

The INSTITUTE of GEOLOGISTS of IRELAND

Land Use & Spatial Planning in Ireland

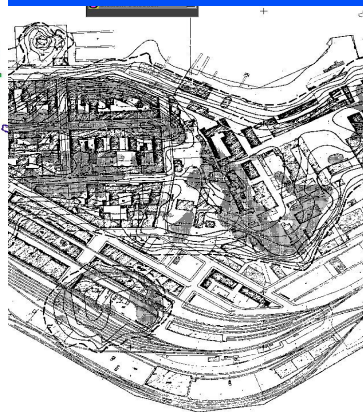
Use of Existing Geotechnical Information in Urban Planning

Ilkka Vähäaho
City Real Estate Department
Geotechnical Division

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Dublin Castle 26th February 2003

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www.hel.fi/kv/geo

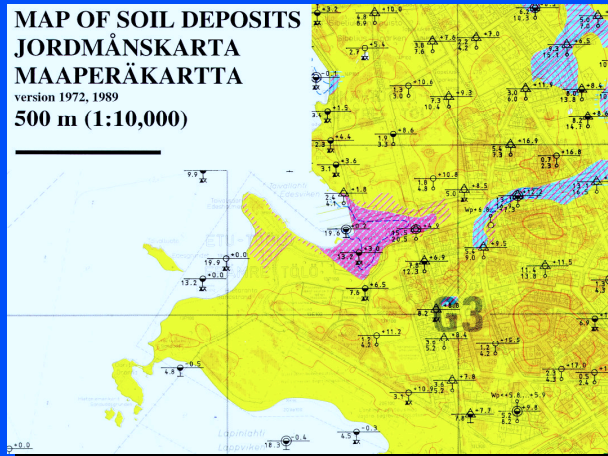
Natural landform in the city centre 1:2000 Green areas have been filled since the 1800 s



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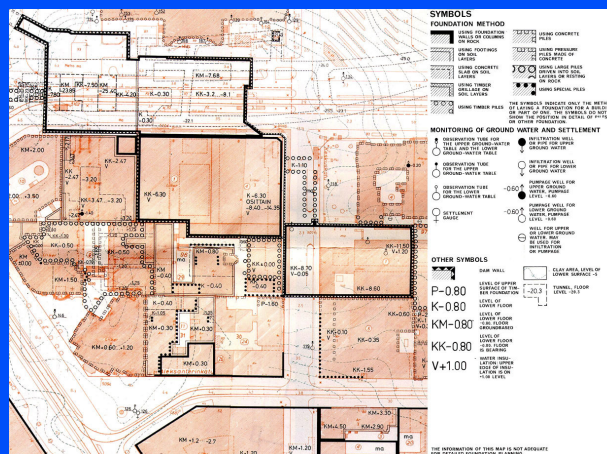
Map produced from geotechnical database



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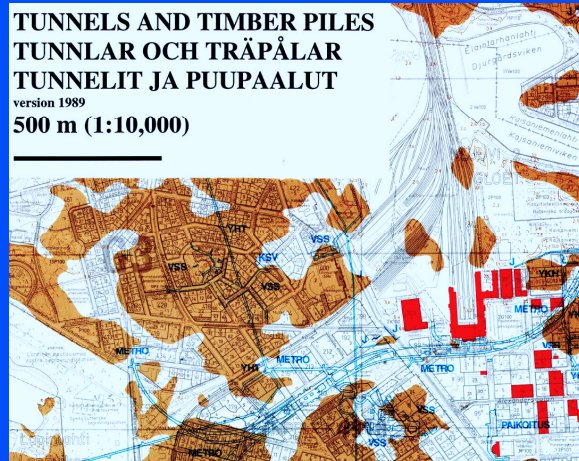
Foundation map of the groundwater risk areas from 1983 (1:2000)



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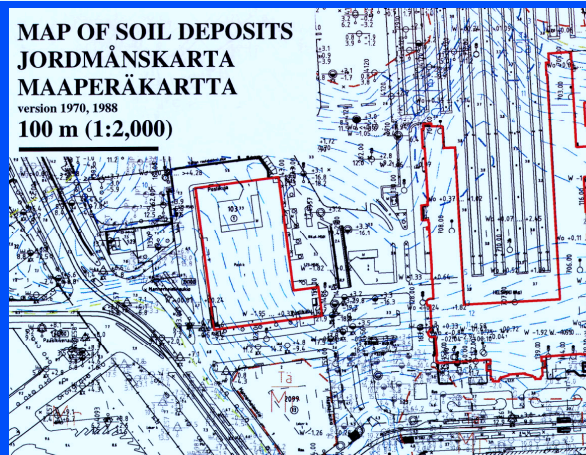
Thematic map produced from geotechnical database



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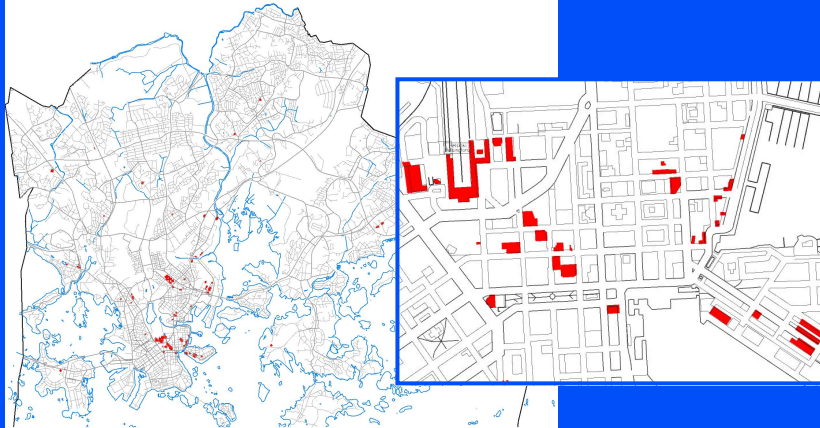
Filtering is needed when using geotechnical database



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Houses on timber piles



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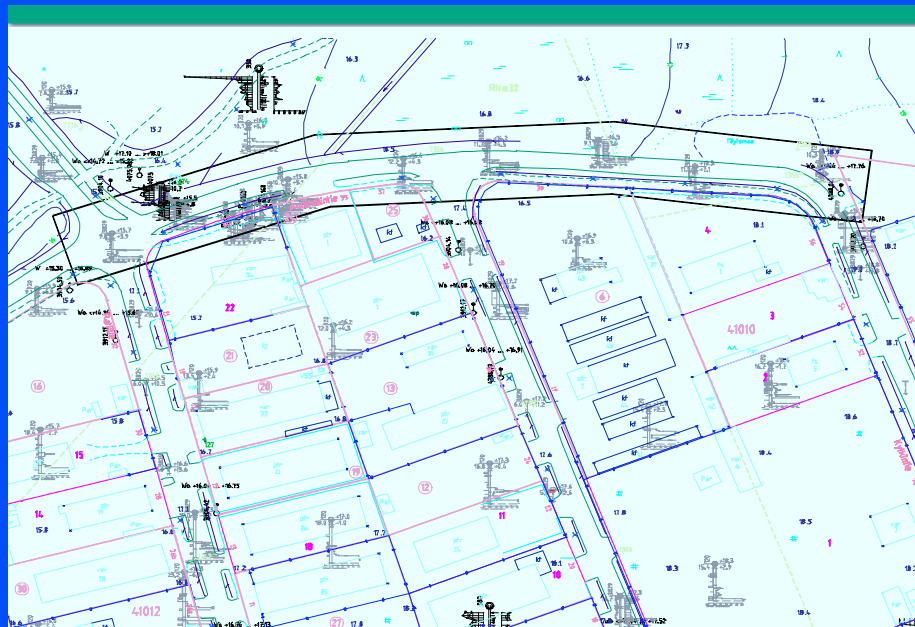
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Searching for existing geotechnical data



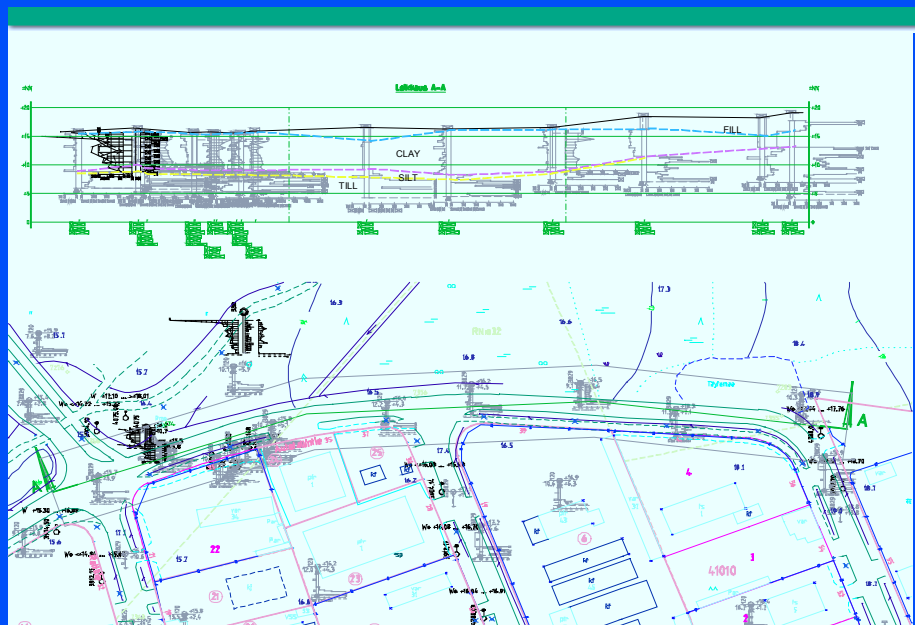
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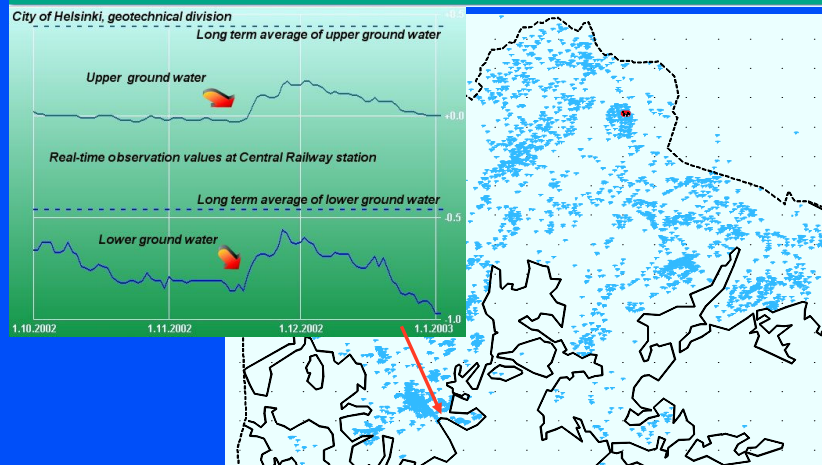
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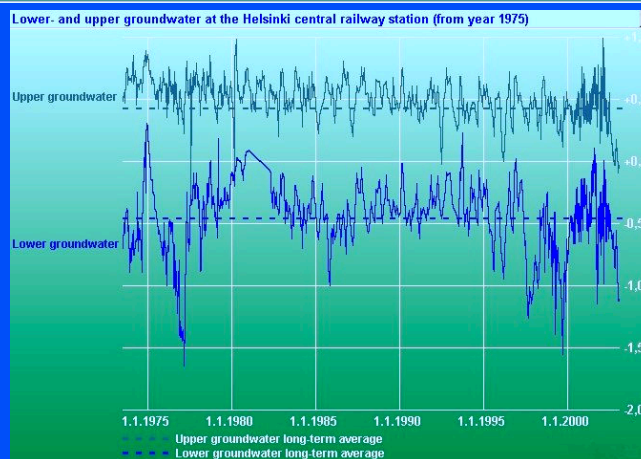
Groundwater data



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Lower and upper groundwater levels (above and below clay layer) at the Helsinki railway station, 1973-2003

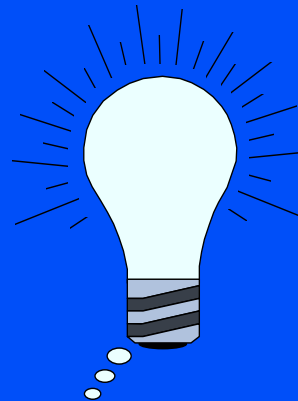


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Helsinki Geotechnical Database statistics (1st January 2003)

- CAD system (3D)
- 185,000 boreholes
12,000 sampling points
4,300 groundwater tubes
in a GIS-type database
- value: 50 million €
(to make new site investigations)



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Environmental GIS-solution (Mahvet)

MahVet - Indeks

Alueet

☒ Projektialue
☒ Kunnostusalue
☒ Saastusalue

Tulostusalue

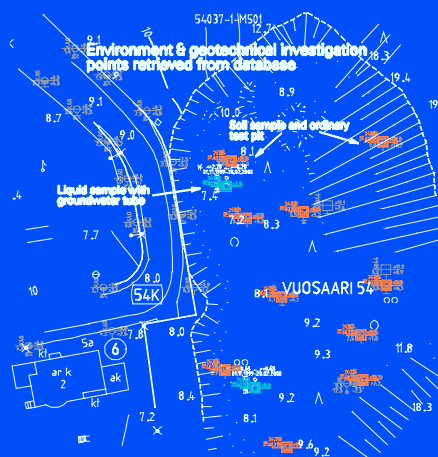
☐ Fensien alueella
☒ Ikkunan alueella (ikkuna: 1)
☐ Kaikki

Tulostustapa

☐ Taustakartaksi
☐ Kuvavetokseen
☒ Näyttöön
☐ Asci-Tiedostoon

Valmis Peruuta

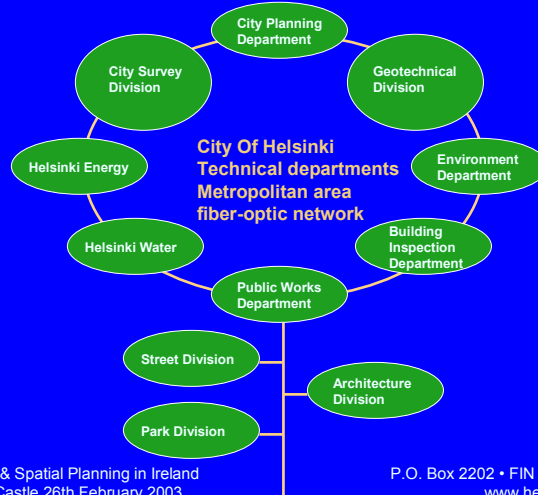
24371
60229 **Sp** +7.3
Soil - sample
taken from pit



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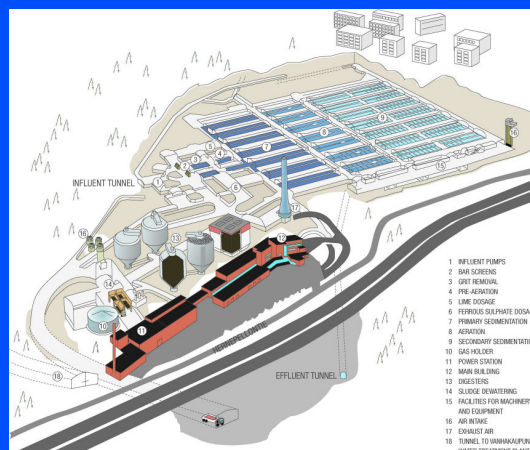
The information network of technical data in Helsinki



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Viikinmäki underground sewage plant

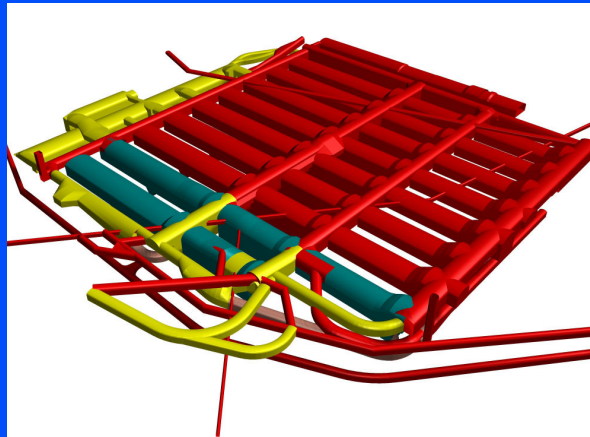


- Volume of tunnels more than 1,200,000 m³
- Residential area 3,500 inhabitants

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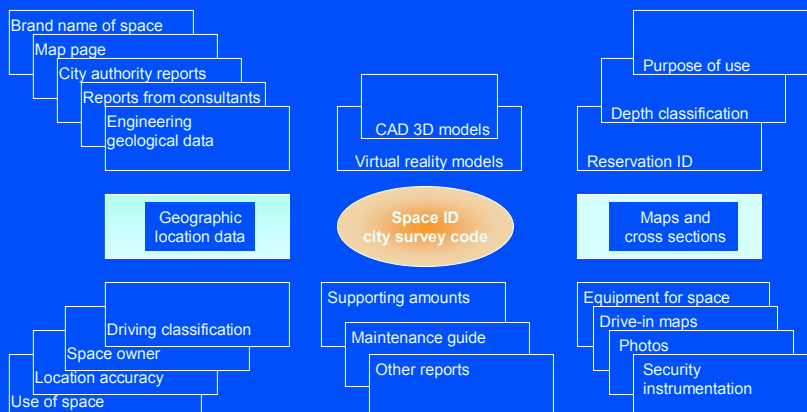
A three-dimensional model of the Viikinkmäki underground sewage plant



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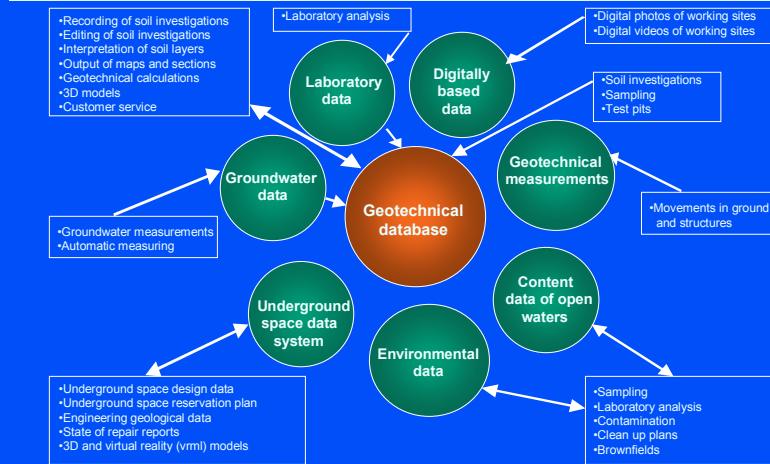
Underground Space Data System



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Helsinki Geotechnical Database



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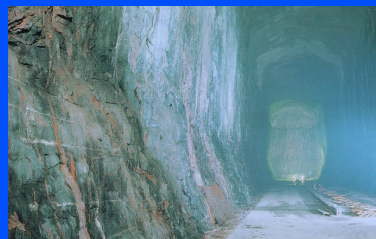
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Geotechnics & City Planning



Underground space can also be beautiful and enjoyable

Fuel oil storage cavern beneath recreational area



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Underground spaces in the city centre, 1980



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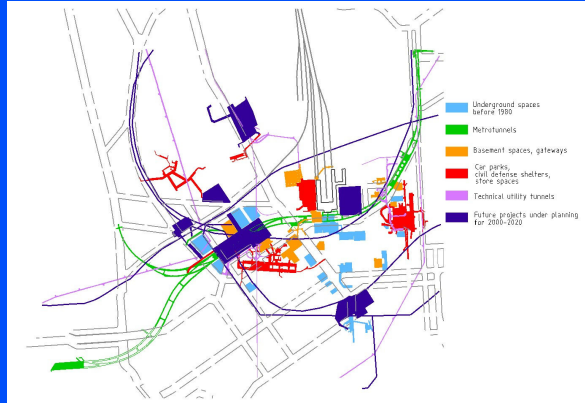
Underground spaces in the city centre, 2000



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Underground spaces in the city centre, 2001-2020 (forecast)



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Conclusions

- Geotechnical data are basic factors in several decisions such as:
 - City planning, regional and individual projects
 - Follow-up analysis of construction sites, effects on surrounding structures and environment
- Extremely long-term and comprehensive contributions are needed to create an effective regional geotechnical database
- Free data sharing of existing geotechnical investigations is best practise for all

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