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AMIR: Asphalt Multi Integrated Roller

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AMIR: ASPHALT MULTI INTEGRATED ROLLER

THE NEED

Conventional rolling equipment, such as steel vibratory rollers, while capable of achieving a specified density, results in construction induced cracks. These cracks are often visually apparent, and they are due to a mismatch between the geometry and relative rigidity of the roller and the asphalt mix.

FIGURE 1 AMIR-1 PROTOTYPE

THE TECHNOLOGY

Roads damage and cracking are not only caused by cold weather since the problems have been also seen on roads of countries with warm climates, but they are also caused by bad quality compaction.

The traditional compactors are built with round, pin-shaped rollers made of very stiff material, which is the reason for the cracks that take place during compacting. This compaction process will create very thin cracks in the asphalt pavement and when the temperature drops, the cracks open up. If water enters the cracks, freezes and the asphalt will break apart.

Asphalt Multi Integrated Roller (AMIR) was developed to compact asphalt and to prevent the surface cracking of pavement. AMIR was developed by replacing the cylindrical stiff shape with a moving flat softer plate which results in a crack free asphalt layer and more uniform compaction along and across the mat.

The special type of rubber material used in AMIR is softer and gentler, yet still applies the same energy due to a much longer period of contact.

THE BENEFITS

Comparative test results performed on asphalt specimens from conventional and AMIR compacted sections. These results show quite significant improvements in density, tensile strength, fatigue life and resistance to moisture damage.

AMIR can replace existing three different rollers, the vibratory, pneumatic and static steel rollers while achieving the same if not better density with less number passes than conventional rollers. AMIR also does not require very highly trained operators, it need only one operator. These features are believed can save big number of money and very beneficial to contractors.

Visible cracks pavement rolled by conventional rollers

Free-crack pavement rolled by AMIR-1 prototype

FIGURE 2 COMPARISON WITH CONVENTIONAL ROLLERS

STATUS

Since 1987, a number of integrated field trials and laboratory experiments have been carried out in Egypt, Sweden, Canada and most recently Australia. Extensive testing of cores, beams and slabs, recovered from field tests, provided data on density, voids, etc., plus tensile strength, stripping and fatigue resistance.

AMIR compactor was originated in Ottawa, Canada and has been used in Egypt, Canada, Sweden and Australia. It is expected to be used to compact asphalt mixes all over the world. Two companies from Australia modified and upgraded AMIR under the name 'HIPAC' and will be selling the new roller world wide by next year.

[Construction Innovation Forum honored AMIR as one of the winners of 1999 Nova Award.](#)

BARRIERS

When this fact sheet was being developed, AMIR is not yet available in the market.

POINTS OF CONTACT

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REFERENCES

1. 1999 Nova Award Nominations, The Nova Award, Construction Innovation Forum, Inc., October 1998
2. AMIR, The Homepage of A.O. Abd El Halim, Department of Civil and Environmental Engineering, Carleton University, <http://civeng.carleton.ca/~ahalim/amir.html>

REVIEWERS

Peer reviewed as an emerging construction technology

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