Temperature, pressure and pre-tension loads on members

The data panel is divided into three sections. The uppermost section has the data group buttons, which further define the type of data to be entered for the current tab. The middle section is comprised of the worksheet area, and the lower section contains additional tool buttons to assist in data entry for the current data group, and also generic worksheet manipulation commands as described in **General commands of the worksheet**

Temperature differences on different faces of a member can induce significant internal forces. These thermal differences can be modeled directly in this worksheet. The variables used to apply thermal loads are:

Temp1:

The temperature difference which results in the longitudinal expansion or contraction. The units of this variable are in [T], i.e. (°) Celsius or Fahrenheit degrees.

Temp2, Temp3:

These variables represent the temperature gradients per unit length in the direction of the local axes (2 and 3 respectively). These factors determine the magnitude of a transverse temperature gradient, which results in a bending about axis 2 or 3. The dimensions of these variables are in [T]/[L], i.e. (°/ft).

Pressure can be applied to members using the following variables:

Pres X, Pres Y, Pres Z:

These variables allow the user to define the pressures that are acting in the three global directions (X, Y, and Z). This option is applicable when a structure is subject to wind or other loads that act as pressures over the different surfaces of the members. Note that for pressure applied in the global axis the engineer can assign a tributary width to the member that is greater than the member width. This is done in the members tab in the connectivity data group.

Pre-tension:

Enter a value to apply a pre-tension force to cables and tensors before loading the structure. This option allows RAM Elements to consider the influence of the initial tension in the deformation and distribution of forces in the structure. This option is generally applied to members defined as tension only cables and tensors. The unit of this variable is [F], i.e. (kip).

Related topics:

Coefficient of thermal expansion in **Entering Material properties**

Tension only members in Hinges