

THE

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CONPLANT TAKES THE TECHNOLOGY LEAD AGAIN

UNMANNED ROLLER IMPROVES SAFETY AND PRODUCTIVITY

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LENDLEASE AND CONPLANT TAKE SAFETY SERIOUSLY

WHEN LENDLEASE WAS LOOKING TO ADDRESS THE CHALLENGES OF SAFELY COMPACTING EDGES ON HIGH EMBANKMENTS ON ITS 22KM NAMBUCCA HEADS TO URUNGA UPGRADE (NH2U) PROJECT, IT HAD IDEAS ABOUT WHAT IT WANTED BUT SPOKE TO COMPACTION SPECIALIST CONPLANT TO ADVANCE THE PROJECT.

The \$780 million NH2U Project is jointly funded by the Australian and NSW Governments, and is being managed by Roads and Maritime Services (RMS), which engaged Lendlease on a design and construct basis. Work commenced in November 2013 and, subject to weather, is scheduled for completion late this year.

Because of the risk of rollover when working close to an embankment edge, Lendlease did not want an operator on this equipment, and was prepared to consider alternatives to conventional compactors as a means of overcoming the challenge of working safely in a high risk environment.

A collaborative process

Remote control was a natural consideration, and Conplant's advice was that, as high risk applications may account for as little as 5% of a compactor's working life, it was best to modify a production machine so that it could be operated remotely but still be used conventionally in low risk applications.



Lendlease and Conplant have been working together on remote control roller systems since August 2014



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MACHINES CAN BE REPLACED,
PEOPLE CAN'T.

IAN COLEMAN

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Conplant was a natural partner for Lendlease in the development of the remote control technology, having previously demonstrated its commitment to compaction safety in developing its ROPS2 (Roll Over Preventative System) technology that provides a 2-stage protocol of warning the operator visually and audibly when a potentially dangerous angle is reached, and shuts down the vibration function when a greater potentially dangerous angle is reached.

The ROPS2 system was initially used by Abigroup (which subsequently became part of Lendlease) on the M7 Project in 2006; commencing a partnership that continues to collaborate on design and technology opportunities to protect workers when operating or working around mobile plant.

ROPS2 is employed on the compaction equipment fitted with remote control, as it is with most machines in the Conplant fleet. In remote mode, the ROPS2 system shuts down the machine rather than just disengaging vibration when the second stage warning level is reached.

Other features that form part of Conplant's remote control modifications include warning lights and directional alarms when the machine is being operated remotely, an automatic parking brake, and remote control devices that are matched to specific machines so that up to 10 machines can be controlled in the same area without interference.



Vinnie the Verge Placer is the other half of the solution in keeping equipment away from the edge when building verges on steep embankments

To date four machines – 2 x Ammann 7-tonne ASC 70 single drum compactors and 2 x Ammann 2.5-tonne ARX 26 tandem rollers – have been fitted with the manned and remote control system, and all are working on the NH2U Project, with a fifth machine (an Ammann 4-tonne ARX 40 tandem roller) due to be delivered to site at the time of writing.

While the remote control's primary purpose was embankment compaction safety, it has also provided benefits in visibility when working close to kerbs or other fixtures that could be damaged by the roller. Standing on the ground and being able to move around with the remote control generally provides the operator with a better view than from the cab seat.

This has advantages with superior quality of work, with less requirement for rectification of damage. The remote control system has been developed as a collaborative partnership between Lendlease and Conplant.

It uses infrared remote control, which stops the machine when the operator loses line of sight with the machine (infrared technology has become almost universal with trench compactors, which are the only class of compaction equipment routinely offered from the factory with remote control).

It is a measure of the success of the system that its fitness for purpose is taken as a given; and discussions largely centre around things like the fine tuning of speed of operation and responsiveness of controls.

This is a valuable two-way conversation; with Conplant receiving input from operators about the feel of the system, and providing Lendlease with alternative technologies that could be employed to improve the speed and responsiveness for the operators. This allows Lendlease to make a considered judgment about whether the additional cost of a modification can be justified by the improved performance.

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THE REMOTE CONTROLLED ROLLER IS BRINGING A RAFT OF BENEFITS TO THE PROJECT; MAXIMISING PRODUCTIVITY, ENHANCING QUALITY BY REDUCING DAMAGE TO THE EDGE OF THE CONCRETE PAVEMENT, AND MOST IMPORTANTLY, IMPROVING SAFETY BY REDUCING THE RISK OF HUMAN ERROR.

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◀ FROM PAGE 9 – FRONT COVER STORY

User feedback

Damian O'Connor is general superintendent for Lendlease on the NH2U Project, and sees the remote control system as taking the risk away from compaction on the embankment verges.

Currently the 7-tonne rollers are being used to compact conditioned verge fill material placed by “Vinnie the Verge Placer” – a modified LeeBoy RW-100B road widener that receives the fill material from a tipper via a front hopper similar to an asphalt paver, and places and strikes it off to the side.

This keeps both the tipper and the placer wheels away from the edge: the first stage of safe placement and compaction of verges. The verge placer is also used for placing no fines concrete at sub-base level.

Damian sees the choice of operator as a key part of the successful operation of remote control machines. He believes that more experienced operators bring the required level of care to operation of the remote control machines, which require constant vigilance to work in a narrow corridor between the embankment and the kerb without damaging the kerb or risking a rollover.

When asked what the keys to successful remote control operation were, he said, “It still comes down to the fundamental rules of compaction: watch the edge, work the material from the inside to the edge if the material is too loose, and keep the roller level at all times.”

He described operation of the remote control for the ASC 70 as being similar to a

trench roller, except that the machine was much bigger.

“The remote controlled roller is bringing a raft of benefits to the project; maximising productivity, enhancing quality by reducing damage to the edge of the concrete pavement, and most importantly, improving safety by reducing the risk of human error,” said Chris Bryce, Lendlease’s Operations Manager for NSW.

“The project team embraced innovation from the outset and challenged themselves to think outside of the box to reduce risk. I’m really proud we have developed an industry first and can see other possible applications across our business.”

The next stage

Conplant has recently secured Government funding for its next stage of an integrated compaction equipment safety system: Edge Control. This has currently been developed to proof of concept stage, and incorporates:

- sensors and cameras
- angle sensors for steering and/or articulation
- a Central Processing Unit
- an independent steering valve, and
- GPS systems.

This system measures the distance between the roller and a structure (e.g. kerb) or terrain feature (e.g. embankment edge), and automates the steering to maintain a desired

clearance from a structure, or safe operation in proximity to a terrain feature. The edge control system is designed for operation in both remote and manned operations.

Why Conplant does it

Conplant MD Ian Coleman praised Lendlease for its role in fostering the development of the Manned and Remote Control system and complementary safety-oriented systems, saying, “It is often difficult to find a champion for new technology, but Lendlease has proven through its collaborative processes that it not only supports new technology but is an active partner in ensuring that the technology is not only safe but functional and productive.”

While the technology has currently been fitted to only a small number of machines, Ian says, “The technology is capable of being fitted to any of our Ammann rollers up to even the largest 28-tonne units. □

FOOTNOTE: Conplant won the 2015 EMCC Occupational Health & Safety Achievement Award for its compaction equipment safety systems.

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Thursday 15 September
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