RRES

ROBOTIC ROADWORKS & EXCAVATION SYSTEM

DEVELOPING THE FUTURE OF UTILITY EXCAVATION

The **Robotic Roadworks and Excavation System (RRES)** project combines a large and powerful industrial robot, an all-electric track drive system, below-ground locating sensors, artificial intelligence, machine vision and new vacuum excavation methods for all-electric, safer, faster and autonomous roadworks and street excavation. RRES will **reduce accidental damages, minimise carbon emissions and improve safety**.

KEY BENEFITS

Minimise Disruption

RRES aims to expand the use of innovative core and vac methods to improve efficiency of the operation, minimise time in street and reduce costs.

Lower Risk of Damage

GPR and EM technology are being fused to enable the visualisation of buried infrastructure prior to excavation—ensuring buried utilities are not damaged.

Higher Repeatability

Automating work methods on the gas network ensure routine operations are completed uniformly and with the highest level of precision.

Improve Safety

RRES will utilise newly developed soft-touch excavation tooling and methods to further reduce the risk of accidental damage to buried pipelines and high voltage cables.

Reduce CO2 Emissions

In addition to limiting the need for heavy construction vehicles on site, the RRES robot will be battery operated to further reduce carbon emissions.

Expanding Usage

ULC Technologies intends to scale the Robotic Roadworks and Excavation System up or down to adapt to a wide range of construction activity and tasks.

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SYSTEM OVERVIEW

Revolutionising Roadworks

Traditional excavation methods in the utility industry face a wide range of challenges such as third party damage, disruption to traffic, road closures and excessive carbon emissions. While our world has been rapidly transformed by technology, roadworks are still carried out using backhoes and dump trucks.

RRES operates on a robust, all-electric track system with an endurance of more than 8-hours of operation. The untethered robot will be capable of completing end-to-end roadworks for gas distribution and transmission utilities including below-ground sensing, cutting of the road surface, excavation and backfill.

End-to-End Process

01. Below Ground Sensing

Before beginning the actual excavation process, the RRES will deploy integrated below-ground sensors to ensure the robot is digging in the correct location and attempt to identify any other buried utilities that may impede work.

02. Coring and Cutting Roadways

To gain access to the pipeline network under the street, the robotic system will cut a core out of the road surface. The core will then be picked up and set aside for reinstatement at the end of the project.

03. Automated Soft Touch Excavation

ULC Robotics is combining machine vision and sensors with newly developed soft-touch excavation methods to enable the robot to rapidly and autonomously remove the soil one layer at a time while identifying and avoiding other buried utilities.

04. Conduct Work on the Pipe

Once the pipeline has been exposed, the robot will be capable of installing a specialized fitting onto the pipe. Future development of the RRES will aim to expand the range of operations the robot can perform.

05. Backfill and Reinstatement

Lastly, the Robotic Roadworks and Excavation System will backfill the opening in the street and reinstate the core to provide a complete, end-to-end solution.

ABOUT ULC TECHNOLOGIES

ULC Technologies is a leading robotics, technology and machine learning developer for the energy industry, transforming the way that vital infrastructure is maintained and operated. Our diverse team of engineers, sensor scientists, and technicians provide end-to-end solutions for real-world application across a variety of environments.

The deployment of ULC's robotic systems and unmanned aerial systems helps utilities lower operating costs while minimising their impact on customers and the environment.