Cutting Edge Solutions Using Advanced Self Leveling Materials

ICRI National Convention

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Presentation Objectives

- Examine what constitutes the highest performing, advanced, self leveling underlayments, toppings and ancillary products
- Explain how the composition of these materials benefits physical properties
- Discuss standard and specialty applications
- Describe how flooring problems with demanding functional or aesthetic considerations can be solved with state of the art materials and placement techniques

The advent of self leveling materials that are more advanced than gypsum or even portland cement has led to quicker, more durable and more creative flooring repairs and solutions than were previously possible.

What Makes an Advanced Self Leveling Material

- Calcium Aluminate Cement
- Highly Polymer Modified
- Non Shrink Formulation
- Contains No Gypsum
- Admixtures and aggregates selected to maximize performance for the intended use

Why Calcium Aluminate Cement

- **Advantages**
  - Rapid strength gain compared to portland
  - High Bond
  - Lower alkalinity
  - Dimensionally stable
  - High Strength
  - Low permeability

- **Applications**
  - Self leveling underlayments and toppings
  - Rapid turnaround concrete repair materials for DOT and industrial applications
  - Refractories and high temperature repairs

Beyond the Cement

- Like concrete or mortar, Self Leveling Underlayments and Toppings depend on more than just the type of cement for their properties. It is not enough to merely have an arbitrary amount of CAC in the mix to get excellent results in demanding applications. These products are complex formulations consisting of many components that control their strength, bond, flow, working time, dimensional stability, surface integrity, environmental friendliness, and compatibility with different substrates and final flooring

Properties of High Performance Self Leveling

- High Bond – Lower surface preparation
  - May not require mechanical abrasion and profiling of concrete substrate

Properties of High Performance SL

- Rapid Strength Gain and ability to accept final flooring quickly
  - Over 1500 psi in 4 hours
  - Place ceramic tile in 3 hours, or VCT and wood in 16 hours
- Nonshrink:
  - Dimensionally stable – no pulling on edges of substrate
  - Lower incidence of cracking

Properties of High Performance SL

- High Strength
  - Over 5000 psi
- High Durability

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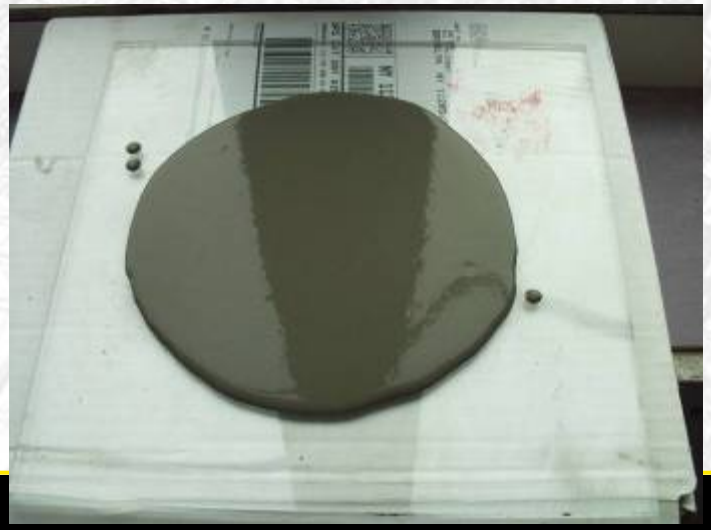
  - **Underlayments that can withstand construction traffic, allowing placement anytime during the construction cycle**
  - **Topping surfaces stronger than concrete**

Properties of High Performance SL

- Lower Alkaline (pH) systems
  - Act as alkali barriers up to 90% RH
    - Protect adhesives from alkali breakdown
    - Contribute to indoor air quality

Properties of High Performance SL

- Long working time
  - Longer healing time
  - Increased production rates
- High Flow
  - Discourages the need to overwater
  - Material lays out flatter and more level



Specialty High Performance SL

- Prepackaged, single component, Lightweight materials
  - ½ the density of standard self leveling, less than ½ the density of concrete
  - High Strength, high durability, does not require a capping material
- Deep Pour Materials
  - Can be placed 3” or more without the addition of aggregate

Primers

- Primers serve 2 purposes:
  - Enhance bond between the self leveling material and the substrate
  - Prevent pinholing from substrate outgassing
- Today's most advanced primers are single component, low VOC liquids that allow the placement of self leveling over non porous surfaces such as power trowelled concrete or even metal

Application of Primer

Ancillary Products for a Successful Application

- Crack suppression/isolation systems
  - Prevent the passage of cracks from the substrate to the self leveling material
- They can be in the form of:
  - Open faced special mesh that is embedded in an adhesive medium, or a highly polymer modified repair material
  - Peel and stick membranes utilizing advanced adhesive technology

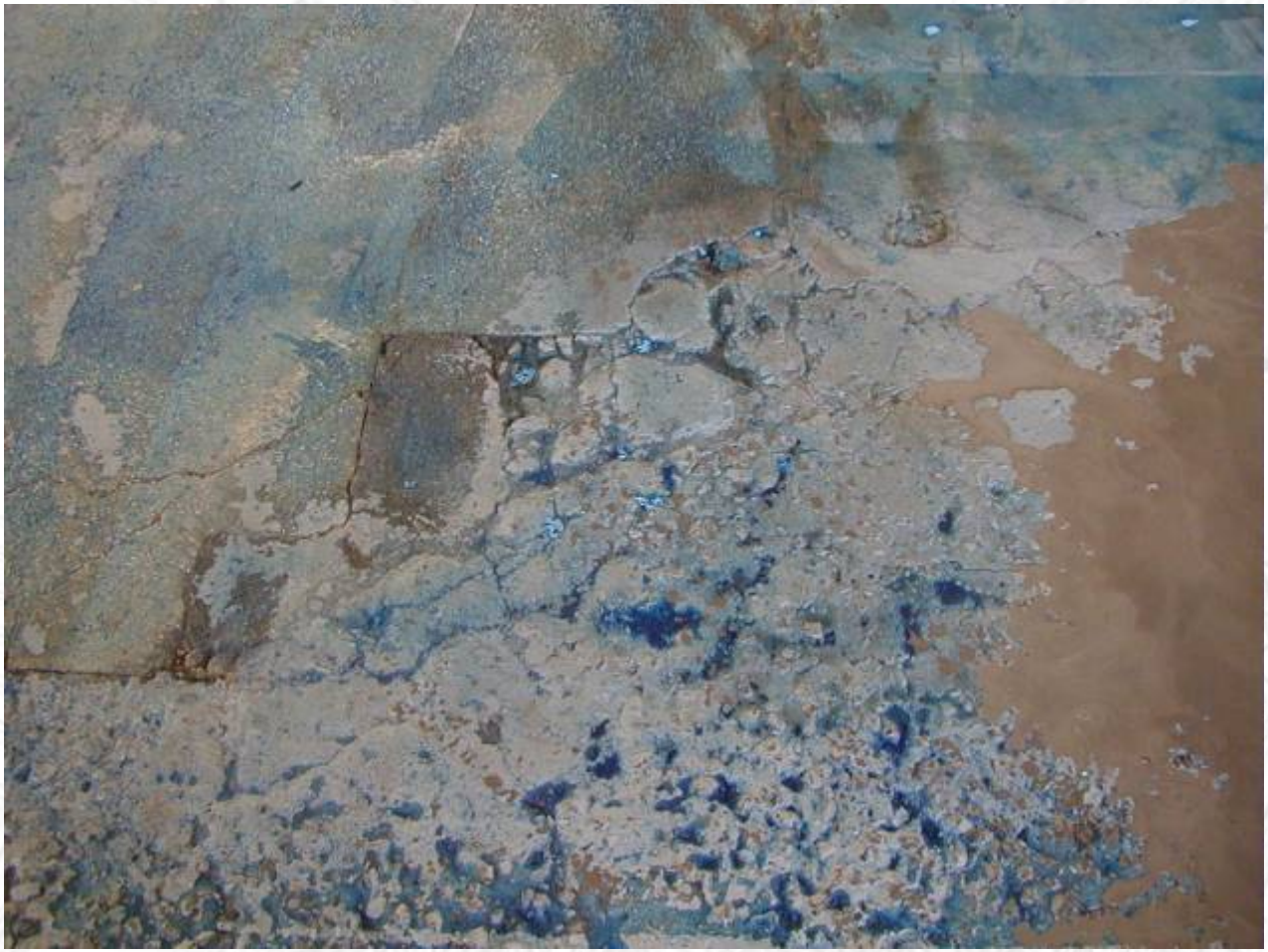
Embedded Mesh

Self Adhering Membrane

Ancillary Products for a Successful Application

- Moisture Vapor Reduction systems
  - Reduce the amount of moisture passing from the substrate to the self leveling. Typically self leveling can withstand much more moisture than the adhesives and non breathable flooring placed over it.
  - Reduce the amount of pressure the vapor exerts
  - Different MVR's for different moisture conditions, ranging from active water channels such as slab on grade, to water of convenience trapped in an elevated slab.
- Today's advanced self leveling compounds can protect adhesives up to 90% RH without the use of MVR's

Self Leveling Topping
48 hour Turnaround of Severely Deteriorated Warehouse Floor

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Repair and Leveling of a Substrate which was Considered Unsalvageable

Original Surface –

Weak, Friable

2” weak, high sand content mortar, surface, disbonded from concrete beneath


1. Repair thinner cracks by overlaying with highly polymer modified repair material


2. Repair larger cracks by embedding mesh
and bridging crack, using same repair material

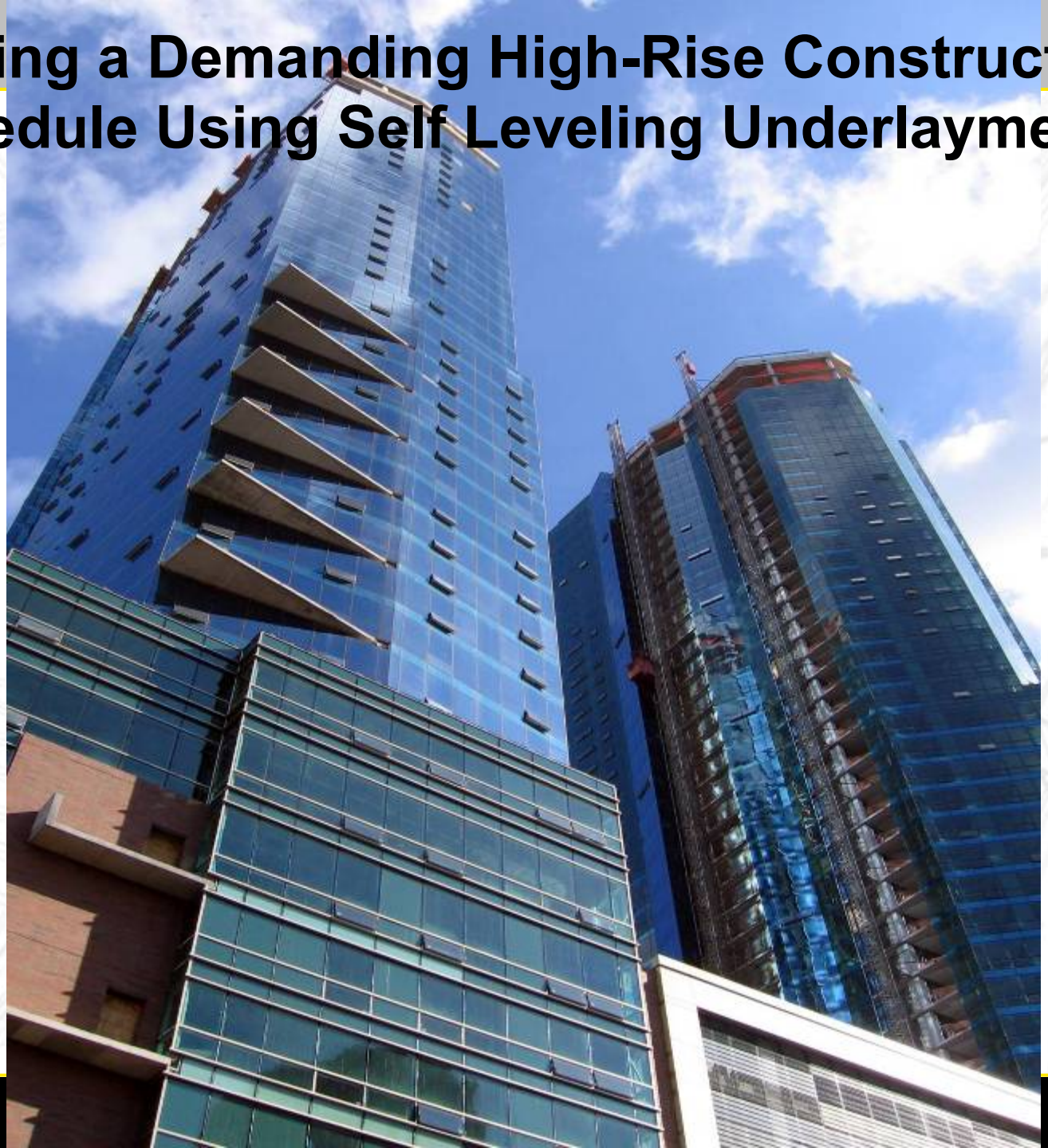

3. Prime entire floor using high solids acrylic non re-emulsifiable primer

Repaired and Leveled Floor

4. Apply 3/4” minimum Calcium Aluminate Self Leveling Underlayment

Installed final floor

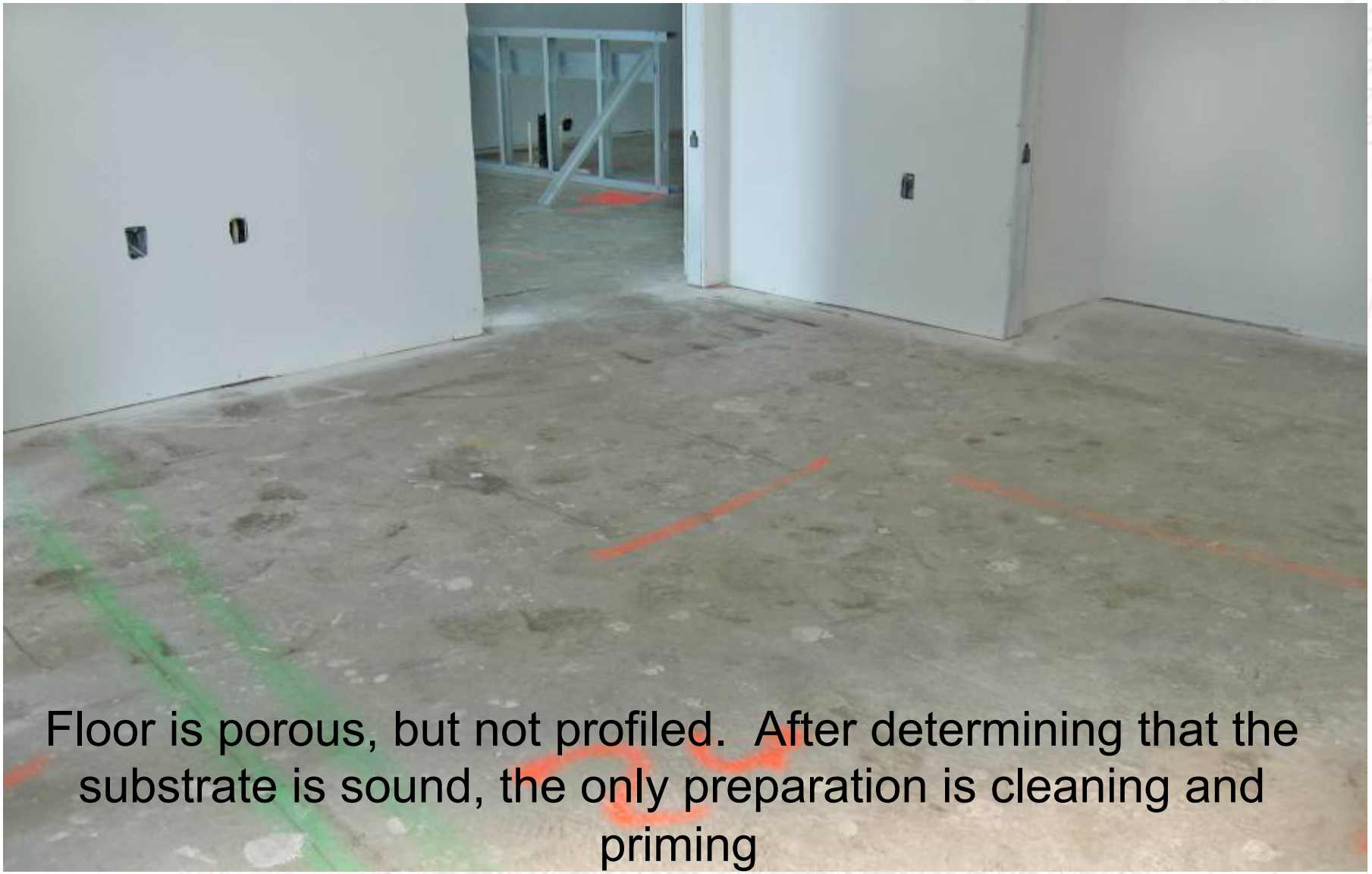
Meeting a Demanding High-Rise Construction Schedule Using Self Leveling Underlayments



The 2 Day Construction Cycle

A Tale of 2 Cities


Only the highest quality, ultramodern, structural, load bearing shoring systems are used!
Why Trowel finish, when you can boot finish concrete?



Floor is porous, but not profiled. After determining that the substrate is sound, the only preparation is cleaning and priming

Floor is primed


Pumping


Smoothing

Outdoor Concrete Repair of High Profile Plaza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BRITISH AIRWAYS


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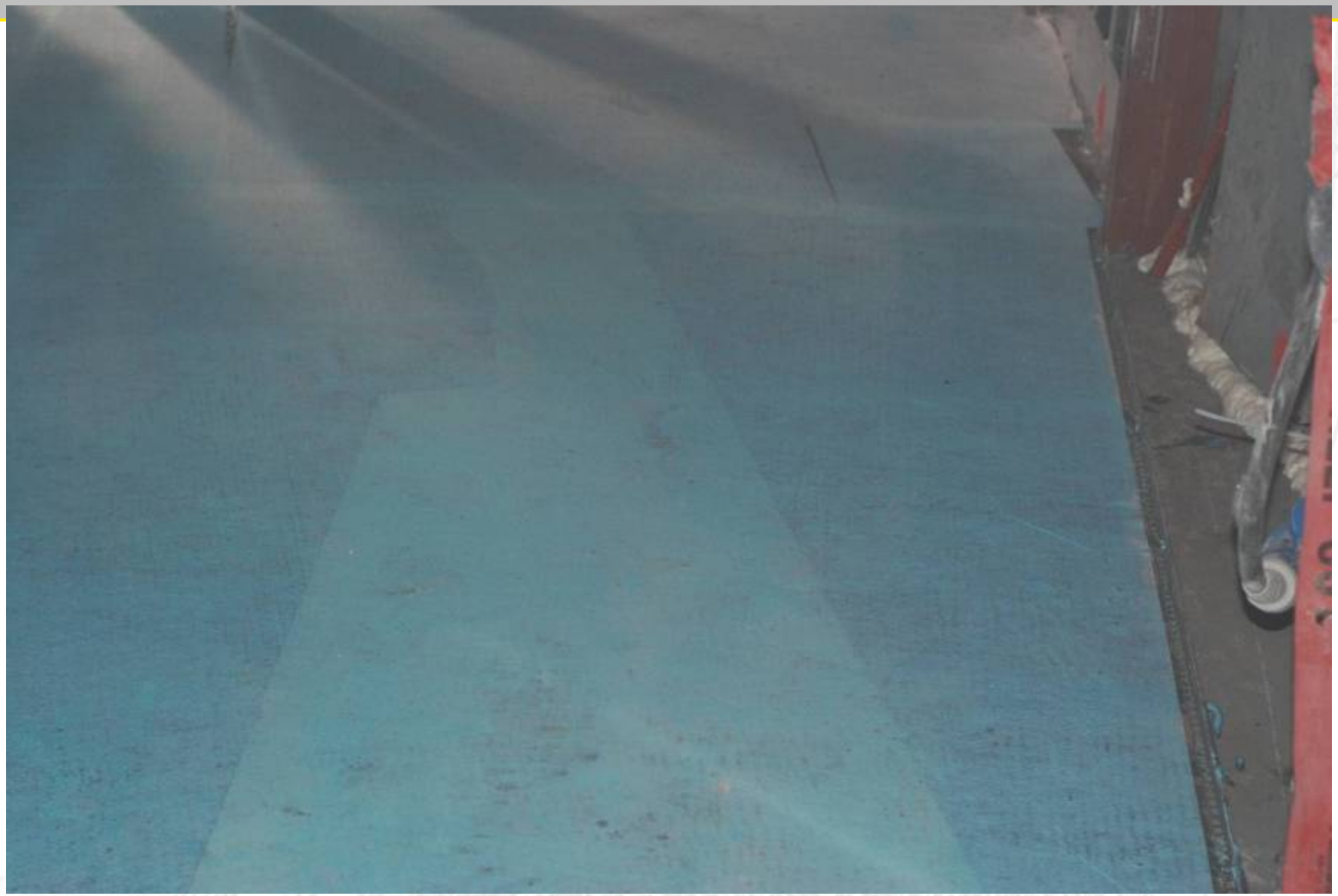
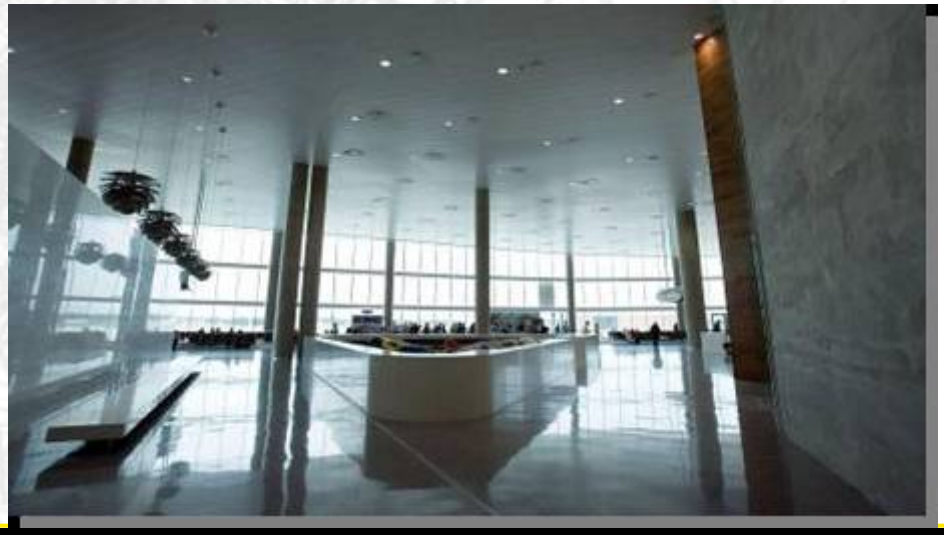
Deep Pour Self Leveling Underlayment with Decorative Topping




Jackson
PROFESSIONAL TOOLS

Other Decorative Possibilities Using Polished Concrete Toppings



THANK YOU FOR YOUR TIME!

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