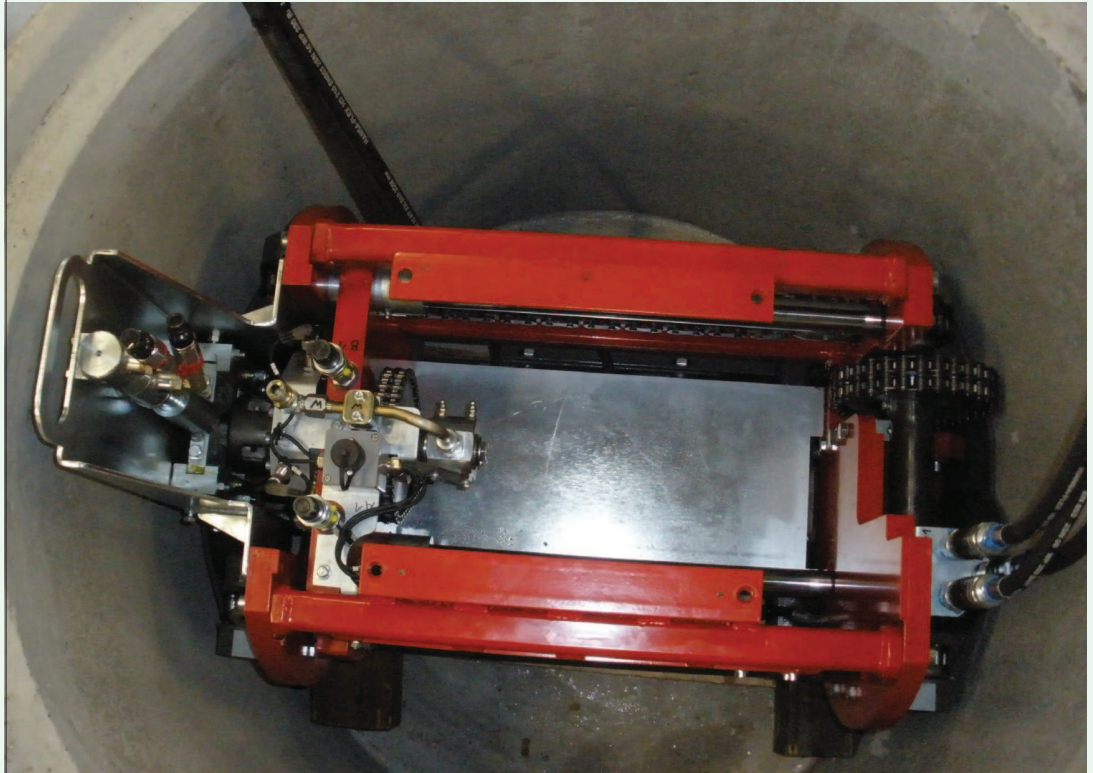


New manhole-launched directional drill



The TERRA MINI-JET MJS 1600 positioned in a manhole

Imagine being able to use existing sewer manholes to lay cables for electricity, gas, water and fibre-optic networks, without the need to dig up roadways or the front gardens of private properties.

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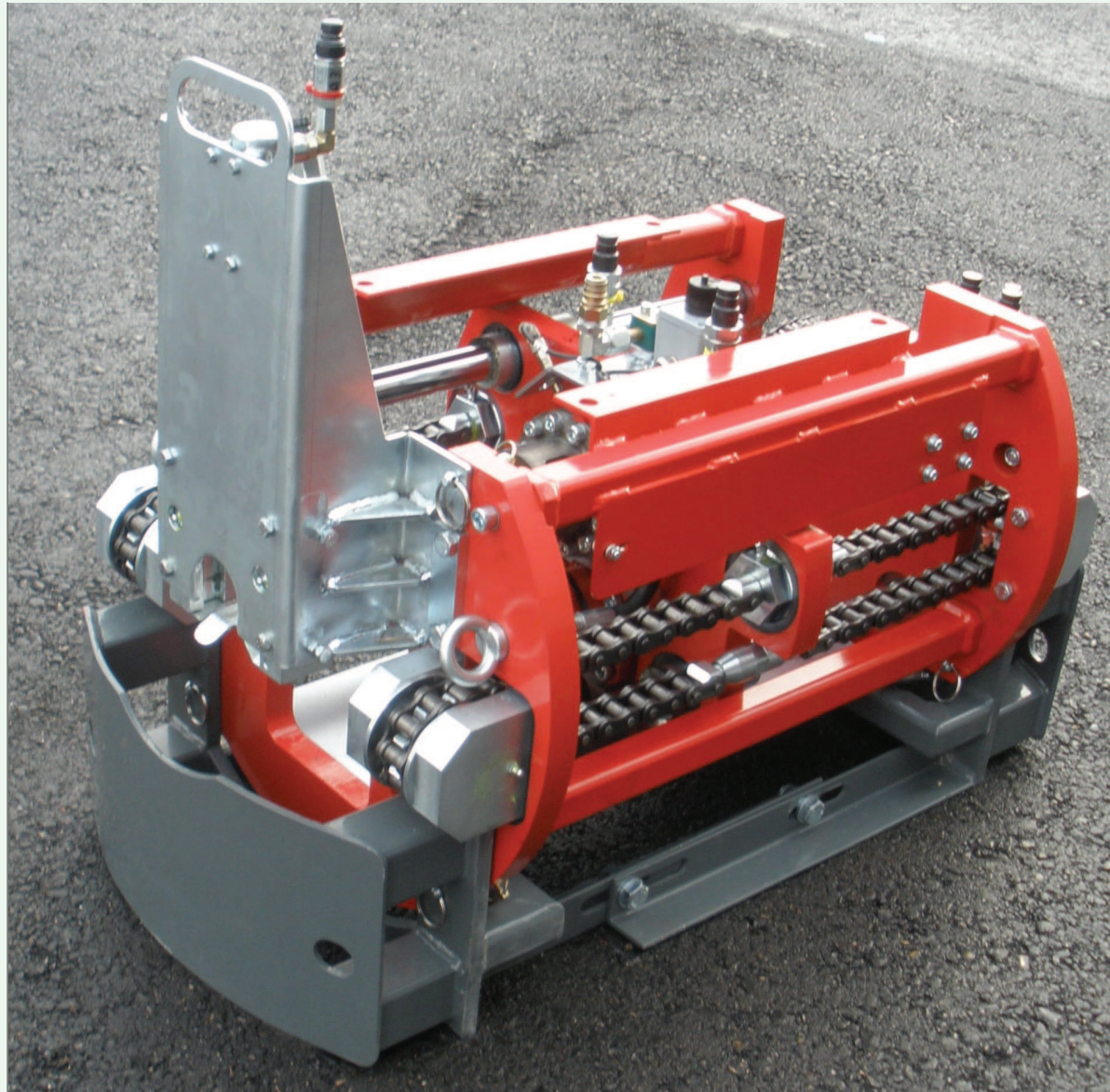
Swiss producer of trenchless pipe and cable-laying equipment, TERRA AG, has developed such a manhole horizontal directional drilling (HDD) drill that is able to undertake directional bores from manhole to manhole for mainline installations and from a manhole to all nearby homes for lateral house connections. At a 0.8 m depth you can lay telephone and fibre-optic cables, at a 1.20 m depth, freshwater lines, and at a 1.60 m depth, gas or power lines.

According to Sam Efrat of Trenchless Technologies, "This innovative pipe-laying method was developed over a two-year period, in close cooperation with the French water supplier SADE." The TERRA MINI-JET MJS 1600 is a manhole HDD drill for directional bores in lengths

of up to 50 m, with a minimum turning radius of 15 m. The directional bore can be reamed in several steps up to 300 mm, even in hard ground. The TERRA MINI-JET MJS 1 600 is equipped with a torque of 1600 Nm and thrust and pullback forces of 60 kN (6 t).

The MJS 1 600 can drill from manholes with an internal diameter of 1.0 m and can fit through manhole entrances of only 0.62 m. If the entrance is smaller than this, the manhole cover frame can be removed. First the drill's bed frame is lowered into place in the manhole and tightened hydraulically in position, and then the manhole drill is lifted vertically through the manhole cover and bolted onto the bed frame.

Efrat explains that the entire operation of the TERRA MINI-JET MJS 1600 is controlled from



RIGHT: TERRA manhole HDD MINI-JET MJS 1 600 can drill bores of up to 50 m with a bending radius of 15 m and back reaming of up to \varnothing 300 mm, enabling drilling from manhole to manhole for main network piping and from manhole to house for lateral connections

BOTTOM RIGHT: Control station MJS 1600 with rod lift

the surface, where the operator, along with the control station, rod magazine and rod lift, is positioned. "There is no requirement to enter the manhole during drilling and back reaming work. The operator inserts a new drill rod into the rod lift. The rod lift transfers it down into the manhole and positions it in the drilling machine. The new drill rod is screwed into the last drill rod. Inductive sensors make this operation possible even where the operator does not have a view into the manhole. The rod lift may also be positioned at an angle over the drilling machine where the manhole entrance is not located directly on top of the drilling machine," he says.

Drilling and back reaming take place with a bentonite drilling fluid pressure of 0 to 55 bar and drilling fluid volumes of 0 to 38 l/min. This makes the TERRA MINI-JET MJS 1600 a small but extremely effective HDD machine. **35**

