



Trinity Tower

Buildings and Industrial Installations
2013 - 2016



**FRANCE -
La Défense**
Client
SETEC TPI

Project owner
Unibail Rodamco

Miscellaneous

32 floors, 140 m high,
Surface: 52600 m²,
Micropiles foundations



Description of the project

The Trinity tower project is located on a slab over the RN192 main road in La Défense (west of Paris). Its foundations will be built without interruption of the traffic. These constraints have resulted during the detailed design phase in the choice of foundations comprising rows of micropiles with a row of buttresses to take up the horizontal loads. These foundations are anchored in the Lutetian marls and stones layer, immediately above the coarse limestone slab and the Ypresian clayey layers, the behaviour of which has an impact on the long-term settlements of the tower.

Key features

- Geotechnical preliminary design studies
- Project studies: Data synthesis, 3D modeling of the foundation system

Description of the mission

The two major aspects of Terrasol's study are:

- The synthesis of the soil data: the emphasis was placed on the determination of the deformation moduli, based on many types of soil testing and on feedback from the neighbouring towers in the district. These moduli are the input data for our study and are assessed consistently with the calculation model used.
- The overall 3D calculation model in PLAXIS: the foundations rows represent several thousand micropiles and piles. They have consequently been modelled by elements of equivalent volume adjusted by means of very detailed models for the behaviour of the micropiles and of their group effect.

On the basis of this overall model, the soil-structure interaction matrix has been defined for the foundation system: it is valid within a precise range of loading. This matrix has been used to optimise the discussions with the structural engineers and has enabled to obtain a similar settlement profile for the soil model and the structure model from the first iteration: the calculated maximum settlement is of the order of 3 to 4 cm in the long term.