
Rumah idaman bagi mereka yang bijak memilih.
2.5KM
3-8926 7500

Problem

input

- uniformly distributed loading
- loading ⇔ Support reaction force
- balancing equilibrium
- weight
- shear stress

young modulus

loading - air resistance

process

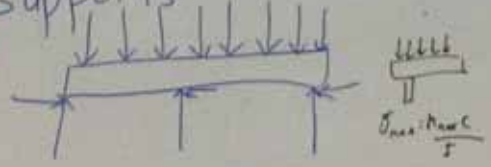
- Bending Moment along the length of support ($M = d \times f$)

$E = \frac{\sigma}{\varepsilon}$

load distribution

- assumptions - find reaction forces on the supports

load balance



Output

$E_{steel} \leq 200$ GPa

- if the bad large surface exceeds the area of air resistance reaction supports, there is a tendency for the support to crack (Deformation) Bending
- design the support of billboard, so that the reaction forces support the load

use stucco

Design

input

- Loading
  - Air resistance
- ✗ Dimension
- ✗ color
- ✗ cost
- ✗ material type
- -stability
  - - max load
  - - max stress
  - -type of material ✗

process

$\Sigma M_o = 0$

$W = mg$

$\sigma_{max} = \frac{Mc}{I}$ ✓

$M = Fd$ - moment

$I = \frac{bH^3}{12}$ - moment of inertia

$\epsilon = \frac{\Delta}{L}$ - strain

poisson ratio $= -\frac{\epsilon_{lat}}{\epsilon_{axial}}$

$E = \frac{\sigma}{\epsilon}$ - young modulus

$\sigma = \frac{P}{A}$ — stress

$I = \frac{\pi}{4} c^4$

output

- steel material ($E = 200 GPA$)
- weather shield paint
- shape
- $\sigma_{yielding} = 250$ MPa

Dimension

cost

Problem

Input (What is required, independent variables)	Process (Descriptions, formula, analysis)	Output (Expected results, dependent variables)
Loading Geometries Type of material Boundary conditions	Hooke's Law Torsion Shear and moment diagrams Flexure formula Bending stress Moment of inertia, moment of area Stress concentrations Shear formula Combined loading Pressure vessels Beam slope and deflection Plane stress transformation Mohr's circle Strain transformation Buckling of column Energy methods	Deformation – displacement, strain Stresses

Design

Input (What is required, independent variables)	Process (Descriptions, formula, analysis)	Output (Expected results, dependent variables)
Loading Maximum strength Yield stress Allowable stress Safety factor	Hooke's Law Torsion Shear and moment diagrams Flexure formula Bending stress Moment of inertia, moment of area Stress concentrations Shear formula Combined loading Pressure vessels Beam slope and deflection	Geometries Type of material

	Plane stress transformation Mohr's circle Strain transformation Buckling of column Energy methods	