



Job Report Cold Recycling

# WR 2500: Recycling project, A 14 between Bologna and Rimini, Italy



## Wirtgen Cold Recycling:

### WR 2500: Recycling with foamed bitumen A 14 between Bologna and Rimini

Thorsten Fröbel, August 2001

## Project details

Country: Italy  
Project name: Maintenance of freeway A14: km 116 – km 111  
Project client: Autostrade IRI.  
Contractor: Gruppo Autostrade spa. / Pavimental spa.  
Recycling sub-contractor: Cavalleri spa.  
Year: 2001

## Existing pavement structure

The existing pavement structure consisted of 50 cm asphalt supported on unbound granular sub-base layers which was in turn supported on a subgrade [Fig. 1]

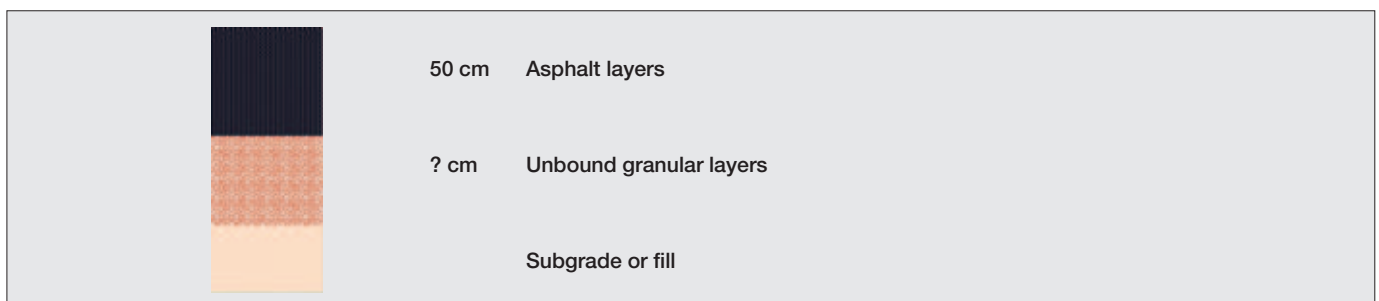


Fig. 1: Existing pavement structure.

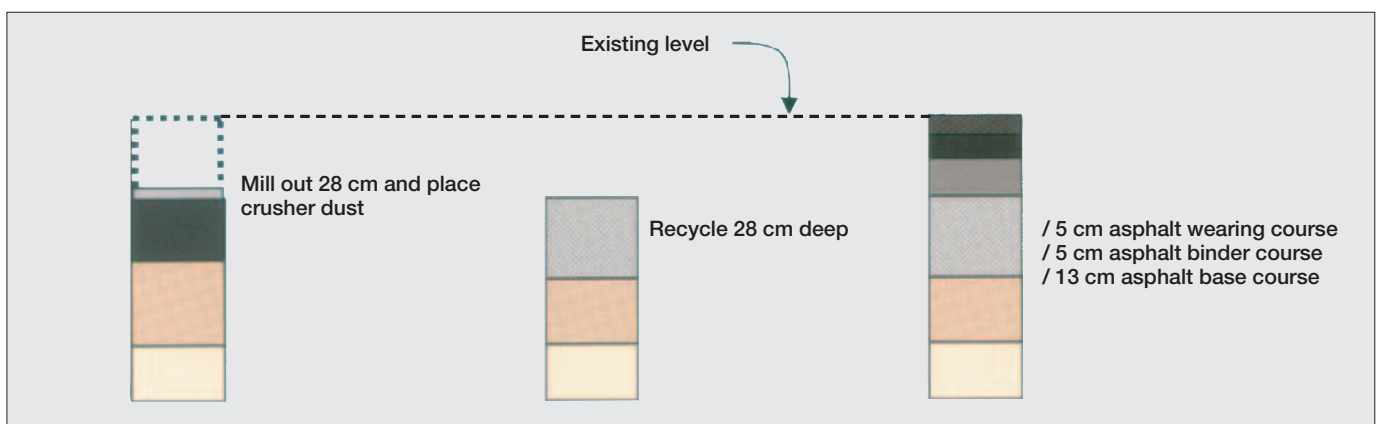


Fig. 2: Schematic of the recycling steps.

## Recycling method

- ▶ Mill out 28 cm of the slow lane. This was carried out using the Wirtgen 2100 DC [Fig. 3 and 4].



Fig. 3: The Wirtgen 2100 DC loading the milled asphalt directly onto a truck.

- ▶ Place 2 cm of 0/2 mm crusher dust. This was done to improve / modify the grading to suit the stabilisation with foamed bitumen. Here a minimum of 5 % fine passing the 0,075 mm sieve was the goal [Fig. 5].



Fig. 4: The first 28 cm deep and 2,1 m wide milling cut using a Wirtgen 2100 DC.



Fig. 5: 0/2 mm crusher dust spread to the 4 m wide milled out section.

- ▶ Pulverise and add stabilising agents using the recycling train, consisting of a Wirtgen WR 2500 recycler and a Wirtgen WM 1000 cement slurry mixer. The stabilising agents consisted of 2,3 % cement and 3,5 % foamed bitumen [Fig. 6 and 7].



Fig. 6: First pass of the Wirtgen recycling train.



Fig. 7: The stabilised material viewed directly behind the milling and mixing chamber.

- ▶ The stabilised material was compacted using a Hamm 3520 HT; being a 19,8 ton single drum vibratory roller with Hammtronic [Fig. 8]. The compaction sequence was using a high amplitude for the first 3 passes, with a reduced amplitude for the remaining 2 to 4 passes. The specified compaction of 98 % of mod. Proctor was achieved without any further compaction equipment.



Fig. 8: Compaction taking place directly behind the recycling train using the Hamm 3520 HT.

Fig. 9 shows clearly the 2,5 m cut width with an approx. 2,0 m stabilised width. This is achieved by switching off some nozzles.



Fig. 9: The first pass compacted and finished.

With the second adjacent pass the remaining 2 m wide unstabilised lane is stabilised, compacted and finished in the same steps as above [Fig. 10 and 11].



Fig. 10: The recycling train, consisting of a bitumen tanker, WM 1000 slurry mixer and WR 2500 recycler together with the compaction and finishing equipment processing the second pass.



Fig. 11: The compacted and finished recycled layer.

After approx. one week of curing, 13 cm asphalt base course, followed by 5 cm asphalt binder and 5 cm wearing course are paved. After the line marking is complete, the slow lane can be opened to traffic [Fig. 12 and 13].



Fig. 12: A view of the finished asphalted and line marked slow lane, ready for the heavy traffic.



Fig. 13: This is being done on both the north and south-bound carriageway of the A14 between Bologna and Rimini.



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