

Mounting Instructions for Signal Foundation LW 2010

Prior to the mounting of the signal foundation, the necessary prerequisites concerning railway law will have to be established. It is mandatory that applicable public stipulations be complied with for the installation. Personal protective equipment will have to be worn during installation.

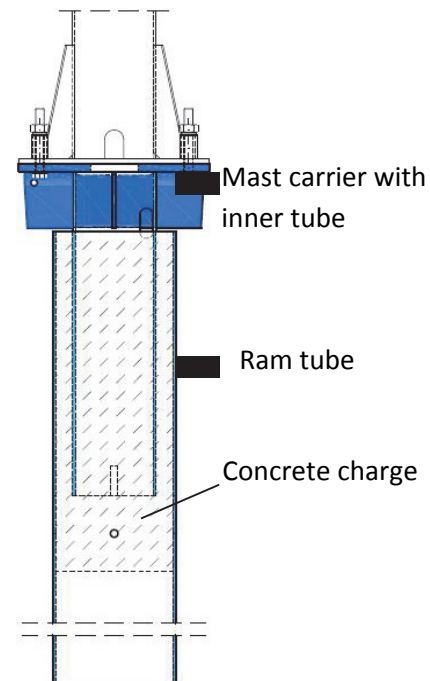
Positioning of the ram tube

The tracks and – if required the embankment - will have to be monitored during the ramming operation until any possible soil consolidation has subsided. The soil condition must be known before ramming is started.

DANGER FROM ELECTRIC SHOCK

Power cables may be damaged during exploration digging and may cause fatal injuries. Lines must not be damaged. Perform the exploration digging cautiously.

1. If the upper 90 cm of the ram pile are cleared, a separate intermediate storage of the different soil layers is required. Perform an exploration digging operation in order to ensure that no existing lines are damaged. The mast carrier is capable of a continuous compensation of ramming tolerances of up to 190 mm on account of its specific geometry.
2. Determine the ramming depth in accordance with the enclosure, dependent on the soil type. Ensure the proper safety distance to supply lines.
3. Position the ram tube.



Insertion of the mast carrier

The mast carrier with inner tube is inserted after ramming in the ram tube.

1. Attach the mounting aid for height compensation of the mast carrier onto the ram tube after it has been rammed in. The height of the mast carrier may be continuously adjusted in a range from 10 to 150 mm with a mounting aid.
2. Roughly set the height of the props on the mounting aid.

WARNING – HEAVY LOAD

The mast carrier is quite heavy and may cause injuries. Make sure to wear your personal protective equipment. Use a second person for assistance. Do not overestimate your own powers.

3. Insert the mast carrier into the ram tube. The head of the mast carrier is supported by the mounting aid.
4. Set the mast carrier to the required height, using the props of the mounting aid.
5. Verify the height.
6. If required, readjust the height.

Select the distance between signal mast and track centerline in accordance with the specifications. If the ram tube was rammed in with an offset on account of existing lines, the mast carrier will have to be shifted accordingly within the ram tube.

7. Shift or rotate the mast carrier to the required distance to the track centerline. Increase the track distance in accordance with the signal table (front edge of a foundation with a width of 540 mm) to the forward edge of the mast head by 20 mm.
8. Verify the distance.
9. If required, again reposition the mast carrier.
10. Check the cable connection for the signal. If the cable connection is within the foundation, a flexible pipe may be fed in through the oblong holes. Infeed of the cables will be possible either at ground level or lowered, depending on the location of the cables.

Filling in the concrete

The mast carrier incl. inner tube is secured inside the ram tube with a concrete charge.

1. Fill C25/30 XC4 XF1 concrete into mast carrier and ram tube.
2. Verify position of mast carrier and distance to track and adjust, if required.

Work completion

1. Remove the mounting aid after 24 hours.
2. The temporarily stored soil layers are inserted by layers (30 cm max.) and condensed according to good professional practice after the ramming operations. Recreate the site profiling.
3. Erect the signal after 60 % of the standard strength of a C25/30 has been reached.

Note for the acceptance inspection:

During the acceptance inspection, conformity of the adapters utilized with the homologation will have to be verified. For this purpose, the pile heads sport a conformity badge of manufacturer and external monitoring facility. The badges feature a serial number and may be compared at the manufacturer via the registration (badge samples cf. enclosure).

Enclosure

Sample of the conformity badge with serial number

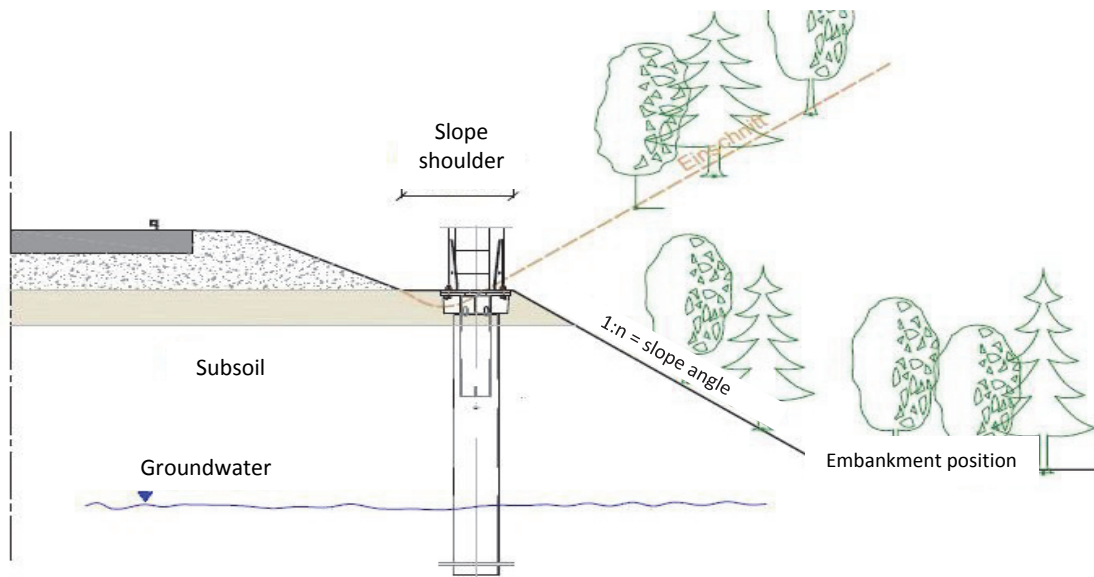
Enclosure: Ram tube dimensioning

In accordance with the minimum requirements taken from the homologation "foundation BF LW 2010" as well as the mounting instructions of DB Netz AG S 8240.25.2.t

Procedure:

1. Determination of the slope angle
2. Determination of the groundwater level

3. Determination of the slope shoulder
4. Determination of soil conditions, soil survey if required



Slope inclination	Slope up to 1:1.5 and slope shoulder > 0.75 m (1:∞ to 1:1.5) or 0° to 33.6°		Slope
Groundwater	≥ 0.8 m below UTE deeper than 0.8 m below UTE	< 0.8 m below UTE between 0.0 m – 0.8 m below UTE	Embankment position, no groundwater
Cohesive soil Ram tube length Wall thickness	Cohesive & composite soil 5 m 10 mm	Cohesive soil (min. stiff) 6 m 12.5 mm	Cohesive & coarse soil (min. stiff) 6 m 12.5 mm
Non-cohesive soil Ram tube length Wall thickness	Non-cohesive soil 4 m 10 mm	Non-coh. soil (min. med. dense) 4.5 m 10 mm	Non-cohesive & composite soil 6.5 m 12.5 mm

* UTE = Upper Track Edge

All tube lengths apply to steel tube in acc. with technical drawing S 8240.35.3

Minimum requirements on subsoil for use of table values (in acc. with S8240.25.2.t):

All soils: $\delta_a = 2/3 \varphi$; $\delta_p = -\varphi/2$

Min. soil parameters	Non-cohesive soils	Cohesive soils	Composite soils
E_{sk} [MN/m ²]	20	10 (5) (for values between 5 and 10, increase the wall thickness to 14.2 mm)	10
cal E_{sk} [MN/m ²]	12	6 (3)	6
C [kN/m ²]	-	5	-
φ [°]	30	22.5	27.5
γ [kN/m ²]	18	18	20
γ [kN/m ²]	10	8	10