

Out to sea



A Geomachine GM100 drill rig is lifted onto a barge by the Helsinki Geotechnical Department for sea-bottom investigation for a bridge link from east Helsinki to the downtown area

It is well known that new wind parks are being built farther and farther offshore; however, less well-known is the trend of Nordic capitals extending their footprint towards the sea

All of the Nordic capital cities, Helsinki, Stockholm, Oslo and Copenhagen, are located by the sea. With fast-growing populations, particularly in Sweden and Finland, their

seafronts are being developed for new neighbourhoods. Half a dozen of these, each with over 10,000 inhabitants, have been built or are in the planning stages in Helsinki.

Stockholm is witnessing the same trend, while in Oslo major tunnelling and bridge construction are reshaping the city. All the new coastal developments also require new traffic arrangements. ▸

Geomachine's GM100 GT conducting offshore site investigation

"Helsinki uses barge drilling for weight sounding, standard penetration tests, percussion drilling, vane tests, sampling and coring"



► OFFSHORE INVESTIGATION

Special techniques and equipment are required to conduct site investigation offshore for these types of projects. Barge-mounted site-investigation drilling works according to the same principles as drilling on shore.

Usually in infrastructure projects, the sea depths are between 10-30m and the drilling depths 3-5m from the sea bottom. For wind parks the drilling depths are deeper, up to 10-15m.

In Scandinavia the tide does not change the sea level very much, so anchoring of the barge, which includes movable support legs, is usually enough. In fact, avoiding ships and ferries and the waves they create are usually more of an issue.

The drilling should preferably be done in the middle of the barge through the open drilling hole. Multipurpose barges of

150-200t can not only carry the rig but are big enough to carry the pull-up power of the rig in case of the drill rod jamming.

The drill rig is fixed on a barge the same way as for transport. The Finnish Geomachine rigs are designed with special fixings for this purpose, among other barge drilling equipment.

The investigation drill rigs need to be large enough to have the needed push-down and pull-up power. Geomachine's 4t GM75 GT rigs are suited for shallow waters, while its 8t GM100 GT is meant for deeper waters. In-situ investigation drilling with online data loggers helps make the drilling precise and productive.

The investigation methods are the same as on shore, and the same Eurocode requirements apply as well. However, a special characteristic of barge-mounted investigation drilling is the pipe manifold that protects the investigation hole.

The city of Helsinki Geotechnical Department uses barge drilling for weight sounding, standard penetration tests, percussion drilling, vane tests, sampling and coring.

The trend is clear: easy city expansions will soon not be an option, and the cities will have to expand farther and farther out to sea. ▽

GM100 GT investigation rig specs

• Weight	7t
• Push-down power	9t
• Pull-up power	13t
• Stroke	2.5m
• Carry-on compressor	5cc
• Rotation unit	6,000Nm
• Drill methods	all Eurocode
• Hammer	top/DTH