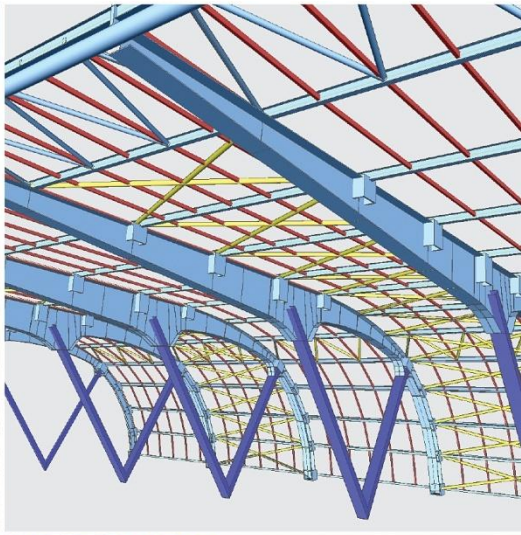
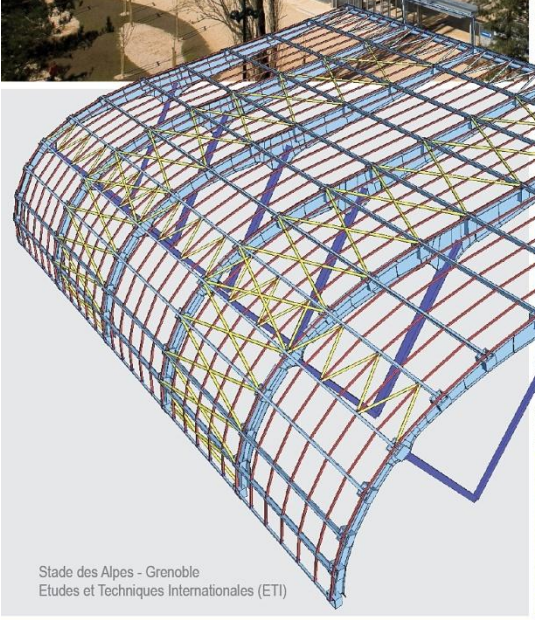
NEMETSCHEK Scia





Stade des Alpes - Grenoble
Etudes et Techniques Internationales (ETI)

Tutorial

Train Loads

Scia Engineer

Release:	2007.1	
Req. Module:	ESA.00	Base Modeller
	ESA.01	2D Surfaces
	ESAS.00	Linear Statics 2D
	ESA.08.x	a language module
	ESAS.04	Train Loads

Manual:	Scia Engineer Train Loads
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SCIA Group n.v.

Scientific Application Group

Industrieweg 1007 B-3540 Herk-de-Stad (België)

Tel.(+32) (0)13/55 17 75 Fax.(+32) (0)13/55 41 75

E-mail scia@scia.be

SCIA W+B Software b.v.

Postbus 30119 NL-6803 AC Arnhem (Nederland)

Tel.(+31) 26-3201230 Fax.(+31) 26-3201239

E-mail scia@scia.nl

SCIA Software Gbr

Emil-Figge-Str. 76-80 D-44227 Dortmund (Deutschland)

Tel.(+49) 231/974.25.86 Fax.(+49) 231/974.25.87

E-mail scia@scia.de

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WELCOME **3**

The input of Load patterns and Load tracks **3**

Load pattern on train **7**

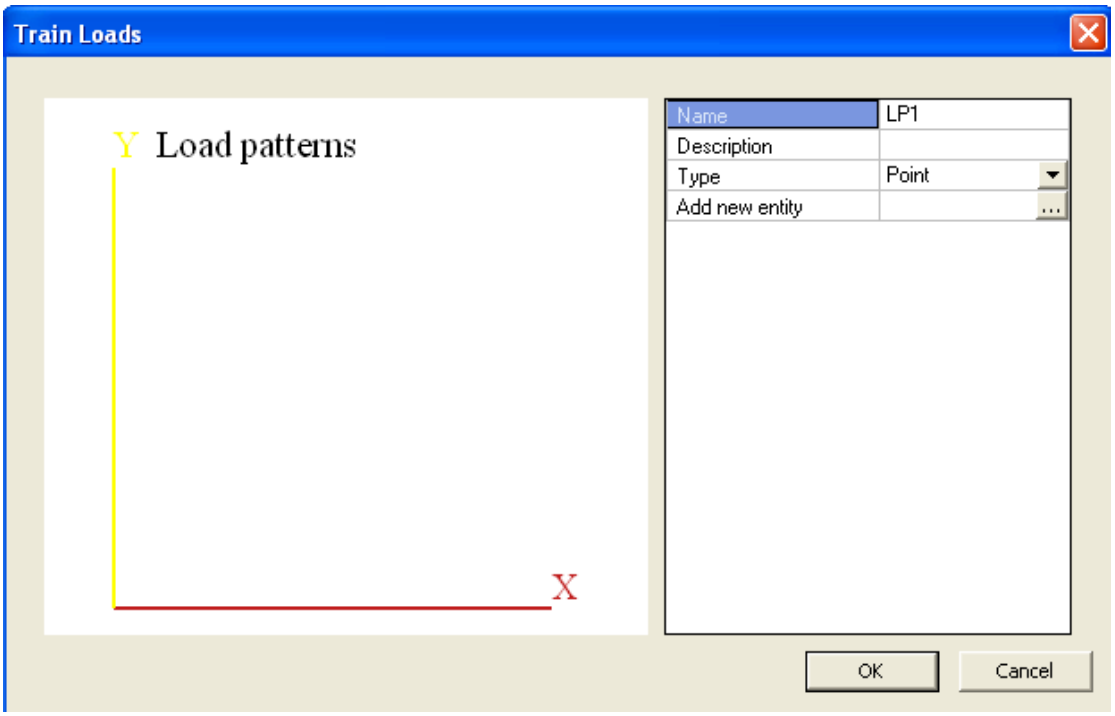
Welcome

The input of Load patterns and Load tracks

Scia Engineer offers the possibility to define a trainload on a load track. In this addendum to the tutorial concrete plate we will discuss the main options. The given examples in this document will use the example for the tutorial of the concrete plate as a starting point.

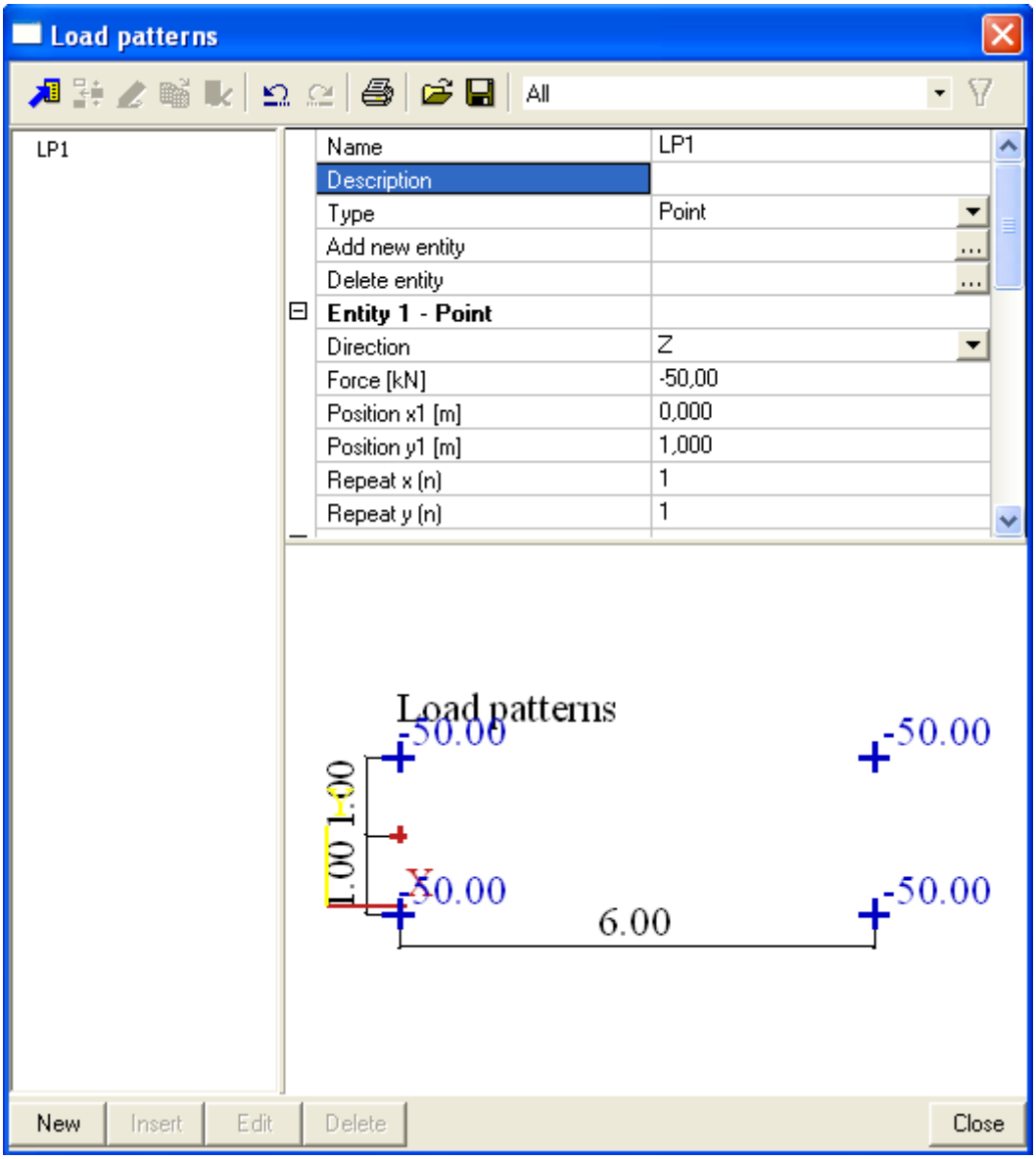
Defining a load pattern

1. Double-click on Load in the main tree.
2. Since you have already defined some load cases in this tutorial, you can open the Load Pattern option, otherwise you have to make a standard load case first.
3. You see there are two options, to define a load pattern click on the single load pattern button. The following dialogue appears.



4. In this dialogue you can create a load pattern. For this tutorial, add four entities, type point. The error that occurs is because the four entities are on the same spot; this ain't wrong. The types line and rectangle mean line force or surface load in a load pattern. The option turning joint will be explained later.
5. The forces are 50 kN each and will work in a square. For the first entity change the force into –50 and the position (y) to 1. The second entity do the same only change position (y) to –1. the third and fourth entity are the same as the first and second entity only postition (x) is changed to 6. Click [OK]

6. The following dialogue pops up:



7. You see the pattern that is created.

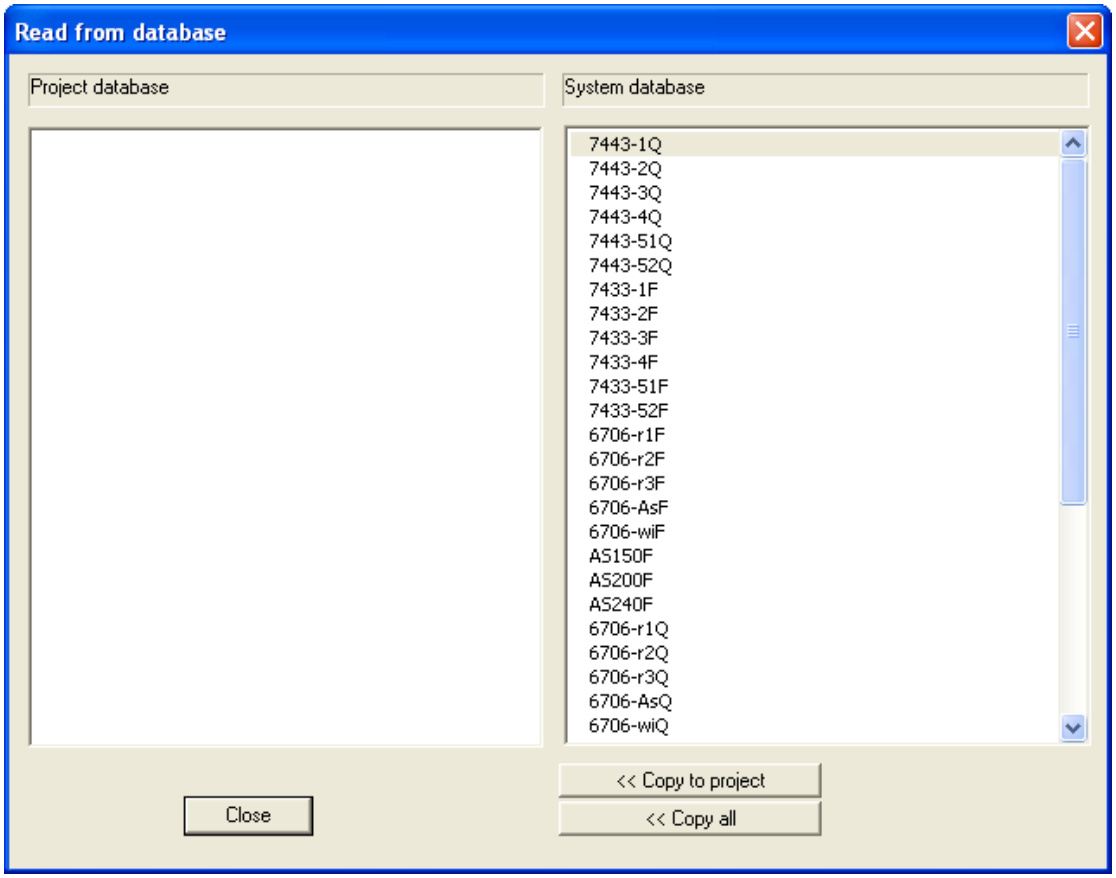
8. The program also has the type “turning joint”. With this function you can add a point to the system line of the load pattern. This point will be used to let the

9. Close the load pattern dialogue and return to the project. Click Esc once, otherwise you will insert the load pattern.

Opening Load pattern Database.

1. Besides defining a load pattern oneself, it is also possible to input a load pattern from a database. This system database includes the different train load patterns and traffic patterns from NEN6706 and EN1991-2

2. Click on the button in the load pattern dialogue to open a system database. When you want to define some load patterns you often use, you can also choose to save some load patterns to a custom database, therefore use the button.



Defining a load track

1. Double click on the New mobile load track button under the load pattern option.

2. With this option you have the opportunity to define a track that the load pattern follows. The new track will be inserted with straight lines and circular arcs. Define the following track:

   The program automatically starts with a straight line.

   start point: 0;2 endpoint: 13;2

   Click on the circular arc button to insert a curve or a bend:

   Intermediate point: @1;0 End point @1;1

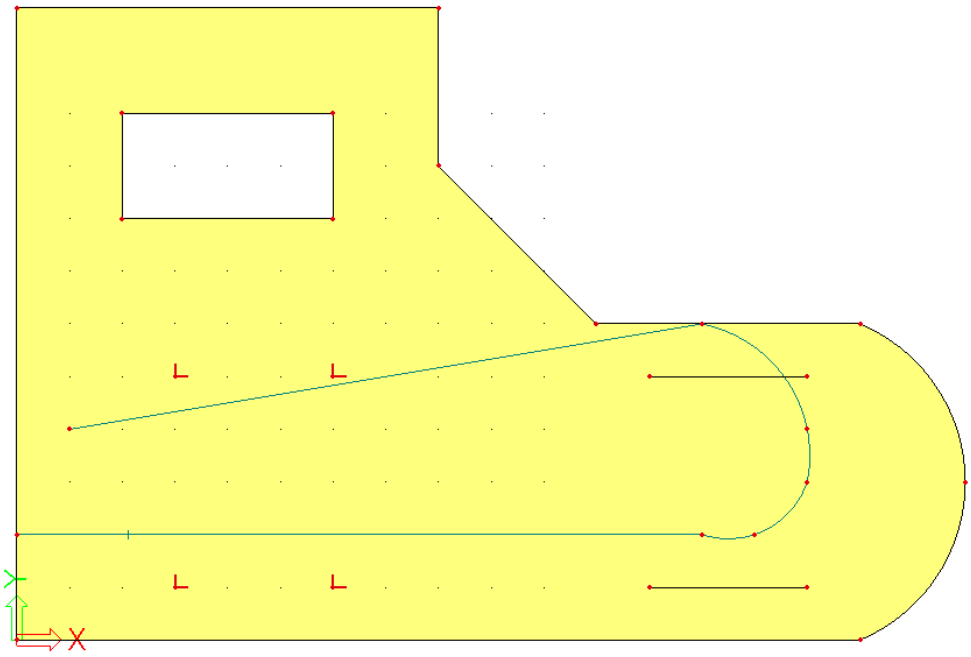
   Create a second circular arc. The option has to be selected again.

   Intermediate point: @0;1 End point @-2;2

The last part is a straight line again:

End point: @-12;-2

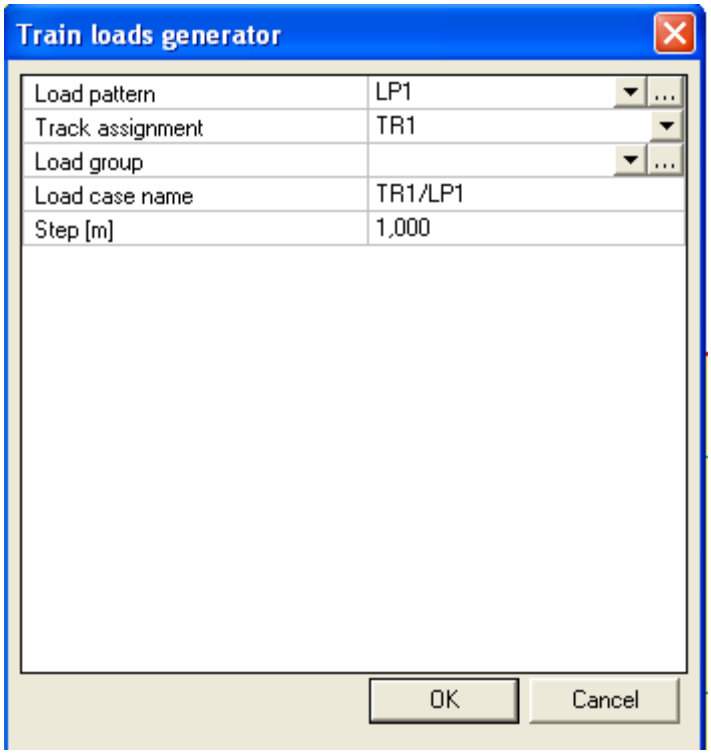
3. Press Esc to end action and to cancel the selection.
4. The following Track is created:



5. As you can see you can define the track to your own wishes, with straight lines and circular arcs.

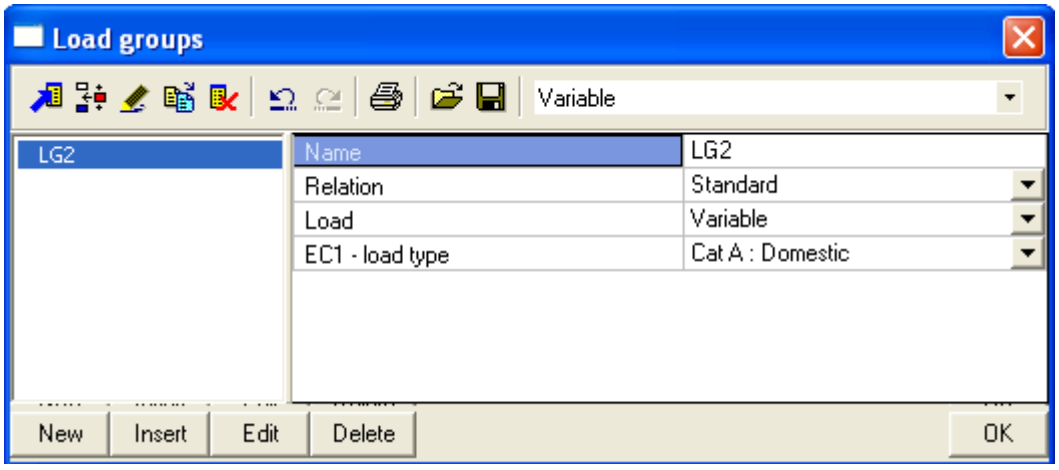
Load pattern on train

1. Double click on the Load Pattern on train button under the load pattern option.



2. In the first two fields you are able to select a load pattern respectively a load track.

3. If you want to click OK, nothing happens. This is because you haven't defined a load group. Click on the … behind load group.



4. Set the relation to Exclusive. This is necessary because you don't want the created load cases to work on the construction at the same time. Click OK

5. Finally the steps between the load cases can be changed. Change the step(m) into 2.

6. Press OK to create the different load cases. The program automatically generates all the load cases.

Generated load cases

1. In the Load menu you can see that the program has created 17 load cases. The load pattern is placed on the track with steps of 2 (m).

2. These Load cases can be put into a combination just as normal load cases. The combination recognizes the load group. Since the relation is set to exclusive, the program will not make any combination that includes more than one of the generated load cases.