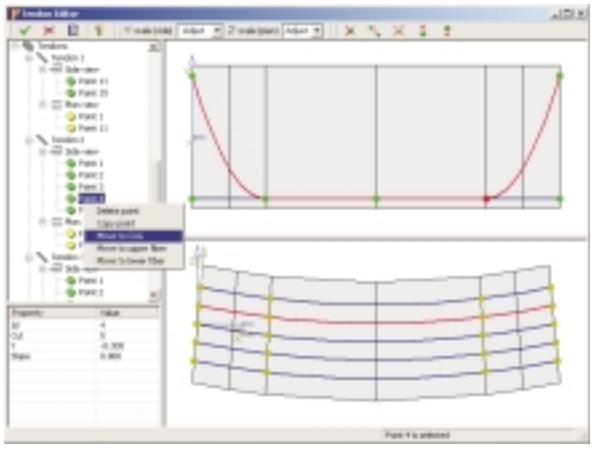
Advanced Prestressed Concrete Module

The objective of the Advanced Prestressed Concrete module is to supply, tools that make more user friendly the study of complex prestressed effects.

It includes a graphic 3D geometric tendon editor. The tendon editor allows defining and/or modifying the tendon layout, in both plan and elevation views, by an interactive and graphic form. Using this editor it is possible to easily generate, modify, copy, delete and assign any tendon to the finite element model.
At the same time, from the tendon editor, the program automatically calculates the immediate and long-term prestressing losses and the consequently stress distribution through each tendon. Furthermore, the program automatically transfers the resultant prestressing forces to the finite element model, either for beam or solid elements. By using the tendon editor, the user can control both the tendon geometry and the stress, and its effect over the structure.

This module also allows for checking and designing prestressed concrete structures taking into account the prestress actions. Although the prestressed utilities are oriented to the bridge calculation, it is also possible to make use of them on other type of structures such as prestressed slabs, silos and so on.

Advanced Prestressed Concrete Module Features



1. THREE-DIMENSIONAL TENDON EDITOR

- Graphic definition and edition of the geometric and strength properties of the prestressing tendons
- Graphic definition of the tendons layout in both plan and elevation views
- Uses third degree Bezier curves to represent the prestressing cables layout. It automatically performs tangential adjustment among different types of curves

2. PRESTRESSING LOSSES

- It automatically calculates both immediate and long-term prestress losses for the tendons defined with CivilFEM tendon editor

- Takes into account the following immediate losses:
  - Losses due to friction
  - Losses due to anchorage slip
  - Losses due to elastic shortening of the concrete

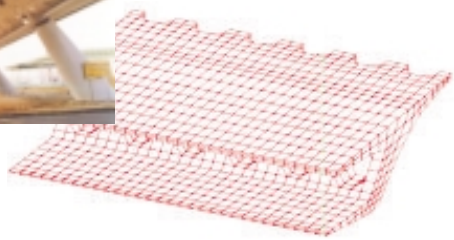
- Long-term losses:
  - Losses due to concrete shrinkage
  - Losses due to concrete creep
  - Losses due to steel relaxation

3. TRANSFERENCE OF THE PRESTRESSING ACTIONS

- Prestress actions, after all the immediate and long-term losses have occurred, are automatically transferred to the model by means of an equivalent system of forces at each node of the element crossed by the tendon

4. CHECKING AND DESIGN OF PRESTRESSED STRUCTURES

- Serviceability limit state: checking of cracking according to codes (*)
- Ultimate limit state: checking and design according to codes, taking into account all the loads applied over the structure



(*) Please for further information and available capabilities contact your local CivilFEM Support Distributor