



Ville Niutanen

Practical examples of the use of waste and by-products in infrastructure construction works

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Outline of the presentation

- Laws and regulations
- Short list of different waste and by-product aggregates
- Machinery and methods
- Practical examples



Laws and regulations of using by-products and wastes in infrastructure works

- Extremely highly regulated and monitored
- In the larger scale environmental permit is needed
- Under jurisdictional movement
 - New laws and regulations coming up...
 - Old regulations under construction...
 - EU and National regulations
- Need of time and patience in designing stage
- Landfill taxes!!!!
- Re-use of 100 % as a target



Waste and by-products as a raw materials

- There are plenty of different wastes and by-products available:
 - Fly ashes (coal, peat, wood, oil shale, RDF...)
 - Furnace slags and sand, ferrosilag (metal industry)
 - Concrete/demolition waste
 - Asphalt waste, tyres
 - Fibre clay, kaolin, green liquor sludge (wood ind.)
 - Soft soils (excavated peat and clay)

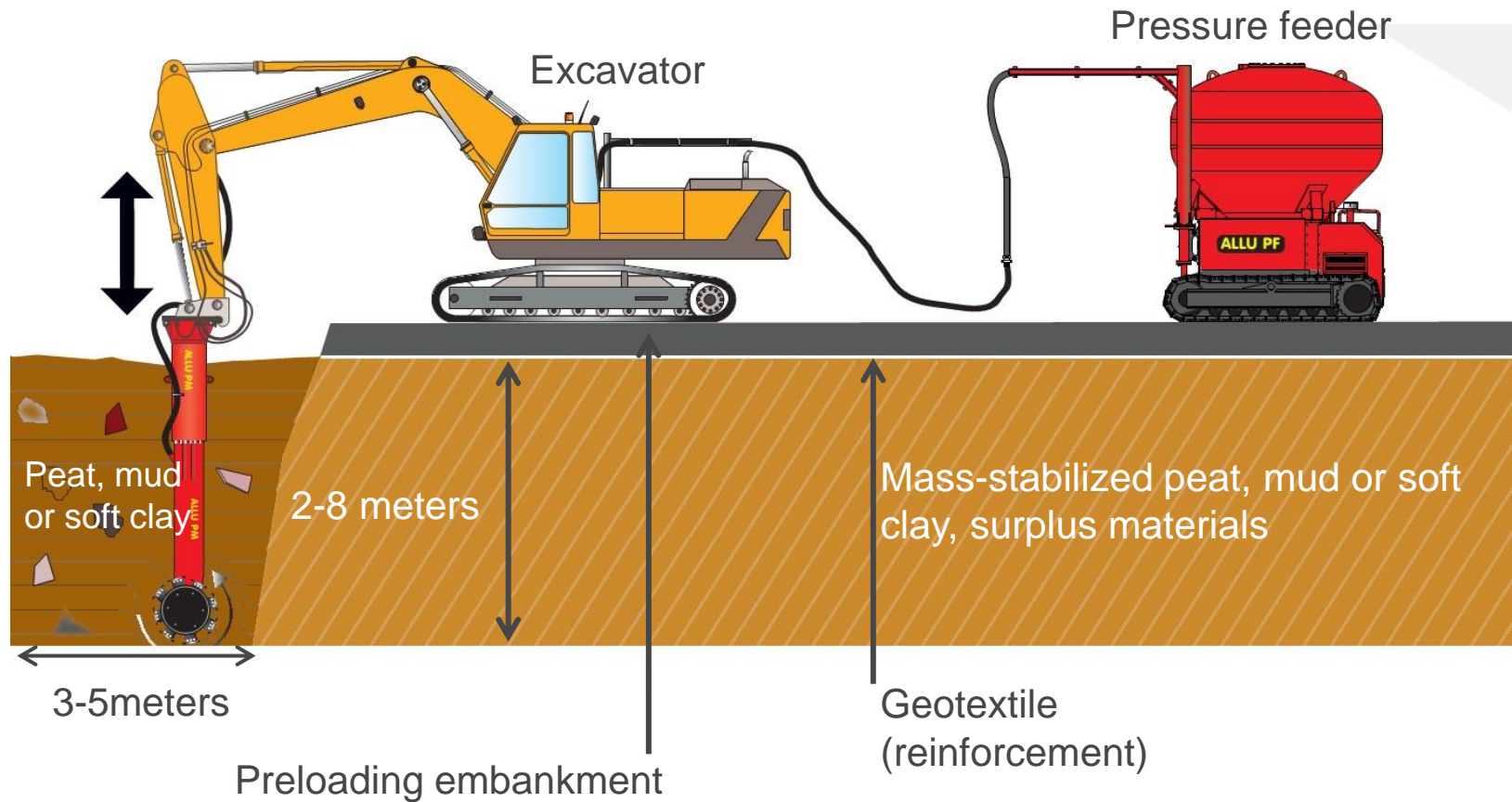


Machinery and methods

- Need of refining and mixing
- Logistical issues
 - Transportation
 - Storage
 - Mixing locations
- Usage as bulk or with binder type

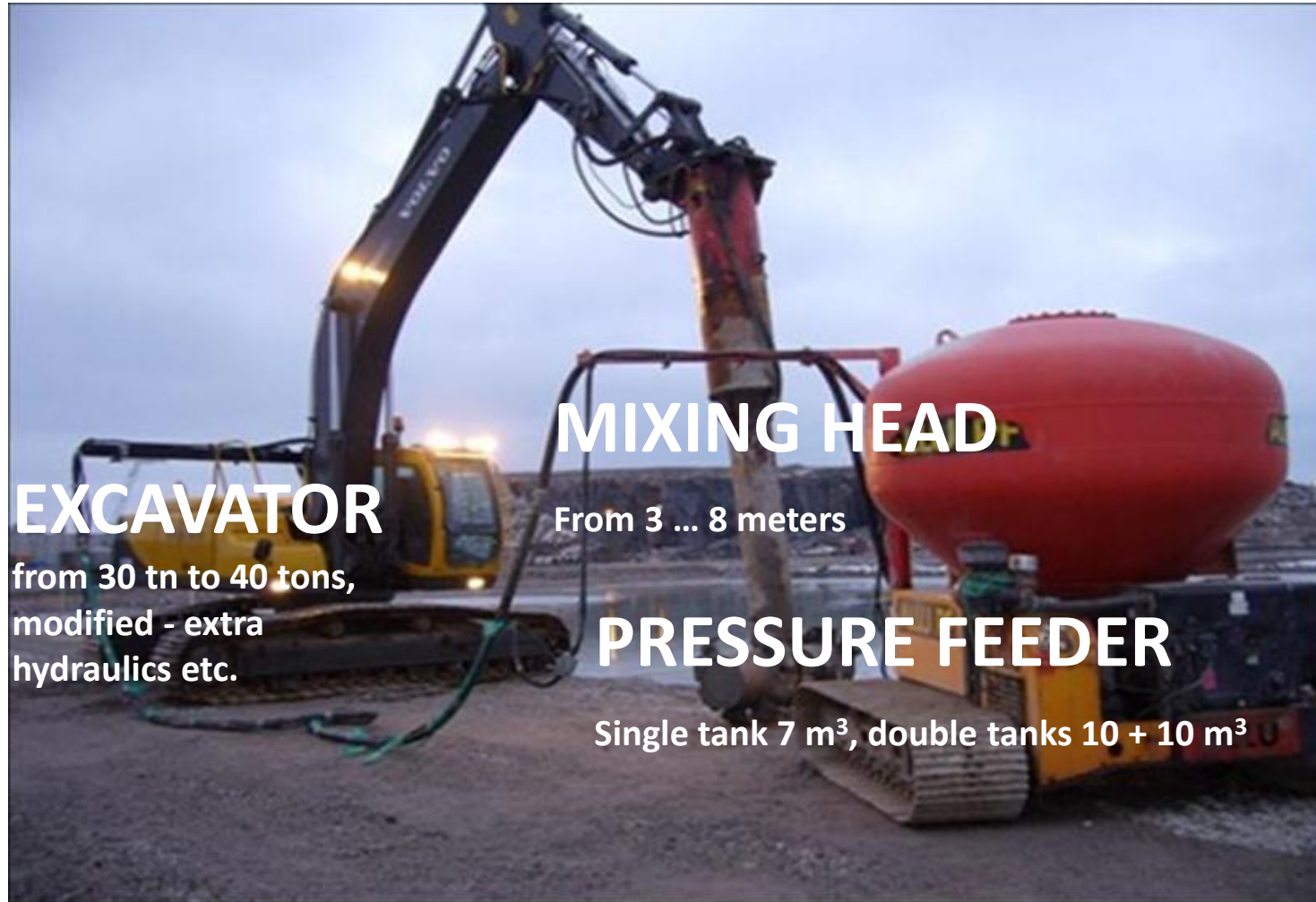


Machinery and methods - Mass stabilisation, principle and equipments





Machinery and methods, typical setup of mass stabilisation machinery



EXCAVATOR

from 30 tn to 40 tons,
modified - extra
hydraulics etc.

MIXING HEAD

From 3 ... 8 meters

PRESSURE FEEDER

Single tank 7 m³, double tanks 10 + 10 m³



Machinery and methods, mixing stations movables and semi-movables





Machinery and methods, windrow mixers

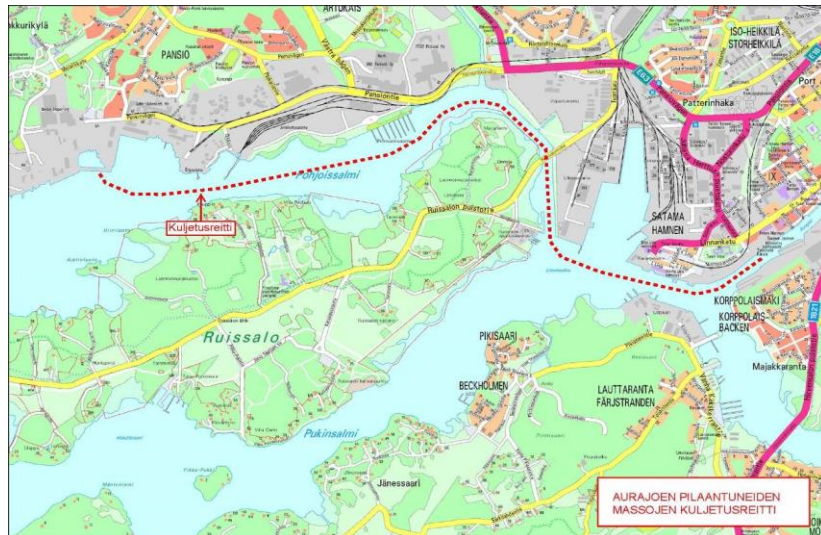




Practical examples, Pansio Turku

Contaminated river dredging and stabilisation by-using industrial by-products:

- Fly ash, appr. 12 000 tn as a binder
- Furnace slag, appr. 8000 tn as a binder



Controlled Treatment of TBT-Contaminated Dredged Sediments for the Beneficial Use in Infrastructure Applications. Case: Aurajoki (river Aura)– Turku, Finland



Dredging with environmental grab



Transportation



Process stabilisation

Utilisation in harbour fillings





Practical examples, Pansio Turku





Practical examples, UPM Rauma

Forest industry integrate. Building of field structures of Sampaanala bay.

- Fly ash usage: appr. 165 000 tons
- Kaolin, green liquor 80 000 tons





Practical examples, UPM Rauma

Stage 1, mass stabilisation of basin A.





Practical examples, UPM Rauma

Stage 2, field structures of basin A.





Practical examples, Roads





Surplus soil stabilisation – new machines and methods, ABSOILS project



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