



# First Americans Museum, Oklahoma City

Severely cracked floor slab provides master class in repair and restoration.

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Imagine you're called in to polish a concrete floor in a building constructed years earlier but never used. It's a 12-inch slab with 2-foot piers anchoring support columns set about 50 feet apart with few construction joints and control joints. The building's HVAC system mitigated cold and humidity in the intervening years but no one's maintained the slab.

When representatives of a joint venture formed to finish the project arrive, extensive cracking in floors throughout the building forces them to scuttle their plan to polish the slab and opt instead for a polished concrete overlay.

Now imagine that a design team retained by the joint venture removed some walls and added others to reconfigure spaces. That construction is underway as your crew installs the overlay in the lobby, hallways, café and restaurant, and bathrooms. Other

trades agree to lay Ram Board covered with 1/8-inch plywood on the polished surface – but don't. Their equipment gouges the beautifully finished floor in what will be the most heavily trafficked areas.

The bathroom floors are out of tolerance so they must be raised ½-inch. The subcontractor called in to pour new concrete doesn't pin the new slab to the existing slab, so you have to ask them to come back to bond the slabs by injecting epoxy between them. That process creates a spiderweb of epoxy-filled cracks and holes. Before you can think about placing a self-leveling underlayment, much less a polishable overlay, your crews reinforce the entire surface with plastic lath.

That's the scenario brothers Josh and Thomas Owens faced when their crews worked at the First Americans Museum in Oklahoma City in 2020.

Conceived in the 1990s to educate the public about the 39 tribes that live in Oklahoma, the 175,000-square-foot museum was built in more than a dozen phases over 15 years as federal funding waxed and waned with the Great Recession, natural disasters, and the pandemic. A ground-blessing ceremony was held in 2005, construction was completed in April 2021, and the museum opened that September.

### **Justifying a Product Change Request**

The 130,000 people who visited the museum during its first year walked on a decorative but durable polished concrete floor in three colors: Rapid Set® TRU® SP in Gray and Natural everywhere except a café, where the self-leveling cementitious overlayment was integrally colored black.

The polished concrete topping contains aggregate that produces a salt-and-pepper (hence, "SP") finish when ground and polished, which crews can begin 24 hours after placement. The product is available in two base colors, Gray and Natural, with additional colors available in each category. Gray colors also include Cloud, French Gray, Gray Ash, and Ebony; under Natural, Ivory and Gray Mist. All can be customized with decorative aggregate.

An Ardex polished concrete product had been specified, but the Owens brothers asked to use TRU® SP overlay instead. Their crews hadn't used Ardex products and, after almost a decade working with TRU® overlays, have refined staging, mixing, pouring, and finishing to streamline installations.

By that point in the project, the number of organizations comprising the public-private partnership formed to fund and deliver the project had expanded. Each had a say in the floor's color and finish.

“We’d done a lot of small projects with TRU®, so we decided to fight for a product change,” says Josh Owens. “They wanted a 6-by-6-foot mockup of every color, so we ended up placing something like 25 colors in a 20-by-30-foot area. I have a picture of all these people standing around in hard hats arguing over which shade to choose. But they approved the change.”

## **Managing Oklahoma City’s Heat & Humidity**

Owens Concrete Staining’s crews installed 22,000 square feet of TRU® SP in roughly 3,000-square-foot sections in several phases over seven months beginning in May. That means they worked through Oklahoma City’s hot and humid summer months. The city lies in a “temperate humid subtropical climate.”

“It’s surprising how humidity affects a mix,” Owens says. He asked CTS Sales Representative Billy Rangel to show his crew how to perform a flow test so they could maintain mix consistency throughout the day.

“We began by deciding how many bags we were going to pour for a section,” Owens says. “Then we measured and confirmed how much material and water we needed to achieve proper flow consistency. We tested flow again mid-day to make sure the mix wasn’t getting drier. If you don’t clean out material that’s accumulated in the mixer bucket, it will start going through its heat cycle and affect new material you add to the mixer.

“That’s one thing I learned about TRU® SP and self-levelers in general: They go through that heat cycle so fast that it can be a real problem if you inadvertently jumpstart the process. So, eliminating that was important.”

Owens Concrete Staining uses CS Unitech Portamix® Mega Hippo portable mixing stations, which can mix up to six bags at a time. For the museum job, a batch consisted of four 60-pound bags of TRU® SP and 36.8 pounds of water (4.4 quarts per bag).

The crew poured all the water into the mixer, turned it on at low speed and added three bags of TRU® SP. Then they turned the mixer to high speed and slowly added the fourth bag. Once mixed, they turned the mixer off, scraped the sides, and mixed for 2 minutes.

“We don’t like to redo something, so we’re pretty detailed,” Owens says.

Of course, the crew couldn’t start placing the overlayment until they’d patched cracks and popouts with Rapid Set® Cement All®, which can be applied from featheredge to 4 inches thick. They used Rapid Set® Concrete Mix, which can be applied from 2 inches to 2 feet thick, to repair more extensive damage.

Both products achieve structural strength in 1 hour, so the crew could prep the surface for the overlay the same day. In areas that didn't need to be raised, they applied Rapid Set® TXP™ Epoxy Primer to the patched and shotblasted surface and then broadcast sand to refusal. In the bathrooms, they sealed the plastic-lath surface with Rapid Set® Concrete Leveler™ Primer to increase adhesion to the self-leveling underlayment, Rapid Set® Concrete Leveler®.

### **Finishing a TRU® Self-Leveling Overlay**

TRU® self-leveling overlays may be ground wet or dry and polished after 24 hours. They don't require use of a densifier.

However, Owens Concrete Staining follows Ameripolish's five-step SmartFloor "refinement" protocol in which a densifier is applied after grinding and a sealer is applied after polishing.

For this job, the crew began with Ameripolish 50 grit metal bond inserts on a 30-inch planetary grinder, switched to 50-grit hybrid inserts to remove scratches, and then moved to 100-grit hybrids, making two passes with each insert change.

Once the aggregate was fully exposed, they began polishing with 400-grit inserts and finished with 800-grit inserts. While no distinctness-of-image (DOI) or haze level was specified, during mockups project stakeholders preferred the "little bit higher than a satin finish but not quite a high gloss" produced at the 800-grit level.

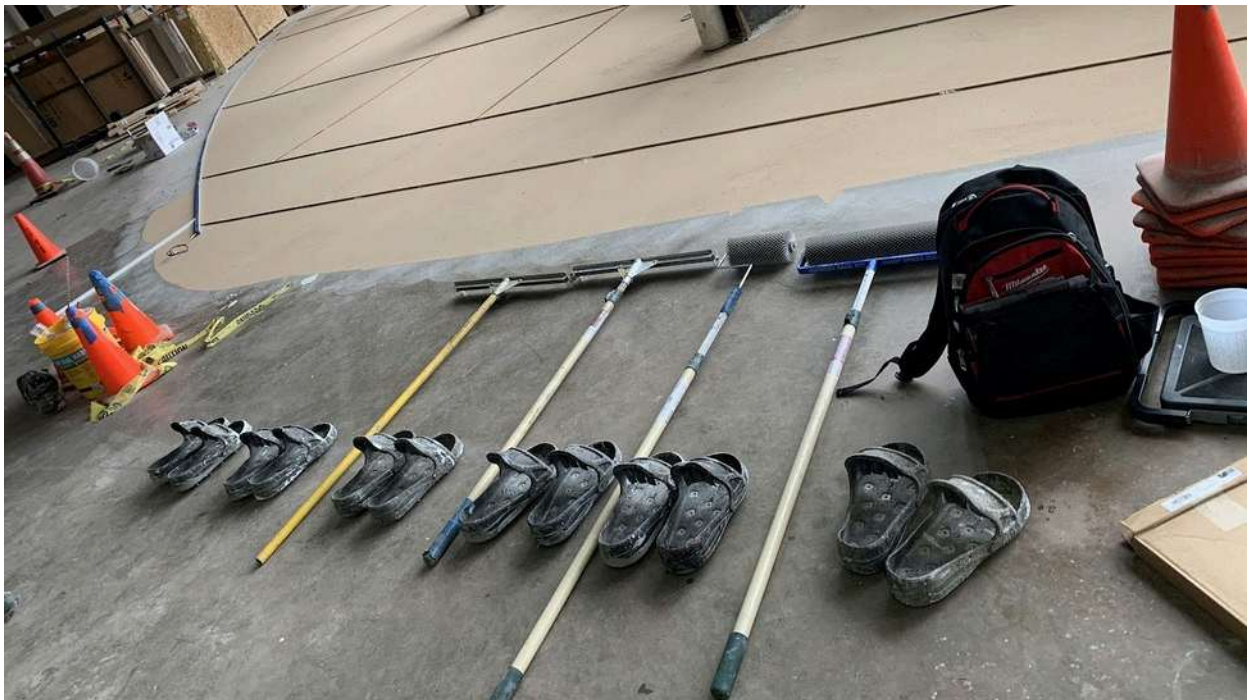
### **The Pain of the Polishing Contractor**

"We'd come back after finishing a phase and just about the worst that could imagine happening to your floor would've happened," says Owens. "Lifts with downriggers out on the floor with no covering, water pouring in out of doors flooding it, you name it."

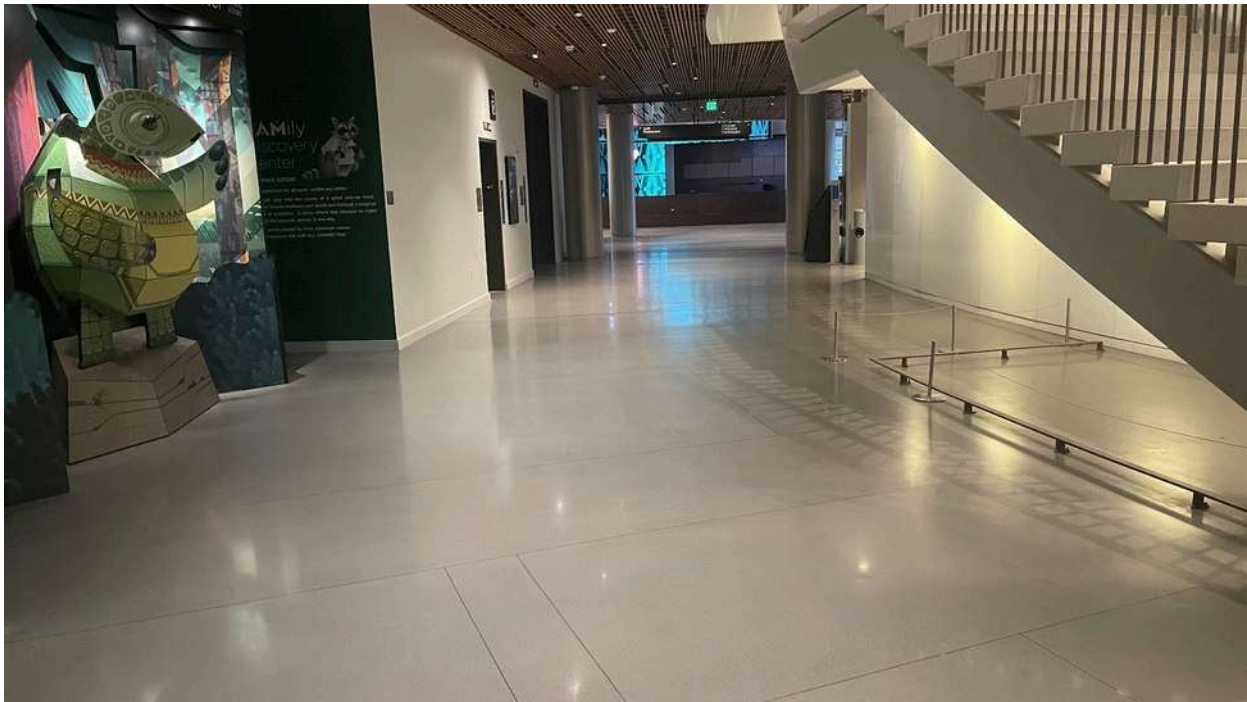
A screw imbedded sideways in a tire gouged about 100 feet of the lobby surface, "like somebody laid a screw there and fossilized it." Owens Concrete Staining patched the damage with Rapid Set® Cement All®, wet-burnished it off and flattened the patch, and then re-sealed the surface.



Support columns were imbedded in 1-foot concrete piers under a 12-inch slab with few construction joints or control joints. Owens Concrete Staining repaired cracks and popouts with Rapid Set® Cement All® and Rapid Set® Concrete Mix before placing a Rapid Set® TRU® SP polished concrete topping. Some areas, like the bathroom at right, had to first be raised with Rapid Set® Concrete Leveler® underlayment. Photos courtesy Josh Owens



Self-leveling Rapid Set® TRU® SP polished concrete topping maintains workability for up to 20 minutes. To give crews plenty of time to coax material into corners and minimize pinhole formation, Owen Concrete Staining's crews lined up gauge rakes and spiked rollers before mixing.



In all, Owens Concrete Staining restored 22,000 square feet of concrete floor on two levels of the First Americans Museum.



### Project at a glance

- **Project Type:** Commercial
- **Application:** Flooring, Polished Concrete
- **Location:** Oklahoma City, OK
- **Size:** 22,000 square feet
- **Dates:** May - November 2020
- **Owner:** State of Oklahoma
- **General Contractor:** Centennial Builders (joint venture, Manhattan Construction and Flintco)
- **Flooring Contractor:** Owens Concrete Staining

- **Products:** Cement All®, Concrete Leveler®, Concrete Leveler™ Primer, Concrete Mix, TRU® SP, TXP™ Fast Epoxy Primer

## Products Mentioned



**RAPID SET**  
Cement All®



**RAPID SET**  
Concrete Leveler®



**RAPID SET**  
Concrete Leveler™  
Primer



**RAPID SET**  
Concrete Mix



**RAPID SET**  
TRU® SP



**RAPID SET**  
TXP™ Fast