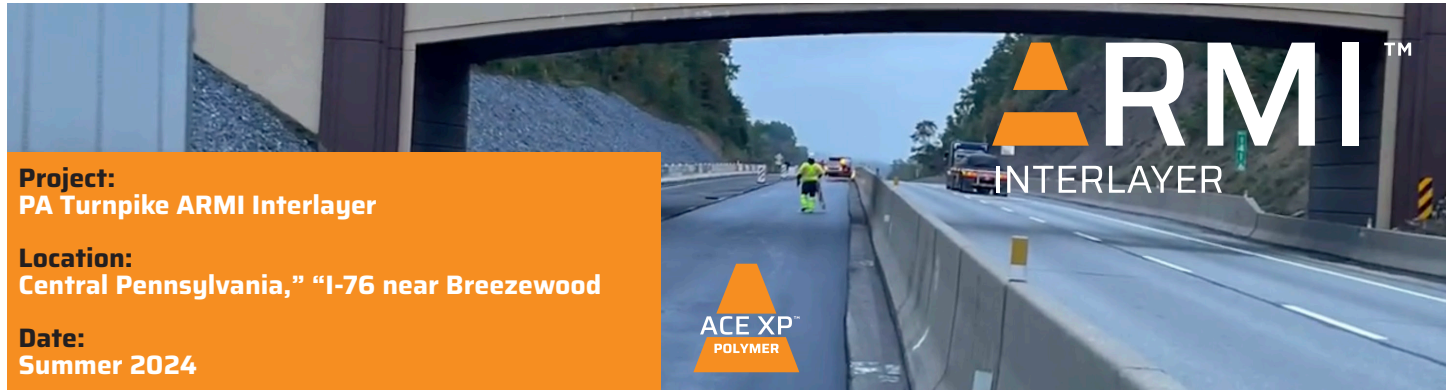


## PA Turnpike Project: Combating Reflective Cracking



**Project:**  
PA Turnpike ARMI Interlayer

**Location:**  
Central Pennsylvania, "I-76 near Breezewood

**Date:**  
Summer 2024

**Client/Owner:**  
Pennsylvania Turnpike Authority

**Contractor:**  
New Enterprise contractors

**Consultant/Engineer:**  
BATT: Phil Blankenship

**Surface Tech Product:**  
ARMI Interlayer

## ARMI Interlayer Implementation and Benefits

New Enterprise installed **4 miles, I-76 west of Breezewood, PA** in September 2024, followed by a standard polymer overlay. The Turnpike plans future aramid fiber inclusion in overlays for a "one-two punch" against cracking, with another interlayer section planned west towards Pittsburgh next year.

ARMI Interlayer is truly groundbreaking: it is engineered to be **50 to 100 times more strain tolerant or crack tolerant** than normal pavement. BATT Lab's Phillip Blankenship, P.E. describes it as a "shock dampening" or "a movement dampening system," akin to having a "pure inch of rubber" that absorbs movement energy rather than passing it through. This is critical because the primary cause of reflective cracking is **shear movement**, and ARMI Interlayer is specifically designed to address this.

Beyond its crack-dampening capabilities, the ARMI Interlayer is also **impermeable**, forming a crucial water barrier. This solution is projected to extend the life of the overlay by an impressive **50 to 100%**, significantly improve ride quality, and provide superior protection for the underlying base.

## Project Overview

*The Pennsylvania Turnpike, the oldest turnpike in the US, faced persistent and aggressive reflective cracking issues on its old concrete pavements.*

To address this critical challenge Surface Tech was engaged to implement the ARMI Interlayer solution.

The solution is an interlayer with a 6428 binder and a double dose of aramid fiber to meet high polymer specifications. **ARMI Interlayer was chosen to combat the most difficult type of distress: reflective cracking on old concrete.**

Specifications for the project were finalized in January 2024, and the project was bid and awarded to New Enterprise contractors in central Pennsylvania. Surface Tech delivered the final ARMI interlayer mix design in September 2024.

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# Case Study

## Comparison to Other Solutions

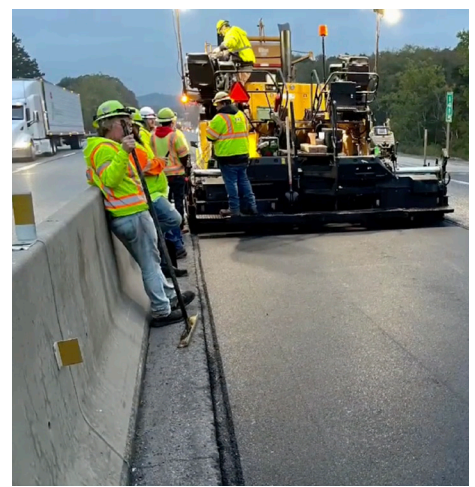
ARMI Interlayer stands out when compared to traditional methods for addressing reflective cracking:

**“Do Nothing” Approach:** This common, yet ineffective, method typically sees cracks reappearing within 4-5 years, leading to rapid pavement deterioration.

**Fabric (Petromat):** While a widely used solution, fabric interlayers only offer a temporary delay of 9-12 months before cracks resurface. They also present significant challenges during the milling process, complicating future rehabilitation efforts.

**Glass Grid:** Glass grids are effective for managing horizontal movement but struggle with vertical movement at pavement joints. Their installation is also more complex, requiring tensioning and often third-party involvement.

**In stark contrast, ARMI interlayer** is producer made and paver laid streamlining the construction process and allowing for quick return to traffic within 3-6 hours. Crucially, it directly addresses shear movement, which is identified as the primary cause of reflective cracking, offering a more robust and long-lasting solution..



## ARMI Interlayer Performance Metrics

ARMI Interlayer has demonstrated exceptional performance in rigorous testing, far surpassing conventional and even polymer-modified pavements:

### Fatigue Testing (High Strain Testing at 2,000 micro strain):

- A normal surface typically lasts only a few seconds, equivalent to about 1,000 cycles.
- A polymer surface extends this to an impressive 5,000 cycles.
- ARMI Interlayer can achieve **50,000+ cycles**, showcasing its remarkable durability and fatigue resistance.

### Balanced Mix Design (BMD) Test (Ideal CT): This critical test measures cracking resistance.

- A normal mixture typically scores in the range of 80 to 100.
- ARMI interlayer consistently achieves a value of 700, and more **typically over 1,200**, demonstrating over **100 times** the cracking resistance of conventional mixes.

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