

Structural Concrete Spall Repair JHA

Worked instructional example

Work and worksite

A specialist repair crew will carry out a localized engineer-specified spall repair on a ground-level reinforced-concrete building member. The released limits and temporary-support plan govern removal of unsound concrete, preparation around identified reinforcement and placement of the specified cementitious repair material. Exposed-bar replacement or redesign is not part of this example. This fictional learning example describes planned controls; it records no actual inspection or work authorization.

- A responsible engineer/designer assesses the damage, establishes the repair detail and specifies any required support and staged removal limits before disturbance.
- The substrate, coatings, embedded services, preparation tools, silica controls and actual repair product are identified for the work; unresolved suspect materials remain undisturbed.
- This is partial coverage of concrete repair and patching. Cosmetic wall finishing, overhead repairs, reinforcement replacement, large-section reconstruction and unassessed structural distress are excluded.

Questions before work

- Who establishes the permissible removal limits and the temporary load path while this member is being repaired?
- What happens if the exposed reinforcement or damage extends beyond the released repair assumptions?
- Which preparation, material acceptance and curing records govern the eventual load or access release?

Task Hazard Control

1 Release the repair detail and work boundary

Hazard: Removing damaged concrete without a structural assessment can further weaken the member.

Control: Repair lead obtains the current condition assessment, repair detail and staged support/removal requirements. Mark the approved area and protect adjacent access. Resolve unknown services or materials and assign the responsible technical contact before disturbance.

Verification: Lead compares the marked repair with current design and support documents.

Reasoning: The extent that looks damaged is not automatically the extent permitted for removal.

2 Establish support and preparation controls

Hazard: Support interference, dust or flying fragments can harm workers before the repair material is applied.

Control: Install and accept any specified temporary support under its separate engineered method. Set the repair boundary and use the exposure-control plan for the actual cutting or chipping tools, with fragment, noise and adjacent-worker protection. Maintain supported access and waste collection.

Verification: Assigned reviewer checks support status; silica competent person verifies the chosen preparation controls.

Reasoning: Structural restraint and exposure protection must be in place before the surface is opened.

3 Remove concrete within the released limits

Hazard: Overbreak or aggressive contact with retained reinforcement can change the remaining section and load path.

Control: Trained crew removes only the marked unsound material with the specified controlled method. Protect retained bars, concrete and supports. Pause when removal reveals deeper damage, moving material, uncharted reinforcement or a condition outside the assessed scope; obtain a revised technical decision before enlarging the repair.

Verification: Repair lead records actual exposed conditions and compares them with the release limits.

Reasoning: Unexpected findings are information for the designer, not permission to keep breaking.

Complete the work and hand over

4 Prepare and accept the repair interface

Hazard: Unaccepted bar loss or an inadequately prepared substrate can leave the repair unable to perform its intended function.

Control: Prepare the retained reinforcement and concrete interface to the current repair specification. Present the exposed area at the specified inspection hold point; record findings and resolve required treatment or bar-condition decisions before covering the work. Do not invent a universal permissible corrosion loss.

Verification: Responsible reviewer records interface and reinforcement findings against project acceptance criteria.

Reasoning: Once filled, the critical interface is harder to see and correct.

5 Mix and apply the specified repair

Hazard: Wrong material, uncontrolled mixing dust and cement contact can injure workers and compromise the repair.

Control: Use the identified product, approved batches and measured preparation under its instructions. Control bag-opening and mixing exposure, protect skin and eyes and provide washing. Place within the specified thickness and application requirements without substituting additives or covering unresolved findings.

Verification: Repair lead checks product and batch records, application conditions and required material observations.

Reasoning: A similar-looking patch product may not meet the engineered repair requirements.

6 Cure and preserve restrictions

Hazard: Early loading or removal of support can damage an incompletely accepted repair.

Control: Protect and cure the repair using the actual specification and product instructions. Record the required conditions and acceptance results and maintain support and access restrictions until the responsible release is documented. Collect debris with the planned dust-control method and hand over open actions.

Verification: Responsible reviewer checks the required curing/acceptance evidence and states the actual release limits.

Reasoning: Surface hardness or elapsed time alone does not establish repaired-member capacity.

Pause and reassess

- Removal exposes damage, bar condition or embedded items outside the released repair assumptions.
- Temporary support moves, damaged material becomes unstable or the silica controls cannot be maintained.
- Product, application conditions or curing/acceptance evidence differs from the repair specification.

Improve the controls

Needs improvement: Chip back to sound concrete and patch it.

More useful: Crew follows the engineer's marked limits and controlled removal method; unexpected depth or reinforcement findings stop work for a revised decision.

Needs improvement: It is hard, so take the shores out.

More useful: Responsible reviewer assesses the specified acceptance evidence and separately documents the permitted loading and support-release conditions.

Decisions that change the analysis

Why is this separate from the cosmetic sack-and-patch example?

That example excludes structural repairs and sends exposed reinforcement or structural distress for technical review. This scope begins with that assessment and a released repair detail, preserving the temporary load path through controlled section repair and acceptance.

What must the crew record for actual use?

Record the member and damage assessment, current repair and support revisions, marked removal limits, preparation tools and exposure controls, actual reinforcement/interface findings, product batches and application records, curing/acceptance evidence and remaining load or support restrictions.

Training needs

- Project-specific repair instruction covering marked removal limits, preserved reinforcement, temporary support and the point at which unexpected findings require designer review.
- Task-specific silica-control and repair-product instruction, including tool compatibility, cement contact protection, mixing, application and specified curing records.

Confirm applicable qualifications and actual training evidence for the people assigned. Related toolbox talks support discussion; they do not establish competence.

References and adaptation

ACI RAP Bulletin6 Vertical and Overhead Spall Repair by Hand Application
<https://www.concrete.org/portals/0/files/pdf/rap-6.pdf>

OSHA 1926.1153 Respirable crystalline silica
<https://www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.1153>

OSHA Preventing Skin Problems from Working with Portland Cement
<https://www.osha.gov/sites/default/files/publications/OSHA-3351-portland-cement.pdf>

References reviewed October 9, 2026. Use actual equipment and product instructions, project design and site requirements. This original draft supplies no fabricated inspection, signature or approval.