CASE HISTORY

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STRENGTHENING & RECONSTRUCTION OF NH-752 FROM Km 0/0 to 1/200 to 1/800, Km 42/400 to 43/900 to 44/100, Km 47/400 to 59/100, Km 64/450 to 72/680, Km 78/750 to 79/050, Km 79/050 to 88/330 IN THE STATE OF RAJASTHAN

KOTA, RAJASTHAN, INDIA

Pavement Stabilization

Client:	Products used:
PWD NH RAJASTHAN	• ASPHALT INTERLAYER COMPOSITE : AIC 100
Main contractors:	
VISHNU PRAKASH R. PUNGLIA LIMITED	
Manufacturer & Supplier:	Year of Construction:
TECHFAB (INDIA) INDUSTRIES LTD.	2024

Project Description:

The National Highway 752 (NH752), connecting Aklera to Baran in Rajasthan, is a vital transportation link that also serves as a key route connecting Kota to various other states. Spanning approximately 100 kilometers, this highway experiences heavy traffic volume, which has led to the development of significant road distress, particularly in the form of reflecting cracks. These cracks, if left untreated, could potentially propagate through the newly constructed bituminous concrete (BC) surface, compromising the durability and safety of the road.

Reflective cracking is a major issue for road maintenance, as it can lead to the degradation of the BC surface and requires costly and frequent repairs. Reconstructing the BC surface on such a vast stretch of highway would result in significant maintenance expenditures, causing both financial strain and disruption to traffic.

To address these challenges, the Public Works Department National Highway of Rajasthan has decided to undertake the Strengthening and Reconstruction of specific segments along NH752. The project will cover critical sections including Km 0/0 to 1/800, Km 42/400 to 44/100, Km 47/400 to 59/100, Km 64/450 to 72/680, and Km 78/750 to 88/330. This project aims to enhance the structural integrity of these stretches and ensure the longevity of the road, ultimately reducing the need for costly repairs and enhancing the safety and efficiency of travel along NH752.

Photo 1 : Surface Cleaning & Potholes Filling

Solution:

TechFab India recommended the use of AIC 100 (Asphalt Interlayer Composite) as an interlayer system, in accordance with the IRC SP 59:2019 guidelines. AIC is a composite material that combines nonwoven geotextile and geogrid, providing exceptional strength, high modulus, and low creep characteristics. This advanced system is specifically designed to enhance the durability and performance of pavement structures by preventing reflective cracking and improving load distribution.

The nonwoven geotextile component of AIC helps manage moisture, while the geogrid reinforces the pavement structure, ensuring stability under heavy traffic loads. By incorporating AIC as an interlayer, stress from traffic-induced deformation is effectively minimized, extending the lifespan of the road and reducing the frequency of repairs. As outlined in IRC SP 59:2019 (Clause 5.7.6), AIC offers a reliable solution for strengthening pavement systems, ensuring long-term performance and minimizing maintenance costs. This technology contributes to safer, more durable roads for the future.

Photo 2 : Laying of Tack Coat on prepared surface

Photo 3 : Laying of AIC Fabric on Tack Coat

Installation Procedure:

- The finished base layer of pavement must show no significant signs of pumping, movement or structural instability. All patches, pothole repairs and crack sealing if any, should be done prior to laying of AIC (Fig 1). AIC adheres best to a smooth, flat surface.
- The tack coat used to impregnate the fabric and bond the fabric to the pavement shall be paving grade Bitumen of VG-10. The tack coat shall be applied using a calibrated distributor spray bar (Fig 2). Hand spraying, squeegee and brush application may be used only in locations where the distributor truck cannot reach.
- The tack coat shall be uniformly applied at a rate to bond the nonwoven scrim to the existing pavement surface. The tack coat application rate shall be 1 kg per square meter or as specified in the contract.
- The target width of the tack coat application shall be equal to the AIC width plus 100 - 150 mm. The tack coat shall be applied only as far in advance of AIC installation as is appropriate to ensure a tacky surface at the time of AIC placement. Traffic shall not be allowed on the tack coat. Excess tack coat shall be cleaned from the pavement.
- The AIC shall be placed onto the tack coat using mechanical or manual lay down equipment capable of providing a smooth installation with a minimum amount of wrinkling or folding (Fig 3). The AIC shall be placed before to the tack coat cools and loses tackiness.
- After laying the AIC, some loose bituminous premix material shall be sprinkled on it in the wheel path of the paver and the tipper to ensure that the fabric is not picked up between the wheels. AIC shall not be installed in areas where the bituminous overlay tapers to a thickness of less than 40 mm.
- Additional hand-placed tack coat may be required at laps and repairs as determined by the Engineer to satisfy bitumen retention of the lapped AIC. All areas where AIC have been placed shall be paved the same day. No traffic except necessary construction equipment will be allowed to drive on the AIC. Turning of the paver and other vehicles shall be done gradually and kept to a minimum to avoid movement and damage to the AIC. Abrupt starts and stops shall also be avoided. Damaged fabric shall be removed and replaced with the same type of fabric
- Overlaps shall be shingle-lapped in the direction of paving. Additional tack coat shall be placed between the overlap to satisfy saturation requirements of the fabric. Overlap shall be sufficient to ensure full closure of the joint but not exceed 150mm. Transverse joints shall be overlapped in the direction of the pavement by 100 to 150 mm or as per the manufacturer's recommendations or as directed by the Engineer. Longitudinal joints shall be overlapped by 20-30 mm or as per the manufacturer's recommendations or as directed by the engineer. The overlay operations shall be completed at the earliest after laying the fabric.

Photo 4 : Preparation of BC (Bituminous Concrete) Layer

Photo 5 : Compaction of BC (Bituminous Concrete) Layer

Conclusion:

The project was successfully completed in February 2024, meeting all expectations. The client expressed satisfaction with the high-quality product and the excellent service provided. This accomplishment reflects our commitment to delivering reliable solutions and maintaining strong client relationships, ensuring long-term performance and safety in infrastructure projects.

"Discover the seamless installation of AIC for enhanced pavement durability and long-lasting performance. Watch the full guide here!"

https://www.youtube.com/watch?v=Jwaj0bhlXJc

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