

Pile Foundation Services

Advanced Soil-Structure-Interaction Analysis for Pile Foundation

Framatome has a unique set of knowledge, experience, and tools in the field of pile foundation engineering and Soil-Structure Interaction (SSI).

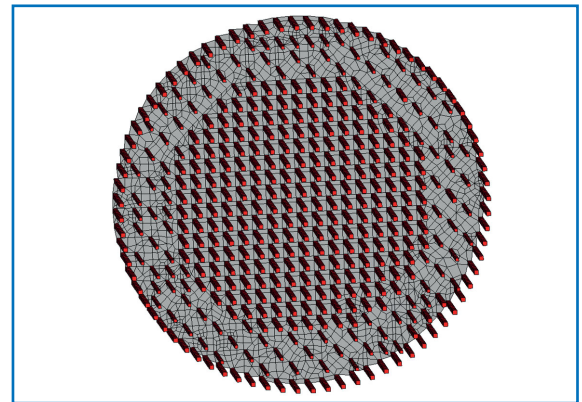
Challenge / Solution

The combination thereof allows Framatome to provide innovative solutions in support of small and large projects such as Seismic Margin Assessments (SMA) or Seismic Probabilistic Risk Assessments (SPRA) of entire nuclear plants. Framatome also provides regulatory support or offers peer reviews where industry leading tools such as SC-SASSI and PILES (Kaynia) are used to efficiently lead our client's projects through regulatory reviews.

Tools

A variety of special tools are used to provide the appropriate level of analyses to our clients and to solve the most challenging engineering problems:

- **PILES** – A specialized pile analysis program
A pile analysis program by an internationally recognized expert in dynamic analysis of pile foundations. Publications by this author are exclusively used to benchmark pile elements in FEM software. The acquired PILES program allows Framatome to compute analytical (closed-form) solutions to complex pile foundation problems.
- **SC-SASSI** – Soil-Structure Interaction program
The most capable SSI software on the market which supports a variety of features, most notably High Performance Computing (HPC) and piles.
- **High Performance Computing** – Center Erlangen / Paris
Framatome's in house state-of-the-art computing center allows us to offer advanced solutions to large pile foundation and SSI problems. FE models with 55000 interaction nodes were successfully performed before.
- **Commercial FEM software** – ANSYS, LS-DYNA, SOFiStiK, RFEM, Code_Aster, and SASSI2010



Reactor Building Foundation (430 Quadratic Piles, Different Cross Sections)

References

Framatome has completed multiple pile foundation SSI analyses in the past. All projects are performed with the goal to provide products and services that meet or exceed customer requirements. Some of the most recent references are:

- Borssele Nuclear Power Station
 - Multiple SSI analyses as part of a SMA
 - Reactor Building supported by 430 quadratic concrete piles with different pile cross sections
- Gösgen Nuclear Power Plant
 - Multiple SSI analyses as part of a SMA
 - Reactor Building, Systemtrakt Building (4 piles), Cooling Tower 1 (4 piles), and Cooling Tower 2 (5 piles)
- SC-SASSI Advanced Pile Element Development Project. Implementation of a superior pile element into SC-SASSI, benchmarking with PILES, coordination of 3 different industry consultants

Services

The following is a list of the most common SSI (including piles) services offered:

- linear-elastic SSI analyses of nuclear and conventional structures
- non-linear SSI analyses
- regulatory consultations
- peer reviews
- research and development projects

Your performance
is **our everyday commitment**

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