

Resilient Asphalt Roads:

ASPHALT KEEPS COMMERCE FLOWING IN THE WAKE OF DISASTER

When highway accidents damage or destroy critical infrastructure, threatening major economic impacts, state agencies need to be able to count on resilient pavements for immediate options.

As defined by the FHWA, “Resilience is the ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions.” In the aftermath of disasters where high traffic volume roads or bridges are destroyed or damaged beyond use, priority number one is to get traffic moving safely and efficiently again, to minimize collateral impacts to the surrounding communities. Every day that vital, arterial roadways are closed, there are compounding costs to the local and broader economies.

Asphalt: The Best Choice to Rebuild I-95 After Philadelphia Fire

On June 11, 2023, a truck hauling roughly 8,500 gallons of gasoline caught fire beneath the I-95 overpass at Cottman Avenue. While the cause for the crash and the fire’s ignition are not entirely clear, what is certain is that extreme heat from the fire collapsed the support structures upholding the northbound lanes of the bridge. The southbound bridge was also severely damaged and would need to be removed. The response to the emergency, both locally and on a federal level, was lightning quick.

Roughly 160,000 vehicles travel the corridor daily, and an estimated 40% of the US domestic GDP utilizes I-95. According to the Bureau of Transportation Statistics, in 2021, trucks carried 21 million tons of freight worth \$104 billion through the Philadelphia region, largely via I-95.

Within hours of the bridge collapse, after it was determined that both the northbound and southbound bridge spans needed to be removed, C. Abbonizio Contractors Inc. was called upon to clear away the damaged section, and Buckley & Co. took on the job of filling the resulting gap left by the collapsed structure. Thus, temporary lanes were paved quickly, and the corridor reopened. Both contractors were already working on I-95 projects nearby and were selected due to their proximity and prior experience working with PennDOT.

The first hurdle PennDOT’s Harold Windisch, Assistant District Executive for Construction, faced once the site was cleared was an 86-inch sewer line underneath the site. “We originally discussed a dirt embankment fill, and then the possibility of using RAP,” he said. “The Philadelphia Water Department informed us there would be issues with the weight of those materials putting pressure on those [sewer] lines.”



Ultimately, a lightweight aggregate (at about a fifth of conventional fill weight) created from recycled consumer glass products by nearby AeroAggregates provided the stability and strength needed. More than 8,000 cubic yards of foamed glass aggregate were used.

Next, Buckley & Co. laid down 8 inches of sub-base and then SJA Construction placed 10 inches of asphalt base, 2.5 inches of intermediate layer, and finally a 1.5 inch wearing layer. All three asphalt mixes were produced just five miles from the site of the accident at Riverside Materials.

“They were standard mix designs produced and on-hand regularly,” said Frank Magdzinski, Quality Control Manager for Riverside Materials. “The only real adjustment was making it a slightly finer grade where rumble strips had to be filled in, and that was no problem at all.”

“You only need about 80 feet to get three lanes open in each direction,” said PennDOT’s Windisch. Since the primary goal was to get traffic moving again as quickly as possible, asphalt was the clear material choice.

When weather became a factor as storms loomed over the city, the project was able to move ahead. “Using a nuclear gauge, we saw density was where we needed it for the material. The call was made to carry on despite the rain,” Windisch noted. “We paved both lifts overnight, and that saved us losing a day.”

A total of six temporary inner lanes were paved, three northbound and three southbound, and with each lane 11. The permanent bridge structure will be built around them, shifting the flow of traffic to accommodate crews until its estimated completion in mid-2024. The projected total cost of the rebuild is \$25-\$30 million.

When unanticipated disasters strike, threatening major economic disruption, asphalt is the perfect choice to rebuild pavements safely and quickly. The original estimated time to reopen the lanes was up to two months. However, due to asphalt’s ease of installation, constructability, strength, and recyclability, the northbound I-95 traffic reopened to the public just 12 days after its collapse.



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