

(제7공구)  
대동 JCT 본선2교 강재동바리 한치부 구조 검토

tonf := 1000kgf

【 사 용 부 재 】

$$\square = -200 \times 80 \times 7.5 / 11T$$

$$A := 31.33\text{cm}^2$$

$$W_{\text{unit}} := 24.6 \frac{\text{kgf}}{\text{m}}$$

$$I := 1950\text{cm}^4$$

$$Z := 195\text{cm}^3$$

【 하 중 계 산 】

$$\gamma_1 := 24000 \frac{\text{N}}{\text{m}^3} = 2.447 \times \frac{\text{tonf}}{\text{m}^3}$$

$$\gamma_2 := 3750 \frac{\text{N}}{\text{m}^2} = 0.382 \times \frac{\text{tonf}}{\text{m}^2}$$

$$\gamma_3 := 400 \frac{\text{N}}{\text{m}^2} = 0.041 \times \frac{\text{tonf}}{\text{m}^2}$$

$$t_1 := 0.9\text{m}$$

$$t_3 := 1.3\text{m}$$

$$t_2 := t_1 + \frac{t_3 - t_1}{1.33} \times (0.44 + 0.45) = 1.168\text{m}$$

$$w_1 := \gamma_1 \times t_1 + \gamma_2 + \gamma_3 = 0.026 \times \text{MPa}$$

$$w_1 = 2.626 \times \frac{\text{tonf}}{\text{m}^2}$$

$$w_1 = 0.026 \times \frac{\text{N}}{\text{mm}^2}$$

$$w_2 := \gamma_1 \times t_2 + \gamma_2 + \gamma_3 = 0.032 \times \text{MPa}$$

$$w_2 = 3.281 \times \frac{\text{tonf}}{\text{m}^2}$$

$$w_3 := \gamma_1 \times t_3 + \gamma_2 + \gamma_3 = 0.035 \times \text{MPa}$$

$$w_3 = 3.605 \times \frac{\text{tonf}}{\text{m}^2}$$

【 해석 모델링 】

$$0.44\text{m} = 440 \times \text{mm}$$

$$0.44\text{m} + 0.45\text{m} = 890 \times \text{mm}$$

$$0.44\text{m} + 0.45\text{m} + 0.44\text{m} = 1330 \times \text{mm}$$

$$-0.25\text{m} = -250 \times \text{mm}$$

$$-0.25\text{m} + 0.083\text{m} = -167 \times \text{mm}$$

$$-0.25\text{m} + -0.15\text{m} = -400 \times \text{mm}$$

【 해석 결과 】

【 단 면 응 력 검 토 】

$$\sigma_{ba} := 1.0 \times 1400 \frac{\text{kgf}}{\text{cm}^2} = 1400 \times \frac{\text{kgf}}{\text{cm}^2} \quad : \text{구조용 강재의 허용 휨응력}$$

$$\sigma_{ba} = 137.293 \times \text{MPa}$$

$$\tau_b := 1.0 \times 800 \frac{\text{kgf}}{\text{cm}^2} = 800 \times \frac{\text{kgf}}{\text{cm}^2} \quad : \text{구조용 강재의 허용 전단응력}$$

$$M := 0.35\text{tonf} \times \text{m} \times 1.1 = 0.385 \times \text{tonf} \times \text{m} \quad : \text{H-700 Beam 간격 1.1m 보정}$$

$$P := 7.77\text{tonf} \times 1.1 = 8.547 \times \text{tonf}$$

$$\sigma := \frac{P}{A} + \frac{M}{Z} = 46.115 \times \text{MPa}$$

【 볼 트 응 력 검 토 】

$$P := \sqrt{(2.35\text{tonf})^2 + (7.46\text{tonf})^2} = 7.821 \times \text{tonf}$$

$$P := P \times 1.1 = 8.604 \times \text{tonf}$$

$$P = 84.372 \times \text{kN}$$

F8T 볼트  $\phi 22\text{mm}$  사용의 경우

$$P_a := 39\text{kN} = 3.977 \times \text{tonf}$$

$$P_a := P_a \times 2 = 7.954 \times \text{tonf}$$