TWIN-PIPE FOUNDATIONS

1. General

Railway construction work causes always at least temporary low operation in railway traffick. The total costs of the work consist of the costs of the construction itself and the costs of the traffic arrangement. Furthermore the costs of the passenger inconvenience and the delay in the cargo delivery are impossible to evaluate in practise. In many cases the cost of the construction work itself is the tiny part of total costs compared to the side costs as limitations in traffic.

Construction and maintenance methods by which can be retained from railway traffic limitations are always under research but only few of them will be employed in practical level. It is not enough that the invention is noble. The benefits concerning to railway traffic are in most significant role, because the most notable cuts in the costs are coming from the savings of the traffic arrangements.

The twin-pipe foundation is simple construction solution for power-poles. The construction time is short and the structure is simple and easy to implement.

2. Structure

Twin-pipe foundation is composed of two into the ground drilled micropile pipes and of the pole foot. The electric wires, wire beam and the pole are supported by the foundation (fig. 1). Actual foundation is composed of two drilled micropiles which embedded length is 4 metres. The embedding is independent of the soil quality at the construction site.

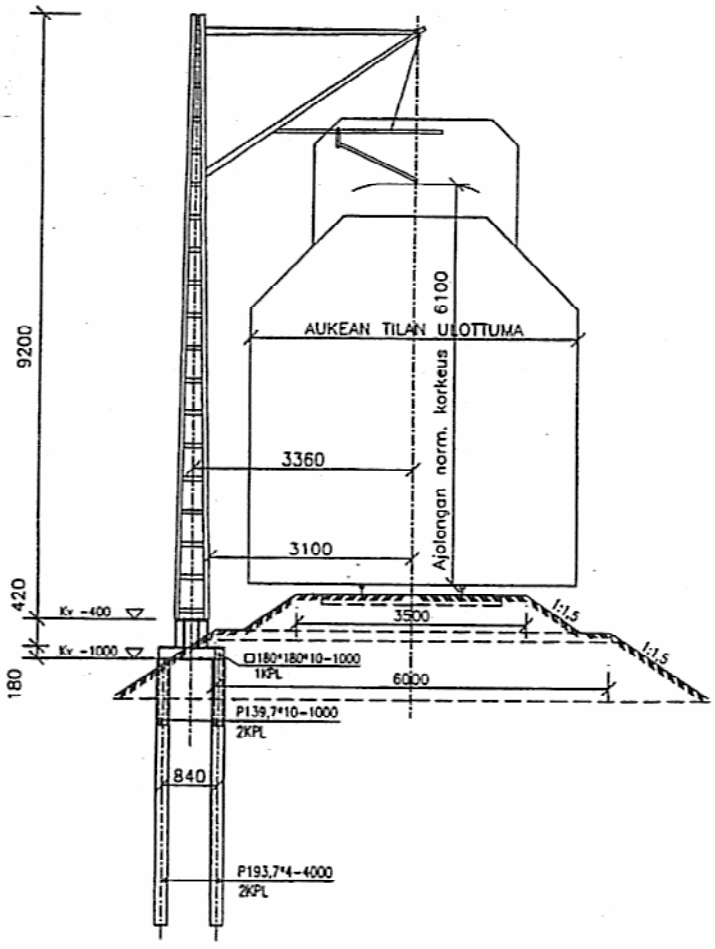

Figure 1. Twin-pipe foundation.

An outer diameter of the piles is 140 to 200 mm and wall thickness 4 to 10 mm. The piles are precut and the drill shoes are mounted before the transportation to the construction site when the extra phases of work as cutting and welding are not needed at the building site.

The pole foot is equipped with two short overhangs to seize the pole foot to the piles. The final attachment between the pile and overhangs is performed by the cement mortar (fig. 2). The diameter of the overhangs is less than the inner diameter of the pile which allows the final adjustment of the pole foot thus the accuracy in positioning the piles is in high level

The pole will be fastened to foot by bolts for which the holes are predrilled. The amount and placing of the predrilled holes may vary, which makes feasible the use of various type of poles.

Figure 2 Joint between the pole foot and drilled piles.

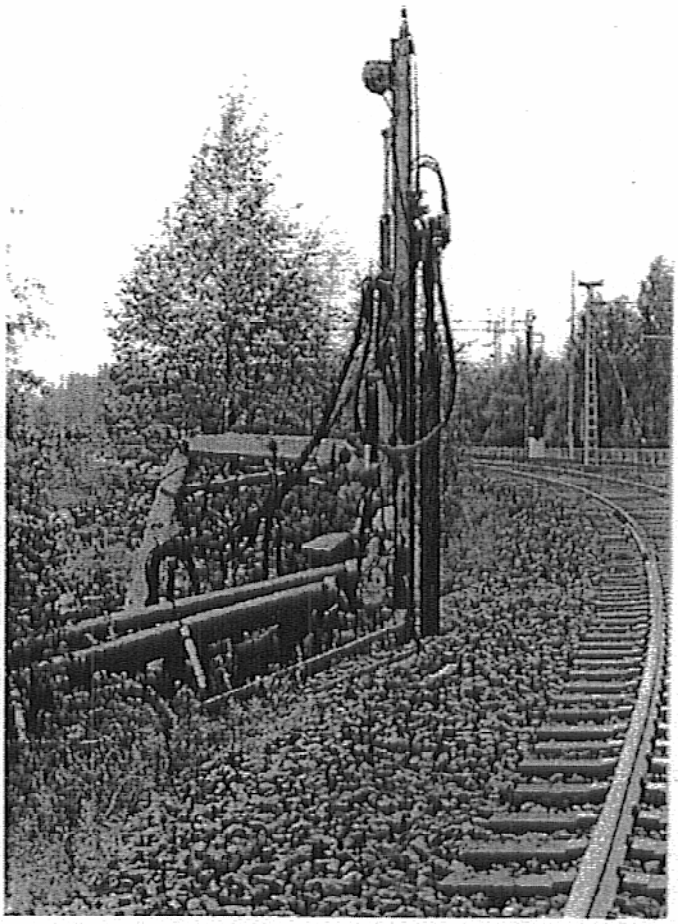

Figure 3. Drilling carried out outside of the load gauge

3. Dimensioning

The dimensioning of the footing is straightforward work. Both structural and geotechnical dimensioning shall be carried out. The cases for the geotechnical dimensioning are compression, tension and lateral loading. In the structural dimensioning can be applied the analogy of jointed structures. The dimensioning factors are, most frequently, the allowable displacement and rotations of the foundation.

4. Construction

The drilling can be carried out from the side of the railway when the traffic disturbance is minimized (fig. 3). The drilling method can be eccentric or centric drilling. In Finland the applied drilling method has been centric drilling.

When the drilling work is completed and the pipe is cleaned, the pipe will be filled with cement mortar. The overhangs of a pole foot will be sunk into the mortar. The balance and the high level of a pole foot surface will be adjusted by the temporary wooden wedges. After cement mortar hardened the pole can be mounted.