



IMPROVING PRODUCTION ON TUNNELLING PROJECTS WITH SURFACE MINERS

When undertaking excavation works on civil projects, speed and precision are vital to keeping the project on time, reducing costs and keeping disruption to the community to a minimum. Surface miners can be ideal for such projects where there is often hard rock involved, and drill and blast methods are not viable. Surface excavation machines like Vermeer's range of Terrain Leveler Surface Miners help contractors manage noise levels, vibration and air quality for a safer and more productive worksite.

Surface miners are used for a number of civil applications, including roads and site levelling. They are also frequently used on tunnelling projects to assist with lowering bench levels where the cross section of a tunnel is being increased, whilst simultaneously cutting the bench and levelling the floor during construction of new tunnels.

Originally used for selective ore extraction in the mining industry, Jeff Lawson, General Manager of Sales at Vermeer Australia, said surface miners are now being utilised regularly in civil applications due to their power to cut through hard rock at depths of around 50cm at a time.

"Surface miners are a great alternative to drilling and blasting because it is cheaper and disruption to the community is reduced. Also, if the machine features the onboard dust suppression system then the safety of operators and workers onsite is improved as there is less chance of flying rock and dust inhalation," Mr Lawson said.

A TOP-DOWN APPROACH

The Vermeer range of Terrain Leveler Surface Miners has been developed for top-down cutting for greater efficiency and productivity.

"Top-down cutting allows the cutter teeth to gain penetration without using the machine's tractive effort to drive the teeth into the material," Mr Lawson said.

"As the machine travels forward and the drum rotates, the teeth on the drum are positioned over the material surface, and the top-down cutting action of the teeth instantly creates a consistent-sized product. This can then be handled more efficiently than the product generated by drilling and blasting.

"The product size produced by surface miners greatly reduces the need for primary crushing and can be controlled by increasing or decreasing the depth of cut for smaller material or reduced fines."

The top-down method also allows the machine to cut through harder materials than competitive models which cut in an upward direction. The cut depth, controlled by either laser or GPS, produces a smooth floor for increased production, and easier loading and hauling.

DUST SUPPRESSION FOR IMPROVED PRODUCTIVITY

The range of surface miners are also designed to be compatible with Vermeer's on-board dust suppression system, eliminating the need for a separate trail-behind dusts system unit.

"The on-board dust suppression system is ideal for hard rock and tunnelling application to increase productivity and reduce overhead costs," Mr Lawson said.

"It is hydraulically driven and features both a left and right unit, which become part of the machine, reducing the need for an external power source or operator and, in turn, the amount of diesel consumption, emissions and labour costs.

"Its superior maneuverability means you can work in confined or closed-in spaces and while cutting high walls, perfect for tunnelling projects."

A RANGE OF OPTIONS

The T1255 Terrain Leveler SEM is available with either a chain drive or direct drive drum attachment, depending on the job needs, allowing you to get the most out of the machine.

The chain drive drum is ideal for the removal of ground surface or creating a smooth, level area for site preparation, road construction or soil remediation.

"When you need to get in and extract material to form a high wall, the chain drive drum gives you the capability to cut along a vertical high wall. It has a maximum cutting depth of 68.6 cm (27 inches). The chains are driven by low-speed, high-torque hydrostatic motors," Mr Lawson said.

On the other hand, with the drive motor mounted directly to the cutter drum, the direct drive drum maximises

work efficiency and reduces wear costs associated with other types of transmissions.

Hydraulic low-speed, high-torque motors on each side of the cutter head provide more direct drive power for improved productivity. The direct drive attachment offers a maximum cutting depth of 53.3cm (21 inches).

DESIGNED WITH OPERATORS IN MIND

The range of surface miners has also been designed for the safety and comfort of operators.

"These machines have an elevated enclosed cab to provide operators with a productive vantage point, which is also equipped with a filtered air system, self-contained cooling and heating systems, sound attenuating foam, and more features to improve comfort—and in turn productivity—all day long.

"It is also designed with a rollover protective module (ROPM) which is rated to withstand the impact of a rollover in such environments. It also serves as a falling object protective structure (FOPS)," Mr Lawson said.

It comes with the TEC® Plus operating system to improve ease of operation. This system has been proven over many years in Vermeer Track Trencher range allows the SEM to communicate with the various control modules located throughout the machine. The load control feature allows the machine to automatically adjust ground speed to use full engine horsepower, thus maximising productivity, and protects the engine from operator error to prevent stalling the engine under load.

"Our machines are proven in civil applications, having been used on a number of tunnelling projects throughout Sydney," Mr Lawson said.

"If you're interested in finding out more about surface miners, I'd encourage you to contact your local Vermeer team. We can help you develop a methodology based upon our Australian project experience and to select the surface miner solution that is right for your application."