Field Guide to Concrete Repair
Application Procedures

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ACI WEB SESSIONS

ACI RAP 10 – Leveling and Reprofiling of Vertical and Overhead Surfaces

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What Do I Need to Know?

• When do I use leveling or reprofiling
• What is the purpose of leveling or reprofiling
• How do I prepare the concrete substrate
• How do I select the correct material
• What tools do I need
• How to apply leveling and reprofiling materials
• Validation – How do I check the installation

When do I use Leveling or Reprofiling?

• Leveling or reprofiling is indicated whenever concrete with an unacceptable finish is exposed to the elements or in contact with aggressive chemicals.
• Leveling or reprofiling can be used on:
  – Exterior or interior façades
  – Foundations
  – Beams, columns and soffits found in buildings
  – Parking structures
  – Retaining walls
  – Bridges
  – Storage tanks
  – Tunnels.
• Leveling or reprofiling is used to improve the aesthetic appearance or prepare the surface for subsequent coating or application.
What is the purpose of leveling/reprofiling?

• Primary function is to correct surface deficiencies and provide the intended surface
• Deficiencies includes:
  – Non-moving hairline and plastic shrinkage cracks
  – Small or shallow surface air voids
  – Honeycombs or rock pockets
• This will allow for an acceptable surface to receive aesthetic or protective coatings.

How to prepare the surface?

• Concrete must be clean and open profile.
• It must be sound.
• It must be free of bond-inhibiting materials.
• Depending on the selected material, the surface profile should be similar to 60 – 100 grit sandpaper.

How do I select the correct material?

<table>
<thead>
<tr>
<th>Applications</th>
<th>Acrylic-based ready-to-use</th>
<th>Cement-based mortar</th>
<th>Polymer-modified cement-based mortar</th>
<th>Polymer-resin-based mortar</th>
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</thead>
<tbody>
<tr>
<td>Building façades/o nonstructural elements</td>
<td>X</td>
<td>X</td>
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<td>Curtain walls</td>
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<td>beams and columns</td>
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<td>Bridge wall/pavement</td>
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<td>Tunnels</td>
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<td>Water, wastewater, and process tanks</td>
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</tbody>
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What tools do I need?

• Required tools include the following:
  – Surface preparation equipment
  – Heavy-duty mixing drill
  – Mixing paddle (jiffy or box)
  – Clean buckets
  – Mortar hawk
  – Pool, margin, or finishing trowels
Optional: Most materials can be sprayed on with a hopper gun or a wet spray mortar equipment.

How to apply the leveler?

• Spray or Trowel into place.
• Apply adequate pressure to push material into voids.
• Finish surface to desired texture.
• Note: Excess Material may be shaved off to provide a smooth surface.

Validation – How do I check the repair?

Test Methods:
• Non-destructive:
  – Sound out the surface.
  – Impact-echo
• Destructive:
  – Direct Tensile Bond Test - (ASTM C1583).