas where oil or other contaminants penetrate deep into the concrete may require removal by mechanical methods.
2. Shot Blasting: Required surface preparation method for remedial construction, is also the preferred method for new construction. Mechanically prepare surface by shot blasting to industry standard surface texture (ICRI's CSP3-4) without causing additional surface defects in deck surface. Shot blasting does not remove deep penetrating oils, grease, tar or asphalt stains. Proper cleaning procedures should be followed to insure proper bonding of the deck coating.
3. Cracks and Cold Joints: Visible hairline cracks (up to 1/16" in width) in concrete and cold joints shall be cleaned, primed as required and treated with liquid flashing a minimum distance of 2" on each side of crack to yield a total thickness of 30 dry mils. Large cracks (over 1/16" in width) shall be routed and sealed with sealant. Sealant shall be applied to inside area of crack only, not applied to deck surface. Detail sealed cracks with liquid flashing a distance of 2" on each side of crack to yield a total thickness of 30 dry mils.
4. Control Joints: Seal secondary control joints with sealant. Sealant shall be applied to inside area of joint only, not applied to deck surface. Detail sealed joints with liquid flashing a distance of 2" on each side of joint to yield a total thickness of 30 dry mils.
5. Flashing Tape: Install flashing tape where indicated on the drawings prior to the application of elastomeric coating.
6. Surface Condition: Surface shall be clean and dry prior to coating.

B. EXISTING COATING:

1. Remove all existing surface coating material that is loose or marginally bonded.
 2. Check all exposed concrete surfaces for defects and repair in accordance with section 03310.
 3. Clean existing deck coatings by power washing, (600 to 800 psi), with trisodium phosphate or other non-sudsing detergent. The use of stiff bristle brooms may be required to help remove some contaminants. Rinse decks thoroughly with clean potable water and allow to dry completely. All low spots where water puddles must be vacuumed dry to remove any contaminants left by the rinsing operation.
 4. Existing Membrane 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.
3. Surface Condition: Surface shall be clean and dry prior to coating.

3.04 VEHICLE TRAFFIC MEMBRANE APPLICATION:

A. NEW & EXISTING CONCRETE SURFACES:

1. Complete all preparatory work before application begins. Apply base coat, intermediate, and top coats with properly sized equipment to arrive at required mil thickness. Verify mil thickness of all coats by use of wet-mil thickness gauge.
2. Vacuum thoroughly all surfaces to be coated. Apply primer to all deck surfaces at manufacturers recommended application rate. Force primer into pores and voids to eliminate pinholes. Do not apply Primer over pre-striping.
3. Installation:
 - a. **Primer:** Apply 7760/7761 or 7780/7781 primer at a rate of 300 sf/gallon to all exposed concrete and coated surfaces in strict accordance with procedures outlined by NEOGARD®. **Within 24 hours of application of primer, base coat must be applied. If base coat cannot be applied within 24 hours, re-prime.**
 - b. **Base Coat:** Apply FC7500/FC7960 series to surfaces at a rate of 80 sf/gallon (20 mils) in strict accordance with procedures outlined by NEOGARD®. Extend base coat over cracks and control joints which have received treatment.
 - c. **Heavy Duty Wearing Surface Coat:** Apply 70714/70715 series coat at a rate of 133 sf/gallon (12 mils) in strict accordance with procedures

outlined by NEOGARD® and immediately broadcast **7992 aggregate**, evenly distributed, into wet coating at the rate of 15 to 20 pounds per 100 square feet.

- d. **Finish Top Coat:** When dry, remove excess aggregate and recoat surface with FC7540/FC7964 at rate of 100/gallon (14 mils) in strict accordance with procedures outlined by NEOGARD®.
- e. Total system coating thickness averages 50 dry mils exclusive of aggregate.

3.05 PROTECTION

- A. After completion of application, do not allow traffic on coated surfaces for a period of at least 36 hours at 75°F. and 50% R.H., or until completely cured.

3.05 FIELD QUALITY CONTROL

- A. Contractor to provide a minimum 25 square foot mock-up for Engineer review and adhesion testing. Adhesion testing to be performed by Contractor or their representative. Notify Engineer for review.
- B. Manufacturer's Field Service. Final inspection: Warranty request. Manufacturer's representative will inspect finished surface preparation, application, and finished coating and may require further preparation or application to achieve appropriate result. In no case will manufacturer's representative approve surface or finish if following conditions are found: pinholes, insufficient coating thickness, or any other conditions, that, in manufacturer's representative's opinion, may cause failure of installation.

3.06 CLEANING

- A. Conform with specification Section 01710.
- B. Clean all equipment, tools, and spillage with manufacturer's recommend solvent.
- C. Clean up and properly dispose of all debris remaining on job site related to application.

END OF SECTION

SECTION 07920

JOINT SEALANT

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

1. The drawings and general conditions of the contract including General and Supplementary Conditions and other Division 1 Specification sections apply to work of this section.
2. Examine all other sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.
3. Coordinate work with that of all trades affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract

1.02 DESCRIPTION OF WORK

- A. This Section includes replacement of joint sealants for the following locations:
 1. Concrete repair perimeters.
 2. Crack chase repairs.

1.03 RELATED SECTIONS

- A. Concrete Repair: Section 03310.
- B. Traffic Membranes: Section 07180.

1.04 SYSTEM PERFORMANCE REQUIREMENTS

- A. Provide elastomeric joint sealants that have been produced and installed to establish and to maintain watertight and airtight continuous seals without causing staining or deterioration of joint substrates.

1.05 SUBMITTALS

- A. Unless otherwise specified, submittals required in this section shall be submitted for review. Submittals shall be prepared and submitted in accordance with Division 1.
- B. General Contractor shall submit a Submittal Schedule to the engineer within 10 days after they have received the Owner's Notice to Proceed.
- C. All submittals shall be reviewed and returned within 10 working days.
- D. Incomplete submittals will not be reviewed.**
- E. Submittals not reviewed by the General Contractor prior to submission to the Engineer will not be reviewed. Include on the submittal statement or stamp of approval by Contractor, representing that the Contractor has seen and examined the submittal and that all requirements listed in this Section and Division 1 have been complied with.
- F. Engineer will review submittals a maximum of two review cycles as part of their normal services. If submittals are incomplete or otherwise unacceptable and re-submitted, General Contractor shall compensate the Owner for additional review cycles.
- G. Product Data: Submit producer's or manufacturer's specifications and installation instructions for the following products. Include laboratory test reports and other data to show compliance with specifications (including specified standards).
 - 1. Joint Sealant Material.
 - 2. Certification that joint sealant product plus the primers and cleaners required for sealant installation comply with local regulations controlling use of volatile organic compounds.
 - 3. Warranty.
 - 4. Applicator's qualifications.

1.06 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of the most recent version, except as otherwise indicated:
 - 1. ACI 504 “Guide to Sealing Joints in Concrete Structures.”
 - 2. SWR “Applying Liquid Sealants.”
 - 3. SWR “Sealants: The Professionals Guide.”
 - 4. “Code of Federal Regulations, Part 1926” per the Occupational Safety and Health Administration (OSHA), Department of Labor (Latest Revision).
- B. Installer Qualifications: Engage an experienced Installer who has completed joint sealant applications similar in material, design, and extent to that indicated for Project that have resulted in construction with a record of successful in-service performance for a minimum of 5 years.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver Materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multicomponent materials.
- B. Store and handle materials in compliance with manufacturer’s recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.08 PROJECT CONDITIONS

- A. Environmental Conditions: Do not proceed with installation of joint sealants under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer or below 40 deg. F.
 - 2. When joint substrates are wet.
- B. Joint Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than or greater than that allowed by joint sealant manufacturer for application indicated.
- C. Joint Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

1.09 WARRANTY

- A. System Manufacturer: Furnish Owner with written joint and several warranty that system will be free of defects, water penetration and chemical damage related to system design, workmanship or material deficiency, consisting of:
 - 1. Any adhesive or cohesive failures.
 - 2. Weathering.
 - 3. Surface crazing.
 - 4. Any damage resulting from lack of conformance of sealant thickness.
- B. If material surface shows any of defects listed above, supply labor material to repair all defective areas and to repaint all damaged line stripes.
- C. Warranty period shall be 5 yrs commencing with date of acceptable Work.
- D. Perform any repair under this warranty at no cost to Owner.
- E. Before Construction, provide Owner with sample of final warranty. Warranty shall be provided by manufacturer.
- F. Vandalism and abnormally abrasive maintenance equipment are exempted from warranty.

PART 2- PRODUCTS

2.01 MATERIALS GENERAL

- A. Compatibility: Provide joint sealants, joint fillers, and other related materials that are compatible with one another, with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience and the traffic membrane.

2.02 ELASTOMERIC JOINT SEALANTS

- A. General building sealants: single-component, Type I, urethane sealant, conforming to ASTM C 920.
- B. Accepted general building sealants:
 - 1. "Sikaflex-1C SL," Sika Corp., Lyndhurst, NJ.
 - 2. Or approved equal.

- C. Color to match existing.

2.04 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint sealant manufacturer for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming in any way joint substrates and adjacent nonporous surfaces, and formulated to promote optimum adhesion of sealants with joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint sealant performance. Do not proceed with installation of joint sealants until unsatisfactory have been corrected.

3.02 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturer and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean concrete, masonry, unglazed surfaces of ceramic tile, and similar porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from

above cleaning operations by vacuuming or blowing out joints with oil-free compressor.

3. Remove laitance and form release agents from concrete.
 4. Clean metal, glass, porcelain, enamel, glazed surfaces of ceramic tile, and other nonporous surfaces with chemical cleaners or other means that do not stain, harm surfaces, or leave residues capable of interfering with adhesion of joint sealants.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.03 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:
1. Install joint fillers to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - a. Do not leave gaps between ends of joint fillers.
 - b. Do not stretch, twist, puncture, or tear joint fillers.
 - c. Remove absorbent joint fillers that have become wet prior to sealant application and replace with dry material.
 - d. Use gage to ensure uniform depth to achieve correct profile, coverage and performance.
- D. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability. Install sealants at the same time sealant backings are installed.

- E. Tooling of Non sag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
 - 1. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
 - a. Use masking tape to protect adjacent surfaces of recessed tooled joints.
 - F. Allow sufficient time before allowing pedestrian and vehicular traffic to travel over the completed joint. Follow manufacturer recommend curing procedures.
- 3.05 MOCKUP
- A. Contractor is to install a joint sealant mockup for Engineers inspection and testing. Mockup shall be reviewed by sealant manufacturer representative, sealant installer, engineer and owner. Contractor shall provide adhesion testing as part of mockup.
- 3.06 FIELD QUALITY CONTROL
- A. Perform adhesion tests in accordance with manufacturer instructions and ASTM C1193, Method A, Field-applied Sealant Joint Hand-Pull Tab.
 - B. Perform 5 adhesion tests for the first 1000 feet and 1 test for each 1000 feet thereafter. Perform 3 additional tests for each failed test.
 - C. Sealants failing adhesion test shall be removed, substrates cleaned, sealants re-installed, and re-testing performed.
 - D. Maintain test log and submit report to Engineer indicating tests, locations, dates, results and remedial actions.
- 3.06 CLEANING
- A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.
 - B. After completion of sealant joints.

3.07 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so that and installations with repaired areas are indistinguishable from original work.

END OF SECTION