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HDD for connection in gas storage field - Annulus filling

Abstract:
The purpose of the work was to lay, in an urban area for a length of about 730 m, a steel pipe-duct DN850 (25 mm thick), containing a 34 mm thick steel pipe for the transport of methane gas at very high pressure (210 bar).

The installation with the HDD technique involved many critical aspects linked to three factors:
- Thickness of the pipes (mechanical stress due to the considerable thickness of the pipes)
- Geology (mixed saturated sands and small gravel for the first 11 meters above gravel levels)
- Urban logistics (almost all of the route insisted under the road)

The need linked to the geology of not being able to deepen the laying plan forced to lay the pipeline at a very limited depth, about 6 - 7 meters below the road.
This depth, considering the hole DN1200 made for the diameter of the DN850 pipe, has suggested that the empty space of the hole filled by bentonite muds alone, could be subjected to high stresses due to surface traffic, which could generate settlements on the surface portions of ground and also affect the road surface.
To avoid any sagging / swelling of the road surface, an accessory work has been planned, consisting in the installation of three “Tubes A’ Manchettes" of 3” welded on the external wall of the DN850 pipe distributed at 120 °, about 70 meters long, equal to the crossing of the road. The purpose of the TAM was to inject a cement mixture into the interspace by displacing the portions of bentonite mud in order to fill and consolidate the empty space between the walls of the hole and the pipe, guaranteeing the hole stability of medium / long term and ensuring the holding of the road above.