



## DeepEX 2026 – Advancing the Future of Deep Excavation Design

We are proud to announce the release of **DeepEX 2026**, the latest version of Deep Excavation LLC’s industry-leading deep excavation and shoring design software. Available starting **January 2026**, this release represents a major step forward in computational power, modelling realism, and workflow efficiency.

DeepEX 2026 introduces advanced nonlinear analysis capabilities, expanded 3D FEM functionality, enhanced soil and structural modelling, and new design wizards aligned with international standards. With significant solver optimizations and new automation tools, engineers can now tackle larger, more complex projects with greater confidence, accuracy, and speed.

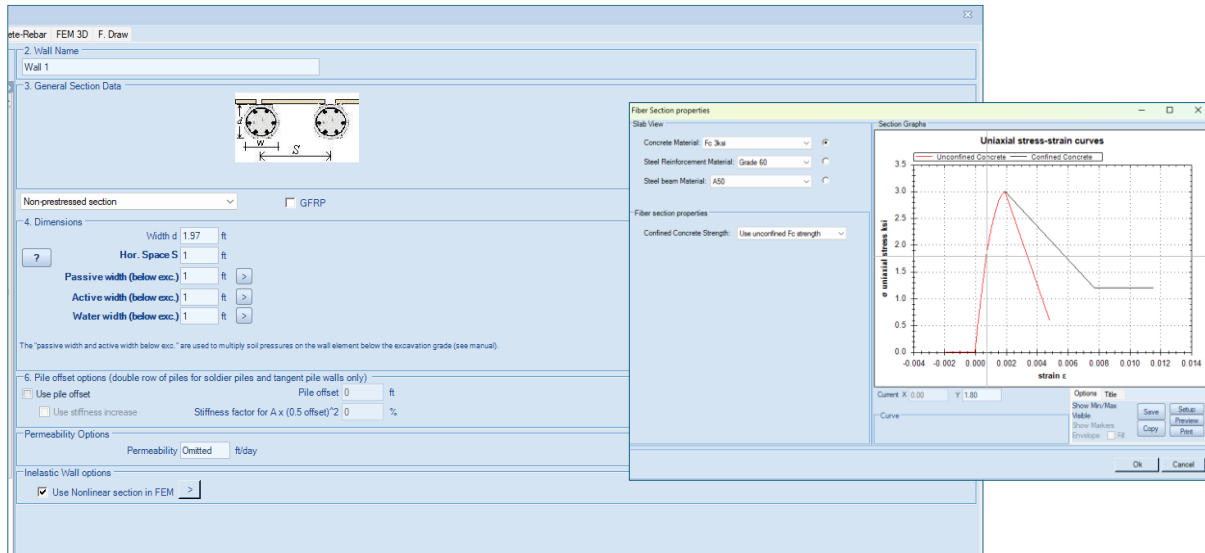


## Key Enhancements and New Capabilities

### Advanced Structural & Material Modelling

- **Nonlinear Fiber Section Analysis**

Structural elements now support nonlinear fiber section analysis, enabling accurate modelling of complex sectional behavior and advanced material nonlinearity.



- **Enhanced Pile Modelling in 3D FEM**

Support for **multiple-section piles** allows engineers to model realistic pile geometries with varying properties along depth.

- **Optimization of Wall Reinforcement**

Automated optimization for walls with **multiple reinforcement zones**, accommodating reinforcement changes with depth.

### Next-Generation Soil Constitutive Modelling

- **Advanced Small-Strain Soil Hardening Model**

Implementation of a smooth small-strain constitutive law based on **Bower et al. (2018)**, delivering significantly faster convergence compared to earlier small-strain models (Benz et al.).

- **Unsaturated Soil Response (LEM)**

Enables more realistic modeling of partially saturated ground conditions.

- **Anisotropic Soil Strength Profiles (LEM)**

Supports directional soil strength behavior for more accurate stability analyses.

- **Liquefaction Soil Model (Coming Early 2026)**

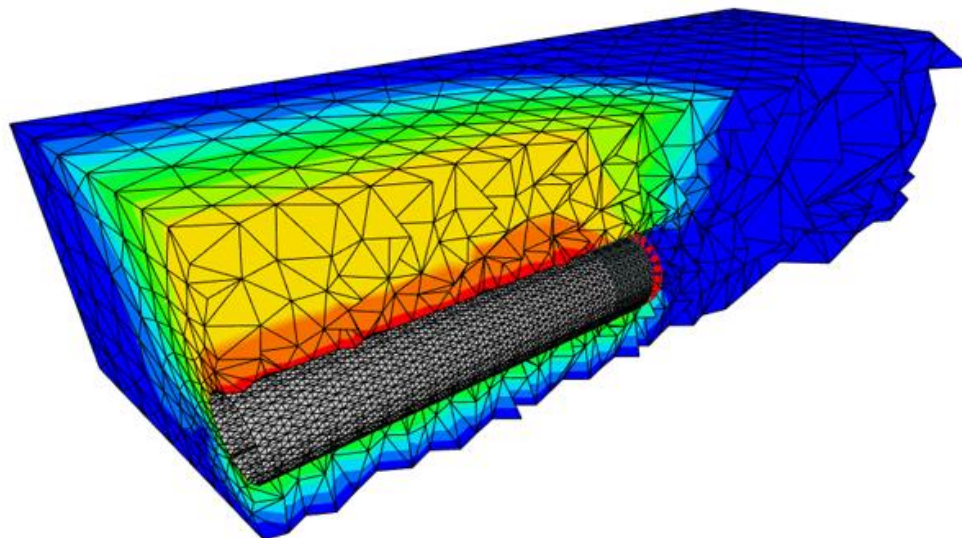
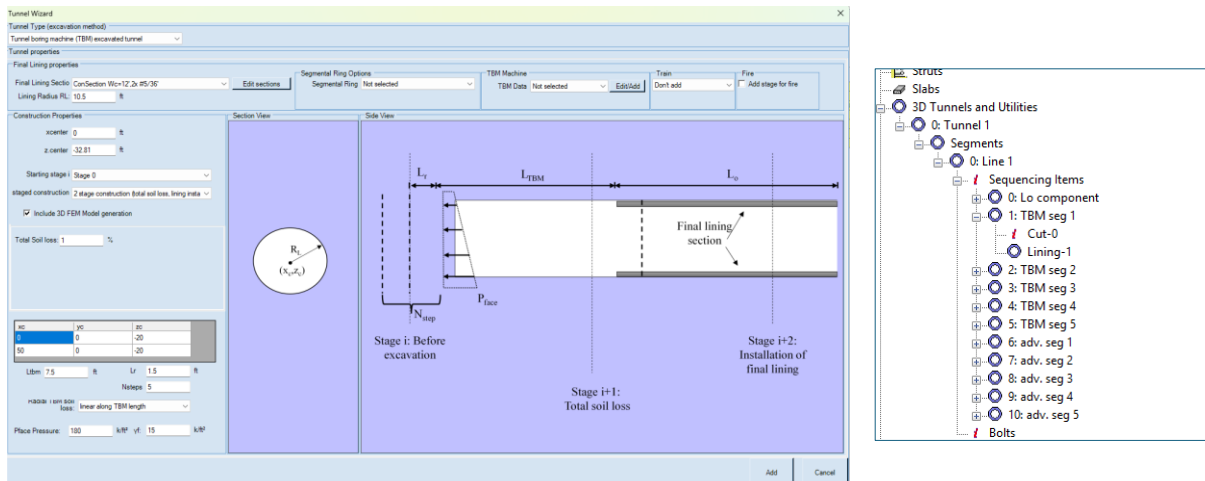
A **Dafalias-based liquefaction model** is currently under development and will be released shortly after DeepEX 2026.

### Expanded 3D FEM Capabilities

- **3D FEM Tunneling Wizard (TBM & SEM)**

A new intuitive wizard simplifies 3D tunnel geometry, loading, and staging definition.

- Tree-view tunnel staging interface
- Seamless **2D-to-3D model conversion** for TBM and SEM tunneling projects



- **3D FEM Consolidation Analysis**

Fully coupled **fluid–soil–structure interaction** under time-dependent loading is now available in 3D FEM, allowing more realistic prediction of settlement and pore pressure dissipation.

- **Solver Optimization for Large-Scale Models**

Major re-architecture of memory management enables efficient analysis of **very large 3D FEM models exceeding 1 million DOFs**, significantly improving performance and stability.

## User Customization & Automation

- **User-Defined Constitutive Models via Python**

Engineers can now create and integrate custom constitutive models using a flexible and accessible **Python scripting interface**, opening the door to project-specific material behavior.

```
def calc_elastic_tensor(elastic_matrix, input_properties, changing_parameters):

    E, v = input_properties
    mu = E / (2 * (1 + v))
    lam = v * E / ((1 + v) * (1 - 2 * v))

    # Build 6x6 stiffness tensor
    C = np.zeros((6, 6))

    # Fill tensor
    For i in range(3)
        For j in range(3)
            C[i, j] = lam
            C[i, i] += 2 * mu # diagonal

    For i in range(3, 6)
        C[i, i] = mu

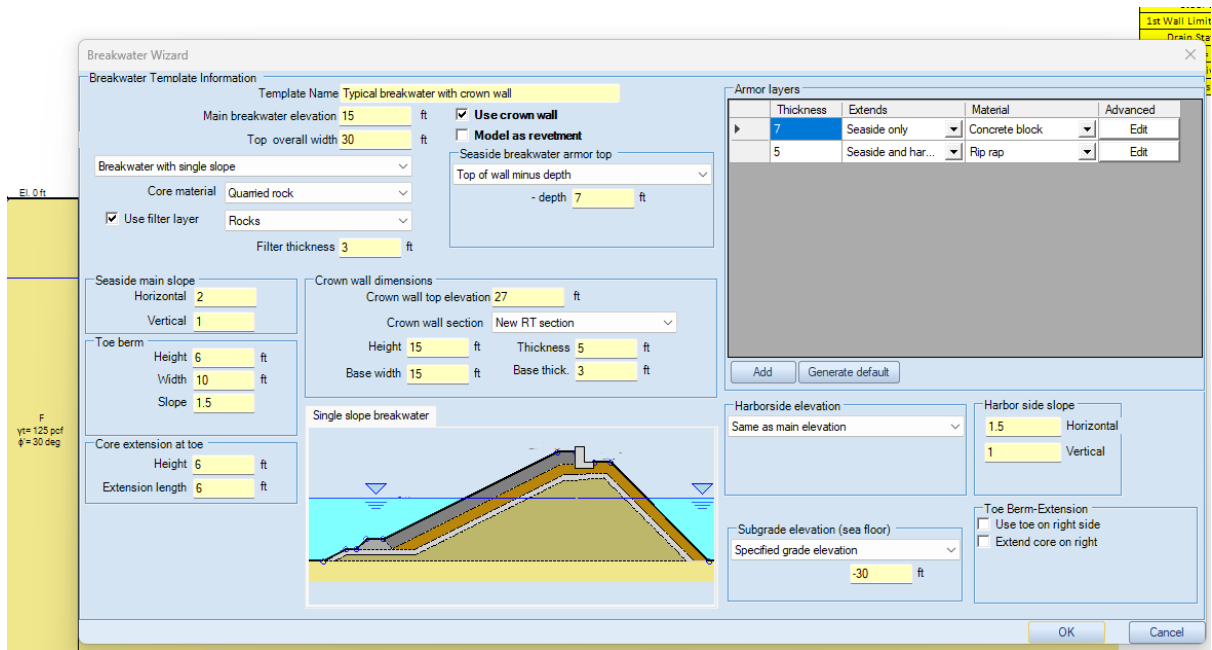
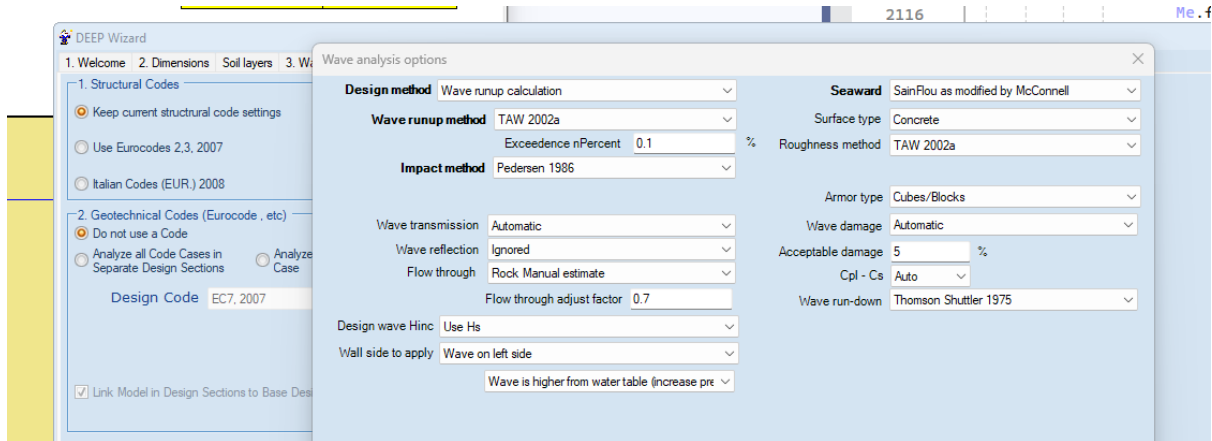
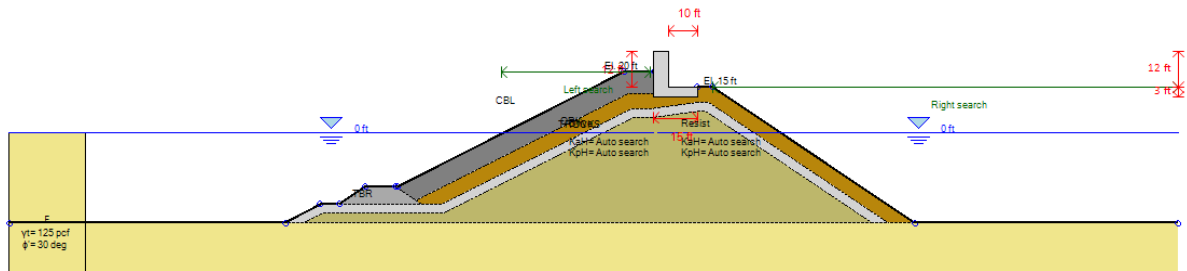
    # Copy back To elastic_matrix ( array length 36)
    For i in range(6)
        For j in range(6)
            elastic_matrix[i * 6 + j] = C[i, j]
```

## New Design Wizards & Coastal Engineering Tools

- **Seawall, Embankment, and Revetment Wizards**

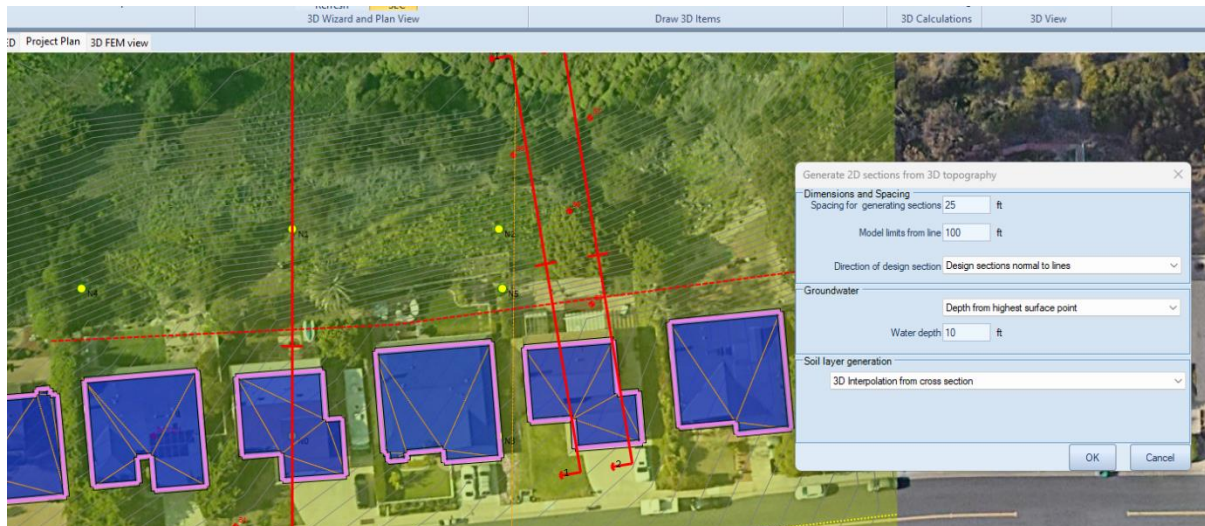
Developed following **Rock Manual** guidelines, these wizards streamline coastal structure modeling and stability evaluation, including:

- Surface roughness
- Impact wave forces
- Wave transmission and reflection
- Flow-through rate estimation
- Stability numbers
- Crown wall and armor stability



### Improved Geometry & Section Generation Tools

- Draw **2D design sections without a wall**, automatically tracing ground elevations and generating soil and water profiles.
- Automatically generate **multiple 2D sections along a polyline**, with options for:
  - Sections normal to alignment
  - Automatic detection of steepest direction (Available under the 3D Model Wizard)



- **New 2D Wizard Option:** Ability to retain the **existing ground surface** (currently for one wall at a time).

## Limit Equilibrium Method (LEM) Enhancements

- **Inclined rakers connecting wall-to-wall** for LEM analysis (2D FEM option planned for early 2026)
- **Transient water flow analysis**
- **Unsaturated soil response**
- **Anisotropic soil strength profiles**

## Codes & Standards

- **New Design Code Added: Austrian Eurocode 7**

## Why Choose DeepEX 2026?

DeepEX 2026 is designed for engineers who demand accuracy, flexibility, and performance. Whether you are designing deep excavations, complex shoring systems, tunnels, or coastal structures, DeepEX 2026 empowers you with:

- State-of-the-art nonlinear and 3D analysis
- Faster and more stable solutions for large models
- Customizable constitutive behavior
- Automated workflows that save time and reduce errors
- Continuous alignment with international standards

We invite you to experience the next generation of deep excavation design with **DeepEX 2026**.