

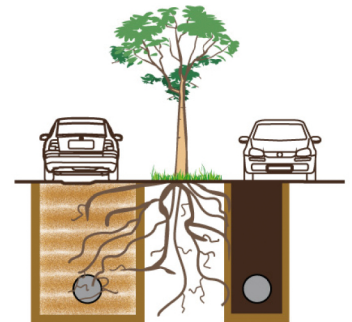
RSS Flüssigboden® mix design for backfillings with protection against root penetration

Due to close-by tree populations, sewer constructions are often subject to damages by roots penetrating the conduit zone. In the conventional backfilling with compactable backfill materials therefore a complex, structural protection against root penetration is necessary

Mix design development

The requirements some specific properties of RSS Flüssigboden® for backfilling with protection against root penetration are higher than for normal liquid soil. Durable and defined properties of the backfill material need to be guaranteed. RSS Flüssigboden® prevents roots from growing into the conduit zone, as important growth conditions and requirements are avoided:

- As all zones around the pipes are backfilled homogeneously, no cavities or zones with lower density are formed, which could favour root growth.
- Furthermore, the density of the applied liquid soil can be set higher than the density of the surrounding soil, and so the zones of conduits and trenches backfilled with this liquid soil have a higher resistance against root growth than the surrounding soil. Roots will grow around the zones backfilled with this RSS Flüssigboden®.
- In contrast to foam concretes and similar materials, RSS Flüssigboden® does not contain any artificial cavities, eg crated by air- entraining agents. It can be produced in a highly dense quality, so the pore spaces are minimised. This way, deposits of oxygen or nutrients are avoided, and thus, roots are prevented from growing, as their biological processes depend on oxygen. Thus, the application of RSS Flüssigboden® as backfill material for the protection against root penetration in conduit zones makes sense, is economic and more efficient than all the other methods and material-based solutions currently in use.



Classic way of construction (left) compared with RSS Flüssigboden®

Advantages

- Mix design adjustment on site
- Testing institute accredited by RAL
- External monitoring person accredited by RAL
- Developers of RSS Flüssigboden®
- Successful application of RSS Flüssigboden® with protection against root penetration on numerous construction sites

Data

- Costs basic mix design: €1092
- + 3 x samples surface friction each €270
- + 2 x samples settlement rate each €74.03, additional costs possible
- Validity of mix design: 1 year
- typical q_u value after 28 d: 0.15-0.5 N/mm²
- typical EV2 value after 28 d: >45 MN/m²
- typical k_f value after 28 d: < 1.00E-08 m/s

If required, the properties can be adjusted within limits.

How a RSS Flüssigboden® mix design for backfillings with protection against root penetration is developed

We obtain a sufficient quantity of source material (depending on the desired application at least 50 litres, with protocol of sample collection) and the cement to be used (CEM I R). Additionally, the customer provides the desired nominal values of the mix design properties, including the properties of the surrounding soil. For this purpose, we use the form "Mix design Specification". In addition to the nominal values stated by the customer, the nominal values required for the liquid soil from our perspective are also relevant. We produce liquid soil in the soil laboratory, check the processability, and test the specimens we produced. If the results are meet the requirements, you get a preliminary mix design in hard copy.



FiFB Forschungsinstitut
für Flüssigboden GmbH
Wurzner Straße 139
D-04318 Leipzig, Germany

Tel +49(0)341-24469-21
Fax +49(0)3423-72424-74
E-Mail j.detjens@fi-fb.de
Internet www.fi-fb.de