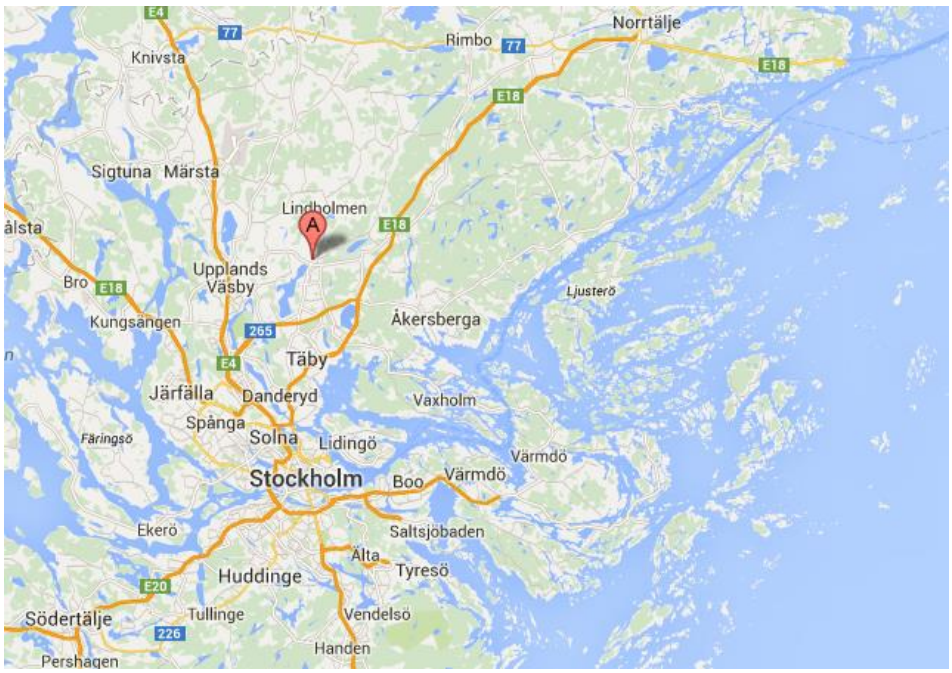
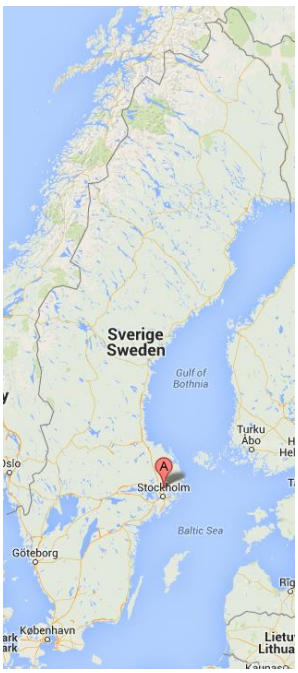
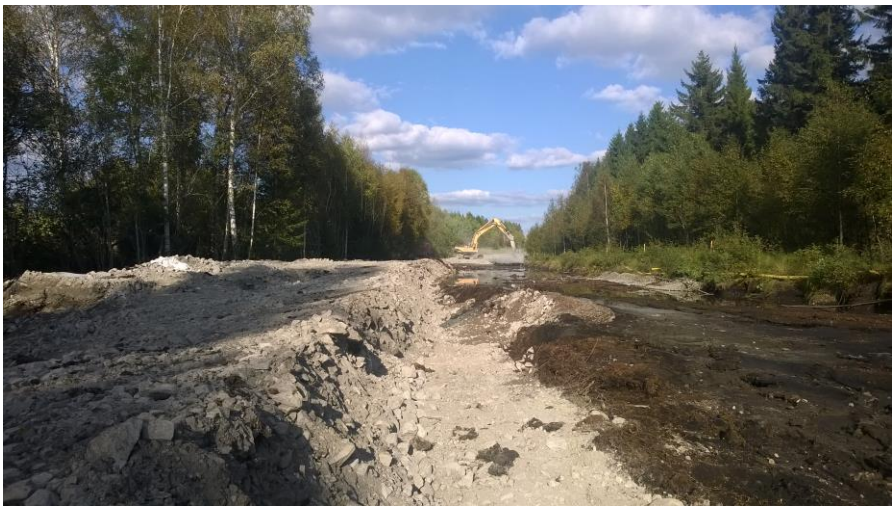
ROSLAGSBANAN
Stockholm, Sweden
Railroad modernization

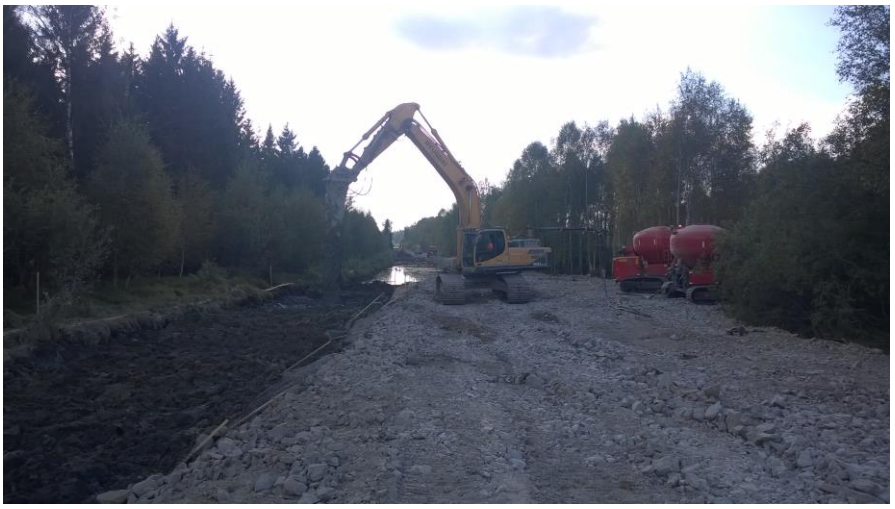
Key words:
mass stabilization, railroad, peaty ground

General information	The modernization of the Roslagsbanan railroad was carried out in the Vallentuna community. The railroad originated from the end of the 19th century. A 65km long part of the railroad leading from Stockholm towards the north is still in use. Parts of the railroad had been originally constructed on a very soft soil and settling foundation. During the modernization process which also included the construction of a double track, the areas with soft soil from Lindholmen -to Kårstaon were mass stabilized.
Advantages of stabilization	Mass stabilization was allowed for avoiding mass exchange and pile slab. Mass stabilization was a fast and economic solution in this site.
Project timetable	2014 (mass stabilization)
Volumes and dimensions	The stabilized area was 650 m long and 10 m width. The subgrade was stabilized to the depth of 3-4 m. The total volume of the stabilized mass was 18 000 m^3.
Geology and stabilized material	The total thickness of the soft soil layers was about 10 m. The layers of peat and gyttja over clay were very soft.
Target strength of the stabilized material	75 kPa, shear strength
Binder(s)	Cement- slag (Merit) 70/30 –mixture ratio, 200 kg/m^3
Laboratory and field tests	Quality control soundings were carried out in the stabilization blocks after 14 and 28 days of curing time.
Other	Mass stabilized foundation was a part of very demanding project.
Long-term follow-up and lessons learned	Mass stabilization was very successfully applied during a similar modernization project of another part of the Roslagbanan a few years earlier.
Sources	Järnvägsnyheter.se *"Ny geoteknik vid Roslagsbanan"*20.11.2014 Markusson, M. , *Peaty ground- made for mass stabilization*, 17th Nordic Geotechnical Meeting, Reykjavik 2016.
Stabilization contractor	Lemminkäinen Infra Oy (mass stabilization)









Mass stabilization works in progress – part of the Roslagsbanan railroad between Lindholmen and Kårstaon.