

# Repair Application Procedure Bulletin #6

## Vertical and Overhead Spall Repair by Hand Application

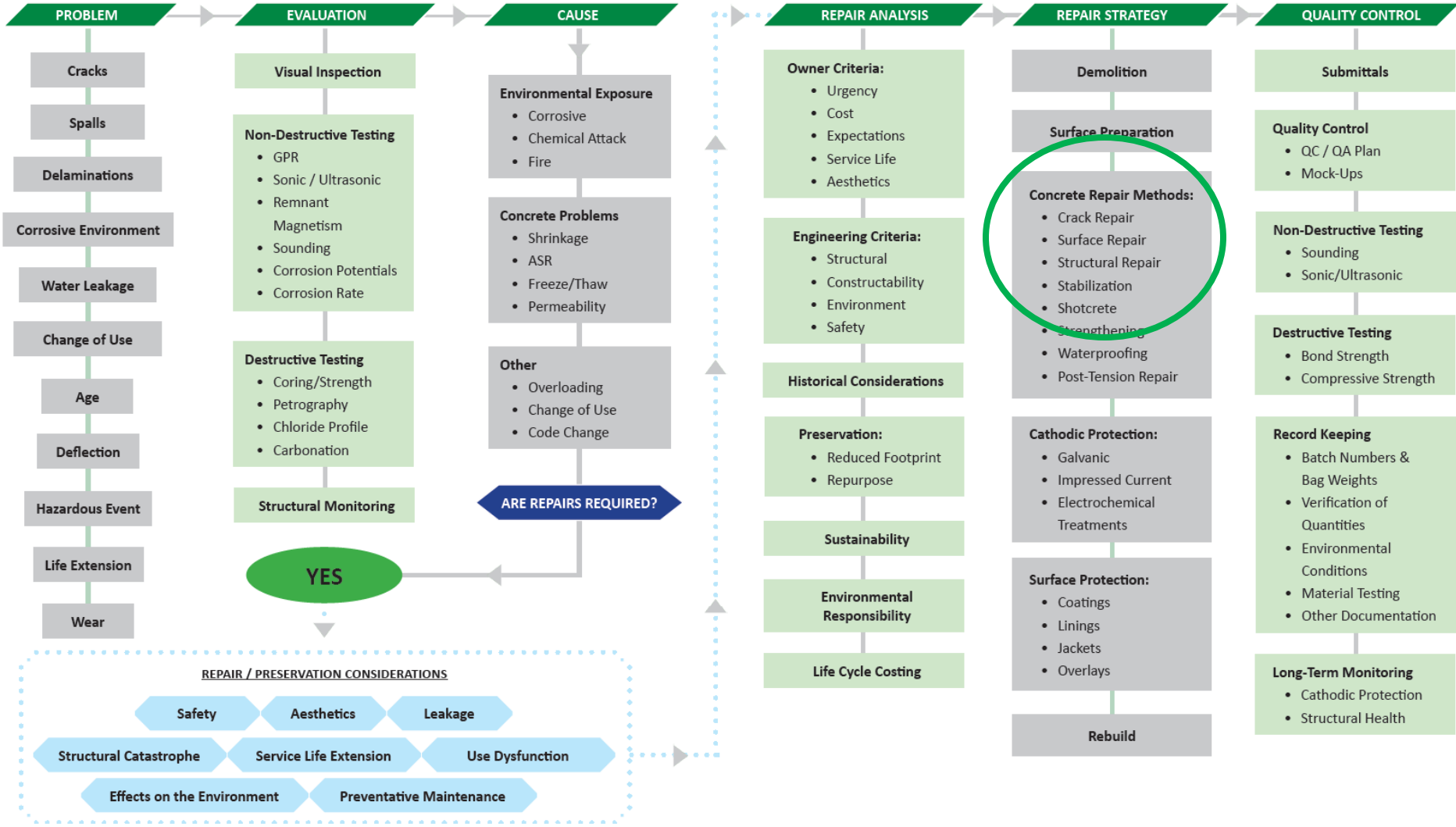
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# CONCRETE PRESERVATION PROCESS



# Purpose of the Repair

- Replaced spalled or deteriorated concrete
- Approves appearance of structure
- Provides protection to reinforcing steel in the repair area



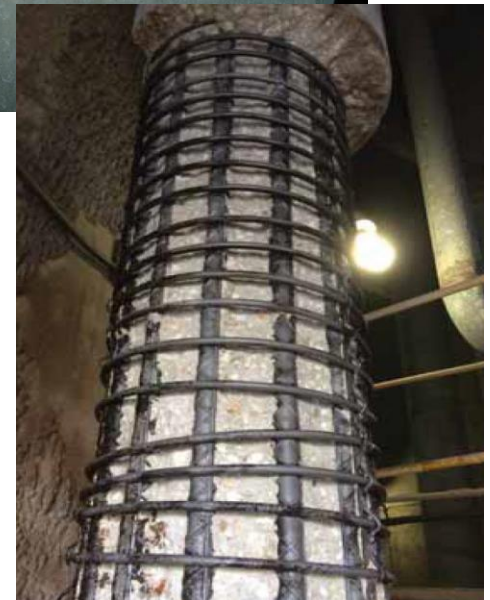


# When to Use the Repair

- This method is commonly use for small, thin or cosmetic repairs
- Appropriate for most vertical and overhead surfaces
  - columns, beams, walls, soffits, building facades
- Larger or structural repairs should consider other methods
  - form and pour/pump
  - shotcrete
  - grouted pre-placed aggregate



Hand / Trowel



Structural  
Repair

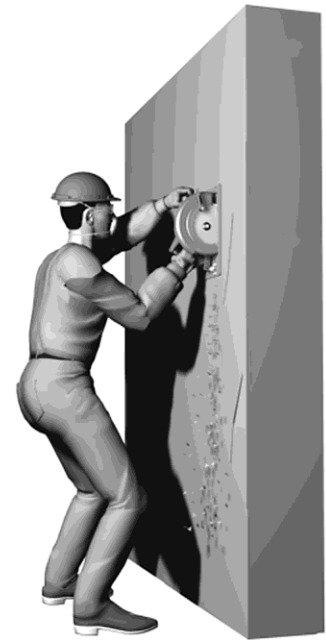
# Bulk Concrete Removal

- Remove loose concrete with lightweight chipping hammer (15 lb.)
- Create a rough surface for bonding the repair material – approx. ¼ in. amplitude
- Continue bulk removal until clean steel is encountered
- Approximately ¾” or greater clearance behind exposed reinforcement
- Follow material manufacturer requirements



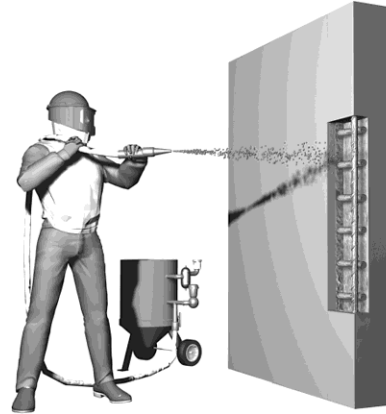
# Edge Conditioning and Cleaning

- Repair should be square or rectangular in shape
- Sawcut edges perpendicular to surface ½ in. deep to prevent featheredge



# Preparation and Cleaning

- Concrete is cleaned of dust, contaminants and fractured concrete for bonding
  - Abrasive blasting or pressure washing (min. 3000 psi)
- Remove rust and cement paste from steel
  - Abrasive blast, wire wheel, etc.
- Concrete surface should be saturated surface dry (SSD)



Ref: ICRI Guideline 310.1R, "Guide for Surface Preparation for Repair of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion."



# Reinforcement Protection

## Options

- No Additional Protection
- Reinforcement Coating
- Type 1 Embedded Galvanic Anodes
- Reinforcement Coating and Type 1 Embedded Anodes



# Material and Equipment Selection

- Non-sag repair materials
  - Properties should be specified
- Mixing
  - Drill and paddle for small quantities
  - Mortar mixer for larger quantities
- Equipment to measure bag weight and volume of water
- Air compressor, sawcutting equipment, pressure cleaner, abrasive blasters
- Trowels and other finishing tools



# Safety Considerations

- Follow OSHA standards
- Review SDS
  - Portland cement is highly alkaline material
  - Silica exposure considerations
- Wear Appropriate PPE
  - Hand, skin and eye protection
  - Respirators
  - Hearing protection
- Equipment in working order





# Step-by-Step Procedures

- Apply the repair material
  - Saturated Surface Dry Surface
  - Apply thin layer to make intimate contact
  - Consolidate in corners





# Step-by-Step Procedures

- Apply in multiple lifts if required
  - Roughen first lift to promote bond between lifts
- Strike off level with surface and finish
- Cure material per manufacturer's instructions
  - Moist cure
  - Curing compounds



# Checking the Repair

- Inspect concrete surface profile and cleanliness prior to application
- Material testing by qualified laboratory
- In-situ bond testing
  - ICRI Technical Guideline No. 210.3
  - ASTM C1583
- Sounding for delaminations
- Before and after photos



# Questions

