

SECTION 03930

JOINT FILLING AND CONCRETE SLAB REPAIR

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. Provide all labor, products and equipment required to properly install semi-rigid filler in joints in the interior concrete floor slabs and low viscosity structural polymer required for narrow crack, surface spall, bolt hole, or defect repair.
- B. Scope of Work
 - 1. Fill all contraction and construction joints in the interior concrete floor slab where joints have been previously left unfilled.
 - 2. Joint filler removal and replacement where existing joints have been previously filled and show signs of deficiency.
 - 3. Repair of all non-moving narrow cracks with low viscosity structural repair polymer, 1/32" – 1/4".
 - 4. Repair of non-moving or moving cracks over 1/4" up to 1" with rapid setting polyurea joint filler compound.
 - 5. Repair of surface defects including pop-outs, chips, spalls, and surface pitting.

1.2 SUBMITTALS

- A. Section 01330 - Submittal Procedures: Procedures for Submittals.
- B. Contractor Qualifications
 - 1. Installer shall have a minimum of three (3) years experience in performing the types of work covered by this Section and shall be an Approved Applicator of the material manufacturer.
 - 2. Use only Manufacturer Approved Applicators for work covered by this section.
 - 3. Approved Applicator shall use tools and equipment specifically designed for the preparation and placement of industrial joint fillers.
- C. Product data for:
 - 1. Submit Manufacturer's data describing joint filler proposed for use on the project.
 - 2. Submit Manufacturer's Approved Applicator Certificate.
 - 3. All products and primary equipment used for repair of existing concrete slab defects.

1.3 ENVIRONMENTAL REQUIREMENTS

- A. Limit and control damage from excessive dust caused by demolition, preparation, and installation of all Work.
- B. Limit and control damage from moisture.
- C. All replaced concrete shall be cured a minimum of 28 days prior to joint filler installation.
- D. Concrete repair area shall be closed to traffic during preparation and repair for a time as recommended by manufacturer.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Subject to compliance with project requirements, provide products as manufactured by the following:
 - 1. Metzger/McGuire (800) 223-6680.

- B. Polyurea Joint Filler: Rapid setting, two-component polyurea polymer liquid of 100% solids content, Shore hardness 85-90, compatible with construction materials in contact.
 - 1. Edge-Pro 90, by Metzger/McGuire.
 - 2. Spal-Pro RS 88, by Metzger/McGuire
 - 3. Match color of adjacent exposed concrete slab surface.

- C. Joint Filler Stain Preventing Film: (Where pre-installation test proves necessary)
 - 1. SPF by Metzger/McGuire.

- D. Low Viscosity Rigid Urethane:
 - 1. Rapid Refloor, by Metzger/McGuire.
 - 2. Rapid Refloor XP, by Metzger/McGuire.
 - 3. Match color of adjacent exposed concrete slab surface.

2.2 EQUIPMENT - DUST FREE PREPARATION EQUIPMENT

- A. Subject to compliance with project requirements, provide equipment manufactured by the following:
 - 1. U.S. Saws
 - 2. Gorilla Concrete Tools
 - 3. Pulman-Ermator
 - 4. Diamatic
 - 5. Husqvarna
 - 7. HTC
 - 8. Perfect-Trac

- B. DUST EXTRACTION SYSTEM FOR GRINDING/SAWING:
 - 1. HEPA filtration vacuum, designed for use with all hand tools when grinding sawing concrete (minimum 125CFM air flow).
 - 2. Provide one of the following:
 - a. S26/S36, by Pullman-Ermator
 - b. D30/D60, by HTC
 - c. Approved equal

- C. JOINT FILLER REMOVAL AND PREPARATION
 - 1. Dust Buggy (MKIII or Standard) by U.S. Saws
 - 2. GCT-10/X Tank by Gorilla Concrete Tools
 - 3. JS-130/JS-100E by U.S. Saws
 - 4. Perfect-Trac Saw by Perfect-Trac.
 - 5. Approved equal

- D. CRACK REPAIR:
 - 1. GCT-4.5/GCT-9 by Gorilla Concrete Tools
 - 2. CC-100 by U.S. Saws
 - 3. 5" Premium Handheld Crack Chaser by U.S. Saws
 - 4. Approved equal

- E. SURFACE GRINDER:
 - Handheld 5"-7" electric surface grinder with dustless shroud/housing:
 - 1. 5" Pro GC Metabo with Shroud by U.S. Saws
 - 2. Approved equal

- F. MEDIUM GRIT FINISHING PADS
 - 1. Rapid Strip by Norton Abrasives

2. Gator Grit Medium Finishing Pad by Ali Industries

PART 3 - EXECUTION

3.1 EXAMINATION

- A. An evaluation of the existing floor slab shall be conducted, identifying all defects. Scope of repairs shall be confirmed by the Owner and Architect of Record prior to commencement of work.
- B. Repairs are not acceptable unless specifically approved on a case-by-case basis by the Owner and/or Architect of Record.

3.2 PREPARATION

- A. Protect surface of slab immediately adjacent to defect under repair.

3.3 FULL DEPTH JOINT FILLER PLACEMENT

- A. If joints have been previously filled and existing filler is loose, easily removed, or able to be forced downward with a hand tool, remove all filler material from joint.
- B. Where potential staining from new joint filler application may be objectionable, utilize Metzger/McGuire SPF (Stain Preventing Film) following manufacturer's installation instructions. Apply SPF prior to joint cleanout process.

1. Clean existing joints full depth with a dry-cut, vacuum-equipped saw using a slightly oversized concrete diamond blade. The blade width should be sufficient to encapsulate the widest spall along a given contraction joint segment to produce a sharp corner on each side of the joint with a minimum of two passes through the joint.

2. Remove all existing filler material where present. Clean joint of all debris and laitance.

3. Refill with semi-rigid polyurea joint filler per manufacturer's installation guidelines. Fill joints from the bottom up, taking care not to entrap large air bubbles. Slightly overfill and razor off overfill flush to the slab surface after cure, approximately 1 hour after placement

3.4 SPALLED JOINT REPAIR (LESS THAN 1")

- A. For joints that are spalled or have radius tooled edges not exceeding 1" in width at slab surface.
- B. Where potential staining from new joint filler application may be objectionable, utilize Metzger/McGuire SPF (Stain Preventing Film) following manufacturer installation instructions.

1. Re-saw the joint edge to a minimum depth of 3/4" with a dry-cut, vacuum-equipped saw allowing removal of the widest spall along a given joint segment to produce a sharp corner on each side of the joint with a minimum of two passes through joint.

2. Clean joint of loose concrete, joint filler, laitance, dirt, debris, backer rod, etc.

3. Joints must be dry prior to placement of material.

4. Fill joint cavity per manufacturer's instructions, taking care not to entrap large air bubbles. Overfill joint slightly and shave flush to slab surface. It may be necessary to place a trace layer (1/8"-1/4") of clean dry silica sand at the joint base to prevent material seepage down through the shrinkage crack.

3.5 CRACK REPAIR

- A. Cracks from 1/32" to 1/4" in width.
1. Clean crack cavity.
 - a. Remove loose concrete, dirt and debris from crack with a wire brush or hand grinder with twisted wire wheel attachment.
 - b. Remove any loose segments, including islands formed by crack, with sharp tool.
 - c. Use methods that will not widen existing crack.
 - d. Vacuum crack to remove all dirt, debris and other laitance.
 2. Mask slab surface along crack as necessary to minimize overfill.
 3. Cracks must be dry prior to placement of material.
 4. Choose material color that closely matches the color of the adjacent floor.
 5. Install Rapid Refloor in accordance with manufacturer's instructions.
 6. Repeat until all voids are filled and material crowns slab surface.
 - a. Watch for bubble formation and off gassing as that would indicate that moisture is present in crack cavity and steps will need to be taken to dry area prior to further repairs.
 - b. Do not allow material to harden before adding additional material.
 7. Grind material flush to surface upon full cure, approximately 30 minutes to 1 hour, using a medium grit finishing pad.
- B. Cracks from 1/4" to 1" in width
1. Saw along crack to provide square edge, minimum 1/2" in depth.
 - a. Use small hand grinder with maximum 5" diameter blade with dust attachment.
 - b. Take care to minimize overall crack width.
 2. Clean crack cavity.
 - a. Vacuum crack to remove all dirt, debris and other laitance.
 - b. Prepared crack must be dry prior to material placement.
 3. Mask slab surface along crack as necessary to minimize overfill or utilize Metzger/McGuire SPF (Stain Preventing Film) to prevent residual staining from overfill.
 4. Install Spal-Pro RS88 rapid set polyurea joint filler per manufacturer's installation instructions.
 5. Wait approximately 1hr, periodically checking for material cure.
 - a. Check condition of material by shaving with razor scraper.
 - b. Material will shave smooth when cured.
 - c. Proper timing is crucial, approximately 1 hour after placement.
 - 1) Too long and material will be difficult to shave
 - 2) Too soon and material will ravel.
 6. Shave material flush to slab surface per manufacturer's instructions.

3.6 SURFACE SPALLING REPAIR

- A. Defects from 1/4" to 6" in diameter
1. Abraid spalled surface to remove all dirt and laitance. Nyalox coated wire preferred.
 2. Mask slab at perimeter of spall with painter's tape.
 3. Surface of repair area must be dry.

- B. Install Rapid Refloor low viscosity rigid urethane repair material closely following manufacturer's installation guidelines.

NOTE: Where isolated or localized surface spalling has occurred adjacent to joints, a form material may be needed to temporarily support vertical face of spalled joint edge. Ensure that the repair material will not adhere to the form.

3.7 BOLT HOLE/POP-OUT SPALL REPAIR

1. Recess steel bolt a minimum of 1/2" below finish floor by either punching or cutting.
2. Clean cavity of all debris and laitance with drill activated, Nyalox coated wire wheel. Vacuum hole to remove all dirt, debris and other laitance.
3. Surface of repair area must be dry.
4. Dispense Rapid Refloor low viscosity rigid urethane at moderate pace using steady pressure. Dispense material into void, refilling as necessary to produce slight crown.
5. Grind material flush to slab surface per manufacturer's instructions approximately 30 min after placement.

3.8 SURFACE PITTING REPAIR

1. Clean pitted sections with 90-degree angle grinder equipped with wire wheel to remove all dirt/laitance. Wheel should be run over defect in multiple directions to ensure proper cleaning.
2. Vacuum prepared pitted sections.
3. Surface must be dry.
4. Dispense Rapid Refloor low viscosity rigid urethane repair material generously in and around pitted areas.
5. Immediately trowel repair material flush with slab surface and repeat troweling in opposite directions until material begins to thicken (approximately 1 1/2 minutes). If material sticks to trowel, wipe with de-natured alcohol. Ensure a thin, uniform layer of repair material covers the pitted areas. Refill any low spots as needed.
6. Allow repair material to fully cure (approximately 90-120 minutes for thin film).
7. Grind overfill with 80-grit metal-bond pads, ensuring repair material is flush with slab surface.
8. Repeat repairs in areas as required if repair material pulls out of defects. Allowing a longer curing time typically minimizes material pull out.

3.9 PROTECTION

- A. Protect surfaces of finished floor.
- B. Prohibit traffic until floor repairs have received final approval by Owner.

END OF SECTION