



## Lappeenranta

### Williparkki

#### Pit support with CFA and jet grouting

In the city center of Lappeenranta, close to the old timber church, a new parking garage was designed. The house will be constructed with two underground floors and parking spaces for approximately 150-160 cars.

Originally, the pit support was planned with a secant pile wall but KFS offered the client a solution with CFA (continuous flight auger) piles and gap sealing with jet grouting half columns.



#### Project data

##### Investor

Williparkki Oy  
Villimiehenkatu 1  
Lappeenranta

##### Client

KREATE Oy  
Haarakaari 42  
Tuusula

##### Design and soil investigation

WSP Finland Oy  
Heikkiläntie 7  
Helsinki

##### Performance

60 CFA Piles  
60 jet grouting half columns with 1.6 m  
50 hollow bar anchors  
20 permanent strand anchors

##### Execution period

May - July 2015

#### KFS Finland Oy

Kellokukantie 4  
Vantaa

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By elaborating a new static design with bigger spacing between the piles and jet grouting gap sealing, Keller KFS was able to combine these two products, what led to reductions in terms of costs and construction time.

In order to avoid bracings which would make the excavation more difficult, anchors were executed to bear the horizontal forces. Both, hollow anchors and permanent pre-stressed strand anchors were executed depending on the static requirements.

In cooperation with WSP, Keller KFS suggested and designed a concrete bearing in every second field between the piles instead of a capping beam, in order to save space inside the building.

One of the main difficulties of the project was the close location of the historical St. Mary Church. This wooden church, built in the 18th century, had to be underpinned with jet grouting prior to the works mentioned above, to prevent any settlements and damages on the old construction.