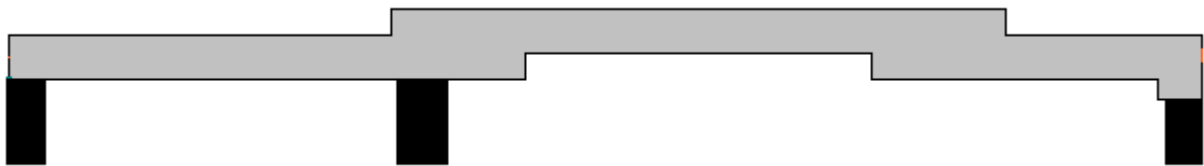

PO Box A2293, Sydney South, NSW 1235, Australia
tel: 02 9267 0114 e-mail: info@inducta.com.au
fax: 02 9267 0168

Tendon Profile Definition Using PT3D Software

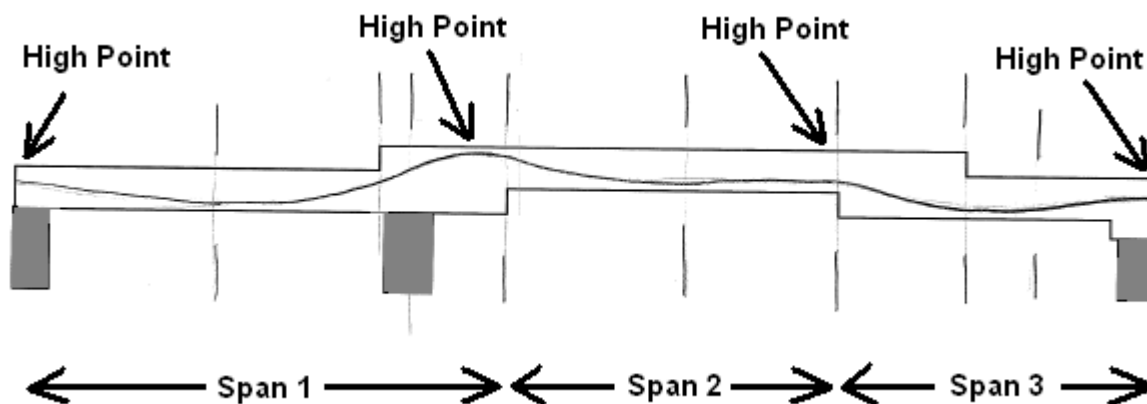
10 March 2006

Let us consider a cross section through a slab with two folds and three supports, where we want to define a tendon using PT3D software.



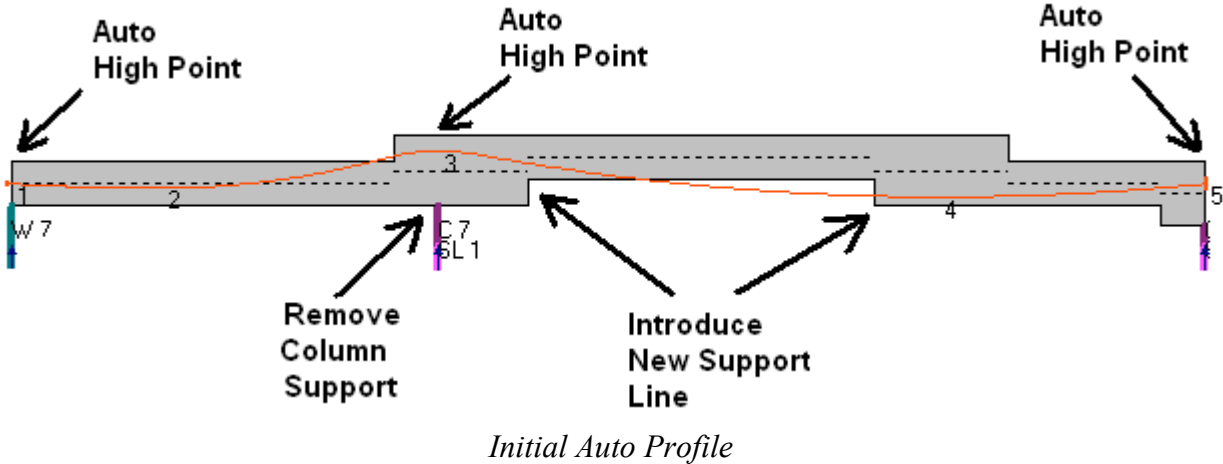
Concrete Outline

In the figure below we have sketched the tendon profile. We can observe that the tendon profile has four High Points, which sub-divide the tendon into three “spans”. Each tendon profile is defined as a series of spans, with High Points at the end of each “span”, and one Low mid-span point. We can observe that two internal tendon High Points do not coincide with the wall or column supports.



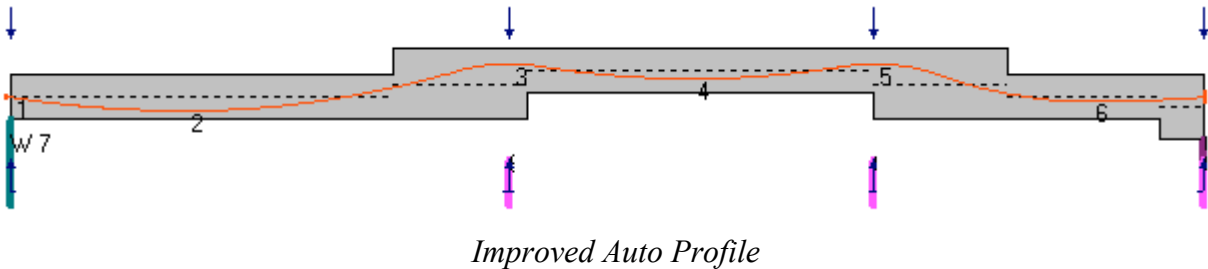
Suggested Tendon Profile

When we open the tendon profile editor first time, PT3D will assign an automatic profile (see figure below). The initial Auto Profile (below) can recognise only three supports, and because of that it will generate only two spans, with three high points. We can observe that we need to remove the mid-span column support, and we need to introduce two new support lines at the steps.



This is done on the main scree. The mid-span column has to be selected, and set the “Auto High Point” property to “No”, so the auto profile will ignore it. Also, on the main screen we will introduce two support lines perpendicular to the tendon line. Any number of support lines can be defined anywhere along the tendon.

Now, when we open the profile again, and we delete the old one a new Auto Profile will be generated, which has the desired shape. (see figure below) Note that the High Point No 3 below is not exactly on the step, while High Point No 5 is exactly on the step.

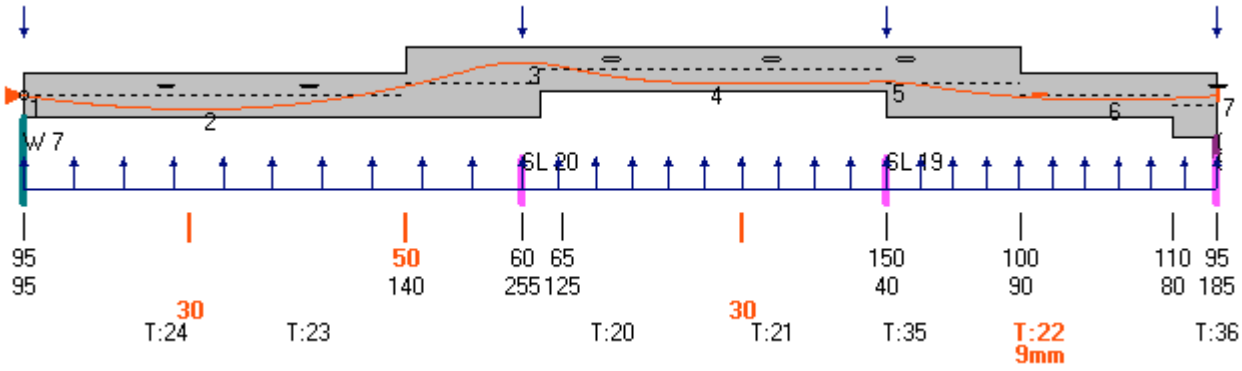


Once we have the general shape correct, we can adjust the height of any point. In this case we need to adjust “h” of two point, 4 and 5. (see table below) In the table the distance from tendon Centre of Gravity to the bottom concrete surface is used.

Point No.	X (m)	h (m)	Location
1 -basic	0.	0.105	mid-point
2 -basic	1.958	0.041	low-point
3 -basic	5.6	0.262	high-point
4 -basic	7.65	0.04	low-point
5 -basic	9.7	0.17	high-point
6 -basic	12.106	0.085	low-point
7 -basic	13.4	0.195	high-point

Tendon Profile CG

After the adjustment of the profile, we can display the duct cover, top and bottom. PT3D checks the cover at all high and low points, and at each step. (see figure below). If the cover is less than the default values the number will be shown in red, indicating an error.



Final Tendon Profile and Concrete Cover

When we adjust the point heights, we need to make certain that in each span the Low mid-point is marginally lower than the High Point on both ends. The difference can be as little as 1mm, so we will get almost flat profile.

Also, in the figure above all cross tendons are shown. Any clashing, i.e overlap with the ducts of the cross tendons will be marked in red. In the figure above there is a clash, a 9mm overlap with the ducts of tendon No 22.