

ADDENDUM

Peoria Park District
Planning, Design and Construction Department
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ADDENDUM NO. ONE

PROJECT TITLE: STRUCTURAL
CONCRETE REPAIRS

ISSUANCE DATE: April 4, 2025

LOCATION: CENTRAL PARK POOL

The proposed Contract Documents for this Work are modified as follows:

- I. **GENERAL INFORMATION:** No Change

- II. **DRAWINGS:** Remove Sheets S001, S101, and S102, all stamped with “Issued for Review Not for Construction” and **Replace** with the attached stamped and sealed sheets S001, S101, and S102.

- III. **PROJECT MANUAL/TABLE OF CONTENTS/PROJECT SPECIFICATIONS:**
 - A. Under Technical Specifications, **Remove** text that reads “SECTION 071616- CEMENTIOUS CRYSTALLINE WATERPROOFING” and **Replace** with text that reads “SECTION 071616- REPAIR COMPLETE, SEAL WALL LEAK”

 - PROJECT MANUAL/SPECIFICATIONS.**
 - A. Add the attached technical specification ‘SECTION 033000- GENERAL CONCRETE WORK’
 - B. Add the attached technical specification ‘SECTION 051200- STEEL FRAMING’
 - C. Add the attached technical specification ‘SECTION 071616- REPAIR COMPLETE, SEAL WALL LEAK’

- IV. **INVITATION TO BID:** No Change

END OF ADDENDUM NO. ONE

(Addendum may be bound into Project Manual, attached to front cover, faxed, mailed, emailed or delivered to bidders.)

SECTION 033000 - GENERAL CONCRETE WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, finishes, concrete repair materials, concrete sealers and traffic membranes applied to concrete substrates.

1.3

- A. Cementitious Materials: Portland cement alone or in combination with one (1) or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments:
 - 1. Indicate amounts of mixing water to be withheld for later addition at Project site.
- C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

1.5 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For each of the following, signed by manufacturers:
 - 1. Cementitious materials.
 - 2. Admixtures.
 - 3. Steel reinforcement and accessories.
 - 4. Curing compounds.

5. Bonding agents.
6. Adhesives.
7. Repair materials.

B. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:

1. Aggregates.

C. Field quality-control reports.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment:

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

B. Testing Agency Qualifications: An independent agency, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated:

1. Personnel conducting field tests shall be qualified as ACI Concrete Field-Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.

C. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M, "Structural Welding Code - Reinforcing Steel."

E. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301, "Specifications for Structural Concrete," Sections 1 through 5.
2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

F. Repair guidelines:

1. ICRI Technical Guideline No. 310.R – Guideline for surface preparation for the repair of deteriorated concrete resulting from reinforcing steel corrosion.
2. ACI RAP Bulletin 1- Structural Crack Repair by Epoxy Injection
3. ACI RAP Bulletin 4 - Surface Repair Using Form-and-Pour Techniques
4. ACI RAP Bulletin 5 - Surface Repair Using Form-and-Pump Techniques

5. ACI RAP Bulletin 6 - Vertical and Overhead Spall Repair by Hand Application
6. ACI RAP Bulletin 7 - Spall Repair of Horizontal Concrete Surfaces
7. ACI RAP Bulletin 8 - Installation of Embedded Galvanic Anodes

- G. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage. Avoid damaging coatings on steel reinforcement.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints:
1. Plywood, metal, or other approved panel materials.
- B. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 in. by 3/4 in., minimum.
- C. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces:
1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- D. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal:
1. Furnish units that will leave no corrodible metal closer than 1 in. to the plane of exposed concrete surface.
 2. Furnish ties that, when removed, will leave holes no larger than 1 in. in diameter in concrete surface.

2.2 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
- B. All-Thread Bars: ASTM F593, Grade 60 (Stainless Steel)
- C. Plain-Steel Wire: ASTM A 82/A 82M, as drawn.

- D. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain, fabricated from as-drawn steel wire into flat sheets.

2.3 REINFORCEMENT ACCESSORIES

- A. Concrete Screw Anchors:
 - 1. Hilti: KH-EZ SS316 Screw Anchor or approved equal
- B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
 - 1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.
 - 2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.

2.4 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
 - 1. Portland Cement: ASTM C 150, Type I/II, gray. Supplement with the following:
 - a. Fly Ash: ASTM C 618, Class F or C.
 - b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
- B. Normal-Weight Aggregates: ASTM C 33, Class 3M coarse aggregate or better, graded. Provide aggregates from a single source:
 - 1. Maximum Coarse-Aggregate Size:
 - a. Precast Panel Support Foundations: 3/4 in.- nominal.
 - b. Concrete repairs with exposed reinforcing: 3/8 in.- nominal.
 - c. Full depth concrete repairs: 3/8 in.- nominal.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- C. Water: ASTM C 94/C 94M and potable.

2.5 CONCRETE REPAIR MATERIALS

- A. Crack Healer/Sealer Repair Material:
 - 1. Sika Corporation; Sikadur 35 Hi Mod LV
- B. Cementitious Patching Material: Vertical and Overhead Repairs:

1. Sika Corporation; Sikaquick VOH, or
 2. Sika Corporation; Sikacrete 211 SCC+
- C. Cementitious Patching Material: Horizontal Repairs:
1. Sika Corporation; Sikaquick 1000, or
 2. Sika Corporation; Sikacrete 421 CI Rapid
- D. Cementitious Bonding Agent and Reinforcement Protection:
1. Sika Corporation; Sika Armatec EpoCem 110. (verify compatibility with epoxy coating or reinforcement)

2.6 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C 260.
- B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride:
1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
 4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
 6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.
- C. Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C 494/C 494M, Type C:
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Axim Italcementi Group, Inc.; CATEXOL CN-CI.
 - b. BASF Construction Chemicals - Building Systems; Rheocrete CNI.
 - c. Grace Construction Products, W. R. Grace & Co.; DCI.
 - d. Sika Corporation; Sika CNI.
- D. Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-set-accelerating, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete:
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. BASF Construction Chemicals - Building Systems; Rheocrete 222+.

- b. Grace Construction Products, W. R. Grace & Co.; DCI-S.
- c. Sika Corporation; FerroGard 901.

2.7 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete:
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. BASF Construction Chemicals - Building Systems; Confilm.
 - b. Conspec by Dayton Superior; Aquafilm.
 - c. Dayton Superior Corporation; Sure Film (J-74).
 - d. Euclid Chemical Company (The), an RPM company; Eucobar.
 - e. Kaufman Products, Inc.; Vapor-Aid.
 - f. Meadows, W. R., Inc.; EVAPRE.
 - g. Sika Corporation; SikaFilm.
- B. Water: Potable.

2.8 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301:
 - 1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
 - 1. Fly Ash: 25 percent.
 - 2. Combined Fly Ash and Pozzolan: 25 percent.
- C. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.
- D. Admixtures: Use admixtures according to manufacturer's written instructions:
 - 1. Use water-reducing high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.

2.9 CONCRETE MIXTURES FOR CONCRETE REPAIRS

- A. Repair Concrete: Proportion normal-weight concrete mixture as follows:
 - 1. Minimum Compressive Strength: 5,000 psi at twenty-eight (28) days.

2. Maximum Water-Cementitious Materials Ratio: 0.45.
3. Slump Limit: 4 in. or 8 in. for concrete with verified slump of 2 to 4 in. before adding high-range water-reducing admixture or plasticizing admixture, plus or minus 1 in.
4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/8 in.- nominal maximum aggregate size.

2.10 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.11 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information:
 1. When air temperature is between 85 and 90°F, reduce mixing and delivery time from one and one-half (1-1/2) hours to seventy-five (75) minutes; when air temperature is above 90°F, reduce mixing and delivery time to sixty (60) minutes.

PART 3 - EXECUTION

3.1 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
 1. Class A, 1/8 in. for smooth-formed finished surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical:
 1. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Chamfer exterior corners and edges of permanently exposed concrete.
- I. Form openings, chases, offsets, sinkages, keyways, blocking, screeds, and bulkheads required in the Work to match existing conditions. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded:
 - 1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

3.3 REMOVING AND REUSING FORMS

- A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50°F for twenty-four (24) hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations and curing and protection operations need to be maintained:
 - 1. Leave formwork for beam soffits, joists, slabs, and other structural elements that supports weight of concrete in place until concrete has achieved at least 70 percent of its twenty-eight (28) day design compressive strength.
 - 2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.
- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect/Engineer.

3.4 SHORES AND RESHORES

- A. Comply with ACI 318 and ACI 301 for design, installation, and removal of shoring and reshoring.
- B. In multistory construction, extend shoring or reshoring over a sufficient number of stories to distribute loads in such a manner that no floor or member will be excessively loaded or will induce tensile stress in concrete members without sufficient steel reinforcement.
- C. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

3.5 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one (1) mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.
- F. Epoxy-Coated Reinforcement: Repair cut and damaged epoxy coatings with epoxy repair coating according to ASTM D 3963/D 3963M. Use epoxy-coated steel wire ties to fasten epoxy-coated steel reinforcement.

3.6 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect/Engineer.

- C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301:
1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Deposit concrete continuously in one (1) layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation:
1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 in. into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete:
1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 2. Maintain reinforcement in position on chairs during concrete placement.
 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 4. Slope surfaces uniformly to drains where required.
 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
- F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures:
1. When average high and low temperature is expected to fall below 40°F for three (3) successive days, maintain delivered concrete mixture temperature within the temperature range required by 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 antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- G. Hot-Weather Placement: Comply with ACI 301 and as follows:
1. Maintain concrete temperature below 90°F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is

calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.7 CONCRETE REPAIR MATERIALS

- A. Install concrete repair material as specified in the contract documents and following written recommendations from the product manufacturer.

3.8 FINISHING FORMED SURFACES

- A. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities:

1. Apply to concrete surfaces exposed to public view.

- B. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.9 MISCELLANEOUS CONCRETE ITEMS

- A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

3.10 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.

- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- E. Cure concrete according to ACI 308.1, by one (1) or a combination of the following methods:
 - 1. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three (3) hours after initial application. Maintain continuity of coating and repair damage during curing period.
 - 2. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three (3) hours after initial application. Repeat process twenty-four (24) hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.11 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
- B. Inspections:
 - 1. Steel reinforcement placement.
 - 2. Verification of use of required design mixture.
 - 3. Concrete placement, including conveying and depositing.
 - 4. Curing procedures and maintenance of curing temperature.
 - 5. Verification of concrete strength before removal of shores and forms from beams and slabs.
- C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
 - 1. Testing Frequency: Obtain one (1) composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one (1) set for each additional 50 cu. yd. or fraction thereof.
 - 2. Slump: ASTM C 143/C 143M; one (1) test at point of placement for each composite sample, but not less than one (1) test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
 - 3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one (1) test for each composite sample, but not less than one (1) test for each day's pour of each concrete mixture.
 - 4. Concrete Temperature: ASTM C 1064/C 1064M; one (1) test hourly when air temperature is 40°F and below and when 80°F and above, and one (1) test for each composite sample.
 - 5. Compression Test Specimens: ASTM C 31/C 31M:
 - a. Cast and laboratory cure two (2) sets of two (2) standard cylinder specimens for each composite sample.

6. Compressive-Strength Tests: ASTM C 39/C 39M; test one (1) set of two (2) laboratory-cured specimens at seven (7) days and one (1) set of two (2) specimens at twenty-eight (28) days:
 - a. A compressive-strength test shall be the average compressive strength from a set of two (2) specimens obtained from same composite sample and tested at age indicated.
7. Strength of each concrete mixture will be satisfactory if every average of any three (3) consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
8. Test results shall be reported in writing to Architect/Engineer, concrete manufacturer, and Contractor within forty-eight (48) hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at twenty-eight (28) days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both seven (7) and twenty-eight (28) day tests.
9. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect/Engineer but will not be used as sole basis for approval or rejection of concrete.
10. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect/Engineer. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect/Engineer.
11. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
12. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

END OF SECTION 033000

SECTION 051200 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Structural steel.
 - 2. Shrinkage-resistant grout.

1.3 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

1.4 ACTION SUBMITTALS

- A. Product Data:
 - 1. Shrinkage-resistant grout.
 - 2. Post installed anchors.
- B. Shop Drawings: Show fabrication of structural-steel components.
 - 1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
 - 2. Include embedment drawings.
 - 3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
 - 4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical, high-strength bolted connections.
 - 5. Identify members not to be shop primed.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer, fabricator, and testing agency, upon request.
- B. Product Test Reports: For the following:
 - 1. Nonshrink grout.
 - 2. ICC-ES Reports for Post-Installed Anchors.
- C. Source quality-control reports.

1.6 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.1/D1.1M.
 - 1. Welders and welding operators performing work on bottom-flange, demand-critical welds shall pass the supplemental welder qualification testing, as required by AWS D1.8/D1.8M. FCAW-S and FCAW-G shall be considered separate processes for welding personnel qualification.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.
 - 1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.
- B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
 - 1. Fasteners may be repackaged provided testing and inspecting agency observes repackaging and seals containers.
 - 2. Clean and relubricate bolts and nuts that become dry or rusty before use.
 - 3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F3125/F3125M, Grade F1852 bolt assemblies and for retesting bolt assemblies after lubrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Comply with applicable provisions of the following specifications and documents:
 - 1. ANSI/AISC 303.
 - 2. ANSI/AISC 360.

3. RCSC's "Specification for Structural Joints Using High-Strength Bolts."

B. Connection Design Information:

1. Option 1: Connection designs have been completed and connections indicated on the Drawings.

2.2 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes: ASTM A992 or ASTM A572, Grade 50.
- B. Channels, Angles: ASTM A36.
- C. Plate and Bar: ASTM A36 or ASTM A572, Grade 50, as indicated on the Drawings.
- D. Cold-Formed Hollow Structural Sections: ASTM A500, Grade B structural tubing.
- E. Steel Pipe: ASTM A53/A53M, Type E or Type S, Grade B.
 1. Weight Class: As indicated.
 2. Finish: Black.
- F. Welding Electrodes: Comply with AWS requirements.
 1. E70XX, unless noted otherwise.

2.3 BOLTS AND CONNECTORS

- A. High-Strength A325 Bolts, Nuts, and Washers: ASTM F3125, Grade A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; and ASTM F436, Type 1, hardened carbon-steel washers; all with plain finish.
 1. Direct-Tension Indicators: ASTM F959, Type 325-1, compressible-washer type with plain finish.
- B. Shear Stud Connectors: ASTM A108, AISI C-1015 through C-1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.

2.4 RODS

- A. Headed Anchor Rods: ASTM F1554, Grade 36 or ASTM F1554, Grade 55, as indicated on Drawings, straight.
 1. Nuts: ASTM A563 heavy-hex carbon steel.
 2. Plate Washers: ASTM A36/A36M carbon steel.
 3. Washers: ASTM F436, Type 1, hardened carbon steel.
 4. Finish: Plain.
- B. Threaded Rods: ASTM A36/A36M or ASTM A572/A572M, Grade 50.

1. Nuts: ASTM A63 heavy-hex carbon steel.
2. Washers: ASTM F436, Type 1, hardened carbon steel.
3. Finish: Plain.

C. Post-Installed Anchors: Provide type and size as indicated on Drawings.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Hilti.
 - b. Powers Fasteners.
 - c. Simpson Strongtie.
2. Anchor Types:
 - a. Wedge Anchors: Wedge type, torque-controlled, with impact section to prevent thread damage complete with required nuts and washers. Provide anchors with length identification markings conforming to ICC ES AC01 or ICC ES AC193.
 - 1) Interior Use: Unless otherwise indicated on the Drawings, provide carbon steel anchors with zinc plating in accordance with ASTM B633, Type III Fe/Zn 5 (SC1).
 - 2) Exterior Use: As indicated on the Drawings, provide stainless steel anchors. Stainless steel anchors shall be provided with stainless steel nuts and washers of matching alloy group and minimum proof stress equal to or greater than the specified minimum full-size tensile strength of the externally threaded fastener. Stainless steel nuts shall conform to ASTM F594 unless otherwise specified. Avoid installing stainless steel anchors in contact with galvanically dissimilar metals.
 - 3) to ASTM F594 unless otherwise specified. Avoid installing stainless steel anchors in contact with galvanically dissimilar metals.
 - b. Screw Anchors: screw type. Pre-drilling of the hole requires a standard ANSI drill bit with the same diameter as the anchor and installing the anchor will be done with an impact wrench. Provide anchors with a diameter and anchor length marking on the head. Heavy Duty Sleeve Anchors: Torque-controlled, exhibiting follow-up expansion under load, with provision for rotation prevention during installation.
 - c. ion during installation.
 - 1) Interior Use: Unless otherwise indicated on the Drawings, provide carbon steel anchors with zinc plating equivalent to DIN EN ISO 4042 (8µm min.).
 - d. Heavy Duty Metric Sleeve Anchors: Torque-controlled, exhibiting follow-up expansion under load, with provision for rotation prevention during installation. Type and size as indicated on Drawings.

- 1) Interior Use: Unless otherwise indicated on the Drawings, provide carbon steel anchors manufactured from materials conforming to ISO 898 Part 1, with zinc plating equivalent to ASTM B633, Type III Fe/Zn 5 (5µm min.).
 - 2) Exterior Use: As indicated on the Drawings, provide stainless steel anchors. Stainless steel anchors shall be manufactured from materials conforming to ISO 3506 Part 1 and having corrosion resistance equivalent to AISI [Type 304] [and] [Type 316] stainless steel. Stainless steel anchors shall be provided with stainless steel nuts and washers of matching alloy group and minimum proof stress equal to or greater than the specified minimum full-size tensile strength of the externally threaded fastener. All nuts shall conform to ISO 3506 Part 2 unless otherwise specified. Avoid installing stainless steel anchors in contact with galvanically dissimilar metals.
 - 3) . All nuts shall conform to ISO 3506 Part 2 unless otherwise specified. Avoid installing stainless steel anchors in contact with galvanically dissimilar metals.
 - 4) ts shall conform to ISO 3506 Part 2 unless otherwise specified. Avoid installing stainless steel anchors in contact with galvanically dissimilar metals.
- e. Heavy Duty Undercut Anchors: Bearing-type. Installed anchor shall have a minimum tension bearing area in the concrete, measured as the horizontal projection of the bearing surface, not less than two times the net tensile area of the anchor bolt. The installed anchor shall exhibit a form fit between the bearing elements and the undercut in the concrete.
- 1) Interior Use: Unless otherwise indicated on the Drawings, provide carbon steel anchors manufactured from materials conforming to ISO 898 Part 1, with zinc plating equivalent to ASTM B633, Type III Fe/Zn 5 (5µm min.).
 - 2) Exterior Use: As indicated on the Drawings, provide sherardized or stainless steel anchors. Sherardized anchors shall be manufactured from materials conforming to ISO 898 Part 1 and having corrosion resistance equivalent to ASTM A153 with sherardized dry diffusion zinc coating (50 µm min.). Stainless steel anchors shall be manufactured from materials conforming to ISO 3506 Part 1 and having corrosion resistance equivalent to AISI [Type 316] stainless steel. Stainless steel anchors shall be provided with stainless steel nuts and washers of matching alloy group and minimum proof stress equal to or greater than the specified minimum full-size tensile strength of the externally threaded fastener. All nuts shall conform to ISO 3506 Part 2 unless otherwise specified. Avoid installing stainless steel anchors in contact with galvanically dissimilar metals.
- f. Cartridge Injection Adhesive Anchors: Threaded steel rod, inserts or reinforcing dowels, complete with nuts, washers, polymer or hybrid mortar adhesive injection system, and manufacturer's installation instructions. Type and size as indicated on Drawings. Capsule Anchors: Threaded steel rod, inserts and reinforcing dowels with 45 degree chisel point, complete with nuts, washers, glass or foil capsule

anchor system containing polyvinyl or urethane methacrylate-based resin and accelerator, and manufacturer's installation instructions.

- g. tions. Type and size as indicated on Drawings. Capsule Anchors: Threaded steel rod, inserts and reinforcing dowels with 45 degree chisel point, complete with nuts, washers, glass or foil capsule anchor system containing polyvinyl or urethane methacrylate-based resin and accelerator, and manufacturer's installation instructions.
- h. tor, and manufacturer's installation instructions.
- i. installation instructions.
 - 1) Interior Use: Unless otherwise indicated on the Drawings, provide carbon steel threaded rods conforming to ASTM A36, ASTM A 193 Type B7 or ISO 898 Class 5.8 with zinc plating in accordance with ASTM B633, Type III Fe/Zn 5 (SC1) or carbon steel HIT TZ rods conforming to ASTM A510 with chemical composition of AISI 1038.
 - 2) Exterior Use: As indicated on the Drawings, provide stainless steel anchors. Stainless steel anchors shall be provided with stainless steel nuts and washers of matching alloy group and minimum proof stress equal to or greater than the specified minimum full-size tensile strength of the externally threaded fastener. All nuts shall conform to ASTM F594 unless otherwise specified. Avoid installing stainless steel anchors in contact with galvanically dissimilar metals.

2.5 PRIMER

A. Steel Primer:

- 1. Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.
 - a. Coordinate with special coatings specified in Division 9 and on architectural drawings. Use primer compatible with special coatings and paints.

B. Galvanized-Steel Primer: MPI#26 or MPI#134.

- 1. Etching Cleaner: MPI#25, for galvanized steel.
- 2. Galvanizing Repair Paint: ASTM A780.

2.6 SHRINKAGE-RESISTANT GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.7 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate in accordance with ANSI/AISC 303 and to ANSI/AISC 360.
 - 1. Camber structural-steel members where indicated.
 - 2. Fabricate beams with rolling camber up.
 - 3. Identify high-strength structural steel in accordance with ASTM A6/A6M and maintain markings until structural-steel framing has been erected.
 - 4. Mark and match-mark materials for field assembly.
 - 5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.
- B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.
 - 1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.
- C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.
- D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.
- E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted in accordance with SSPC-SP 2. Shear Stud Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Weld using automatic end welding of headed-stud shear connectors in accordance with AWS D1.1/D1.1M and manufacturer's written instructions.
- F. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.
 - 1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
 - 2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
 - 3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.8 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for type of bolt and type of joint specified.
 - 1. Joint Type: Snug tightened, unless noted otherwise.
- B. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
 - 1. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in ANSI/AISC 303 for mill material.

2.9 GALVANIZING

- A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel in accordance with ASTM A123/A123M.
 - 1. Fill vent and drain holes that are exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.
 - 2. Galvanize all steel.

2.10 SHOP PRIMING

- A. Shop prime steel surfaces, except the following:
 - 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
 - 2. Surfaces to be field welded.
 - 3. Surfaces of high-strength bolted, slip-critical connections.
 - 4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
 - 5. Galvanized surfaces.
- B. Surface Preparation of Steel: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces in accordance with the following specifications and standards:
 - 1. SSPC-SP 2, unless noted otherwise.
- C. Priming: Immediately after surface preparation, apply primer in accordance with manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
 - 1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
 - 2. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

2.11 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 for grouting.
- B. Galvanize plates.

2.12 LOOSE STEEL LINTELS

- A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated. Fabricate in single lengths for each opening unless otherwise indicated. Weld adjoining members together to form a single unit where indicated.

- B. Size loose lintels to provide bearing length at each side of openings equal to 1/12 of clear span but not less than 8 inches (200 mm) unless otherwise indicated.
- C. Galvanize finish.

2.13 STEEL WELD PLATES AND ANGLES

- A. Provide steel weld plates and angles not specified in other Sections, for items supported from concrete construction as needed to complete the Work. Provide each unit with no fewer than two integrally welded steel strap anchors for embedding in concrete.

2.14 SOURCE QUALITY CONTROL

- A. Testing Agency: Contractor will engage a qualified testing agency to perform shop tests and inspections.
 - 1. An exception to this requirement for special inspections is provided where the fabricator is approved in accordance with Paragraph 1704.2.2 of the International Building Code (IBC), which states in part that: "Special inspections required by this code are not required and approved to perform such work without special inspection. Approval shall be based upon review of the fabricator's written procedural and quality control manuals and periodic auditing of fabrication practice by an approved special inspection agency." The qualification for 'fabricator exemption' stated in Chapter 17 of IBC follow very closely with that required of AISC Certified Fabricators. However, AISC Certification does not automatically qualify the Fabricator for the 'fabricator exemption' permitted by Chapter 17. Such exemption must be approved by the authority having jurisdiction (building official). Each approved fabricator that is exempt from Special Inspection of shop fabrication and implementation procedures per section 1704.2 of IBC must submit a *Fabricator's Certificate of Compliance* at the completion of fabrication.
 - 2. Allow testing agency access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
 - 3. Bolted Connections: Inspect and test shop-bolted connections in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
 - 4. Welded Connections: Visually inspect shop-welded connections in accordance with AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
 - a. Liquid Penetrant Inspection: ASTM E165/E165M.
 - b. Magnetic Particle Inspection: ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
 - c. Ultrasonic Inspection: ASTM E164.
 - d. Radiographic Inspection: ASTM E94/E94M.
 - 5. In addition to visual inspection, test and inspect shop-welded shear stud connectors in accordance with requirements in AWS D1.1/D1.1M for stud welding and as follows:
 - a. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear stud connector.

- b. Conduct tests in accordance with requirements in AWS D1.1/D1.1M on additional shear stud connectors if weld fracture occurs on shear stud connectors already tested.
- 6. Prepare test and inspection reports.
- B. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated on Drawings.
 - 1. Do not remove temporary shoring supporting composite deck construction and structural-steel framing until cast-in-place concrete has attained its design compressive strength.

3.3 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and in accordance with ANSI/AISC 303 and ANSI/AISC 360.
- B. Baseplates, Bearing Plates, and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
 - 1. Set plates for structural members on wedges, shims, or setting nuts as required.
 - 2. Weld plate washers to top of baseplate.
 - 3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
 - 4. Promptly pack shrinkage-resistant grout solidly between bearing surfaces and plates, so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for grouting.

- C. Maintain erection tolerances of structural steel within ANSI/AISC 303.
- D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that are in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
 - 1. Level and plumb individual members of structure. Slope roof framing members to slopes indicated on Drawings.
 - 2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.
- E. Splice members only where indicated.
- F. Do not use thermal cutting during erection unless approved by Architect. Finish thermally cut sections within smoothness limits in AWS D1.1/D1.1M.
- G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.
- H. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.

3.4 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for bolt and joint type specified.
 - 1. Joint Type: Snug tightened, unless noted otherwise.
- B. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
 - 1. Comply with ANSI/AISC 303 and ANSI/AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
 - 2. Remove backing bars or runoff tabs, where indicated, back gouge, and grind steel smooth.
 - 3. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in ANSI/AISC 303 for mill material.

3.5 POST-INSTALLED ANCHORS

- A. Drilled-In Anchors:
 - 1. Drill holes with rotary impact hammer drills using carbide-tipped bits, hollow drill bit system, and/or core drills using diamond core bits. Drill bits shall be of diameters as specified by the anchor manufacturer. Unless otherwise shown on the Drawings, all holes shall be drilled perpendicular to the concrete surface.

- a. Cored Holes: Where anchors are permitted to be installed in cored holes, use core bits with matched tolerances as specified by the manufacturer. Properly clean cored hole per manufacturer's instructions.
 - b. Embedded Items: Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Exercise care in coring or drilling to avoid damaging existing reinforcing or embedded items. Notify the Engineer if reinforcing steel or other embedded items are encountered during drilling. Take precautions as necessary to avoid damaging prestressing tendons, electrical and telecommunications conduit, and gas lines.
 - c. Base Material Strength: Unless otherwise specified, do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
2. Perform anchor installation in accordance with manufacturer instructions.
 3. Wedge Anchors, Heavy-Duty Sleeve Anchors, and Undercut Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in part to be fastened. Set anchors to manufacturer's recommended torque, using a torque wrench. Following attainment of 10% of the specified torque, 100% of the specified torque shall be reached within 7 or fewer complete turns of the nut. If the specified torque is not achieved within the required number of turns, the anchor shall be removed and replaced unless otherwise directed by the Engineer.
 4. Cartridge Injection Adhesive Anchors: Clean all holes per manufacturer instructions to remove loose material and drilling dust prior to installation of adhesive. Inject adhesive into holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive. Follow manufacturer recommendations to ensure proper mixing of adhesive components. Sufficient adhesive shall be injected in the hole to ensure that the annular gap is filled to the surface. Remove excess adhesive from the surface. Shim anchors with suitable device to center the anchor in the hole. Do not disturb or load anchors before manufacturer specified cure time has elapsed.
 5. Capsule Anchors: Perform drilling and setting operations in accordance with manufacturer instructions. Clean all holes to remove loose material and drilling dust prior to installation of adhesive. Remove water from drilled holes in such a manner as to achieve a surface dry condition. Capsule anchors shall be installed with equipment conforming to manufacturer recommendations. Do not disturb or load anchors before manufacturer specified cure time has elapsed.
- B. Observe manufacturer's recommendations with respect to installation temperatures for cartridge injection adhesive anchors and capsule anchors.
 - C. capsule anchors.

3.6 REPAIR

- A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing, and repair galvanizing to comply with ASTM A780/A780M.
- B. Touchup Painting:

1. Immediately after erection, clean exposed areas where primer is damaged or missing, and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - a. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
- C. Post-installed Anchors: Remove and replace misplaced or malfunctioning anchors. Fill empty anchor holes and patch failed anchor locations with high-strength non-shrink, nonmetallic grout. Anchors that fail to meet proof load or installation torque requirements shall be regarded as malfunctioning.

3.7 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector to inspect field welds and high-strength bolted connections.
- B. Bolted Connections: Bolted connections will be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- C. Welded Connections: Field welds will be visually inspected according to AWS D1.1/D1.1M.
 1. In addition to visual inspection, field welds will be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
 - a. Liquid Penetrant Inspection: ASTM E 165.
 - b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
 - c. Ultrasonic Inspection: ASTM E 164.
 - d. Radiographic Inspection: ASTM E 94.
- D. In addition to visual inspection, test and inspect field-welded shear connectors according to requirements in AWS D1.1/D1.1M for stud welding and as follows:
 1. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
 2. Conduct tests on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1/D1.1M.
- E. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

END OF SECTION 051200

REPAIR COMPLETE, SEAL WALL LEAK

Section 071616

PART 1 – GENERAL

1.01 SUMMARY

- A. **Section Includes:** Furnishing of all labor, materials, services and equipment necessary for the supply and installation of cementitious crystalline waterproofing to concrete substrates, above-grade or below-grade, on either dry or wet side of substrates, as indicated on drawings and as specified herein.
- B. **Related Sections:**
1. Section 031000 - Concrete Forming and Accessories
 2. Section 079000 - Joint Protection
 3. Section 099000 - Paints and Coatings

1.02 REFERENCES

- A. **Applicable Standards:** The following standards are referenced herein.
1. American Society for Testing and Materials (ASTM)
 2. Army Corps of Engineers (CRD)
 3. American National Standards Institute (ANSI)
 4. NSF International
 5. European Standards (EN)
 6. RILEM
 7. Drinking Water Inspectorate (DWI)

1.03 SYSTEM DESCRIPTION

- A. **Cementitious Crystalline Waterproofing:** Concrete waterproofing and protection system shall be of the crystalline type that is a blend of Portland cement, fine treated silica sand and active proprietary chemicals. When mixed with water and applied as a cementitious coating, the active chemicals diffuse into the concrete and cause a catalytic reaction which generates a non-soluble crystalline structure within the pores and capillary tracts of concrete. This crystalline system causes the concrete to become sealed against the penetration of liquids from any direction and protects the concrete from deterioration due to harsh environmental conditions. The system is used for above or below-grade walls and slabs, including liquid retaining structures and where enhanced chemical resistance is required.

1.04 SYSTEM PERFORMANCE REQUIREMENTS

- A. **Testing Requirements:** Crystalline waterproofing system shall have been tested in accordance with the following standards and conditions and at the dosage rate specified by the manufacturer, and the testing results shall meet or exceed the performance requirements as specified herein.
- B. **Independent Laboratory:** Testing shall have been performed by an accredited independent laboratory meeting the requirements of ASTM E 329 or other applicable international standard for certification of testing laboratories. Testing laboratory shall have obtained all control and treated concrete samples.
- C. **Crystalline Penetration:** Crystallizing capability of waterproofing material shall be evidenced by independent SEM (Scanning Electron Microscope) photographs. Crystal growth 12 inches (30 cm) from the surface of the coating shall be evident with 1000X magnification 1 year after application of the coating and exposure of the sample to normal weathering.
- D. **Permeability:** Independent testing shall be performed according to U.S. Army Corps of Engineers CRD C48 "Permeability of Concrete". Concrete samples shall have design strength of 2000 psi (14 MPa) and thickness of 2 inches (50 mm). Treated samples shall have two coats of crystalline waterproofing applied per manufacturer's directions. Samples to be pressure tested to 175 psi (405 foot head of water) or 1.2 MPa (123.4 m head of water). Control samples shall leak and treated samples, after crystalline growth has occurred, shall exhibit no measurable leakage.
- E. **Permeability - Negative Side Application:** Independent testing shall be performed according to EN 12390-8 or other recognized direct pressure test. Concrete samples shall have a design strength of 25 MPa (3600 psi). Treated samples shall be exposed to water pressure on the side opposite to the crystalline coating. Coated samples shall exhibit a greater than 90% reduction in depth of water penetration as compared to the control samples.
- F. **Chemical Resistance:** Independent testing shall be performed according to ASTM C 267 "Chemical Resistance of Mortars" and ASTM C 39 "Compressive Strength of Cylindrical Concrete Specimens". Concrete samples (treated and untreated) shall have design strength of 4000 psi (27.6 MPa). Treated samples shall have two coats of crystalline waterproofing applied per manufacturer's directions. Untreated and treated specimens must be immersed for a minimum of 84 days in following chemical solutions: hydrochloric acid (3.5 pH), brake fluid, transformer oil, ethylene glycol, toluene, caustic soda. Treated specimens shall exhibit no detrimental effects after exposure and shall have an average of 17% increase in compressive strength versus untreated control specimens.
- G. **Acid Resistance:** Independent testing shall be performed to determine "Sulfuric Acid Resistance of Concrete Specimens". Treated concrete samples shall be tested against untreated control samples. All samples shall be immersed in 5% sulfuric acid and

weighed weekly for 10 weeks. Untreated samples shall exhibit at least 8 times more mass loss than treated samples.

- H. **Carbonation Resistance Testing:** Independent testing shall be performed according to RILEM CPC-18 or other recognized accelerated carbonation test. Concrete samples shall have a 0.5 w/cm ratio or be approximately 30 MPa (4500 psi) in strength. Coated samples shall have crystalline coating applied one day after casting and all samples to be cured for 7 days prior to carbonation. After 91 days exposure to CO₂ the coated samples shall show a 35% or greater reduction in carbonation depth as compared to the control samples.
- I. **Potable Water Approval:** Waterproof material shall have a current, valid approval certificate from NSF (NSF 61), DWI, or other recognized certification agency.

1.05 SUBMITTALS

- A. **General:** Submit listed submittals in accordance with conditions of the Contract and with Division 1 Submittal Procedures Section.
- B. **Product Data:** Submit product data, including manufacturer's specifications, installation instructions, and general recommendations for waterproofing applications.
- C. **Test Reports:** Submit for acceptance, complete test reports from approved independent testing laboratories certifying that waterproofing system conforms to performance characteristics and testing requirements specified herein.
- D. **Manufacturer's Certification:** Provide document signed by manufacturer or manufacturer's representative certifying that the materials to be installed comply with the requirements of this specification.
- E. **Manufacturer's Field Report:** Provide copy of report from manufacturer's representative that the surfaces to which waterproofing material is to be applied are in a condition suitable to receive same.

1.06 QUALITY ASSURANCE

- A. **Manufacturer Qualifications:** Manufacturer shall be ISO 9001 registered and shall have no less than 10 years experience in manufacturing the cementitious crystalline waterproofing materials for the required work. Manufacturer must be capable of providing field service representation during construction phase. Manufacturers who cannot provide ongoing field support or the performance test data specified herein will not be considered for the project.
- B. **Applicator:** Waterproofing applicator shall be experienced in the installation of cementitious crystalline waterproofing materials as demonstrated by previous successful installations and shall be approved by the manufacturer in writing.

- C. **Pre-Installation Conference:** Prior to installation of waterproofing, conduct meeting with waterproofing applicator, Architect/Engineer, owner's representative, and waterproofing manufacturer's representative to verify and review the following:
1. Project requirements for waterproofing as set out in Contract Document.
 2. Manufacturer's product data including application instructions.
 3. Substrate conditions, and procedures for substrate preparation and waterproofing installation.
- D. **Technical Consultation:** The waterproofing manufacturer's representative shall provide technical consultation on waterproofing application and provide on-site support as needed.

1.07 DELIVERY, STORAGE AND HANDLING

- A. **Ordering:** Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- B. **Delivery:** Deliver packaged waterproofing materials to project site in original undamaged containers, with manufacturer's labels and seals intact.
- C. **Storage:** Store waterproofing materials in dry, enclosed location, at a minimum temperature of 45°F (7°C).

1.08 PROJECT CONDITIONS

- A. **Compliance:** Comply with manufacturer's product data regarding condition of substrate to receive waterproofing, weather conditions before and during installation, and protection of the installed waterproofing system.

1.09 WARRANTY

- A. **Manufacturer's Warranty:** Manufacturer shall provide standard product warranty executed by authorized company official.
- B. **Applicator's Warranty:** Applicator shall warrant the waterproofing installation against defects caused by faulty workmanship or materials for a period of typically (specify term) years from Date of Substantial Completion. The warranty will cover the surfaces treated and will bind the applicator to repair, at his expense, any and all leaks through the treated surfaces which are not due to structural weaknesses or other causes beyond applicator's control such as fire, earthquake, tornado and hurricane. The warranty shall read as follows:
1. **Warranty:** The applicator warrants that, upon completion of the work, surfaces treated with cementitious crystalline waterproofing will be and will remain free from water leakage resulting from defective workmanship or materials for a period of (specify term) years from Date of Substantial Completion. In the event that water leakage occurs within the warranty period from such causes, the applicator shall, at his sole

expense, repair, replace or otherwise correct such defective workmanship or materials. Applicator shall not be liable for consequential damages and applicator's liability shall be limited to repair, replacement or correcting of defective workmanship or materials. Applicator shall have no responsibility with respect to water leakage or other defects caused by structural failure or movement of the structure, or any other causes beyond Applicator's control.

PART 2 – PRODUCTS

2.01 MATERIALS

A. **Acceptable Manufacturer:**

Xypex Chemical Corporation
13731 Mayfield Place, Richmond, B.C., Canada V6V 2G9
Tel: 800 961.4477 or 604 273.5265 Fax: 604 270.0451
E-mail: info@xypex.com Website: www.xypex.com

Note: Acceptable manufacturers include all licensed manufacturing operations of Xypex Chemical Corporation.

B. **Proprietary Products:** Xypex crystalline waterproofing materials as follows:

1. Xypex Concentrate
2. Xypex Modified
3. Xypex Patch'n Plug

Note: Supplemental specifications are available for Xypex Admix series (admixture) and Xypex Concentrate DS-1/DS-2 (dry shake).

C. **Substitutions:** No substitutions permitted.

D. **Source Quality:** Obtain all proprietary crystalline waterproofing products from a single manufacturer.

2.02 MIXES

A. **General:** Mix waterproofing material by volume with clean, potable water. Mix waterproofing material in quantities that can be applied within 20 to 30 minutes from time of mixing. As mixture thickens, stir frequently, but do not add additional water. Do not mix bonding agents or admixtures with crystalline waterproofing materials.

B. **Brush Application Mix:** Measure dry powder and place in mixing container. Measure water and mix into the dry powder with a paddle on a slow speed electric drill (250 RPM) or other type mixer which is acceptable to manufacturer. Mixing proportions shall be as follows:

Coverage	Proportions (by volume)
1.5 lb./sq. yd. (0.8 kg/m ²)	5 powder to 2 water
2.0 lb./sq. yd. (1.0 kg/m ²)	3 powder to 1 water

- C. **Spray Application Mix:** Mixing shall be same as specified for brush application except that mixture shall be thinner. Use following proportions as a guide only. Adjust proportions to match type of spray equipment and pressures used. Mixing proportions shall be as follows:

Coverage	Proportions (by volume)
1.5 lb./sq. yd. (0.8 kg/m ²)	5 powder to 3 water

- D. **Dry-Pac Mix:** Using a trowel, mix 1 part clean water with 6 parts Xypex Concentrate powder for 10 to 15 seconds. It is acceptable that lumps may be present in mixture. Mix only as much as can be applied in 15 minutes.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. **Site Visit:** Prior to waterproofing installation, arrange visit to project site with waterproofing manufacturer's representative. Representative shall complete a field review, confirming that the sample areas observed, are considered to be in acceptable condition to receive Xypex Coating.
- B. **Verification of Substrates:** Verify that concrete surfaces are sound and clean, and that form release agents and materials used to cure the concrete are fully removed.
- C. **Examination for Defects:** Examine surfaces to be waterproofed for defects such as honeycombing, rock pockets, faulty construction joints and cracks. Such defects to be repaired in accordance with manufacturer's product data and 3.02 below.

3.02 PREPARATION

- A. **Surface Preparation:** Smooth surfaces (e.g. where steel forms are used) or surfaces covered with form oil or other contaminants shall be cleaned, water-blasted, lightly sand-blasted, or acid etched as necessary to provide a clean absorbent surface. The surface must also have an open capillary system to provide "tooth and suction" for the Xypex treatment. A minimum of CSP-3 per the International Concrete Repair Institute Concrete Surface Profile Chips or other equivalent standard is required. Surfaces to be acid-etched shall be should be saturated with water before application of the acid. After acid etching flush concrete thoroughly with clean water. Horizontal surfaces shall have a rough wood float or broom finish. Where a smooth trowel finish is required on horizontal surface, crystalline waterproofing material shall be applied by dry shake method at time of concrete finishing in accordance with manufacturer's product data.
- B. **Repair of Defects:** Concrete defects shall be repaired in accordance with manufacturer's technical literature including relevant Method Statements (www.xypex.com/technical/statements). Procedures are generally as follows:

1. Cracks and Faulty Construction Joints:
 - a. Chip out cracks, faulty construction joints and other defects to a depth of 1.5 inches (37 mm) and a width of one inch (25 mm). A "V" shaped slot is not acceptable. The slot may be saw cut instead of chipped but ensure that the slot is dovetailed or otherwise shaped such that there will be mechanical interlock of materials placed into the slot at a later stage.
 - b. Clean slot of debris and dust. Soak area with water and remove excess surface water. Apply a slurry coat of Xypex Concentrate at the rate of 1.5 lb./sq. yd. (0.8 kg/m²) to the slot.
 - c. While slurry coat is still tacky, fill cavity with Dry-Pac. Compress tightly into cavity using pneumatic packer or block and hammer.
 - d. This step may be omitted if the area filled with Dry-Pac will be subsequently covered with Xypex coating. Wet Dry-Pac surface lightly with water, then apply a slurry coat of Xypex Concentrate at a coverage rate of 1.5 - 2 lb./sq. yd. (0.8 - 1 kg/m²) over the repaired area to 6" (150 mm) on either side of slot.
2. Rock Pockets, Honeycombing or other defective concrete: All areas of poor concrete consolidation (honeycomb or rock pockets) shall be repaired.

Note: Where there is active water-flow see Method Statements or contact Xypex Technical Services Representative for assistance.

- C. **Wetting Concrete:** Xypex requires a saturated surface dry (SSD) substrate. Concrete surfaces must be thoroughly saturated with clean water prior to the application so as to aid the proper diffusion of the Xypex chemistry and to ensure the growth of the crystalline formation deep within the pores of the concrete. Remove excess water before the application such that there is no glistening water on the surface. If concrete dries out before application, it must be re-wetted.

3.03 APPLICATION

- A. **Construction Joints:** In addition to specified waterstops, apply one coat of Xypex Concentrate slurry at a rate of 2 lb./sq. yd. (1 kg/m²) to joint surfaces between concrete pours. Moisten surfaces prior to slurry application. Apply slurry and keep moist for 12 hours then allow slurry to set or dry. Where joint surfaces are not accessible prior to pouring new concrete, contact Xypex Technical Services Representative for assistance.

Note: Inclusion, type and position of waterstops are at the discretion of the designer. Expanding waterstops may be placed on Xypex after it has dried or before Xypex slurry application. Xypex slurry may only be applied over waterstop if approved by waterstop manufacturer.

- B. **Sealing Strips:** Where hydrostatic conditions exist, sealing strips shall also be applied at construction joints by filling grooves that are created along the joints. Dimensions of the grooves shall be 1 inch (25 mm) wide and 1.5 inches (37 mm) deep. If grooves are not pre-formed then chip grooves to those dimensions. Fill the grooves as follows:

1. Apply slurry coat of Xypex Concentrate slurry to slot in accordance with

- manufacturer's instructions or recommendations.
2. While slurry coat is still tacky, fill slot with Xypex Concentrate Dry-Pac.
 3. Compact tightly using pneumatic packer or hammer and block.
 4. This step may be omitted if the area filled with Dry-Pac will be subsequently covered with Xypex coating. Wet Dry-Pac surface lightly with water, then apply a slurry coat of Xypex Concentrate at a coverage rate of 1.5 - 2 lb./sq. yd. (0.8 - 1 kg/m²) over sealing strip and extending to 6" (150 mm) on either side.

Note: For further information, see Xypex Schematic Drawings for standard construction joint details.

- C. **Form Tie Holes:** Form tie holes shall be waterproofed in accordance with manufacturer's technical literature including relevant Method Statements (www.xypex.com/technical/statements). Procedures are generally as follows:

1. Prepare the tie hole to create a straight sided void with a profile of at least ICRI CSP-3. For through element ties holes such as those created by taper ties the prepared void is to be at least 5" (125 mm) deep. For cone ties the void is to be to the bottom of the cone.
2. Clean and profile the area to a 12 inch (300 mm) diameter around the tie hole to an ICRI CSP-3 profile.
3. For through-element tie holes create a solid plug of material at the bottom of the profiled hole using Xypex Patch'n Plug leaving at least 4" (100 mm) of empty tie hole from the top of the plug to the surface of the concrete element.
4. Apply a coat of Xypex Concentrate slurry at a rate of 1.5 lb./sq. yd. (0.8 kg/m²) to the inside of the tie hole and to a 12" (300 mm) diameter area around the hole.
5. Fill and compact the tie hole with Xypex Concentrate Dry-Pac.
6. This step may be omitted if the area filled with Dry-Pac will be subsequently covered with Xypex coating. Wet Dry-Pac surface lightly with water, then apply a slurry coat of Xypex Concentrate at a coverage rate of 1.5 - 2 lb./sq. yd. (0.8 - 1 kg/m²) over the repaired area to a 12" (300 mm) diameter area around the filled void.

- D. **Surface Application:** After repairs, surface preparation, treatment of construction joints and sealing strip placement have been completed in accordance with manufacturer's product data and as specified herein, apply Xypex treatment to concrete surfaces with semi-stiff bristle brush, push broom (for large horizontal surfaces), or suitable spray equipment. The Xypex coating must be uniformly applied and should be just under 1/16" (1.25 mm) thick.

Application rates and locations shall be as indicated in the drawings and in accordance with manufacturer's product data. When brushing, work slurry well into surface of the concrete, filling surface pores and hairline cracks. When spraying, hold nozzle close enough to ensure that slurry is forced into pores and hairline cracks.

1. First Coat (of one or two coat application): Apply Xypex Concentrate slurry coat to locations indicated on drawings in accordance with manufacturer's product data.
2. Second Coat (of two coat application): Where indicated on drawings or as required by manufacturer's product data, apply Xypex Modified or Xypex Concentrate slurry coat after the first coat of Xypex Concentrate has reached an initial set but while it is still "green" (less than 48 hours). Curing by misting the coating with water should be

done between coats. Ensure first coat is in SSD condition before application of the second coat.

Note: Prior to the installation, it is recommended that a test section be completed under anticipated ambient and project conditions to demonstrate acceptable bond

- E. ***Sandwich (Topping) Application:*** When treated structural slabs are to receive a concrete or other topping, place the topping while waterproofing material is still “green” (less than 48 hours) but after it has reached an initial set. The preferred time frame is 12 to 24 hours after the installation of Xypex coating. Curing by misting the coating with water should be done between application of coating and installation of concrete overlay. Ensure coating is in SSD condition prior to placement of concrete.

3.04 CURING

- A. ***General:*** Begin curing as soon as Xypex coating has hardened sufficiently so as not to be damaged by a fine spray. Cure Xypex treatment with a mist fog spray of clean water three times a day for 2 to 3 days. Wet burlap and some specialty curing blankets are also effective for curing during the prescribed period. In warm climates, more than three sprayings per day may be necessary to prevent excessive drying of coating.
- B. ***Air Circulation:*** Do not lay plastic sheeting directly on the waterproofing coating as air contact is required for proper curing. If poor air circulation exists in treated areas, it may be necessary to provide fans or blown air to aid in curing of waterproofing treatment.
- C. ***Holding Structures:*** For water holding structures such as swimming pools, reservoirs, water treatment tanks and wet wells, cure Xypex treatment for three days and then allow treatment to set for 12 days before filling. For structures holding hot or corrosive liquids, cure waterproofing treatment for three days and allow to set for 18 days before filling.
- D. ***Protection:*** During the curing period, protect treated surfaces from damage by wind, sun, rain, puddling of water and temperatures below 36°F (2°C). If plastic sheeting is used for protection, it must be raised off of the waterproofing coating to allow sufficient air circulation.

3.05 INTERFACE WITH OTHER MATERIALS

- A. ***Backfilling:*** Do not backfill for 36 hours after application. If backfill takes place within seven days after application, then backfill material shall be moist so as not to draw moisture from waterproof coating.
- B. ***Paint, Epoxy or Similar Coatings:*** Do not proceed with surface preparation or application of paint or other coatings until waterproofing treatment has cured and set for a minimum of 21 days. Light abrasive blasting or washing the Xypex surface with a 3 - 5% acid solution followed by a rigorous rinse with clean water is recommended before applying the coating. Be sure to flush all acid off the surface. Alternately, removal of the Xypex coating by high pressure washing or abrasive blasting following full curing is acceptable. Consult epoxy and paint manufacturer for additional coating instructions and restrictions.

- C. **Grout, Cement Parge Coat, Plaster or Stucco:** It is recommended that any other cementitious system be applied over the Xypex coating after the Xypex has completely set but while it is still “green” (12 to 48 hours). The 12-to-24-hour window is considered ideal. Contact your Xypex Technical Services Representative regarding surface preparation and other procedures for installations of other materials onto Xypex coatings older than 48 hours. Alternately, removal of the Xypex coating by high pressure washing or abrasive blasting following the full 21 day curing is acceptable. Use of a polymer additive to help improve bond in the over coating mortar mix should be considered.
- D. **Responsibility to Ensure Compatibility:** Xypex Chemical Corporation makes no representations or warranties regarding compatibility of Xypex treatment with coatings, plasters, stuccos, tiles or other surface-applied materials. It shall be the responsibility of the installer of the surface-applied material that is to be applied over the Xypex waterproofing treatment, to take whatever measures are necessary, including testing, to ensure acceptance by or adhesion to the waterproofing treatment.

Note: Prior to the installation, it is recommended that a test section be completed under anticipated ambient and project conditions to demonstrate acceptable bond.

3.06 FIELD QUALITY CONTROL

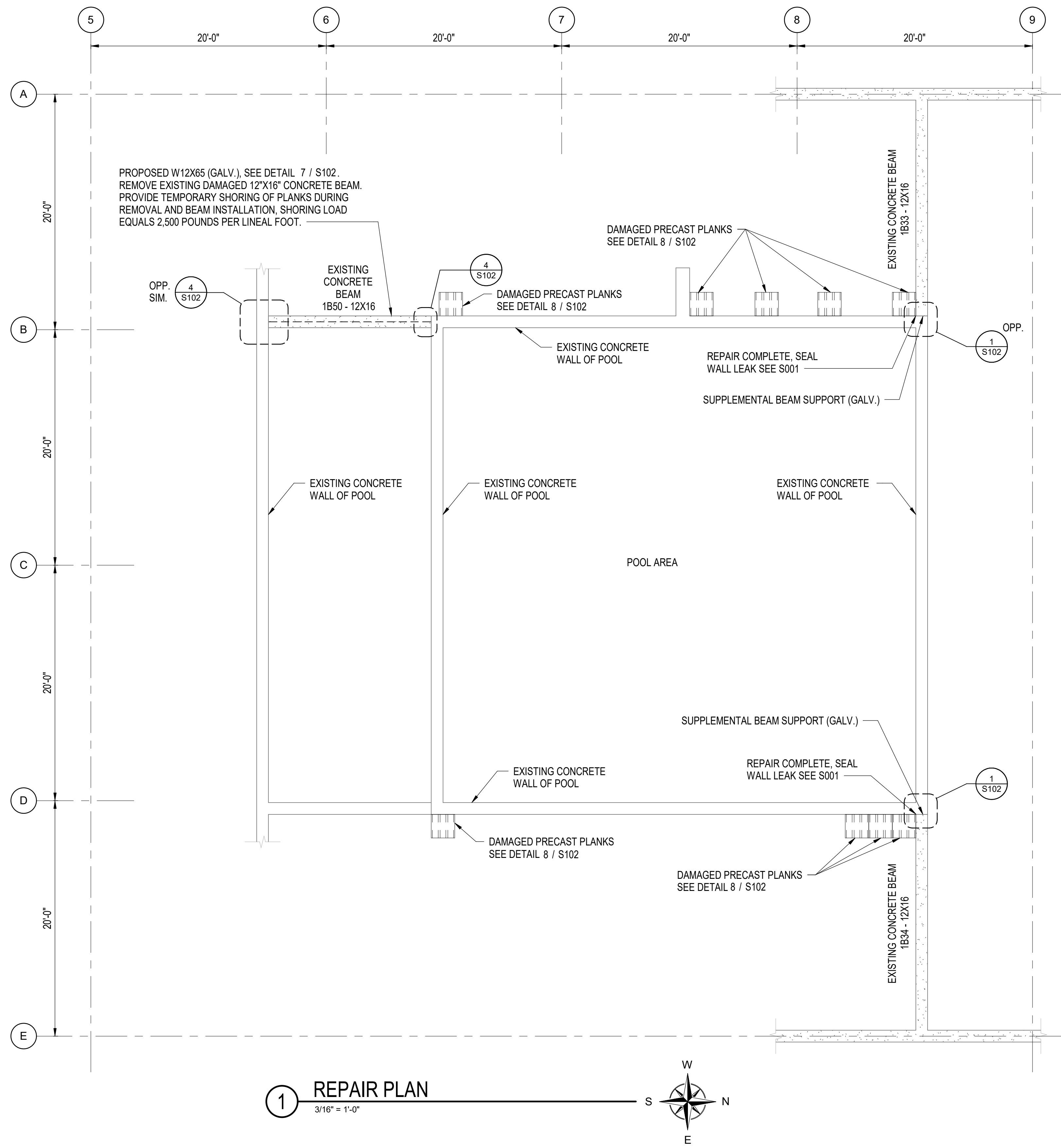
- A. **Observation:** Do not conceal installed waterproofing system before it has been observed by Architect/Engineer, waterproofing manufacturer's representative and other designated entities.
- B. **Testing for Tanks and Foundation Works**
 - 1. Testing: Fill tanks or, for foundation works, shut off dewatering system as soon as practical so that the structure shall be exposed to its normal service conditions. Examine for leaks. For structures that will be dry until a specific event (e.g. interior located containment basin) the concrete elements should be fully saturated several times over a period of several weeks to encourage crystal development to occur.
 - 1. Monitoring:
 - a. Actively leaking cracks and joints shall be left to self-heal for as long as practical. Depending on job site and ambient conditions crack healing can be expected to take several days to weeks.
 - b. Any crack or joints that do not heal in the allowable time frame shall be repaired by the general contractor.
 - c. Moving cracks shall be repaired using polyurethane injection or other appropriate method.
 - 2. Repair: Use Xypex repair procedures to seal any static crack or joint that does not self-heal. See Method Statements (www.xypex.com/technical/statements) or contact Xypex Technical Services Representative for appropriate repair procedures.

Note: Lower temperatures will extend the times for crystalline development.

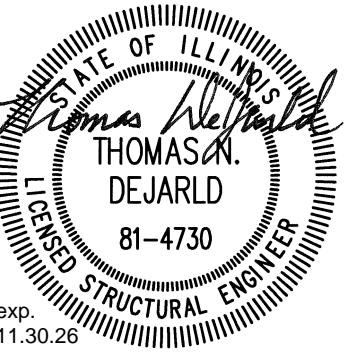
3.07 CLEANING AND PROTECTION

- A. **Cleaning:** Clean spillage and soiling from adjacent surfaces using appropriate cleaning agents and procedures.
- B. **Protection:** Take measures to protect completed Xypex coating until the coating is hard enough to not be damaged. In normal conditions protect from pedestrian traffic for 3 days and vehicular traffic for 7 days. If coatings will be exposed to ongoing vehicular traffic or other abrasive environments consult Xypex Technical Services.

End of Section 071616



1 REPAIR PLAN
 3/16" = 1'-0"

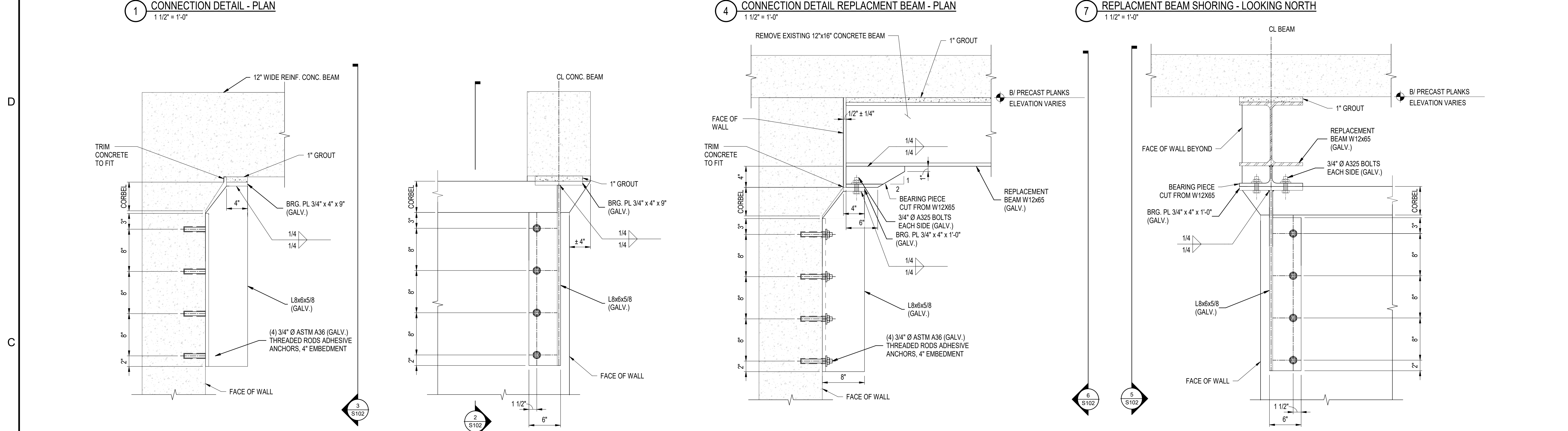
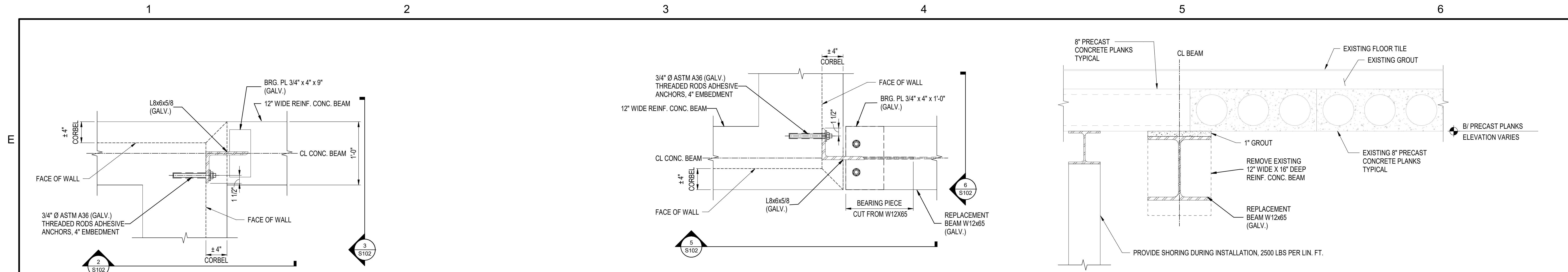


**CONCRETE
 REPAIRS FOR
 CENTRAL PARK
 POOL**

MARK	DATE	DESCRIPTION

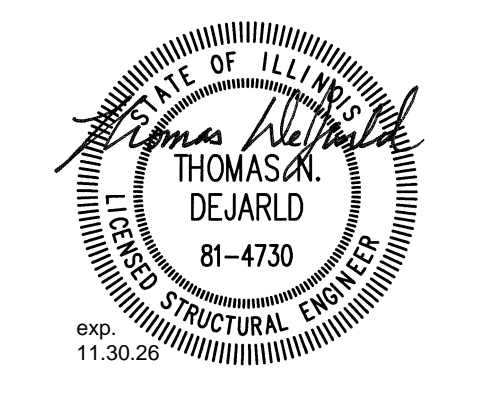
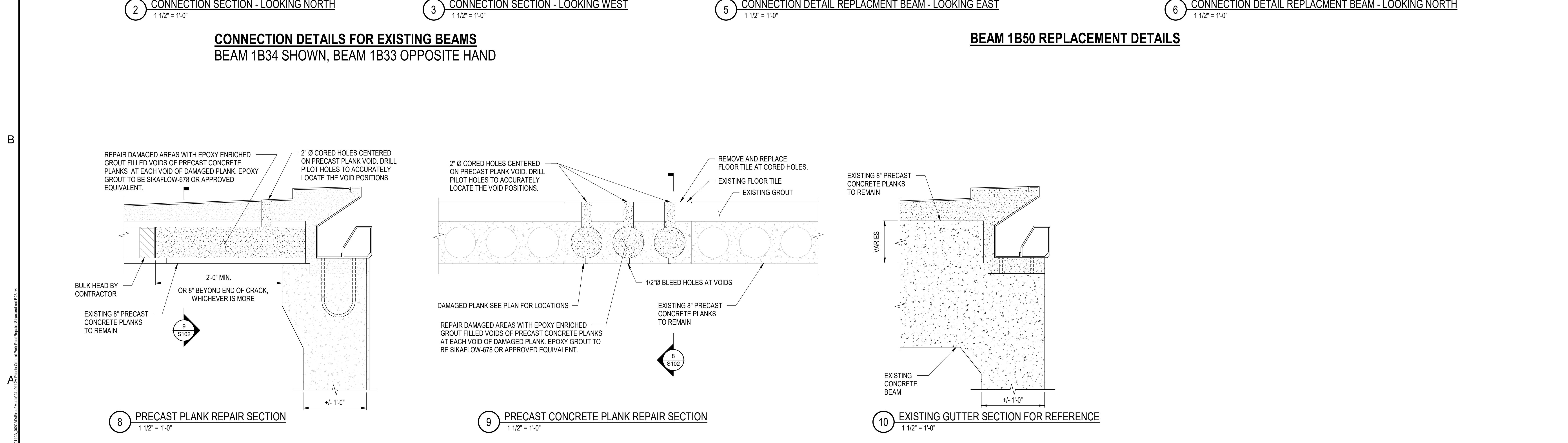
ISSUE: 1/20/2025
 PROJECT NO: 24L0112A
 CAD FILE:
 DRAWN BY: RKN
 CHECKED BY: TND
 REVIEWED BY: TND

SHEET TITLE
 PLAN



CONNECTION DETAILS FOR EXISTING BEAMS
BEAM 1B34 SHOWN, BEAM 1B33 OPPOSITE HAND

BEAM 1B50 REPLACEMENT DETAILS



CONCRETE
REPAIRS FOR
CENTRAL PARK
POOL

MARK	DATE	DESCRIPTION

ISSUE: 1/20/2025
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SHEET TITLE
REPAIR DETAILS