

### CABLE PULLING PIPES, SLEEVE PIPES

In the plant construction site cable pulling pipes are generally placed according to the requirements in ground and concrete foundations in order to protect power-, communication- and other service cables in the ground. To add service cables easy flexible is from prime importance for the later operation of the plant. In general Cable Pulling Pipes are installed in diameters in between 40 and 175mm (As an example System Rehau or Kabuflex). To avoid confusion the description should display clearly the inner and outer diameter. Cable pulling pipes are produced as straight pipes and as flexible pipe coils. They are connected with double bushes which are also available in a water tight specification. Placing of cable bundles in layers distance holders should be used to enable a placement in line. Too narrow located cables can interference each other in particularly in between communication and high voltage power cables. The sleeve pipes should be placed in layers, hand compacted and backfilled with stone free sand. Due to skin friction between sleeve pipe and higher sized cables the total length of the sleeve pipe is restricted. An imprecise placing of the pipes causes a rise of the skin friction. To facilitate the pulling of the cables an additional embedded pulling lace can be ordered. In the design of cable routing a cable duct should be arranged after 25m of routing or after a change of direction.



Pic. 1 Sleeve Pipe in the foundation



Pic. 2 Sleeve Pipe in the foundation later stage



Pic. 3 Sleeve pipes after casting the concrete

If the sleeve pipes are within a concrete foundation (*Pic. 1-3*) an exact topographical surveying at the pipe ends is necessary to enable an access for later installed machine members. To insert the pipe in the foundation the minimum diameter is to respect.

Should the pulling pipe be routed through a watertight wall a custom-built bushing solutions is necessary. Kabuflex System provides a watertight wall bushing up to 3bar. Good results were also performed with Doyma sealing (product name) in order to tighten such a wall recess (*Fig. 1*). This system exists of two components and the round wall recess. A round wall penetration has to be produced by casting a PVC pipe into the concrete wall. The PVC Pipe will be stripped after curing the concrete together with the formwork. The exact diameter of the PVC recess pipe has to be identified to match the round recess with the Doyma gasket and sleeve pipe bushing. Easier to install are prefab fibre cement pipe sleeves used in conjunction with gasket inserts. Later on the sleeve pipe bushing needs to be tightened to the PVC pipe by fastening the screws of the Doyma gasket sealing ring in between. The designer should strictly respect rectangular to the wall routed cables pipes and should avoid sloped routings. From experience sloped cast-in PVC recesses are almost impossible to built-in or later on to fit in water tight quality. In order to route multilayered cable lanes through the concrete wall a distance between the PVC recess pipes of at least one time the diameter (1x $d_m$ ) should be held to keep sufficient space for pouring concrete and the required space to install the reinforcement is provided. Is the building bedded insensitive against settlements on piles a difference in the

### Water tight wall penetration

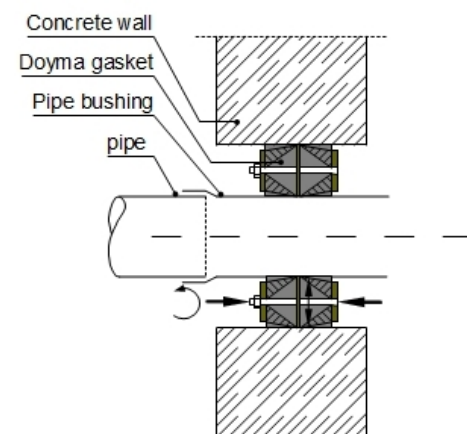


Fig. 1 Water tight wall penetration

settlement to the surrounding soil could shear the cable pulling pipe from the building over the years. To face this problem settlement pockets in the foundation together with 1 m long flexible pipe should be arranged (Fig. 2).

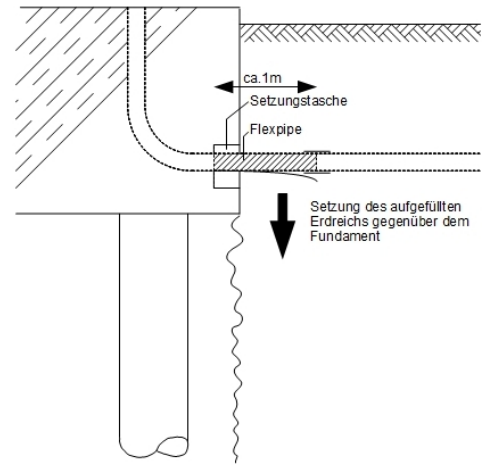


Fig. 2 settlement pocket in the foundation

| release     | Date       | Item | Name        |
|-------------|------------|------|-------------|
| 1st release | 26.10.2010 |      | M. Hartmann |
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