FAQ – Can I Create an Embankment Using the DeepEX Model Wizard?

DeepEX includes a dedicated **Embankment Wizard** that allows geotechnical engineers to generate embankment and earth dam models quickly and consistently. By guiding the user through geometry definition, loading, reinforcement, and ground improvement options, the wizard significantly reduces model setup time while maintaining technical rigour.

How does the Embankment Wizard improve productivity?

The Embankment Wizard is designed to reflect common embankment design workflows. Instead of manually defining geometry, loads, and improvement measures element by element, the wizard creates a **ready-to-analyse base model** in just a few steps. This allows engineers to focus on assessing stability, settlements, and performance rather than spending time on repetitive modelling tasks.

Step-by-step: Creating an embankment using the DeepEX Model Wizard

Step 1 – Access the Embankment Wizard

From the **Model Wizard** menu, select **Embankment Wizard**. This option launches a template specifically developed for generating **embankments and earth dams**, with or without additional features such as flood walls, reinforcement, or ground improvement.

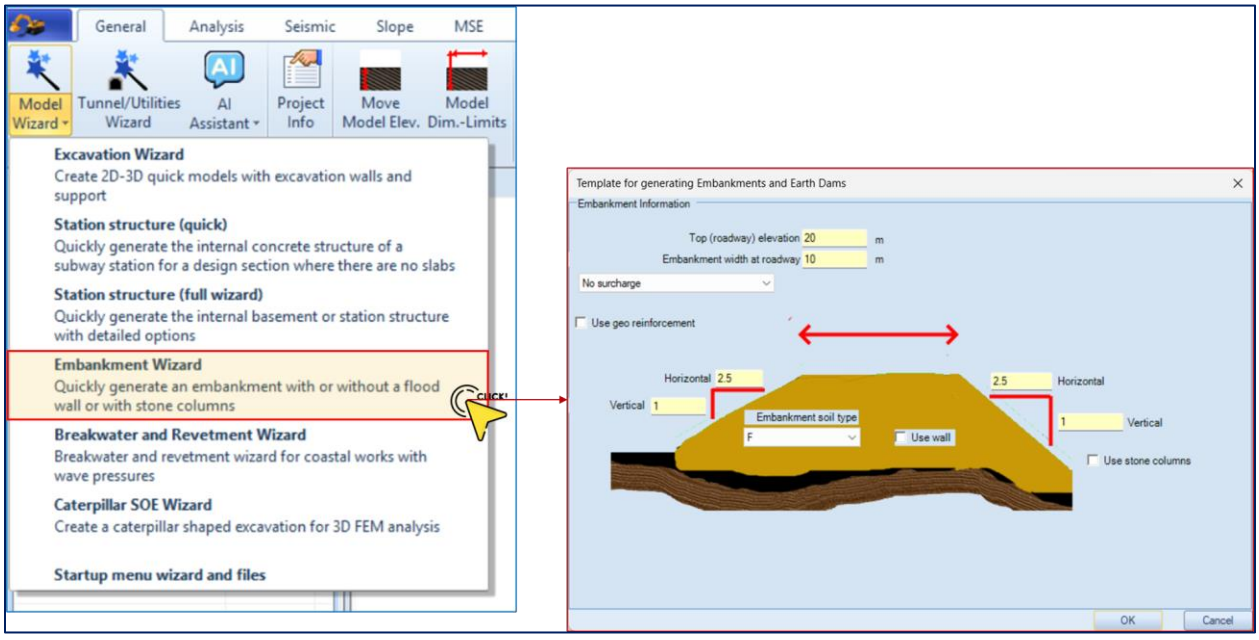

Fig. 1- Accessing the Embankment Wizard.

Step 2 – Define basic embankment geometry

In the **Embankment Information** panel:

- define the **top (roadway) elevation**,
- specify the **embankment width at the crest**, and
- define the **slope geometry** using horizontal and vertical ratios on both sides.

At this stage, the wizard generates the basic embankment shape automatically.

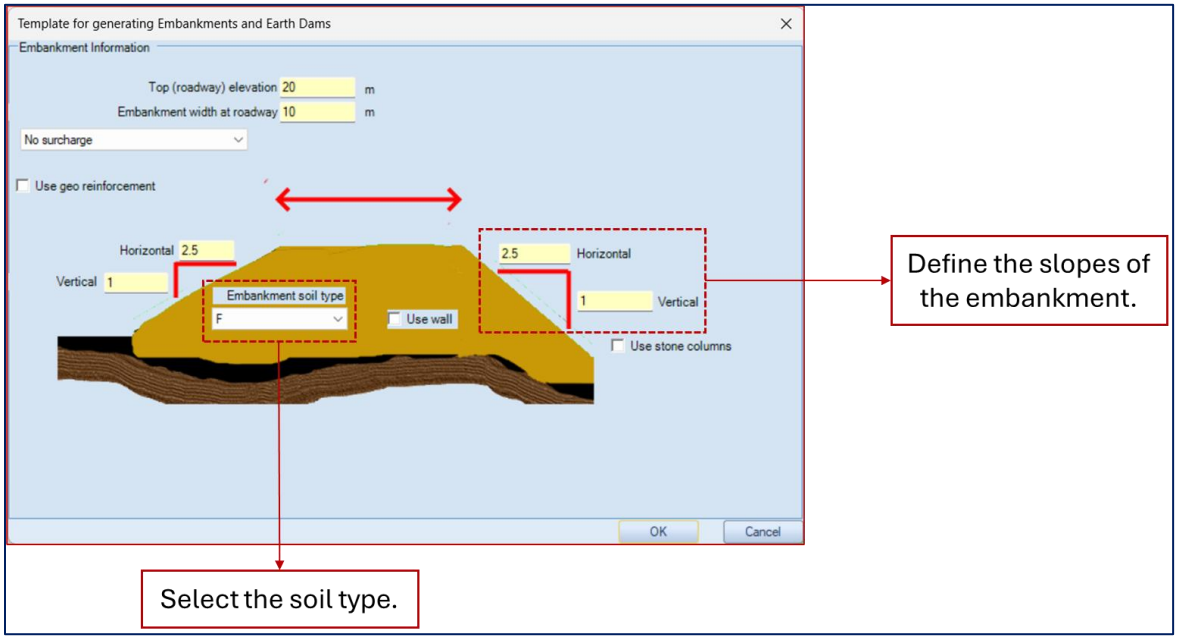

Fig. 2- Defining the soil type and geometry of the embankment.

Step 3 – Select embankment material and optional structural elements

Choose the **embankment soil type** from the available soil definitions. Optional features can also be activated, including:

- a **retaining or flood wall** at the embankment toe, and
- other structural elements as required by the project.

This ensures consistency between the embankment fill properties and the rest of the soil model.

Step 4 – Define surcharge loading on the embankment crest

The wizard allows the user to apply different surcharge conditions at the embankment crest, such as:

- **no surcharge**,

- **strip load**, or
- **train track loading** (with the number of tracks defined explicitly).

These options make it straightforward to represent traffic or railway loading without additional manual input.

Fig. 3- Adding a load on the embankment.

Step 5 – Add geosynthetic reinforcement (optional)

By enabling **Use geo reinforcement**, the user can:

- define reinforcement spacing,
- select the reinforcement type (e.g. geogrid, geotextile, steel strip), and
- assign mechanical and durability properties from a database or user-defined sections.

Reinforcement can be applied to a single stage or across all stages, supporting both temporary and permanent embankment designs.

Step 6 – Include ground improvement using stone columns (optional)

The Embankment Wizard also supports **stone column ground improvement**. When activated, the user can:

- define column diameter, spacing, and length,
- select the analysis approach (e.g. area replacement or user-defined percentage), and
- apply consistent properties across all columns.

This allows rapid evaluation of embankments on soft ground with improvement measures included directly in the model.

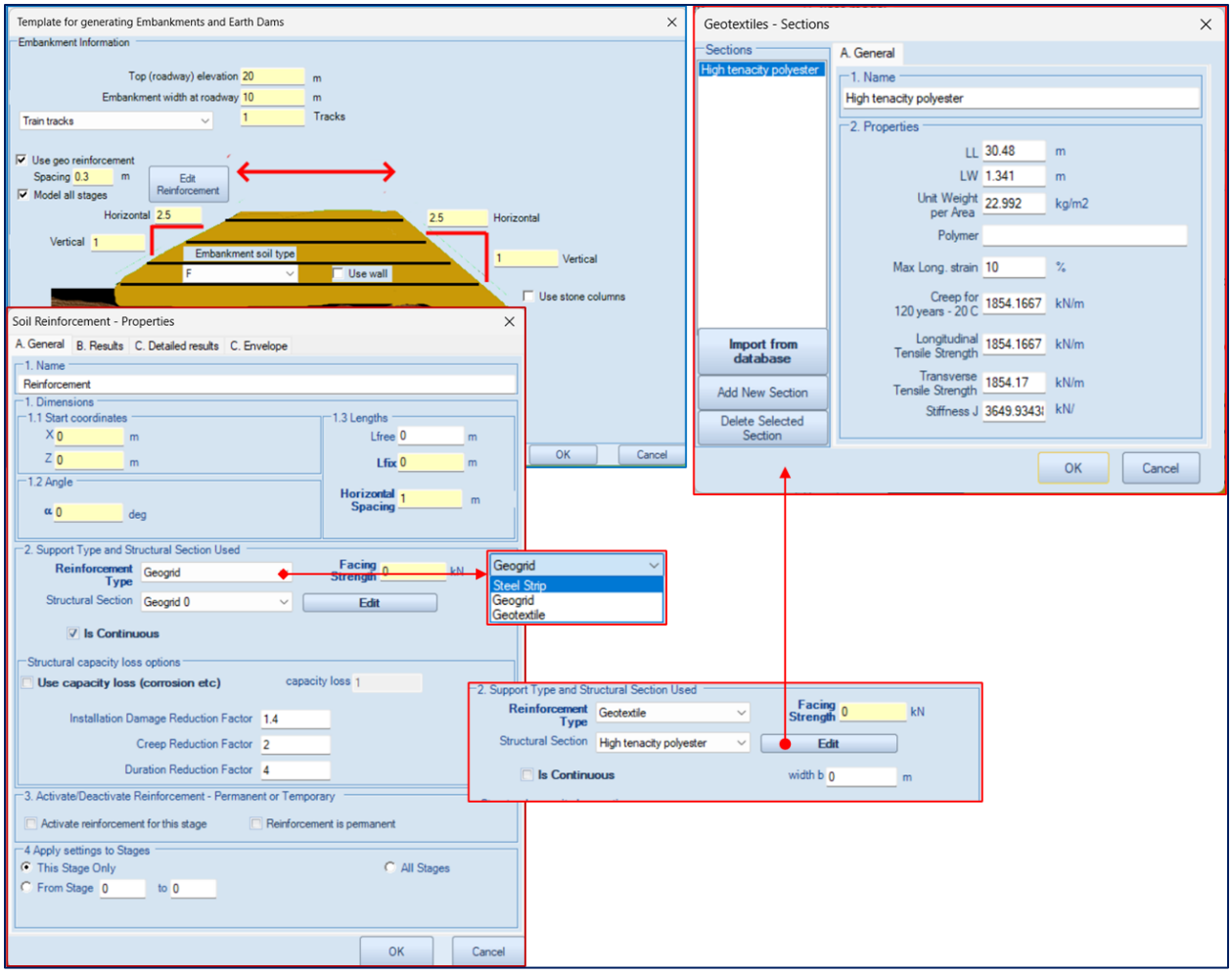

Fig. 4- Geosynthetic reinforcement properties.

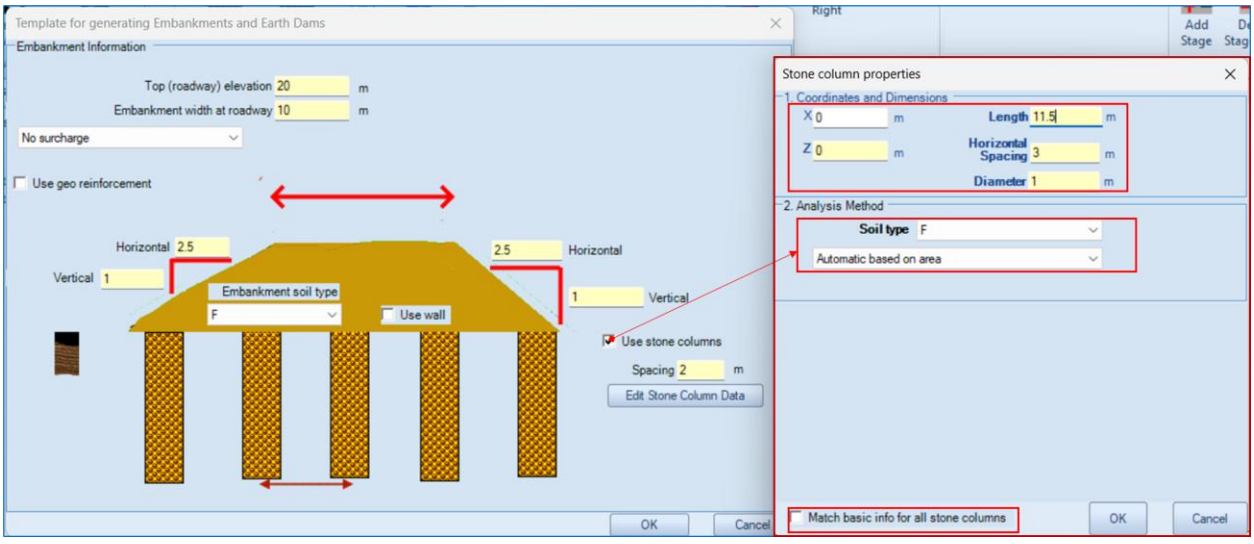

Fig. 5- Gound improvement with stone columns.

Step 7 – Generate the model and proceed with analysis

Once the wizard inputs are confirmed, DeepEX automatically generates the embankment model, which can then be analysed using:

- slope stability methods,
- settlement and consolidation analysis, and
- more advanced numerical approaches if required.

The generated model remains fully editable, allowing further refinement beyond the wizard stage.

Why use the Embankment Wizard instead of manual modelling?

- **Speed**: complex embankment geometries are created in minutes
- **Consistency**: standardised inputs reduce modelling errors
- **Flexibility**: reinforcement, surcharge, and ground improvement are easily included
- **Scalability**: models can be extended from simple checks to advanced analyses

Example

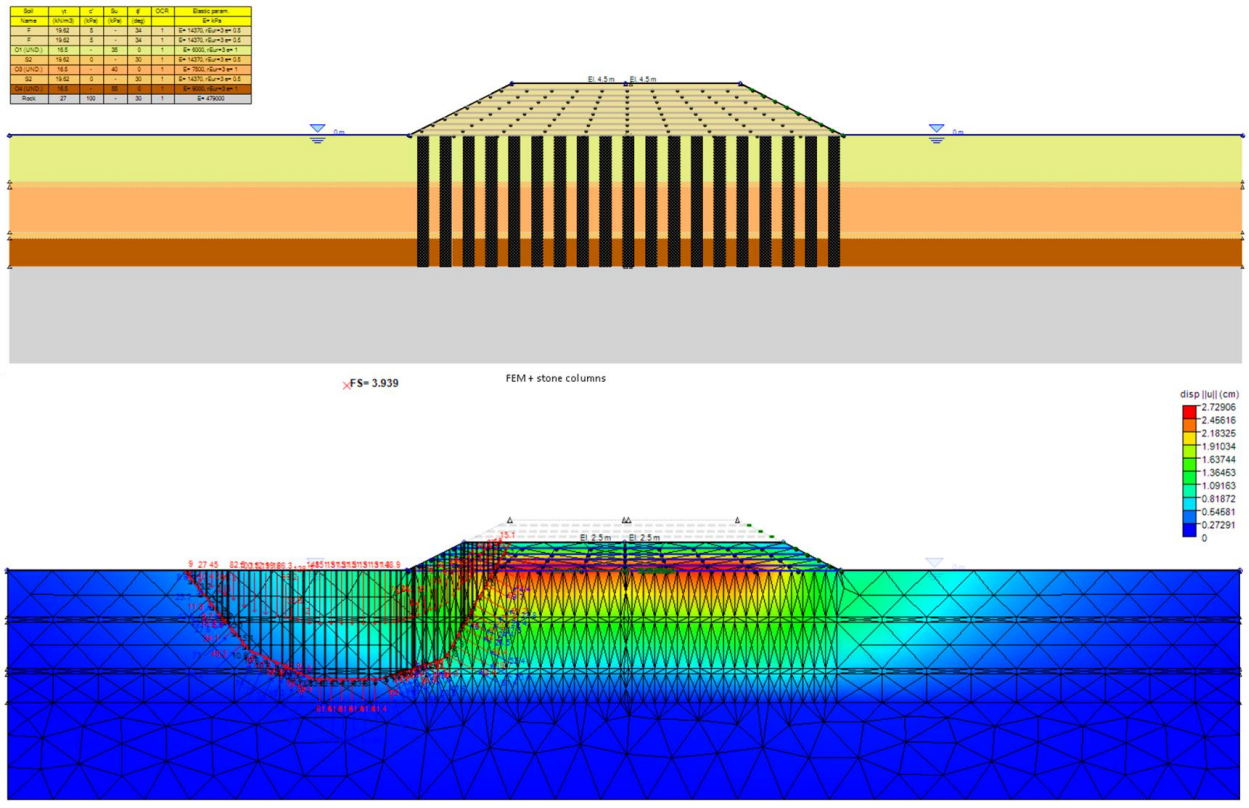

Fig. 6- Example of an embankment with geosynthetics and stone columns for DeepEX FEM analysis.

Summary

The DeepEX Embankment Wizard provides a fast and reliable way to create embankment and earth dam models without sacrificing engineering control. By automating geometry creation and integrating loading, reinforcement, and ground improvement options, the wizard boosts productivity and allows engineers to focus on evaluating performance, stability, and design alternatives rather than spending time building models from scratch.

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