BID OF_____

2018

PROPOSAL, CONTRACT, BOND AND SPECIFICATIONS

FOR

2018 PARKING GARAGE MAINTENANCE

CONTRACT NO. 8190

MUNIS NO. 8214556X

IN

MADISON, DANE COUNTY, WISCONSIN

AWARDED BY THE COMMON COUNCIL
MADISON, WISCONSIN ON_____

CITY ENGINEERING DIVISION
1600 EMIL STREET
MADISON, WISCONSIN 53713

https://bidexpress.com/login

2018 PARKING GARAGE MAINTENANCE
CONTRACT NO. 8190

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This Proposal, and Agreement have
been prepared by:

CITY ENGINEERING DIVISION
CITY OF MADISON
MADISON, DANE COUNTY, WISCONSIN

David C. Dryer, P.E.,
City Traffic Engineer and
Parking Utility Manager

DD: BP

SECTION A: ADVERTISEMENT FOR BIDS AND INSTRUCTIONS TO BIDDERS

REQUEST FOR BID FOR PUBLIC WORKS CONSTRUCTION
CITY OF MADISON, WISCONSIN

A BEST VALUE CONTRACTING MUNICIPALITY

PROJECT NAME:	2018 PARKING GARAGE MAINTENANCE
CONTRACT NO.:	8190
SBE GOAL	6%
BID BOND	5%
SBE PRE BID MEETING (1:00 P.M.)	4/27/2018
PREQUALIFICATION APPLICATION DUE (2:00 P.M.)	4/26/2018
BID SUBMISSION (2:00 P.M.)	5/3/2018
BID OPEN (2:30 P.M.)	5/3/2018
PUBLISHED IN WSJ	4/19/2018 & 4/26/2018

SBE PRE BID MEETING: Representatives of the Affirmative Action Department will be present to discuss the Small Business Enterprise requirements at 1600 Emil Street, Madison Wisconsin.

PREQUALIFICATION APPLICATION: Forms are available on our website, www.cityofmadison.com/business/pw/forms.cfm. If not currently prequalified in the categories listed in Section A, an amendment to your Prequalification will need to be submitted prior to the same due date. Postmark is not applicable.

BIDS TO BE SUBMITTED by hand to 1600 EMIL ST., MADISON, WI 53713 or online at www.bidexpress.com.

THE BID OPENING is at 1600 EMIL ST., MADISON, WI 53713.

STANDARD SPECIFICATIONS

The City of Madison's Standard Specifications for Public Works Construction - 2018 Edition, as supplemented and amended from time to time, forms a part of these contract documents as if attached hereto.

These standard specifications are available on the City of Madison Public Works website, www.cityofmadison.com/Business/PW/specs.cfm.

The Contractor shall review these Specifications prior to preparation of proposals for the work to be done under this contract, with specific attention to Article 102, "BIDDING REQUIREMENTS AND CONDITIONS" and Article 103, "AWARD AND EXECUTION OF THE CONTRACT." For the convenience of the bidder, below are highlights of three subsections of the specifications.

SECTION 102.1: PRE-QUALIFICATION OF BIDDERS

In accordance with Wisconsin State Statutes 66.0901 (2) and (3), all bidders must submit to the Board of Public Works proof of responsibility on forms furnished by the City. The City requires that all bidders be qualified on a biennial basis.

Bidders must present satisfactory evidence that they have been regularly engaged in the type of work specified herein and they are fully prepared with necessary capital, materials, machinery and supervisory personnel to conduct the work to be contracted for to the satisfaction of the City. All bidders must be pre-qualified by the Board of Public Works for the type of construction on which they are bidding prior to the opening of the bid.

In accordance with Section 39.02(9)(a)l. of the General Ordinances, all bidders shall submit in writing to the Affirmative Action Division Manager of the City of Madison, a Certificate of Compliance or an Affirmative Action Plan at the same time or prior to the submission of the proof of responsibility forms.

The bidder shall be disqualified if the bidder fails to or refuses to, prior to opening of the bid, submit a Certificate of compliance, Affirmative Action Plan or Affirmative Action Data Update, as applicable, as defined by Section 39.02 of the General Ordinances (entitled Affirmative Action) and as required by Section 102.11 of the Standard Specifications.

SECTION 102.4 PROPOSAL

No bid will be accepted that does not contain an adequate or reasonable price for each and every item named in the Schedule of Unit Prices.

A lump sum bid for the work in accordance with the plans and specifications is required. The lump sum bid must be the same as the total amounts bid for the various items and it shall be inserted in the space provided.

All papers bound with or attached to the proposal form are considered a part thereof and must not be detached or altered when the proposal is submitted. The plans, specifications and other documents designated in the proposal form will be considered a part of the proposal whether attached or not.

A proposal submitted by an individual shall be signed by the bidder or by a duly authorized agent. A proposal submitted by a partnership shall be signed by a member/partner or by a duly authorized agent thereof. A proposal submitted by a corporation shall be signed by an authorized officer or duly authorized registered agent of such corporation, and the proposal shall show the name of the State under the laws of which such corporation was chartered. The required signatures shall in all cases appear in the space provided thereof on the proposal.

Each proposal shall be placed, together with the proposal guaranty, in a sealed envelope, so marked as to indicate name of project, the contract number or option to which it applies, and the name and address of the Contractor or submitted electronically through Bid Express (www.bidexpress.com). Proposals will be accepted at the location, the time and the date designated in the advertisement. Proposals received after the time and date designated will be returned to the bidder unopened.

SECTION 102.5: BID DEPOSIT (PROPOSAL GUARANTY)

All bids, sealed or electronic, must be accompanied with a Bid Bond equal to at least 5% of the bid or a Certificate of Annual/Biennial Bid Bond or certified check, payable to the City Treasurer. Bid deposit of the successful bidders shall be returned within forty-eight (48) hours following execution of the contract and bond as required.

MINOR DISCREPENCIES

Bidder is responsible for submitting all forms necessary for the City to determine compliance with State and City bidding requirements. Nothwithstanding any language to the contrary contained herein, the City may exercise its discretion to allow bidders to correct or supplement submissions after bid opening, if the minor discrepancy, bid irregularity or omission is insignificant and not one related to price, quality, quantity, time of completion or performance of the contract.

Bidders for this Contract(s) must be Pre-Qualified for at least one of the following type(s) of construction denoted by an ☒

Building Demolition

101 ☐ Asbestos Removal
120 ☐ House Mover
110 ☐ Building Demolition

Street, Utility and Site Construction

201 ☐ Asphalt Paving
205 ☐ Blasting
210 ☐ Boring/Pipe Jacking
215 ☐ Concrete Paving
220 ☐ Con. Sidewalk/Curb & Gutter/Misc. Flat Work
221 ☐ Concrete Bases and Other Concrete Work
222 ☐ Concrete Removal
225 ☐ Dredging
230 ☐ Fencing
235 ☐ Fiber Optic Cable/Conduit Installation
240 ☐ Grading and Earthwork
241 ☐ Horizontal Saw Cutting of Sidewalk
242 ☐ Infrared Seamless Patching
245 ☐ Landscaping, Maintenance
246 ☐ Ecological Restoration
250 ☐ Landscaping, Site and Street
251 X Parking Ramp Maintenance
252 ☐ Pavement Marking
255 ☐ Pavement Sealcoating and Crack Sealing
260 ☐ Petroleum Above/Below Ground Storage Tank Removal/Installation
262 ☐ Playground Installer
265 ☐ Retaining Walls, Precast Modular Units
270 ☐ Retaining Walls, Reinforced Concrete
275 ☐ Sanitary, Storm Sewer and Water Main Construction
276 ☐ Sawcutting
280 ☐ Sewer Lateral Drain Cleaning/Internal TV Insp.
285 ☐ Sewer Lining
290 ☐ Sewer Pipe Bursting
295 ☐ Soil Borings
300 ☐ Soil Nailing
305 ☐ Storm & Sanitary Sewer Laterals & Water Svc.
310 ☐ Street Construction
315 ☐ Street Lighting
318 ☐ Tennis Court Resurfacing
320 ☐ Traffic Signals
325 ☐ Traffic Signing & Marking
332 ☐ Tree pruning/removal
333 ☐ Tree, pesticide treatment of
335 ☐ Trucking
340 ☐ Utility Transmission Lines including Natural Gas, Electrical & Communications
399 ☐ Other_____

Bridge Construction

501 ☐ Bridge Construction and/or Repair

Building Construction

401 ☐ Floor Covering (including carpet, ceramic tile installation, rubber, VCT
402 ☐ Building Automation Systems
403 ☐ Concrete
404 ☐ Doors and Windows
405 ☐ Electrical - Power, Lighting & Communications
410 ☐ Elevator - Lifts
412 ☐ Fire Suppression
413 ☐ Furnishings - Furniture and Window Treatments
415 ☐ General Building Construction, Equal or Less than $250,000
420 ☐ General Building Construction, $250,000 to $1,500,000
425 ☐ General Building Construction, Over $1,500,000
428 ☐ Glass and/or Glazing
429 ☐ Hazardous Material Removal
430 ☐ Heating, Ventilating and Air Conditioning (HVAC)
433 ☐ Insulation - Thermal
435 ☐ Masonry/Tuck pointing
437 ☐ Metals
440 ☐ Painting and Wallcovering
445 ☐ Plumbing
450 ☐ Pump Repair
455 ☐ Pump Systems
460 ☐ Roofing and Moisture Protection
464 ☐ Tower Crane Operator
461 ☐ Solar Photovoltaic/Hot Water Systems
465 ☐ Soil/Groundwater Remediation
466 ☐ Warning Sirens
470 ☐ Water Supply Elevated Tanks
475 ☐ Water Supply Wells
480 ☐ Wood, Plastics & Composites - Structural & Architectural
499 ☐ Other_____
_____

State of Wisconsin Certifications

1 ☐ Class 5 Blaster - Blasting Operations and Activities 2500 feet and closer to inhabited buildings for quarries, open pits and road cuts.
2 ☐ Class 6 Blaster - Blasting Operations and Activities 2500 feet and closer to inhabited buildings for trenches, site excavations, basements, underwater demolition, underground excavations, or structures 15 feet or less in height.
3 ☐ Class 7 Blaster - Blasting Operations and Activities for structures greater than 15 ' in height, bridges, towers, and any of the objects or purposes listed as “Class 5 Blaster or Class 6 Blaster”.
4 ☐ Petroleum Above/Below Ground Storage Tank Removal and Installation (Attach copies of State Certifications.)
5 ☐ Hazardous Material Removal (Contractor to be certified for asbestos and lead abatement per the Wisconsin Department of Health Services, Asbestos and Lead Section (A&LS).) See the following link for application: www.dhs.wisconsin.gov/Asbestos/Cert. State of Wisconsin Performance of Asbestos Abatement Certificate must be attached.
6 ☐ Certification number as a Certified Arborist or Certified Tree Worker as administered by the International Society of Arboriculture
7 ☐ Pesticide application (Certification for Commercial Applicator For Hire with the certification in the category of turf and landscape (3.0) and possess a current license issued by the DATCP)
8 ☐ State of Wisconsin Master Plumbers License.

SECTION B: PROPOSAL

Please refer to the Bid Express Website at https://bidexpress.com look up contract number and go to Section B: Proposal Page

You can access all City of Madison bid solicitations for FREE at www.bidexpress.com

Click on the "Register for Free" button and follow the instructions to register your company and yourself. You will be asked for a payment subscription preference, since you may wish to bid online someday. Simply choose the method to pay on a 'per bid' basis. This requires no payment until / unless you actually bid online. You can also choose the monthly subscription plan at this time. You will, however, be asked to provide payment information. Remember, you can change your preference at anytime. You will then be able to complete your free registration and have full access to the site. Your free access does not require completion of the 'Digital ID' process, so you will have instant access for viewing and downloading. To be prepared in case you ever do wish to bid online, you may wish to establish your digital ID also, since you cannot bid without a Digital ID.

If you have any problems with the free registration process, you can call the bidexpress help team, toll free at 1-888-352-2439 (option 1, option1).

SECTION C: SMALL BUSINESS ENTERPRISE

Instructions to Bidders
City of Madison
SBE Program Information

2 Small Business Enterprise (SBE) Program Information

2.1 Policy and Goal

The City of Madison reaffirms its policy of nondiscrimination in the conduct of City business by maintaining a procurement process which remains open to all who have the potential and ability to sell goods and services to the City. It is the policy of the City of Madison to allow Small Business Enterprises (SBE) maximum feasible opportunity to participate in City of Madison contracting. The bidder acknowledges that its bid has been submitted in accordance with the SBE program and is for the public's protection and welfare.

Please refer to the "ADVERTISEMENT FOR BIDS" for the goal for the utilization of SBEs on this project. SBEs may participate as subcontractors, vendors and/or suppliers, which provide a commercially useful function. The dollar value for SBE suppliers or 'materials only' vendors shall be discounted to 60% for purposes of meeting SBE goals.

A bidder which achieves or exceeds the SBE goal will be in compliance with the SBE requirements of this project. In the event that the bidder is unable to achieve the SBE goal, the bidder must demonstrate that a good faith effort to do so was made. Failure to either achieve the goal or demonstrate a good faith effort to do so will be grounds for the bidder being deemed a non-responsible contractor ineligible for award of this contract.

A bidder may count towards its attainment of the SBE goal only those expenditures to SBEs that perform a commercially useful function. For purposes of evaluating a bidder's responsiveness to the attainment of the SBE goal, the contract participation by an SBE is based on the percentage of the total base bid proposed by the Contractor. The total base bid price is inclusive of all addenda.

Work performed by an SBE firm in a particular transaction can be counted toward the goal only if it involves a commercially useful function. That is, in light of industry practices and other relevant considerations, does the SBE firm have a necessary and useful role in the transaction, of a kind for which there is a market outside the context of the SBE Program, or is the firm's role a superfluous step added in an attempt to obtain credit towards goals? If, in the judgment of the Affirmative Action Division, the SBE firm will not perform a commercially useful function in the transaction, no credit towards goals will be awarded.

The question of whether a firm is performing a commercially useful function is completely separate from the question of whether the firm is an eligible SBE. A firm is eligible if it meets the definitional criteria and ownership and control requirements, as set forth in the City of Madison's SBE Program.

If the City of Madison determines that the SBE firm is performing a commercially useful function, then the City of Madison must then decide what that function is. If the commercially useful function is that of an SBE vendor / supplier that regularly transacts business with the respective product, then the City of Madison will count 60% of the value of the product supplied toward SBE goals.

To be counted, the SBE vendor / supplier must be engaged in selling the product in question to the public. This is important in distinguishing an SBE vendor / supplier, which has a regular trade with a variety of customers, from a firm which performs supplier-like functions on an ad hoc basis or for only one or two contractors with whom it has a special relationship.

A supplier of bulk goods may qualify as an eligible SBE vendor / supplier if it either maintains an inventory or owns or operates distribution equipment. With respect to the distribution equipment; e.g., a fleet of trucks, the term "operates" is intended to cover a situation in which the supplier leases the equipment on a regular basis for its entire business. It is not intended to cover a situation in which the firm simply provides drivers for trucks owned or leased by another party; e.g., a prime contractor, or leases such a party's trucks on an ad hoc basis for a specific job.

If the commercially useful function being performed is not that of a qualified SBE vendor / supplier, but rather that of delivery of products, obtaining bonding or insurance, procurement of personnel, acting as a broker or manufacturer's representative in the procurement of supplies, facilities, or materials, etc., only the fees or commissions will apply towards the goal.

For example, a business that simply transfers title of a product from manufacturer to ultimate purchaser; e. g., a sales representative who re-invoices a steel product from the steel company to the Contractor, or a firm that puts a product into a container for delivery would not be considered a qualified SBE vendor / supplier. The Contractor would not receive credit based on a percentage of the cost of the product for working with such firms.

Concerning the use of services that help the Contractor obtain needed supplies, personnel, materials or equipment to perform a contract: only the fee received by the service provider will be counted toward the goal. For example, use of a SBE sales representative or distributor for a steel company, if performing a commercially useful function at all, would entitle the Contractor receiving the steel to count only the fee paid to the representative or distributor toward the goal. This provision would also govern fees for professional and other services obtained expressly and solely to perform work relating to a specific contract.

Concerning transportation or delivery services: if an SBE trucking company picks up a product from a manufacturer or a qualified vendor / supplier and delivers the product to the Contractor, the commercially useful function it is performing is not that of a supplier, but simply that of a transporter of goods. Unless the trucking company is itself the manufacturer or a qualified vendor / supplier in the product, credit cannot be given based on a percentage of the cost of the product. Rather, credit would be allowed for the cost of the transportation service.

The City is aware that the rule's language does not explicitly mention every kind of business that may contribute work on this project. In administering these programs, the City would, on a case-by-case basis, determine the appropriate counting formula to apply in a particular situation.

2.2 Contract Compliance

Questions concerning the SBE Program shall be directed to the Contract Compliance Officer of the City of Madison Department of Civil Rights, Affirmative Action Division, 210 Martin Luther King, Jr. Blvd., Room 523, Madison, WI 53703; telephone (608) 266-4910.

2.3 Certification of SBE by City of Madison

The Affirmative Action Division maintains a directory of SBEs which are currently certified as such by the City of Madison. Contact the Contract Compliance Officer as indicated in Section 2.2 to receive a copy of the SBE Directory or you may access the SBE Directory online at www.cityofmadison.com/dcr/aaTBDir.cfm.

All contractors, subcontractors, vendors and suppliers seeking SBE status must complete and submit the **Targeted Business Certification Application** to the City of Madison Affirmative Action Division by the time and date established for receipt of bids. A copy of the Targeted Business Certification Application is available by contacting the Contract Compliance Officer at the address and telephone indicated in Section 2.2 or you may access the Targeted Business Certification Application online at www.cityofmadison.com/dcr/aaTBDir.cfm. Submittal of the Targeted Business Certification Application by the time specified does not guarantee that the applicant will be certified as a SBE eligible to be utilized towards meeting the SBE goal for this project.

2.4 Small Business Enterprise Compliance Report

2.4.1 Good Faith Efforts

Bidders shall take all necessary affirmative steps to assure that SBEs are utilized when possible and that the established SBE goal for this project is achieved. A contractor who self performs a portion of the work, and is pre-qualified to perform that category of work, may subcontract that portion of the work, but shall not be required to do so. When a bidder is unable to achieve the established SBE goal, the bidder must demonstrate that a good faith effort to do so was made. Such a good faith effort should include the following:

2.4.1.1 Attendance at the pre-bid meeting.

2.4.1.2 Using the City of Madison's directory of certified SBEs to identify SBEs from which to solicit bids.

2.4.1.3 Assuring that SBEs are solicited whenever they are potential sources.

2.4.1.4 Referring prospective SBEs to the City of Madison Affirmative Action Division for certification.

2.4.1.5 Dividing total project requirements into smaller tasks and/or quantities, where economically feasible, to permit maximum feasible SBE participation.

2.4.1.6 Establishing delivery schedules, where requirements permit, which will encourage participation by SBEs.

2.4.1.7 Providing SBEs with specific information regarding the work to be performed.

2.4.1.8 Contacting SBEs in advance of the deadline to allow such businesses sufficient time to prepare a bid.

2.4.1.9 Utilizing the bid of a qualified and competent SBE when the bid of such a business is deemed reasonable (i.e. 5% above the lowest bidder), although not necessarily low.

2.4.1.10 Contacting SBEs which submit a bid, to inquire about the details of the bid and confirm that the scope of the work was interpreted as intended.

2.4.1.11 Completion of Cover Page (page C-6), Summary Sheet (page C-7) and SBE Contact Reports (pages C-8 and C9) if applicable.

2.4.2 **Reporting SBE Utilization and Good Faith Efforts**

The Small Business Enterprise Compliance Report is to be submitted by the bidder with the bid: This report is due by the specified bid closing time and date. Bids submitted without a completed SBE Compliance Report as outlined below may be deemed non-responsible and the bidder ineligible for award of this contract. Nothwithstanding any language to the contrary contained herein, the City may exercise its discretion to allow bidders to correct or supplement submissions after bid opening, if the minor discrepancy, bid irregularity or omission is insignificant and not one related to price, quality, quantity, time of completion, performance of the contract, or percentage of SBE utilization.

2.4.2.1 If the Bidder meets or exceeds the goal established for SBE utilization, the Small Business Enterprise Compliance Report shall consist of the following:

2.4.2.1.1 **Cover Page,** Page C-6; and
2.4.2.1.2 **Summary Sheet,** C-7.

2.4.2.2 If the bidder does not meet the goal established for SBE utilization, the Small Business Enterprise Compliance Report shall consist of the following:

2.4.2.2.1 **Cover Page,** Page C-6;
2.4.2.2.2 **Summary Sheet,** C-7; and
2.4.2.2.3 **SBE Contact Report,** C-8 and C-9. (A separate Contact Report must be completed for each applicable SBE which is not utilized.)

2.5 Appeal Procedure

A bidder which does not achieve the established goal and is found non-responsible for failure to demonstrate a good faith effort to achieve such goal and subsequently denied eligibility for award of contract may appeal that decision to the Small Business Enterprises Appeals Committee. All appeals shall be made in writing, and shall be delivered to and received by the City Engineer no later than 4:30 PM on the third business day following the bidder's receipt of the written notification of ineligibility by the Affirmative Action Division Manager. Postmark not acceptable. The notice of appeal shall state the basis for the appeal of the decision of the Affirmative Action Division Manager. The Appeal shall take place in accordance with Madison General Ordinance 33.54.

2.6 SBE Requirements After Award of the Contract

The successful bidder shall identify SBE subcontractors, suppliers and vendors on the subcontractor list in accordance with the specifications. The Contractor shall submit a detailed explanation of any variances between the listing of SBE subcontractors, vendors and/or suppliers on the subcontractor list and the Contractor's SBE Compliance Report for SBE participation.

No change in SBE subcontractors, vendors and/or suppliers from those SBEs indicated in the SBE Compliance Report will be allowed without prior approval from the Engineer and the Affirmative Action Division. The contractor shall submit in writing to the City of Madison Affirmative Action Division a request to change any SBE citing specific reasons which necessitate such a change. The Affirmative Action Division will use a general test of reasonableness in approving or rejecting the contractor's request for change. If the request is approved, the Contractor will make every effort to utilize another SBE if available.

The City will monitor the project to ensure that the actual percentage commitment to SBE firms is carried out.

2.7 SBE Definition and Eligibility Guidelines

A Small Business Enterprise is a business concern awarded certification by the City of Madison. For the purposes of this program a Small Business Enterprise is defined as:

A. An independent business operated under a single management. The business may not be a subsidiary of any other business and the stock or ownership may not be held by any individual or any business operating in the same or a similar field. In determining whether an entity qualifies as a SBE, the City shall consider all factors relevant to being an independent business including, but not limited to, the date the business was established, adequacy of its resources for the work in which it proposes to involve itself, the degree to which financial, equipment leasing and other relationships exist with other ineligible firms in the same or similar lines of work. SBE owner(s) shall enjoy the customary incidents of ownership and shall share in the risks and profits commensurate with their enjoyment interests, as demonstrated by an examination of the substance rather than form or arrangements that may be reflected in its ownership documents.

B. A business that has averaged no more than $4.0 million in annual gross receipts over the prior three year period and the principal owner(s) do not have a personal net worth in excess of $1.32 million.

Firm and/or individuals that submit fraudulent documents/testimony may be barred from doing business with the City and/or forfeit existing contracts.

SBE certification is valid for one (1) year unless revoked.

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Small Business Enterprise Compliance Report

This information may be submitted electronically through Bid Express or submitted with bid in sealed envelope.

Cover Sheet

Prime Bidder Information

Company:_____

Address:_____

Telephone Number:_____ Fax Number:_____

Contact Person/Title:_____

Prime Bidder Certification

I, _____, _____ of
Name Title

_____ certify that the information
Company

contained in this SBE Compliance Report is true and correct to the best of my knowledge and belief.

_____ _____
Witness' Signature Bidder's Signature

_____
Date

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Small Business Enterprise Compliance Report

Summary Sheet

SBE Subcontractors Who Are NOT Suppliers

Name(s) of SBEs Utilized	Type of Work	% of Total Bid Amount
		%
		%
		%
		%
		%
		%
		%
		%
		%
		%
		%
		%
		%

Subtotal SBE who are NOT suppliers: _____ %

SBE Subcontractors Who Are Suppliers

Name(s) of SBEs Utilized	Type of Work	% of Total Bid Amount
		%
		%
		%
		%
		%
		%

Subtotal Contractors who are suppliers: _____ % x 0.6 = _____ % (discounted to 60%)

Total Percentage of SBE Utilization: _____%.

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Small Business Enterprise Compliance Report

SBE Contact Report

Submit separate copy of this form for each SBE which you are not able to utilize towards meeting the SBE goal for this project. Attach separate sheets if necessary.

SBE Information

Company:_____

Address:_____

Telephone Number:_____

Contact Person/Title:_____

1. Outline below all efforts to solicit a bid from the above SBE. Include date, means of contact, who from your company made this contact and the result.

   _____

   _____

   _____

2. Describe the information provided to the aforementioned SBE regarding the scope of work for which he/she was to provide a bid.

   _____

   _____

   _____

   Is this the same scope of work on which the subcontractor you intend to utilize based his/her bid?

   ☐ Yes ☐ No

3. Did this SBE submit a bid? ☐ Yes ☐ No

4. Is the General Contractor pre-qualified to self-perform this category of work?

   ☐ Yes ☐ No

5. If you responded “Yes” to Question 3, please check the items below which apply and provide the requested detail. If you responded “No” to Question 3, please skip ahead to item 6 below.

☐ The SBE listed above is unavailable for work on this project for the following reasons. Provide specific detail for this conclusion.

_____

_____

☐ The SBE listed above is unqualified for work on this project. Provide specific details for this conclusion.

_____

_____

☐ The SBE listed above provided a price that was unreasonable (i.e. more than 5% above the lowest bidder). Provide specific detail for this conclusion including the SBE’s price and the price of the subcontractor you intend to utilize.

_____

_____

☐ A contract with the SBE listed above may constitute a breach of the bidder’s collective bargaining agreements. Provide specific detail for this conclusion including, but not limited to, correspondence from the SBE indicating it will not sign a project labor agreement and/or correspondence from the applicable trade union indicating a project labor agreement will not be allowed at the time of project bidding.

_____

_____

☐ Other; please specify reason(s) other than listed above which made it impossible for you to utilize this SBE on this project.

_____

_____

6. Describe any other good faith efforts:

_____

_____

SECTION D: SPECIAL PROVISIONS

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It is the intent of these Special Provisions to set forth the final contractual intent as to the matter involved and shall prevail over the Standard Specifications and plans whenever in conflict therewith. In order that comparisons between the Special Provisions can be readily made, the numbering system for the Special Provisions is equivalent to that of the Specifications.

Whenever in these Specifications the term “Standard Specifications” appears, it shall be taken to refer to the City of Madison Standard Specifications for Public Works Construction and Supplements thereto.

SECTION 102.12: BEST VALUE CONTRACTING

This Contract shall be considered a Best Value Contract if the Contractor’s bid is equal to or greater than $61,000 for a single trade contract; or equal to or greater than $297,500 for a multi-trade contract pursuant to MGO 33.07(7).

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SECTION 01 00 00
GENERAL REQUIREMENTS

PART 1 GENERAL

1.1 SECTION SUMMARY

A. Section Includes:

1. SECTION SUMMARY
2. WORK COVERED BY CONTRACT DOCUMENTS
3. CONTRACTOR DUTIES
4. CONTRACTS
5. TIME OF COMPLETION AND LIQUIDATED DAMAGES
6. WORK SEQUENCE
7. CONTRACTOR USE OF PUBLIC RIGHT-OF-WAYS
8. CONTRACTOR USE OF PREMISES
9. DEFINITIONS
10. MEASUREMENT OF QUANTITIES
11. PROJECT MEETINGS
12. JOB SITE ADMINISTRATION
13. SUBMITTALS
14. TEMPORARY UTILITIES
15. TRAFFIC/DUST/DEBRIS
16. SPECIAL CONTROLS
17. PARKING
18. SECURITY
19. CLEANING
20. PROJECT CLOSOUT
21. RECORD DRAWINGS

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. This work covers repairs at the Capitol Square North (CSN), State Street Capitol (SSCo), State Street Campus-Lake (SSCL), State Street Campus-Frances (SSCF), and Overture Center (OC) parking ramps in Madison, Wisconsin. Work includes concrete repair of slabs, columns. and beams, joint repairs, sealant replacement at slab cracks and joints, epoxy injection crack repair, expansion joint replacement, membrane repair and placement, penetrating sealer placement, powerwash, prime, grit-blast and paint steel and concrete, repair cracked stair treads, repair railings.

B. The repair work to be done is shown on the plans/details and described in these specifications.

C. Ramp construction

1. Capitol Square North (CSN): post-tensioned cast-in-place concrete
2. Overture Center (OC) Ramp: post-tensioned cast-in-place concrete
3. State Street Campus Lake (SSCL): mild steel reinforced cast-in-place concrete (beams are post-tensioned concrete)
4. State Street Campus Frances (SSCF):

a. post-tensioned cast-in-place concrete (levels 1-2)
b. precast concrete (levels 3-5)

5. State Street Capitol (SSCo):

a. mild steel reinforced cast-in-place concrete (levels 1-3)
b. post-tensioned cast-in-place concrete (levels 4-6)

1.3 CONTRACTOR'S DUTIES

A. Except as specifically noted, provide and pay for:

1. Labor, materials, and equipment.
2. Tools, construction equipment, and machinery.
3. Water, heat and utilities required for construction not part of the existing ramp system.
4. Other facilities and services necessary for proper execution and completion of work.

B. Pay legally required sales, consumer and use taxes.

Secure and pay for, as necessary for proper execution and completion of work and as applicable at time of receipt for bids:

1. Permits
2. Government fees
3. Licenses

C. Give required notices.

D. Comply with codes, ordinances, rules, regulations, orders and other legal requirements of public authorities, which bear on performance of work.

E. Contractor is responsible for complying with City Affirmative Action and Best Value Engineering requirements.

F. Promptly submit written notice to Engineer of observed variance of Contract Documents from legal requirements. It is not Contractor's responsibility to make certain that drawings and specifications comply with codes and regulations.

G. Appropriate modifications to Contract Documents will adjust necessary changes.

H. Assume responsibility for work known to be contrary to such requirements, without notice.

I. Enforce strict discipline and good order among employees. Do not employ on work, unfit persons or persons not skilled in assigned task.

1.4 CONTRACTS

A. Construct work under a unit price contract with unit prices included to account for changes in the quantity of work from that estimated. Review proposal form for work to be completed as Lump Sum.

1.5 TIME OF COMPLETION AND LIQUIDATED DAMAGES

A. Construction is anticipated to start on or before July 2, 2018, and to be completed by October 19, 2018.

B. The successful Contractor must agree to commence work on a date to be specified in a written Notice to Proceed and to fully complete by dates specified.

C. Liquidated damages for failure to complete construction by given date shall be as stated in the third paragraph of Section 109.9 of the City of Madison Standard Specifications for Public Works Construction – most current year.

D. Completion shall include all construction as outlined in the plans and specifications as well as removal of all materials, debris, barricades, and other construction related items from the site.

E. Final project closeout shall be completed within 30 days of the construction completion date for all work addressed above. Final project closeout shall include, but not be limited to, submittal of warranties, lien waivers, wage rate compliance affidavits, documents of completed work, and proper pay applications

F. Each day shall be defined as a twenty-four (24) hour period beginning at 12:01 a.m.

1.6 WORK SEQUENCE

A. The Contractor will be allowed 70 parking stalls out of service at each ramp for the work. This will include the top side of the deck being restored and the level below. The parking structure will be open during the weekends. Additional parking spaces may be made available upon request and will be reviewed on a case by case basis. The Contractor shall make as many spaces available as possible other than those designated for restoration.

B. No parking or traffic will be allowed above areas being restored on the underside of the slab or below the areas being restored on the topside of the slab. This area will be included in the Contractor's work area. Contractor shall keep ramp attendant and cashier informed about the number of parking stalls out of service.

C. Contractor shall conduct their work between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday unless written request for special circumstances is acceptable to the Owner. Contractor shall plan work and make request in writing at least seven days prior to deviation from normal.

D. Concrete pours shall be scheduled between 9:00 a.m. and 2:30 p.m. to avoid conflicts with peak hour traffic. Contractor shall provide the Engineer and Owner with their schedule for concrete pours.

E. Dust protection must be in place prior to beginning work; refer to Traffic/Dust/Debris section (1.15).

F. Prior to the weekend, the Contractor shall clean the site adequately and secure equipment to prevent vandalism, personal injury, or theft.

G. The Contractor will be asked to reduce the number and type of parking spaces out of service for Special Events dates. The city will provide the Contractor with a schedule of dates. These dates will include but not be limited to Art Fair on the Square, IronMan, Taste of Madison, Mad City Marathon, Maxwell Street Days, and Freakfest (Halloween).

H. Prior to start of work, the Contractor shall survey the existing utilities within and around the structure. Existing utilities include electrical lighting and conduits, water piping including sprinklers, and mechanical duct work. Existing utilities that are broken shall be brought to the attention of the Engineer. The Contractor at the Contractor's expense shall remove and/or protect in place existing utilities. Existing utilities damaged by the Contractor shall be replaced by the Contractor at the Contractor's expense.

I. Prior to the start of work, the Contractor in the presence of the Engineer and Owner shall inspect the condition of the drains in areas affected by the Contractor's work to determine that they are clean and in proper working order. During and at the completion of the project, the drains shall be in similar condition and working order as observed in the initial inspection.

1.7 CONTRACTOR USE OF PUBLIC RIGHTS-OF-WAY

A. The General Contractors proposed use of the site may require a Street Occupancy Permit.

B. The General Contractor shall make application for a Street Occupancy Permit before proceeding with work in any public right-of-way. At the time of application for a Street Occupancy Certificate, the Contractor shall provide a drawing showing construction site fencing, construction entrances, proposed placement of equipment, and traffic routing.

C. A copy of the Street Occupancy Permit shall be at the job site during working hours.

D. Peak hour traffic flow in Madison occurs between the hours of 7:00 and 8:30 a.m. and between 3:30 and 5:30 p.m., Monday through Friday. During these hours work that will interfere with the flow of traffic shall not be permitted on or in the street governed by this permit.

E. All signing or barricading shall be done in conformance with the Federal "Uniform Manual on Traffic Control Devices".

F. All pavement markings removed, disturbed or damaged shall be restored or replaced, in kind, by the City at the expense of the city.

G. For removal or replacement of traffic and parking signs, contact the City of Madison Traffic Engineering Field Operations, 1120 Sayle Street 266-4767, 8:00 a.m. - 4:00 p.m., 24 hours in advance of when you need the sign removed. This service is provided free of charge. If you remove the signs, you will be billed for reinstallation and any damage to the sign installation.

H. NO MATERIALS shall be stored in the street or street right of way.

I. A fence may be required around the occupancy area and the construction site depending on the Contractor's intended use. The occupancy area shall be considered part of the construction site. No stopping, standing or parking signs shall be installed, by the contractor, on the fence surrounding the construction site.

J. A clean, safe access route shall be provided to the parking ramp at all locations desired by the City of Madison, Parking Utility.

K. Sidewalk Closed Use Other Side signs shall be installed at each end of the block when a portion of the block is closed to pedestrian traffic.

1.8 CONTRACTOR USE OF PREMISES

A. Confine operations at the site to areas permitted by law, ordinance, permits, and contract documents

B. Do not unreasonably encumber site with materials and equipment.

C. Do not load structure with weight that will endanger structure.

D. Assume full responsibility for protection and safekeeping of products stored on the premises. Construction equipment, shoring, tools, etc. shall not be stored in areas of the Owner's continued use.

E. Move any stored products which interfere with operations of Owner or other Contractor.

F. There is no storage for materials outside of Contractor's work area.

1.9 DEFINITIONS

A. CONTRACT DOCUMENTS - Contract documents for this project include but are not limited to:

1. Specifications and Drawings for “City of Madison 2018 Parking Garage Maintenance”.

2. General Conditions, which are included in the Standard Specifications for Public Works Construction, most current year, of the City of Madison, Department of Public Works. The Standard Specifications described above are available online at https://www.cityofmadison.com/business/pw/specs.cfm

3. Architectural and structural drawings for the original construction. Drawings are available for review at the City Department of Transportation office, Room 100, Madison Municipal Building, Madison, Wisconsin 53701.

B. UNSOUND CONCRETE - Concrete which contains internal and/or surface cracking or loss of density, and which in the judgment of the Engineer is detrimental to the strength and serviceability of the structure. Unsound concrete is also associated with concrete surface spalling and crumbling, infiltration of moisture and salts, corrosion of reinforcement, rust staining, increased porosity, and reduced strength.

C. DELAMINATION - Planar cracking of concrete usually initiated by bursting stresses due to expansion of corrosion by-products of embedded reinforcing.

D. SOUND CONCRETE - Firm, dense, homogeneous concrete which contains in the judgment of the Engineer no significant detriments to its strength or serviceability.

E. REMOVAL - Removal of unsound and sound concrete, epoxy patches and asphalt using chipping hammers or other means.

F. SCARIFYING - The process of making numerous cuts into a concrete surface, which results in fracturing the cement paste and aggregate, exposing a new roughened surface free of contaminants.

G. SLAB - Flat, horizontal or ramped layers of reinforced concrete which spans and is supported by columns, beams or walls.

H. SUPPORT BARS - Reinforce bars used to support the main reinforcing bars and not shown on the original drawings as main reinforcing bars themselves.

I. DRAWINGS - Graphical description of the work to be performed, designated.

J. SPECIFICATIONS - Written description of the work to be performed, designated.

1.10 MEASUREMENT OF QUANTITIES

A. Work to be performed on a unit price basis shall be measured according to the quantities described in the above work items. Payment will be made for work actually performed, based on quantities recorded by the Contractor and approved by the Engineer. Unless stated otherwise, records described below shall consist of both plan view drawings and tables cross-referenced to the drawings with the required measured quantities. Unless otherwise stated, the Engineer will verify the accuracy of the record by visual examination of the work performed and measuring the quantities with a measuring tape, wheel, or other appropriate device.

B. The Contractor shall notify the Owner and the Engineer at once in writing of any unit price work that deviates materially from the prescribed basis for bidding and for which an adjustment in Unit Price is desired. The Contractor shall measure and quantify all such deviations, subject to the Engineer's verification, prior to any repair work which might make verification impossible. No adjustments in Unit Prices will be considered unless supporting field measurements are provided, and subject to the Owner's prior approval. Adjustments will only be considered if all repairs of a given type have been measured and all deviations, both plus and minus have been included in the determination of the average deviation from the Unit Price basis.

C. Removal of top and underside of slab, beams, columns and joist stem concrete,

1. The Contractor shall maintain a record of the location and quantity of concrete removed, identified by unit price item. This record shall be submitted to the Engineer on a weekly basis. The quantities shall be reported in the form of ¼" = 1'-0" scale maps along with tables cross-referenced to the drawings.

D. Placing replacement and supplemental reinforcing

1. The Contractor shall maintain a record of the location and quantity of reinforcement placed. This record shall show the quantity and size placed. Replacement and supplemental reinforcement records shall be associated with the concrete removal maps. This record shall be submitted to the Engineer on a weekly basis.

E. Installation of slab crack and joint sealant

1. The Contractor shall maintain a record of the location and quantity of cracks and joints sealed. Drawings in the form of 1/8” = 1’-0” scale maps along with tables cross-referenced to the drawings shall show length of crack and joint sealed and related work item.

F. Placement of Traffic Coatings

1. The Contractor shall maintain a record of the areas of traffic coating placement. This is to include areas receiving the Full Membrane System and those that receive the Wear Coat and Top Coat. Drawings in the form of 1/8” = 1’-0” scale maps.

1.11 PROJECT MEETINGS

A. Pre-Bid Meeting

1. Refer to Section A: Advertisement for Bids and Instructions to Bidders

B. Pre-Construction Meeting

1. Soon after award of Contract and prior to the start of construction, each Prime Contractor shall attend a pre-construction conference with representatives of the Owner and Engineer.
2. The Contractor shall have at the meeting responsible representatives from subcontractors who are to perform the work.
3. The Contractor shall submit the following information at the Pre-Construction Meeting:
    a. Construction Schedule
    b. List of Sub-Contractors
    c. Procedures for demolition
    d. Procedures for dust control
    e. Procedures for noise control
4. The Construction Schedule submitted by the Contractor shall describe in detail when each portion of the work is to be accomplished and subcontractors shall participate in the discussion. The Engineer will serve to interpret the Contract Documents should such questions arise. A representative of the Owner may also be present to discuss work to be completed by others in conjunction with this project and the Owner' partial occupancy and use of the garage during construction.
5. Any other questions that the Contractor or subcontractors have about the work or its scheduling shall be raised at this meeting.
6. Requirements for contract administration and construction operations will be defined for participants.
7. Prepare in reproducible form approved by the Engineer and include:
    a. Breakdown of work activities in categories approved by Engineer, segmented as necessary to allow close monitoring of progress of the work during construction.
    b. Order of work necessary to meet Time for Completion.
    c. Breakdown of the work of all Subcontractors scheduled in cooperation with the Contractor's work.
    d. Signatures of all Contractors.
    e. Space for the additional display of actual performance on the schedule.
8. After necessary revisions and approval by the Engineer, provide two prints of project construction schedule to the Engineer.
9. Time, date and place of the meeting will be determined by the Engineer.

C. Progress Meetings

1. Weekly project meetings will be held at the project site by the Engineer's representative and Owner's representative for the purpose of coordinating and expediting the Work progress.
2. Attendance at project meetings by all Prime Contractors, or their authorized representative, is mandatory.
3. Date and time of the meetings will be determined at the pre-construction meeting.

4. Contractors shall give verbal reports of progress on the project, discuss the work schedule for the coming period and present all conflicts, discrepancies or other difficulties for resolution.
5. Upon request of the Engineer, update the schedule to reflect changes required by actual conditions and indicate actual work completed. Provide the Engineer with same number of copies as required for original submission.
6. Show changes occurring since previous submission of schedule such as:
    a. Major changes in scope.
    b. Activities modified since previous submission.
    c. Revised projections of progress and completion.
    d. Other identifiable changes.
7. Provide a narrative report as needed to define:
    a. Problem areas, anticipated delays, and the impact on the schedule.
    b. Corrective action recommended, and its effect.
    c. The effect of changes in schedules of other Prime Contractors.
8. Where work is not performed according to the Construction Schedule, a short narrative should be written describing the cause of delay and intended action to remedy the delay.
9. When the work performed is not meeting the construction schedule, the Engineer may request that the contractor increase the labor and equipment being furnished in order to meet the schedule. Should the contractor choose not to follow the engineer's request he shall provide a written submittal explaining how the schedule is to be met without an increase in labor and equipment.
10. Meeting minutes will be distributed with two (2) business days of the meeting by the Engineer, and will serve as the meeting agenda for the next progress meeting.

1.12 JOB SITE ADMINISTRATION

A. The Contractor shall have at the site of the work at all times, while work is in progress, a superintendent or foreman having authority both to receive orders from the Engineer and to act for the Contractor.

B. The Engineer will have a representative on site six (6) hours per week on average during progress of the work.

C. The Engineer's inspections and project coordination shall take place between regular business hours of 7 a.m. to 5 p.m. The Contractor will take all necessary steps to allow the Engineer to carry out the Engineer’s duties without interference by noise, dust, or other construction activities.

1.13 SUBMITTALS

A. General
    1. Refer to General Conditions for basic requirements for all submittals.
    2. Refer to technical specifications for all submittals required.

B. Submittal Requirements

1. Project information shall be first sent to the Engineer.
2. Schedule submittals at least 14 days before the time that reviewed and approved submittals will be needed.
3. Accompany submittals with transmittal letter containing the date, project title and number, Contractor's name and address, the quantity of items submitted, notifications of any deviations from Contract Documents, the Section of Work and other pertinent data.

C. Schedules

1. Refer to Project Meetings

D. Subcontractor and Materials List

1. The Subcontractor and major suppliers list shall be submitted on or before the first pre-construction meeting.
2. The Engineer will promptly review list and indicate in writing approval or disapproval of subcontractors and/or materials. Resubmit revised list, upon disapproval of any item, until such time as approval of all items has been obtained from the Engineer.
3. Use of unspecified or unapproved materials and equipment will not be permitted.

E. Schedule of Values

1. Before the first Application for Payment, the Contractor shall submit to the Engineer a schedule of values of the various portions of the Work, including quantities if required by the Engineer, aggregating the total Contract Sum, divided so as to facilitate payments to Subcontractors.
2. Prepare a schedule of values in such form and supported by such substantiating data as the Engineer may require. Each item in the schedule of values shall include its proper share of overhead and profit. This schedule, when approved by the Engineer, shall be used only as a basis for the Contractor's Applications for Payment.

F. Material Safety Data Sheets

1. Contractor shall submit Material Safety Data Sheets for all products (sealants, concrete, etc.) they intend to use on the project.

G. Test Reports and Data

1. Submit test reports and data where required by technical specifications. Results of testing, including concrete cylinder breaks, shall be submitted to the Contractor and the Engineer.

H. Application for Payment

1. For each progress payment (no more frequent than once a month) the Contractor shall submit to the Engineer an itemized Application for Payment supported by the following data: record scale maps with cross-referenced tables of removal and replacement areas, including top and underside of slab locations and areas of vertical and joist stem repairs approved by the Engineer. Also submit locations and areas of membrane and waterproofing placement. Work not complete at the time of the itemized Application for Payment submittal will not be included in that payment. Contractor shall use AIA Documents G702 and G703 Application and Certificate for Payment or similar.

I. Record Drawings

1. The Contractor shall provide and maintain in proper order, in good, clean condition, in field office at the project site, one complete set of prints of all drawings.

2. At time of final acceptance and prior to final payment present these corrected prints to the Owner through the Engineer. Note all data and changes on these record drawings in sufficient detail, clarify and provide information necessary for preparation of "as-built" drawings.

J. Guarantees, Warranties, and Certificates

1. Submit all guarantees, warranties and certificates to the Engineer prior to final payment.

1.14 TEMPORARY UTILITIES

A. The Contractor shall arrange for, obtain and pay for all temporary utilities necessary to complete the work except as stated otherwise in these specifications.

B. WATER: The Owner, during non-freezing conditions, will provide needed water for the Contractor's use. This shall consist of the existing water supply in the ramp. Water requirements beyond what is supplied in the garage shall be the responsibility of the Contractor and paid for by the Contractor. Water shall be used prudently. Connections are the responsibility of the Contractor.

1. The Contractor shall not permit water to run uncontrolled off of their work or be carried airborne off the site or onto vehicles and persons occupying part of the site. To prevent this, suitable enclosures shall be provided.

2. The Contractor shall meet the DNR waste water regulations for construction site runoff requirements.

C. ELECTRICAL AND LIGHTING: The Contractor shall provide all temporary electric power and connections necessary for the Contractor’s work. The Contractor can use the existing 110/220 volt service in the ramp. The Owner will provide the existing lighting. Supplementary lighting, if necessary, shall be provided by the Contractor.

D. DRAINS, SUMPS AND SEWERS: The Contractor shall not permit debris, or other deleterious contaminants to be washed down drains within the garage and be discharged into the City sewer system. The Contractor shall meet the DNR waste water regulations of 40 milligrams of solids per liter measured at the discharge from the sump pit. The Contractor shall provide filters, settling tanks or other methods necessary to meet these requirements.

E. TELEPHONE: The Contractor shall provide temporary telephone service to the job site. This service shall consist of at least a cellular phone for the Contractor’s purpose.

F. TOILETS: The Contractor shall provide and maintain suitable, weather tight, sanitary toilet facilities for all workers during construction period. When toilet facilities are no longer required, promptly remove from site, disinfect and clean or treat the area as required.

1. The Contractor shall keep all toilet facilities clean and supplied with toilet tissue at all times. Maintain facilities in accordance with requirements of applicable building codes.

G. PROJECT SIGN: No individual advertising signs, plaques or credits, temporary or permanent, will be permitted on the building or premises, except the name of each contractor on their office or material shed.

H. EXPLOSIVES: Use of explosives, for any purpose, is prohibited.

I. FIRST AID: The Contractor shall provide temporary first-aid facilities on the site.

J. FIRE PROTECTION: The Contractor shall provide temporary fire protection as required by federal, state, and local laws and ordinances.

1.15 TRAFFIC/DUST/DEBRIS

A. The Contractor shall provide personnel, signs, barricades, lights and warning devices to control the orderly flow of traffic, both inside and outside of the garage where needed, and prevent pedestrians and cars from entering areas of the Contractor's operations. The traffic devices shall meet the requirements of the U.S. Department of Transportation Manual on Uniform Traffic Control Devices.

B. The Owner will continue to use the building during the renovation. The Contractor must schedule and arrange the work so as to maintain access to undisturbed parking areas. Short interruptions in traffic flow may be permitted but must be scheduled and written approval given by the Engineer seven (7) days prior to the planned interruption. During these interruptions, the Contractor shall provide personnel and signage to direct traffic within the structure.

C. Traffic control signs may be necessary several bays removed from the actual work area to maintain an orderly flow of traffic. The Owner shall make the final determination as to the required limit of traffic control.

D. The Contractor shall move these signs, barricades, lights and warning devices as necessary as the location of the work within the garage changes and previously worked-in areas are occupied by the Owner.

E. Contractor will provide appropriate signage warning the public of the construction area and directing them to exits. They shall provide and maintain necessary walkway with appropriate protective railings and enclosures required to prevent bodily injury to the public and maintain normal public usage during course of construction.

F. The General Contractor shall provide temporary barriers around areas of overhead removal to prevent damage or injury from flying debris associated with this work. Barriers shall consist of plywood screen walls or reinforced polyethylene extending from the top of floor to the underside of the floor above and supported by steel post shores or Ellis post shores.

G. Where possible, hoses, electrical cords, etc. shall be located overhead. Whenever such items are located in traffic paths, plywood coverings with adequate signs shall be provided.

H. General Contractor shall provide and maintain necessary safe passage through the areas being restored to prevent bodily injury to the public and to maintain normal public usage during course of construction. Engineer's approval required for all proposed temporary exit ways or walkways.

I. The Contractor shall erect temporary enclosures around the area of work, including areas adjacent to stairwells, driving lanes, parapets, walkways, etc. The Contractor shall provide adequate protection to prevent damage or injury from flying debris associated with this work. Barriers shall consist of plywood screen walls or reinforced polyethylene extending from the top of floor to the underside of the floor above and supported by steel post shores or Ellis post shores.

J. Dust protection is required around work area and shall be fastened tight to the floor and ceiling above. Flexible duct work or similar shall be used in addition to fans to vent work areas to the outside. Exhaust air shall be filtered, and filters maintained to prevent escaping dust. Dust protection must be in place prior to any concrete removal.

K. The Contractor shall be responsible for maintaining any means of egress required by governing codes, for the continued use of the parking facility. Enclosures which limit the means of egress from the structure shall have provisions for emergency egress through the partitions.

L. Dust filters shall be erected to limit dust being carried from the site. Contractor shall use crack router with vacuum attachment to eliminate dust from this process. Water shall be used during concrete removal, sawing, etc. to hold down dust.

M. Removal areas need to be covered during times contractor is not present to prevent pedestrians from entering Contractor's area of work. Removal areas in public pathways shall be covered with steel plates.

N. The Contractor shall maintain access to undisturbed parking areas throughout the concrete restoration and membrane placement.

O. All Contractors shall comply with applicable OSHA regulations.

P. All plastic sheeting shall be new or like new with no holes or rips that will allow the escape of dust. Plastic sheeting shall be replaced when it becomes torn.

Q. All plastic sheeting shall conform to NFPA 701

1.16 SPECIAL CONTROLS

A. NOISE CONTROL: Contractor shall confine hours of work from 7:00am to 7:00pm Monday through Friday except holidays. Noise levels shall be held to a minimum at all times considering the nature of the work and are subject to City ordinance.

1. Contractor shall erect noise control around work areas for primary goal of minimizing construction work noise affecting the parking attendant's booth. Noise control shall consist of insulating blankets, batt insulation, or other similar means. Noise control shall be erected along edge of work area directly in line with attendant booths and shall return along the work area a distance sufficient in controlling the construction noise.

2. The Contractor shall erect sound barriers around all equipment including air compressors that will sit outside the ramp.

B. SPECIAL RESPONSIBILITIES: The Contractor shall be responsible for damages to vehicles in or near the garage, resulting from their operations. The Contractor shall settle claims within 30 days of receipt of claim.

C. POLLUTION CONTROL: All internal combustion engines used in the Contractor's work and operating in a fixed location while running shall have their exhaust piped to the outside of the building and directed away from this building or any adjacent structures so as to prevent accumulation of fumes or carbon stains on the surfaces of the structure.

1. Compressors may be located on the roof level of the ramp. Care shall be taken to prevent the exhaust from entering the attendant booth air intake ducts.

2. Place plywood or other suitable material below compressors to protect the substrate from grease, oil, and other debris.

1.17 PARKING

A. Parking of vehicles and equipment required for construction purposes shall be in the Contractor's designated work areas. No parking will be provided for employees of any Contractor on site. Any vehicle in the parking ramp not parked within the construction area, which are required for this project, will be charged for parking.

B. All Contractors and their employees shall cooperate with the General Contractor and others in the parking of vehicles to avoid interference with normal construction activities.

C. Do not obstruct existing service drives and parking areas outside the Contractor's work area with equipment, materials and/or vehicles. Keep accessible for Owner's use at all times.

1.18 SECURITY

A. The Contractor shall provide for the security of materials and equipment stored at the site. Material and equipment shall not be stored in areas which the Owner continues to use. The Contractor may store equipment and materials in areas in which the Contractor is working; otherwise they shall be removed from the site.

1.19 CLEANING

A. General

1. Each Contractor shall keep premises free of accumulation of surplus materials and debris resulting from their operations and the operations of Subcontractors.

a. Do not throw debris from ramp.
b. Remove all debris from premises.
c. No burning of debris on premises allowed.
d. Do not use Owner’s dump containers.

2. At a minimum, remove debris dumpster weekly and additionally as required by the Engineer. Keep interior of ramp free at all times of unattended combustible debris.

3. Drive lanes, adjacent to work area, shall be cleaned daily to eliminate airborne dust.

4. Remove all tools, equipment, scaffolding and temporary facilities immediately when no longer required for execution of the work.

5. The Contractor shall "broom clean" all floors within and adjacent to work areas as construction progresses to eliminate dirt and trash accumulation and maintain proper project cleanliness. Stair towers and areas of pedestrian traffic flow shall be “broom-clean” daily. Unless work area is secured against entry by pedestrians, all rubble shall be removed from ramp surface and all open holes shall be covered with steel plates.

B. Safety Requirements

1. Store volatile wastes in covered metal containers and remove from premises daily.
2. Prevent accumulation of wastes which create hazardous conditions.
3. Provide adequate ventilation during use of volatile or noxious substances.
4. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
5. Do not burn or bury waste materials on the project site.
6. Do not dispose of volatile wastes such as mineral spirits, oil or paint thinner in storm and sanitary drains.

C. Materials

1. Use only cleaning materials recommended by manufacturer of surface to be cleaned.
2. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

D. Submittals

1. Submit plan for disposal of waste.

E. Cleaning During Construction

1. Execute cleaning to ensure that building, grounds and public properties are maintained free from accumulation of waste materials.
2. Wet down dry materials to lay dust and prevent blowing dust.
3. At daily intervals during progress of work, clean site and public properties, and dispose of waste materials. Prior to any removal, the Contractor shall submit their plan for confining, collecting, and disposal of waste material as a result of the Contractor’s removal operations.
4. Provide on-site dump container for collection of waste materials. Contractor shall coordinate with Owner for location of dumpster.
5. Remove waste materials in a controlled manner with as few handlings as possible. Do not drop or throw materials from heights.
6. Schedule cleaning operations so that dust and other contaminants resulting from the cleaning process will not fall on wet, newly painted surfaces or adjacent parked cars.

F. Final Cleaning

1. Immediately prior to final inspection, the Contractor shall clean all surfaces to condition acceptable for immediate occupancy by the Owner and remove all foreign matter from all finished items.

2. The Contractor shall leave all work clean in all respects, ready for use and occupancy by the Owner without additional work.
3. Employ experienced workers, or professional cleaners, for final cleaning.
4. In preparation of substantial completion or occupancy, conduct final inspection of sight exposed interior and exterior surfaces, and of concealed spaces.
5. Repair, patch, and touch up marred surfaces to specified finish, to match adjacent surfaces.
6. Water blast and broom clean to remove dust and debris from paved surfaces, walls, ceilings and stairs. Hand wash with rags, sponges or equivalent, all railings, pipes, windows, door frames, light fixtures, etc. and rinse, from within work areas and other areas affected by construction. If dust protection is not erected and maintained to prevent dust and debris from being tracked through the structure, the Contractor will be required to perform final cleaning procedures throughout the structure from the top level to the basement.
7. Remove debris from drains and sumps and check that drains are again operable.

1.20 PROJECT CLOSEOUT

A. Completion

1. All work shall be complete when written notice requesting final inspection is submitted to the Engineer.

B. Guarantees, Bonds, and Affidavits

1. Required prior to final payment is made. Submit all required written documents including guarantees, bonds, and affidavits.
2. Guarantees shall extend the full period of the required guarantee period after:
    a. Replacement of work found defective during guarantee period at any time after Completion.
    b. Repair of inoperative items or adjustments to proper working condition of items not operating properly at time of inspection at Completion.
    c. Completion of work not completed at time of Completion.
3. Items of equipment or material bearing a guarantee of the manufacturer or supplier longer than that described in the City of Madison Standard Specifications for Public Works Construction – most current year, shall not serve to release the manufacturer or supplier from their obligation to repair or replace such items within the limits of their guarantee after expiration of guarantees required by these specifications.

1.21 RECORD DRAWINGS

A. Required prior to final payment is made

END OF SECTION

SECTION 01 22 00
UNIT PRICES

PART 1 GENERAL

1.1 PAYMENT

A. Work is to be paid for on Unit Price basis and bid on estimated quantities. These work items are to be installed and completed per specifications and as shown on drawings.

1.2 MEASUREMENT OF QUANTITIES

A. Refer to General Requirements for complete information.

B. Work to be performed on unit price basis shall be measured according to quantities described above. Payment will be made for work actually performed, based on quantities recorded by Contractor and approved by Engineer. Unless stated otherwise, records described below shall consist of both plan view drawings and tables cross-referenced to drawings with required measured quantities. Unless otherwise stated, Engineer will verify accuracy of record by visual examination of work performed and measuring quantities with measuring wheel and tape measure.

C. Contractor shall notify Owner and Engineer at once in writing of any unit price work that deviates materially from prescribed basis for bidding and for which adjustment in Unit Price is desired. Contractor shall measure and quantify all such deviations, subject to Engineer's verification, prior to any repair work which might make verification impossible. No adjustments in Unit Prices will be considered unless supporting field measurements are provided, and subject to Owner's prior approval. Adjustments will only be considered if all repairs of given type have been measured and all deviations, both plus and minus have been included in determination of average deviation from Unit Price basis.

Item	Type of Work	Unit Price
1	Topside slab repair below one layer of reinforcing steel including removal of concrete to an estimated variable depth of 2” to 5” from top of slab, sandblasting of the newly exposed concrete surface and reinforcing steel, and placing “ready-mix” concrete fill (pre-packaged concrete at Contractor’s option). Refer to detail 1/D1 and specification sections 02 41 17, 03 01 30, and 03 30 00. Payment based on area of concrete placed at top surface of slab.	$/Sq. Ft.
2	Topside slab repair below two layers of reinforcing steel including removal of concrete to an estimated variable depth of 4” to 7” from top of slab, sandblasting of the newly exposed concrete surface and reinforcing steel, and placing “ready-mix” concrete fill (pre-packaged concrete at Contractor’s option). Refer to detail 3/D1 and specification sections 02 41 17, 03 01 30, and 03 30 00. Payment based on area of concrete placed at top surface of slab.	$/Sq. Ft.
3	Concrete repair at vertical surfaces including removal of concrete, sandblasting of newly exposed concrete surface and reinforcing steel, and placing pre-packaged concrete fill. Refer to detail 2/D2 and specification sections 02 41 17 and 03 01 30. Payment based on exposed surface area of concrete placed.	$/Sq. Ft.

4	Concrete repair at bottom of slab and beams including removal of concrete with ¾" gap all around reinforcing bar, sandblasting of newly exposed concrete surface and reinforcing steel, and placing pre-packaged or shotcrete concrete fill. Refer to detail 5/D1 and specification sections 02 41 17, 03 01 30 and 03 37 13. Payment based on exposed area of concrete placed.	$/Sq. Ft.
5	Concrete repair at top of columns including removal of cracked and delaminated concrete; grit-blasting newly exposed concrete surface and reinforcing steel. Reset existing posts, form and cast replacement concrete at pier. Work also includes the removal and reinstallation of parking bumpers. Refer to detail 5/D2 specification sections 02 41 17, 03 01 30, 03 12 00 and 03 30 00. Payment based on area of pier repaired.	$/Sq. Ft.
6	Concrete repair at joist stems at SSCL including removal of concrete, grit-blasting of newly exposed steel, and placing pre-packaged or shotcrete concrete fill. Refer to detail 4/D1 and specification sections 02 41 17, 03 01 30 and 03 37 13. Payment based on linear foot of joist patched.	$/Lin. Ft.
7	Thicken column sections at SSCL including sandblasting of exposed concrete surface, reinforcing steel, steel fabrication, supply, detailing, storing, placing replacement reinforcing steel and placing "ready-mix" concrete fill. Refer to detail 1/D3 and specification sections 02 41 17, 03 12 00, 03 20 00 and 03 30 00. Payment based on number of complete column section repaired.	$/Each
8	Repair cracked stair treads at parking structures. Work will include restoration at designated stair treads, installation of dowels. Resetting rail posts and casting replacement concrete at stair tread. Refer to detail 6/D1 and specification sections 02 41 17, 03 01 30, and 03 30 00. Payment is based on square feet of work completed.	$/Sq. Ft.
9	Column base repair at SSCO including removal of concrete, sandblasting of newly exposed concrete surface and reinforcing steel, installing sonotube concrete form and placing "ready-mix" concrete fill. Refer to detail 3/D3 and specification sections 02 41 17, 03 01 30, 03 12 00 and 03 30 00. Payment based on each column repaired.	$/Each
10	Epoxy inject concrete cracks including preparing cracks with epoxy paste, pressure-inject or gravity feed epoxy. Refer to specification section 03 01 30. Payment based on length of epoxy installed.	$/Lin. Ft.
11	Rout and seal cracks including grinding crack and joint edges, installing backer rod or bond breaker tape, and installing sealant. Refer to detail 4/D2 to specification section 07 92 00. Payment based on length of sealant installed.	$/Lin. Ft.

12	Replace sealant at horizontal and vertical surfaces including removal of existing sealant from cracks and joints, grinding crack and joint edges, installing backer rod or bond breaker tape, and installing new sealant. Joint width varies. Refer to detail 2/D2 and specification section 07 92 00. Payment based on length of sealant installed.	$/Lin. Ft.
13	Full system membrane placement including surface preparation of existing membrane and exposed concrete surfaces at existing and new concrete patch areas. Work shall include surface preparation, primer, base coat, wear coat, and top coat. Refer to specification section 07 18 00. Payment based on area of membrane installed.	$/Sq. Ft.
14	Membrane wear coat and top coat placement including surface preparation of existing membrane system. Work includes placement of wear coat and top coat membrane over existing areas with exposed membrane (base coat) and areas with heavily worn or weathered membrane. Refer to specification section 07 18 00. Payment based on area of membrane installed.	$/Sq. Ft.
15	Replace expansion joint header material including removal of existing damaged header material, inspection of and adhering existing seal, and installing new header material. Refer to specification section 07 95 00. Payment is based on length of header material installed.	$/Lin. Ft.
16	Replace existing expansion joint including removal of existing joint materials, placing concrete to form new block out where required and placing new joint seal system. Refer to detail 3/D2 and specification sections 02 41 17 and 07 95 00. Payment based on length of expansion joint slab system installed.	$/Lin. Ft.
17	Replace Expansion Joint - 4” Wide Polyurethane Seal including removal of existing expansion joint seal, replace/rebuild epoxy block outs, replace epoxy nosing and remove and replace traffic plates as needed and install new 4” wide polyurethane joint seal. Refer to Detail 1/D2 and specification sections 03 01 30 and 07 95 00. Payment based on length of expansion joint seal installed.	$/Lin. Ft.
18	Replace Expansion Joint - 8” Wide Polyurethane Seal including removal of existing expansion joint seal, replace/rebuild epoxy block outs, replace epoxy nosing and remove and replace traffic plates as needed and install new 4” wide polyurethane joint seal. Refer to Detail 1/D2 and specification sections 03 01 30 and 07 95 00. Payment based on length of expansion joint seal installed.	$/Lin. Ft.
19	Guardrail Anchor Plates including cleaning of existing surfaces, fabrication of steel angles, storage, welding angles to existing railings, and concrete anchors. Refer to details 2/D3 and 4/D3 and specification section 05 50 00. Payment based on each railing base supported (per 2 anchor plates).	$/Each

20	Repaint all blue guardrails and bumper stops including all preparation, priming, painting and cleaning as outlined in specification section 09 91 13. Surfaces to be painted include all existing exterior blue steel at SSCF, not including doors, windows, frames, or stairwell railings. Payment is lump sum for all surfaces outlined for the State Street Campus - Frances parking garage.	Lump Sum
21	Grit-blast and repaint support angles at knock out slab including all preparation, gritblasting to near white conditions, priming, and painting as outlined in Specification Section 09 91 13. Surfaces to be painted include steel support angles at OC future elevator knock out slab, as shown on plan. Payment is based on length of angle painted.	$/Lin. Ft.
22	Repaint original tapered columns including all preparation, priming, painting and cleaning as outlined in specification section 09 91 13. Surfaces to be painted include all original tapered columns on level 2 and other selected columns receiving repairs this year at State Street Capitol Parking Garage yellow. Payment is based on each column painted, approximately 54 columns.	$/Each
23	Clean and repaint Steel Doors and Frames including all preparation, priming, and painting as outlined in Specification Section 09 91 13. Surfaces to be painted include select steel doors and frames at SSCL and SSCO parking garages. Payment is based on each door and frame painted.	$/Each
24	Replace finishing at framed beam at OC including removal of existing damaged drywall and plaster, replacing steel edging if required, cutting, placing of drywall, and finishing the surface with exterior paint. Refer to details 6/D2 and specification section 09 21 16. Payment based on sum of required repair.	Lump Sum

PART 2 PRODUCTS

A. Not Used

PART 3 EXECUTION

A. Not Used

City of Madison 2018 Parking Ramp Maintenance
Quantity Summary of All Ramps

Item	Type of Work	SSCL	SSCF	OC	SSCO	CSN	Total	Unit
1	Topside of Slab Repair Below One Layer of Reinforcing Steel	0	0	10	1,300	0	1,310	SF
2	Topside of Slab Repair Below Two Layers of Reinforcing Steel	0	0	0	1,050	0	1,050	SF
3	Concrete Repair at Vertical Surfaces of Columns/Walls/Beams	15	5	40	15	0	75	SF
4	Concrete Repair Overhead at Slabs and Beams	20	0	20	160	0	200	SF
5	Concrete Repair at Top of Columns	45	0	0	0	0	45	SF
6	Concrete Repair at Joist Stems	40	0	0	0	0	40	LF
7	Thicken Column Sections	2	0	0	0	0	2	EA
8	Repair Cracked Stair Treads	0	0	15	0	0	15	SF
9	Column Base Repair	0	0	0	28	0	28	EA
10	Epoxy Inject Concrete Cracks	30	0	0	0	0	30	LF
11	Rout and Seal Cracks	0	0	50	70	20	140	LF
12	Replace Sealant at Horizontal & Vertical Surfaces	80	15	0	0	195	290	LF
13	Full System Membrane Placement	0	0	400	2,000	6,800	9,200	SF
14	Membrane Wear Coat & Top Coat Placement	3,000	0	0	0	23,000	26,000	SF
15	Expansion Joint Header Material Replacement	25	0	10	0	200	235	LF
16	Replace Expansion Joint - Wing Joint	0	120	0	50	0	170	LF
17	Replace Expansion Joint - 4" Wide Polyurethane Seal	0	0	25	0	0	25	LF
18	Replace Expansion Joint - 8" Wide Polyurethane Seal	0	0	60	0	0	60	LF
19	Guardrail Anchor Plates	0	81	0	0	0	81	EA
20	Repaint All Blue Guardrails and Bumper Stops	0	1	0	0	0	1	LS
21	Grit-Blast and Repaint Support Angles at Knock Out Slab	0	0	240	0	0	240	LF
22	Repaint Original Tapered Columns	0	0	0	54	0	54	EA
23	Clean and Repaint Steel Doors and Frames	3	0	0	5	0	8	EA
24	Replace Finishing at Framed Beam at OC	0	0	1	0	0	1	LS

SECTION 02 41 17
REMOVAL OF EXISTING CONCRETE AND SURFACE PREPERATION

PART 1 GENERAL

1.1 RELATED WORK

A. Applicable provisions of Division 01 shall govern work of this section.

B. Related work specified elsewhere:

1. Section 03 01 30 - Maintenance of Cast-in-Place Concrete
2. Section 03 11 15 - Shoring
3. Section 03 20 00 - Concrete Reinforcing
4. Section 03 30 00 - Cast-in-Place Concrete
5. Section 03 37 13 - Shotcrete

1.2 SUMMARY

A. Include materials, labor, services and incidentals necessary for completion of this Section of Work.

B. Include the removal of unsound concrete, examination of exposed reinforcing, sandblasting of acceptable reinforcing, replacement of unacceptable reinforcing with new, and cleaning of the newly exposed underlying sound concrete prior to casting new fill concrete.

C. Sandblasting of exposed reinforcing steel and concrete surfaces is not required with Hydro-demolition concrete removal option. Concrete and steel surfaces shall be thoroughly cleaned of all slurry and residue following removal, prior to application of rebar coating and bonding agent.

D. The removal work shall be carried out in a manner so as to create a minimum disturbance with the continued use of the parking structure.

E. Warning: Concrete slabs at Capitol Square North and the Overture Center Ramps are reinforced with post-tensioned (P/T) tendons. Contractor shall locate P/T tendons prior to removal of concrete. Contractor shall exercise extreme caution when chipping so as not to damage nor displace P/T tendons or anchorages. Any damage shall be repaired at Contractor's expense.

PART 2 PRODUCTS

2.1 EQUIPMENT

A. CHIPPING HAMMERS: Use chipping hammers with a total weight not to exceed:

1. At State Street Capitol (except levels 4-6) parking slabs:

a. 60 pounds and equipped with flat chisel type points with a cutting edge not less than ¾" or greater than 2½" in width may be used for initial removal to the level of the top layer of reinforcing steel

b. 30 pounds to remove concrete to the elevation of the second, lower elevation of reinforcing provided the removal is one layer of reinforcing.

c. Chipping hammers with a total weight not to exceed 15 pounds must be used once the reinforcing is exposed.

d. If, in the opinion of the Engineer, it appears that the 30 pound hammer is having detrimental effects on the existing concrete slab and encased reinforcing steel, its use shall be discontinued and nothing heavier than a 15 pound hammer will be allowed.

e. Use chipping hammers of nominal 15 pound class or less for removal of concrete from beneath reinforcing.

2. At State Street Campus Lake and Capitol Square North:

a. 15 pounds and equipped with flat chisel type points with a cutting edge not less than ¾" or greater than 2½" in width.

B. GRIT-BLASTING EQUIPMENT: Grit-blasting equipment shall be capable of removing rust from the exposed reinforcement and laitance from newly exposed concrete surfaces.

C. COMPRESSED AIR EQUIPMENT: Compressed air equipment shall be capable of removal of dust and dirt from concrete repair areas.

PART 3 EXECUTION

3.1 CONCRETE REMOVAL

A. Prior to removal, the Contractor shall submit the Contractor's plan for confining dust and water run-off, collecting and disposal of broken concrete, steel reinforcement and other waste material as a result of the Contractor's removal operations. This plan shall be submitted to the Engineer and the Owner prior to start of construction. Dumpster location shall be coordinated with the Engineer and the Owner. Stockpiling of removal debris within parking garage is not allowed unless authorized and coordinated with the Engineer.

B. Shore the structure as required. Shoring design, supply, and installation is the responsibility of the Contractor.

C. Contractor responsible for removing and reinstalling or protection in place of mechanical, electrical, and plumbing utilities including electrical lighting and conduits as required for repair work.

D. At slab areas with a membrane place plywood protection on the topside of slab for overhead concrete removal above to prevent damage to the membrane floor coating.

E. Delaminated areas which require removal of unsound concrete will be identified and marked by the Engineer. The unsound concrete shall be removed by chipping to sound concrete. The marking by the Engineer in the field does not guarantee that unsound concrete is not present in areas beyond those marked. Additional concrete removal may be required after the Contractor's initial removal. The Engineer will review the removal areas prior to concrete replacement.

F. Where possible, the areas removed shall be rectangular in shape in plan view. Do not feather edges, but chip edges square or slightly undercut.

G. Following the initial removal of concrete and visual location of P/T tendons (at OC) in area of patch, perimeter of removal area shall be saw cut to square the area of removal prior to placing new concrete.

H. During the chipping process in deteriorated concrete areas, care shall be exercised to avoid cracking of the underlying sound concrete.

I. During removal of unsound concrete, if more than half of the reinforcing bar diameter is exposed or if the bar is not firmly bonded to the surrounding concrete, or if the bar is corroded, then the remaining concrete around the bar shall be removed. The clearance between the bar and the concrete shall be a minimum of ¾". Support bars for the main reinforcing steel shall not be exposed provided there is no corrosion on these bars.

J. The newly exposed sound concrete shall be cleaned by blowing away loose material with a deep sandblast, with chipping hammer removal option, followed by cleaning with a compressed air jet.

K. The Engineer shall be allowed 24 hours for the inspection of properly prepared concrete surfaces and reinforcement, before the scheduled concrete placement.

3.2 REINFORCEMENT CLEANING AND REPLACEMENT

A. Exposed reinforcing shall be thoroughly cleaned by sandblasting, to remove rust and unsound concrete with chipping hammer removal option.

B. Bars that are damaged or that have lost more than 10 percent of their original area at any point along the length shall be considered unacceptable and shall be removed and replaced with an equivalent new bar of equal length at the Engineer's direction. No. 8 bars and smaller that have lost between 5 percent and 10 percent of their original area at any point can be blast cleaned and reused as long as a new full length #4 bar is used as supplemental steel next to the old cleaned bar at the Engineer's direction.

C. Exposed or supplemental reinforcing bars shall be no closer than ¾" measured radially from existing concrete. The elevation of exposed or supplemental reinforcing shall be maintained at the original height.

D. Where portions of reinforcing bars are exposed, the Engineer will determine if the embedded portion of the bar is soundly bonded to the remaining concrete. If, in the Engineer's judgment, the bar is not soundly bonded, the Contractor shall remove concrete around and under the bar for a length as determined by the Engineer.

E. Install additional reinforcing bars as detailed.

F. Drill and epoxy in dowels as detailed.

G. Cleaned reinforcing shall be coated with protective rebar primer prior to casting new concrete.

3.3 CLEAN UP

A. Contractor shall remove loose concrete from the site and leave the area broom clean.

B. Debris shall not be flushed down the existing floor drains.

END OF SECTION

SECTION 03 01 30
MAINTENANCE OF CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 RELATED WORK

A. Applicable provisions of Division 01 shall govern Work of this Section.

B. Related work specified elsewhere:

1. Section 03 30 00 - Cast-in-Place Concrete

1.2 SUMMARY

A. Products for maintenance of concrete, including the following:

1. Horizontal repair mortar
2. Vertical and overhead concrete repair
3. Rebar primer and bonding agent
4. Epoxy crack-injection

1.3 REFERENCES

A. ACI 503.3 - Specification for Producing a Skid-Resistant Surface.

B. ASTM International (ASTM):

1. ASTM C 33/C 33M - Standard Specification for Concrete Aggregates.
2. ASTM C 109/C 109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens).
3. ASTM C 144 - Standard Specification for Aggregate for Masonry Mortar.
4. ASTM C 150/C 150M - Standard Specification for Aggregate for Masonry Mortar.
5. ASTM C 618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
6. ASTM C 881/C 881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.
7. ASTM C 928/C 928M - Standard Specification for Packaged, Dry, Rapid-Hardening Cementitious Materials for Concrete Repairs.
8. ASTM C 937 - Standard Specification for Grout Fluidifier for Preplaced-Aggregate Concrete.
9. ASTM C 1059/C 1059M - Standard Specification for Latex Agents for Bonding Fresh To Hardened Concrete.
10. ASTM C 1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures.
11. ASTM D 2240 - Standard Test Method for Rubber Property-Durometer Hardness.

1.4 SUBMITTALS

A. Submit under provisions of Section 01 00 00 - General Requirements.

B. Product Data: Manufacturer's data sheets on each product to be used, including:

1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

C. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square representing actual product, color, and patterns.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum 5 year experience manufacturing similar products.

B. Installer Qualifications: Minimum 2 year experience installing similar products.

C. Source Limitations: For repair products, obtain each color, grade, finish, type, and variety of product from single source and from single manufacturer with resources to provide products of consistent quality in appearance and physical properties.

D. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.

1. Finish areas designated by Engineer.
2. Do not proceed with remaining work until workmanship is approved by Engineer.
3. Refinish mock-up area as required to produce acceptable work.

1.6 PRE-INSTALLATION MEETINGS

A. A pre-construction meeting is required with Contractor in order to coordinate work schedule and inspection required by Engineer

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.

B. Handling: Handle materials to avoid damage.

1.8 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.9 SEQUENCING

A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

PART 2 PRODUCTS

2.1 HORIZONTAL REPAIR MORTAR

A. Flowable structural-repair concrete with integral corrosion inhibitor.

1. “MasterEmaco S 466 CI” by BASF
2. “SikaTop 111 Plus” by Sika
3. “Eucocrete Supreme” by The Euclid Chemical Company
4. Or approved equal

2.2 OVERHEAD AND VERTICAL REPAIR MORTARS

A. One-component, shrinkage-compensated, fiber-reinforced product that contains an integral corrosion inhibitor.
   1. “MasterEmaco S 488 CI” by BASF
   2. “SikaTop 123 Plus” by Sika
   3. “Duraltop Gel” by The Euclid Chemical Company
   4. Or approved equal with corrosion inhibitor

2.3 REBAR PRIMER AND BONDING AGENT

A. Water-based epoxy-cementitious bonding agent and rebar coating.
   1. “MasterEmaco P 124” by BASF
   2. “Sika Armatec 110 EpoCem” by Sika
   3. “Duralprep AC” by The Euclid Chemical Company
   4. Or approved equal

2.4 EPOXY CRACK-INJECTION MATERLALS

A. Epoxy Crack-Injection Adhesive.
   1. “MasterInject 1380” by BASF
   2. “Epojet LV” by MAPEI
   3. “Sikadur Injection Gel” by Sika
   4. Or approved equal

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Engineer of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Refer to Specification Section 02 41 17 “Removal of Existing Concrete and Surface Preparation” for requirements.

B. Remove unsound material, dirt, oil, grease and other bond inhibiting materials.

C. Remove rust and loose concrete on exposed reinforcing steel by sandblasting.

D. Concrete substrate shall be saturated surface dry with no standing water prior to application and shall be saturated for a minimum of two hours prior to application.

E. Conform to additional specific preparation requirements specified by manufacturer or ACI Standard for each patching product as applicable.

F. Cavities will be examined prior to commencement of patching operations. Sounding the surface shall be part of the examination. Delamination noted during the sounding shall be removed as specified.

G. Airblasting is required as a final step to remove sand and debris. Debris shall be removed from the site prior to the start of patching.

H. Coat exposed reinforcing steel with rebar primer. Apply per manufacturer's instructions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions and in proper relationship with adjacent construction.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 03 11 15
SHORING

PART 1 GENERAL

1.1 RELATED WORK

A. Applicable provisions of Division 01 shall govern Work of this Section.

B. Related work specified elsewhere:

1. Section 03 01 30 - Maintenance of Cast-in-Place Concrete
2. Section 03 30 00 - Cast-in-Place Concrete
3. Section 03 12 00 - Concrete Formwork
4. Section 03 37 13 - Shotcrete

1.2 SUMMARY

A. Include materials, labor, services and incidentals necessary for completion of this Section of Work.

B. Include materials related to shoring as described below.

C. Shoring shall be designed by Contractor to temporarily support members whose support is to be removed by partial demolition and concrete removal.

1.3 SUBMITTALS

A. The Contractor shall submit to Engineer, a record of reference elevations of shored members at various stages as described below.

1.4 QUALITY ASSURANCE

A. Contractor shall obtain reference elevations of members supported by shoring prior to concrete removal, during concrete removal, after concrete removal, during and after concrete replacement, and after shoring removal.

B. When reference elevations indicate unanticipated movements, shoring shall be adjusted to minimize adverse effects of that movement.

PART 2 PRODUCTS

2.1 VERTICAL LOAD SHORES

A. Shores supporting vertical loads shall be adjustable through positive means, such as by adjustable screw jacks, in order to compensate for elastic shortening of shores during loading and other effects. Ellis Shore clamps shall not be used.

B. Shores shall be effectively cross braced to prevent buckling failure of individual members and overall shoring stability failure.

C. Shores shall be provided to carry full weight of floor system for entire bay in which work is being performed. Shores shall be in place prior to removal of unsound slab concrete and shall be supported on 1 structural level or to grade.

PART 3 EXECUTION

3.1 INSTALLATION

A. Shores shall be installed snug, plumb and square.

B. Shores shall be adjusted as required during progress of work as indicated by movements measured during relative elevation surveys of shored members.

3.2 REMOVAL

A. Shores shall only be removed when compressive strength results of replacement concrete reaches 75 percent of its specified 28 day strength. If Contractor chooses to have supplemental strength tests, it shall be the responsibility of the Contractor to make and pay for costs of these tests. Supplemental cylinders shall be stored on the structure in vicinity of the area they represent and shall be cured in the same manner as that portion of the structure.

B. Shores that have been removed shall not be stored in such a manner that they interfere with Owner's continued use of the structure. If shoring is not to be used within the structure it shall be removed from the structure or stored in the area in which Contractor is working.

END OF SECTION

SECTION 03 12 00
CONCRETE FORMWORK

PART 1 GENERAL

1.1 RELATED WORK

A. Applicable provisions of Division 01 shall govern work of this section.

B. Related work specified elsewhere:

1. Section 03 01 30 - Maintenance of Cast-in-Place Concrete
2. Section 03 11 15 - Shoring
3. Section 03 20 00 - Concrete Reinforcing
4. Section 03 30 00 - Cast-in-Place Concrete

1.2 WORK INCLUDED

A. Include materials, labor, services and incidentals necessary for completion of this Section of Work.

B. Include formwork for cast in place concrete as required by Concrete Contractor.

C. Notify trades in ample time for each to install own work required in conjunction with formwork.

D. Inserts, sleeves and other miscellaneous embedded items required by mechanical, electrical or plumbing trades shall be supplied and installed by those respective trades.

E. Provide and install inserts, sleeves and other miscellaneous embedded items other than those required by mechanical, electrical or plumbing trades.

F. Supply, install and maintain shoring and re-shoring related to concrete formwork.

1.3 QUALITY ASSURANCE

A. Industry Standards, Specifications and Codes:

1. General:
   a. Comply with provisions of the following codes and standards except as modified herein.
   b. Referenced codes and standards including revisions and commentaries shall be the most currently adopted as of the date of these Contract Documents.
2. American Concrete Institute (ACI)
   a. ACI 301 Specifications for Structural Concrete for Buildings
   b. ACI 318 Building Code Requirements for Structural Concrete
   c. ACI 347 Guide to Formwork for Concrete
3. National Forest Products Association (NFPA)
   a. NDS National Design Specification for Wood Construction including Design Values for Wood Construction
4. The Engineered Wood Association (APA)
   a. Plywood Design Specification

1.4 DESIGN CRITERIA

A. Design forms, shores and bracing. Include factors pertaining to safety of formwork structure such as live load, dead load, weight of equipment on formwork, concrete mix, height of concrete drop, vibration reactions and similar factors.

B. Design formwork to be readily removable without impact, shock or damage to cast in place concrete surfaces and adjacent materials.

1.5 ALLOWABLE TOLERANCES

A. Flatwork true to plane: 1/4 inch in 10 feet

B. Vertical surfaces true to plane: 1/4 inch floor to floor

C. Formwork displacement: Maximum 1/4 inch

D. Deviation of building dimensions indicated on drawings and position of columns, walls and partitions: 1/4 inch

E. Deviation in cross sectional dimensions of columns, piers or beams or in thickness of slabs and walls: plus/minus 1/4 inch

PART 2 PRODUCTS

2.1 FORM MATERIALS

A. General: Plywood, metal framed plywood faced or other acceptable panel type materials to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practical sizes to minimize number of joints. Provide form material with sufficient thickness to withstand pressure of newly placed concrete without bow or deflection.

B. Formed Surfaces Exposed to View: New plywood complying with U.S. Standard PS 1 Polyform Class I, B Concrete Form Plywood, B-Matte MDO Plywood by Simpson, 5/8 inch or 3/4 inch thick without defects, mill oiled and edge sealed or wood forms lined with 3/16 inch tempered pressed wood or 1/4 inch thick plywood B conforming to EXT DFPA as large a size as possible to minimize joints.

C. Formed Surfaces Concealed from View: Clean straight lumber dressed on face and edges, nominal 1 inch thickness or plywood 5/8 inch or 3/4 inch thick conforming to EXT DFPA or metal forms smooth and as large a size as possible.

D. Reveals and Chamfers: Wood or purpose-made plastic or high-density plastic foam to achieve sharp, true lines.

E. Round Concrete Column Forms:

1. Concrete Column Forms:

    a. Sonotube Concrete Forms.Description: Multiple layers of 100 percent recycled paperboard, spirally wound, and laminated with adhesive.
    b. Interior Surface: Smooth with spiral seam. Alathon release and moisture barrier coating.
    c. Exterior Surface: Micryl moisture barrier coating.
    d. Spiral Mark: Impart visible spiral mark on concrete columns.
    e. Recyclable.
    f. Inside Diameter: As indicated on the drawings, field verified.

2.2 FORMWORK ACCESSORIES

A. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sizes as required of sufficient strength and character to maintain formwork in place while placing concrete.

B. Form Ties:
   1. For Unexposed Concrete: Adjustable length removable or snap off type which will leave holes no larger than 1 inch in diameter in face of concrete and when forms are removed no metal will be within 1 inch of finished concrete surface.
   2. For Exposed Concrete: Ties shall be snap-off type (break point 1 inch or more from surface) with plastic cones added to form a 1-1/4 inch diameter, 1-1/2 inch deep recess around tie, which shall be grouted flush to match adjacent concrete surface.
   3. No wire ties or site fabricated ties permitted.

2.3 FORM COATINGS

A. Form coatings for exposed concrete shall consist of an approved non-staining form oil, lacquer or plastic. Plywood approved for reuse shall be recoated as directed by Engineer. When oil is used, excess shall be wiped off with rags. When lacquer is used, a light coating of form oil over lacquer will be permitted provided excess is wiped off. When factory applied plastic coatings are used, follow manufacturer's instructions. Contact surface of forms shall be free of foreign matter, including dust. Form oil shall be applied to forms before reinforcing is erected. Form oil shall be of type which will not affect bonding of specified exterior finish.

2.4 CONSTRUCTION JOINT MATERIALS

A. Solid Wood Lumber: Spruce-Pine-Fur (SPF) #2 or equivalent.

PART 3 EXECUTION

3.1 PREPARATION

A. Verify lines, levels and centers before proceeding with formwork. Ensure dimensions agree with Drawings.
   1. The Contractor shall be responsible for replacement with 1-1/2” crushed stone, mechanically compacted, of any material necessary to bring the subbase to grade, where the Contractor has undercut the subbase without direction of the Engineer.
   2. For sidewalk, the foundation shall be formed by excavating or filling to the required elevation of the bottom of the concrete. The foundation so constructed shall be thoroughly mechanically compacted to insure stability. The Contractor shall undercut a minimum of two (2) inches below subgrade and back fill with two (2) inches of compacted sand, screenings (limestone or sand) or crushed aggregate base course. Three (3) inches of compacted crushed aggregate base course shall be placed under sidewalk when the centerline grade of the street exceeds 5%. Driveway aprons and curb ramps shall have six (6) inches of compacted crushed aggregate base course. The cost of excavating and compacted select backfill shall be incidental to the item of sidewalk construction.

3.2 COORDINATION

A. Coordinate work of other sections and cooperate with trades involved in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors and other inserts. Do not perform work unless specifically indicated on Drawings or reviewed prior to installation.

3.3 FORMWORK ERECTION

A. 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. Construct forms to sizes, shapes, lines and dimensions shown on Drawings and to obtain accurate alignment, location and grades. Level and plumb work. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide back up at joints to prevent leakage of cement paste.

C. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses and like to prevent swelling and for easy removal.

D. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings on forms at inconspicuous locations.

E. At all exposed corners of concrete walls, beams, columns, slab edges and miscellaneous items not specified or indicated, provide 3/4 inch, 45 degree chamfer.

F. Install ties so portion remaining within concrete after removal is at least 1 inch inside concrete. Remove so surrounding concrete is not disfigured and cleanout hole remains to be patched.

G. Coat contact surfaces of forms with form coating compound before reinforcement is placed.

H. Thin form coating compounds only with thinning agent of type and in amount and under conditions of form coating compound manufacturer's directions. Do not allow excess form coating material to accumulate in forms or to come into contact with concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.

3.4 INSERTS, EMBEDDED PARTS AND OPENINGS

A. Plumbing, Heating and Electrical Items:
   1. Premanufactured items including inserts, sleeves and other embedded items required by mechanical, electrical and plumbing trades shall be supplied, accurately located, and installed by respective trades.
   2. Site fabricated box outs for chases, sleeves and other miscellaneous openings for mechanical, electrical and plumbing trades shall be supplied and installed by Formwork Contractor.
   3. Location of mechanical, electrical and plumbing inserts, embedded parts, openings and recesses shall be coordinated with respective trades by General Contractor.

B. Other Items:

1. Other inserts, embedded parts, box outs for openings, chases, reveals and recesses except those specifically mentioned above by mechanical, electrical or plumbing trades, shall be installed by Formwork Contractor. Special inserts, embedded parts or other special requirements needed by specific trades shall be supplied by that respective trade to Formwork Contractor for installation. General Contractor shall have overall responsibility for coordinating location of inserts, embedded parts, openings and recesses.
2. Install concrete accessories in accordance with manufacturer's recommendations; straight, level and plumb. Ensure items are not disturbed during concrete placement.
3. Set and build into Work, anchorage devices and other embedded items required for other work attached to or supported by cast in place concrete. Use setting drawings, diagrams, instructions and directions provided by suppliers of items to be attached.

3.5 JOINTS AND EDGE FORMS

A. Locate construction joints as shown on Drawings or as approved by Engineer. Form with keyway. Place perpendicular to main reinforcement. Continue reinforcement through joint, except slabs-on-grade, and locate joint so as not to affect structural integrity or appearance of structure. Includes joint between wall and footing.

B. Set edge forms or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in finished slab surface. Provide and secure units of sufficient strength to support types of screeds required. Align concrete surface to elevation of screed strips by use of strike off templates or accepted compacting type screeds.

3.6 CLEANING

A. Clean forms as erection proceeds to remove foreign matter. Remove cuttings, shavings and debris from within forms. Flush with water or use compressed air to remove remaining foreign matter. Ensure water and debris drain to exterior through clean out ports. Retighten forms after concrete placement if required to eliminate mortar leaks.

3.7 FIELD QUALITY CONTROL

A. Inspect and check completed formwork, shoring and bracing to ensure work is in accordance with formwork design and supports, fastenings, wedges, ties and parts are secured.

B. Clean and repair surfaces of forms to be reused in Work. Split, frayed, delaminated or otherwise damaged form facing material will not be acceptable. Apply new form coating compound material to concrete contact form surfaces as specified for new formwork.

C. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joints to avoid offsets. Do not use "patched" forms for exposed concrete surfaces. Do not use metal cover plates for repairing defects in forms for exposed concrete work.

D. Inform Engineer when formwork is complete and has been cleaned to allow for inspection. Obtain review prior to placing concrete.

E. For exposed to view concrete surfaces do not reuse plywood formwork.

F. Allow Engineer to inspect each section of plywood type formwork prior to reuse.

3.8 FORMWORK REMOVAL

A. Notify Engineer and Owner's field representative prior to removing formwork, centering, shoring and reshoring.

B. Remove forms in a manner to insure safety of structure at all times. Where entire structure is supported on shores; beam and girder sides, columns and similar vertical forms may be removed after 48 hours, providing concrete is sufficiently hard not to be injured thereby. In no case shall supporting forms or shoring be removed until members have acquired sufficient strength to support their weight and load safely. Coordinate removal with work of other trades.

C. Remove forms according to ACI 347. However, the following schedule shall govern the minimum waiting period after placing concrete before bottom forms and shores of similar falsework supporting flexural members such as girders, beams, joists, slabs, etc. may be disturbed or stripped:

Structural Members	Waiting Period
Columns, walls and beam sides	2 days
Spans less than 12 foot - slabs and beam bottoms	7 days
Spans between 12 foot and 30 foot slabs and beam bottoms	14 days
Spans greater than 30 foot - slabs and beam bottoms	28 days

D. The above schedule applies to daily curing temperatures above 50 degrees. For lower daily curing temperatures, increase waiting period. In addition to above requirements, do not remove forms until concrete has attained 80 percent of minimum design strength.

E. Re shore removed area before removing additional adjacent formwork.

F. Retain re shores in place for a minimum of 14 days and concrete has attained 100 percent of minimum design strength. Retain re shores in place until concrete construction above has attained sufficient strength to not require shoring below.

END OF SECTION

SECTION 03 20 00
CONCRETE REINFORCING

PART 1 GENERAL

1.1 RELATED WORK

A. Applicable provisions of Division 01 shall govern work of this section.

B. Related work specified elsewhere:

1. Section 03 01 30 - Maintenance of Cast-in-Place Concrete
2. Section 03 30 00 - Cast-in-Place Concrete
3. Section 03 37 13 - Shotcrete

1.2 SUMMARY

A. Include materials, labor, services and incidentals necessary for completion of this Section of Work.

B. Work includes fabrication and placement of reinforcement for cast in place concrete including bars, welded wire fabric, ties, dowels, stirrups, supports and accessories required.

C. Work also includes the addition of supplemental reinforcing to replace bar cross section loss due to corrosion.

1.3 QUALITY ASSURANCE

A. Industry Standards, Specifications and Codes:
1. General:
   a. Comply with provisions of the following codes and standards except as modified herein.
   b. Referenced codes and standards including revisions and commentaries shall be the most currently adopted as of the date of these contract documents.

B. American Concrete Institute (ACI):
1. ACI 301 Specifications for Structural Concrete for Buildings
2. ACI 318 Building Code Requirements for Structural Concrete
3. ACI 315 Details and Detailing of Concrete Reinforcement

C. Concrete Reinforcing Steel Institute (CRSI):
1. Manual of Standard Practice
2. Recommended Practice for Placing Reinforcing Bars

D. American Society for Testing and Materials (ASTM):
1. Specific ASTM numbers are noted in later text.

1.4 QUALIFICATIONS

A. Acceptable Manufacturers:
1. Shall be regularly engaged in the manufacture of steel bar, welded wire fabric reinforcing and mechanical splicing devices.

B. Installer Qualifications:

1. Shall have three (3) years' experience in installation of steel bar and welded wire fabric reinforcing.

C. Source Quality Control:
   1. Mill test certificates identifying chemical and physical analysis of each load of reinforcing steel delivered if requested.

1.5 SUBMITTALS

A. Submit in accordance with Division 01 requirements.

B. Steel Properties:
   1. Submit certification of grade, chemical analysis and tensile properties of steel furnished if requested.

PART 2 PRODUCTS

2.1 REINFORCING STEEL

A. Reinforcing Bars:
   1. Conform to ASTM A 615 "Standard Specification for Deformed and Plain Billet Steel Bars for Concrete Reinforcement".
   2. Reinforcing bars shall be deformed, except that plain bars may be used for spirals.
   3. Main reinforcing bars and other bars not listed above shall be Grade 60, unless noted otherwise on Contract Documents.

B. Welded Wire Fabric:
   1. Conform to ASTM A 185 "Standard Specification for Welded Steel Wire Fabric, Plain for Concrete Reinforcement".
   2. Welded wire fabric shall be electrically welded and 65,000 psi yield strength.

2.2 ACCESSORIES

A. Supports for Reinforcement:
   1. Provide supports for reinforcement including bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcement in place.
   2. Use wire bar type supports complying with CRSI recommendations unless otherwise indicated. Do not use wood, brick and other unacceptable materials, e.g., mortar blocks, coarse aggregates.
   3. For exposed to view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are plastic protected. For sandblasted or bush hammered concrete provide stainless steel protected or special stainless bar supports.
   4. In areas of concrete removal, short lengths of reinforcing bar shall be used to provide support for bars on chipped or rough concrete surfaces using similar spacing of supports.

2.3 FABRICATION

A. Shop fabricate reinforcing bars to conform to required shapes and dimensions. In case of fabricating errors, do not re bend or straighten reinforcement in a manner that will injure or weaken materials.

B. Reinforcement shall be bent cold unless otherwise permitted by Engineer.

C. Unacceptable Materials:
   1. Reinforcement with any of the following defects will not be permitted in Work:

a. Bar lengths, depths and bends exceeding specified fabrication tolerances.
b. Bends or kinks not indicated on Drawings or final Shop Drawings.
c. Bars with reduced cross section due to excessive rusting or other cause.

2.4 PRODUCT DELIVERY, STORAGE AND HANDLING

A. General:
1. Deliver reinforcement to project site in bundles marked with metal tags indicating bar size, lengths and other information corresponding to markings shown on placement drawings.
2. Handle and store materials to prevent dirt or excessive rust.

PART 3 EXECUTION

3.1 INSPECTION

A. Examine formwork and other conditions under which concrete reinforcement is to be placed and notify Formwork Contractor of unsatisfactory conditions. Do not proceed with work until unsatisfactory conditions have been corrected in a manner to your satisfaction.

3.2 PLACEMENT

A. Comply with specified codes and standards and CRSI "Recommended Practice for Placing Reinforcing Bars" for details and methods of reinforcement placement and supports and as specified.

B. Clean reinforcement to remove loose rust and mill scale, earth, ice and other materials which reduce or impair bond with concrete.

C. 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.

D. Place reinforcement to obtain coverage for concrete protection as indicated on Contract Documents. Arrange, space and securely tie bars and bar supports together with 16 gage wire to hold reinforcement accurately in position during concrete placement operations. Set wire ties so ends are directly away from exposed concrete surfaces.

E. Exposed or additional reinforcing shall be no closer than 3/4 inch measured radially from existing concrete. Elevation of exposed or additional reinforcing shall be maintained at original height.

F. At openings in structural slabs, provide two #4 bars top and bottom of slab at 45 degrees on all 4 corners, each bar 48 inch minimum length.

G. At openings in concrete slabs additionally provide a minimum of two #5 bars around opening.

H. Provide two #4 bars 3 inches apart on 4 sides of floor drains in slabs.

I. Unless permitted by Engineer, reinforcing shall not be bent after being embedded in hardened concrete.

J. Welded wire fabric shall lap one full mesh at side and end laps and must be wired together.

K. Provide sufficient number of supports and sizes as required to carry reinforcement. Maximum spacing of chairs is 48 inches on center. Do not place reinforcing bars more than 2 inches beyond the last leg of any continuous bar support. Do not use supports as bases for runways for concrete conveying equipment and similar construction loads.

3.3 WELDING OF REINFORCEMENT

A. Welding of reinforcement covered by this Section is prohibited.

3.4 FIELD QUALITY CONTROL

A. Notify Engineer when reinforcing is in place so he or she may review reinforcing placement. Engineer shall have a minimum of 24 hour notice prior to placement of concrete.

B. Tend to reinforcing at all times during concrete placement and make necessary adjustments to reinforcing which has been dislodged by concrete placement or workmen.

C. Bar Placement Tolerances:
   1. 1/4 inch (plus/minus) between bars
   2. 1/4 inch (plus/minus) vertically for members 8 inches deep or less
   3. 1/2 inch (plus/minus) vertically for members over 8inches deep and less than 2 feet deep
   4. 1 inch (plus/minus) vertically for members 2 feet or deeper

END OF SECTION

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 RELATED WORK

A. Applicable provisions of Division 01 shall govern work of this section.

B. Related work specified elsewhere:

1. Section 03 01 30 - Maintenance of Cast-in-Place Concrete
2. Section 03 11 15 - Shoring
3. Section 03 12 00 - Concrete Formwork
4. Section 03 20 00 - Concrete Reinforcing
5. Section 03 37 13 - Shotcrete

1.2 WORK INCLUDED

A. Include materials, labor, services, and incidentals necessary for completion of this section of Work.

B. Extent of cast in place concrete work is shown on Drawings.

C. Notify other trades of the date for concrete placement in ample time for each to install their own work.

D. Install anchor bolts, embedded plates, inserts and similar items furnished by other trades.

1.3 NOTIFICATION

A. Contractor shall notify the inspection/testing agency and Engineer at least 24 hours prior to major concrete pour.

1.4 PROTECTION OF ADJACENT WORK

A. Contractor shall be responsible to see that due care is exercised to avoid staining adjacent finished material during concrete work. Contractor, without expense, shall make such damage good to Owner.

1.5 QUALITY ASSURANCES

A. Industry Standards, Specifications and Codes:

1. General:
   a. Comply with provisions of the following codes and standards except as modified herein.
   b. Referenced codes and standards including revisions and commentaries shall be the most currently adopted as of the date of these Contract Documents.
2. American Concrete Institute (ACI):
   a. ACI 117 Standard Specifications for Tolerances for Concrete Construction and Materials
   b. ACI 301 Specifications for Structural Concrete
   c. Additional ACI sections are noted in later text.

B. American Society For Testing And Materials (ASTM):
   1. Specific ASTM standards are noted in later text.

1.6 ALLOWABLE TOLERANCES

A. Flatwork tolerance for random-traffic floors should be measured in accordance with ASTM E 1155.

B. Floor tolerance measurements shall be made within 16 hours after completion of final troweling operation, and where applicable, before removal of supporting shores.

C. Floor slabs shall conform to the following ACI F-number requirements:
   1. Slab-On-Grade and Level Suspended Slabs Shored Until After Testing:
      a. Specified Overall Values - FF30/FL20
      b. Minimum Local Values - FF15/FL10
   2. Unlevel Shored Suspended Slabs and Unshored Suspended Slabs:
      a. Specified Overall Value - FF25
      b. Minimum Local Value - FF15

D. See ACI 117 for other tolerances not stated herein.

1.7 SUBMITTALS

A. Submit in accordance with Division 01 requirements.

B. Mix Designs:
   1. Prepare design mixtures for each class of concrete on the basis of laboratory trial mixtures or field test data, or both in accordance with ACI 301. Design mixtures shall meet the requirements listed in Table 33000-1. Submit material content per cubic yard of each class of concrete furnished including:
   2. Weight of cementitious materials.
   3. Saturated surface dried weights of fine and coarse aggregates.
   4. Quantities, type and name of admixtures.
   5. Weight of mixing water or water/cementious material ratio.

C. Submit to Engineer mix designs, certification that materials used in concrete mixtures meet ASTM and other applicable specifications, and documentation indicating proposed concrete proportions will produce an average compressive strength equal to or greater than the required compressive strength as specified in ACI 301. Obtain approval prior to placing concrete.

D. Test Reports:
   1. Submit reports of concrete testing including, compressive strength, density (unit weight), air content, temperature and slump. Furnish copies to General Contractor, Consulting Engineer, Concrete Supplier and Owner Representative. Test results shall be reported in writing within 2 days that tests are made.

PART 2 PRODUCTS

2.1 MATERIALS

A. Hydraulic Cement:
   1. For normal concrete, hydraulic cement shall meet requirements of ASTM C 150, ASTM C 595, or ASTM C 1157.

2. For air entrained concrete, cement shall meet requirements of ASTM C 150 cement specified for normal concrete used with an air entraining admixture conforming to ASTM C 260.

B. Slag Cement:
   1. Slag cement shall meet requirements of ASTM C 989.

C. Silica Fume Cement:
   1. Silica fume shall meet the requirements of ASTM C 1240.

D. Fly ash:
   1. Fly ash shall meet the requirements of ASTM C 618.

E. Aggregates:
   1. Normal weight aggregate shall comply with requirements of ASTM C 33. Lightweight aggregates shall comply with requirements of ASTM C 330.

F. Water:
   1. Water used for batching concrete shall meet the requirements of ASTM C 1602.

2.2 ADMIXTURES

A. No other admixtures will be allowed except those listed without Engineer's approval.

B. Air Entraining:
   1. Shall Conform to ASTM C 260, certified by the manufacturer to be compatible with other required admixtures. The Entrained air content shall be controlled at 6½ percent for ¾" aggregate concrete and 5½ percent for 1½" aggregate concrete within limits of plus or minus 1½ percent each.
   2. Products: Subject to compliance with requirements, provide one of the following:
      a. "Darex II" – W.R. Grace, www.na.graceconstruction.com
      b. "AEA 92S" – The Euclid Chemical Company, www.euclidchemical.com
      c. "Catexol AE 260" – Axim Concrete Technologies, www.aximconcrete.com
      d. "Micro-Air" – BASF Admixtures, Inc., www.basfadmixtures.com
      e. "MB AE 90" – BASF Admixtures, Inc.

C. Water Reducing:
   1. Shall conform to ASTM C 494, Type A
   2. Products: Subject to compliance with requirements, provide one of the following:
      a. "WRDA 82" – W.R. Grace
      b. "Eucon WR-91" – The Euclid Chemical Company
      c. "Catexol 1000N" – Axim Concrete Technologies
      d. "Pozzolith 200N" – BASF Admixtures, Inc.

D. Mid-Range Water Reducing:
   1. Shall conform to ASTM C 494, Type A or Type F
   2. Products: Subject to compliance with requirements, provide one of the following:
      a. "Daracem 65" – W.R. Grace
      b. "Eucon MR" - The Euclid Chemical Company
      c. "Catexol 3500N" – Axim Concrete Technologies
      d. "Polyheed 997" - BASF Admixtures, Inc.

E. High-Range Water Reducing (Super Plasticizer):
   1. Shall conform to ASTM C 494, Type F or Type G.

2. Products: Subject to compliance with requirements, provide one of the following:
    a. "Daracem 19" - W.R. Grace & Co.
    b. "ADVA 100" - W.R. Grace & Co.
    c. "Eucon 37" - The Euclid Chemical Company
    d. "Catexol 1000SP-MN" – Axim Concrete Technologies
    e. "Rheobuild 1000" - BASF Admixtures, Inc.

F. Water Reducing, Non-Chloride Accelerator:
    1. Shall conform to ASTM C 494, Type C or Type E.
    2. Products: Subject to compliance with requirements, provide one of the following:
        a. "Polarset" - W.R. Grace & Co.
        b. "Accelguard 90" - The Euclid Chemical Company
        c. "Catexol 2000RHE" – Axim Concrete Technologies
        d. "Pozzutec 20" - BASF Admixtures, Inc.

G. Water Reducing, Retarding:
    1. Shall conform to ASTM C 494, Type D.
    2. Products: Subject to compliance with requirements, provide one of the following:
        a. "Daratard 17" - W.R. Grace & Co.
        b. "Eucon Retarder 100" - The Euclid Chemical Company
        c. "Catexol 1000R" – Axim Concrete Technologies
        d. "Pozzolith 100XR" - BASF Admixtures, Inc.
    3. Grace or Rheocrete CNI by BASF Admixtures, Inc.
    4. Admixtures shall not contain calcium chloride as an intentionally added ingredient. Calcium chloride as an admixture is not permitted. Admixtures containing more than ½ of 1 percent (0.5 percent) chloride ions by weight of admixture are not permitted.

2.3 RELATED MATERIALS

A. Evaporation Retardant and Finishing Aid: Shall be “Eucobar” by The Euclid Chemical Company or “MasterKure ER 50” by BASF Admixtures, Inc.

B. Slab-On-Grade Poly Fiber Reinforcement Systems:
    1. Synthetic Structural Fiber Reinforcement: Provide synthetic structural fibers complying with the following requirements:
        a. Synthetic structural fibers shall meet requirements of ASTM C 1116, Paragraph 4.1.3, Type III.
        b. Synthetic structural fibers shall be monofilament, made of polypropylene or polypropylene/polyethylene blend.
        c. Synthetic structural fibers shall have a minimum length of 1.38 inches (35 mm) and a maximum length of 2.00 inches (51 mm).
        d. Specific gravity between 0.90 and 0.95
        e. Synthetic structural fibers shall have an aspect ratio (length divided by equivalent diameter of fiber) between 60 and 100.
        f. Dosage rate:
            1 5.0 lbs/cubic yard or the addition rate to achieve the concrete required minimum equivalent flexural strength, fe3 of 165 psi for a concrete with a compressive strength of 4,000 psi at 28 days. This shall be determined from the manufacturer’s test data verifying fiber performance in concrete based on ASTM C1609-05, utilizing the beam size 6” x 6”x 20” (fe3) calculated using JCI-SF4 method.

g. Synthetic structural fibers shall be:
    1 Grace STRUXÒ 90/40 synthetic fiber
    2 NovomeshÒ 950 synthetic fiber by Propex Concrete Systems
    3 Tuf-Strand SF by Euclid Chemical Company

C. Absorptive Cover: Burlap cloth made from jute or Kenaf, weighing approximately 9 ounces per square yard, complying with AASHTO M182, Class 2.

D. Moisture-Retaining Cover: One of the following, complying with ASTM C 171, Type 1 or 2:
1. Polyethylene Film
2. Polyethylene Coated Burlap

E. Liquid Membrane-Forming Curing Compound: Liquid type membrane-forming curing compound complying with ASTM C 1315 “Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete”, Type I, Class A unless other type acceptable to Architect. Moisture loss not more than 0.040 gr./square cm. In 72 hours when applied at 300 sq. ft./gal. Material must be compatible with resilient flooring and carpeting adhesives. Concrete contractor shall verify compatibility before applying curing compound.
1. Products: Subject to compliance with requirements, provide one of the following:
    a. "Diamond Clear” by The Euclid Chemical Company
    b. "MasterKure CC 250 SB" by BASF
    c. "TK AS-1, 1315” by TK Products, Inc.
    d. "Cure and Seal" - Symons Corp.

F. Isolation Joint Filler: Shall be bituminous (1/2 inch and ¼ inch thicknesses) conforming to ASTM D 994.

G. Control Joint Insert: Shall be hardboard or fiberboard.

H. Expansion Joint Filler: Shall be extruded polystyrene.

I. Rebar Coating
    a. “MasterEmaco P 124” by BASF
    b. “Sika Armatec 110 EpoCem” by Sika
    c. “Duralprep AC,
    d. The Euclid Chemical Company.
    e. Or approved equal

2.4 READY MIXED CONCRETE

A. Ready mixed concrete shall be measured, mixed and delivered according to ASTM C94, except as modified herein.

B. Prepare design mixtures for each class of concrete on the basis of laboratory trial mixtures or field test data, or both in accordance with ACI 301. Design mixtures shall meet the requirements listed in Table 33000-1

C. Addition of water is permitted for batches of material with insufficient slump at the job site but is limited to the lesser of; 1 gallon per cubic yard or the quantity of water indicated on the delivery ticket such that the mixing water content on approved mix design is not exceeded.

D. Ready Mixed Concrete Delivery Tickets:

1. Furnish 2 delivery tickets with each batch of concrete before unloading at site; 1 for Contractor and 1 for Engineer on which is printed, stamped or written the following information:
    a. Name of ready mix batch plant
    b. Serial number of ticket
    c. Date and truck number
    d. Name of Contractor
    e. Job name and location
    f. Specific class or designation of concrete
    g. Amount of concrete (cubic yards)
    h. Time loaded or of first mixing of cement and aggregates
    i. Type, name and amount of admixture
    j. Type, brand and amount of cement
    k. Total water content by producer (or W/C ratio)
    l. Maximum size of aggregate
    m. Weights of fine and course aggregates

E. Mix Proportioning:
    1. Minimum amount of cementitious material identified in the following mix proportions shall apply for mixes for which field experience or trial mixture information required is not provided.

Table 03 30 00 - 1

Class	Type of Construction	Specified Comp. Strength @ 28 Days (PSI)	Max. Agg. Size (In.)	Air Entrain-ment % +/- 1½%	Notes
1	Slab Replacement, overlay	4000	0.75	6.0	(1)(2)(3)(4)
2	Concrete Columns, Piers	4000	0.75	6.0	(1)(2)(3)
3	Grout			(5)	

Notes:

a. Maximum water-cementitious ratio by weight shall be 0.45.

b. A maximum of 30 percent total replacement of Portland cement with GGBFS (Ground Granulated Blast-Furnace Slag) and fly ash at a 1:1 ratio; up to 350 pounds, with a maximum 25 percent fly ash. If fly ash is used alone, limit maximum replacement to 25 percent.

c. Corrosion inhibitor.

d. Slump shall be such that the finished surface follows that of the existing inclined ramps with no sagging or bulging due to gravity on the plastic mix.

e. Grout for bonding replacement concrete to existing concrete. Grout shall consist of equal parts by weight of cement and sand. It shall be mixed with sufficient water to form a stiff slurry. The consistency of this slurry shall be such that it can be applied with a stiff brush or broom to the old concrete in a thin, even coating that will not run or puddle in low spots. For use on vertical joints, this grout shall be thinned to paint consistency.

PART 3 EXECUTION

3.1 GENERAL

A. Clean all mixing and transportation equipment. Wet forms and exposed concrete surfaces thoroughly. Remove all ice, excess water, mud and other debris from within forms and from restoration surfaces and reinforcement. Notify Engineer prior to placing in ample time for inspection of forms, exposed concrete surfaces and reinforcing.

B. A pre-construction meeting shall take place prior to placing concrete. Topic of discussion shall include: concrete handling, placing, finishing and curing.

3.2 PLACEMENT OF CONCRETE

A. Pre Placement Inspection:
   1. Before placing concrete, inspect and complete formwork installation, reinforcing steel and items to be embedded or cast in-place. Notify other Contractors to permit installation of their work; cooperate with other trades in setting such work as required. Thoroughly wet wood forms immediately before placing concrete as required where form coatings are not used. Notify inspection agency and Engineer 24 hours in advance of pouring.

B. Placing Concrete In Forms:
   1. Deposit concrete in forms in horizontal layers not deeper than 18 inches and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.
   2. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause formation of seams or planes of weakness within the section. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete as nearly as practicable to its final location to avoid segregation due to rehandling or flowing.
   3. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand spading, rodding or tamping. Use vibrators designed to operate with vibratory element submerged in concrete, maintaining a speed of not less than 6000 impulses per minute. Alternate methods of consolidating concrete including the use of self-consolidating concrete may be submitted to the Engineer for approval.
   4. Do not use vibrators to move concrete inside of forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix.

C. Placing Concrete Slabs:

1. Deposit and consolidate concrete slabs in a continuous operation until placing of a panel or section is completed.
2. Place suspended slabs in sections as large as practicable to complete finishing, within limits acceptable to Engineer.
3. Consult with Engineer with regard to limits of single placements prior to commencing work.
4. Consolidate concrete during placing operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
5. Bring slab surfaces to correct level with a straightedge and strikeoff. Use bull floats or darbies to smooth surface, leaving it free of humps or hollows. Do not sprinkle water on plastic concrete surface. Do not disturb slab surfaces prior to beginning finishing operations. "Wet Screed" placement of slabs is not allowed.
6. Maintain reinforcing in the proper position during concrete placement operations.

D. Placing Concrete Curb and Gutter
1. Wherever directed by the engineer, driveway gutters shall be built instead of regular curb and gutters.
2. Unless otherwise specified, curb and gutter shall be installed in minimum lengths of six (6) feet and maximum lengths of fifteen (15) feet.
3. The Contractor shall install a header at the end of each pour. At no time shall the contractor be allowed to spread excess concrete as a base for the next or any succeeding pour.
4. Whenever different types of curb and gutter are employed, the Contractor shall take care that transitions from one type of curb and gutter to another type are done smoothly without loss of flow line grade or curb head shape.
5. The reconnection of existing drains from adjacent properties to the curb and gutter shall be incidental to concrete curb and gutter.
6. The slope of the curb and gutter shall not exceed 1" in 12" thru handicap accessible ramps.

E. Placing Sidewalk
1. The sidewalk shall then be given a brush or corrugated finish as the Engineer directs. Sidewalk ramps shall be given surface texturing as shown on Standard Plate for Madison Standard Sidewalk Ramps as the Engineer directs.
2. The Contractor shall install a header at the end of each pour. At no time shall the contractor be allowed to spread excess concrete as a base for the next or any succeeding pour. Minimum length blocks of four (4) feet six (6) inches may be poured only at the end of a day's pour and then only with permission of the engineer.

F. Cold Weather Placing:
1. Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions or low temperatures in compliance with ACI 301.
2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt or other materials containing anti freeze agents or chemical accelerators other than approved, non-chloride accelerating admixtures.
4. Do not allow carbon dioxide from heating units to contact freshly placed concrete surfaces for 48 hours. Vent heaters outside of enclosure.

G. Hot Weather Placing:
1. When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 301.
2. Wet forms thoroughly before placing concrete.

3. Do not use retarding admixtures without the written permission of the Engineer.

3.3 CONCRETE JOINTS

A. Construction Joints:
   1. Locate as directed by Engineer or as shown on Drawings. Form keyway. Place perpendicular to main reinforcement. Continue reinforcement through joint. Locate joint so as not to affect structural integrity or appearance of the structure. Includes joint between wall and footing.

B. Isolation Joints:
   1. Form with keyway with bituminous (preformed filler, 1/4 inch or 1/2 inch as called for) thick full depth of slab-on-grade. Reinforcement is non-continu¬ous. Locate at points of contact between slab-on-grade and vertical structural concrete.

C. Control Joints:
   1. Locate on grid lines or on lines as shown on Drawings or as directed by Engineer. Joint size shall be 1/4 inch wide by 1/5 to 1/4 of slab depth. Continue reinforcement through joint. Contrac¬tor's option to tool or use inserts. Do not tool joints in slabs to receive a finished flooring material. Control joints should be made within first 24 hours of concrete pour.
      a. Curb and Gutter
         1 Full contraction joints shall be a minimum of three (3) inches in depth, and shall be uniformly spaced not less than six (6) feet nor more than fifteen (15) feet apart unless otherwise directed by the Engineer.
         2 If machine methods are used for forming and finishing curb and gutter the Contractor may saw contraction joints or planes of weakness may be created by the insertion of approved partial depth separator plates having a minimum depth of three (3) inches. The depth of cut and equipment used in sawing shall meet the approval of the Engineer. The sawing shall be done as soon as practicable after the concrete has set sufficiently to preclude raveling during the sawing and before any shrinkage cracking takes place in the concrete. If this method results in random cracking the Contractor shall be required to use the partial depth separator plates.
         3 Transverse expansion joints shall be one-half (1/2) inch in width and shall be placed across the curb and gutter perpendicular to the curb line at all radius points of curves having a radius of two hundred (200) feet or less, and on both sides of all inlets installed in curb and gutter. All expansion joints shall extend through the entire thickness of the curb and gutter and shall be perpendicular to the surface. All expansion joints shall be formed by inserting during construction, and leaving in place, the required thickness of joint filler which shall extend through the entire thickness of both curb and gutter.
         4 Where curb and gutter and concrete sidewalk or concrete driveways join, and expansion joint one (1) inch in width must be constructed between walks and curb.
         5 The joint filler in transverse joints shall be flush with the finished surface of the gutter. The concrete adjacent to these joints shall be finished with a wooden flat which is divided through the center and which will permit finishing on both sides of the filler at the same time. Before the curb and gutter is opened to traffic, excess joint filler shall be cut off level with the finished surface.
      b. Sidewalk

1. Transverse joints shall be constructed at right angles to the center line of the sidewalk, and longitudinal joints shall be constructed parallel to the center line of the walk, unless otherwise provided. The joints shall be constructed as laid out in the field by the Engineer. Whenever the entire area between the back of the curb and the right-of-way or lot line is to be covered with concrete sidewalk and when a permanent structure is located within such area or on the right-of-way or lot line, such sidewalk shall be constructed in alternate sections extending from the back of the curb to the permanent structure, and such sections shall not exceed twelve (12) linear feet of sidewalk length. When the alternate sections placed in the first operation have been cured as specified, the intervening sections shall be placed to complete the walk.
2. When the sidewalk is constructed in partial width slabs, transverse joints in adjacent slabs shall be placed in line with like joints in the previously constructed slabs. In the case of widening existing sidewalks, transverse joints shall be placed in line with like joints in the existing sidewalk.
3. Insofar as feasible large sidewalk slabs shall be divided into sections not less than five (5) feet nor more than twelve (12) feet in any dimension. The unit areas shall be produced by use of metal slab division forms extending to the full depth of the concrete, or, when so approved by the Engineer, by contraction joints, as defined hereinafter.
4. Whenever the concrete walk abuts on or is adjacent to buildings, walls, ramps, steps, castings, sidewalks, or other structures, one-half (1/2) inch expansion joint filler shall be placed. Whenever the walk abuts on or is adjacent to the curb, one (1) inch expansion joint filler shall be placed between the curb and the sidewalk. Sidewalk ramps and driveways shall have one-half (1/2) inch expansion joint filler installed between the sidewalk ramp or driveway and the City sidewalk, and one (1) inch expansion joint filler installed between the sidewalk ramp or driveway and the curb. At intervals at approximately fifty (50) feet on continuous sidewalk construction and at the ends of all radii, one-half (1/2) inch expansion joint filler shall be placed. Where the sidewalk extends from buildings to curbs, expansion joints shall be located not more than thirty (30) feet apart.
5. Joints shall not be sealed, unless otherwise specified.
6. Where the concrete walk abuts the buildings, walls, other pavement or as directed by the engineer in placing exposed aggregate sidewalk the material shall be left 1/2” below the surface and shall extend to the bottom of the concrete. A removable plastic strip, flush with the surface of the concrete, shall be placed over the foam or sponge rubber material while the concrete is being poured and cured.
7. The Contractor shall place a troweled joint at standard back edge of sidewalk where sidewalk extends to meet buildings.
8. Expansion joint material shall be non-staining and compatible with the sealant and of resilient nature such as closed cell resilient foam or sponge rubber. Materials impregnated with oil, bitumen or similar materials shall not be used.

3.4 FINISHING

A. General:

1. Strike and level concrete. Allow to set before floating. Power float on disappearance of water sheen. Hand float areas inaccessible to power float. Applicable to flat work to obtain smooth, uniform, granular texture. Floors shall be flat and level within tolerances given in Part 1, except where drains occur or sloped floors are indicated, in which case tolerance applies to planes indicated.

B. Troweled Finish:
   1. Power trowel to smooth finish. Hand trowel areas inaccessible to power trowel. Applicable to flatwork to receive finished flooring material.

C. Broom Finish:
   1. Draw broom across surface after floating to form a regular, parallel pattern. Applicable to parking ramps, drives, ramps and stairs. Direction of brooming shall be perpendicular to traffic pattern.

D. Formed Concrete:
   1. Top of concrete: Strike concrete smooth then float and trowel surface to texture comparable to formed surface.
   2. Formed Surface: As cast finish, patch holes and defects after form removal. Remove fins.
   3. Rubbed Surface: Rub with rubbing stone to remove all projections and round corners. Wet surface and brush evenly with cement grout mixture. Provide rubbed concrete surfaces in finished areas to be left to view in stairwells, where concrete is exposed to view in a finished area and wherever else a rubbed surface is called for on architectural plans.
   4. Slope exterior steps down 1/8 inch.

3.5 CURING

A. Comply with ACI 301.

B. Class B Concrete Curing:
   1. Concrete items listed below shall be sheet cured per ACI 308 2.3.1 Plastic Film or 2.3.2 Reinforced Paper only, for 7 days after placement. Curing system joints shall be sealed and moisture added daily to maintain concrete surface in a damp condition. Insulating blankets used during cold weather do not need sealed joints as long as concrete surface is damp.

C. Formed Surfaces:
   1. Cure formed concrete surfaces including walls, columns, underside of beams, supported slabs and other similar surfaces by moist curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by membrane curing.

D. Protection:
   1. Protect concrete from damaging mechanical disturbances including load stresses, heavy shock, excessive vibration, and from damage caused by rain or flowing water. Protect finished concrete surfaces from damage by subsequent construction operations.

3.6 CONCRETE REPAIR PROCEDURES

A. Concrete Surface Repairs:
   1. Comply with ACI 301 “Specifications for Structural Concrete”.
   2. Remove and replace, at no additional cost, concrete not formed as shown on Drawings, concrete out of alignment, surfaces beyond required tolerances or defective surfaces which cannot be properly repaired or patched, including concrete failing to meet strength requirements as determined by testing laboratory.

3. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to Architect. Cut out honeycomb, rock pockets, voids over 1/4 inch in any dimension, and holes left by tie rods and bolts, down to solid concrete but, in no case to a depth of less than 1 inch. Make edges of cuts perpendicular to concrete surface. Thoroughly clean, dampen with water and brush coat area to be patched with specified bonding agent. Place patching mortar after bonding compound has dried.
4. For exposed to view surfaces, blend white Portland cement and standard Portland cement so that, when dry, patching mortar will match color surrounding. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.
5. Repair of Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Architect. Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets, fins and other projections on surface and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes, fill with dry pack mortar or precast cement cone plugs secured in place with bonding agent.
6. Repair concealed formed surfaces, where possible, that contain defects that affect durability of concrete. If defects cannot be repaired, remove and replace concrete.
7. Repair of Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as specified. Test unformed surfaces sloped to drain for trueness of slope, in addition to smoothness, using a template having required slope.
8. Repair finished unformed surfaces that contain defects that affect durability of concrete. Surface defects, include crazing, cracks in excess of 0.01 inch wide or which penetrate to reinforcement or completely through non-reinforced sections regardless of width, spalling, popouts, honeycomb, rock pockets and other objectionable conditions.
9. Correct high areas in unformed surfaces by grinding, after concrete has cured at least 14 days.
10. Correct low areas in unformed surfaces during or immediately after completion of surface finishing operations by cutting out low areas and replacing with fresh concrete. Finish repaired areas to blend into adjacent concrete. Proprietary leveling compounds may be used when acceptable to Architect.
11. Repair defective areas, except random cracks and single holes not exceeding 1 inch diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least 3/4 inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
12. Repair isolated random cracks and single holes not over 1 inch in diameter by dry-pack method. Groove top of cracks and cut out holes to sound concrete and clean of dust, dirt and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Mix dry-pack, consisting of 1 part Portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing. Place dry-pack after bonding compound has dried. Compact dry-pack mixture in place and finish to match adjacent concrete. Keep patched area continuously moist for not less than 72 hours.

13. Do not use repair methods not specified above and do not perform structural repairs, except with prior written approval of Architect for method and procedure, using specified epoxy adhesive mortar.

3.7 QUALITY CONTROL TESTING DURING CONSTRUCTION

A. General:
   1. Sample fresh concrete to conform to ASTM C 172.

B. Aggregate Tests:
   1. Chloride content in aggregate shall be tested in accordance with ASTM D 1411. Tests shall be made and results must be approved by Engineer before the aggregate is used in concrete.

C. Slump:
   1. In accordance with ASTM C 143. One slump test at point of discharge from ready mix truck for each set of test cylinders taken, unless noted otherwise, with additional tests when concrete consistency seems to have changed. Slump tests, when taken, shall be conducted after site addition of superplasticizer, however a visual estimate of slump shall be recorded prior to site addition of superplasticizer to a mix. Visual slump should only be used after correlation has been established with actual slump tests.

D. Air Content:
   1. Only for air entrained concrete, in accordance with ASTM C 231 pressure method for normal weight concrete and ASTM C 173 for lightweight concrete. One air content test for each set of strength test cylinders made unless noted otherwise. If measured air content falls outside limits specified, a check test shall be made immediately on another portion of the same sample. In the event of a second failure, concrete will be considered to have failed to comply with Specifications. In compliance with ASTM C 94, site addition of additional air entrainment admixture is permissible until plant adjustments have been made. For site added superplasticizer, air should only be checked after the addition of superplasticizer.

E. Concrete Temperature:
   1. In accordance with ASTM C 1064 each time a set of compression test specimen is made.

F. Strength Tests:
   1. Strength test for any class of concrete shall consist of 4 standard cylinders made from a composite sample secured from a single load of concrete in accordance with ASTM C 172, except when in the opinion of the Engineer, he may require additional specimens.
   2. All Concrete:
      a. Make test cylinders in accordance with ASTM C 31. Each test shall consist of a minimum of 4 cylinders.
      b. After 24 hours, 3 cylinders to be carefully transported to testing laboratory for moist curing.
      c. 1 laboratory cured cylinder to be tested at 7 days and 2 laboratory cured cylinders to be tested at 28 days, the fourth cylinder shall be held.
   3. Test results at 28 days shall be the average strength of specimens determined in accordance with ASTM C 39.
   4. Strength test shall be made for each truck.
   5. Strength of each concrete class shall be deemed satisfactory when both of the following criteria are met:

a. The average of three consecutive compressive-strength tests equals or exceeds specified compressive strength.
b. Any individual compressive-strength test result does not fall below specified compressive strength by more than 500 psi.

6. Testing shall be performed in compliance with Division 01 provisions by an approved testing laboratory at Owner's expense, which shall submit complete reports of tests to General Contractor, Concrete Supplier, Engineer and Owner's representative. Reports of compressive strength tests shall contain project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials, weather at time of placement and compressive breaking strength and type of break. An individual having ACI Level 1 Technician certification shall complete testing, including test cylinder production. Site protection of test cylinders shall be made in compliance with ASTM C 31.
7. If Engineer has reason to believe cylinder strength tests are not representative of strength of concrete in place, he shall require drilled cores to be cut and tested at Contractor's expense. Coring and testing shall be in accordance with ASTM C 42 “Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete”. Acceptance or rejection of concrete shall be based on cylinders made from concrete sampled at point of discharge. Impact hammer, sonoscope or other nondestructive device may be permitted, but shall not be used as the sole basis for acceptance or rejection.
8. Extent of Testing:
   a. Class A: Trucks shall be tested for air content and slump at truck during discharge. After a consistent slump has been established, alternate slump tests may be a visual estimate. Test reports shall be sent to A/E immediately upon completion.

END OF SECTION

SECTION 03 37 13
SHOTCRETE

PART 1 GENERAL

1.1 RELATED WORK

A. Applicable provisions of Division 01 shall govern work of this section.

B. The word "Shotcrete" used in this specification shall mean the wet mix process as described in ACI 506R.

C. Related work specified elsewhere:

1. Section 02 41 17 - Removal of Existing Concrete and Surface Preparation
2. Section 03 01 30 - Maintenance of Cast-in-Place Concrete
3. Section 03 30 00 - Cast-in-Place Concrete

1.2 SUMMARY

A. Include all materials, labor, services and incidentals necessary for the completion of this section of the work.

B. Furnish the necessary equipment and materials to apply shotcrete patches on the underside of the parking structure slab, columns or beams.

1.3 REFERENCES

A. INDUSTRY STANDARDS, SPECIFICATIONS AND CODES

B. GENERAL
1. Comply with all provisions of the following codes and standards except as modified herein.
2. All referenced codes and standards including all revisions and commentaries shall be the most currently adopted as of the date of these contract documents.

C. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)
1. ASTM C-33 Specification for Concrete Aggregate
2. ASTM C-39 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
3. ASTM C-42 Standard Method of Obtaining and Testing Drilled Cored and Sawed Beams of Concrete
4. ASTM C-150 Specification for Portland Cement
5. ASTM C-260 Standard Specification for Air Entrained Admixtures for Concrete
6. ASTM C-309 Standard Specification for Liquid Membrane - Forming Compounds for Curing Concrete
7. ASTM E-329 Specification for Inspection and Testing Agencies for Concrete, Steel and Bituminous Materials as used in Construction
8. Additional ASTM numbers are noted in later text.

D. AMERICAN CONCRETE INSTITUTE (ACI)
1. ACI 301 Specification for Structural Concrete in Buildings
2. ACI 305 Recommended Practice for Hot Weather Concreting
3. ACI 306 Recommended Practice for Cold Weather Concreting

4. ACI 318 Building Code Requirements for Reinforced Concrete
5. ACI 506 Guide to Shotcrete
6. ACI 506.2 Specification for Materials, Proportioning and Application of Shotcrete
7. Field Guide to Concrete Repair Application Procedures:
8. RAP Bulletin # 12 Concrete Repair by Shotcrete Application

1.4 SUBMITTALS

A. The Contractor shall submit trial mix proportions with compressive strength results as described later in this section.

B. The Contractor shall submit test results of shotcrete core tests after each day's gunning as described later in this section.

1.5 APPLICATOR QUALIFICATIONS

A. The Contractor shall have three years of experience in performing work similar to that shown in the drawings and specifications. The foreman of the shotcrete crew shall have a minimum of two years experience as a shotcrete nozzleman, finisher and gunman. The nozzleman shall have certification or a minimum 3000 hours experience as a nozzleman and completed at least on similar application as a nozzleman.

B. The Contractor shall submit a list of three projects in which similar work to that specified was successfully completed. This list shall contain the following for each of the three projects:
   1. Project Name
   2. Owner of project
   3. Owner's representative, address and phone number
   4. One-sentence description of work
   5. Cost of this shotcrete work
   6. Total restoration cost of project
   7. Date of completion

C. The sum of the costs for shotcrete work of the five projects provided above shall be a minimum of $100,000.

1.6 DELIVERY, STORAGE AND HANDLING

A. Cement shall be stored in weathertight enclosures which shall provide protection from dampness and contamination. Aggregate stockpiles shall be arranged and used in a manner to avoid segregation or contamination with foreign matter or other aggregates. Reinforcement shall be stored so as to avoid contact with the ground.

PART 2 PRODUCTS

A. Contractor’s option to use batched material or use of pre-portioned bag mix.

2.2 PRE-PORTIONED BAG MIX

A. MS-W1 Synthetic Fiber Shotcrete by King Packaged Materials Company, Ontario CA

2.3 CONCRETE TYPE, STRENGTHS AND USES

A. The minimum compressive strength indicated, based on 3" diameter, 3" long core specimens shall be as follows:

Concrete Type	Strength	Use
Shotcrete	7 days - 3300 PSI 28 days - 4000 PSI	Beams and underside of slab repair

B. Ends of the test specimens shall be properly prepared for testing as described in ASTM C-42 "Obtaining and Testing Drilled Cores and Sawed Beams of Concrete".

2.4 MATERIALS

A. CEMENT
   1. Shall be Portland Cement conforming to ASTM C-150, Type 1.

B. ADMIXTURES
   1. Admixtures shall be submitted to the Engineer for approval.
   2. The total chloride ion content of the mix shall not exceed 0.10% by weight of cement.

C. AIR ENTRAINING
   1. Shall conform to ASTM C-260. The entrained air content shall be controlled in a range of 6% to 8% of total air at the pump.
   2. Air entraining shall be required for all shotcrete used in exterior applications.

D. WATER
   1. Mixing water shall be fresh, clean and potable.

E. REINFORCING
   1. Corroded reinforcing shall be prepared per Section 02 41 17 “Removal of Existing Concrete and Surface Preparation”.

F. AGGREGATES
   1. Aggregates shall be clean, free of salt and organic impurities and conform to the requirements of ASTM C-33. The combined gradation shall conform to one of the gradations shown below:

GRADATION LIMITS FOR COMBINED AGGREGATE - GRADATION NO.1

SIEVE SIZE U.S. STANDARD SQUARE MESH	PERCENT BY WEIGHT PASSING
1/2"	-
3/8"	100
No. 4	95-100
No. 8	80-100
No. 16	50-85
No. 30	25-60
No. 50	10-30
No. 100	2-10

2.5 MIX PROPORTIONS AND PRECONSTRUCTION TESTING

A. The required shotcrete mix shall be developed prior to the actual application of shotcrete to any surface forming a permanent part of the repair work. A trial mix shall be made with the same ingredients and tested in the same mixing and placing equipment that is proposed for use in the work. The mix design proposed for use, when tested as described below shall have a minimum compressive strength of 3300 PSI at 7 days and 4000 PSI at 28 days.

B. A sand to cement ratio of 3½ to 4.0 is recommended, the actual mix proportions used will be at the discretion of the Contractor so long as the requirements for strength and proper steel encasement are met. The lowest water-cement ratio compatible with the above parameters is recommended.

C. Mix designs of each separate mix shall be prepared and the following data shall be submitted to the Engineer for each mix design. The Contractor shall be responsible for costs relating to testing.
   1. Sieve analysis for fine and coarse aggregate
   2. Test for aggregate organic impurities
   3. Proportions of all materials
   4. Mixing method
   5. Mill certificates for cement
   6. Slump at the pump
   7. Air content at the pump

D. Two test panels shall be made using the trial mix by one of the nozzlemen expected to work on the job. The panel shall be at least 18" x 18" x 3"; they shall be gunned in an upside-down horizontal position simulating actual field conditions. At least 6 cubes or cores shall be cut from each of the test panels. These specimens shall be cut from the shotcreted test panels not earlier than 5 days after shotcreting. The specimens shall be examined by the Engineer for sand pockets or lamination. Three specimens shall be tested for compressive strength at 7 and 28 days. For cube specimens and core cylinders with a length/diameter ratio less than 2, the minimum compressive strength shall be at least equal to the specified strength divided by 0.85. During storage, the specimens shall be kept continuously moist. Costs for cutting and testing shall be paid by the Owner.

E. The proportions of materials determined on the basis of developed mix proportions and trial mix testing along with compressive strength data shall be submitted to the Engineer for approval. After approval by the Engineer, these proportions shall be used in the actual application of shotcrete and shall not be varied without further approval.

PART 3 EXECUTION

3.1 PREPARATION OF CHIPPED-OUT SURFACES TO RECEIVE SHOTCRETE

A. The Engineer will locate and mark the areas to be repaired.

B. Refer to section 02 41 17 “Removal of Existing Concrete and Surface Preparation”.

3.2 BATCHING AND MIXING

A. Weight batching shall be used to control mix proportions. With the Engineer's permission, volume batching may be used during shotcreting operations provided that a minimum of one weight batching check is made every 8 hours for control purposes. Cement may be batched by integral bags.

B. Aggregate and cement shall be thoroughly mixed in the surface dry state before being deposited in the placing equipment. The moisture content of the combined aggregate at the time of mixing shall meet the approval of the inspector and should be in the range of 3% to 6% of weight of the oven-dry (110˚C) aggregate.

C. The water content of the mix should be such as to produce the minimum slump that can be handled by the pump. A slump in the range of 1½" to 3" at the pump is normally suitable. The applied mix shall be dry enough to prevent sagging or sloughing from the repair surface.

3.3 PLACEMENT OF SHOTCRETE

A. The provisions of "Guide to Shotcrete" (ACI 506) and "Specification for Materials, Proportioning and Application of Shotcrete" (ACI 506.2) should be followed insofar as they apply to the work.

B. The thickness of any given layer of shotcrete shall be such as to preclude sagging or falling away. If wind or air currents cause separation of the nozzle stream during placement, shotcreting shall be discontinued or suitable means shall be provided to screen the nozzle stream.

C. The surface of freshly placed shotcrete shall be broomed or scraped to remove any loose material if additional layers of shotcrete are to be applied thereto after hardening. Such surfaces shall also be dampened before applying succeeding layers.

D. No shotcrete shall be placed if drying or stiffening of mix takes place at any time prior to delivery to the nozzle. Under no circumstances shall any rebound or previously expended material be included in the work or used in the shotcrete mix.

E. If during the placement of shotcrete there is any overspray on adjacent surfaces including replacement subsequently to be shotcreted, all such overspray or rebound shall be removed prior to final set and before placement of shotcrete on such surfaces.

F. Shotcrete which lacks uniformity, exhibits segregation, honeycombing or lamination, or which contains any dry patches, voids or sand pockets shall be removed and replaced.

G. The nozzle shall be held at such a distance and angle so that material shall be fully placed behind reinforcement before any material is allowed to accumulate on its face.

H. Provide alignment wires to establish thickness and plane surfaces. Install alignment wires at corners and offsets not established by form work. Ensure alignment wires are tight, true to line and placed to allow further tightening.

3.4 FINISHING

A. Scraping with a featheredge or screed to remove high spots shall not be done until the shotcrete has become stiff enough to withstand the pull of the screeding device.

B. The final surface finish shall be troweled for architectural appearance. The finished surface shall retain the original architectural form. Partial forming of edges and corners with multiple passes of shotcrete shall be provided as directed by the Engineer.

3.5 CURING

A. Freshly applied shotcrete shall be protected from premature drying and temperatures below 40˚F and shall be maintained with minimal moisture loss at a relatively constant temperature.

B. Shotcrete shall be kept continuously moist for at least 7 days. The following method shall be used:

1. Applying a curing compound in accordance with ASTM C-309 "Specifications for Liquid Membrane – Forming Compounds for Curing Concrete". Two applications shall be made; the second shall be within an hour of the first application. Curing compounds shall not be used on any surface which additional shotcrete or other cementitious materials are to be bonded. Curing compounds shall be compatible with the surface sealer to be used.

3.6 LIMITATIONS OF OPERATIONS

A. No traffic shall be permitted in the bay above during the shotcreting work for 48 hours thereafter.

B. Traffic and pedestrian movement through the work area shall be limited to prevent damage or injury resulting from the work. Adjacent surfaces shall be protected as much as possible and shall be cleaned after the shotcrete work is completed.

3.7 FIELD QUALITY CONTROL

A. Specimens for determining compressive strength shall be made by the Contractor for each 8-hour period that shotcrete is placed.

B. A test panel with minimum dimensions of 18" x 18" x 3" shall be gunned in the same position as the work represented and field cured in the same manner as the work. The panels shall be gunned by the nozzleman doing most of the work.

C. At least three 3" diameter cores or 3" cubes shall be cut from each panel for testing. Panels shall not be removed prior to 12 hours after shotcreting. Specimens shall not be cut until immediately prior to testing. All cutting and testing shall be performed by a qualified approved testing laboratory which meets the requirements of ASTM E-329 and their reports will be sent to the Engineer and the Contractor. Cost for fabrication of the test panel shall be paid for by the Contractor. Cost for cutting and testing shall be paid for by the Owner.

D. Testing of cores and cubes shall be in accordance with ASTM C-42. Each test report shall contain the following information for each set:
   1. Individual test specimen strength, type of failure
   2. Specimen number
   3. Portion of structure represented by the concrete tested
   4. Date cast
   5. Date tested
   6. Concrete properties specified
   7. Notice if tests indicate concrete is not in conformance with specifications.

E. The specimens shall be tested at an age of 7 days. Strength of concrete shall be considered satisfactory if average of two 7-day tests in each set of cores or cubes equals or exceeds 3300 PSI and neither of the 7-day tests is 500 PSI or more below the specified 7-day strength.

F. Should results of test not meet preceding requirements, associated shotcrete work will either be rejected by the Engineer or additional testing will be performed at 28 days. If strength acceptance criteria are not met by core tests at 28 days, the Contractor shall remove and replace all questionable areas of concrete at the Contractor's expense. The costs of additional tests shall be paid for by the Contractor.

G. Contractor may choose to have cores removed and tested from the work in place rather than the test panels at his expense.

H. The Engineer may perform additional destructive and non-destructive testing to detect voids in the shotcrete repairs. If any voids are found, the costs of these initial tests as well as all subsequent tests shall be paid by the Contractor. The Contractor shall also remove and replace at no cost to the Owner, all shotcrete repairs found to contain voids. If no voids are found, the costs of all tests will be paid by the Owner.

END OF SECTION

SECTION 05 50 00
METAL FABRICATIONS

PART 1 GENERAL

1.1 RELATED WORK

A. Applicable provisions of Division 01 shall govern work of this section.

B. Related work specified elsewhere:

1. Section 03 01 30 - Maintenance of Cast-in-Place Concrete
2. Section 09 91 13 - Exterior Painting

1.2 SUMMARY

A. Include labor, materials, services and incidentals for completion of the Section of Work.

B. Supply and install guardrail reinforcing angles at State Street Campus - Frances Parking Garage, as indicated on drawings.

1.3 PERFORMANCE REQUIREMENTS

A. Thermal Movements: Provide exterior metal fabrications that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient material surfaces.

1.4 SUBMITTALS

A. Product Data: For the following:

1. Concrete anchor

B. Shop Drawings: Show fabrication and installation details for metal fabrications.

C. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

D. Provide templates for anchors and bolts specified for installation under other Sections.

E. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

F. Welding certificates.

G. Qualification Data: For Engineer.

1.5 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to the following:

1. AWS D1.1, "Structural Welding Code--Steel."
2. AWS D1.3, "Structural Welding Code--Sheet Steel."

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of parapet walls and other construction contiguous with metal fabrications by field measurements before fabrication and indicate measurements on Shop Drawings.

B. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating metal fabrications without field measurements. Coordinate existing parapet wall and other contiguous construction to ensure that actual dimensions correspond to established dimensions. Provide allowance for trimming and fitting at site.

1.7 COORDINATION

A. Coordinate installation of anchorages for metal fabrications. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete. Deliver such items to Project site in time for installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
   1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
   2. Products: Subject to compliance with requirements, provide one of the products specified.
   3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
   4. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces, unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

2.3 FERROUS METALS

A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

B. Rolled-Steel Floor Plate: ASTM A 786/A 786M, rolled from plate complying with ASTM A 36/A 36M or ASTM A 283/A 283M, Grade C or D.

2.4 FASTENERS

A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.

B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with hex nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.

C. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, nuts and, where indicated, flat washers; ASTM F 593 (ASTM F 738M) for bolts and ASTM F 594 (ASTM F 836M) for nuts, Alloy Group 1 (A1).

D. Anchor Bolts: ASTM F 1554, Grade 36.
   1. Provide hot-dip or mechanically deposited, zinc-coated anchor bolts where item being fastened is indicated to be galvanized.

E. Machine Screws: ASME B18.6.3 (ASME B18.6.7M).

F. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).

G. Plain Washers: Round, ASME B18.22.1 (ASME B18.22M).

H. Lock Washers: Helical, spring type, ASME B18.21.1 (ASME B18.21.2M).

I. Expansion Anchors: Anchor bolt and sleeve assembly with capability to sustain, without failure, a load equal to four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.
   1. Material for Anchors in Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B 633, Class Fe/Zn 5.
   2. Material for Anchors in Exterior Locations: Alloy Group 1 (A1) stainless-steel bolts complying with ASTM F 593 (ASTM F 738M) and nuts complying with ASTM F 594 (ASTM F 836M).

2.5 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Shop Primers: Provide primers that comply with Division 09 painting Sections.

C. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79.
   1. Use primer with a VOC content of 420 g/L (3.5 lb/gal.) or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
   2. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

D. Zinc-Rich Primer: Complying with SSPC-Paint 20 or SSPC-Paint 29 and compatible with topcoat.
   1. Use primer with a VOC content of 420 g/L (3.5 lb/gal.) or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
      Products:
      a. Benjamin Moore & Co.; Epoxy Zinc-Rich Primer CM18/19.
      b. Carboline Company; Carbozinc 621.
      c. ICI Devoe Coatings; Catha-Coat 313.
      d. International Coatings Limited; Interzinc 315 Epoxy Zinc-Rich Primer.
      e. PPG Architectural Finishes, Inc.; Aquapon Zinc-Rich Primer 97-670.
      f. Sherwin-Williams Company (The); Corothane I GalvaPac Zinc Primer.
      g. Tnemec Company, Inc.; Tneme-Zinc 90-97.

E. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.

F. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for exterior applications. Products:
   1. Euclid, Dry Pack Grout
   2. Sika, Sika Grout 212
   3. Or approved equal

G. Concrete Materials and Properties: Comply with requirements in Division 03 Section "Cast-in-Place Concrete" for normal-weight, air-entrained, ready-mix concrete with a minimum 28-day compressive strength of 4000 psi, unless otherwise indicated.

2.6 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm), unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work true to line and level with accurate angles and surfaces and straight edges.

E. Weld corners and seams continuously to comply with the following:
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.
   4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts, unless otherwise indicated. Locate joints where least conspicuous.

G. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

2.7 MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

B. Fabricate units from steel shapes, plates, and bars of welded construction, unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction retained by framing and supports. Cut, drill, and tap units to receive hardware, hangers, and similar items.

C. Galvanize miscellaneous framing and supports where indicated.

D. Prime miscellaneous framing and supports with zinc-rich primer where indicated.

2.8 LOOSE BEARING AND LEVELING PLATES

A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.

B. Galvanize plates after fabrication.

C. Prime plates with zinc-rich primer.

2.9 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish metal fabrications after assembly.

2.10 STEEL AND IRON FINISHES

A. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:
   1. Exteriors (SSPC Zone 1B) and Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
   2. Interiors (SSPC Zone 1A): SSPC-SP 3, "Power Tool Cleaning."

B. Shop Priming: Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes and those to be embedded in concrete, sprayed-on fireproofing, or masonry, unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

PART 3 EXECUTION

3.1 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.

4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag bolts, wood screws, and other connectors.

3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.

3.3 INSTALLING BEARING AND LEVELING PLATES

A. Clean concrete bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.

B. Set bearing plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with grout.
   1. Use nonshrink nonmetallic grout, in concealed locations where not exposed to moisture; use nonshrink, nonmetallic grout in exposed locations, unless otherwise indicated.
   2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.4 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
   1. Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.

B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Division 09 painting Sections.

C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION

SECTION 07 18 00
TRAFFIC COATINGS

PART 1 GENERAL

1.1 RELATED WORK

A. Applicable provisions of Division 01 shall govern work of this section.

B. Related work specified elsewhere:

1. Section 07 92 00 - Joint Sealants

1.2 SUMMARY

A. Include materials, labor, services and incidentals necessary for completion of this Section of work.

B. Work includes surface preparation and application of a fully adhered, fluid applied, traffic coating to areas indicated or placement of wear coat and top coat onto previously applied coated surfaces as indicated on drawings and as specified.

C. Includes removal of unbonded traffic coating at OC ramp.

D. Includes removal of bonded traffic coating at area of CSN ramp.

E. Detail work including cove sealants is included in cost of traffic coating.

F. The Owner will repaint line stripes after floor coating is applied and cured.

1.3 QUALITY ASSURANCE

A. Industry Standards, Specifications and Codes

1. General:
   a. Comply with provisions of the following codes and standards except as modified.
   b. Referenced codes and standards including revisions and commentaries shall be the most currently adopted as of the date of these Contract Documents.
2. American Society for Testing and Materials (ASTM):
   a. Specific ASTM numbers are noted in later text.

B. Pre-Construction Meeting

1. A pre-construction meeting is required with Contractor in order to coordinate work schedule and inspection required by Engineer. Stepped sample of coating system shall be reviewed and agreed to for surface texture. Approved surface texture shall be used throughout. Areas deemed to vary from sample shall be recoated at no additional cost. These primarily are areas devoid of surface aggregates that present a slippery surface when wet.

C. APPLICATOR QUALIFICATIONS

1. System applicator shall be licensed or trained to install selected traffic coating system and shall have experience in application of fluid applied deck coatings. Contractor or their subcontractor shall submit qualifications to A/E showing traffic coating applicator has experience in installing specified traffic coating. Traffic coating applicator shall have completed a minimum of 200,000 s.f. of traffic coating application. Qualifications shall consist of a minimum of 5 projects completed within the past 5 years using traffic coating Contractor proposes to install for this Project. List shall include name of project, location, areas of product application, and contact person with phone number. Projects listed shall be a minimum of 10,000 s.f. per project listed.
2. Applicator shall check wet film (mil) thickness and maintain a daily record.

D. Manufacturer's Qualifications
1. System manufacturer shall provide a representative who will instruct applicator's crews on proper methods and techniques of mixing and applying materials.

1.4 SUBMITTALS

A. Applicator Qualifications

B. Sample
1. Submit stepped sample of coating system applied to 1/4 inch by 6 inch by 6 inch plywood or similar rigid base showing each component for each duty grade to be applied. Sample shall be noted with component mil thicknesses and aggregate size and manufacturer. Also submit sample of aggregate to be used.

C. Manufacturer's Literature
1. Submit manufacturer's literature for products furnished including appropriate material safety data sheets.

D. Applicator's License Certificate
1. Submit copy of 'Certificate of License' issued to system applicator by traffic coating manufacturer.

E. Maintenance Manual
1. Upon completion of work required by this Section, submit maintenance manual, identified with project name, location and date; type of coating system applied and surface to which system was applied, including sketches where necessary. Include recommendations for periodic inspections, care and maintenance and snow removal guideline. Identify common causes of damage with instructions for temporary patching until permanent repair can be made.

F. Guarantee
1. Installer shall review surface condition of slab prior to the installation of traffic coating system. Written notice shall be provided to Engineer stating any condition which will impair performance of traffic coating system, including compatibility with existing traffic coating were present. Installation of traffic coating system shall constitute acceptance of surface by Installer.
2. Completed installation shall be guaranteed jointly and severally on a single document, by traffic coating manufacturer and applicator, against defects of materials and workmanship for a period of 5 years.

3. Installer and manufacturer shall provide labor and materials to repair deficiencies or defects which develop due to normal use. Snowplows, abrasive maintenance equipment, and vandalism are not normal traffic use and are exempt from the warranty.

1.5 JOB CONDITIONS

A. General
   1. Install traffic coating materials in strict accordance with safety and weather conditions required by manufacturer product literature, material safety data sheets or as modified by applicable rules and regulations of local, State and Federal authorities having jurisdiction.
   2. Job conditions are restricted only to inspection and preparation of top surface of substrate to be coated.
   3. Post 'No Smoking' signs in area during and for at least 8 hours following application period.
   4. Open fires and spark producing equipment shall not be in application areas until vapors have dissipated.

B. Environmental Conditions
   1. Rain shall not be anticipated within 8 hours of application.
   2. Substrate surface temperatures shall be above 40 degrees F and lower than 110 degrees F.
   3. Proper notices shall be given prior to start of membrane application.
   4. Positive ventilation for interior applications is to be continuously supplied throughout application period and 8 hours after. Installer is responsible for fume control. Air intakes for buildings are to be protected against infiltration of fumes into ventilation systems.

PART 2 PRODUCTS

2.1 GENERAL

A. Components shall be products of selected traffic coating system or shall be certified as compatible with components produced by system manufacturer.

B. Traffic coating system shall be a fully adhered, fluid applied, traffic bearing, elastomeric membrane system. System shall be capable of preventing infiltration of water, salts, gasoline and other fluids into concrete.

C. Installer shall not change traffic coating system after selection of system has been made without approval of A/E.

D. Installer shall verify slab surface condition prior to installation of system. Areas of heavy wear or slab irregularities shall be filled prior to traffic coating placement to assure a level, uniform surface. This shall be done according to membrane manufacturers recommendations.

E. Areas identified having a topping system shall be manufacturer’s heavy duty system. These systems shall consist of a primer, base coat or membrane, wear coat and top coat.

F. Wear coats are to be saturated with aggregate.

G. Material thicknesses are wet film thicknesses. Thickness listed for wear coat does not include aggregate.

H. Approved traffic coating systems include systems described for Full System replacement. At placement for worn membrane the replacement will consist of wear coat and finish or top coat:
   1. Overture Center Ramp:

a. "MasterSeal Traffic 2500 - Heavy Duty Traffic System" by BASF. System shall consist of primer, base coat, intermediate coat, and finish coat. Total wet film thickness shall be 50 mils exclusive of aggregate. Thickness does not include primer. Color: Grey
b. Requests for substitutions will be considered in accordance with the submittals of Section 01 00 00 - General Requirements.

2. Capitol Square North Ramp:

a. "Kelmar FWC III - Exposure 3" by Technical Barrier Systems. System shall consist of primer, base coat, wear coat, and finish coat. Total wet film thickness shall be 71 mils exclusive of aggregate. Thickness does not include primer. Color: Black
b. Requests for substitutions will be considered in accordance with the submittals of Section 01 00 00 - General Requirements.

I. Where lapping onto existing traffic coating, new traffic coating shall be compatible and match existing. Contractor shall perform "pull off" bond test or similar to prove compatibility with existing.

J. Color
1. Top coat color varies and shall match existing.

2.2 RELATED MATERIALS

A. Installer shall furnish related materials required for crack repair, cant sealant, overbanding and flashing per system manufacturers' requirements to achieve a complete waterproof system.

2.3 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver materials to job site in sealed, undamaged containers. Each container shall be identified with material name, date of manufacture and lot number.

B. Materials shall be stored indoors or covered at temperatures not exceeding 90 degrees F. Higher temperatures will reduce shelf life of product.

C. Drums shall be stored on sides, pails shall be stored inverted.

PART 3 EXECUTION

3.1 GENERAL

A. Work shall be performed in accordance with manufacturer's specifications.

3.2 CONDITION OF SURFACES

A. Before coating work is commenced, top surface of slab shall be shotblasted to remove laitance concrete from existing, replaced, or new concrete slab. Areas of worn or heavily weathered membrane to receive a new wear coat shall also be shotblasted prior to application. Surfaces shall be cleaned with oil free compressed air jet following shotblasting.

B. Concrete slabs shall be prepared using a shotblast machine followed by cleaning with a compressed air jet. Prepared concrete shall have a surface profile of CSP 3-4 (Concrete Surface Preparation 3-4 as established by International Concrete Repair Institute #310.2-1997). Surface appearance shall be verified and approved by Owner and Engineer prior to sealer application. Note: CSP 3-4 is the typical deck coating MFG. recommendation ICRI #310.2-1997 is the new designation.

C. Areas inaccessible to shotblast machine shall be sandblasted to achieve CSP 1 surface profile.

D. Additional cleaning to remove deposits, which hinder bond of traffic coating to concrete surface, shall be done by traffic coating applicator as part of application with no additional cost to Owner.

E. Remove foreign projections on deck by grinding or other suitable methods.

F. Honeycomb, voids, deteriorated, or unsound concrete shall be repaired to produce a sound, uniform surface in accordance with Engineer's recommendations and as shown on Drawings.

G. Concrete surfaces shall be visibly dry and pass a 4 hour rubber mat test (no condensation) prior to application of coating system. Mat shall be black and taped to deck on edges.

H. Verify curing methods used for concrete are compatible with surface requirements for coating system.

I. Top surfaces of substrates other than concrete shall be treated as required by traffic coating manufacturer.

J. Commencement of coating installation implies acceptance of top surface of substrate area only, as suitable to accept traffic coating. Responsibility for other aspects of substrate shall be responsibility of others.

3.3 PREPARATION

A. Rout or sawcut cracks exceeding 1/16 inch in width and fill with sealant as detailed.

B. Traffic coating system shall bridge cracks that open up in substrate up to 1/16 inch in width maximum. Acceptable width of caulked joints is per system manufacturers' specification.

C. Fill expansion, control and construction joints to be overcoated by deck coating with sealant. Joints larger than 1 inch shall be reviewed with traffic coating system specification.

D. Protect adjacent surfaces with drop cloths or masking tape as required.

3.4 FLASHINGS

A. At projections through deck coatings where projections are structurally and rigidly connected to substrate, such as posts, vents, pipes, stanchions, railings, rigidly connected wall/slab intersections and similar connected items having limited movement, provide a bead of sealant. Tool sealant to form a cant and allow to cure before overcoating. Tooled sealant shall be overlain with a fluid applied integral membrane flashing.

B. At locations of potential high movement such as wall/slab intersections which are not structurally and rigidly connected, provide sheet flashing or reinforce coating with uncoated, woven fiberglass cloth. Where sheet flashings are used, they shall be free or unbonded to substrate near meeting angle but shall be fully bonded away from meeting angle. Do not use precured sheet flashings over expansion joints in horizontal surfaces.

3.5 PRIMER

A. Prime concrete, masonry and metal surfaces at manufacturers recommended rate. Concrete primer shall be compatible for use intended. Note traffic coating on horizontal surface shall be placed on concrete while vertical placement may be on concrete or brick.

3.6 DETAIL WORK

A. Apply non flowing type coating over flashings (sheet flashings, sealant cants and rigid corners). Extend coating beyond flashing out onto adjacent deck surface and extend above top of flashing and terminate in a straight line. Use masking tape.

B. Apply non-flowing type detail coats over cracks, construction joints, cant joints, patch perimeters, etc. Detail coats shall be included in deck coating cost.

C. Allow detail work to cure prior to installation of coating system.

3.7 BASE COAT

A. In areas identified by Project Drawings to receive traffic coating, apply coating material at film thickness specified. Extend coating over fluid applied flashings and detail coatings.

B. Allow to cure per by manufacturers requirements.

3.8 WEAR COAT

A. Apply wear coating material at thickness specified to horizontal areas indicated on Project Drawings to receive traffic coating. Vertical surface will not receive a wear coat.

B. While coating is still fluid, uniformly broadcast aggregate over surface. Aggregate to be applied to saturation for wear coat.

C. Allow to cure per manufacturers requirements.

D. Remove excess aggregate from deck surface by manual sweeping or mechanical vacuum, followed by air blast.

3.9 TOP COAT

A. Apply a top coat of material as recommended by manufacturer, to encapsulate top layer of aggregate. Application of top coat is not to eliminate non-slip surface texture of membrane system in place.

B. Allow finished installation to cure per manufacturer before permitting traffic on surfaces.

3.10 CLEANING

A. Clean stains from adjacent surfaces per manufacturer's instructions.

B. Note: When using solvents for cleanup, extinguish sources of ignition in the area and observe proper precautionary measures for handling materials.

C. Remove foreign matter from finished coating surfaces.

3.11 MAINTENANCE

A. Damaged surfaces may be cleaned and have liquid coating and grit applied to match surrounding surface. Where a regular maintenance and cleaning program is required, surfaces may be washed with commercial detergents or chlorinated solvents.

END OF SECTION

SECTION 07 92 00
JOINT SEALANTS

PART 1 GENERAL

1.1 RELATED WORK

A. Applicable provisions of Division 01 shall govern work of this section.

B. Related work specified elsewhere:

1. Section 07 18 00 - Traffic Coatings

1.2 SUMMARY

A. Include all materials, labor, services and incidentals necessary for the completion of this section of the work.

B. Sealants are required at, but are not necessarily limited to the following general locations:
1. Routed random cracks, concrete control joints and construction joints.
2. Masonry and concrete control joints exterior and interior.
3. Isolation joints between structure and other elements.
4. Joints at penetrations of walls, decks and floor by piping and other services and equipment.
5. Joints between items of equipment and other construction.
6. Around hollow metal windows.
7. Joints associated with flashing and sheet metal.
8. Specific drawing details requiring caulking. Wherever caulking is called for on Drawings it shall mean "sealant".

1.3 QUALITY ASSURANCE

A. Applicator Qualifications
1. Contractor shall have a minimum of 3 years of experience in performing work similar to that shown in Drawings and Specifications.

B. Guarantee
1. The completed installation shall be guaranteed jointly and severally on a single document, by sealant manufacturer and installer agreeing to repair or replace sealants which fail to perform as airtight and watertight joints or fail in joint adhesion, cohesion, abrasion resistance, weather resistance, extrusion resistance, migration resistance, stain resistance or general durability or appear to deteriorate in other manner not clearly specified by submitted manufacturer's data as an inherent quality of material for exposure indicated.
2. Guarantee period shall be 5 years.

1.4 SUBMITTALS

A. Manufacturer's Data
1. Submit manufacturer's specifications, recommendations and installation instructions for each type of sealant, caulking compound and associated miscellaneous material required. Include manufacturer's published data, letter of certification or certified test laboratory report indicating each material complies with requirements and is intended generally for applications shown. Show by transmittal that 1 copy of each recommendation and instruction has been distributed to installer.

B. Guarantee
   1. Submit sample copy prior to start of work.

C. Samples
   1. Submit samples of each color required for each type of sealant or caulking compound exposed to view. Compliance with other requirements is exclusive responsibility of Contractor.

D. Applicator Qualifications
   1. Contractor shall submit a list of 5 projects in which similar work to that specified was successfully completed. List shall contain the following for each of the 5 projects:
      a. Project name
      b. Owner of project
      c. Owner's representative, address and telephone number
      d. One sentence description of work
      e. Cost of portion of work similar to that specified in this section
      f. Total restoration cost of projects
      g. Date of completion of work
   2. The sum of costs of the projects shall be a minimum of $50,000.00.

PART 2 PRODUCTS

2.1 SEALANT

A. Traffic-bearing, 2 component, Type 1 self-leveling, as applicable, unmodified polyurethane sealant containing no asphalt, fillers or plasticizers. Follow manufacturer's previously submitted recommendations for type required at joints. Sealants shall conform to Federal Specification TT-S-00227E.
   1. Acceptable Productions and Manufacturers:
      a. For slab cracks and joints subject to vehicular traffic:
         1 "Sikaflex-2C NS/SL" by Sika
         2 "MasterSeal NP2/SL2" by BASF
         3 "THC-900/901 for self-leveling" by Tremco
         4 "Dymeric 240 FC for gun grade" by Tremco
         5 or approved equal
      b. For joints not subject to vehicular traffic including exterior façade sealants or where noted as such:
         1 "Sikaflex - 15 LM" by Sika
         2 "MasterSeal NP150" by BASF
         3 "Dymonic FC by Tremco
      c. Sealant color will be chosen at time of construction from manufacturer's standard color pallet.

2.2 JOINT CLEANER

A. Provide type of joint cleaning compound recommended by sealant or caulking compound manufacturer for joint surfaces to be cleaned.

2.3 JOINT PRIMER/SEALER

A. Provide type of joint primer/sealer recommended by the sealant manufacturer for joint surfaces to be primed or sealed.

2.4 BOND BREAKER TAPE

A. Polyethylene tape or other plastic tape as recommended by sealant manufacture shall be applied to sealant-contact surfaces where bond to substrate or joint filler must be avoided for proper performance of sealant. Provide self-adhesive tape wherever applicable.

2.5 SEALANT BACKER ROD

A. Compressible rod stock polyethylene foam, polyethylene jacketed polyurethane foam or other flexible, permanent, durable non-absorptive material as recommended for compatibility with sealant by sealant manufacturer which control joint depth for sealant placement, break bond of sealant at bottom of joint, form optimum shape of sealant bead on back side and provide a highly compressible backer to minimize possibility of sealant extrusion when joint is compressed. Backer rod shall be at least 1/4 inch larger than width of joint.

PART 3 EXECUTION

3.1 PRE INSTALLATION MEETING

A. The installer, Engineer, sealant manufacturer's technical representative and other trades involved in coordination with sealant work shall meet with Contractor at Project Site to review procedures and time schedule proposed for installation of sealants and coordination with other work. Review each major sealant application required on the Project.

3.2 WEATHER CONDITIONS

A. Do not proceed with installation of sealants under adverse weather conditions or when temperatures are below or above manufacturer's recommended limitations for installation. Proceed with work only when forecasted weather conditions are favorable for proper cure and development of high early bond strength. Coordinate time schedule with Contractor to avoid delay of project.

3.3 JOINT SURFACE PREPARATION

A. Removal of sealants by means of waterblasting is not permitted.

B. Complete removal of existing sealant is required prior to installation of new sealants.

C. At location of weld plate or flange connectors, sandblast exposed steel to near white metal condition and coat with zinc rich coating. Install bond breaker tape over horizontal steel surface prior to sealant installation.

D. Clean joint surfaces immediately before installation of sealant or caulking compound. Grind or sandblast joint blackouts to remove dirt, coatings, existing sealant, moisture and other substances which interfere with bond of sealant or caulking compound.

E. Installer must examine joint surfaces, backing and anchorage of units forming sealant rabbet and conditions under which sealant work is to be performed and notify Contractor in writing of conditions detrimental to proper and timely completion of work and performance of sealants. Do not proceed with sealant work until unsatisfactory conditions have been corrected in a manner acceptable to installer.

3.4 INSTALLATION

A. Comply with sealant manufacturer's printed instructions except where more stringent requirements are shown or specified and except where manufacturer's specific recommendations directs otherwise.

B. Contractor shall saw and grind surface of cracks and joints. Edges of cracks or joints to be sealed shall be of sound substrate. Prior to installing sealant, surfaces shall be cleaned of foreign debris and edges ground. Joint edges shall be slightly rounded. Rout out random cracks to a nominal depth of 3/8" and a width of ¼"

C. Prime or seal joint surfaces wherever shown or recommended by the sealant manufacturer. Do not allow primer or sealant to spill or migrate onto adjoining surfaces.

D. Install backer rod for sealants except where specifically noted to be omitted or recommended to be omitted by sealant manufacturer for application shown.

E. Install bond breaker tape wherever required by manufacturer's recommendations

F. Employ only proven installation techniques so sealants will be deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of joint bond surfaces equally on opposite sides. Except as otherwise indicated, fill sealant rabbet to a slightly concave surface slightly below adjoining surfaces. Where horizontal joints are between a horizontal surface and a vertical surface, fill joint to form a slight cove so joint will not trap moisture and dirt.

G. Install sealant to depths as recommended by sealant manufacturer.

3.5 CURE AND PROTECTION

A. Cure sealants and caulking compounds in compliance with manufacturer's instructions and recommendations to obtain high early bond strength, internal cohesive strength and surface durability.

B. Installer shall advise Contractor of procedures required for the curing and protection of sealants and caulking compounds during construction period to avoid deterioration or damage (other than normal wear and weathering) prior to time of Owner's acceptance.

C. After completion of sealant work, Contractor shall water test structure and demonstrate to the satisfaction of Engineer that the structure is waterproofed.

END OF SECTION

SECTION 07 95 00
EXPANSION CONTROL

PART 1 GENERAL

1.1 RELATED WORK

A. Applicable provisions of Division 01 shall govern work of this section.

B. Related work specified elsewhere:

1. Section 03 01 30 - Maintenance of Cast-in-Place Concrete
2. Section 07 92 00 - Joint Sealants

1.2 SUMMARY

A. Include all materials, labor, services and incidentals necessary for the completion of this section of the work.

B. This work shall consist of furnishing and installing a deck joint sealing expansion control system at the location shown on the plans, and in accordance with the following specification. The sealing system shall prevent the passage of water through the expansion joint opening.

C. The expansion joint blockouts shall be provided as detailed on the drawings and specified under other sections of the specifications.

1.3 SUBMITTALS

A. Manufacturer's Data and Samples

1. Submit three copies of manufacturer's specifications, recommendations and installation instructions for each type of sealant and associated miscellaneous material required. Include manufacturer's published data, letter of certification or certified test laboratory report indicating that each material complies with the requirements and is intended generally for the applications shown. Show by transmittal that one copy of each recommendation and instruction has been distributed to the installer. Literature, details, samples, shop drawings, warranties, etc. shall be included in the submittal.

B. Warranty

1. The system manufacturer shall furnish the Owner with a written single source performance warranty that the expansion joint sealant system be free of defects related to design, workmanship or material deficiency for a five year period from the date of substantial completion of the work required under this section. The following problems shall be specifically covered under the warranty:
   a. Adhesive or cohesive failure of the seal.
   b. Discoloration, crazing or other weathering deficiency of the seal.
   c. Abrasion or tear failure of the seal resulting from normal traffic use.
   d. Defective joint installation.
2. Perform repair under this warranty at no cost to the Owner.
3. The system manufacturer shall submit a detailed warranty consistent with the terms of this specification prior to construction for approval. The approved warranty shall be made part of the contractual agreement and shall represent the sole warranty statement for the project.

4. Snowplows, abrasive maintenance equipment, and vandalism and are not normal traffic use and are exempt from the warranty.
5. Furnish the Owner with five copies of the snow removal guidelines for the areas covered by this warranty.

C. Joint Installer Qualification
1. Expansion joint installer shall submit qualification to Engineer for approval showing 5 years experience and a minimum of 5 locations where the installer has successfully installed the specified joint sealants. Engineer reserves the right to reject installer with insufficient or improper qualifications.

PART 2 PRODUCTS

2.1 MATERIALS

A. General
1. The expansion joint seal system shall be a complete system of compatible materials designed by the manufacturer to produce waterproof, traffic bearing expansion joint seals as detailed on the drawings.
2. Expansion joint seal system must conform to Americans with Disabilities Accessibility Guidelines for Buildings and Facilities.

B. Acceptable Products and Manufacturers for replacement seal system at SSCo and SSCF:
1. "WaboCrete Membrane System – ME Series" by Watson Bowman Acme
2. "Thermaflex Membrane/Nosing System, Type TCR" by Emseal
3. or approved equal

C. Acceptable Products and Manufacturers for replacement seal system at OC:
1. "Wabo UreFlex Expansion Control System, Model T" by Watson Bowman Acme
2. "Iso-Flex Factory Molded Expansion Joint System" by LymTal International, Inc.
3. or approved equal

PART 3 EXECUTION

3.1 GENERAL

A. The system manufacturer shall review and approve joint layouts, methods of providing joints, concrete finishing and curing methods and related details prior to construction.

B. The seal system manufacturer shall assume direct contractual responsibility for installation of the seal system.

C. Where expansion joint header material is to be replaced, carefully remove existing polycrete header material to prevent damage to other joint material and concrete blockout. Inspect and prepare existing seal and blockout as detailed on the Drawings.

3.2 PREPARATION

A. A blockout of the size detailed shall be provided by the Concrete Contractor. It shall be the responsibility of the Concrete Contractor to provide blockouts with clean, sound substrates free of voids and honeycomb and in accordance with dimensions detailed in the drawings and per manufacturer's requirements.

B. If blockout is not as detailed, inform the Concrete Contractor for rework of the blockout to meet detailed dimensions.

C. Concrete Contractor shall be responsible for protecting blockout and removal of foreign material which might impair expansion joint performance. Expansion joint contractor shall perform final cleaning and sandblasting or physical abrading of surface. Commencing of work by expansion joint contractor shall constitute acceptance.

D. A site inspection shall be made by authorized personnel prior to commencing installation of the system for the purpose of reviewing and approving related conditions affecting performance requirements of this specification.

E. Work shall not proceed until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

F. Joint edges shall have a tooled radius.

3.3 INSTALLATION

A. Work shall not proceed under adverse weather conditions or when temperatures are below or above manufacturer's recommended limitations for installation.

B. Installation procedures shall be in accordance with the system manufacturer's written instructions.

C. Joints shall be protected from water immersion (due to rain, snow or other work) during the initial installation.

D. The expansion joint seal system shall be protected from traffic until completely cured.

E. Prior to opening to traffic, test joist seal for leaks by keeping seal continuously wet for 2 hours. Repair leaks observed by review of underside of seal. Repeat test and repairs until seal is proven to be watertight for 2 hours.

END OF SECTION

SECTION 09 21 16
GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Gypsum sheathing.

B. Gypsum wallboard.

C. Joint treatment and accessories.

D. Textured finish system.

1.2 RELATED REQUIREMENTS

A. Section 07 92 00 - Joint Sealants.

1.3 REFERENCE STANDARDS

A. ANSI A108.11 - American National Standard for Interior Installation of Cementitious Backer Units; 1999 (R2010).

B. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2015.

C. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2015.

D. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2013.

E. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2015.

F. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2014.

G. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2013.

H. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel; 2013.

I. ASTM C1280 - Standard Specification for Application of Gypsum Sheathing; 2013.

J. ASTM C1325 - Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cement Substrate Sheets; 2014.

K. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2014.

L. ASTM C1658/C1658M - Standard Specification for Glass Mat Gypsum Panels; 2013.

M. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2013.

N. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.

O. ICC (IBC) - International Building Code; 2009.

P. GA-216 - Application and Finishing of Gypsum Board; Gypsum Association; 2013.

Q. GA-253 - Recommended Specifications for the Application of Gypsum Sheathing; Gypsum Association; 2016.

R. GA-600 - Fire Resistance Design Manual; Gypsum Association; 2015.

S. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

1.4 SUBMITTALS

A. See Section 01 00 00 - General Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

C. Samples: Submit two (2) samples of gypsum board finished with proposed texture application, 24 inches square in size, illustrating finish color and texture.

1.5 QUALITY ASSURANCE

A. Copies of Documents at Site: Maintain at the project site a copy of each referenced document that prescribes execution requirements.

1.6 REGULATORY REQUIREMENTS

A. Conform to applicable code for fire rated assemblies as indicated on drawings.

PART 2 PRODUCTS

2.1 BOARD MATERIALS

A. Manufacturers - Gypsum-Based Board:

1. Georgia-Pacific Gypsum LLC: www.gp.com/gypsum.
2. National Gypsum Company: www.nationalgypsum.com.
3. USG Corporation: www.usg.com.
4. CertainTeed Corporation: www.certainteed.com.
5. American Gypsum: www.americangypsum.com.
6. Substitutions: See Section 01 0000 - General Requirements.

B. Wallboard: Paper-faced gypsum wallboard as defined in ASTM C 1396/C 1396M; sizes to minimize joints in place; ends square cut.

1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
2. Glass-mat-faced gypsum panels as defined in ASTM C1658/C1658M, suitable for paint finish, of the same core type and thickness may be substituted for paper-faced board.

3. Unfaced fiber-reinforced gypsum panels as defined in ASTM C1278/C1278M, suitable for paint finish, of the same core type and thickness may be substituted for paper-faced board.
4. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
5. Mold-resistant board is required at all locations.

C. Ceiling Board: Special sag-resistant gypsum ceiling board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
1. Thickness: 5/8 inch.
2. Edges: Tapered.
3. Products:
a. American Gypsum; Interior Ceiling Board.
b. CertainTeed Corporation; ProRoc Interior Ceiling.
c. Georgia-Pacific Gypsum LLC; ToughRock CD Ceiling Board.
d. National Gypsum Company; High Strength Brand Ceiling Board.

2.2 ACCESSORIES

A. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
1. Tape: 2 inch wide, creased paper tape for joints and corners, except as otherwise indicated.
2. Ready-mixed vinyl-based joint compound.

B. Textured Finish Materials: Latex-based compound; plain.

C. Screws for Attachment to Steel Members Less Than 0.03 inch in Thickness, to Wood Members, and to Gypsum Board: ASTM C1002; self-piercing tapping type; cadmium-plated for exterior locations.

D. Screws for Attachment to Steel Members From 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws for application of gypsum board to loadbearing steel studs.

PART 3 EXECUTION

3.1 EXAMINATION

1. Verify that project conditions are appropriate for work of this section to commence.

3.2 BOARD AND GLASS MAT FACED BOARD INSTALLATION

A. Comply with ASTM C840, GA-216 and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Exterior Sheathing: Comply with ASTM C1280. Install sheathing vertically, with edges butted tight and ends occurring over firm bearing.

C. Single-Layer Non-Rated: Install gypsum board perpendicular to framing, with ends and edges occurring over firm bearing.

D. Exception: Tapered edges to receive joint treatment at right angles to framing.

E. Double-Layer Non-Rated: Use gypsum board for first layer, placed parallel to framing or furring members, with ends and edges occurring over firm bearing. Place second layer perpendicular to framing or furring members. Offset joints of second layer from joints of first layer.

F. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.

G. Tile Backing Board: Install over metal framing members where indicated, in accordance with ANSI A108.11 and manufacturer's instructions; treat cut edges and holes with sealant.

H. Installation on Metal Framing: Use screws for attachment of all gypsum board except face layer of non-rated double-layer assemblies, which may be installed by means of adhesive lamination.

3.3 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and as directed.

B. Not more than 30 feet apart on walls and ceilings over 50 feet long.

C. Corner Beads: Install at external corners, using longest practical lengths.

D. Edge Trim: Install at locations where gypsum board abuts dissimilar materials and as indicated.

3.4 JOINT TREATMENT

A. Glass Mat Faced Gypsum Board: Use fiberglass joint tape, bedded and finished with chemical hardening type joint compound.

B. Paper Faced Gypsum Board: Use paper joint tape, bedded with ready-mixed vinyl-based joint compound and finished with ready-mixed vinyl-based joint compound.

C. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:

1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.

2. Level 1: Fire rated wall areas above finished ceilings, whether or not accessible in the completed construction.

D. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.

1. Feather coats of joint compound so that camber is maximum 1/32 inch.

2. Taping, filling and sanding is not required at the base layer of double layer application.

3.5 TEXTURE FINISH

A. Apply finish texture coating by means of spraying apparatus or trowel in accordance with manufacturer's instructions and to match approved sample.

3.6 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION

SECTION 09 91 13
EXTERIOR PAINTING

PART 1 GENERAL

1.1 RELATED WORK

A. Applicable provisions of Division 01 shall govern work of this section.

1.2 SUMMARY

A. This section includes surface preparation and the application of paint systems on the following exterior substrates:

1. Concrete
2. Steel

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples of Initial Selection: For each type of topcoat product indicated.

C. Samples for Verification: For each type of paint system and each color and gloss of topcoat indicated.

1. Submit Samples on rigid backing, 8 inches (200 mm) square.
2. Step coats on Samples to show each coat required for system.
3. Label each coat of each Sample.
4. Label each Sample for location and application area.

D. Product List: For each product indicated, include the following:

1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
2. Printout of current "MPI Approved Products List" for each product category specified in Part 2, with the proposed product highlighted.

1.4 QUALITY ASSURANCE

A. MPI Standards:

1. Products: Complying with MPI standards indicated and listed in "MPI Approved Products List."
2. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.6 PROJECT CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).

B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

1.7 EXTRA MATERIALS

A. Furnish extra materials described below that are from same production run (batch mix) as materials applied and that are packaged for storage and identified with labels describing contents.

1. Quantity: Furnish an additional 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Sherwin-Williams Company (The), Premium Grade.

2.2 PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another, existing painted surfaces and substrates indicated, under conditions of service and applications as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

B. Colors: White-ceilings and walls,

2.3 BLOCK FILLERS

A. Interior/Exterior Latex Block Filler: MPI #4

1. VOC Content: E Range of E2

2.4 PRIMERS/SEALERS

A. Alkali-Resistant Primer: MPI #3.

1. VOC Content: E Range of E1.

B. Bonding Primer (Water Based): MPI #17.

1. VOC Content: E Range of E1.

C. Bonding Primer (Solvent Based): MPI #69.

1. VOC Content: E Range of E1.

2.5 METAL PRIMERS

A. Alkyd Anticorrosive Metal Primer: MPI #79.

1. VOC Content: E Range of E1.

B. Quick-Drying Alkyd Metal Primer: MPI #76.

1. VOC Content: E Range of E1.

C. Cementitious Galvanized-Metal Primer: MPI #26.

1. VOC Content: E Range of E1.

D. Waterborne Galvanized-Metal Primer: MPI #134.

1. VOC Content: E Range of E1.
2. Environmental Performance Rating: EPR 1.

2.6 EXTERIOR LATEX PAINTS

A. Exterior Latex (Semi-gloss): MPI #10 (Gloss Level 1).

1. VOC Content: E Range of E1.

B. Exterior Latex (Semi-gloss): MPI #11 (Gloss Level 5).

1. VOC Content: E Range of E1.

C. Exterior Latex (Gloss): MPI #119 (Gloss Level 6, except minimum gloss of 65 units at 60 deg).

1. VOC Content: E Range of E1.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Concrete: 12 percent.
2. Masonry (CMU): 12 percent.

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.

1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.

B. Remove plates, machined surfaces, and similar items already in place that are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
2. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

C. Clean substrates of substances that could impair bond of paints, including dirt, oil, grease, and incompatible paints and encapsulants.

1. Remove incompatible primers and reprime substrate with compatible primers as required to produce paint systems indicated.

D. Concrete Substrates: Remove release agents, curing compounds, existing peeling paint, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instruction.

E. Concrete Masonry substrate: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instruction.

F. Steel Substrates: Remove rust and loose mill scale. Clean using methods recommended in writing by paint manufacturer.

G. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

H. Aluminum Substrates: Remove surface oxidation.

I. Plastic Trim Fabrication Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

3.3 APPLICATION

A. Apply paints according to manufacturer's written instructions.

1. Use applicators and techniques suited for paint and substrate indicated.
2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.

B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 FIELD QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure at any time and as often as Owner deems necessary during the period when paints are being applied:

1. Owner will engage the services of a qualified testing agency to sample paint materials being used. Samples of material delivered to Project site will be taken, identified, sealed, and certified in presence of Contractor.
2. Testing agency will perform tests for compliance of paint materials with product requirements.
3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying-paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR PAINTING SCHEDULE

A. Concrete Substrates, Nontraffic Surfaces:

1. Latex System: MPI REX 3.1A- Window Sills, Ledges
   a. Prime Coat: MPI #3 A24W8300 series.
   b. Intermediate Coat: Exterior Latex matching Topcoat. MPI #11 A8W151 series.
   c. Topcoat: Exterior Latex Topcoat. MPI #11 A8W151 series.
2. High-Build Latex System: MPI REX 3.1L, applied to form dry film thickness of not less than 10 mils (0.25 mm)-Walls, Ceilings, Columns.
   a. Prime coat: MPI #3 A24W8300 series.
   b. Intermediate Coat: MPI #40 A5W451 series.
   c. Topcoat: High-build latex (exterior) MPI #40 A5W451 series.

B. Steel Substrates:

1. Epoxy and Polyurethane System: MPI REX 5.1F-Angles, Tube Steel Haunches.
   a. Prime coat: Epoxy zinc-rich primer. MPI #18 B65G11 series.
   b. Intermediate Coat: Exterior 2-part Epoxy color matching topcoat. MPI #120 B58W610 series.
   c. Topcoat: Exterior 2-part Polyurethane (semi-gloss). MPI #174 B65W651 series

C. Chemical Components of Field-Applied Interior Paints and Coatings: Provide topcoat paints and anti-corrosive and anti-rust paints applied to ferrous metals that comply with the following chemical restrictions; these requirements do not apply to paints and coatings that are applied in a fabrication or finishing shop:

1. Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
2. Restricted Components: Paints and coatings shall not contain any of the following:
    a. Acrolein.
    b. Acrylonirile.
    c. Antimony.
    d. Benzene.
    e. Butyl benzyl phthalate.
    f. Cadmium.
    g. Di (2-ethylhexyl) phthalate.
    h. Di-n-butyl phthalate.
    i. Di-n-octyl phthalate.
    j. 1,2-dichlorobenzene.
    k. Diethylphthalate.
    l. Dimethel phthalate.
    m. Ethylbenzene.
    n. Formaldehyde.
    o. Hexavalent chromium.
    p. Isophorone.
    q. Lead.
    r. Mercury.
    s. Methyl ethyl ketone.
    t. Methyl isobutyl ketone.
    u. Methylene chloride.
    v. Napthalene.
    w. Toluene (methylbenzene).
    x. 1,1,1-trichloroethane.
    y. Vinyl chloride.

END OF SECTION

SECTION E: BIDDERS ACKNOWLEDGEMENT

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Bidder must state a Unit Price and Total Bid for each item. The Total Bid for each item must be the product of quantity, by Unit Price. The Grand Total must be the sum of the Total Bids for the various items. In case of multiplication errors or addition errors, the Grand Total with corrected multiplication and/or addition shall determine the Grand Total bid for each contract. The Unit Price and Total Bid must be entered numerically in the spaces provided. All words and numbers shall be written in ink.

1. The undersigned having familiarized himself/herself with the Contract documents, including Advertisement for Bids, Instructions to Bidders, Form of Proposal, City of Madison Standard Specifications for Public Works Construction - 2018 Edition thereto, Form of Agreement, Form of Bond, and Addenda issued and attached to the plans and specifications on file in the office of the City Engineer, hereby proposes to provide and furnish all the labor, materials, tools, and expendable equipment necessary to perform and complete in a workmanlike manner the specified construction on this project for the City of Madison; all in accordance with the plans and specifications as prepared by the City Engineer, including Addenda Nos. _____ through _____ to the Contract, at the prices for said work as contained in this proposal. (Electronic bids submittals shall acknowledge addendum under Section E and shall not acknowledge here)
2. If awarded the Contract, we will initiate action within seven (7) days after notification or in accordance with the date specified in the contract to begin work and will proceed with diligence to bring the project to full completion within the number of work days allowed in the Contract or by the calendar date stated in the Contract.
3. The undersigned Bidder or Contractor certifies that he/she is not a party to any contract, combination in form of trust or otherwise, or conspiracy in restraint of trade or commerce or any other violation of the anti-trust laws of the State of Wisconsin or of the United States, with respect to this bid or contract or otherwise.
4. I hereby certify that I have met the Bid Bond Requirements as specified in Section 102.5. *(IF BID BOND IS USED, IT SHALL BE SUBMITTED ON THE FORMS PROVIDED BY THE CITY. FAILURE TO DO SO MAY RESULT IN REJECTION OF THE BID).*
5. I hereby certify that all statements herein are made on behalf of _____ (name of corporation, partnership, or person submitting bid) a corporation organized and existing under the laws of the State of _____ a partnership consisting of _____; an individual trading as _____; of the City of _____ State of _____; that I have examined and carefully prepared this Proposal, from the plans and specifications and have checked the same in detail before submitting this Proposal; that I have fully authority to make such statements and submit this Proposal in (its, their) behalf; and that the said statements are true and correct.

_____
SIGNATURE

_____
TITLE, IF ANY

Sworn and subscribed to before me this
_____ day of _____, 20_____.

_____
(Notary Public or other officer authorized to administer oaths)
My Commission Expires _____
Bidders shall not add any conditions or qualifying statements to this Proposal.

SECTION F: BEST VALUE CONTRACTING

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Best Value Contracting

1. The Contractor shall indicate the non-apprenticeable trades used on this contract.

_____

_____

2. Madison General Ordinance (M.G.O.), 33.07(7), does provide for some exemptions from the active apprentice requirement. Apprenticeable trades are those trades considered apprenticeable by the State of Wisconsin. Please check applicable box if you are seeking an exemption.

☐ Contractor has a total skilled workforce of four or less individuals in all apprenticeable trades combined.

☐ No available trade training program; The Contractor has been rejected by the only available trade training program, or there is no trade training program within 90 miles.

☐ Contractor is not using an apprentice due to having a journey worker on layoff status, provided the journey worker was employed by the contractor in the past six months.

☐ First-time Contractor on City of Madison Public Works contract requests a onetime exemption but intends to comply on all future contracts and is taking steps typical of a "good faith" effort.

☐ Contractor has been in business less than one year.

☐ Contractor doesn't have enough journeyman trade workers to qualify for a trade training program in that respective trade.

☐ An exemption is granted in accordance with a time period of a "Documented Depression" as defined by the State of Wisconsin.

3. The Contractor shall indicate on the following section which apprenticeable trades are to be used on this contract. Compliance with active apprenticeship, to the extent required by M.G.O. 33.07(7), shall be satisfied by documentation from an applicable trade training body; an apprenticeship contract with the Wisconsin Department of Workforce Development or a similar agency in another state; or the U.S Department of Labor. This documentation is required prior to the Contractor beginning work on the project site.

☐ The Contractor has reviewed the list and shall not use any apprenticeable trades on this project.

LIST APPRENTICABLE TRADES (check all that apply to your work to be performed on this contract)

- ☐ BRICKLAYER
- ☐ CARPENTER
- ☐ CEMENT MASON / CONCRETE FINISHER
- ☐ CEMENT MASON (HEAVY HIGHWAY)
- ☐ CONSTRUCTION CRAFT LABORER
- ☐ DATA COMMUNICATION INSTALLER
- ☐ ELECTRICIAN
- ☐ ENVIRONMENTAL SYSTEMS TECHNICIAN / HVAC SERVICE TECH/HVAC INSTALL / SERVICE
- ☐ GLAZIER
- ☐ HEAVY EQUIPMENT OPERATOR / OPERATING ENGINEER
- ☐ INSULATION WORKER (HEAT & FROST)
- ☐ IRON WORKER
- ☐ IRON WORKER (ASSEMBLER, METAL BLDGS)
- ☐ PAINTER & DECORATOR
- ☐ PLASTERER
- ☐ PLUMBER
- ☐ RESIDENTIAL ELECTRICIAN
- ☐ ROOFER & WATER PROOFER
- ☐ SHEET METAL WORKER
- ☐ SPRINKLER FITTER
- ☐ STEAMFITTER
- ☐ STEAMFITTER (REFRIGERATION)
- ☐ STEAMFITTER (SERVICE)
- ☐ TAPER & FINISHER
- ☐ TELECOMMUNICATIONS (VOICE, DATA & VIDEO) INSTALLER-TECHNICIAN
- ☐ TILE SETTER

SECTION G: BID BOND

KNOW ALL MEN BY THESE PRESENT, THAT Principal and Surety, as identified below, are held and firmly bound unto the City of Madison, (hereinafter referred to as the "Obligee"), in the sum of five per cent (5%) of the amount of the total bid or bids of the Principal herein accepted by the Obligee, for the payment of which the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

The conditions of this obligation are such that, whereas the Principal has submitted, to the City of Madison a certain bid, including the related alternate, and substitute bids attached hereto and hereby made a part hereof, to enter into a contract in writing for the construction of:

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1. If said bid is rejected by the Obligee, then this obligation shall be void.

2. If said bid is accepted by the Obligee and the Principal shall execute and deliver a contract in the form specified by the Obligee (properly completed in accordance with said bid) and shall furnish a bond for his/her 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.

   If said bid is accepted by the Obligee and the Principal shall fail to execute and deliver the contract and the performance and payment bond noted in 2. above executed by this Surety, or other Surety approved by the City of Madison, all within the time specified or any extension thereof, the Principal and Surety agree jointly and severally to forfeit to the Obligee as liquidated damages the sum mentioned above, it being understood that the liability of the Surety for any and all claims hereunder shall in no event exceed the sum of this obligation as stated, and it is further understood that the Principal and Surety reserve the right to recover from the Obligee that portion of the forfeited sum which exceed the actual liquidated damages incurred by the Obligee.

   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 an extension of the time within which the Obligee 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, on the day and year set forth below.

Seal PRINCIPAL

Name of Principal

By Date

Name and Title

Seal SURETY

Name of Surety

By Date

Name and Title

This certifies that I have been duly licensed as an agent for the above company in Wisconsin under National Provider No. _____ for the year _____, and appointed as attorney in fact with authority to execute this bid bond and the payment and performance bond referred to above, which power of attorney has not been revoked.

Date Agent Signature

Address

City, State and Zip Code

Telephone Number

NOTE TO SURETY & PRINCIPAL

The bid submitted which this bond guarantees shall be rejected if the following instrument is not attached to this bond:

Power of Attorney showing that the agent of Surety is currently authorized to execute bonds on behalf of the Surety, and in the amounts referenced above.

Certificate of Biennial Bid Bond

TIME PERIOD - VALID (FROM/TO)
NAME OF SURETY
NAME OF CONTRACTOR
CERTIFICATE HOLDER City of Madison, Wisconsin

This is to certify that a biennial bid bond issued by the above-named Surety is currently on file with the City of Madison.

This certificate is issued as a matter of information and conveys no rights upon the certificate holder and does not amend, extend or alter the coverage of the biennial bid bond.

Cancellation: Should the above policy be cancelled before the expiration date, the issuing Surety will give thirty (30) days written notice to the certificate holder indicated above.

Signature of Authorized Contractor Representative

Date

SECTION H: AGREEMENT

THIS AGREEMENT made this _____ day of _____ in the year Two Thousand and Eighteen between _____ hereinafter called the Contractor, and the City of Madison, Wisconsin, hereinafter called the City.

WHEREAS, the Common Council of the said City of Madison under the provisions of a resolution adopted _____, and by virtue of authority vested in the said Council, has awarded to the Contractor the work of performing certain construction.

NOW, THEREFORE, the Contractor and the City, for the consideration hereinafter named, agree as follows:

1. **Scope of Work.** The Contractor shall, perform the construction, execution and completion of the following listed complete work or improvement in full compliance with the Plans, Specifications, Standard Specifications, Supplemental Specifications, Special Provisions and contract; perform all items of work covered or stipulated in the proposal; perform all altered or extra work; and shall furnish, unless otherwise provided in the contract, all materials, implements, machinery, equipment, tools, supplies, transportation, and labor necessary to the prosecution and completion of the work or improvements:

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2. **Completion Date/Contract Time.** Construction work must begin within seven (7) calendar days after the date appearing on mailed written notice to do so shall have been sent to the Contractor and shall be carried on at a rate so as to secure full completion SEE SPECIAL PROVISIONS, the rate of progress and the time of completion being essential conditions of this Agreement.

3. **Contract Price.** The City shall pay to the Contractor at the times, in the manner and on the conditions set forth in said specifications, the sum of _____($_____) Dollars being the amount bid by such Contractor and which was awarded to him/her as provided by law.

4. **Affirmative Action.** In the performance of the services under this Agreement the Contractor agrees not to discriminate against any employee or applicant because of race, religion, marital status, age, color, sex, disability, national origin or ancestry, income level or source of income, arrest record or conviction record, less than honorable discharge, physical appearance, sexual orientation, gender identity, political beliefs, or student status. The Contractor further agrees not to discriminate against any subcontractor or person who offers to subcontract on this contract because of race, religion, color, age, disability, sex, sexual orientation, gender identity or national origin.

   The Contractor agrees that within thirty (30) days after the effective date of this agreement, the Contractor will provide to the City Affirmative Action Division certain workforce utilization statistics, using a form to be furnished by the City.

   If the contract is still in effect, or if the City enters into a new agreement with the Contractor, within one year after the date on which the form was required to be provided, the Contractor will provide updated workforce information using a second form, also to be furnished by the City. The second form will be submitted to the City Affirmative Action Division no later than one year after the date on which the first form was required to be provided.

   The Contractor further agrees that, for at least twelve (12) months after the effective date of this contract, it will notify the City Affirmative Action Division of each of its job openings at facilities in Dane County for which applicants not already employees of the Contractor are to be considered. The notice will include a job description, classification, qualifications and application procedures

and deadlines. The Contractor agrees to interview and consider candidates referred by the Affirmative Action Division if the candidate meets the minimum qualification standards established by the Contractor, and if the referral is timely. A referral is timely if it is received by the Contractor on or before the date started in the notice.

Articles of Agreement
Article I

The Contractor shall take affirmative action in accordance with the provisions of this contract to insure that applicants are employed, and that employees are treated during employment without regard to race, religion, color, age, marital status, disability, sex, sexual orientation, gender identity or national original and that the employer shall provide harassment free work environment for the realization of the potential of each employee. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation and selection for training including apprenticeship insofar as it is within the control of the Contractor. The Contractor agrees to post in conspicuous places available to employees and applicants notices to be provided by the City setting out the provisions of the nondiscrimination clauses in this contract.

Article II

The Contractor shall in all solicitations or advertisements for employees placed by or on behalf of the Contractors state that all qualified or qualifiable applicants will be employed without regard to race, religion, color, age, marital status, disability, sex, sexual orientation, gender identity or national origin.

Article III

The Contractor shall send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding a notice to be provided by the City advising the labor union or worker's representative of the Contractor's equal employment opportunity and affirmative action commitments. Such notices shall be posted in conspicuous places available to employees and applicants for employment.

Article V

The Contractor agrees that it will comply with all provisions of the Affirmative Action Ordinance of the City of Madison, including the contract compliance requirements. The Contractor agrees to submit the model affirmative action plan for public works contractors in a form approved by the Affirmative Action Division Manager.

Article VI

The Contractor will maintain records as required by Section 39.02(9)(f) of the Madison General Ordinances and will provide the City Affirmative Action Division with access to such records and to persons who have relevant and necessary information, as provided in Section 39.02(9)(f). The City agrees to keep all such records confidential, except to the extent that public inspection is required by law.

Article VII

In the event of the Contractor's or subcontractor's failure to comply with the Equal Employment Opportunity and Affirmative Action Provisions of this contract or Section 39.03 and 39.02 of the Madison General Ordinances, it is agreed that the City at its option may do any or all of the following:

1. Cancel, terminate or suspend this Contract in whole or in part.

2. Declare the Contractor ineligible for further City contracts until the Affirmative Action requirements are met.

3. Recover on behalf of the City from the prime Contractor 0.5 percent of the contract award price for each week that such party fails or refuses to comply, in the nature of liquidated damages, but not to exceed a total of five percent (5%) of the contract price, or five thousand dollars ($5,000), whichever is less. Under public works contracts, if a subcontractor is in noncompliance, the City may recover liquidated damages from the prime Contractor in the manner described above. The preceding sentence shall not be construed to prohibit a prime Contractor from recovering the amount of such damage from the non-complying subcontractor.

Article VIII

The Contractor shall include the above provisions of this contract in every subcontract so that such provisions will be binding upon each subcontractor. The Contractor shall take such action with respect to any subcontractor as necessary to enforce such provisions, including sanctions provided for noncompliance.

Article IX

The Contractor shall allow the maximum feasible opportunity to small business enterprises to compete for any subcontracts entered into pursuant to this contract. (In federally funded contracts the terms “DBE, MBE and WBE” shall be substituted for the term “small business” in this Article.)

5. Substance Abuse Prevention Program Required. Prior to commencing work on the Contract, the Contractor, and any Subcontractor, shall have in place a written program for the prevention of substance abuse among its employees as required under Wis. Stat. Sec. 103.503.

6. **Contractor Hiring Practices.**

Ban the Box - Arrest and Criminal Background Checks. (Sec. 39.08, MGO)

This provision applies to all prime contractors on contracts entered into on or after January 1, 2016, and all subcontractors who are required to meet prequalification requirements under MGO 33.07(7)(I), MGO as of the first time they seek or renew pre-qualification status on or after January 1, 2016. The City will monitor compliance of subcontractors through the pre-qualification process.

a. **Definitions.** For purposes of this section, “Arrest and Conviction Record” includes, but is not limited to, information indicating that a person has been questioned, apprehended, taken into custody or detention, held for investigation, arrested, charged with, indicted or tried for any felony, misdemeanor or other offense pursuant to any law enforcement or military authority.

“Conviction record” includes, but is not limited to, information indicating that a person has been convicted of a felony, misdemeanor or other offense, placed on probation, fined, imprisoned or paroled pursuant to any law enforcement or military authority.

“Background Check” means the process of checking an applicant’s arrest and conviction record, through any means.

b. **Requirements.** For the duration of this Contract, the Contractor shall:

1. Remove from all job application forms any questions, check boxes, or other inquiries regarding an applicant’s arrest and conviction record, as defined herein.

2. Refrain from asking an applicant in any manner about their arrest or conviction record until after conditional offer of employment is made to the applicant in question.

3. Refrain from conducting a formal or informal background check or making any other inquiry using any privately or publicly available means of obtaining the arrest or conviction record of an applicant until after a conditional offer of employment is made to the applicant in question.

4. Make information about this ordinance available to applicants and existing employees, and post notices in prominent locations at the workplace with information about the ordinance and complaint procedure using language provided by the City.

5. Comply with all other provisions of Sec. 39.08, MGO.

c. Exemptions: This section shall not apply when:

1. Hiring for a position where certain convictions or violations are a bar to employment in that position under applicable law, or

2. Hiring a position for which information about criminal or arrest record, or a background check is required by law to be performed at a time or in a manner that would otherwise be prohibited by this ordinance, including a licensed trade or profession where the licensing authority explicitly authorizes or requires the inquiry in question.

To be exempt, Contractor has the burden of demonstrating that there is an applicable law or regulation that requires the hiring practice in question, if so, the contractor is exempt from all of the requirements of this ordinance for the position(s) in question.

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IN WITNESS WHEREOF, the Contractor has hereunto set his/her hand and seal and the City has caused these presents to be sealed with its corporate seal and to be subscribed by its Mayor and City Clerk the day and year first above written.

Countersigned:

Company Name

Witness Date

President Date

Witness Date

Secretary Date

CITY OF MADISON, WISCONSIN

Provisions have been made to pay the liability that will accrue under this contract.

Approved as to form:

Finance Director

City Attorney

Signed this _____ day of _____, 20_____

Witness

Mayor Date

Witness

City Clerk Date

SECTION I: PAYMENT AND PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, that we _____
as principal, and _____
Company of _____ as surety, are held and firmly bound unto the City of Madison, Wisconsin, in the sum of _____ ($_____) Dollars, lawful money of the United States, for the payment of which sum to the City of Madison, we hereby bind ourselves and our respective executors and administrators firmly by these presents.

The condition of this Bond is such that if the above bounden shall on his/her part fully and faithfully perform all of the terms of the Contract entered into between him/herself and the City of Madison for the construction of:

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in Madison, Wisconsin, and shall pay all claims for labor performed and material furnished in the prosecution of said work, and save the City harmless from all claims for damages because of negligence in the prosecution of said work, and shall save harmless the said City from all claims for compensation (under Chapter 102, Wisconsin Statutes) of employees and employees of subcontractor, then this Bond is to be void, otherwise of full force, virtue and effect.

Signed and sealed this _____day of _____

Countersigned:

_____
Company Name (Principal)

_____ _____
Witness President Seal

_____
Secretary

Approved as to form:

_____
Surety Seal
☐ Salary Employee ☐ Commission

_____ By _____
City Attorney Attorney-in-Fact

This certifies that I have been duly licensed as an agent for the above company in Wisconsin under National Producer Number _____ for the year _____, and appointed as attorney-in-fact with authority to execute this payment and performance bond which power of attorney has not been revoked.

_____ _____
Date Agent Signature