

JOB TITLE Castle Inn, Hickstead			ITEM Structural calculations		
DESIGNED BY GM	DATE Mar 25	CHECKED BY	JOB NO. 24283	SHEET 07	REV

STAIR BEAMS

BEAM 1 SIDE OF LANDING DESIGN SPAN = 4.2m

FLOOR/STAIR LOAD = $\frac{4}{2} \times 4.5 = 9 \text{ kN/m}$

WALL = $2.5 \times 0.5 = 1.25 \text{ kN/m}$

SW = 0.35 kN/m

TOTAL = 10.6 kN/m u.s.

BM = $10.6 \times \frac{4.2^2}{8} = 23 \text{ kNm}$ x/f = 36 kNm - u.s.

Req. $\frac{5 \times 10.6 \times 4200^3 \times 360}{384 \times 205 \times 10^3} = 1796 \times 10^4 \text{ mm}^4$

6:5 PROVIDE 203 x 133 x 30 UB M: 39 kNm

BEAM 2 2.4m DESIGN SPAN

$R_1 = 10.6 \times \frac{4.2}{2} = 22 \text{ kN}$

FLOOR LOAD = $\frac{1.5}{2} \times 4.5 = 3.4 \text{ kN/m}$ } 3.75 kN/m

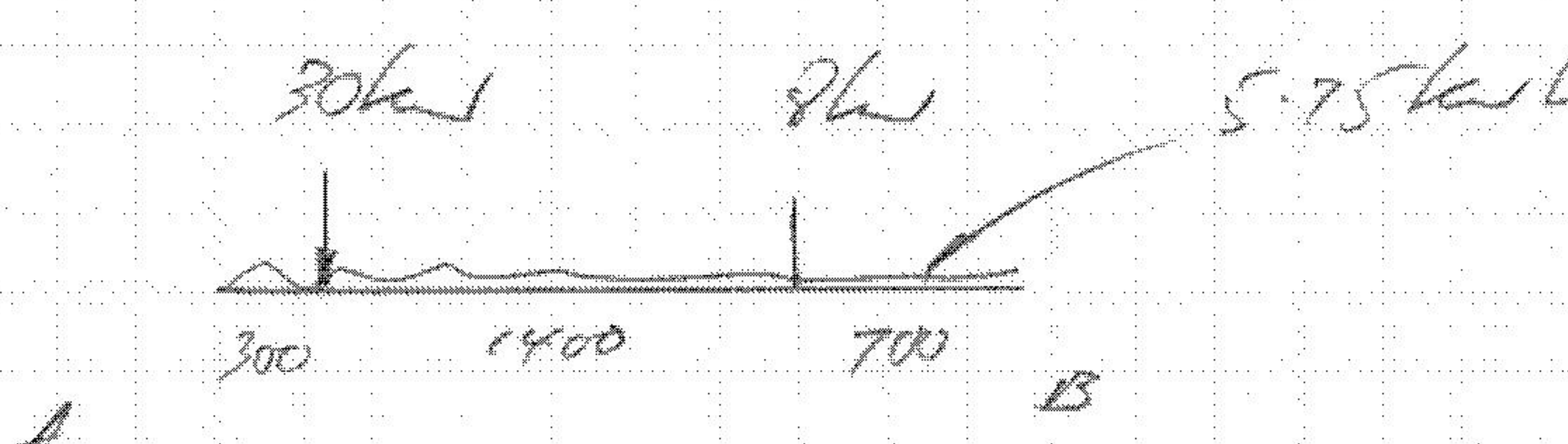
SW = 0.35 kN/m }

PER ABUT

SW = $0.4 \times 2.5 \times 4 = 4 \text{ kN}$ } 8 kN

ROOF = $\frac{5.3}{2} \times 1.5 \times 1.9 = 4 \text{ kN}$ }

+ BRICK = $0.5 \times 4 = 2 \text{ kN}$



30kN 8kN 5.75kN

300 1400 700 A B

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$$R_1 = \frac{1}{2.4} (30 \times 2.1 + 8 \times 0.7 + \frac{5.75 \times 2.4^2}{2}) = 35 \text{ kN}$$

$$R_2 = 17 \text{ kN}$$

$$x = \frac{35 - 30}{5.75} = 0.9 \text{ m}$$

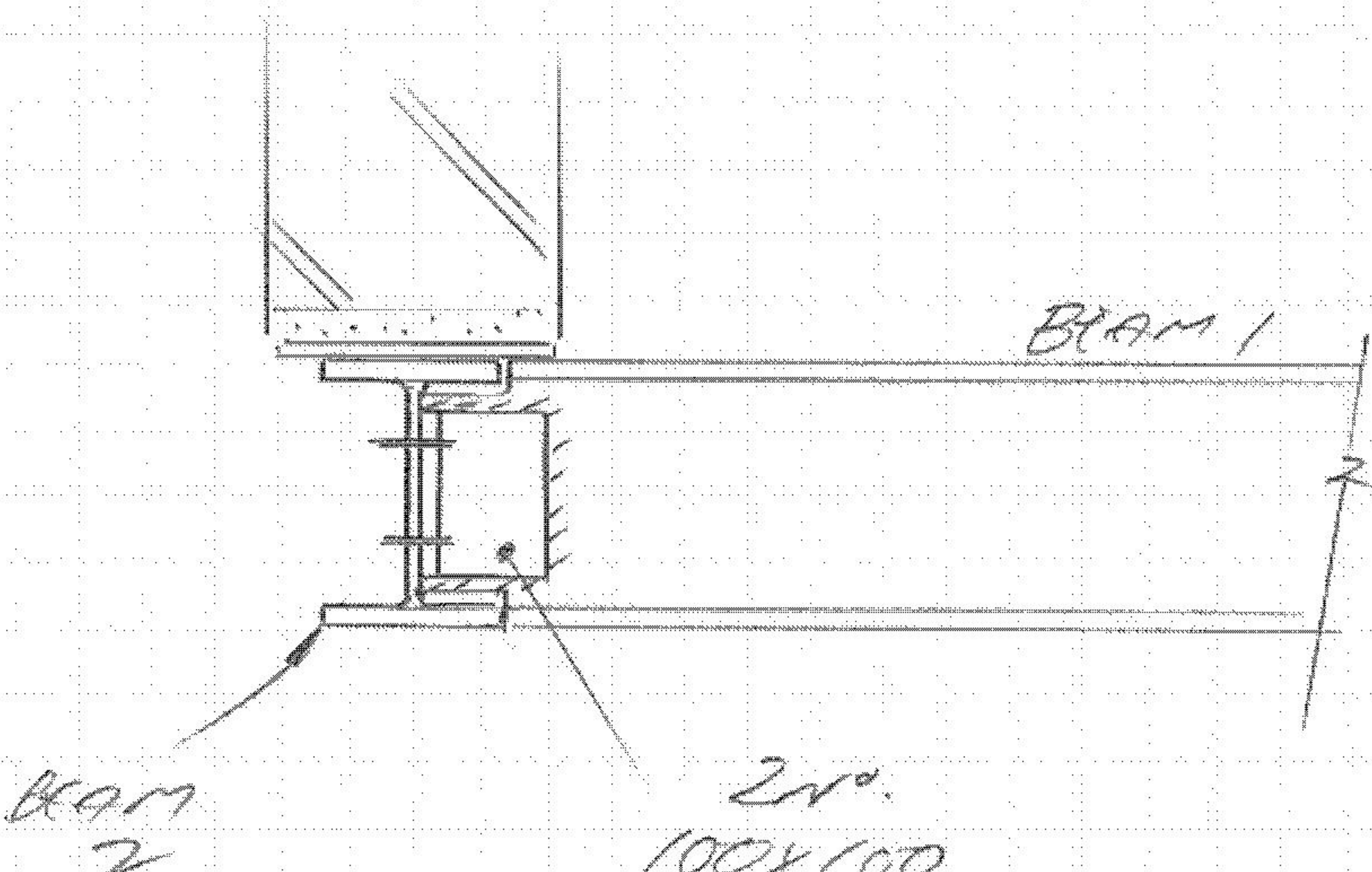
$$BM = 35 \times 0.9 - \frac{5.75 \times 0.9^2}{2} - 30 \times 0.6 = 11.2 \text{ kNm}$$

$$w_{equiv} = \frac{11.2 \times 8}{2.4^2} = 15.5 \text{ kNm}$$

$$I_{eq} = 492 \times 10^4 \text{ mm}^4$$

$$l = 3 \text{ m}$$

PROVIDE 203 x 133 x 30 UB



PADSTONE

$$AREA = \frac{35 \times 11.3 \times 1.58 \times 35}{4.1 \times 1.58}$$

$$= 29878 \text{ mm}^2$$

∴ MIN. 330mm LONG CONCRETE PADSTONE.

2 NO.
 100x100
 ANGLE
 CLEATS
 + 4 NO. M16
 BOLTS