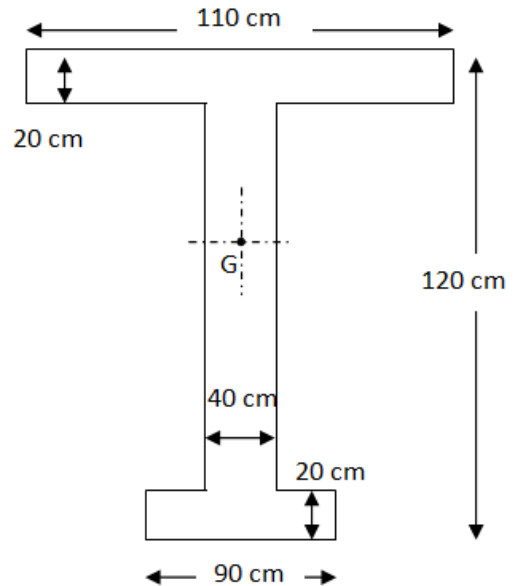


Tutoriel: Prestressed Concrete : Chapter 3

Exercise 1:

A simply supported beam of T-shape is shown in the figure below; determine the following geometric characteristics:

1. The area of section (B)
2. static moment (S)
3. The distance from the upper fiber (y_s) and the distance from the lower fiber (y_i)
4. The moment of inertia (I)
5. The resistance modulus (Z)
6. The radius of gyration (i)
7. The yield of the section (ρ)



Exercise 2:

A. Consider a section with the following characteristics:

Height $h = 130$ cm; surface area $A = 0.5$ m²; static moment $S_{\Delta} = 0.22$ m³; moment of inertia $I_{\Delta} = 0.19$ m⁴.

Determine the characteristics of the gross section:

1. Distance from the upper fiber y_s [m]
2. Distance from the lower fiber y_i [m]
3. Moment of inertia about the center of gravity I_G [m⁴]
4. Section yield ρ

B. This section comprises 6 ducts with a diameter of 65 mm, located respectively 110 mm and 320 mm from the lower fiber. The center of gravity of the ducts is 1.085 m from the upper fiber.

Determine the characteristics of the net section:

1. Area of section B_n [m²]
2. Static moment $S_{n\Delta}$ [m³]
3. Distance from the upper fiber y_s [m]
4. Distance from the lower fiber y_i [m]
5. Moment of inertia relative to the axis " Δ " $I_{n\Delta}$ [m⁴]
6. Moment of inertia about the center of gravity I_n [m⁴]
7. Section yield ρ_n

