

Estimation & Costing (DI04006021)

Lecture 22: BBS for Beams and Lintels

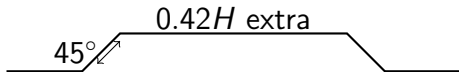
Reinforcement in Beams

Beams usually have:

- ① **Main Straight Bars:** At the bottom.
- ② **Bent-up (Crank) Bars:** Bent near supports to resist shear.
- ③ **Anchor / Top Bars:** To hold stirrups.
- ④ **Stirrups:** Shear reinforcement.

Cutting Length of Bent-up Bar

- A bar bent at 45° increases in length by $0.42H$, where H is the depth between top and bottom reinforcement.
- **Total Length** = Clear Span + 2(Bearing) - 2(Cover) + 2(Hooks) + (No. of cranks $\times 0.42H$).



Cutting Length of Stirrups

- For a rectangular beam of size $B \times D$, let a and b be the inner dimensions of the stirrup.
- $a = B - 2(\text{cover})$
- $b = D - 2(\text{cover})$
- **Cutting Length** = $2(a+b) + \text{Hook length (approx. } 24d \text{ for two } 135^\circ \text{ hooks)} - \text{Bend deductions.}$