Considerations installing inclinometer casings

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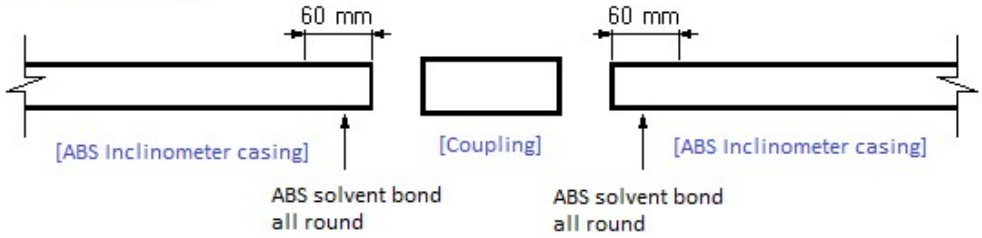
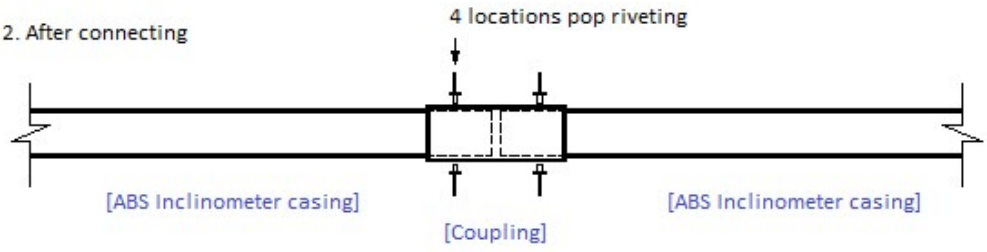
The inclinometer casing is a necessary measurement item for civil engineering measurement for the purpose of measuring the underground horizontal displacement. Therefore, it is necessary to understand the proper casing selection, transportation and storage, the surrounding matters and the ratio of the backing grouting material as a whole. And semi-permanent measurement is possible, please use the following guide lines well.

<table>
<tr><td rowspan="4">Consideration of casing selection</td><td>Casing I.D</td><td>Use</td></tr>
<tr><td>Φ50 mm</td><td>1. buried in concrete or attached to a structure
2. installed in the Borehole of the rock
3. installed where the displacement is small or the distribution load acts</td></tr>
<tr><td>Φ60 mm</td><td>1. a suitable displacement is expected
2. most suitable for most structures, buried layers.</td></tr>
<tr><td>Φ70 mm</td><td>1. installing for long term monitoring
2. installing in area, that depth is more than 40meters deep or much shearing exit
3. installing a horizontal inclinometer</td></tr>
<tr><td>Cautions when transporting and strong</td><td colspan="2">Direct sunlight and heat can be caused of twist of ABS casing, so it should be stored in bows during transport and before installation. Also it should be kept flat and horizontally supported during long term storage in filed.</td></tr>
<tr><td>Installation Precautions</td><td colspan="2">1. If the installation depth of the casing is very deep or the size of the displacement is expected to be very large, install a telescopic section in the middle of the casing to absorb the displacement into the expansion of the casing to prevent damage to the casing and sensor.
2. In the case of short-term measurement at installation of casing or short depth of installation less than 10m, it is not a big problem in measurement even if only pop rivet is used to connect coupling and casing in simple installation.
3. Dams that require long-term measurement during casing installation and soft ground where large displacement is expected in the case of roads and embankments, be sure to bond the casing joints with casing using an ABS solvent bond between the casings – couplings – casings Rivet the rivet using a Pop rivet at the specified position, apply the surface with silicone, and wrap the sealing tape.

Equivalent to connecting a PVC pipe – coupling – PVC pipe using a PVC solvent bond when connecting a PVC pipe line.

1. Before connecting
 

2. After connecting
 
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2. Ratio of backfill grouting material

	Division	Material	Weight	Ratio
Ratio of backfill grouting material	Hard ground	Portland General Cement	1Unit (40kg)	100 %
		Bentonite granules	1/3Unit (10kg)	25 ~ 30 %
		Water	100 ℓ	250 %
	Soft ground	Portland General Cement	1Unit (40kg)	100 %
		Bentonite granules	3/5Unit (16~17kg)	30 ~ 40 %
		Water	260 ℓ	650 %
	Mixing order	1. Mix water and cement. 2. After mixing well, add bentonite to make the paste into a state that water does not flow down. 3. If it is kneaded too thinly, remove the water. If it is kneaded too much, it is difficult to operate the pump. Add an appropriate amount of water.		