

# Design & Beam Analysis using SAP2000

- WD = 20 K/ft, WL = 60 k/ft, Fy = 60 Ksi, fi' = 4 ksi.

## Steps:

- Unit = Kft-f
- New model = Beam.
  - span = 2.
  - Modify x1 =0.
  - x2=20.
  - x3 = 45.
- Option > Preference
  - concrete code = ACI 2003.

## Define:

Define > Material Create, Modify fy = fys = 60 Ksi, fi' = 4 ks

- Define > Frame sections.
  - Add rectangular section.
  - Name = B 15 \* 12.
  - Depth = 15m.
  - width = 12" Reinforcement, click Beam bottom.
  - Clear cover top = Bottom = 2.5"
- Define> load cases, add live load.
- Define > add default combo. Check concrete & convert to user editable boxes.
- Select beams

## Assign:

Assign > frame

- Frame section.
- select B15\* 12.

- Select > get previous select.
- Assign > frame load
  - Distributed.
  - Load cases = dead.
  - Load = 0.02.
- Select > get previous select
- Assign > frame load
  - Distributed.
  - Load case = live.
  - Load= 0.0 6
- Analyze > analysis case. x-z plane
- Save model.

## Analysis:

### Analyze > Run analysis.

- Select model.
- Click do not run.
- Click "Run".
- Design > deformed shape, select DCON2.
- Display > show forces/stress.
  - Select UDCON2,
  - select F22, it gives such values.
  - Uncheck fill,
  - check show values.
- Display > show forces/stresses,
  - select m<sup>3</sup>3. It gives banding moment values.
- By clicking right button of mouse on any member, a window opens showing full details of shear, moment & deflation of that member.
- Display > show forces/stress
  - Joints.
  - Select UDCON2, this gives Joint reaction.