

## K2D Fornebubanen

Oslo, Norway

### KEY ACHIEVEMENTS

The project involved the construction of two shafts with three techniques: secant pile wall, interlock pile wall, and sheet piling.

The secant pile wall was built with 1.3-meter diameter piles and extended to bedrock at depths of up to 28 meters, navigating challenging ground conditions, including soft clay layers. Effective coordination between both production sites was essential to manage the confined working area efficiently.



### The project

The Fornebu Line is a metro extension connecting Fornebu to Majorstuen in Oslo's western region, with multiple stations planned along its route. As part of this project, Keller constructed two shafts down to bedrock to enable further blasting to the designed depth. Secant pile walls were installed using an electric drill rig, aligning with the project's emission-free requirements for construction.

## The challenge

- Challenging logistics due to confined space in urban area.
- Challenging ground conditions, involving clay above bedrock; Tested UCS value of the encountered bedrock of up to 280MPa.
- Strict control for execution of the secant pile wall due to its rare execution in Norway.
- Casting of piles resulting in overconsumption of concrete.

## The solution

- Use of fully electric rig to execute large-diameter bored piles.
- Good coordination for casting and retrieval of the drill casings.
- Use of the right equipment to be able to ensure the smooth execution of the project.
- Constant adjusting of sequence for drilling of primary and secondary piles to ensure good progress.

## Project facts

### Owner(s)

Fornebubanen

### Keller business unit(s)

Keller Geoteknikk

### Main contractor(s)

Implenia Norge AS

### Engineer(s)

Main Contractor`s Project Manager  
Jostein Hårklau  
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### Solutions

Heavy foundations

### Markets

Infrastructure

### Techniques

Secant pile walls  
Sheet piles  
Ground anchors  
Bored piles / drilled shafts

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