Metropolitan Wastewater
MANAGEMENT COMMISSION

partners in wastewater management

PRIME BIDDER PREQUALIFICATION INSTRUCTIONS AND APPLICATION

Project Name and #: Primary Clarifiers and Final Treatment Concrete Repair P80118

Due Date and Time for Prequalification Application: Thursday, March 5, 2026 @ 11:59 PM

Anticipated Bid Date: May 19, 2026

Submit Application by email to: Matt Dapkus @ mdapkus@springfield-or.gov

Date Application Prepared: _____

***Application of:** _____
(Legal Business Name)

Physical Address: _____

***Mailing Address (if different):** _____

***City, State, Zip:** _____

***Contact Person:** _____ ***Phone:** _____

Cell: _____ **Fax:** _____

***Email:** _____

Description of Work

MWMC Project P80118 is a multi-phase project including concrete structure surface demolition and rehabilitation sufficient to remove all unsound concrete, independent lab testing to confirm sound concrete has been reached through demolition techniques, and reconstruction and rehabilitation such that structural integrity and dimensions from the original construction are restored. Some or all of the repaired surfaces will also be treated with an epoxy coating once structural repairs are complete, and mechanical bypass of portions of the final treatment process through installation of temporary pumps and piping will be required to complete repair work in the chlorine contact basins effluent channel. This project will occur in a wastewater environment and present the hazards and corrosive elements typically found in that environment. All concrete rehabilitation Work must be completed in accordance with Attachment A - Specification Section 03 01 32 Repair of Vertical and Overhead Concrete Surfaces and reflect an understanding of the corrosive nature of wastewater and its elements. The MWMC expects that the Work described in Attachment A, with the possible exception of hydro-demolition at each bidder's discretion, will be completed with the Contractor's (Prime Bidder's) own forces. The current construction estimate to complete the Work is $18M.

INSTRUCTIONS

1. INTRODUCTORY STATEMENT

The application and questionnaire forms bound herewith comply with the requirements of public contracting rules for bidder prequalification and must be used in determining the qualifications of applicants to perform the work of the project described herein. Any prospective bidder ***(herein referred to as Applicant)*** must submit a full and complete statement concerning their equipment, experience, and expertise in constructing public improvements of the nature described herein.

2. QUESTIONS ABOUT THE PREQUALIFICATION PROCESS

Applicants who have questions about the prequalification process must submit those by email to the person named herein for the receipt of applications no later than seven (7) days prior to the deadline for submission of applications. Answers to questions will be posted on the MWMC webpage no later than three (3) days prior to the deadline for submission of applications.

3. COMPLETING THE APPLICATION

Complete application must include equipment and experience information only for the specific business organization or entity applying for prequalification, and who would be the signatory on a contract with the MWMC.

Applicant must use care and integrity in preparing this information. The Metropolitan Wastewater Management Commission (MWMC) may make independent inquiries concerning Applicant's past performance and/or capabilities.

All responses and other entries on the form, except signatures, must be filled in electronically or printed by hand in a legible manner. Applicant is responsible for providing all requested information in specific and complete detail. Failure to respond completely may result in rejection of the application at the sole discretion of the MWMC.

Application must be signed by Applicant and sworn to as the form indicates. Signatory of the statement guarantees the truth and accuracy of all responses contained in this application. If email is used to submit application, Applicant must keep the original notarized copy on file until Final Completion of the project.

4. USE OF ATTACHMENTS

Schedules, reports and other forms of prequalification statements may be used as attachments to the prescribed form provided that the information contained therein specifically includes the information required by this form.

5. COMPLIANCE WITH SPECIFICATIONS

In providing the information requested below, each Applicant must clearly demonstrate it can meet the qualifications in Subsection 1.04(A) of Attachment A and is able to perform the work in accordance with the specifications in Attachment A.

6. TIME OF SUBMISSION

Completed application must be received by the MWMC prior to the due date and time for submission of applications indicated herein.

7. NOTIFICATION OF ACTION TAKEN BY THE MWMC

Notice of prequalification status will be given within thirty (30) days of receipt of the application, and not less than thirty-five (35) days prior to the due date and time when Bids for the Work are due. **Only Bids from prequalified Applicants will be considered for the upcoming solicitation.**

8. APPEAL

Applicant shall have the right to appeal the MWMC's decision in accordance with ORS 279C.445-450.

1. BONDING CAPACITY

State the total amount of work, in dollars, which the Applicant can be bonded at one time:

$_____

2. BID AND PERFORMANCE SURETY BONDS

List the following about Applicant's bonding agent:

Agent's Name _____

Agent's Address: _____

Agent's Telephone No.: (_____)_____

3. APPLICANT'S ENTITY STATUS

(a) Applicant is a (check one):

☐ Individual Sole Proprietorship	
☐ General Partnership, state of formation:	
☐ Corporation, state of incorporation:	
☐ Joint Venture, state of formation:	
☐ Member of Joint Venture, state of formation:	
☐ Limited liability company, state of formation:	
☐ Limited partnership, state of formation:	
☐ Limited liability partnership, state of formation:	

(b) Date Entity was formed: _____

(c) If a foreign (out of state) corporation or organization:

(i) Date Entity was authorized to do business in the State of Oregon: _____

(ii) Name and address of Entity's registered agent in Oregon:

Name: _____

Address: (street) _____

(City, state, zip code: _____

(d) If a *non-resident* bidder, has Applicant filed with the Oregon Dept. of Revenue as required by ORS 279A.120?

☐ Yes ☐ N/A – Applicant is a ***resident*** bidder

(e) If doing business under an assumed name:

(i) Assumed Name: _____

(ii) Date Name was registered in Oregon: _____

(f) Officers/persons authorized to execute bids and contracts on behalf of Applicant:

NAME	**TITLE**

(g) How many years has Applicant conducted business under its current name:

As a Prime contractor: _____ years As a subcontractor: _____ years

(h) How many years' experience in construction work:

As a Prime contractor: _____ years As a subcontractor: _____ years

The MWMC may require additional information and documentation from Applicant concerning its entity status.

4. APPLICANT'S EQUIPMENT LISTING

(a) List Equipment and tools owned by the Applicant. List only major items which will be employed in this Work and lump together small equipment and tools.

Quantity, Description and Capacity of Items	**Age(s) in Years**	**Condition of Equipment**

(b) Total market value of equipment: $

(c) If Applicant intends to rent equipment, provide general description of equipment and terms of lease:

5. APPLICANT'S EXPERIENCE

List at least three (3) major projects Applicant has undertaken in the last five (5) years similar to this project, with an emphasis on wastewater facility projects, beginning with most recent. See Summary of Work on page 1.

Project Name	
Project Owner	
Project Owner's Address	
Project Owner Representative's Name	
Project Owner Representative's Phone No.	
Contractor's Superintendent	
Original Contract Amount	
Final Contract Amount	
Date of Completion (if completed)	
Location of Project	
Surety Company if Project Bonded & Amount of Bond	
Name of Design Firm	
Designer Phone Number	

Project Name	
Project Owner	
Project Owner's Address	
Project Owner Representative's Name	
Project Owner Representative's Phone No.	
Contractor's Superintendent	
Original Contract Amount	
Final Contract Amount	
Date of Completion (if completed)	
Location of Project	
Surety Company if Project Bonded & Amount of Bond	
Name of Design Firm	
Designer Phone Number	

APPLICANT'S EXPERIENCE (Continued)

Project Name	
Project Owner	
Project Owner's Address	
Project Owner Representative's Name	
Project Owner Representative's Phone No.	
Contractor's Superintendent	
Original Contract Amount	
Final Contract Amount	
Date of Completion (if completed)	
Location of Project	
Surety Company if Project Bonded & Amount of Bond	
Name of Design Firm	
Designer Phone Number	

Project Name	
Project Owner	
Project Owner's Address	
Project Owner Representative's Name	
Project Owner Representative's Phone No.	
Contractor's Superintendent	
Original Contract Amount	
Final Contract Amount	
Date of Completion (if completed)	
Location of Project	
Surety Company if Project Bonded & Amount of Bond	
Name of Design Firm	
Designer Phone Number	

(Add additional sheets as necessary)

6. APPLICANT'S PRINCIPALS

What is the construction experience of principal individuals in Applicant's organization who, if successful, will be assigned to this project? At a minimum include Owner, Project Manager, onsite Superintendent, and crew Foreman.

Individual's Name	Current Position	Years of Construction Experience	Years of Wastewater Project Experience	In What Capacity or Role

7. LICENSES AND REGISTRATIONS

State which of the following licenses and registrations are held by Applicant and provide the requested information:

License - Registration	Number/Designation
Oregon Secretary of State Corporation Division – Active Business Registry No. https://sos.oregon.gov/business/Pages/find.aspx Phone: (503)986-2200	
Oregon Construction Contractors Board No. www.ccb.state.or.us Phone: 503-378-4621	
International Masonry Institute Concrete Repair Certification Indicate how many field personnel on Applicant's roles who could be assigned to this project possess this certification.	
Other repair mortar and/or epoxy application certifications possessed by field personnel. Indicate how many field personnel on Applicant's roles who could be assigned to this project possess each certification. See attached specification Subsection 1.03(B)(5)	

8. APPLICANT REMARKS

The following space may be used for general remarks and explanations pertaining to the foregoing responses. Applicant is encouraged to use this space to clarify how Applicant is capable of performing the work of the project described in accordance with the attached specification section(s).

9. PRIOR ACTION

(a) Has Applicant ever been denied prequalification by any federal, state or local agency in Oregon or any other state?

☐ Yes ☐ No If yes, explain:

(b) Has Applicant ever been debarred from bidding on contracts by any federal, state or local agency in Oregon or any other state?

☐ Yes ☐ No If yes, explain:

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(c) Has Applicant ever failed to complete a federal, state or local agency public improvement (works) contract in Oregon or any other state?

☐ Yes ☐ No If yes, explain:

(d) Has any officer, partner, shareholder or principal of Applicant ever been found in breach of a federal, state or local agency public improvement (works) contract in Oregon or any other state?

☐ Yes ☐ No If yes, explain:

(e) Has Applicant filed for bankruptcy in the last 10 years?

☐ Yes ☐ No If yes, explain:

(f) Has Applicant had any OSHA violations in the last 10 years?

☐ Yes ☐ No If yes, explain:

(g) Has Applicant had any claims placed against a payment or performance bond in the last 10 years?

☐ Yes ☐ No If yes, explain:

(h) Within the last three years have you, your company, or any officers, agents or employees of your company been found to have violated any State or Federal prevailing wage statute, regulation (including the federal Davis-Bacon and Related Acts and ORS 279C.830 et. seq.) in any Final Order of the Oregon Bureau of Labor and Industries or the US Department of Labor, or by any court of competent jurisdiction?

☐ Yes ☐ No If yes, provide copies of the final order or judgment and explain in detail the following:

- The circumstances behind any violation, including the amount not paid
- Whether the amounts have now been paid
- Reason(s) for the violation
- All efforts undertaken to prevent future violations

10. AFFIDAVIT

Applicant must complete the following affidavit:

STATE OF _____)

ss.

County of _____)

_____ being first sworn, state that I am

_____ of the Applicant herein and that the statements made in this

(Title)

Application is true and I acknowledge that any false, deceptive or fraudulent statements on the application will result in the denial of prequalification and may subject me to charges of false swearing or perjury. Should there be any subsequent material reduction in Applicant's ability to carry out the project for which Applicant desires to submit a bid, Applicant must give written notice of such change to the designated officer to whom this application is submitted at least ten (10) days prior to the bid opening and that it is understood such notice may change Applicant's eligibility to be considered for award of a contract.

_____ _____

(Authorized Representative) **(Title)**

Subscribed and sworn to before me this _____ day of _____, **Year** _____

Notary Seal or Stamp

_____

Original Notary Public Signature

My commission expires _____

SECTION 03 01 32
REPAIR OF VERTICAL AND OVERHEAD CONCRETE SURFACES

PART 1 GENERAL

1.01 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. American Association of State Highway and Transportation Officials (AASHTO): T277, Standard Method of Test for Electrical Indication of Concrete's Ability to Resist Chloride Ion Penetration.
2. American Concrete Institute (ACI):
   a. 301, Specifications for Structural Concrete.
   b. 506.2, Specification for Shotcrete.
3. ASTM International (ASTM):
   a. A615/A615M, Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
   b. A1064/A1064M, Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
   c. A706/A706M, Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement.
   d. C42/C42M, Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
   e. C78/C78M, Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading).
   f. C109/C109M, Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-inch or [50-mm] Cube Specimens).
   g. C157/C157M, Standard Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete.
   h. C293/C293M, Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Center-Point Loading.
   i. C348, Standard Test Method for Flexural Strength of Hydraulic-Cement Mortars.
   j. C469, Standard Test Method for Static Modulus of Elasticity and Poisson's Ratio of Concrete in Compression.
   k. C496/C496M, Standard Test Method for Splitting Tensile Strength of Cylindrical Concrete Specimens.
   l. C531, Standard Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes.

m. C596, Standard Test Method for Drying Shrinkage of Mortar Containing Hydraulic Cement.
n. C666/C666M, Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing.
o. C882/C882M, Standard Test Method for Bond Strength of Epoxy-Resin Systems Used with Concrete by Slant Shear.
p. C928/C928M, Standard Test Method for Bond Strength of Epoxy-Resin Systems Used with Concrete by Slant Shear.
q. C1012/C1012M, Standard Test Method for Length Change of Hydraulic-Cement Mortars Exposed to a Sulfate Solution.
r. C1202, Standard Test Method for Electrical Indication of Concrete's Ability to Resist Chloride Ion Penetration.
s. C1583/C1583M, Standard Test Method for Tensile Strength of Concrete Surfaces and the Bond Strength or Tensile Strength of Concrete Repair and Overlay Materials by Direct Tension (Pull-off Method).
t. D638, Standard Test Method for Tensile Properties of Plastics.
u. D695, Standard Test Method for Compressive Properties of Rigid Plastics.
v. D4258, Standard Practice for Surface Cleaning Concrete for Coating.
w. D4259, Standard Practice for Abrading Concrete.
x. E699, Standard Practice for Evaluation of Agencies Involved in Testing, Quality Assurance, and Evaluating of Building Components.

4. International Concrete Repair Institute (ICRI): 310.2, Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair with CSP Chips.
5. Jacobs STEP Team GMP1 Technical Memorandum, Aeration Basin Rehabilitation Product Prequalification.

1.02 DEFINITIONS

A. Abrasive Blasting: Surface preparation method that uses compressed air intermixed with an abrasive medium to clean surface of substrate concrete, exposed steel, and steel reinforcement. Compressed air and abrasive medium is projected at high speed through a nozzle directly at the surface. Method is used to remove corrosion by-products, laitance, or other materials that may inhibit bond of repair concrete.

B. Defective Area:

1. At exposed concrete, defective areas also include texture irregularities, stains, and other color variations that cannot be removed by cleaning.
2. Cold joints.
3. Surface defects that include honeycomb, rock pockets, indentations, and surface voids greater than 3/16-inch deep, surface voids greater than 3/4-inch in diameter, cracks in liquid containment structures and belowgrade habitable spaces that are 0.005-inch wide and wider, and cracks in other structures with visible leakage or that are 0.010-inch wide and wider, spalls, chips, embedded debris, sand streaks, mortar leakage from form joints, deviations in formed surface that exceed specified tolerances and include but are not limited to fins, form pop-outs, and other projections.

C. High-Pressure Water Blasting: Sometimes referred to as hydro-demolition. Uses water that may contain an abrasive medium, projected under high pressure and high velocity. Used for demolition, cutting, partial or full depth removal, cleaning, scarifying, or roughening of concrete surfaces, or removing existing coatings, for preparation of substrate concrete surfaces.

D. Low-Pressure Spray Mortar: Mortar suitable to be applied by low-pressure spraying, and in small areas may be applied by hand troweling.

E. New Concrete: Concrete less than 60 days old forming structures constructed as part of the Work.

F. Rebound: Shotcrete material, mostly aggregates, that bounce off a surface against which shotcrete was projected.

G. Shotcrete: Mortar pumped through hose and projected at high velocity.

H. Submerged: Location at or below top of wall of open water-holding structure, such as a basin or channel, or wall, ceiling, or floor surface inside a covered water-holding structure, or exterior belowgrade wall or roof surface of water-holding structure, open or covered.

I. Surface Void Ratio (SVR): The ratio of the total surface void area to the total concrete surface area after stripping forms and no subsequent applied surface treatment.

J. Unsound Concrete: Concrete with a pH less than 10, concrete that is deteriorating, carbonated, honeycombed, otherwise defective, or which sounds hollow when sounded.

1.03 SUBMITTALS

A. Action Submittals:

1. Product data sheets for each material supplied.
2. Samples: Mesh reinforcement and mesh anchor.
3. Product data sheet and description of operation for high-pressure water blasting equipment. Include description of how equipment will be adjusted to account for varying concrete strength and hardness.
4. Procedure for installing pins to track the existing concrete surface and procedure for placing piano wire to verify final finish thickness.
5. Procedure for protecting adjacent surfaces that are not subject to repair.

B. Informational Submittals:

1. Repair Mortar System Option: Manufacturer's preparation and installation instructions.
2. Mesh manufacturer's installation instructions and allowable load criteria.
3. Written description of equipment proposed for concrete removal and surface preparation.
4. Written description of equipment proposed for repair mortar installation.
5. Certificates:
   a. Shotcrete Nozzleman: Current ACI Certification for each proposed nozzleman.
   b. Mortar Manufacturer's Certificate of Proper Installation.
6. Statements of Qualification:
   a. Contractor.
   b. Contractor's superintendent.
   c. Hydro-demolition Contractor
   d. Hydro-demolition superintendent
   e. Repair mortar system applicator.
   f. Repair mortar system manufacturer's representative.
   g. Independent Testing Laboratory.
7. Field and Laboratory Test Reports:
   a. Compression test reports.
   b. Tension test reports.
   c. pH test reports. Submit field pH test reports weekly.
   d. Letter from repair mortar manufacturer's representative stating that the surface preparation is adequate for the repair mortar.
8. Confirmation bonding agent conforms to ASTM standards.
9. Written description of expected waste during the application of shotcrete or low-pressure spray mortar repair systems.

1.04 QUALITY ASSURANCE

A. Qualifications:

1. Contractor: Successfully completed to Client's satisfaction three projects of similar size and complexity within the last five years.
2. Contractor's superintendent: Superintendent of a minimum of two of the projects used to qualify Contractor.
3. Hydro-demolition Contractor: Successfully completed to Client's satisfaction three projects of similar size and complexity within the last five years.
4. Hydro-demolition Contractor's superintendent: Superintendent of a minimum of two of the projects used to qualify Contractor.

5. Repair Mortar System Applicator:
   a. For Repair System A – Shotcrete Mortar, trained and experienced applicator recognized or certified by repair mortar system manufacturer.
   b. For Repair System B and System C – Low-Pressure Spray Mortar, in lieu of recognition or certification, demonstrate application of repair mortar manufacturer's system and obtain Certification of Proper Installation, in accordance with Article Manufacturer's Services.
6. Repair Mortar System Manufacturer's Representative: Knowledgeable and experienced on technical data and application requirements for specified products.

B. Independent Testing Laboratory: Meet criteria stated in ASTM E699.

C. Demonstration Mockup for Repair System Option A – Shotcrete Mortar and Repair System Option B – Low-Pressure Spray Mortar Repair System:

1. For each noted type of repair mortar system to be used, prepare one demonstration repair of at least 10 feet long by full wall height in the Final Treatment facility as coordinated with Owner.
2. Repair Mortar System Manufacturer's Demonstration:
   a. Schedule time for manufacturer's demonstration of repair system proposed for Project.
   b. Prepare mortar to specified consistency for testing and placement.
   c. Cure portions of each type of surface to be repaired using proposed curing procedure and materials, including overhead and vertical applications.

d. Prepare surface area in advance of demonstration and obtain manufacturer's acceptance of preparation for each type of application.
e. Demonstrate the following:
    1) Mixing and application equipment capabilities and procedures, including flow of material from nozzle or sprayer.
    2) Nozzle operator and person in charge of low-pressure sprayer, capabilities and ability to follow prescribed application procedures and properly operate equipment and apply surface repair materials.
f. Compression Strength Test: Testing company must make compression test samples from wet mortar during demonstration placement and deliver to independent testing laboratory for testing at 7 days and 28 days.
g. Tensile Bond Test: Test in situ or take a core of demonstration placement and test as specified herein below for tensile bond at 7 days as specified in Paragraph Direct Tension Bond Test.
h. Compression and tension testing on the mockup may be done concurrently with repair system application.

D. Where Required by Engineer, demonstration Mockup for Repair System Option C – Polymer Modified Repair Mortar System:

1. Prepare one demonstration repair of at least 10 feet long by full wall height in the Final Treatment facility as coordinated with Owner.
2. Repair Mortar System Demonstration:
    a. Schedule time for demonstration of repair system proposed for Project.
    b. Prepare mortar to specified consistency, for testing and placement.
    c. Cure portions of each type of surface to be repaired using proposed curing procedure and materials, including overhead and vertical applications.
    d. Prepare surface area in advance of demonstration and obtain manufacturer's acceptance of preparation for each type of application.
    e. Demonstrate mixing and application procedures.
    f. Compression Strength Test: Make compression test samples from wet mortar during demonstration placement and deliver to independent testing laboratory for testing at 7 days and 28 days.
    g. Tensile Bond Test: Test in situ or take a core of demonstration placement and test for tensile bond at 7 days as specified in Paragraph Direct Tension Bond Test.

h. Compression and tension testing on the mockup may be done concurrently with repair system application.

E. Prerepair Conference:

1. Required Meeting Attendees:
   a. Contractor.
   b. Repair Subcontractor.
   c. Technical representative for repair material manufacturer.
   d. Engineer.
   e. Testing agency.
   f. Owner.
2. Schedule and conduct prior to incorporation of respective products into Project. Notify Engineer and Owner of location and time.
3. Agenda must include, but not limited to:
   a. Review of field conditions. Conduct field observations of the Work to be performed.
   b. Based on above observations, repair material manufacturer's technical representative must confirm material selection and make Project specific repair method recommendations.
   c. Technical representative for repair material manufacturer must review proposed surface preparation, material application, consolidation, finishing, curing, and protection of repair material from weather conditions.
   d. Review of protection measures for adjacent surfaces not subject to repair.
   e. Other specified requirements requiring coordination.

1.05 MEASUREMENT AND PAYMENT

A. Measurement for vertical and overhead concrete surface removal and repair pay items must be determined per the following procedure:

1. Prior to removal of existing concrete, install 1/4-inch diameter Type 316, stainless steel rods into face of existing walls (at right angle to wall) in a vertical row at 25 feet on center horizontally. Each vertical row shall consist of three anchor rods equally spaced. The rods must be located 12 inches below top of wall, mid-height of the wall, and 12 inches above bottom of wall. Drill and epoxy these stainless steel rods a minimum of 3 inches into the existing wall.
2. After installation of steel rods, cut rods flush with the face of existing concrete. Rods will subsequently be used for measurement purposes. Prior to rod placement, Contractor must prepare a rod layout grid with grid naming convention to allow uniform reference to each area of

concrete repair and submit for Engineer's approval. All measurement and payment must follow this rod layout and naming convention.

3. Remove existing concrete as indicated herein.
4. Following removal of existing concrete, install additional, new 1/4-inch diameter x minimum 6-inch-long Type 316 stainless steel rods 12 inches away from and adjacent to all existing rods. Cover rod ends with rubber bulb to reduce risk of accidental injury after installation. Drill and epoxy new rods a minimum of 3 inches beyond face of demolished concrete. String a steel piano wire between the new rods at the depth of the original existing concrete surface (i.e. with piano wire just touching end of rods placed flush with original concrete surface) and to meet the tolerances listed herein.
5. Screed final product as indicated to original existing concrete surface profile unless a maximum of 1/2 inch of additional build out is required to provide a minimum of 2 inches of clearance over exposed reinforcing.
6. Payment for removal will be based upon measured thickness of removed concrete at rods. The thickness will be determined by averaging the measured depth of removal over each 100 square foot area to determine total quantities for each pay item.
7. Payment for installation of repair will be based upon the measured thickness determined for removal of each 100 square foot area plus any anticipated build out to provide clearance over exposed reinforcing as described in this section. The thickness will be determined by averaging the measured depth of application over each 100 square foot area to determine total quantity for payment.
8. Contractor may submit alternate methods of measurement subject to Owner and Engineer's approval.
9. Pay Items and Unit of Measurement:
    a. Vertical and Overhead Concrete Surface Removal and Repair; Square Foot:
        1) 0 Inch to expected depth noted on Drawings Removal Depth and Repair Layer Thickness: Lump Sum.
        2) Expected depth to expected depth + 1/2" Removal Depth and Repair Layer Thickness: Unit Price.
        3) Greater than expected depth +1/2" Inch Removal Depth and Repair Layer Thickness where approved by Engineer: Unit Price.
        4) Greater than expected depth +1/2" Inch Removal Depth and Repair Layer Thickness where not approved by Engineer: Considered Contractor's means and methods and will not be paid.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Package repair mortar system products in moisture-resistant bags, pails, or moisture-resistant bulk bags.

B. Deliver, store, and handle repair materials in accordance with manufacturer's printed instructions.

1.07 EXISTING FACILITIES

A. Clarifier Rehabilitation:

1. Prior to turnover to the Contractor, Owner will drain and wash down the Clarifier launder, removing residual sludge, grit and scum on the walls. Wash down water will be drained from the launder by Owner, leaving less than 4 inches of standing water remaining. Contractor must provide final cleaning prior to allowing entry of personnel into the basins.
2. Dispose of water after handover from Owner. Coordinate with plant staff for disposal requirements.
3. Coordinate removal and re-installation of the clarifier covers as required.
4. Protect existing clarifier coatings on the main clarifier slab and walls.

B. Final Treatment Rehabilitation:

1. Prior to turnover to the Contractor, Owner will drain and wash down the basin, removing residual sludge, grit and scum on the walls. Wash down water will be drained from the channel by Owner, leaving less than 4 inches of standing water remaining. Contractor must provide final cleaning prior to allowing entry of personnel into the basins.
2. Dispose of water after handover from Owner. Coordinate with plant staff for disposal requirements.

PART 2 PRODUCTS

2.01 REPAIR SYSTEM A – SHOTCRETE MORTAR

A. Mortar Materials:

1. Blend of selected portland cements, microsilica, and specially graded aggregates and fibers applicable for vertical and overhead surfaces.
2. Materials must not contain asbestos, chlorides, nitrates, added gypsum, added lime, or high aluminum cements.
3. Noncombustible before and after cure.
4. Furnish in factory proportioned unit.

5. Workability from 1/4-inch in depth and greater.

B. Mixed Mortar Properties:

1. Working Time: 5 minutes to 10 minutes.
2. Finishing Time: 10 minutes to 20 minutes.
3. Color: Dark gray.

C. Cured Mortar Properties:

1. Compressive strength for 2-inch cubes in accordance with ASTM C109/C109M, or 3-inch cubes in accordance with manufacturer's modification to ASTM C109/C109M:
   a. 7 Days: 4,000 pounds per square inch minimum.
   b. 28 Days: 6,000 pounds per square inch minimum.
2. Flexural Strength (Modulus of Rupture), ASTM C78/C78M or ASTM C348 (Modified) at 28 Days: 750 pounds per square inch minimum.
3. Splitting Tensile Strength, ASTM C496/C496M at 28 Days: 400 pounds per square inch minimum.
4. Slant Shear Bond Strength, ASTM C882/C882M Test Method Modified with No Bonding Agent, at 28 Days: 2,000 pounds per square inch minimum.
5. Drying Shrinkage, ASTM C157/C157M Modified at 28 Days or ASTM C531: 0.1 percent maximum.
6. Chloride Ion Permeability Based on Charge Passed, ASTM C1202: 1,100 coulombs maximum.
7. Mortar must not produce a vapor barrier.

D. Mortars that exceed the 1,100 coulombs maximum chloride ion permeability requirement on submerged surfaces must be coated with an epoxy.

2.02 REPAIR SYSTEM B – LOW-PRESSURE SPRAY MORTAR

A. One-component or two-component, cement based, fiber reinforced, shrinkage compensated, gray in color, with a minimum 30-minute working time.

B. Cured materials mixed in accordance with manufacturer's instructions must conform to the following criteria:

1. Compressive Strength, ASTM C109/C109M at 7 Days: 4,000 pounds per square inch minimum.
2. Compressive Strength, ASTM C109/C109M at 28 Days: 6,000 pounds per square inch minimum.

3. Flexural Strength, ASTM C348 at 28 Days: 750 pounds per square inch minimum.
4. Slant Shear Bond Strength, ASTM C882/C882M Test Method Modified with No Bonding Agent, at 28 Days: 2,000 pounds per square inch minimum.
5. Splitting Tensile Strength, ASTM C496/C496M at 28 Days: 400 pounds per square inch minimum.
6. Drying Shrinkage, ASTM C157/C157M Modified at 28 Days or ASTM C531: 0.1 percent maximum.
7. Chloride Ion Permeability Based on Charge Passed, ASTM C1202: 1,100 coulombs maximum.
8. System must not produce a vapor barrier.
9. Sprayable, extremely low permeability, sulfate resistant, easy to use and requiring only addition of water.
10. Free of chlorides and other chemicals causing corrosion.

C. Mortars that exceed the 1,100 coulombs maximum chloride ion permeability requirement on submerged surfaces must be coated with an epoxy.

2.03 REPAIR SYSTEM C – POLYMER-MODIFIED REPAIR MORTAR

A. Polymer-modified, one-component or two-component, cementitious based, chloride resistant, flowable, gray in color, working time of 20 minutes minimum, surface renovation mortar.

B. Cured Mortar Properties:

1. Compressive Strength, ASTM C109/C109M at 7 Days: 4,000 pounds per square inch minimum.
2. Compressive Strength, ASTM C109/C109M at 28 Days: 6,000 pounds per square inch minimum.
3. Flexural Strength, ASTM C348 at 28 Days: 750 pounds per square inch minimum.
4. Slant Shear Bond Strength, ASTM C882/C882M Test Method Modified with No Bonding Agent, at 28 Days: 2,000 pounds per square inch minimum.
5. Splitting Tensile Strength, ASTM C496/C496M at 28 Days: 400 pounds per square inch minimum.
6. Drying Shrinkage, ASTM C157/C157M Modified at 28 Days or ASTM C531: 0.1 percent maximum.
7. Chloride Ion Permeability Based on Charge Passed, ASTM C1202: 1,100 coulombs maximum.
8. System must not produce a vapor barrier.

C. Mortars that exceed the 1,100 coulombs maximum chloride ion permeability requirement on submerged surfaces must be coated with an epoxy.

2.04 WATER

A. Clean and free from oil, acid, alkali, organic matter, or other deleterious substances, meeting federal drinking water standards.

2.05 REINFORCEMENT

A. Deformed Steel Reinforcement:

1. ASTM A615/A615M or ASTMA706/A706M, Grade 60, where welding is not required.
2. ASTM A706/A706M, Grade 60, for steel reinforcement to be welded.

B. Tie Wire: 16-gauge, galvanized.

2.06 CEMENTITIOUS BONDING AGENT

A. Cementitious adhesive, specifically formulated for bonding plastic portland cement concrete or mortar to hardened portland cement concrete.

1. Mixed Bonding Agent Properties:
   a. Pot Life: 75 minutes to 105 minutes.
   b. Contact Time: 24 hours.
2. Cured Cementitious Adhesive Properties:
   a. Splitting Tensile Strength, ASTM C496/C496M at 28 Days: 500 pounds per square inch minimum.
   b. Flexural Strength, ASTM C348: 1,000 pounds per square inch minimum.
   c. Slant Shear Bond Strength, ASTM C882/C882M at 14 Days:
      1) 2-Hour Open Time: 2,500 pounds per square inch minimum.
      2) 24-Hour Open Time: 2,000 pounds per square inch minimum.
3. Bonding agent must not produce a vapor barrier.
4. Compatible with and from same manufacturer as the repair system used.

B. Product must match what was installed in the test repair. Systems that used a bonding agent must use the bonding agent when applied in the Work. The test repair system that did not use a bonding agent must not use a bonding agent when applied in the Work.

2.07 REINFORCING CORROSION INHIBITOR

A. Cementitious epoxy coating with corrosion inhibitor.

B. Compatible with repair mortar being used.

C. Manufacturers and Products:

1. Sika Chemical Corp., Lyndhurst, NJ; Armatec 110 EpoCem.
2. Euclid Chemical Co., Cleveland, OH; Duralprep A.C.
3. Master Builder Solutions, Beachwood, OH; MasterEmaco P124.

2.08 EVAPORATION RETARDANT

A. As specified in specification Section 03 39 00, Concrete Curing.

2.09 CURING COMPOUND

A. As specified in specification Section 03 39 00, Concrete Curing. Curing compound must not be used on surfaces that will receive a coating.

2.10 FIELD PH TESTING

A. Manufacturers and Products:

1. Micro Essential Laboratory, Brooklyn, NY: Hydrion Insta-check 0-13 Mechanical pH pencil.
2. Germann Instruments Inc, Evanston, IL: Rainbow Indicator Spray.
3. Germann Instruments Inc, Evanston, IL: Deep Purple Spray.

PART 3 EXECUTION

3.01 GENERAL

A. Existing Concrete Work: Repair concrete as identified in Contract Documents.

3.02 APPLICATION

A. Apply repair mortar in accordance with manufacturer’s recommendations.

B. Where a mortar pump is used, provide operable backup mortar pump of equal or better performance than the primary mortar pump. Backup pump must be on site and available at all times. Provide spare parts on site for commonly broken or worn items to minimize pump down time.

3.03 SURFACE VOID RATIO EVALUATION AND LIMITS

A. SVR Evaluation:

1. Void area is the summation of the areas of all voids within a sample space of 24-inch by 24-inch. Voids with an average diameter of less than 3/32-inch are excluded.
2. Surface void ratio is only required to be determined if the entire impression of the surface does not meet the contract expectation as set by the Mock-up Panels.

B. SVR Limits:

1. Void area not to exceed 1.2 percent of test area.
2. Maximum allowed void diameter: 1/2-inch.

3.04 PREPARATION

A. At the Rehabilitation locations, remove unsound concrete to the minimum depth indicated in the Contract Documents. Using pH field testing and sounding, remove additional concrete with a pH of less than 10. Perform field pH tests per testing product manufacturer's instructions. Perform one test every 25 square feet for the first 3 days of concrete removal and every 250 square feet thereafter. Retest as required to expose concrete with a pH greater than 10. Record the pH at each test location in a log for submittal. Test must be performed within 7 hours of concrete demolition to prevent surface carbonation.

B. At the Rehabilitation locations, place pins to mark the existing surface prior to commencing hydrodemolition. The surface control pins must be reviewed and verified with the onsite inspector prior to removal of existing surface. Once the existing surface has been removed, verify with the onsite inspector the accuracy of piano wire or equivalent method for the final finish thickness.

C. Remove unsound concrete from work areas.

1. Use 8,000 pounds per square inch minimum high-pressure water blasting machine as required for Site conditions.
2. Hydrodemolition equipment and the pressure used must be selected such that the machine operator and the inspector can immediately observe the demolished area and ensure that the maximum demolition depth is not being exceeded. Equipment must be able to account for varying concrete strength and hardness.

3. Remove concrete to abrade substrate concrete surfaces to a minimum amplitude as required by the repair mortar manufacturer's product literature.
4. Where final surface is required to be flush with existing adjacent surface remove existing concrete depth as required for application of minimum thickness of repair mortar.
5. Sound concrete by tapping with maximum 24 ounce masons hammer after hydrodemolition and remove fins and loose aggregate that were left behind.
6. Following removal of unsound concrete, check substrate concrete surface by sounding techniques to identify unsound concrete remaining or resulting from use of chipping hammer.

D. Do not use power-driven jackhammers, chipping hammers, or scabblers unless water blasting is not permitted or practical because of Site conditions or may cause other damage to equipment or facilities. In such cases where chipping hammers are required, limit size of chipping hammer to 16 pounds or lighter, or use small electric chipping hammer, to reduce formation of micro-fractures in substrate concrete surface.

E. Pressure wash areas with likely surface voids to remove laitance and expose underlying voids.

F. Remove unsound concrete. Repair system manufacturer's representative, Engineer, or Engineer's representative must confirm that unsound concrete has been removed.

G. Square edges of patch areas by sawing or chipping to avoid tapered shoulders or feather edges. Avoid cutting embedded steel reinforcement. Roughen polished saw-cut edge by high-pressure water blasting.

H. Remove concrete adjacent to steel reinforcement to a minimum of 3/4-inch clearance around steel reinforcement for application and bonding of new repair mortar to circumference of exposed steel reinforcement if it is evident that bond between existing concrete and steel reinforcement has been destroyed or has deteriorated as determined by Engineer.

I. Clean exposed steel reinforcement of loose rust and concrete splatter per recommendations of repair material manufacturer and in accordance with ASTM D4258 and coat with the specified corrosion inhibitor. Do not exceed the manufacturer's open time for the corrosion inhibitor.

J. Keep areas from which concrete has been removed free of dirt, dust, and water blasting waste slurry. Remove laitance and other bond inhibiting contamination from prepared areas.

K. Dampen repair areas at least 6 inches beyond area to receive repair mortar for at least 24 hours to provide saturated surface dry (SSD) condition without standing water at time of application of mortar as required by and in accordance with repair mortar manufacturer's printed instructions.

L. Collect spent water and concrete debris from removal operations and dispose of offsite in manner and location acceptable to Owner.

3.05 REINFORCEMENT INSTALLATION

A. Provide steel reinforcement when existing reinforcement is not exposed, and when mortar application is more than 3 inches deep, unless otherwise shown on the Drawings.

B. Replace deteriorated steel reinforcement that is missing 25 percent or greater of the steel area with new steel reinforcement equivalent in cross-sectional area to the lost sectional area. Extend the new steel reinforcement a lap length past the corroded area. New steel reinforcing must have at least 2-inches of concrete cover after placement of the repair mortar. Coat the new reinforcing with corrosion inhibitive coating.

C. Provide steel mesh reinforcing and anchors where required by repair mortar manufacturer's installation instructions.

D. Coat exposed new and existing steel reinforcement with cementitious reinforcement coating at same time as substrate concrete is coated with cementitious bonding agent, as specified below, per repair mortar and cementitious reinforcement coating manufacturers' printed instructions. Ensure the open time of the coating and bonding agent is not exceeded.

3.06 PROTECTION

A. If cementitious coating, reinforcing corrosion inhibitor, or bonding agent is used, protect adjacent surfaces from over application. Promptly remove cementitious coating, reinforcing corrosion inhibitor, or bonding agent applied beyond repair area.

B. Protect adjacent surfaces, and equipment from overshooting, rebound, and dust, as applicable for repair mortar system used.

C. Protect existing expansion joints during hydrodemolition and mortar application. Document the location of expansion joints to ensure no expansion joints are covered during mortar application.

3.07 REPAIR SYSTEM A – SHOTCRETE MORTAR PLACEMENT

A. Apply shotcrete mortar in accordance with manufacturer's instructions.

B. Track quantity of repair mortar applied by taking depth measurements based on the previously placed piano wire guides. Depth measurement exceeding 1/2 inches beyond approved removal depth, unless authorized by Engineer and Owner, are considered Contractor's means and methods. The number of bags used is not an acceptable measurement of the quantity of mortar applied. The rate of material waste is considered part of the Contractor's means and methods.

C. Do not reuse rebound materials.

D. Apply mortar using dry mix process, in accordance with ACI 506.2.

E. Shotcrete mortar must emerge from nozzle in a steady, uninterrupted flow. If flow becomes intermittent, direct flow away from the Work until flow of mortar becomes constant.

F. Applied Shotcrete Mortar: Minimum thickness to return wall to original design thickness as noted on the Drawings.

G. Nozzle Position: Hold nozzle approximately at right angles to and at a distance from surface in accordance with shotcrete repair mortar system manufacturer's instructions for type of application, nozzle, and air pressure used.

H. Steel Reinforcement Encasement:

1. Modify procedure of shooting shotcrete mortar to better direct material around reinforcement bars.
2. Prevent shotcrete mortar from building up on reinforcement steel when shooting on, around, through, and behind steel to eliminate voids.
3. Provide dense void-free encasement of reinforcement steel.

I. Application of multiple layersmust be done in accordance with shotcrete repair mortar system manufacturer's printed instructions.

J. Slice off excess material with a wire screed 5 minutes to 10 minutes after initial set.

K. Apply smooth form-like finish to exposed shotcrete mortar surface and in accordance with manufacturer's instructions. Apply full strength evaporation retardant.

L. Remove rebound, sand, and miscellaneous debris continuously throughout shotcrete mortar application, and dispose of offsite at an approved disposal facility.

M. Cure in accordance with Subsection 3.11 of this specification section.

3.08 REPAIR SYSTEM B – LOW-PRESSURE SPRAY MORTAR PLACEMENT

A. Mix mortar in accordance with manufacturer's printed instructions.

B. After priming prepared substrate concrete surface per manufacturer's recommendations, apply mortar by low-pressure spraying equipment, unless noted otherwise. At small repair areas, low-pressure spray mortar may be applied by troweling if allowed per the manufacturer's recommendations.

C. Track quantity of repair mortar applied by taking depth measurements based on the previously placed piano wire guides. Depth measurement exceeding 1/2 inches beyond approved removal depth, unless authorized by Engineer and Owner, are considered Contractor's means and methods. The number of bags used is not an acceptable measurement of the quantity of mortar applied. The rate of material waste is considered part of the Contractor's means and methods.

D. Bonding Agent:

1. Use bonding agent when used in demonstration repair for hand applied areas, in accordance with repair mortar manufacturer's instructions.
2. Application of repair mortar over bonding agent must be completed within time frame recommended by bonding agent manufacturer.
3. Consult with manufacturer for optimum and minimum acceptable degrees of surface tackiness of coat.

E. Work mortar firmly and quickly into repair area.

F. Finish repair mortar to match adjacent concrete surface.

G. Provide evaporation retardant at full strength.

H. Cure in accordance with Subsection 3.11 of this specification section.

3.09 REPAIR SYSTEM C – POLYMER-MODIFIED REPAIR MORTAR PLACEMENT

A. Mix mortar in accordance with manufacturer's printed instructions.

B. Bond Coat: Apply to prepared substrate concrete surface before application of mortar if applied during demonstration repair in accordance with repair mortar manufacturer's printed instructions. Do not apply more bond coat than can be covered with mortar before bond coat dries. Do not retemper bond coat.

C. Place mortar by hand or low-pressure spray and trowel to specified surface finish, in accordance with requirements of repair material's printed instructions.

D. Cure in accordance with Subsection 3.11 of this specification section, and in accordance with manufacturer's printed instructions.

3.10 FINISH

A. Finish repair mortar to smooth even surface to match adjacent concrete surface or with a smooth trowel finish if there is no adjacent finished concrete.

B. Tolerances:

1. Wall must be plumb to within 1/4-inch in 10 feet.
2. Depressions in wall surface must not exceed 1/4-inch when 10-foot straightedge is placed on high points in all directions.

3.11 CURING

A. Prior to curing, apply water fog to repair mortar system in accordance with repair mortar system manufacturer's printed instructions.

B. Cure in accordance with repair mortar manufacturer's printed instructions.

C. Where permitted by repair mortar manufacturer's printed instructions, commence water curing after repair mortar system application and when curing will not cause erosion of mortar.

D. Continuously water cure repair mortar system for the length of time it takes the repair mortar to reach 4,000 pounds per square inch or the manufacturer's required cure period, whichever is greater.

E. Do not cure using curing compound or membrane, unless method is part of repair mortar system manufacturer's printed instructions and approval is obtained from Engineer. Do not use curing compound on surfaces that will receive a future coating.

F. Cure intermediate layers of repair mortar in accordance with repair mortar manufacturer's printed instructions.

G. Where curing compound is permitted by repair mortar system manufacturer, apply curing compound in accordance with specification Section 03 39 00 Concrete Curing.

3.12 FIELD QUALITY CONTROL

A. Sounding for Hollow Areas:

1. Light hammer tap repaired areas listening for hollow sound to determine areas that have not properly bonded to substrate concrete.
2. Mark hollow areas for removal and replacement.

B. Testing laboratory retained by Owner will provide the following:

1. Compression Strength Test:
   a. Testing will follow a ASTM C109/C109M.
   b. Cure test samples as specified.
   c. A minimum of three production samples of mixed material will be obtained from each 500 square feet of mortar repair, and a minimum of three samples in total, whichever is greater, for testing at 7 days, and 28 days.
   d. Record location where repair mortar is being applied at time production samples are obtained.
2. Direct Tension Bond Test:
   a. In situ Bond Testing: Perform tension bond test in accordance with ASTM C1583/C1583M.
   b. Perform three tests for each 2000 square feet of repair work.
   c. Record locations of Bond Tests on each type of applied repair mortar tested.
   d. Conduct test 10 days minimum after placement of mortar or as recommended by the repair manufacturer's representative.
   e. Measure the expected mortar depth at the core locations prior to installing mortar.
   f. Locate wall reinforcing prior to drilling core holes. Avoid cutting existing reinforcing.

g. Tests that have the failure in the concrete substrate pass. Tests that have the failure at the interface between the concrete substrate and the repair mortar or within the repair mortar fail.

C. Retest mortar repairs that do not meet test requirements.

D. Repair and fill holes using same repair mortar where core samples have been removed.

3.13 MORTAR REPAIR FAILED TEST

A. Remove and replace unacceptable Work.

B. Hollow Sounding Areas: Saw cut hollow sounding areas to a new square edge. Remove unsound mortar repair. Prepare substrate surface and reapply repair mortar as specified herein.

C. Failed Compression Strength Test: Remove affected areas of repair mortar represented by failed compression strength test results. Prepare substrate surface and reapply repair mortar as specified herein.

D. Failed Bond Tests: Remove affected areas of repair mortar represented by failed bond test results. Prepare substrate surface and reapply repair mortar as specified herein.

E. Retest areas where repair mortar was removed and replaced, in accordance with test requirements specified herein.

3.14 MANUFACTURER'S SERVICES

A. Provide repair mortar system manufacturer's representative at Site to review acceptability of surface preparation, mixing and installation assistance, training of repair mortar system applicators, inspection, and certification of proper installation.

B. The representative must be on site daily during the first 3 days of repair mortar application and at least weekly thereafter as required to confirm surface preparation and mortar application procedures.

3.15 CLEANING

A. Remove overshot shotcrete, Repair System A and low-pressure spray, Repair System B repair mortar and rebound materials as the Work proceeds. Remove waste materials, unsound material from concrete surfaces, material chipped from structure, and water used in preparation of or repair areas, finishing, and curing, and dispose offsite at an approved disposal site.

END OF SECTION