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Kari AVELLAN, D.Sc., C Eng., P.E.

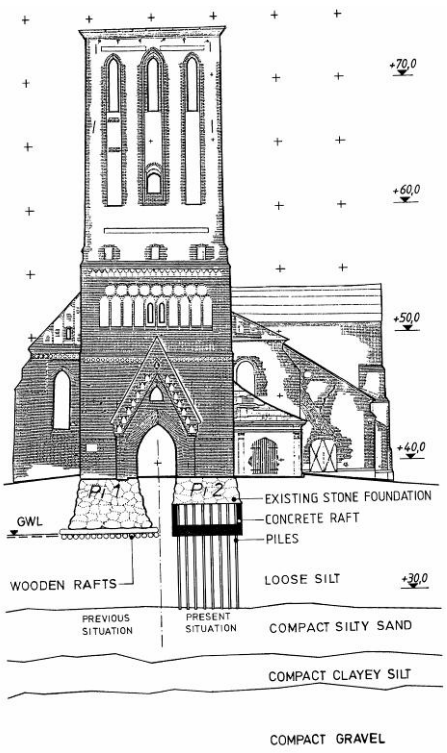
REFERENCE PROJECTS IN THE AREA OF EXPERTISE

Structural and geotechnical engineering for special projects

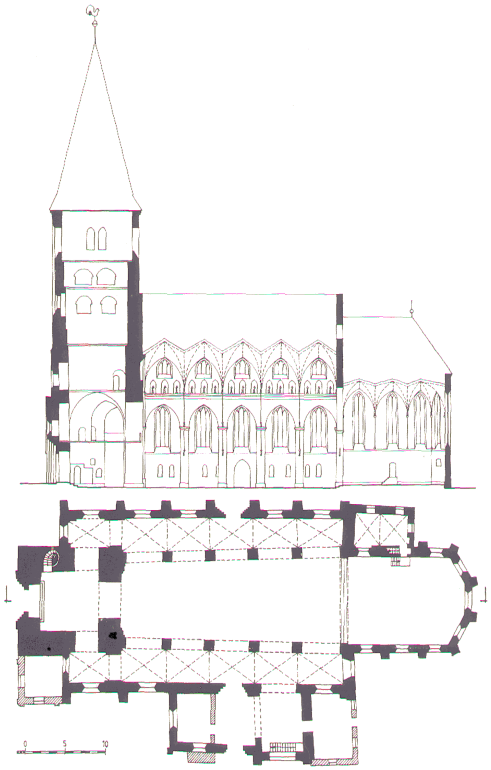
HISTORICAL BUILDINGS IN TARTU, ESTONIA

St.-John's Church 1993 - 1996

- built between 1300 - 1460
- 1.1 Underpinning of the tower between 1993 - 1994 **(pictures 1 and 2)**
- 1.2 Underpinning of the church between 1994 - 1996
- structural and geotechnical design and technical management of the project, jacked piles, spiral drilled piles, permanent pre-tensioned anchors
- investigation/inspection of the condition of the structure on the site
- teaching/training for local unskilled workmen to get skills and competence to execute the work.



Picture 1. St.-John's Church
Foundation of the tower. Previous and present situation.



Picture 2. St.-John's Church
Plan and section of the church.

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Certificate of Honor
Muinsuskaitseamet, Estonia, transfer Kari Avellan 29.6.2005 Certificate of Honor
"The National Heritage Board of Estonia is grateful to Mr. Kari Avellan for his great work at the restoration of St John's Church in Tartu."

Kari Avellan: Lecture, congress proceeding and poster
"St-John's Church, Tartu, Estonia. Underpinning of tower. Principal work realized 1993 - 94. Additional work for smaller supporting structures 1995." ISSMFE Conference, TC 19, Napoli_3. - 4.10.1996. Pages 521-525. Geotechnical engineering for the Preservation of Monuments and Historic Sites".

Kari Avellan: Congress proceeding and poster
"Strengthening the foundations of St. John's Church in Tartu". Proc. XVth ICSMGE. Istanbul 27.- 31.8. 2001. Pages 1687-1690. (Fifteenth International Conference on Soil Mechanics and Geotechnical engineering).

Kari Avellan poster
"Reawakening the spirit: St. John's Church of Tartu, Estonia". 16th General Assembly and International Scientific Symposium, ICOMOS (International Council on Monuments and Sites),29.9. - 4.10.2008, Quebec, Canada.

The House of the Princess of Courland 1994 - 1996

- built between 1600 - 1700, foundations and cellar partly in the fourteenth century
- structural and geotechnical design and technical management of the project
- investigation/inspection of the condition of the structure on the building site
- teaching/training for local unskilled workmen to get skills and competence to execute the work.

The Main Building of Tartu University 1995 - 1996

- built between 1802 - 1806
- strengthening the foundations and specially the foundation of the main entrance (**picture 3**)
- structural and geotechnical design and technical management of the project with the main focus on the foundations and the concrete structures from cellar to ground floor (middle and south parts of the building)
- investigation/inspection of the conditions of the structure on the building site
- teaching/training for local unskilled workmen to get skills and competence to execute the work.

Kari Avellan: Invitation as panelist, lecture and congress proceeding
"Strengthening the foundations of the main building of Tartu University, Estonia".
Proc. XVIth ICSMGE. Osaka 12. - 16.9.2005. Technical Session "4c: Preservation of Historic Sites" (Sixteenth International Conference on Soil Mechanics and Geotechnical Engineering).

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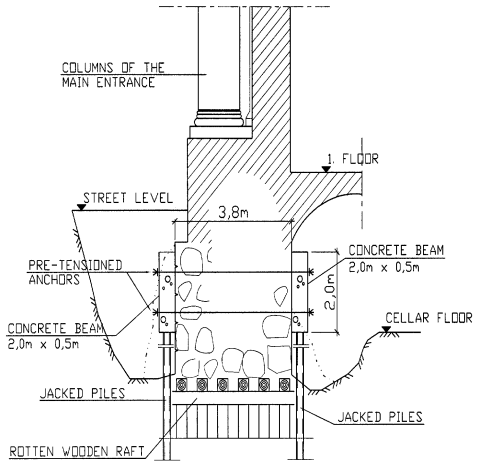

Picture 3. The Main Building of Tartu University
Section of the main entrance.

The School of Treffner (Part of Block) 1996 - 1999

- built between 1600 - 1700, foundations and cellar partly in the fourteenth century
- strengthening the foundations
- structural and geotechnical design and technical management of the project with the main focus on the foundations and the concrete structures from cellar to ground floor
- investigation/inspection of the conditions of the structure on the building site
- teaching/training for local unskilled workmen to get skills and competence to execute the work.

HISTORICAL BUILDINGS IN POLTSAMAA, ESTONIA

The Castle of Oberphalen 1999 - 2000

The Castle was founded by the Livonian Order, in the 14th century

- inside the old site of the castle a new structure was built using the old, original outside walls.
  New foundations were laid close to the old foundations using spiral drilled piles which were rammed inside.
  - structural and geotechnical design and technical management of the project
  - teaching/training for local unskilled workmen to get skills and competence to execute the work.

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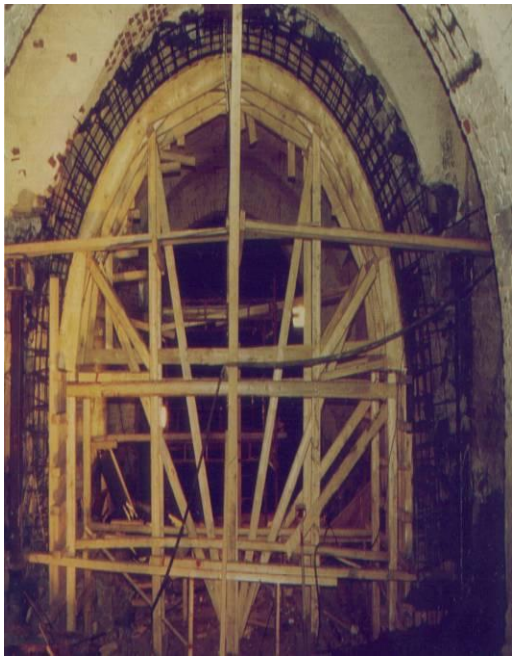
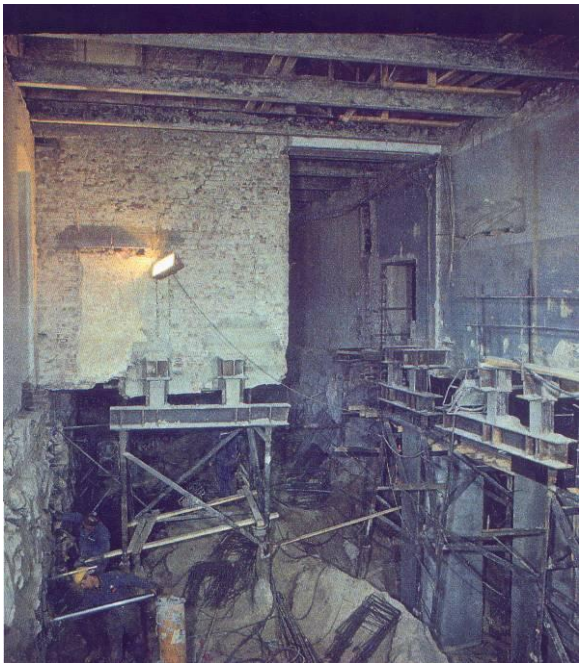
HISTORICAL BUILDINGS IN FINLAND

Merikasarmi, Ministry of Foreign Affairs, Helsinki 1986 - 1988

- original plans by architect C. L. Engel in 1820's
- strengthening the foundations with steel piles and concrete structures
- shoring of "The old Sailors' barrack's walls during reconstruction, underpinning operations, rock blasting and recess of the cellar
- designing of temporary and permanent structures (steel and pre-stressed concrete structures)
- geotechnical and structural design of the foundations and the concrete structures from cellar to ground floor **(pictures 4 and 5).**



Picture 4. Merikasarmi, Ministry of Foreign Affairs.



Picture 5. Merikasarmi, Ministry of Foreign Affairs.

Kari Avellan poster
"Strengthening and underpinning the foundations of the main building of the Ministry of Foreign Affairs of Finland". XIV European conference on Soil Mechanics and Geotechnical Engineering, 24th-27th September 2007, Madrid, Spain.

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The Presidential Palace, Helsinki **1982 -**

- several projects

Aleksanterinkatu 4 - 10, Ministry of Trade and Industry, Helsinki
2 different working periods **1982 – 1985 and 1986 - 1988**

- shoring of the walls during reconstruction
- underpinning operations, rock blasting and recess of the cellar
- design of temporary and permanent structures (steel and pre-stressed concrete structures)
- geotechnical and structural design of the foundations and the concrete structures from cellar to ground floor **(picture 6).**

Picture 6. Digging work under old structures of Aleksanterinkatu 4 - 10.

Kari Avellan congress proceeding:
"Strengthening and underpinning the foundations of the Ministry of Employment and the Economy of Finland at Alexander Street No. 4 and 6". Published in Proceedings of the 17th International Conference on Soil Mechanics & Geotechnical Engineering. Volume 2. Alexandria, Egypt 5-9 October 2009.The Academia & Practice of Geotechnical Engineering. Edited by Mamdouh Hamza, Marawan Shahien, Yasser El-Mossallamy. pp.1240-1242.

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Underwater Civil Engineering and Port Engineering technology

The Prime Minister's official residence, Kesäranta, Helsinki 1988

- diving inspections as well as improvement and renovation plans for the residence of Prime Minister of Finland **(picture 7).**

Picture 7. The Prime Minister's official residence.

Diving inspection of shipwreck St. Michael 1987

- planning and designing of lifting of the early 18th century ship "St. Michael" that sunk off the Finnish coastline in 1747, when sailing from Amsterdam to St. Petersburg
- furnishing safety calculations and cost estimation for lifting plans and procedures. Diving depth 38 m.
- Inspection work was done in the presence of a representative of National Board of Antiquities.

Quay of Storby, Eckerö Finland 1985

- "Engel's Post Quay", length of deck 40 m; the former wooden caissons were made in 1830's
- Making plans for breakwater and dredging
- structural and geotechnical design of permanent wooden caissons.

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Gustav Dalén's lighthouse 1995

The lighthouse was the First one in Finland made as concrete caisson.

- Diving inspections
- Condition analysis
- Improvement and renovation plans for the reparation

Harmaja lighthouse, Helsinki 1998 - 1999

- structural studies on corrosion effects on steel pole part
- strengthening plans
- plans for repair of concrete and steel structures **(picture 8).**

Picture 8. Harmaja lighthouse.

Concrete technology, engineering and design

Helsinki Olympic Stadium Tower, Finland 1995

- expert report on the mismanaged work of the white concrete shotcreting

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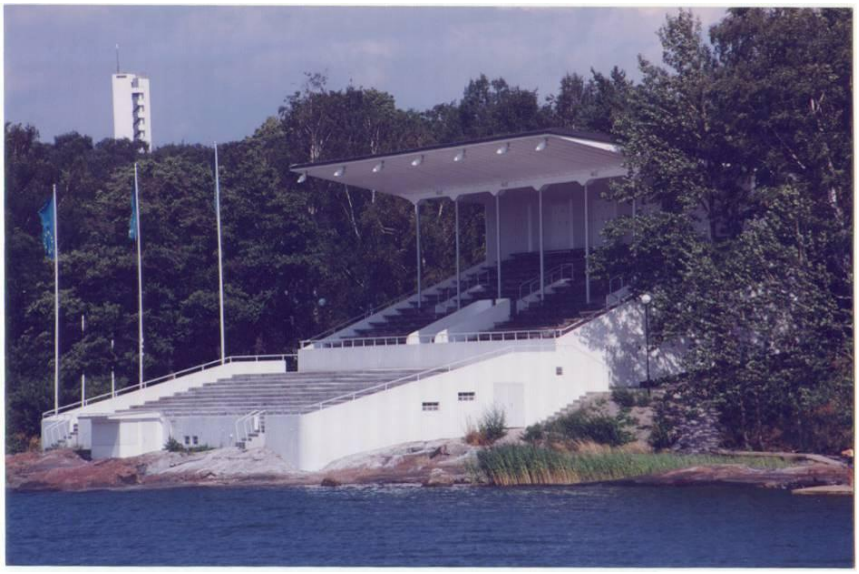
Helsinki Olympic Velodrome, Finland 1997 - 2000

- structural studies of corrosion effects
- carbonation and hardness tests
- strengthening plans and repair the structures
- work supervision

Helsinki Olympic Rowing Stadium, Finland 1997 - 1998

- structural studies of corrosion effects
- carbonation and hardness tests
- plans on how to strengthen and repair the structures
- work supervision
  (picture 9).



Picture 9. Helsinki Olympic Rowing Stadium.

Kari Avellan panelist and oral presentation
"PRINCIPAL RENOVATIONS FOR THE OLYMPIC ROWING STADIUM IN HELSINKI, FINLAND 1996 – 1998". Joint International Scientific Committee Meeting ISCARSAH, 21.6– 23.6.2007. (Chicago, Illinois Institute of Technology).