Training on Frames
Structure & Reinforcement

Example.

① Calculate the Reactions & Draw Internal Forces Diagrams.
② Determine the critical sections in Bending & Shear For the Frame.
③ Draw Main RFT. only, making curtailment of steel using Moment of Resistance.
Draw Main RFT. & Blocks of moment of Resistance.
Calculate the Reactions & Draw Internal Forces Diagrams.

2. Determine the critical sections in Bending & Shear For the Frame.

3. Draw Main RFT. only, making curtailment of steel using Moment of Resistance.
Training on Frames
Example.

2. Determine the critical sections in Bending & Shear For the Frame.
3. Draw Main RFT. only, making curtailment of steel using Moment of Resistance.

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I.F.D.

B.M.D.

N.F.D.

S.F.D.

Training on Frames
Draw Main RFT. & Blocks of moment of Resistance.
Calculate the Reactions & Draw Internal Forces Diagrams.
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Training on Frames
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Training on Frames
Example.

2. Determine the critical sections in Bending & Shear For the Frame.
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I.F.D.

B.M.D.

N.F.D.

S.F.D.

Training on Frames
Page No. 22
Draw Main RFT. & Blocks of moment of Resistance.
Calculate the Reactions & Draw Internal Forces Diagrams.
Determine the critical sections in Bending & Shear For the Frame.
Draw Main RFT. only, making curtailment of steel using Moment of Resistance.
Draw Main RFT. & Blocks of moment of Resistance.
Training on Frames
**Example.**

2. Determine the critical sections in Bending & Shear For the Frame.
3. Draw Main RFT. only, making curtailment of steel using Moment of Resistance.
Draw Main RFT. & Blocks of moment of Resistance.
2. Determine the critical sections in Bending & Shear For the Frame.
3. Draw Main RFT. only, making curtailment of steel using Moment of Resistance.

\[ X_2 = 212.7 \text{ kN} \]

\[ X_2 = 212.7 \text{ kN} \]
Example.

2. Determine the critical sections in Bending & Shear For the Frame.
3. Draw Main RFT. only, making curtailment of steel using Moment of Resistance.
3) Draw Main RFT. & Blocks of moment of Resistance.
Example.

2. Determine the critical sections in Bending & Shear For the Frame.
3. Draw Main RFT. only, making curtailment of steel using Moment of Resistance.

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I.F.Ds

B.M.D.

N.F.D.

S.F.D.

Training on Frames
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Example.

Calculate the Reactions & Draw Internal Forces Diagrams.
Determine the critical sections in Bending & Shear For the Frame.
Draw Main RFT. only, making curtailment of steel using Moment of Resistance.
Draw Main RFT. & Blocks of moment of Resistance.
Training on Frames
Example.

2. Determine the critical sections in Bending & Shear For the Frame.
3. Draw Main RFT. only, making curtailment of steel using Moment of Resistance.

\[ X_1 = 0.302Y_1 \]
\[ X_2 = 0.081Y_2 \]

\[ X_1 = 212.4 \text{ kN} \]
\[ Y_1 = 703.1 \text{ kN} \]
\[ X_2 = 12.4 \text{ kN} \]
\[ Y_2 = 153.1 \text{ kN} \]
Draw Main RFT. & Blocks of moment of Resistance.
Training on Frames
1. **Draw Internal Forces Diagrams.** (*max–max B.M.D.*)
2. Determine the critical sections in Bending & Shear For the Frame.
3. **Draw Main RFT.** only, making curtailment of steel using Moment of Resistance.

### Example

- $W = 30 \, \text{kN}$
- $G = 30 \, \text{kN}$
- $P = 20 \, \text{kN}$
- $g = 6.0 \, \text{kN/m}$
- $w = 30 \, \text{kN}$
- $c = 40 \, \text{kN}$
- $p = 30 \, \text{kN}$
- $g = 10 \, \text{kN/m}$
- $p = 15 \, \text{kN/m}$

**Statical System**
I.F.D.

Case ①

D.L.  T.L.

30 kN  30 kN

70 kN  70 kN  70 kN  70 kN

W = 30 kN
wind

30 kN

310 kN

270 kN

B.M.D.

112.5

112.5

22.5

157.5

180

540

487.5

N.F.D.

30

310 75

310 270

(-)  (-)

(-)  (-)

(--)

(--)

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Critical sections فقط لتحديد أماكن ال max–max B.M.D. و ليس لتصنيح ال Frame و لكن لتصنيح ال Frame نصلح على أي حاله تحميل أولا ثم نكمل باقي التشريحة على حاله التحميل الأخرى.