Force Calculations Team 9

Sketch of our beam is at the end of the two pages.

# To find max Bending moment using Bending Stress calculation

Bending stress =

σ=

=

=

=4400Nm

# To find max force using previously calculated bending moment

Max Force=

Fmax =

=

Fmax = 7.213 kN

σ=44MPa was given to us in lab.

All other measurements where either calculated or taken directly from beam.

# Calculation of mass to weight ratio

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Part No. | Amount | Width | Height | Thickness | Volume Total  (Columns 2-5 multiplied) |
| 1 | 2 | 1.22m | 0.094m | 0.003m | 0.00068808m3 |
| 2 | 2 | 1.22m | 0.06m | 0.003m | 0.0004392m3 |
| 3 | 11 | 0.054m | 0.094m | 0.003m | 0.00016751m3 |
| 4 | 10 | 0.094m | 0.12m | 0.003m | 0.0003384m3 |

Therefore Total Volume of all pieces by density = mass of beam

Total of all volumes = 1.633x10-3 m3

Density given in class = 800kg/m3

Mass = 1.307kg

Force : Mass

7.213kN : 1.307kg

5.519kN : 1.000kg

# Design of beam

