

# Cross section descriptions for FE programs

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September 21, 2017

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## 1 Beam direction

### 1.1 POSEIDON

The  $x$  axis is directed along the beam, coinciding with the center of gravity (neutral axis) from the first node the second. The direction node defines local  $y$  direction. Direction nodes “-1”, “-2”, or “-3” define the local  $y$  direction in global  $x$ ,  $y$ , or  $z$  direction respectively, “-4”, “-5”, or “-6” define the local  $y$  direction in negative global  $x$ ,  $y$ , or  $z$  direction respectively.

### 1.2 Sesam

The  $x$  axis is directed along the beam, coinciding with the center of gravity (neutral axis) and pointing from node “1” to “2”. The GUNIVREC record defines local  $z$  axis.

### 1.3 NASTRAN

The  $x$  axis is directed along the beam, coinciding with the shear center and pointing from node “A” to “B”. G0, or X1, X2, and X3 describe local  $y$  axis.

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## 2 Describing beam cross sections in POSEIDON, Sesam, and Patran

### 2.1 Flat bar

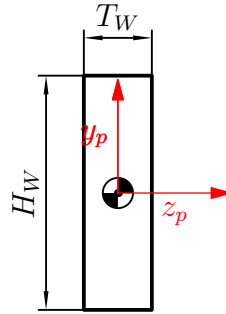


Figure 1: **FB**: Cross section dimensions in an POSEIDON flat bar.

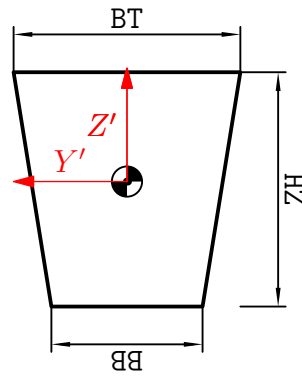


Figure 2: **GBARM**: Cross section dimensions in Sesam massive bar.

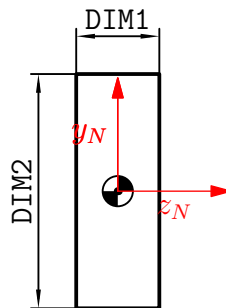


Figure 3: **FB**: Cross section dimensions in a NASTRAN flat bar.

## 2.2 L bar

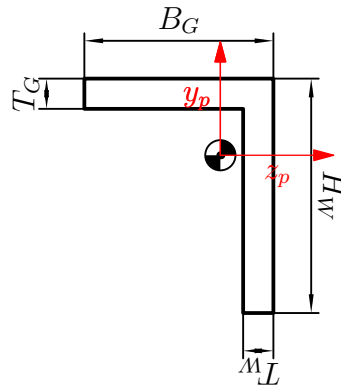


Figure 4: **L**: Cross section dimensions in a POSEIDON L profile section.

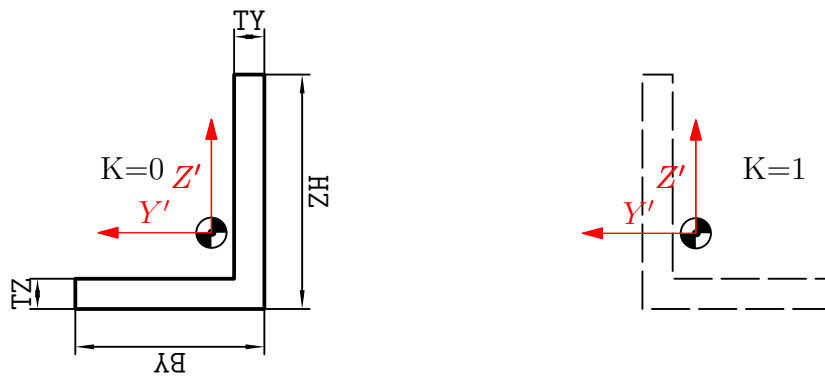


Figure 5: **GLSEC**: Cross section dimensions in a Sesam L profile section.

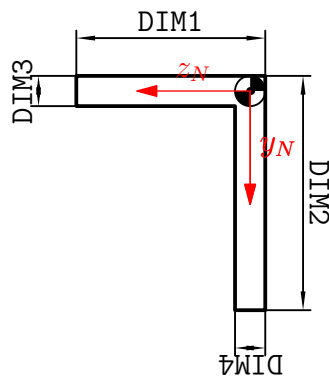


Figure 6: **L**: Cross section dimensions in a Nastran L profile section.

### 2.3 T beam

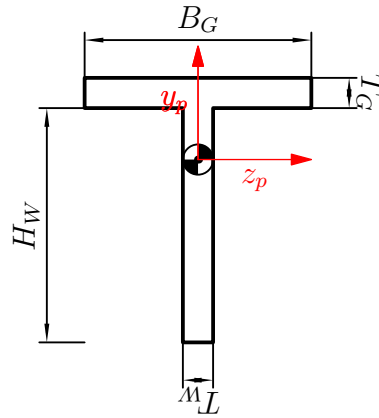


Figure 7: **T**: Cross section dimensions in a Poseidon T profile section.

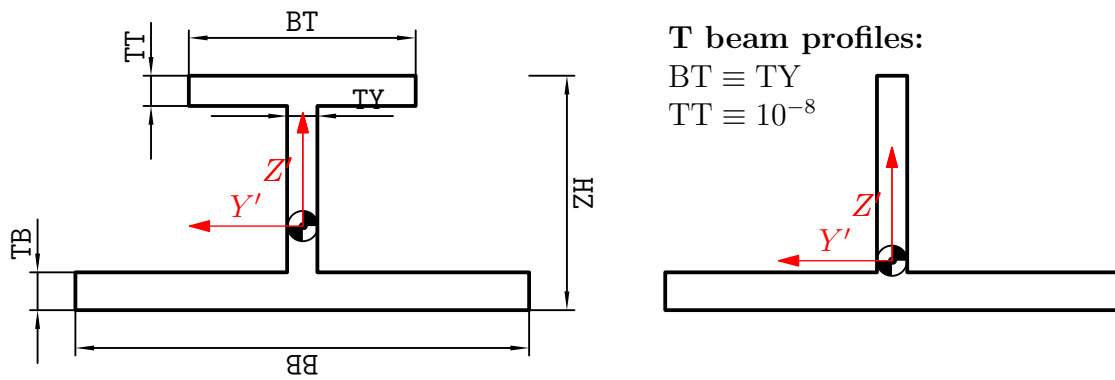


Figure 8: **GIORH**: Cross section dimensions in a Sesam GIORH profile section (used to model T sections).

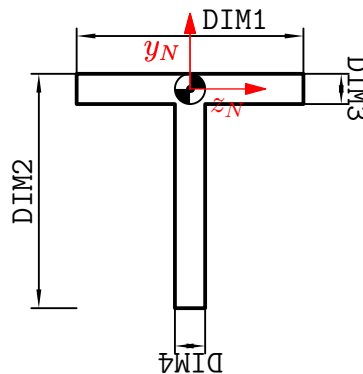


Figure 9: **T**: Cross section dimensions in a Nastran T profile section.

## 2.4 HP profile

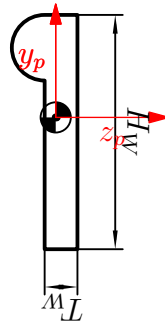


Figure 10: **HP**: Cross section dimensions in a POSEIDON HP profile section.