

SECTION 03900 CONCRETE RESTORATION AND CLEANING

This guide specification has been prepared by Dayton Superior Corporation to assist design professionals in the preparation of a specification section covering graffiti removal, cleaning, epoxy bonding, and cementitious or epoxy patching of existing horizontal and vertical concrete surfaces.

This specification may be used as the basis for developing either a project specification or an office master specification. Since it has been prepared according to the principles established in the Manual of Practice published by The Construction Specifications Institute (CSI), it may be used in conjunction with most commercially available master specifications systems with minor editing.

The following should be noted in using this guide specification:

Editing notes to assist users are included within bordered boxes. Delete these notes prior to final printing.

Optional text requiring a selection by the user is enclosed within brackets, e.g.:
Section [01330] [____]."

Items requiring user input are enclosed within brackets, e.g.: Section [____ - ____]."

Optional paragraphs are separated by an OR" statement, e.g.:

**** OR ****

Metric equivalents to inch-pound units follow the inch-pound units and are contained within parenthesis. Metric measurements are rationalized units based on the SI system of measurement. Delete either the inch-pound or metric units of measure depending on project requirements; do not include both units in a project specification, as conflicting requirements could result.

This guide specification is available in both hard copy and a variety of electronic formats to suit most popular word processing programs and operating platforms. Please contact Dayton Superior Corporation at (800) 745-3707 for additional copies or for information on available electronic formats.

1 GENERAL

1.1 SUMMARY

Edit the following to suit project requirements.

A. Section Includes:

- 1 Graffiti removal from concrete surfaces.
- 2 Cleaning of existing [horizontal] [and] [vertical] concrete surfaces.
- 3 Epoxy repair of cracks in existing [horizontal] [and] [vertical] concrete surfaces.

4 [Cementitious] [Epoxy] patching of existing deteriorated [horizontal] [and] [vertical] concrete surfaces.

B. Related Sections:

1. Section [09960 - High Performance Coatings] [_____ - _____]: Anti-graffiti coating applied to surfaces after cleaning [and patching].

1.2 REFERENCES

A. American Association of State Highway and Transportation Officials (AASHTO) M-235 - Epoxy Resin Adhesives.

B. American Concrete Institute (ACI) 302.1 - Guide for Concrete Floor and Slab Construction.

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

1 C 78 - Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading).

2 C 109 - Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-inch or 50-mm Cube Specimens).

3 C 266 - Test Method for Time of Setting of Hydraulic Cement Paste by Gillmore Needles.

4 C 348 - Test Method for Flexural Strength of Hydraulic Cement Mortars.

5 C 666 - Test Method for Resistance of Concrete to Rapid Freezing and Thawing.

6 C 672 - Test Method for Scaling Resistance of Concrete Surfaces Exposed to Deicing Chemicals.

7 C 881 - Specification for Epoxy-Resin Base Bonding Systems for Concrete.

8 C 882 - Test Method for Bond-Strength of Epoxy-Resin Systems Used with Concrete.

9 C 883 - Test Method for Effective Shrinkage of Epoxy-Resin Systems Used with Concrete.

10 C 928 - Specifications for Packaged, Dry, Rapid-Hardening Cementitious Materials for Concrete Repairs.

11 C 944 - Standard Test Method for Abrasion Resistance of Concrete or Mortar Surfaces by the Rotary-Cutter Method.

12 C 1202 - Test Method for Electrical indication of Concrete's Ability to Resist Chloride Ion Penetration.

- 13 C 1042 - Test Method for Comparing Concrete on the Basis of Bond Developed with Reinforcing Steel.
- 14 C 1059 - Specification for Latex Agents for Bonding Fresh to Hardened Concrete.
- 15 D 570 - Test Method for Water Absorption of Plastics.
- 16 D 638 - Test Method for Tensile Properties of Plastics.
- 17 D 695 - Test Method for Compressive Properties of Rigid Plastics.
- 18 D 790 - Test Method for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

1.3 SUBMITTALS

Edit the following paragraph to indicate the correct Division 1 section.

A. Submit under provisions of Section [01330] [_____]:

- 1 Product Data: Include manufacturer's specifications, surface preparation and application instructions, and protection of adjacent surfaces.
- 2 Test Data: Confirm compliance with specified requirements.

1.4 QUALITY ASSURANCE

A. Mockup:

Edit the following paragraph to indicate the correct Division 1 section. Edit remaining paragraphs to suit project requirements.

- 1 Clean [and repair] existing concrete surfaces under provisions of Section [01430] [_____].
- 2 Size: [100] [_____] square feet ([9] [_____] sq m) [of each substrate].
- 3 Location: [_____] [Approved by Architect/Engineer].

1.5 DELIVERY, STORAGE AND HANDLING

Edit the following paragraph to indicate the correct Division 1 section.

A. Deliver, store, and handle products under provisions of Section [01600] [_____].

B. Store materials in a dry area within temperature range recommended by manufacturer.

1.6 PROJECT CONDITIONS

A. Apply materials within temperature range recommended by manufacturer.

B. Ensure adequate ventilation in application areas.

2 PRODUCTS

2.1 MANUFACTURERS

A. Manufacturer: Dayton Superior Corporation, 402 South First Street, Oregon, IL 61061, (800) 745-3707.

Edit the following paragraph to indicate whether substitutions will be permitted; indicate the correct

Division 1 section.

B. Substitutions: [Not permitted.] [Under provisions of Section [01630] [_____].]

2.2 MATERIALS - CLEANERS

Include the following for a water soluble cleaner and degreaser for concrete floors.

A. Floor Cleaner, Degreaser, and Stripper:

1 Product: Concrete Floor Cleaner and Degreaser (J-47).

2 Description: Water soluble cleaning and degreasing solution.

**** OR ****

Include the following for a VOC compliant, citrus based, heavy duty cleaner, degreaser, and stripper for concrete floors.

B. Floor Cleaner, Degreaser, and Stripper:

1 Product: Citrus Peel (J-48).

2 Description: Water soluble, biodegradable, cleaning, degreasing, and stripping solution.

3 VOC compliant.

2.3 MATERIALS - GRAFFITI CLEANERS

Include the following for a VOC compliant graffiti remover for surfaces coated with Graffiti Protector (J-44).

A. Graffiti Cleaner:

- 1 Product: Graffiti Klean (J-45).
- 2 Description: Biodegradable, non-toxic graffiti cleaner.
- 3 VOC compliant.

**** OR ****

Include the following for a graffiti remover for surfaces not protected by Graffiti Protector (J-44).

B. Graffiti Cleaner:

- 1 Product: Superior Graffiti Remover (J-46) Gel.
- 2 Description: Heavy duty graffiti cleaner.
- 3 VOC compliant.

2.4 MATERIALS - CEMENTITIOUS PATCHING COMPOUNDS

Include the following for a rapid setting, heavy duty concrete patch for horizontal surfaces and vertical and overhead form-and-pour" applications.

A. Patching Compound:

- 1 Product: HD-50.
- 2 Description: Fast setting, cement based, fiber reinforced, latex modified, heavy duty concrete patch for horizontal surfaces and vertical and overhead form-and-pour" applications.
- 3 Pourable and pumpable.
- 4 Meet ASTM C 928.
- 5 Compressive strength: Tested per ASTM C 109 with following results: Test Age Compressive Strength - psi (MPa)
At 75 degrees F (24 degrees C) At 40 degrees F (4 degrees C)
1 hour 2500 (17.2) - - -
3 hours 3500 (24.1) 2700 (18.6)
1 day 6145 (42.4) 6100 (42.1)
7 days 7370 (50.8) 6860 (47.3)
28 days 7990 (55.1) 7800 (53.8)
- 6 Bond strength: Tested per ASTM C 882 with following results: Test Age Bond Strength - psi (MPa)

1 day 1950 (13.4)
7 days 2550 (17.6)

7 Length change: Tested per ASTM C 928 with following results: Test Age Water Storage Air Storage Differential
28 days Plus 0.03 percent Minus 0.09 percent 0.12 percent

8 Freeze/thaw scaling resistance: 0.71 pounds per square foot (0.34 kg/sq m), average of three specimens, tested per ASTM 672.

9 Rapid freeze-thaw test: Average weight loss of 0.3 percent after 300 cycles, tested per ASTM C 666, Method B.

10 Chloride ion permeability: Tested per ASTM C 1202.

a. Elapsed time: 360 minutes.

b. Total charge passed through specimen: 646 coulombs.

c. Chloride permeability rating: Very low.

**** OR ****

Include the following for a rapid setting, high ultimate compressive strength, heavy duty concrete patch for horizontal surfaces.

B. Patching Compound:

1 Product: Day-Chem Perma Patch.

2 Description: Fast setting, cement based, fiber reinforced, silica fume, heavy duty concrete patch for horizontal surfaces.

3 Meet ASTM C 928.

4 Compressive strength: Tested per ASTM C 109 with following results: Test Age Compressive Strength - psi (MPa)
1 hour 2500 (17.2)
3 hours 4000 (27.6)
1 day 5200 (35.8)
7 days 9000 (62.0)
28 days 10,800 (74.5)

5 Length change: Tested per ASTM C 928 with following results: Test Age Water Storage Air Storage

Differential

28 days Plus 0.03 percent Minus 0.07 percent 0.10 percent

6 Freeze/thaw scaling resistance: 0.1 pound per square foot (0.5 kg/0.9 sq m), average of three specimens, tested per ASTM 672.

**** OR ****

Include the following for a patching/resurfacing material for horizontal surfaces requiring thin applications.

C. Patching Compound:

1 Product: Thin Resurfacer.

2 Description: Cement based, polymer modified concrete patching and resurfacing compound for horizontal applications from 1/8 to 1/2 inch (3 to 13 mm).

3 Compressive strength: Tested per ASTM C 109 with following results: Test Age Compressive Strength - psi (MPa)

1 day 1600 (11.0)

3 days 3200 (22.0)

7 days 5700 (39.3)

28 days 6700 (46.2)

4 Bond strength: Tested per ASTM C 1042 with following results: Test Age Bond Strength - psi (MPa)

7 days 2700 (18.6)

28 days 3500 (24.1)

5 Flexural strength: 1100 psi (7.6 MPa), tested per ASTM C 78 at 28 days.

**** OR ****

Include the following for a polymer modified concrete patching compound for vertical and overhead applications.

D. Patching Compound:

1 Product: Polyfast.

2 Description: Cement based, polymer modified, shrinkage compensating concrete patching compound

for vertical and overhead applications.

3 Meet ASTM C 928.

4 Compressive strength: Tested per ASTM C 109 with following results: Test Age Compressive Strength - psi (MPa)

1 day 4100 (22.2)

3 days 6500 (44.8)
7 days 8100 (55.8)
28 days 9000 (62.0)

- 5 Bond strength: 5100 psi (35.1 MPa), tested per ASTM C 1042 at 7 days.
- 6 Flexural strength: 2000 psi (13.8 MPa), tested per ASTM C 348 at 28 days.
- 7 Chloride ion permeability: Tested per ASTM C 1202.
 - a. Elapsed time: 360 minutes.
 - b. Total charge passed through specimen: 8 coulombs.
 - c. Chloride permeability rating: Negligible.

8. Length change: Tested per ASTM C 928 with following results: Test Age Water Cure Air Cure
28 days Minus 0.027 percent Minus 0.03 percent

**** OR ****

Include the following for a fast setting patching compound for vertical and overhead applications.

E. Patching Compound:

- 1 Product: Re-Crete 20 Minute Set with Ad Bond (J-40).
- 2 Description: Cement based patching compound with accelerators.
- 3 Compressive strength: Tested per ASTM C 109 with following results: Test Age Compressive Strength - psi (MPa)
1 day 2250 (15.5)
3 days 5100 (35.2)
28 days 8000 (55.1)

**** OR ****

Include the following for a rapid setting patching compound for plugging water or fluid leaks.

F. Patching Compound:

- 1 Product: Water Stop.
- 2 Description: Noncorrosive, non-rusting, hydraulic cement.

3 Compressive strength: Tested per ASTM C 109 with following results: Test Age Compressive Strength - psi (MPa)
1 hour 975 (6.7)
24 hours 1870 (12.9)
3 days 2950 (20.3)
7 days 3650 (25.1)
28 days 5910 (40.7)

4 Setting time: 2-1/2 minutes initial, 3-1/2 minutes final; tested per ASTM C 266.
Include one of the following epoxy adhesives for patching, resurfacing, and anchoring.

2.5 MATERIALS - EPOXY ADHESIVES

Include the following for a VOC compliant, low modulus, low viscosity epoxy for patching and resurfacing concrete surfaces.

A. Epoxy Adhesive:

- 1 Product: Sure Level Epoxy (J-57).
- 2 Description: Two component, pre-proportioned, 100 percent solids, low modulus, high strength, low viscosity epoxy.
- 3 VOC compliant.
- 4 Tested to ASTM C 881, Type 3, Grade 1, Classes B and C.
- 5 Compressive strength: 7500 psi (51.7 MPa) in 24 hours, tested per ASTM D 579.
- 6 Bond strength: 1600 psi (11.0 MPa) at 14 days, tested per ASTM C 882.
- 7 Tensile strength: 2500 psi (17.2 MPa), tested per ASTM D 638.

**** OR ****

Include the following for a VOC compliant, high strength, high modulus epoxy gel adhesive for patching concrete surfaces and anchoring.

B. Epoxy Adhesive:

- 1 Product: Sure-Anchor I (J-51).
- 2 Description: Two-component, pre-proportioned, 100 percent solids, fast setting, moisture insensitive epoxy adhesive.

- 3 Tested to ASTM C 881, Types 1, 2, 4, and 5, Grade 3, Classes B and C.
- 4 VOC compliant.
- 5 Compressive strength: 10,600 psi (73.0 MPa), tested per ASTM D 695 at 7 days.
- 6 Modulus of elasticity (compressive): 500,000 psi (3447 MPa), tested per ASTM D 695.
- 7 Water absorption: 0.9 percent, tested per ASTM D 570.
- 8 Concrete pullout resistance: Rod Diameter - Inches (mm) Hole Diameter - Inches (mm) Hole Depth
 Inches (mm) Ultimate Pullout STrength based on Concrete Compressive Strength - pounds (kg)
 3500 (24) 4000 (27) 4500 (31)
 3/8 (10) 7/16 (11) 4 (102) 7100 (3216) 7150 (3238) 7190 (3257)
 3/8 (10) 7/16 (11) 5.5 (140) 8500 (3850) 8600 (3896) 8690 (3936)
 1/2 (13) 9/16 (14) 5 (127) 14,200 (6432) 14,400 (6523) 14,600 (6613)
 1/2 (13) 9/16 (14) 6.5 (165) 17,600 (7972) 17,800 (8063) 18,000 (8154)
 5/8 (16) 3/4 (19) 6 (152) 21,500 (9739) 21,700 (9830) 21,900 (9920)
 5/8 (16) 3/4 (19) 7.75 (197) 25,400 (11,506) 25,800 (11,687) 26,200 (11,868)
 3/4 (19) 7/8 (22) 7 (178) 28,600 (12,955) 28,800 (13,046) 29,200 (13,227)
 3/4 (19) 7/8 (22) 9.5 (240) 34,600 (15,673) 34,800 (15,764) 35,200 (15,945)
 7/8 (22) 1 (25) 8.0 (203) 34,400 (15,583) 34,600 (15,673) 35,000 (15,855)
 7/8 (22) 1 (25) 10 (254) 43,500 (19,705) 43,800 (19,841) 44,100 (19,977)
 1 (25) 1-1/8 (28) 10 (254) 43,600 (19,750) 43,900 (19,886) 44,200 (20,022)
 1 (25) 1-1/8 (28) 12 (305) 49,600 (22,468) 49,900 (22,604) 50,200 (22,740)

**** OR ****

2.6 MATERIALS - FLOOR [TOPPINGS] [AND] [OVERLAYS] Include the following for a non-rusting heavy duty or industrial floor topping.

A. Heavy Duty Floor [Topping] [Overlay]:

- 1 Product: Emery Tuff Top.
- 2 Description: Ready to use, floor topping containing pure emery, special additives, and portlandcement.
- 3 Moh hardness of treated concrete: 8 to 9.
- 4 Compressive strength of treated concrete: 14,000 psi (96.5 MPa) in 28 days, tested per ASTM C

109.

- 1 Emery/corundum: Contain minimum 50 percent aluminum oxide.
 - 6. Abrasion resistance of treated concrete: 0.4 grams average weight loss, tested per ASTM C 944 with applied load and time of abrasion doubled.
 - 2 Approved for use on Class 5 through 8 industrial floors per ACI 302.1.
- Edit the following to suit project requirements.

- 3 Color: [Battleship Grey] [French Grey] [Tan] [Terra Cotta] [Tile Red] [Black] [Brown] [Green]

[Light Reflective].

**** OR ****

Include the following for a VOC compliant, low modulus, low viscosity epoxy for resurfacing or patching concrete floors.

B. Epoxy Floor [Topping] [Overlay]:

- 1 Product: Sure Level Epoxy (J-57).
- 2 Description: Two component, pre-proportioned, 100 percent solids, low modulus, high strength, low viscosity epoxy for resurfacing with epoxy or by the broom-and-seed" method.
- 3 VOC compliant.
- 4 Tested to ASTM C 881, Type 3, Grade 1, Classes B and C.
- 5 Compressive strength: 7500 psi (51.7 MPa) in 24 hours, tested per ASTM D 579.
- 6 Bond strength: 1600 psi (11.0 MPa) at 14 days, tested per ASTM C 882.
- 7 Tensile strength: 2500 psi (17.2 MPa), tested per ASTM D 638.

2.7 MATERIALS - EPOXY CRACK REPAIR

Include the following for a VOC compliant, low viscosity, epoxy adhesive for gravity fed or pressure injected crack repair.

A. Epoxy Adhesive:

- 1 Product: Sure-Inject (J-56).
- 2 Description: Two component, pre-proportioned, 100 percent solids, low viscosity epoxy adhesive.
- 3 VOC compliant.
- 4 Tested to ASTM C 881, Types 1, 2, 4, and 5, Grade 1, Classes B and C.
- 5 Compressive strength: Minimum 13,000 psi (89.6 MPa), tested per ASTM D 695.
- 6 Concrete bond strength: 2000 psi (13.8 MPa) at 14 days, tested per ASTM C 882.
- 7 Tensile strength: 7400 psi (51 MPa) at 7 days, tested per ASTM D 638.
- 8 Water absorption: 0.23 percent, tested per ASTM D 570.

9 Shrinkage: Tested per ASTM C 883.

2.8 MATERIALS - EPOXY REINFORCING SPRAY

Include the following for an epoxy spray for protecting reinforcing steel.

A. Epoxy Reinforcing Spray:

- 1 Product: Rebar Epoxy Spray (J-62).
- 2 Description: Epoxy coating in self-contained spray applicator.
- 3 Color: Green.

2.9 MATERIALS - BONDING AGENTS

Include the following for a VOC compliant, high modulus, medium viscosity, epoxy adhesive for spray or brush application as a bonding agent.

A. Epoxy Adhesive:

- 1 Product: Resi-Bond (J-58).
- 2 Description: Two component, pre-proportioned, 100 percent solids, high modulus, medium viscosity epoxy adhesive.
- 3 VOC compliant.
- 4 Tested to ASTM C 881, Types 1, 2, 4, and 5, Grade 2, Classes B and C and AASHTO M-235, Class III - Standard Version.
- 5 Compressive strength: Minimum 10,400 psi (71.7 MPa) in 7 days, tested per ASTM D 695.
- 6 Concrete bond strength: 2550 psi (17.6 MPa) at 2 days and 3150 psi (21.7 MPa) at 14 days, tested per ASTM C 882.
- 7 Tensile strength: 7580 psi (52.3 MPa) at 7 days, tested per ASTM D 638.
- 8 Water absorption: 0.13 percent, tested per ASTM D 570.
- 9 Modulus of elasticity: 275,000 psi (1896 MPa), tested per ASTM D 695.

**** OR ****

Include the following for a non-reemulsifiable, acrylic latex bonding agent.

B. Bonding Agent:

- 1 Product: Day-Chem Ad Bond (J-40).
- 2 Description: Non-reemulsifiable, acrylic latex emulsion bonding agent.
- 3 Tested to ASTM C 1059, Type II.
- 4 Bond strength: Tested per ASTM C 1042, Type II with following results: Test Age
Compressive
Strength - psi (MPa)
14 days 1865 (12.9)
28 days 2436 (16.8)

**** OR ****

Include the following for a reemulsifiable/rewettable, PVA bonding agent. Do not use this product in exterior applications.

C. Bonding Agent:

- 1 Product: Superior Concrete Bonder (J-41).
- 2 Description: Reemulsifiable/rewettable, polyvinyl acetate emulsion bonding agent.

2.10 ACCESSORIES

Include the following for epoxy adhesives used as patching compounds.

A. Sand: Clean, well graded silica sand.

Include the following to extend cementitious patching compound when allowed by the product literature.

B. Aggregate: 3/8 inch (10 mm) clean, washed pea gravel.

2.11 MIXING

Include the following paragraph only for products requiring site mixing.

A. Mix materials in accordance with manufacturer's instructions.

Include the following for epoxy patching compounds.

B. Epoxy Patching Compound: Add sand to mixed epoxy adhesive in accordance with manufacturer's instructions.

Include the following to extend cementitious patching compound when allowed by the product literature.

C. Cementitious Patching Compound: Mix aggregate with patching compound at rate not to exceed manufacturer's recommended ratio.

D. Do not over-water or retemper mixes.

3 EXECUTION

Include the following for removal of graffiti from existing surfaces.

3.1 GRAFFITI REMOVAL

A. Follow manufacturer's instructions for application and coverage.

B. Apply cleaner in a flood coat by low pressure spray, roller, brush, or sponge.

C. Allow cleaner to remain on surface for 5 to 10 minutes, then rinse completely with clean water.

D. If graffiti remains on surface, reapply cleaner to affected areas and scrub with stiff bristle brush. Rinse completely with clean water.

E. After surface has dried completely, apply anti-graffiti coating.

3.2 PREPARATION

A. Clean surfaces to be patched or bonded:

1 Remove loose and foreign matter by sandblasting, chipping, wire brushing, or grinding.

2 Remove deteriorated and loose concrete to expose firm substrate.

3 Clean holes with bristle brush.

4 Remove remaining water and dust with clean, compressed air.

B. Protect adjacent and underlying surfaces.

Include the following when exposed steel reinforcing bars require epoxy protection prior to patching.

3.3 APPLICATION - EPOXY REINFORCING SPRAY

A. Follow manufacturer's instructions.

B. Apply to exposed reinforcing steel in several light, even coats.

Include the following when a bonding agent is required prior to applying cementitious patching

compounds.

3.4 APPLICATION - BONDING AGENTS

- A. Follow manufacturer's instructions.
- B. Apply by [brush] [broom] [roller] [or] [spray].
- C. Place patching compounds within time period recommended by manufacturer, or recoat.

3.5 APPLICATION - INTERIOR EPOXY MORTAR [PATCHING] [OVERLAY]

- A. Follow manufacturer's instructions.
- B. Prime prepared substrate with mixed neat epoxy adhesive.
- C. Apply epoxy mortar before primer becomes tack free.
- D. Place in maximum 1 inch (25 mm) lifts. Allow each lift to cure before placing next lift.
- E. Minimum thickness: 1/4 inch (6 mm).

3.6 APPLICATION - EXTERIOR EPOXY MORTAR [PATCHING] [OVERLAY]

- A. Follow manufacturer's instructions.
- B. Prime prepared substrate with mixed neat epoxy adhesive.
- C. Apply epoxy mortar before primer becomes tack free.
Contact Dayton Superior for thicknesses exceeding 1/2 inch (13 mm).
- D. Thickness: 1/4 inch (6 mm) minimum to 1/2 inch (13 mm) maximum.
Do not use the following for exterior slabs-on-grade.

3.7 APPLICATION - EPOXY BROADCAST OVERLAY

- A. Follow manufacturer's instructions.
- B. Prime prepared substrate with mixed neat epoxy adhesive.
- C. Apply mixed epoxy before primer becomes tack free, using notched squeegee.
- D. After material levels, broadcast sand slowly over surface at rate of 2 pounds per square foot (10 kg/sq m); allow to settle into epoxy binder. Remove excess sand after epoxy sets.

E. After first coat has dried, apply second coat of epoxy and sand.

3.8 APPLICATION - EPOXY CRACK REPAIR

A. Follow manufacturer's instructions.

B. Space injection holes at 8 to 36 inch (200 to 900 mm) intervals depending on crack width and thickness of member.

C. Set injection ports in epoxy adhesive and allow to cure.

D. Seal cracks with epoxy adhesive to prevent loss of injected epoxy.

E. Inject epoxy to refusal.

F. After curing, remove injection ports and grind surfaces smooth.

3.9 PATCHING HORIZONTAL SURFACES - CEMENTITIOUS COMPOUNDS

A. Follow manufacturer's instructions.

B. Saw cut perimeter of area to be repaired.

C. Wet surfaces or apply bonding agent.

D. Thoroughly work repair material into substrate.

E. Float or trowel smooth and flush with adjacent surfaces.

F. Finish to match texture of surrounding concrete.

G. Cure surfaces immediately after finishing to prevent moisture loss; apply curing compound or use wet burlap except use insulated blankets during cold weather.

3.10 PATCHING VERTICAL AND OVERHEAD SURFACES - CEMENTITIOUS

COMPOUNDS

A. Follow manufacturer's instructions.

B. Wet surfaces or apply bonding agent.

C. Thoroughly work material into substrate without voids.

D. Float or trowel smooth and flush with adjacent surfaces.

E. Finish to match texture of surrounding concrete.

F. Cure surfaces immediately after finishing to prevent moisture loss; apply curing compound or use wet burlap except use insulated blankets during cold weather.

END OF SECTION