An ML analysis have been conducted on settlements and rotations of foundations in a plane strain FE calculations. Two different models have been applied

* **Linear regression model** –Based on a linear relationship between the features. Applies least squares method to optimize the fit.
* **Random forest regression** – A model that optimizes predictions by creating multiple decision trees, each trained on a random subset of the data and a random subset of features. The result is the average of the predictions from all the trees in the forest.

The training models are based on a stiff plate element in a plane strain model, exposed to a fixed placed with a various eccentricity. The subgrade consists of random soil layers per 0.5 m. The subgrade has been modelled as a Mohr-Coulomb soil model, with a high failure criterion. The intention is not to evaluate the plastic behaviour of the soil, merely to allow for zero stresses at a foundation edge under high eccentricity. Below is given a list of feature details.

* Stiff plate element, width varies between 1-4 m with 0.5 m intervals.
* Constant load per plate width (100 kN/m/m \* foundation width).
* Load placed with a random eccentricity between 0 and 0.3 \* foundation width.
* Model side BC’s are located 2\*foundation width from the foundation center. Hence, a total model width of 4 times foundation width.
* Model bottom BC is located 2\*foundation width under the foundation.
* Subgrade with random E-modulus between 10-100 MPa are modelled per 0.5 m under the foundation down to bottom BC. An angle of friction of 40° and c’=300 kPa has been applied.

The model has been trained on around 5000 Plaxis 2D calculations. The test samples are just below 600.

# Results





