



ENGINEERS
AUSTRALIA



Strand7 Workshop

Hosted by: Civil/Structural

Earn CPD
hours

**NUMBERS ARE STRICTLY LIMITED.
REGISTER EARLY TO SECURE YOUR POSITION**

Introduction to Strand7 R3

A brief overview of Strand7 R3 will be given together with a short summary of the main differences between R2 and R3.

Simulating the construction of a tunnel by the earth pressure balance method

In this exercise, a Strand7 model of a tunnel boring process is developed and run through the nonlinear static solver as a staged construction simulation. The exercise will touch on a range of important features for soil modelling including nonlinear material models for soil, consideration of pore pressure and definition of the initial in-situ stress state. The staged sequence will be modelled by the removal of soil elements to simulate excavation, and by the addition of concrete elements to simulate the installation of a segmented lining. Finally, the results will be post-processed to inspect deflections as well as total and effective stresses.

Extracting free body diagrams from any Strand7 model

A new type of link element in Strand7 R3 offers the functionality to easily define cuts in an FEA model in order to extract force and moment resultants at any point in the mesh as a free body diagram; any number of elements can contribute to the resultant. The feature will be illustrated by way of the static and dynamic analysis of a multi-storey building, including the extraction of quantities such as base shear in seismic combination cases.

Optimisation of Landscape Sculpture using the Strand7 API

A 20 m tall sculpture is to be installed in a public space, and the task is to engineer it to minimize its weight whilst satisfying the strength requirements, without altering the design proposed by the artist. In this exercise, a manual/intuitive design iteration procedure is compared to a structured procedure implemented using the Strand7 API via a simple VBA program in Excel.

Additional take-home or time-permitting topics

The course notes provided to attendees will include additional worked examples, such as:

Interaction diagrams for reinforced concrete beams and plates

The R/C module in Strand7 R3 can be used to design reinforced concrete plates and slabs. The example considers a floor slab with drop panels and column supports. It shows the steps required to define the R/C layout, to check the force-moment interaction diagram, and to assign the layout to the mesh for analysis. The Strand7 R/C module allows flexible definition of reinforcement layout, including skew reinforcement, and the evaluation of Wood-Armer forces and moments to calculate steel requirements.

Buckling analyses that consider constant and variable load cases

In most cases, a linear buckling analysis considers a single set of loads or load combination, and the load factor to produce buckling is calculated – the load factor scales all of the load. However, if the load case contains gravity in addition to live load, for example, we may need to calculate how much of the live load is required to cause buckling whilst gravity remains constant (assuming the structure does not buckle under just the gravity load). In Strand7 R3 this can be performed automatically because the linear buckling solver offers the option of considering two types of buckling load cases: constant load cases and variable load cases. A tied arch roof structure is used to illustrate this type of analysis.

Please note

To participate you:

- * need to have familiarity with basic Strand7 modelling
- * must bring your own fully charged laptop and power cable (Operating System: Windows 7 or above).
- * Strand7 will provide a USB with a limited life .exe file for the session.
- * Wi Fi is available.

VENUE

“Vivid Room”
NEX (Newcastle Exhibition & Convention Centre)
309 King St
Newcastle West NSW 2302

DATE & TIME

Wednesday 18 July 2018
1pm start – 5pm
Afternoon tea provided

COST

\$100 Members
\$200 Non Members
*Numbers are strictly limited.
Register early to secure your spot.*

REGISTER NOW

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