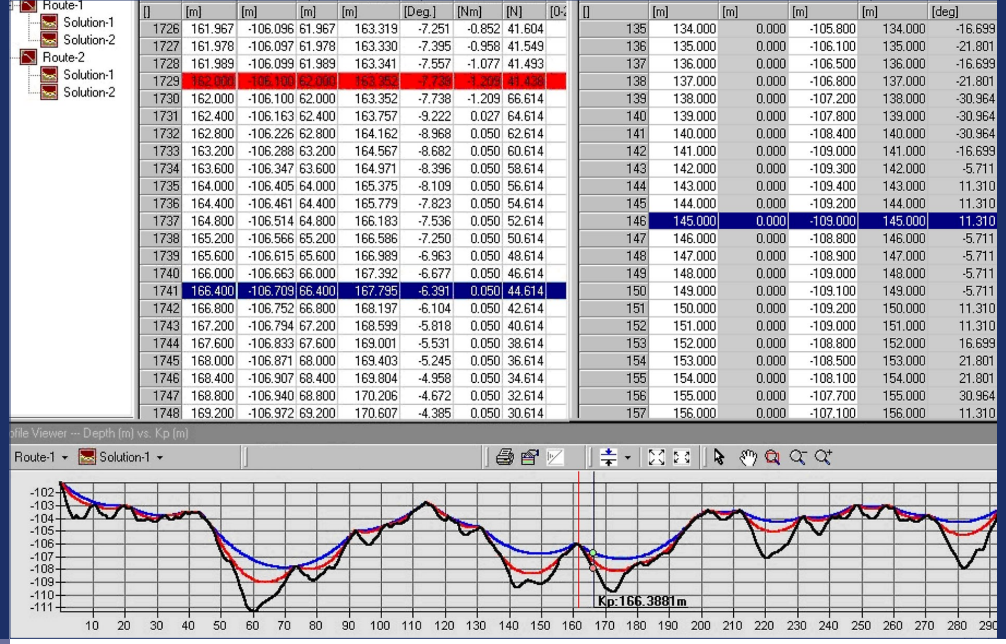
MakaiSpan

Span Analysis Plug-in for Makai Software and Third Party Applications

	Kp	Cum. Cable	Slope	Moment	Shear
	[m]	[m]	[Deg.]	[Nm]	[N]
06.096	61.967	163.319	-7.251	-0.852	41.604
06.097	61.978	163.330	-7.395	-0.958	41.549
06.099	61.989	163.341	-7.557	-1.077	41.493
06.100	62.000	163.352	-7.738	-1.209	41.438
06.100	62.000	163.352	-7.738	-1.209	66.614
06.163	62.400	163.757	-9.222	0.027	64.614
06.226	62.800	164.162	-8.968	0.050	62.614
06.288	63.200	164.567	-8.682	0.050	60.614
06.347	63.600	164.971	-8.396	0.050	58.614
06.405	64.000	165.375	-8.109	0.050	56.614
06.461	64.400	165.779	-7.823	0.050	54.614
06.514	64.800	166.183	-7.536	0.050	52.614



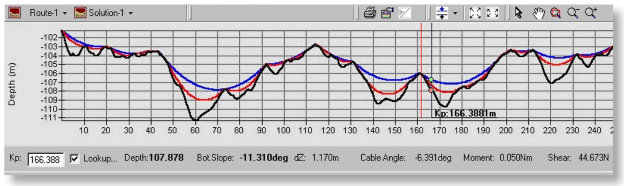
MakaiSpan is a new software engineering tool designed to assist ocean cable and pipeline engineers in calculating an accurate representation of the pipe/cable shape on the seafloor, including:

- the location and length of free spans,
- the reaction forces and bend radii at the seafloor contact points, and
- the induced shear forces and moments along the suspended pipe/cable.

Running on a Microsoft Windows platform, the main computational engine uses bathymetry profiles together with the physical properties of the pipe/cable and the applied horizontal tension, in order to obtain a solution of the pipeline/cable shape along the seafloor. Results are displayed graphically in a 2D view and can be viewed in tabular form as well. Seabed profile data is read from 2D (X,Z) or 3D (X,Y,Z) ASCII data files containing the spatial coordinates and water depth along a specific route. Each profile (track) is automatically assigned an editable route name in the project explorer window. The seabed profile is viewed and it can be edited in the Route Editor window (shown in the figure above).

A 2D Profile Viewer window showing depth vs. distance along the selected Route is shown at the bottom of the screen (selected route is shown as a black line in figure below).

Multiple solutions can be shown simultaneously and each solution can be presented with different line types and colors. Sections of cable/pipe where the length of the spans exceeds the critical span length, defined by the user, are highlighted in red in the Solution Viewer window, (see figure on first page) and by vertical red lines in the profile viewer window (see figure below). The same applies if the bend radius is smaller than the critical value of bend radius defined by the user.



In the figure above, the 2D Profile Viewer shows the route, in black, and two different solutions obtained along the primary route. Both solutions analyze the same cable with the only difference being that the solution in red has a horizontal tension equal to half of that used to obtain the solution in blue. The Kp marker (shown above as a vertical blue line with associated distance) can be used to scroll along the solutions and obtain specific information regarding any point along the suspended pipe/cable. These data are shown in the information bar at the bottom of the window. The Kp marker is also linked to the Route Editor window and to the Solution Viewer window. As the Kp is moved along the profile window (by clicking and dragging the mouse), the Solution and Route Editor windows automatically scroll to the specific Kp row allowing the user to focus on problem areas.

The MakaiSpan module works with:

- **MakaiPlan & MakaiPlan Pro;**
- **MakaiDTM & 3D GridViewer;**
- **and can easily integrate with third-party software applications (contact Makai).**

For more information and pricing, contact Makai Ocean Engineering.

Makai Ocean Engineering
makaispan@makai.com
Phone 1 808.259.8871
Fax 1 808.259. 8238