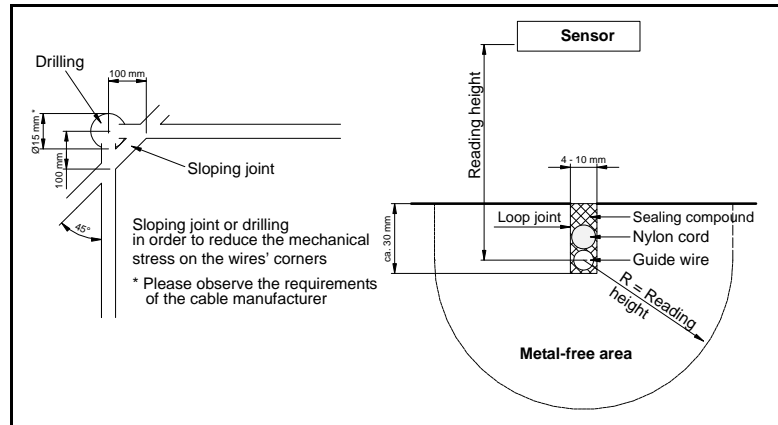


# Guidelines for Guide Wire Laying

## Inductive

- Use an insulated copper strand with a cross section of at least 1.5 mm<sup>2</sup>, for higher mechanical stress use 2.5 or 4 mm<sup>2</sup>.
- The cable slots have to be cut to a width large enough so that the cable is not jammed or squeezed (at least 1 mm wider than the cable diameter, including insulation).
- The wires have to be installed straight-lined in the cable slot.
- The slot should be cut to a depth of 30 to 50 mm. Variations dependant upon requirements possible.
- Corners cut at 90° have to be avoided. Here a slot of 45° is required to eliminate damage to the insulation.
- To avoid any damages to the insulation caused by small rocks, sharp stones (pea gravel or grit) clean the cable slots e.g. with a vacuum cleaner or high pressure water hose. The cable slots have to be dried out using pneumatic air before wire installation.
- The slots have to be dry before sealing.
- To guarantee a sufficient movement of the wires after sealing and during changes in temperature and to prevent them from floating throughout the sealing process and from sticking to one another the wires have to be fixed with a rubber- insulated cord or a nylon cord.
- The sealing compound has to be chosen to match the respective soil condition. For concrete a 2- component- casting resin (cds-casting resin UW of company Possehl [www.possehl-spezialbau.de](http://www.possehl-spezialbau.de)) for tar a hot grouting with bitumen is recommended.
- For hot grouting with bitumen a silicone insulation or an embedding of the wire in quartz sand should be provided to avoid damaging by heat of the insulation.
- A proper compound of sealing material and soil condition prevents an ingress of moisture. Therefore the cut surface has to be clean. If

- required it has to be treated with a suitable binding agent.
- The feeder line has to be executed as a twisted pair.
- To protect the wire junctions against moisture they have to be insulated by a self- fusing shrinkage tube.



- Having finished the sealing process the leakage resistance has to be checked against ground. At a test voltage of 500 V the leakage resistance has to be more than 100 mega ohm. The DC resistance has to be below 1 ohm per 100 m wire length and has to be measured by a corresponding analyzer. The collected values should be recorded for detecting any aging processes. If a suitable analyzer is available the determination of the conductor's loop inductance would be appropriate.
- The parallel laying of outward and inward wire leads to a failure in the zero point of the magnetical vertical components of the field (differential mode voltage, see diagram below).

Failure of the zero point as a function of the distance of outward and inward wire at a fixed sensor height

