

## Pipe Express

Developed by Herrenknecht AG, Pipe Express sets new standards for installing pipelines. With this system, no groundwater lowering is necessary and, in comparison with the open construction method, routes can be considerably narrower. This has a positive effect on construction costs. Because it is a highly ecological and cost-efficient procedure, the development of the new system has been subsidized by the German Environment Ministry.

Pipe Express is a mechanized method for near-surface installation of pipelines up to 2,000 meters long and with diameters of 900 to 1,500 millimeters using the semi-trenchless construction method. A tunnel boring machine (TBM) loosens the soil which is directly conveyed aboveground using a trenching unit which is carried along. The pipeline is installed underground simultaneously. Because earthwork is minimal and no groundwater lowering along the route is necessary, Pipe Express has very little environmental impact. To install pipelines, soil is removed directly instead of being pushed aside. Pipe Express offers great advantages, especially in projects where groundwater level is only a few centimeters below the terrain's surface, in swampy terrain or where nature protection is important.

An operator vehicle accompanies the installation system, providing all logistics: the control stand for the operator, power unit room, high-capacity pump and storage container for bentonite. The integrated crane system allows for swift assembly and dismantling. The thrust force for the excavation unit and the pipeline is provided by a Herrenknecht Pipe Thruster from the launch position. Because the operation vehicle is remote-controlled, it requires minimum manpower and a high degree of safety is ensured.

The new method has a positive influence on costs for realization and re-naturalization in particularly challenging areas with unstable ground, aquiferous layers and at great installation depths. With Pipe Express, the route width can be reduced by up to 70 percent in comparison to the open construction method, thus reducing the necessary earthwork.

This process is more readily accepted by the population, land users and land owners because large equipment use is reduced and construction periods are shortened. Due to the quick installation of the pipeline in one work step, with fewer conventional construction machines, emissions of exhaust gases and noise can be considerably decreased.

The main components of the new installation system include a tunnel boring machine that works underground, a trenching unit with a buggy and an operating vehicle on the terrain surface. The modular design of the entire system allows easy transport and relocation, as well as high flexibility in changing project conditions.

The compact system is remote controlled from the operating vehicle and no trenches have to be dug. This means that a minimum of heavy earthmoving equipment and manpower are needed, increasing work safety at the same time.

When crossing agricultural land, major losses of harvest and thus long-term compensation payments can be prevented compared to the open construction mode.

The natural soil structure is only disturbed to a minimum, making subsequent re-cultivation easier. No complex groundwater lowering is required along the route and water-saturated soil layers are prevented from drying out.

In sensitive areas, PipeExpress® will be a quick, environmentally-friendly and economic alternative to open construction.

In 2013, Herrenknecht's Pipe Express received the IPLOCA New Technologies Award and the "bauma Innovation Award.

The method demonstrated its efficiency in the construction of the "North-South Gas Pipeline" in the Netherlands, where the technology achieved top tunneling performances of up to 1.20 meters per minute. Currently, the machine is in operation near Bangkok in Thailand for the "Fourth Transmission Pipeline." Despite the monsoon season, the 42" gas pipeline is to be installed in several sections with overburdens of 1.20 - 2.30 meters. With the heavy rainfall, this could not be realized efficiently using conventional construction methods with long and wide open construction pits.



**Modular design:** A TBM that works underground and a trenching unit as a vertical connection between the TBM and the terrain surface.

