ICRI 2016 Spring Convention

ARDEX CONCRETE MANAGEMENT SYSTEMS (ACMS)™

Patented Process Innovation - **US Patent 8,857,130 B1**

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March 16, 2016

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- In the current state of concrete slab construction, concrete slab repair or correction is ***REACTIVE.***

- Under present construction practices, the discovery, scheduling and performing of slab repairs, moisture mitigation and leveling occur **late in the job**.

- The **realization** of these issues results in delays, change orders and cost overruns, all without accountability.

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- **Early Phase Concrete Management Systems** transforms current concrete finishing practices by **eliminating the** final float/steel trowel finishing steps
- Allows **specified moisture levels, as well as flatness and levelness tolerances**, to be achieved by installing a moisture control system and self-leveling underlayment as part of the **initial concrete assembly.**

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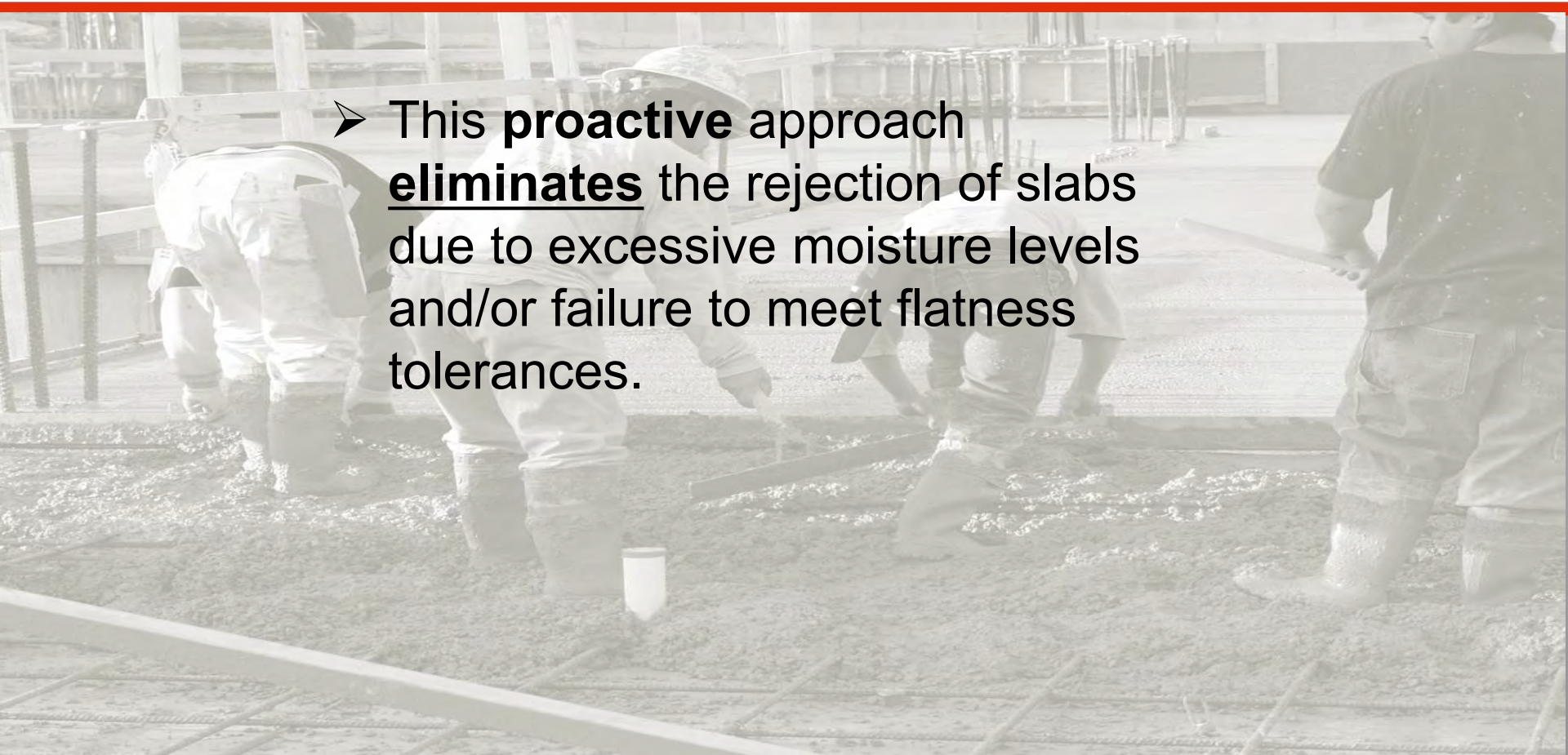

- This **proactive** approach **eliminates** the rejection of slabs due to excessive moisture levels and/or failure to meet flatness tolerances.

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Early Phase Concrete Management Systems

- **Eliminate** the need for moisture testing
- **Eliminate** subfloor preparation change orders
- **Eliminate** disruption to other trades
- **Eliminate** delays in flooring installation
- **Eliminate** arguments about who bears the cost

Using Early Phase Concrete Management Systems, the Concrete Contractor:

- Places
- Consolidates
- Strikes Off
- Bull floats/Re-straightens
- Allows bleed water to dissipate
- Wet cover or membrane cure concrete

Concrete Placement

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Concrete Consolidation

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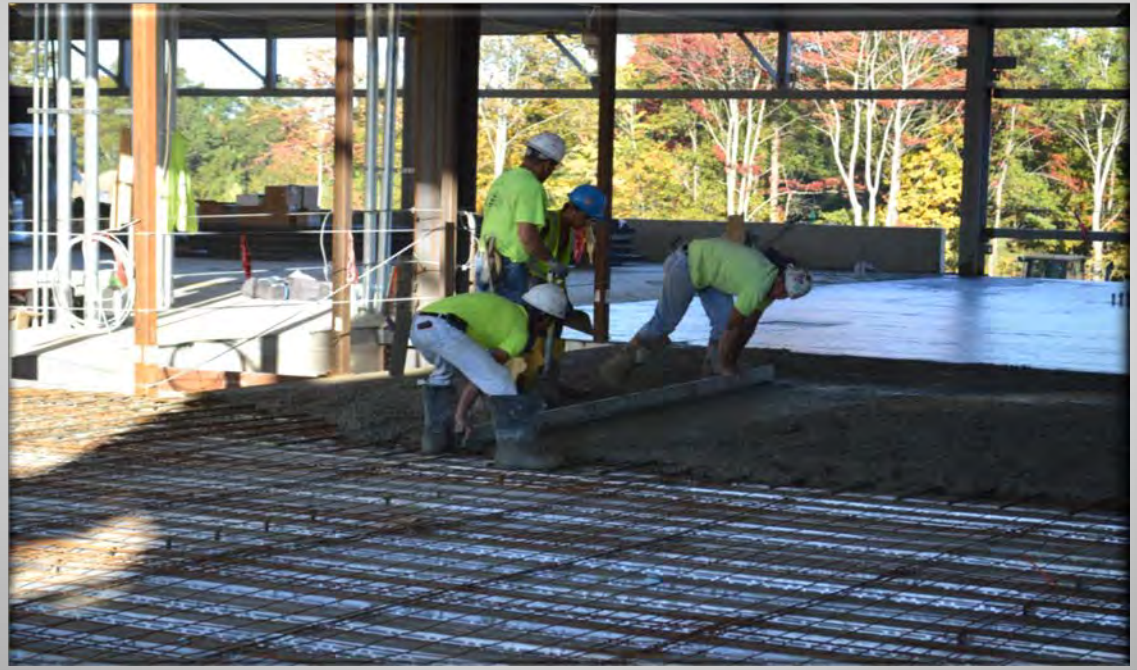
Concrete Strike Off



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Concrete Bull Float / Restraighten

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Allow Bleed Water to Dissipate

For concrete slabs on grade, saw cutting would follow this stage
(typically no more than 12-hours after placement)

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Using the Early Phase Concrete Management Systems, the Concrete Contractor:

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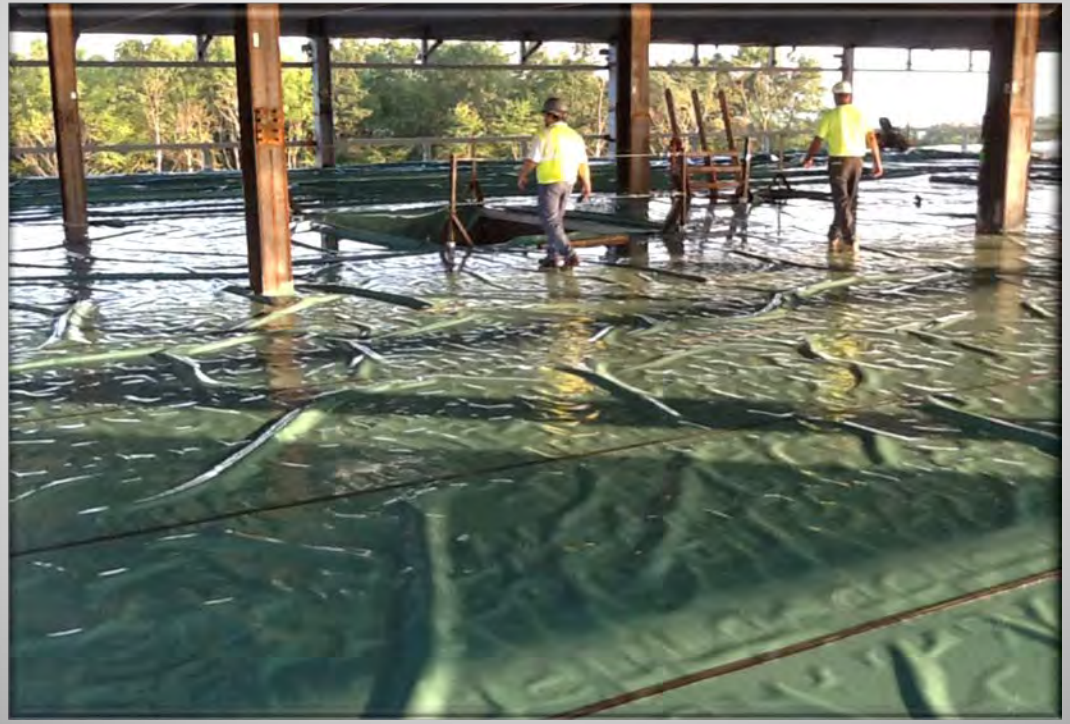
- **Wet cover or membrane cure concrete**

Wet Cover Cure Concrete



Liquid Membrane Cure Concrete

ASTM C309 − 11: Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete

- Specification for curing compounds applied to fresh concrete to reduce water loss during early hardening
- Also, covers curing compounds used for further curing after form removal or initial wet curing
- Requires that the curing compound be **membrane-forming**
  - ***Reactive silicates do not form a membrane and do not meet the requirements of this standard. Their use is NOT approved with ACMS***™***.***
- The loss of water is restricted to not more than 0.55 kg/m2 in 72 hours
- These curing compound shall adhere to fresh concrete, form a continuous film and must be dry to the touch in not more than 4 hours

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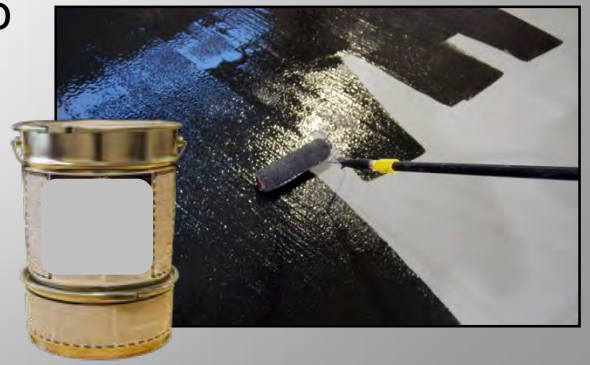
- The **Early Phase Concrete Management Systems** can be installed utilizing different product combinations and timing of leveling

- The **Early Timing Installation Option** will be presented here, in detail, as the most specifiable and high value system

- An alternate **Late Timing Option** will also be reviewed

Early Phase Concrete Management Systems
Early Timing Installation

- After wet cover or chemical cure for 3-7 days, create minimum CSP3 via brush blasting to remove laitance, salt residue and contamination from wet cure
- Install fast-track moisture control system for concrete to receive self-leveling underlayment in four hours
- Survey slab and set level pegs to specified tolerances
- Install self-leveling underlayment



Early Phase Concrete Management Systems

Late Timing Installation

- Prior to performing layout work for interior finishes, shot blast concrete to a minimum CSP 3

- Measure the relative humidity within the concrete, per ASTM 2170

- If the relative humidity is below requirements of flooring manufacturer, proceed with standard acrylic primer and self-leveling underlayment

- If the relative humidity is above the requirements of flooring manufacturer, proceed with fast-track moisture control system and SLU installation

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12	15	16	12
Normal Concrete – No Leveling – No Mitigation	**Normal Concrete – Late Leveling – No Mitigation**	**Normal Concrete – Late Phase MC & Leveling**	**Early Phase Concrete Management Systems – Early Timing MC & Leveling**
Concrete	**Concrete**	**Concrete**	**Concrete**
Concrete Placement	Concrete Placement	Concrete Placement	Concrete Placement
Consolidation/ Strike-Off	Consolidation/ Strike-Off	Consolidation/ Strike-Off	Consolidation/ Strike-Off
Bullfloat to Straighten	Bullfloat to Straighten	Bullfloat to Straighten	Bullfloat to Straighten
Bleed Water Dissipates	Bleed Water Dissipates	Bleed Water Dissipates	Bleed Water Dissipates
Float	Float	Float	
Trowel	Trowel	Trowel	
Joint Work – Saw (slab on ground)	Joint Work – Saw (slab on ground)	Joint Work – Saw (slab on ground)	Joint Work – Saw (slab on ground)
Apply Curing Membrane	Apply Curing Membrane	Apply Curing Membrane	Apply Curing Membrane
Early Phase	**Early Phase**	**Early Phase**	**Early Phase**
			Joint Fill
			Brush Blast
			MC 14 mil w/sand to refusal
			Sand Removal
			Leveling (@ ¼") – *CUBE*
Late Phase	**Late Phase**	**Late Phase**	**Late Phase**
Moisture Testing - Pass	Moisture Testing - Pass	Moisture Testing - Fail	
Mechanical Prep	Mechanical Prep	Mechanical Prep	
Joint Fill	Joint Fill	Joint Fill	
	Set Up/Product Load In	Set Up/Product Load In	
		MC Rapid	
	Primer - P51	Primer - P82	
Skim Coat	Leveling (@ ¼")- barrel	Leveling (@ ¼")- barrel	
	Minor Prep	Minor Prep	Minor Prep

Early Phase Concrete Management Systems

- Versatility of Systems allow for scheduling flexibility, with installation during early or interior build out construction phases

- System provides a complete specification package
  - 03 30 00 Cast-in-Place Concrete
  - 03 54 16 Hydraulic Cement Underlayment
    - Requires self-leveling underlayment installation to achieve specified flatness and levelness tolerances in accordance with ACI 117
  - 07 26 19 Moisture Control

- Early Phase consistently delivers Specified Overall Value (SOV) of F_F 35 / F_L 25 and Minimum Local Value (MLV) of F_F 25 / F_L 20 with standard process, but can also achieve superflat using a more rigorous process

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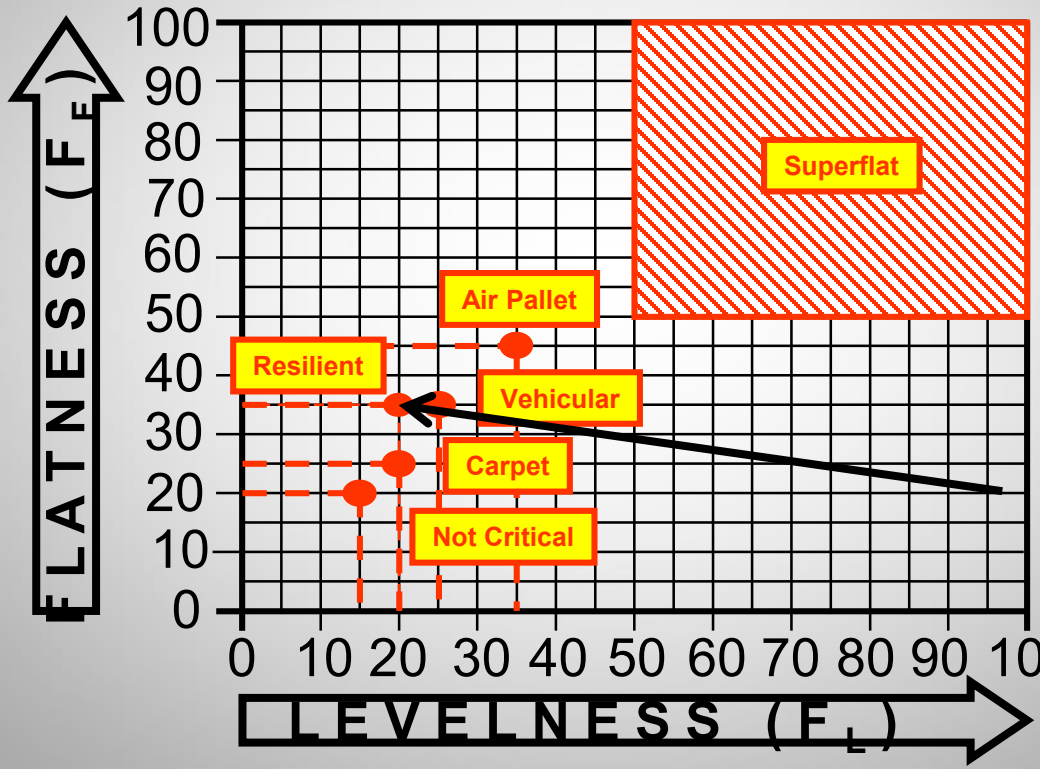
ACI 302 Flatness and Levelness Table



Most hard surface flooring materials require F-numbers in range of **F_F 35** and **F_L 20**

ACI 302.1R-04
Figure 8.7

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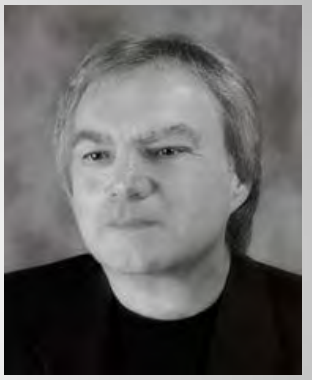
“Early Phase” Consulting Team

Eldon Tipping

- Principal of SSI
- 40 years of experience
- Leading authority on concrete tolerances for both on grade & elevated slabs
- Past Chair of ACI 117 (Tolerances) & ACI 302 (Concrete Floor Const.)

Allen Face

- Author of F-Number System
- Inventor of Dipstick, D-Meter and F-Meter
- Expert on the design, construction & QC of concrete floor slabs
- Authority on floor profiling specification



Peter Craig

- 41 years of exp.
- Leading consultant on moisture-related flooring problems
- ICRI moisture certification program sub-chair and instructor
- Chair ACI 302.2R (Concrete Slabs Rec. Flooring)

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THANK YOU!!

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