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CLIENT PROJECT REPORT CPR1490

Assessment of Radlock Highway Systems Composite Plate with Locking Mechanism

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Contents

Executive summary

This report describes the testing of a composite plate with integral locking mechanism supplied by Radlock Highways Systems under repeated trafficking to assess its suitability for use on the road network to cover trenches up to 700mm wide during utility and highway works.

The plates can be handled and positioned fairly quickly by two reasonably fit people. The locking mechanism can be attached quickly when the plates are nearly in position over the trench, and can be engaged with the sides of the trench qucikly when the plate has been maneavoured into its final position. .

The plates failed after a total of over 65,000 passes, comprising 50,000 passes of a super single wheel at 4 tonnes and a further 15,541 passes of a super single wheel at 5.5 tonnes along a linear run placed over a trench of width 700 mm. This testing regime was very severe with a single wheel running along the centreline of the trench at every pass in both directions.

Taking all factors into account, it is concluded that the total passes in the tests represented typical use over a minimum period of at least 3 years on Type 1 roads, and it is anticipated that much of their use will also be on Type 3 and 4 roads thus extending that period.

The Radlock Composite Road Plates complete with the Radlock Series 15 Locking Mechanism are recommended for use on site.

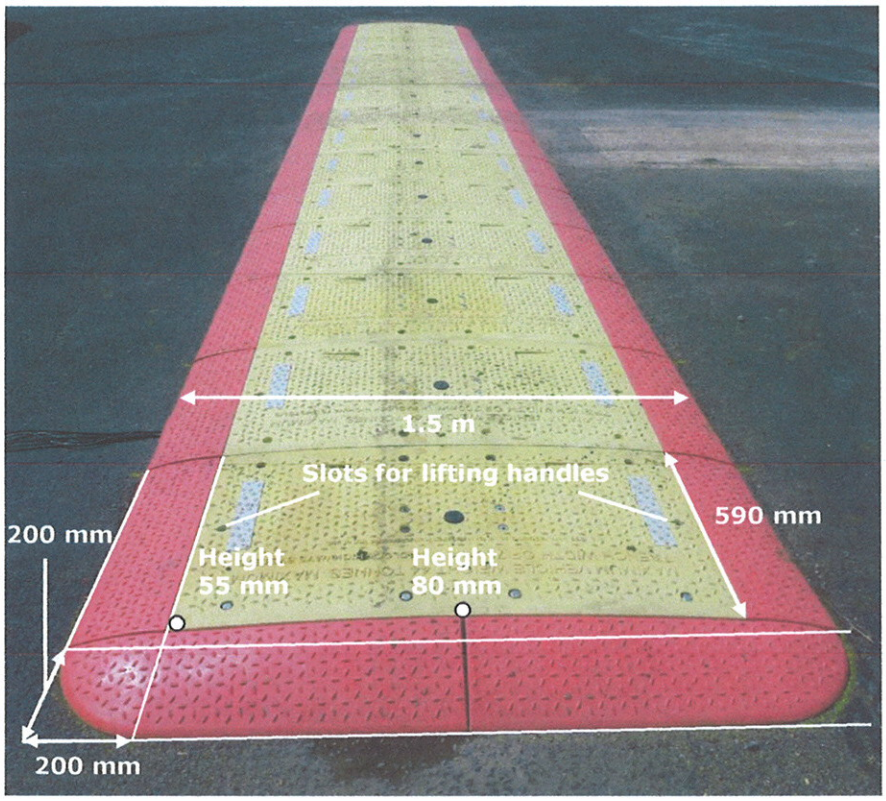

Figure 1.1 – A run of prototype plates

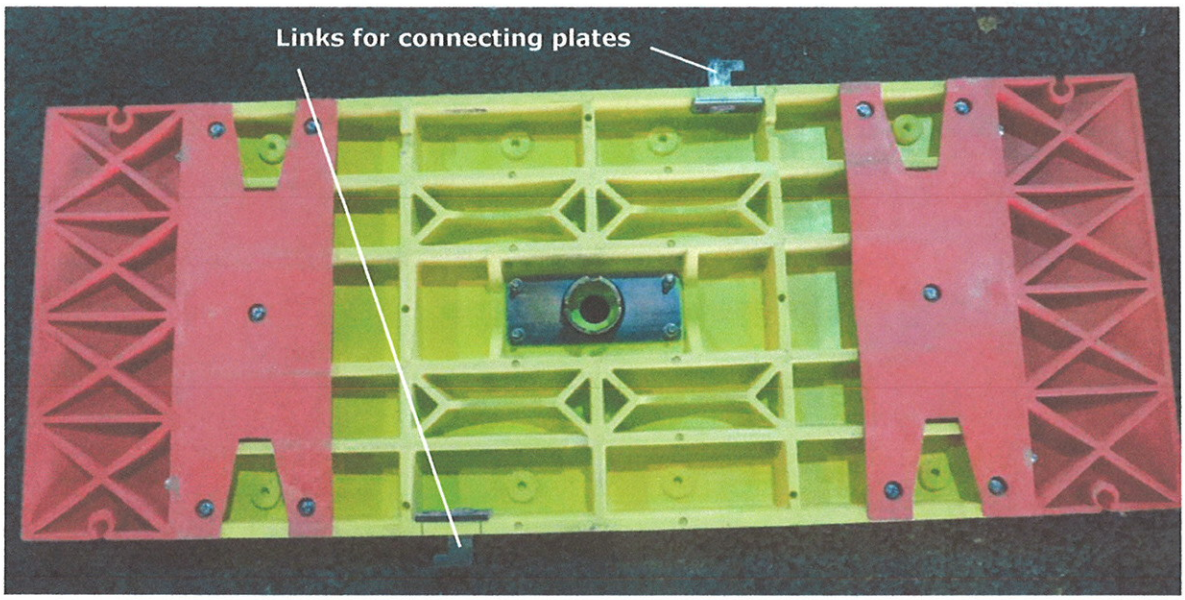

Figure 1.2 – Underside of a final design plate

3 Conclusions

Installation

- The plates can be handled and positioned by two reasonably fit people.
- Whereas the plates can be handled with the locking mechanisms in position, it is easier to store and position the plates if the locking mechanisms are attached to the plates when they are over the trench.
- The locking mechanism can be fitted to a plate in less than a minute. The locking mechanism can be engaged with the sides of the trench in a similar time. Therefore, an installation of surface mounted plates can be completed in a short time.

Performance

- The final design plates failed after over 65,000 passes, comprising 50,000 passes of a super single wheel at 4 tonnes and a further 15,541 passes of a super single wheel at 5.5 tonnes along a linear trench of width 700 mm.
- The test conditions were severe. The linear trafficking loaded the edge of the plates on every pass. The trench width was 700 mm and wider than most trenches at which the plates would be used on roads. Some, probably more, installations will be at transverse trenches rather than at linear trenches. The loading on transverse trenches will be less onerous than that at linear trenches.
- The production version of the final design plates that will be used on roads will be stronger than the final design plates that were tested as the load transfer links will be an integral part of the reinforcement mesh. Taking all factors into account, it is concluded that the total passes in the tests represented typical use over a period of at least 3 years on Type 1 roads.
- The Radlock Series 15 locking mechanisms were considered to be robust and showed no signs of failure during the testing.
- The Radlock Composite Road Plates with Radlock Series 15 locking mechanism as the fixing method are recommended for use on site and the development of case studies on their use is also recommended.

Acknowledgements

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References

R W Jordan, N Anderson, C Sadat-Shafaee and B Meitei (2013 – to be published). Reducing congestion on the road network: Part 1, Use of road plates . TRL Published Project Report. Crowthorne: Transport Research Laboratory.