

영동대교 기둥 조절을 통한 최저 비용 설계

Contents

I. AOD Company

II. Project

III. Motive

IV. Formulation

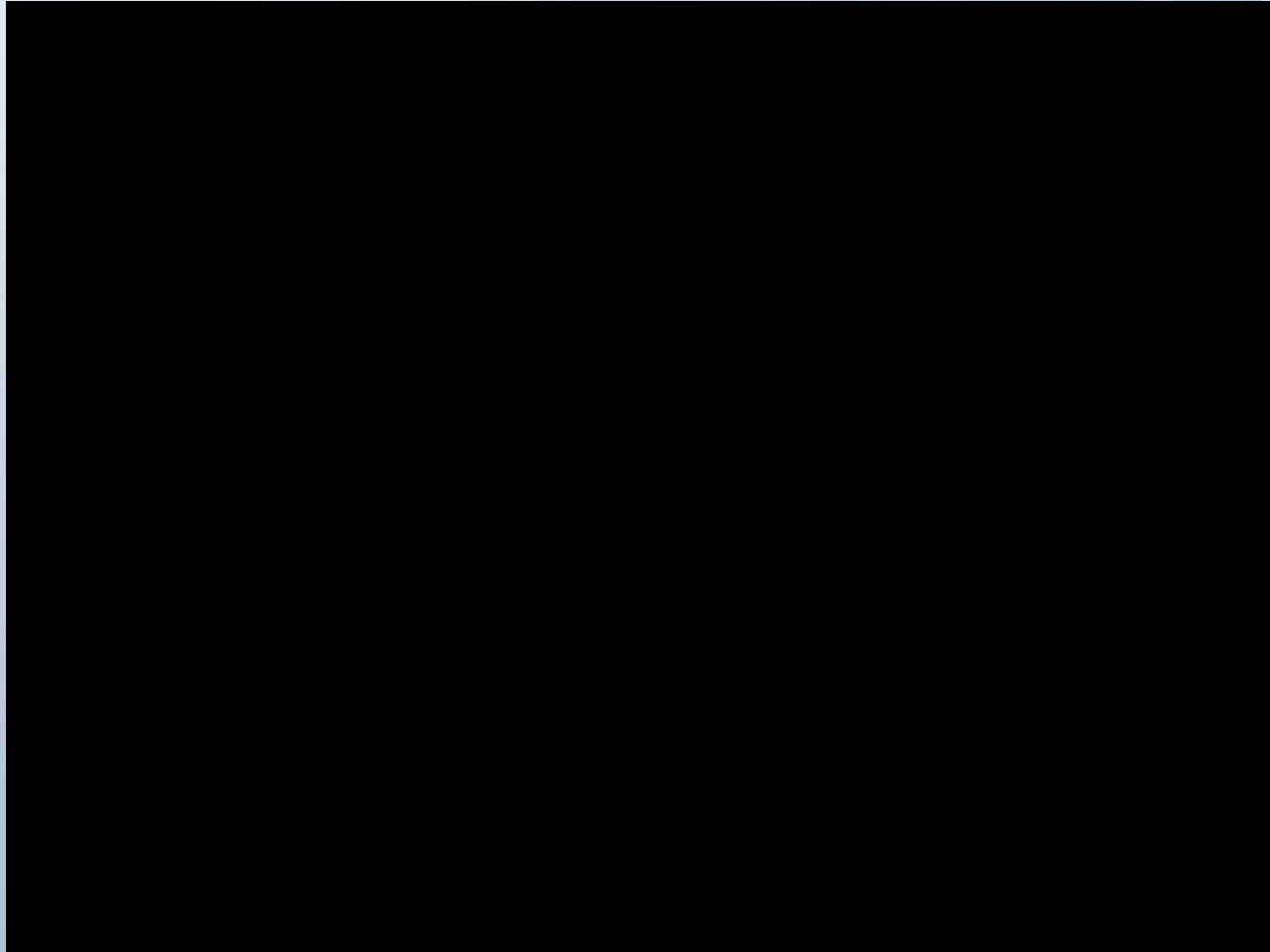
V. Conclusion

A close-up photograph of two hands shaking in a firm grip, symbolizing trust and agreement. The hands are positioned in the center of the frame, with the fingers interlaced. The background is a soft, out-of-focus blue and white, suggesting a professional or business setting. The lighting is bright, highlighting the texture of the skin and the details of the handshake.

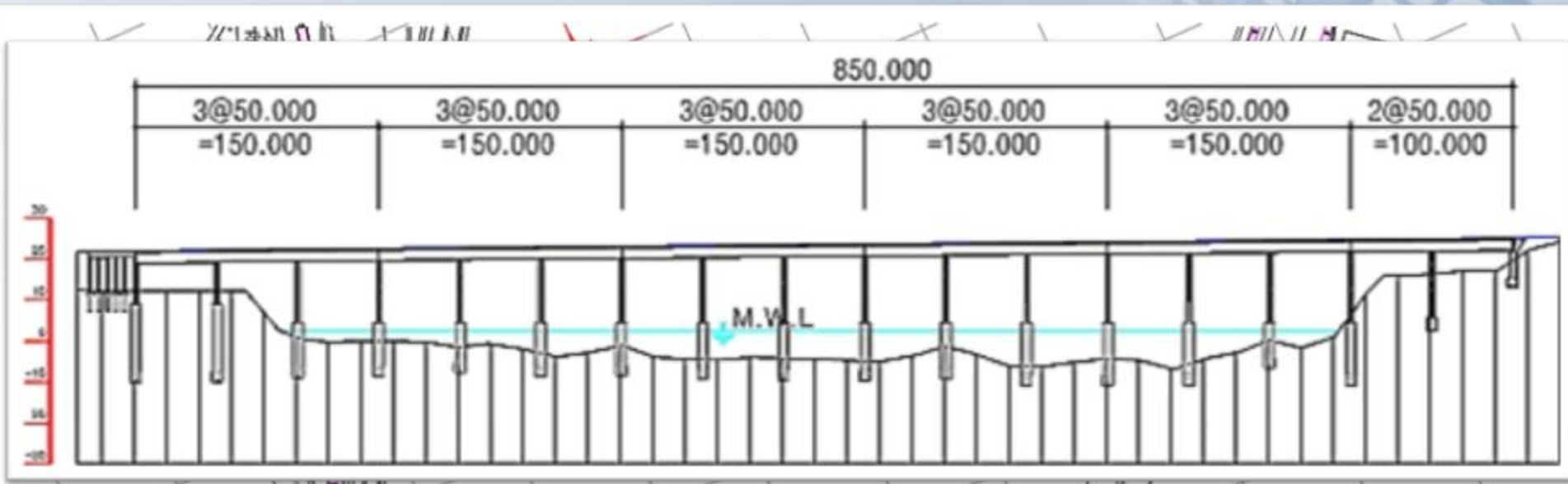
Acme of Optimum Design

Trust! AOD Company!

Motive

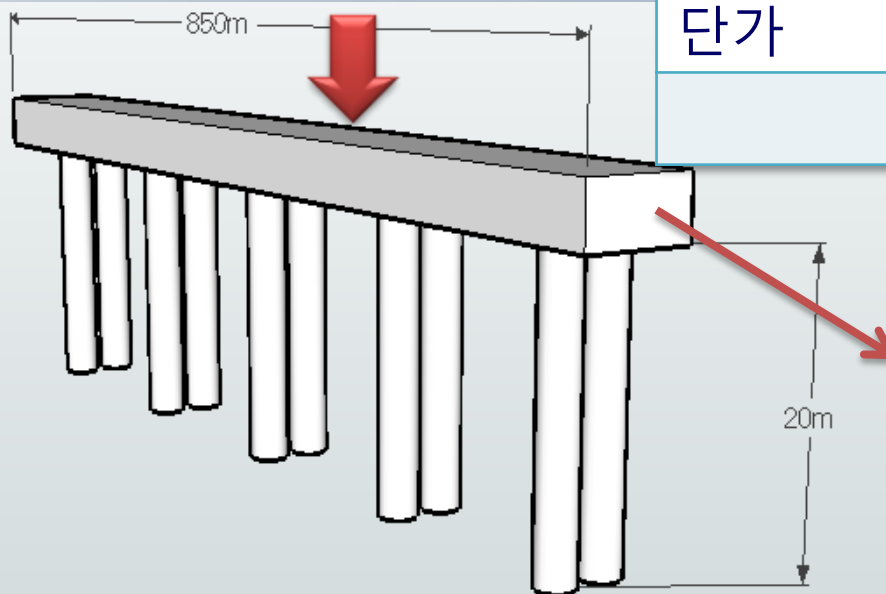


Formulation



Data and information collection

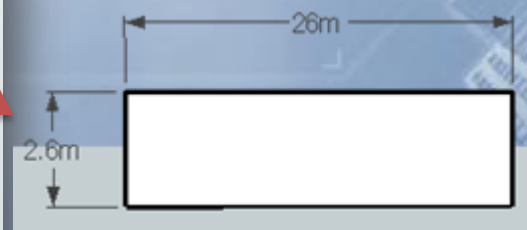
432kN



철근 콘크리트

밀도	$2500\text{kg} / \text{m}^3$
탄성계수	$3300\sqrt{f_{ck}} + 7700\text{MPa}$
최저 설계 기준 강도	35MPa
단가	$236900 \text{ 원} / \text{m}^3$

(도로교 설계기준, 2005-건설교통부)



Formulation

▶ Design variables

- ▶ 기둥 반지름 : r
- ▶ 기둥 간격 : a

▶ Criterion

$$f = c_m (n_1 \cdot \pi r^2 h_1 + n_2 \cdot \pi r^2 h_2)$$

(c_m : 재료가격 , n_i : 기둥개수 , h_i : 기둥높이)

Constraints

▶좌굴

$$F_i \leq P_{cr,i} = \frac{\pi^2 EI}{L_{e,i}^2} \quad (i=1,2)$$

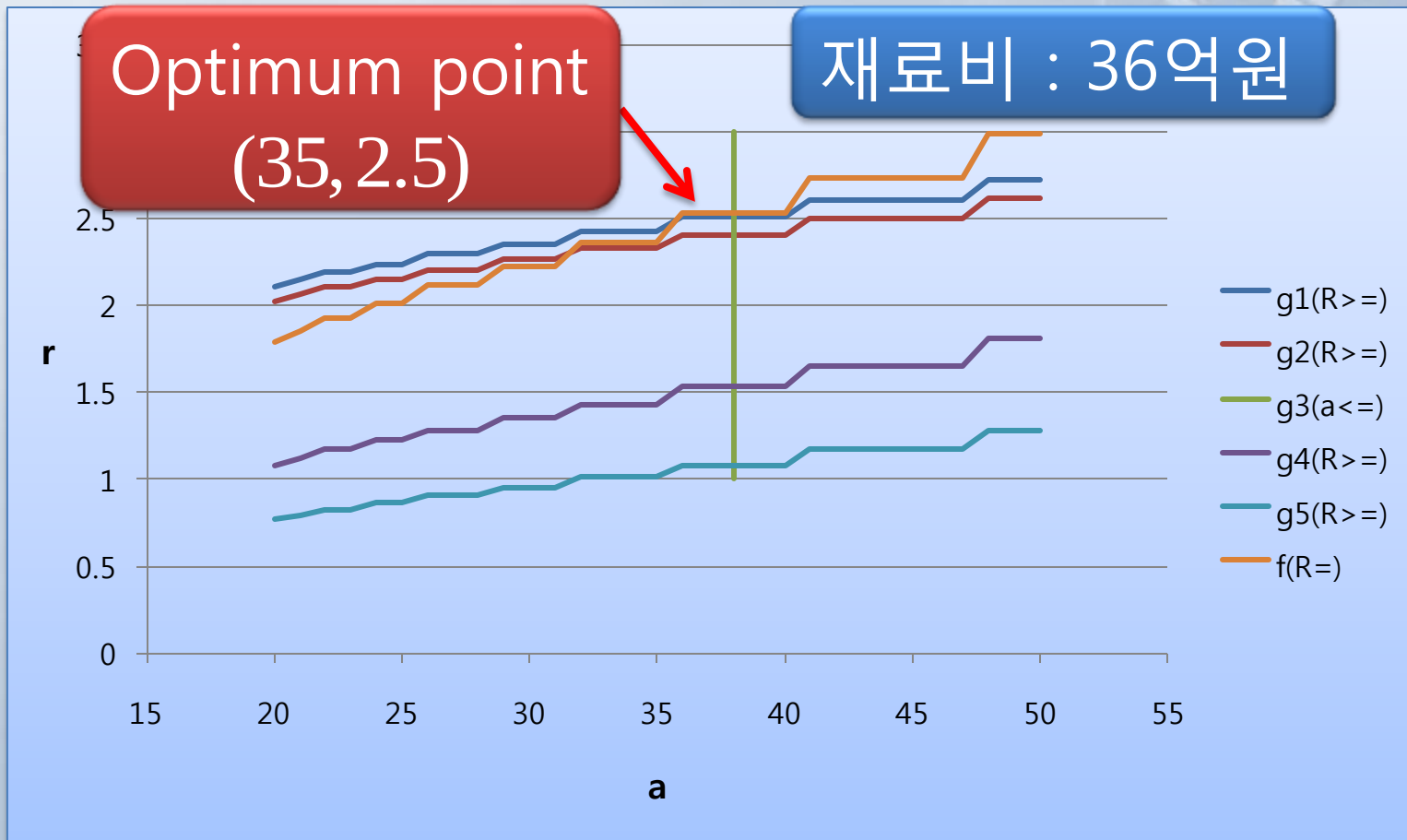
▶압축 응력

$$\sigma_i = \frac{((2/3)F) / n_i}{A} \leq \sigma_a \quad (i=1,2)$$

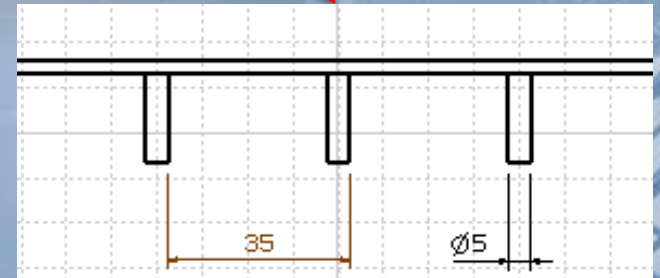
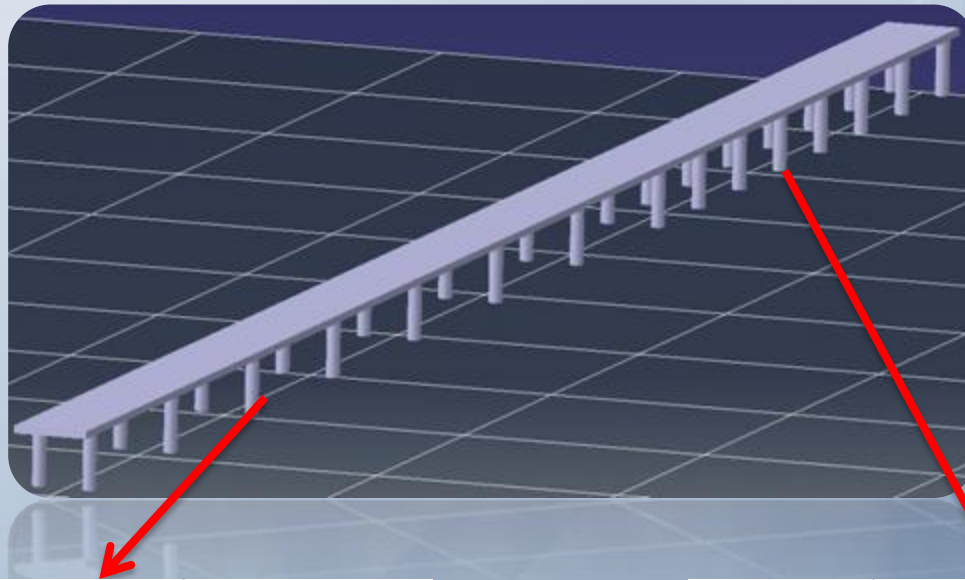
▶처짐

$$\delta_1 = \frac{5w(2a)^4}{384EI} \leq \frac{2a}{800} \quad (w = F / L)$$

Conclusion



Conclusion



Q&A

감사합니다

