

점검통로 구조검토서

2015. 11.

(주) 건 교 산 업

§1. 검토목적

공용중에 있는 교량의 교대, 교각부 점검시설은 상판하부, 주형받침, 교대를 유지관리 작업시 작업원의 안전을 확보하기 위함. 교각부 균열, 파손 등의 점검과 유지관리 및 보수작업의 효율성을 제고하기 위해 설치하는 것으로 점검통로 구조적 안전성 검토

§2. 설치조건

구분	설치조건	점검대상	비고
교대부	·교량 하부조건이 앞채움 성토가 없는 교대로 별도의 장비없이는 접근관찰이 곤란한 경우	·교대측 상판하부, 주형받침, 교대의 균열, 파손등 점검 및 유지보수	
점검시설	·교고(주형하단부터 지면, 수면, 노면 등 까지의 거리)가 7m 이상인 경우⇒매 교각마다 설치	·교대측 상판하부, 주형받침, 교대의 균열, 파손등 유지보수	
교각부	·교고가 7m 미만이라도 별도의 장비설치시 하부 도로를 점유하거나 고속도로 교통소통에 지장을 초래할 경우 ⇒설치를 요하는 교각에 적용		
점검시설	·신축이음 장치가 있는 교각⇒일상 점검이 가능토록 교고에 제한을 받지 않고 설치		

※ 단, ① 교량 점검시설로 인하여 하부 주행차량에 지장을 줄 경우에는 현장여건을 감안하여 제외할 수 있다.

② 연장이 긴 장대교는 경제성, 시공성, 유지관리 측면에 대하여 이동식 점검시설과 설치 타당성을 비교 검토하여 설계에 반영

※ 점검시설 설치조건은 한국도로공사 유지관리시설 설계기준에 의한 것임.

§3. 설계조건

1. 구조형식 : 교대, 교각 점검대용 난간
2. 설계방법 : 허용응력 설계법
3. 설치간격 : 1.500m
4. 설계하중
 - 1) 고정하중 : 사용부재 단위중량적용
 - 2) 활하중

구 분	설 계 조 건	비 고
바닥판(보도)	▪ 보도 등에 작용시키는 설계활하중은 $3.5 \times 10^{-3} MPa$ 로 한다.	▪ 도로교 설계기준 (한국도로교통협회) - P. 2-3 ▪ 도로설계요령 (한국도로공사) - P. 349 ▪ 도로설계실무편람 (한국도로공사) - P. 770
난 간	▪ 난간의 설계하중은 수직하중 600N/m, 수평하중 400N/m를 난간상단에 작용시키는 것으로 한다.	
출입사다리	▪ 사다리에 작용하는 설계활하중은 집중하중으로 고정하중 1kN/인이 2.1m간격으로 걸려있는 것으로 한다.	

5. 사용재료

1) 알루미늄합금

(1) 재 질 : A6063S - T5 - KSD 6759 P 9 참조

(2) 물리상수

- 인장강도(f_u) = 150MPa
- 항복강도(f_y) = 110MPa
- 단위중량(γ) = 2800kg/m³

(3) 허용응력도

- 축방향 인장응력(f_{ta}) = 60MPa
- 축방향 압축응력(f_{ca}) = 60MPa
- 휨 응 력(f_a) = 60MPa
- 전단응력(v_a) = 35MPa
- 지압응력(f_{ba}) = 100MPa

2) Stainless Steel

(1) 재 질 : STS304 - KSB 0241 P 7 참조

(2) 물리상수

- 인장강도(f_u) = 500MPa
- 항복강도(f_y) = 210MPa
- 단위중량(γ) = 7850kg/m³

(3) 허용응력도

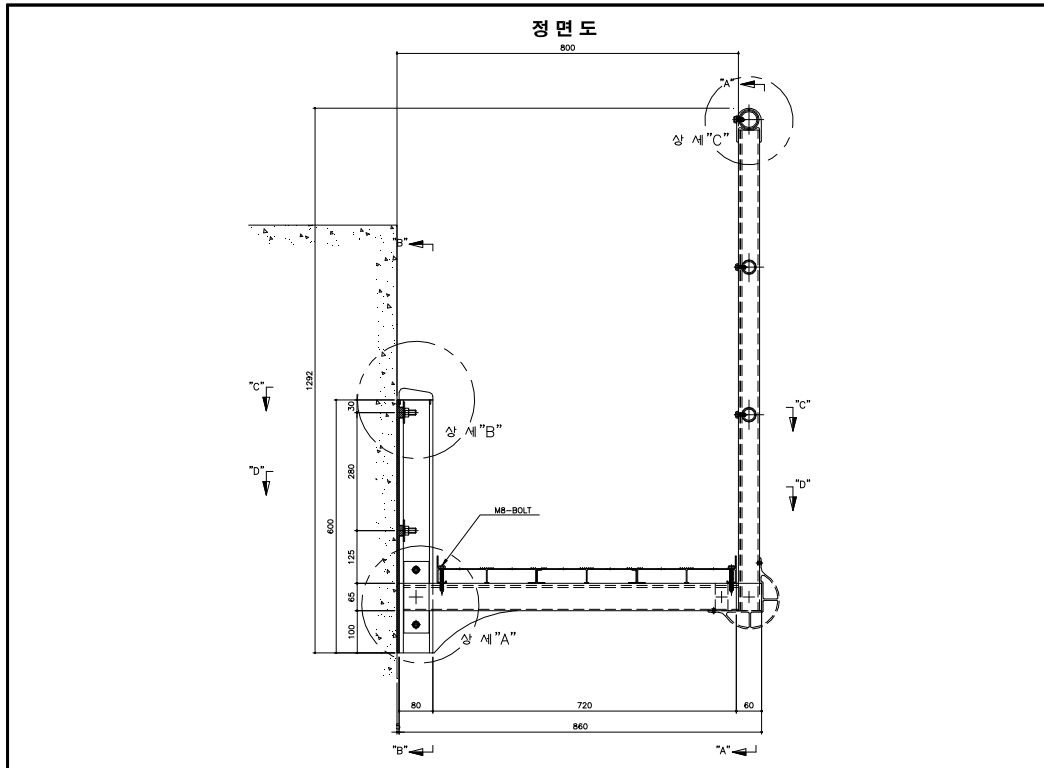
- 축방향 인장응력(f_{ta}) = 210MPa
- 축방향 압축응력(f_{ca}) = 210MPa
- 휨 응 력(f_a) = 210MPa
- 전단응력(v_a) = 120MPa

6. 참고문헌

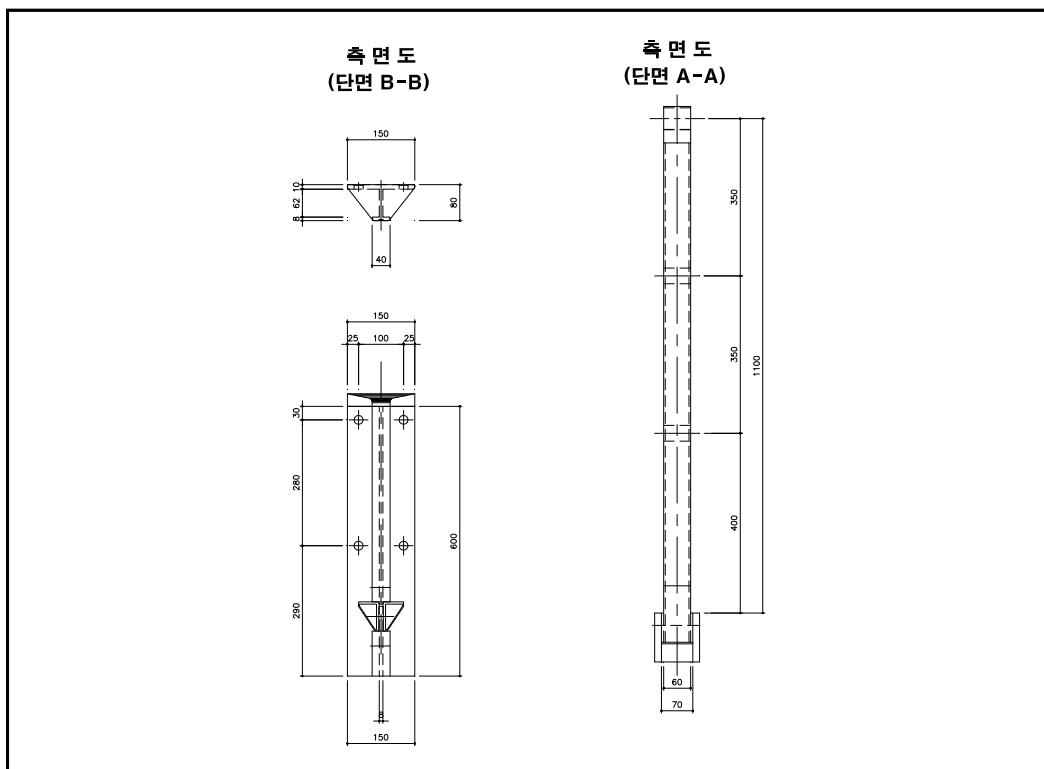
- 1) 도로교설계기준 (한국도로교통협회)
- 2) 도로설계요령 (한국도로공사)
- 3) 도로설계 실무편람 (한국도로공사)
- 4) 교량점검시설 개선검토 참고자료 (한국도로공사)
- 5) 기타 관련도서

§4. 설계단면

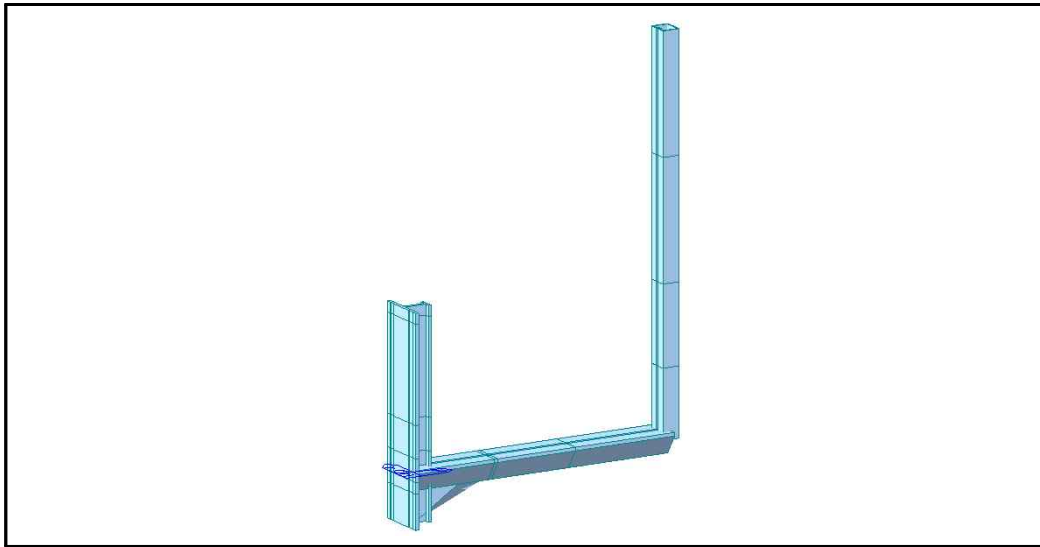
1. 설치 정면도



2. 설치 측면도



3. 모 델 링



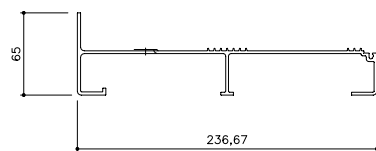
4. 하중산정 및 하중재하

1.바닥판 하중

- 구조물 자중은 프로그램 자동 재하로 고려하였고 기타 상재하중은 1.5m 로 환산하여 등분포하중으로 재하함

- wd : 바닥판 하중

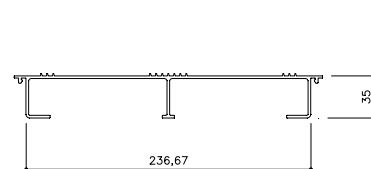
-바닥판 단부하중



$$28\text{kN/m}^3 \times 0.000898\text{m}^2 \times 1.5 \\ = 0.0377\text{kN/m}$$

- wd1 : 0.0377kN/m

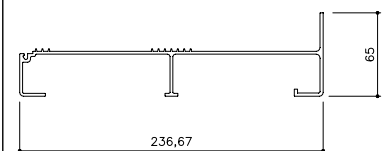
바닥판중앙부 하중



$$28\text{kN/m}^3 \times 0.000762\text{m}^2 \times 1.5 \\ = 0.0320\text{kN/m}$$

- wd2 : 0.0320kN/m

-바닥판 단부하중



$$28\text{kN/m}^3 \times 0.000898\text{m}^2 \times 1.5 \\ = 0.0377\text{kN/m}$$

- wd3 : 0.0377 kN/m

2.작업하중

$$- w_l = 3.5 \times 10^{-3} \text{MPa} \times 1.5\text{m} = 5.25\text{kN/m}$$

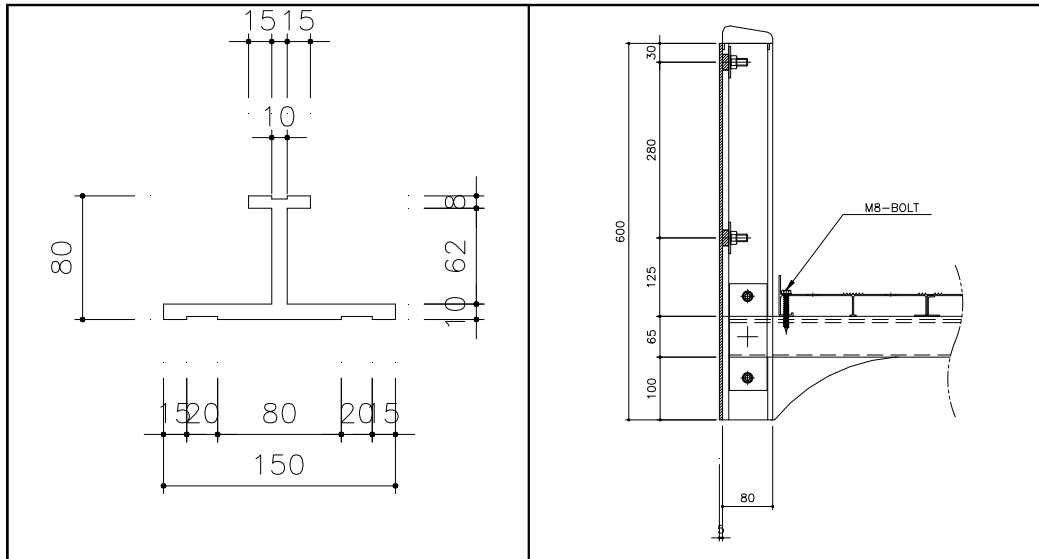
3. 난간 하중

$$- \text{수직하중} : 0.6\text{kN/m} \times 1.5\text{m} = 0.9\text{kN/m}$$

$$- \text{수평하중} : 0.4\text{kN/m} \times 1.5\text{m} = 0.6\text{kN/m}$$

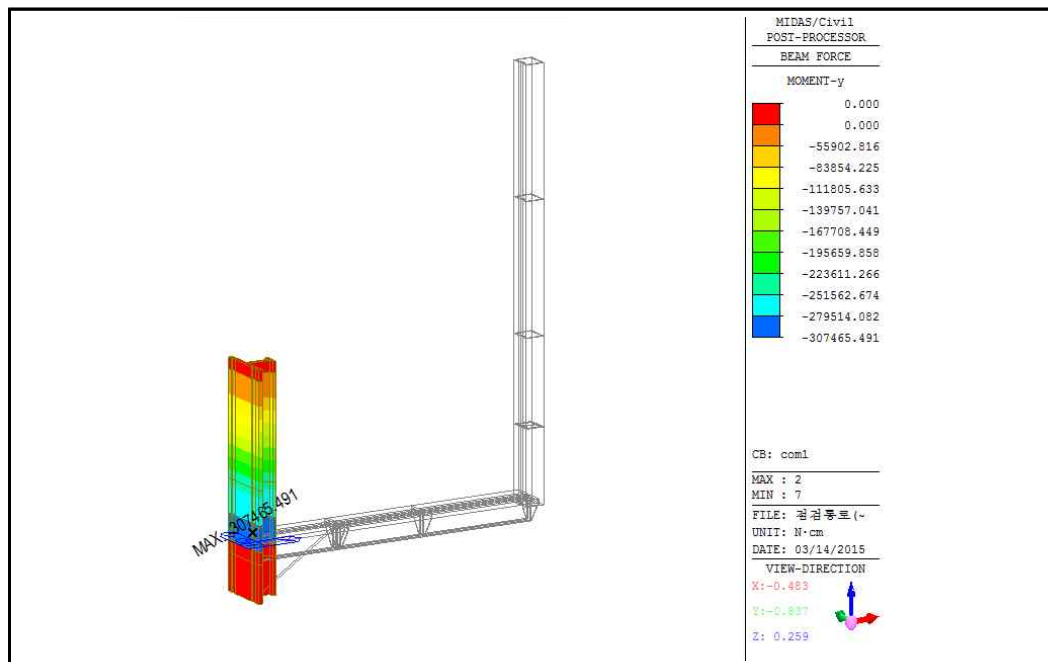
§5. 부재검토

1. Main Post

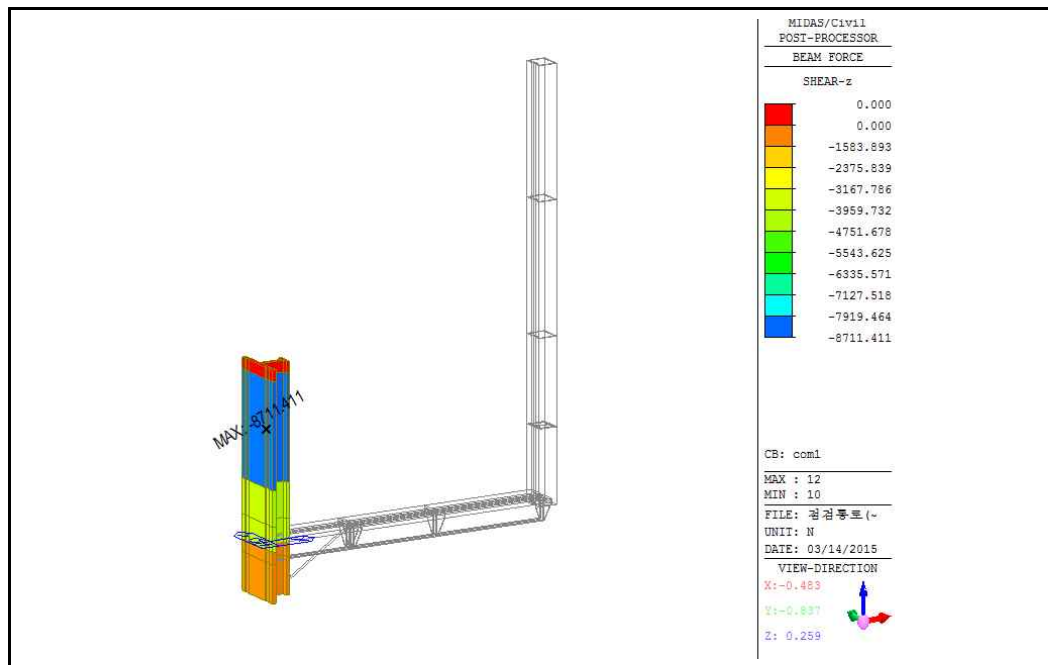


1) 설계단면력산정

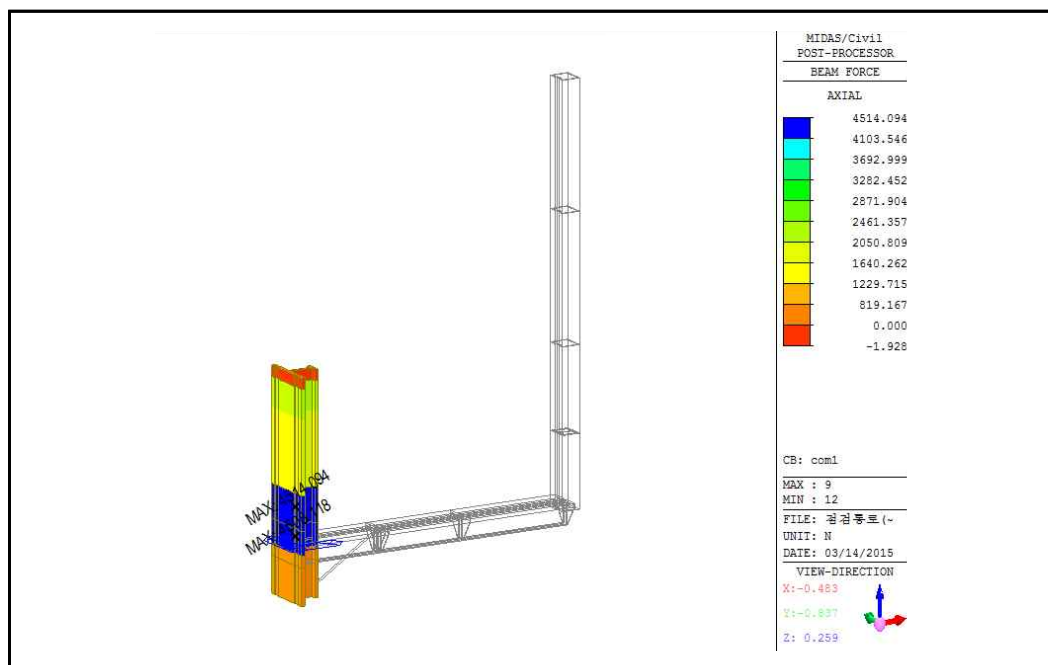
◎모멘트도



◎전단력도



◎축력도

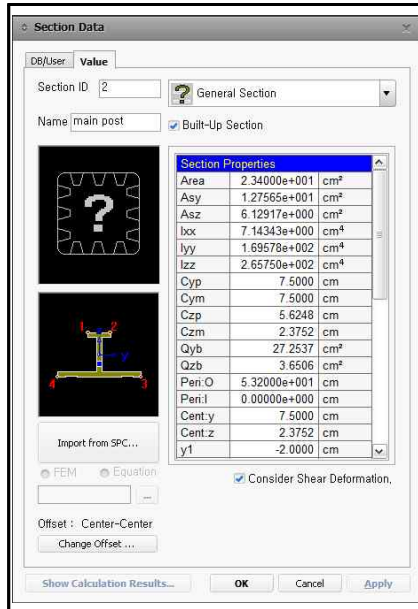


$$\therefore P_A = 4514.094\text{N}$$

$$\therefore V_A = 8711.411\text{N}$$

$$\therefore M_A = 307465.491\text{N} \cdot \text{cm}$$

2) 단면제원



$$\begin{aligned}
 - A_s &= 23.400 \text{ cm}^2 \\
 - A_{\text{web}} &= 1.0 \times 6.00 = 6.000 \text{ cm}^2 \\
 - I_y &\doteq 169.578 \text{ cm}^4 \\
 - Z_{yu} &= I_y / Y_u \\
 &= 169.578 / 5.6248 = 30.148 \text{ cm}^3 \\
 - Z_{yL} &= I_y / Y_L \\
 &= 169.578 / 2.3752 = 71.395 \text{ cm}^3
 \end{aligned}$$

3) 응력검토

· 전단응력검토

$$\begin{aligned}
 - v &= V_A / A_{\text{WEB}} \\
 &= 8711.411 / 6.000 \\
 &= 1451.901 \text{ N/cm}^2 = 14.519 \text{ MPa} < v_a = 35 \text{ MPa} \quad \therefore \text{O.K}
 \end{aligned}$$

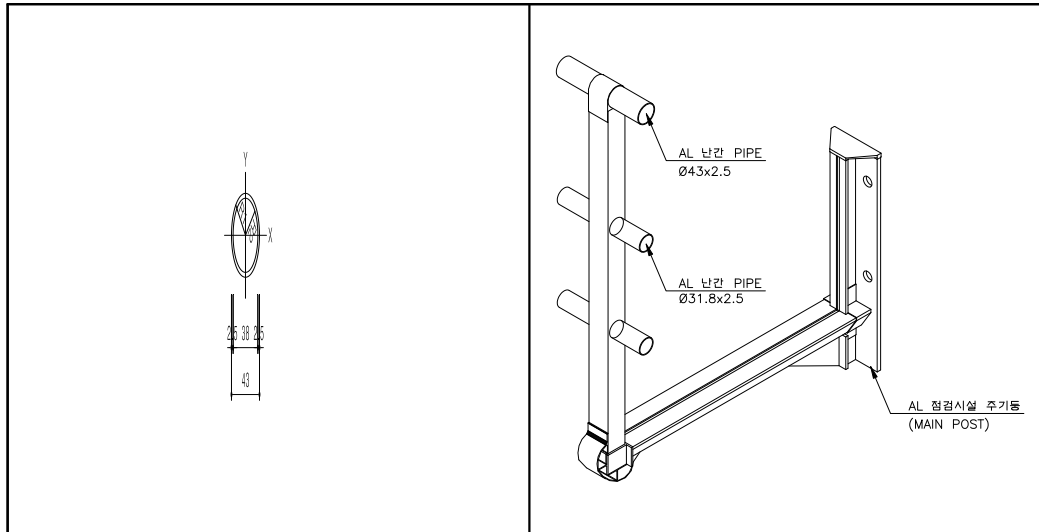
· 휨응력검토

$$\begin{aligned}
 - f_b &= P_A / A_s + M_A / Z_{yL} \\
 &= 4514.094 / 23.400 + 307465.491 / 71.395 \\
 &= 192.910 \text{ N/cm}^2 + 4306.540 \text{ N/cm}^2 \\
 - f_b &= 4499.450 \text{ N/cm}^2 = 44.994 \text{ MPa} < f_{ba} = 60 \text{ MPa} \quad \therefore \text{O.K}
 \end{aligned}$$

· 합성응력검토

$$\begin{aligned}
 \left(\frac{f_b}{f_{ba}} \right)^2 + \left(\frac{v}{v_a} \right)^2 &\leq 1.2 \\
 \left(\frac{44.994}{60} \right)^2 + \left(\frac{14.519}{35} \right)^2 &\leq 1.2 \\
 = 0.734 &\leq 1.2 \quad \therefore \text{O.K}
 \end{aligned}$$

2. 난간 PIPE (φ43 x 2.5t)



1) 설계단면력산정

$$- V_{Ax} = 0.4\text{kN/m} \times 1.5\text{m} \times 1/2 = 0.3\text{kN}$$

$$- V_{Ay} = 0.6\text{kN/m} \times 1.5\text{m} \times 1/2 = 0.45\text{kN}$$

$$\therefore V_A = \sqrt{(V_{Ax}^2 + V_{Ay}^2)} = 0.541\text{kN}$$

- 모멘트 연속보로 검토

$$- M_{Ax} = 0.4\text{kN/m} \times 1.5^2\text{m} \times 1/12 = 0.075\text{kN} \cdot \text{m}$$

$$- M_{Ay} = 0.6\text{kN/m} \times 1.5^2\text{m} \times 1/12 = 0.113\text{kN} \cdot \text{m}$$

$$\therefore M_A = \sqrt{(M_{Ax}^2 + M_{Ay}^2)} = 0.135\text{kN} \cdot \text{m}$$

2) 단면제원

	- $R_1 = 2.150\text{cm}$ - $R_2 = 1.900\text{cm}$ - $A_S = \pi/4 \times (4.300^2 - 3.800^2)$ $= 3.181\text{cm}^2$ - $I_x = I_y = \pi/64 \times (4.300^4 - 3.800^4)$ $= 6.547\text{cm}^4$ - $Z_x = Z_y = I_x / y$ $= 6.547 / 2.150 = 3.045\text{cm}^3$
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3) 응력검토

· 전단응력 검토

$$\begin{aligned} - v &= \frac{4V_A}{3A_s} \times \frac{R_2^2 + R_2R_1 + R_1^2}{R_2^2 + R_1^2} \\ &= \frac{4 \times 541.00}{3 \times 3.180} \times \frac{4.30^2 + 4.30 \times 3.80 + 3.80^2}{4.30^2 + 3.80^2} \\ &= 226.834 \times 1.496 = 339.343 \text{ N/cm}^2 = 3.393 \text{ MPa} < v_a = 35 \text{ MPa} \quad \therefore \text{O.K} \end{aligned}$$

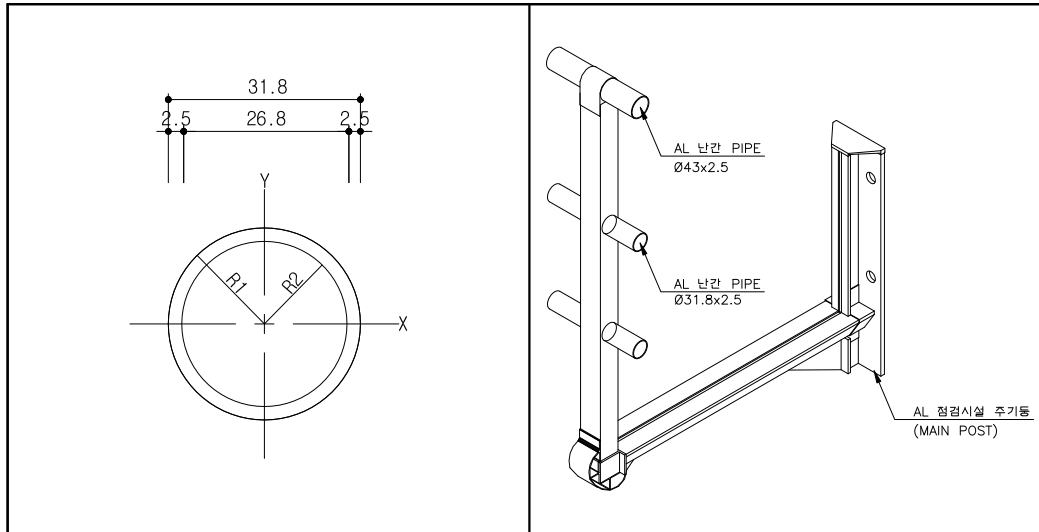
· 휨응력검토

$$\begin{aligned} - f_b &= M_A / Z \\ &= 13500.00 / 3.045 \\ &= 4433.497 \text{ N/cm}^2 = 44.334 \text{ MPa} < f_{ba} = 60 \text{ MPa} \quad \therefore \text{O.K} \end{aligned}$$

· 합성응력검토

$$\begin{aligned} \left(\frac{f_b}{f_{ba}} \right)^2 + \left(\frac{v}{v_a} \right)^2 &\leq 1.2 \\ \left(\frac{44.334}{60} \right)^2 + \left(\frac{3.393}{35} \right)^2 &\leq 1.2 \\ &= 0.556 \leq 1.2 \quad \therefore \text{O.K} \end{aligned}$$

3. 난간 PIPE (φ31.8 x 2.5t)



1) 설계단면력산정

- $V_{Ax} = 0.4\text{kN/m} \times 1.5\text{m} \times 1/2 = 0.3\text{kN}$
- $V_{Ay} = 0.6\text{kN/m} \times 1.5\text{m} \times 1/2 = 0.45\text{kN}$
- $\therefore V_A = \sqrt{(V_{Ax}^2 + V_{Ay}^2)} = 0.541\text{kN}$
- 모멘트 연속보로 검토
- $M_{Ax} = 0.4\text{kN/m} \times 1.5^2\text{m} \times 1/12 = 0.075\text{kN} \cdot \text{m}$
- $\therefore M_A = 0.075\text{kN} \cdot \text{m}$

2) 단면제원

	- $R_1 = 1.590\text{cm}$ - $R_2 = 1.340\text{cm}$ - $A_S = \pi/4 \times (3.180^2 - 2.680^2)$ $= 2.301\text{cm}^2$ - $I_x = I_y = \pi/64 \times (3.180^4 - 2.680^4)$ $= 2.487\text{cm}^4$ - $Z_x = Z_y = I_x / y$ $= 2.487 / 1.590 = 1.564\text{cm}^3$
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3) 응력검토

· 전단응력 검토

$$\begin{aligned} - v &= \frac{4V_A}{3A_s} \frac{R_2^2 + R_2R_1 + R_1^2}{R_2^2 + R_1^2} \\ &= \frac{4 \times 541.00}{3 \times 2.301} \times \frac{3.18^2 + 3.18 \times 2.68 + 2.68^2}{3.18^2 + 2.68^2} \\ &= 313.486 \times 1.492 = 467.721/\text{cm}^2 = 4.677\text{MPa} < v_a = 35\text{MPa} \quad \therefore \text{O.K} \end{aligned}$$

· 휨응력검토

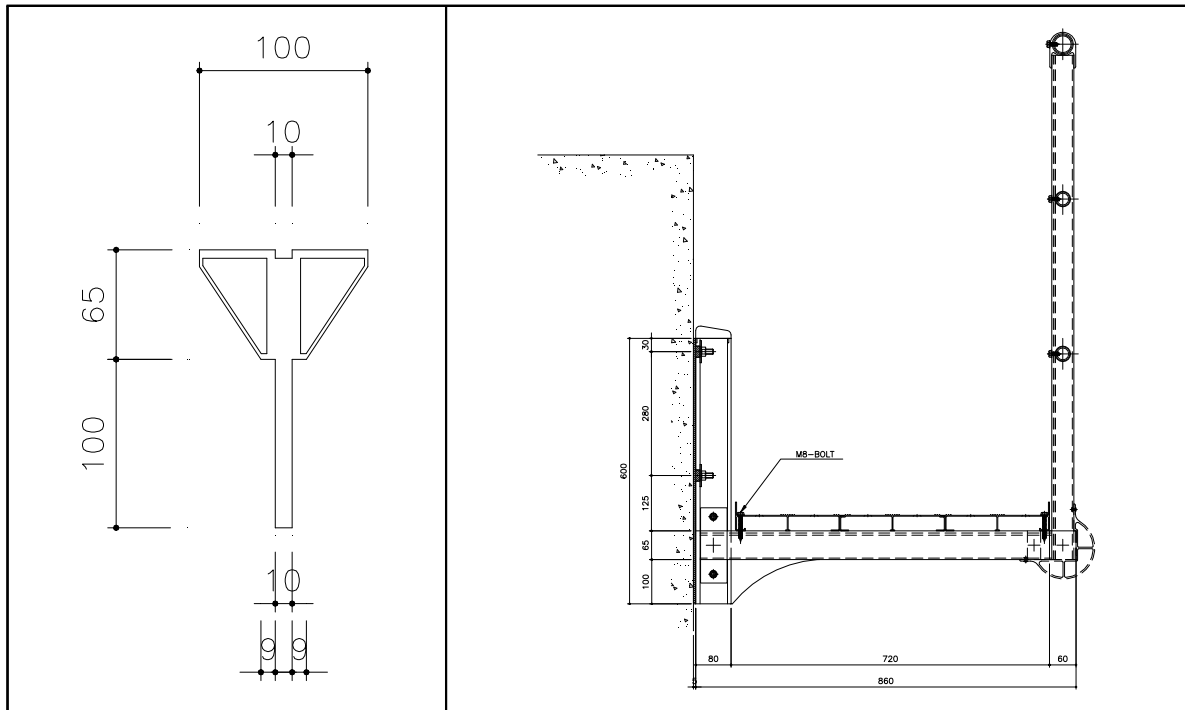
$$\begin{aligned} - f_b &= M_A / Z \\ &= 7500 / 1.564 \\ &= 4795.396\text{N}/\text{cm}^2 = 47.953\text{MPa} < f_{ba} = 60\text{MPa} \quad \therefore \text{O.K} \end{aligned}$$

· 합성응력검토

$$\begin{aligned} \left(\frac{f_b}{f_{ba}} \right)^2 + \left(\frac{v}{v_a} \right)^2 &\leq 1.2 \\ \left(\frac{47.953}{60} \right)^2 + \left(\frac{4.677}{35} \right)^2 &\leq 1.2 \\ &= 0.656 \leq 1.2 \quad \therefore \text{O.K} \end{aligned}$$

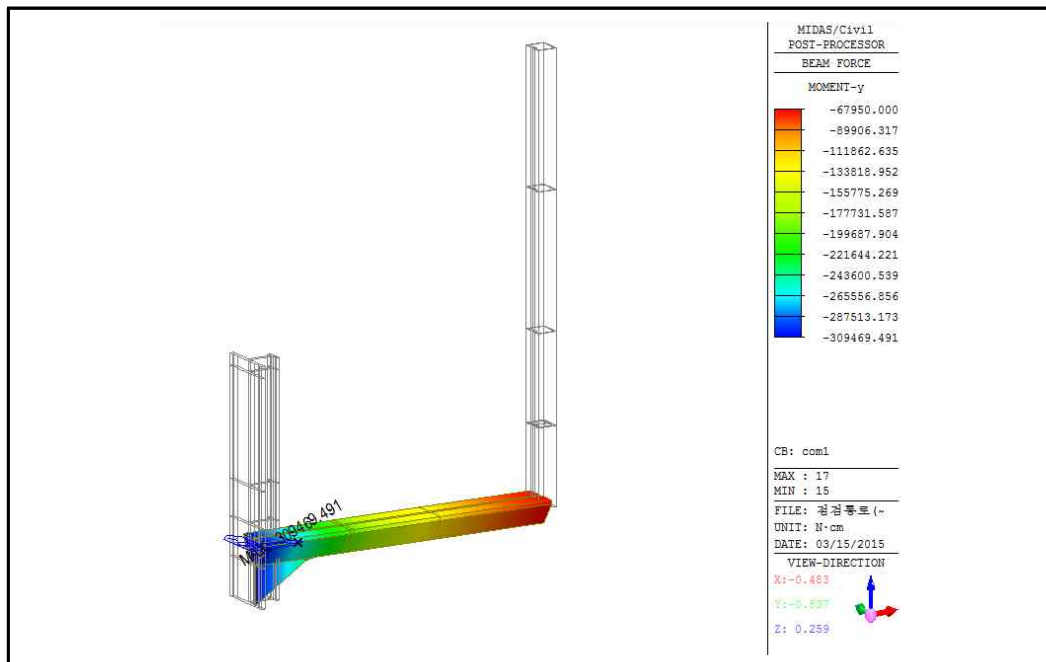
4. 바닥 CHANNEL

(1) $h = 16.5 \text{ cm}$

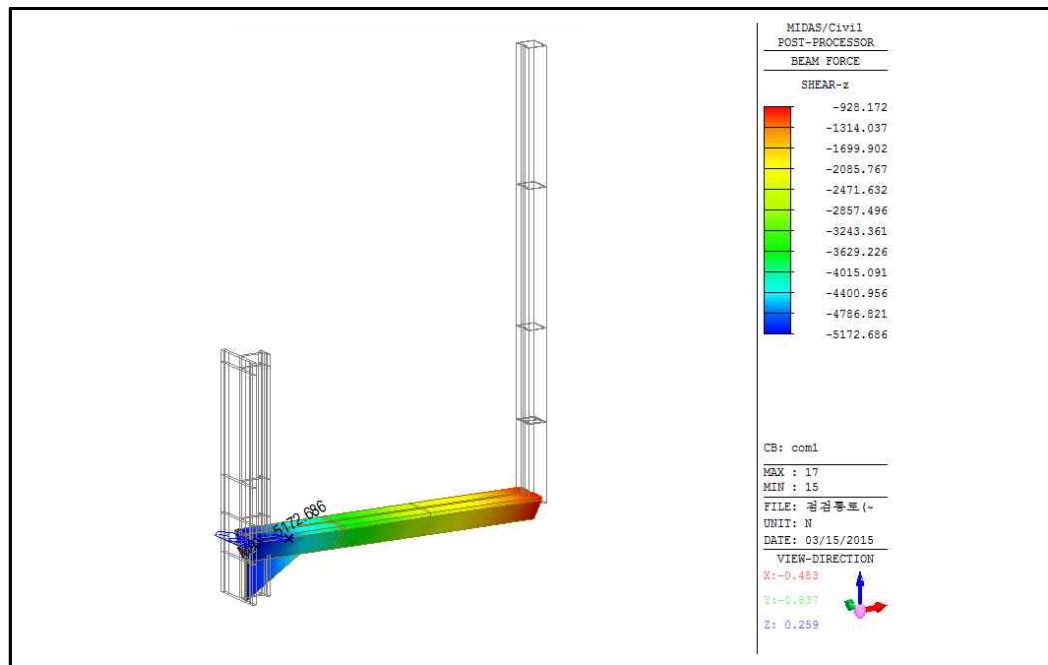


1) 설계단면력산정

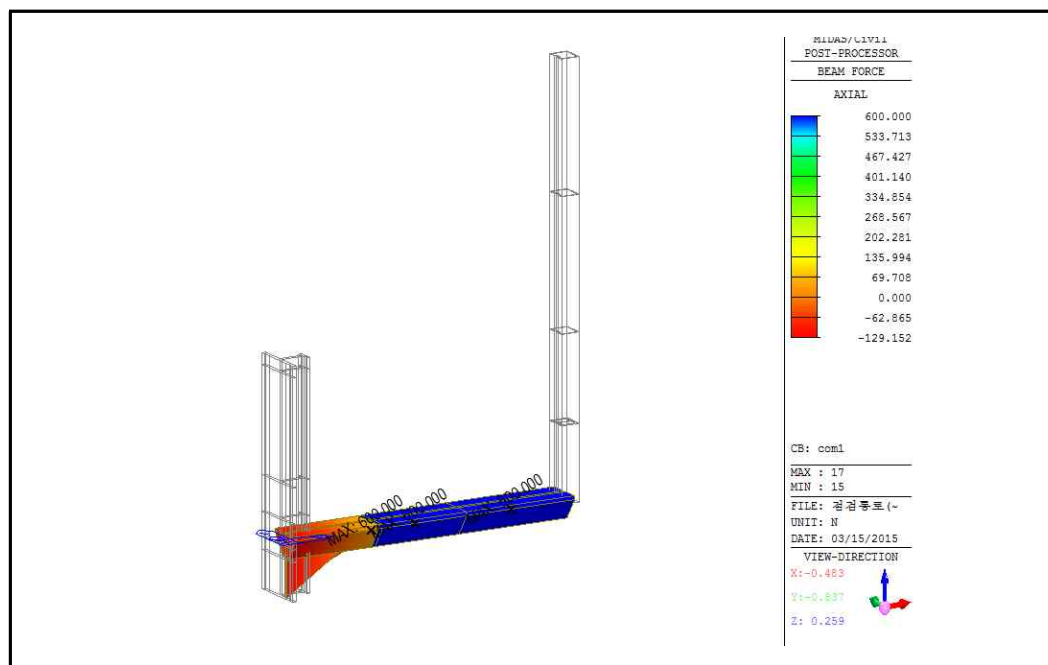
◎모멘트도



◎전단력도



◎축력도

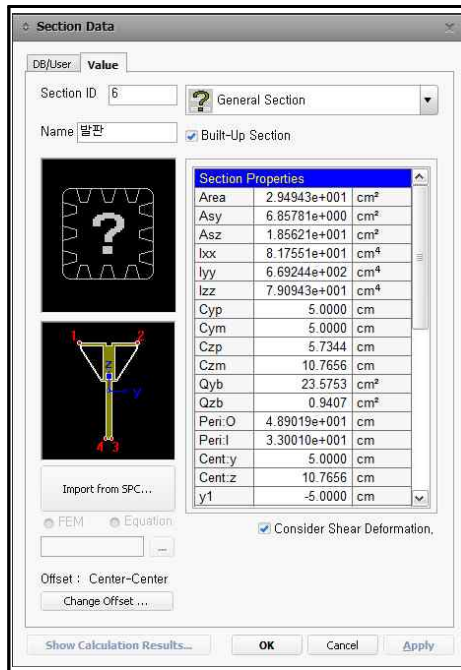


$$\therefore P_A = 600.00\text{N}$$

$$\therefore V_A = 5172.686\text{N}$$

$$\therefore M_A = 309469.491\text{N} \cdot \text{cm}$$

2) 단면제원



$$\begin{aligned}
 - A_s &= 29.494 \text{ cm}^2 \\
 - A_{\text{web}} &= 10.000 \times 1.65 = 16.50 \text{ cm}^2 \\
 - I_y &= 669.244 \text{ cm}^4 \\
 - Z_{yu} &= I_y / Y_u \\
 &= 669.244 / 5.7344 = 116.706 \text{ cm}^3 \\
 - Z_{yL} &= I_y / Y_L \\
 &= 669.244 / 10.7656 = 62.165 \text{ cm}^3
 \end{aligned}$$

3) 응력검토

· 전단응력검토

$$\begin{aligned}
 - v &= V_A / A_{\text{WEB}} \\
 &= 5172.686 / 16.500 \\
 &= 313.496 \text{ N/cm}^2 = 3.134 \text{ MPa} < v_a = 35 \text{ MPa} \quad \therefore \text{O.K}
 \end{aligned}$$

· 휨응력검토

$$\begin{aligned}
 - f_t &= P_A / A_s + M_A / Z_{yu} \\
 &= 600.00 / 29.494 + 309469.491 / 116.706 \\
 &= 20.343 \text{ N/cm}^2 + 2651.701 \text{ N/cm}^2
 \end{aligned}$$

$$- f_t = 2672.044 \text{ N/cm}^2 = 26.720 \text{ MPa} < f_{ta} = 60 \text{ MPa} \quad \therefore \text{O.K}$$

$$\begin{aligned}
 - f_c &= P_A / A_s + M_A / Z_{yL} \\
 &= 600.00 / 29.494 + 309469.491 / 62.165 \\
 &= 20.343 \text{ N/cm}^2 + 4978.194 \text{ N/cm}^2
 \end{aligned}$$

$$- f_c = 4998.537 \text{ N/cm}^2 = 49.985 \text{ MPa} < f_{ca} = 60 \text{ MPa} \quad \therefore \text{O.K}$$

· 합성응력검토

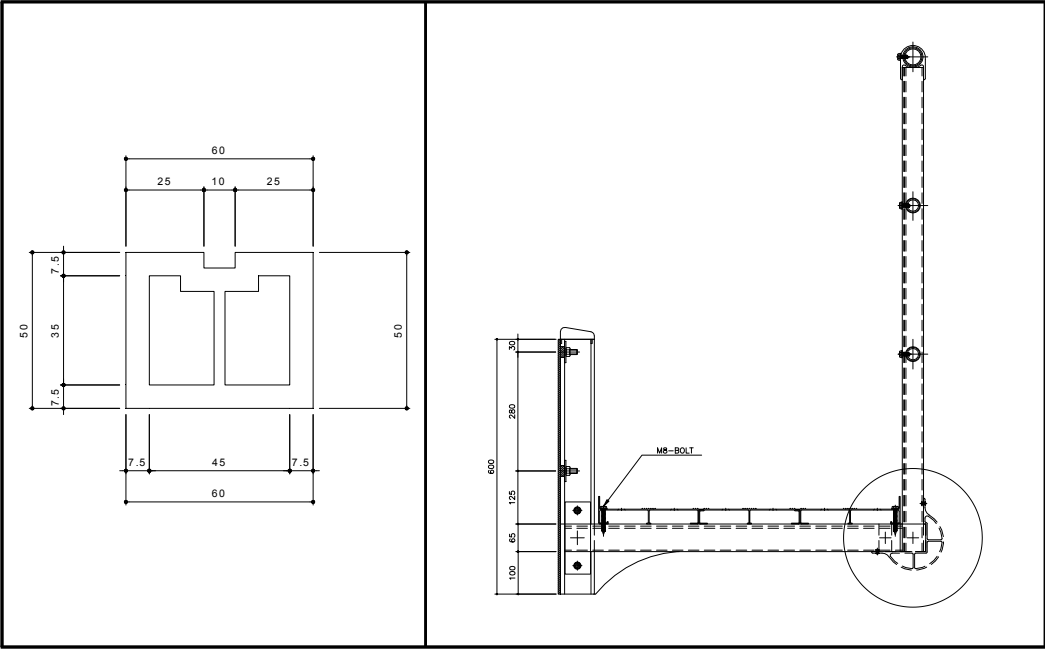
$$\left(\frac{f_b}{f_{ba}} \right)^2 + \left(\frac{v}{v_a} \right)^2 \leq 1.2$$

$$\left(\frac{49.985}{60} \right)^2 + \left(\frac{3.134}{35} \right)^2 \leq 1.2$$

$$= 0.702 \leq 1.2 \quad \therefore \text{O.K}$$

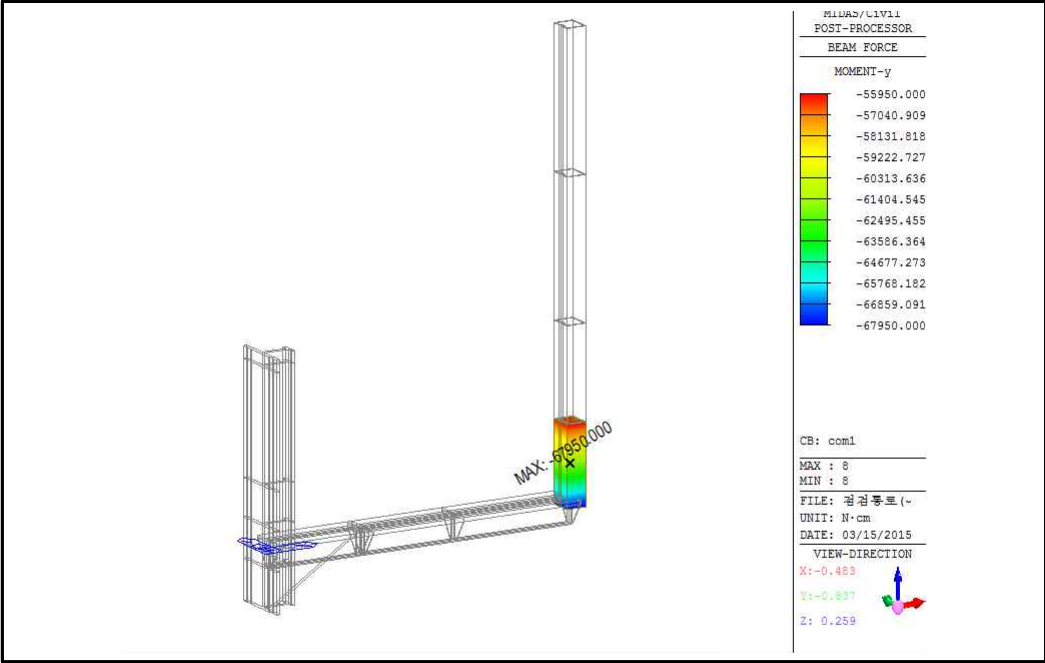
5. 난간 POST

(1) 단부

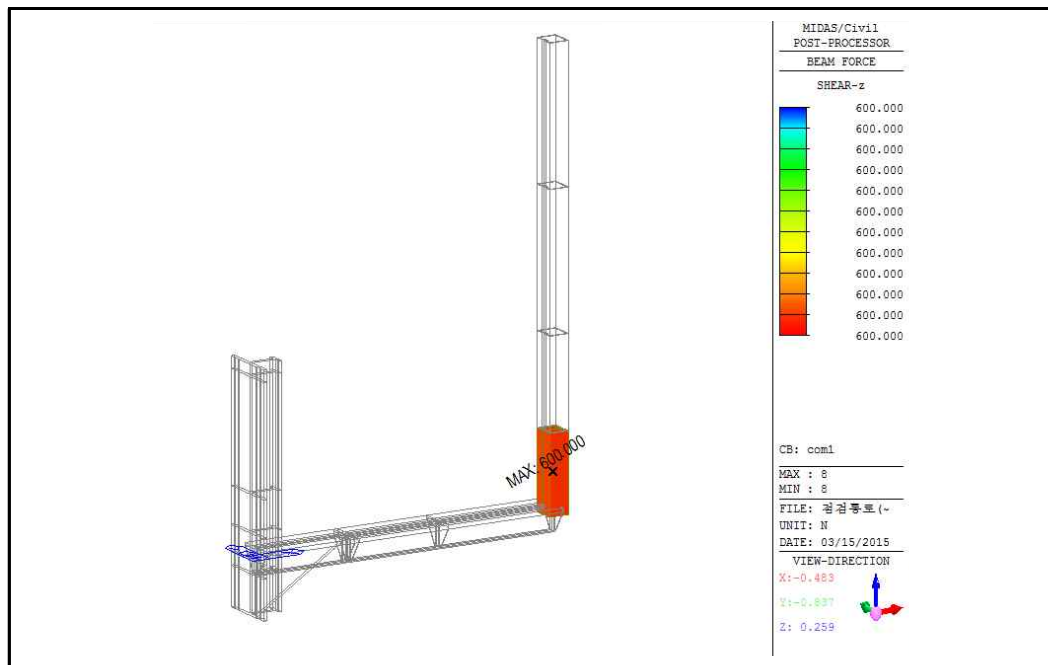


1) 설계단면력산정

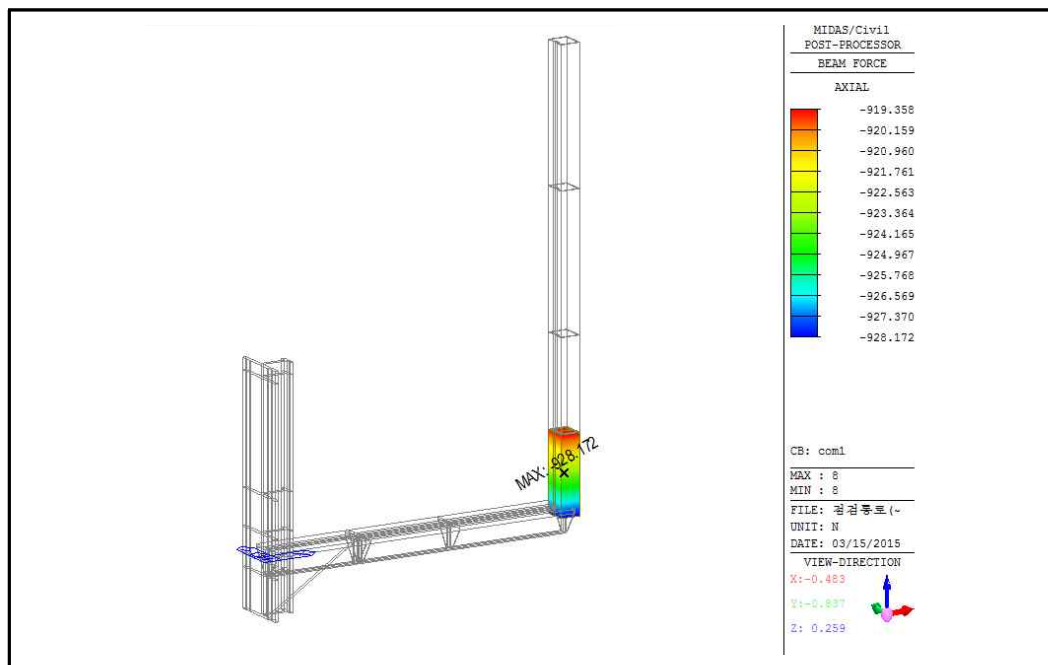
◎모멘트도



◎전단력도



◎축력도

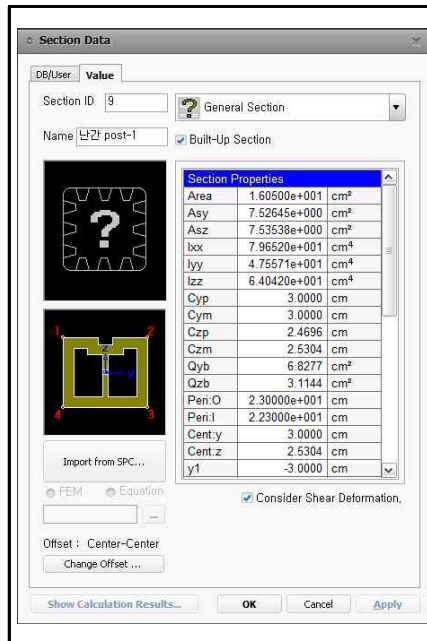


$$\therefore P_A = 928.172\text{N}$$

$$\therefore V_A = 600.00\text{N}$$

$$\therefore M_A = 67950.000\text{N} \cdot \text{cm}$$

2) 단면제원



$$\begin{aligned}
 - A_s &= 16.050 \text{ cm}^2 \\
 - A_{\text{web}} &= 5.0 \times 0.75 \times 2 = 7.5 \text{ cm}^2 \\
 - I_y &= 47.557 \text{ cm}^4 \\
 - Z_{yu} &= I_y / Y_u \\
 &= 47.557 / 2.4696 = 19.256 \text{ cm}^3 \\
 - Z_{yL} &= I_y / Y_L \\
 &= 47.557 / 2.5304 = 18.794 \text{ cm}^3
 \end{aligned}$$

3) 응력검토

· 전단응력검토

$$\begin{aligned}
 - v &= V_A / A_{\text{WEB}} \\
 &= 600.00 / 7.500 \\
 &= 80.000 \text{ N/cm}^2 = 0.800 \text{ MPa} < v_a = 35 \text{ MPa} \quad \therefore \text{O.K}
 \end{aligned}$$

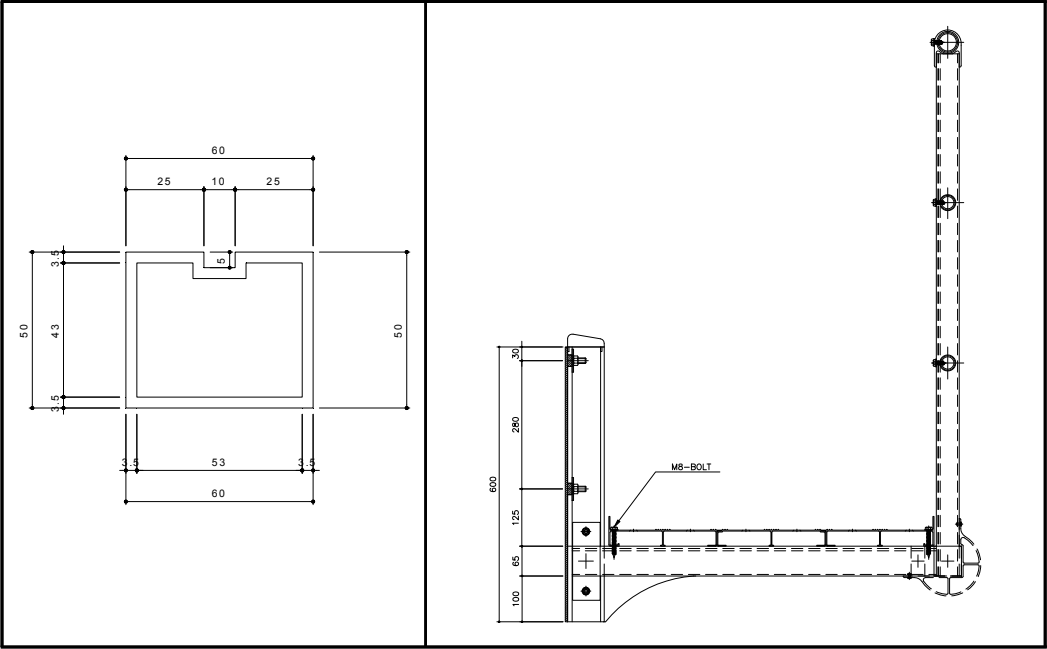
· 휨응력검토

$$\begin{aligned}
 - f_t &= P_A / A_s + M_A / Z_{yu} \\
 &= 928.172 / 16.050 + 67950.000 / 19.256 \\
 &= 57.830 \text{ N/cm}^2 + 3528.770 \text{ N/cm}^2 \\
 - f_t &= 3586.600 \text{ N/cm}^2 = 35.866 \text{ MPa} < f_{ta} = 60 \text{ MPa} \quad \therefore \text{O.K} \\
 - f_c &= P_A / A_s + M_A / Z_{yL} \\
 &= 928.172 / 16.050 + 67950.000 / 18.794 \\
 &= 57.830 \text{ N/cm}^2 + 3615.515 \text{ N/cm}^2 \\
 - f_c &= 3673.345 \text{ N/cm}^2 = 36.733 \text{ MPa} < f_{ca} = 60 \text{ MPa} \quad \therefore \text{O.K}
 \end{aligned}$$

· 합성응력검토

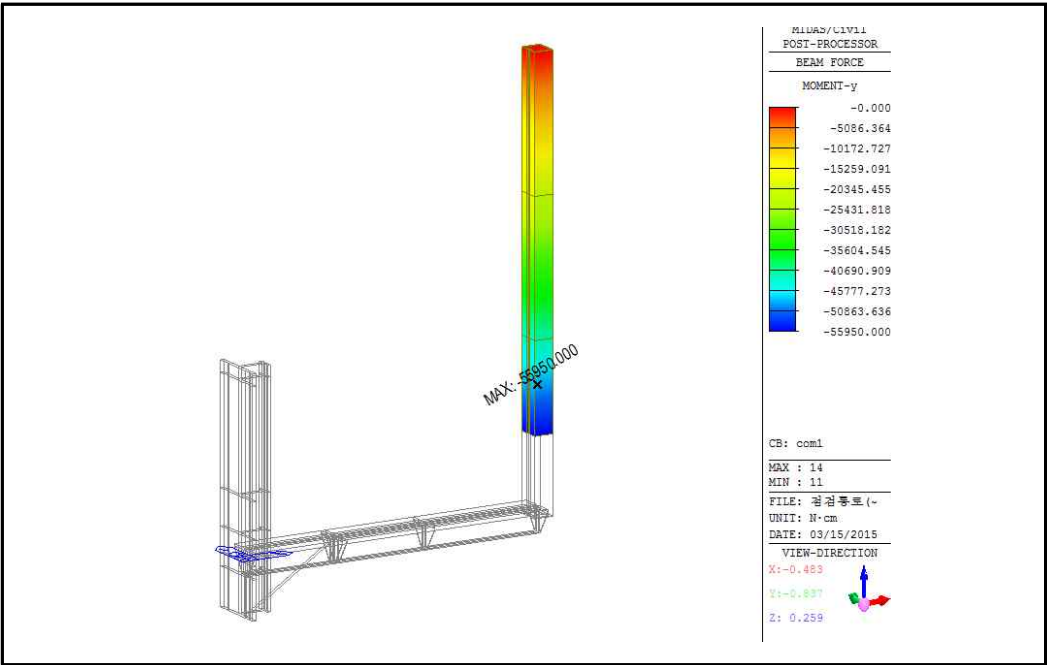
$$\begin{aligned}
 \left(\frac{f_b}{f_{ba}} \right)^2 + \left(\frac{v}{v_a} \right)^2 &\leq 1.2 \\
 \left(\frac{36.733}{60} \right)^2 + \left(\frac{0.800}{35} \right)^2 &\leq 1.2 \\
 &= 0.375 \leq 1.2 \quad \therefore \text{O.K}
 \end{aligned}$$

(2) 일반부

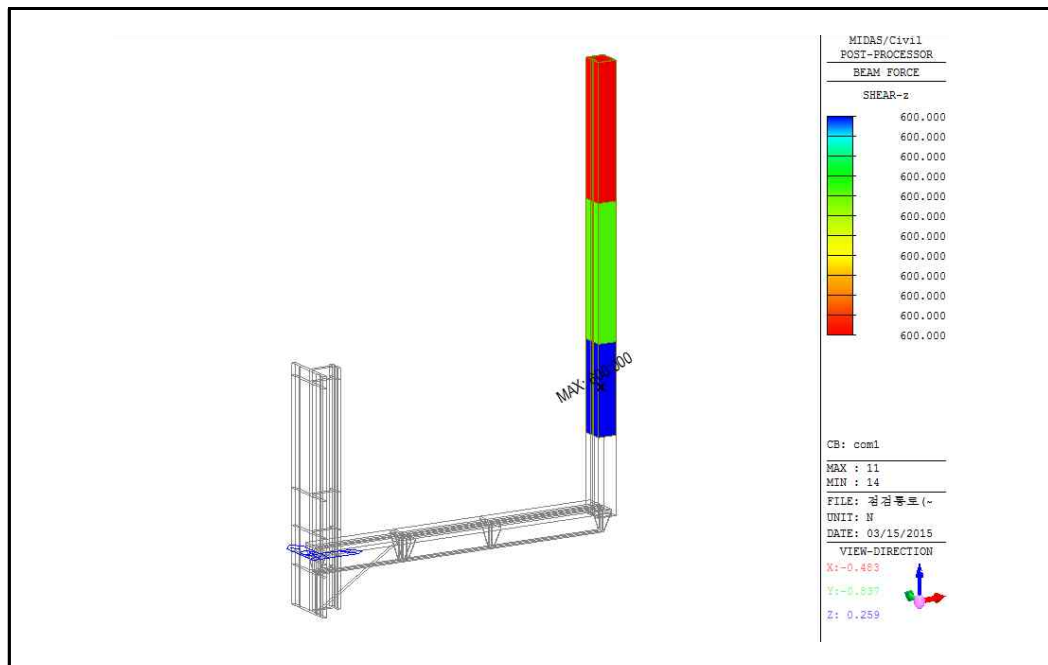


1) 설계 단면력 산정

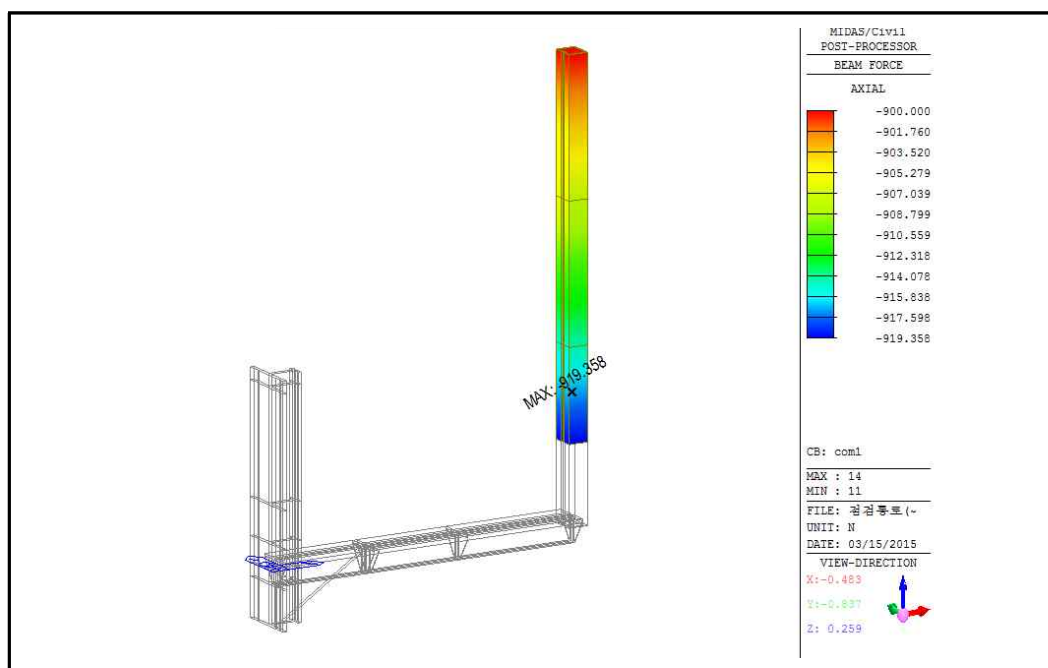
◎모멘트도



◎전단력도



◎축력도

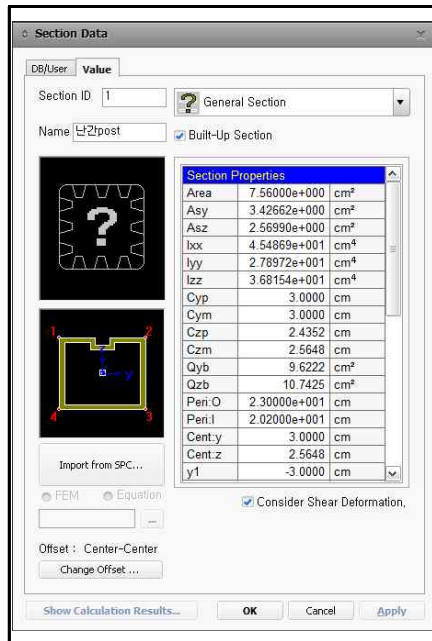


$$\therefore P_A = 919.358\text{N}$$

$$\therefore V_A = 600.00\text{N}$$

$$\therefore M_A = 55950.000\text{N} \cdot \text{cm}$$

2) 단면제원



$$\begin{aligned}
 - A_s &= 7.560 \text{ cm}^2 \\
 - A_{\text{web}} &= 5.0 \times 0.35 \times 2 = 3.5 \text{ cm}^2 \\
 - I_y &= 27.897 \text{ cm}^4 \\
 - Z_{yu} &= I_y / Y_u \\
 &= 27.897 / 2.4352 = 11.455 \text{ cm}^3 \\
 - Z_{yL} &= I_y / Y_L \\
 &= 27.897 / 2.5648 = 10.876 \text{ cm}^3
 \end{aligned}$$

3) 응력검토

· 전단응력검토

$$\begin{aligned}
 - v &= V_A / A_{\text{WEB}} \\
 &= 600.00 / 3.500 \\
 &= 171.428 \text{ N/cm}^2 = 1.714 \text{ MPa} < v_a = 35 \text{ MPa} \quad \therefore \text{O.K}
 \end{aligned}$$

· 휨응력검토

$$\begin{aligned}
 - f_t &= P_A / A_s + M_A / Z_{yu} \\
 &= 919.358 / 7.560 + 55950.000 / 11.455 \\
 &= 121.608 \text{ N/cm}^2 + 4884.329 \text{ N/cm}^2 \\
 - f_t &= 50.059 \text{ N/cm}^2 = 50.059 \text{ MPa} < f_{ta} = 60 \text{ MPa} \quad \therefore \text{O.K} \\
 - f_c &= P_A / A_s + M_A / Z_{yL} \\
 &= 919.358 / 7.560 + 55950.000 / 10.876 \\
 &= 121.608 \text{ N/cm}^2 + 5144.354 \text{ N/cm}^2 \\
 - f_c &= 5265.962 \text{ N/cm}^2 = 52.659 \text{ MPa} < f_{ca} = 60 \text{ MPa} \quad \therefore \text{O.K}
 \end{aligned}$$

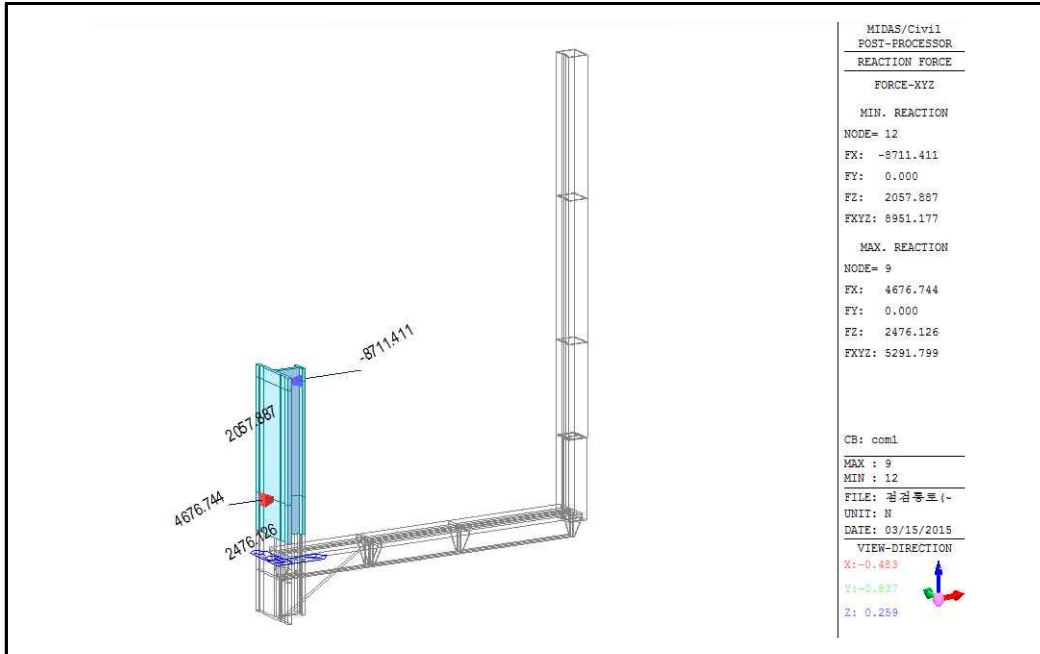
· 합성응력검토

$$\begin{aligned}
 \left(\frac{f_b}{f_{ba}} \right)^2 + \left(\frac{v}{v_a} \right)^2 &\leq 1.2 \\
 \left(\frac{52.659}{60} \right)^2 + \left(\frac{1.714}{35} \right)^2 &\leq 1.2 \\
 &= 0.772 \leq 1.2 \quad \therefore \text{O.K}
 \end{aligned}$$

6. Anchor Bolt 검토 (M12 x 120)-STS304

1) 앵커의 작용하중

◎반력도



$$\therefore N_{ua} = 1.7 \times 8711.411 \text{ N} / 2ea = 7404.699 \text{ N} \text{ (앵커1개에 작용하는 인장력)}$$

$$\therefore V_{ua} = 1.7 \times 2476.226 \text{ N} / 2ea = 2104.792 \text{ N} \text{ (앵커1개에 작용하는 전단력)}$$

2) 앵커의 재료평가 - 탄소강 제작된 것으로 앵커품질에 대한 부록참조

$$\therefore f_{uta} = 795 \text{ MPa} - \text{설계기준 인장강도 (KSB 0241방법적용, 시험성적서 참조)}$$

$$\therefore f_{ya} = 616 \text{ MPa} - \text{설계기준 항복강도 (KSB 0241방법적용, 시험성적서 참조)}$$

콘크리트용 앵커 설계기준은 단면적 감소 30% 이상, 연신율 14% 이상을 연성강재요소의 요건으로 정의하고 있고 주어진 앵커재료는 연성강재이다.

3) 인장하중 하에서 강재강도

$$\phi N_{sa} \geq N_{ua}$$

$$N_{sa} = nA_{se} f_{uta}$$

$$\phi nA_{se} f_{uta} \geq N_{ua} = 7404.699 \text{ N}$$

연성강재요소의 인장파괴에 지배되는 경우 강도감소계수 $\phi=0.75$ 이고 단일앵커이므로 $n = 1$ 이다.

$$\phi N_{sa} = 0.75 \times 1 \times 84.4 \times 795 = 50323.500 \text{ N} > 7404.699 \text{ N} \quad \therefore \text{O.K}$$

강재의 직경 12mm 앵커의 강재강도는 인장하중에 적합함

4) 최소연단거리 - 콘크리트 구조설계기준(2007) 5.4절

∴ 철근의 최소피복두께 이상 : 100 mm 이상

∴ ACI 355.2 에 의한 제품시험에서 최소 모서리 거리 : 65 mm 이상

∴ 최대 골재크기의 2배이상 : $2 \times 25 = 50$ mm 이상

$$c_{a,min} = 150mm \text{ 적용} \quad \therefore \text{O.K}$$

5) 인장하중 하에서 콘크리트 파괴강도

$$\phi N_{cb} \geq N_{ua}$$

∴ “앵커가 범주2 (즉, 중간설치 민감도와 중간신뢰도), 콘크리트조개짐을 제어하기위한 별도의 보조철근이 없는 것으로 가정” 이때 강도감소계수 $\phi=0.55$ 로 적용

$$N_{cb} = \frac{A_{Nc}}{A_{Nco}} \psi_{ed,N} \psi_{c,N} \psi_{cp,N} N_b$$

$$N_b = k_c \sqrt{f_{ck}} h_{ef}^{1.5}$$

$$N_{cb} = \frac{A_{Nc}}{A_{Nco}} \psi_{ed,N} \psi_{c,N} \psi_{cp,N} k_c \sqrt{f_{ck}} h_{ef}^{1.5} \geq N_{ua} = 7404.699 \text{ N}$$

$$k_c = k_{cr} = 7$$

$$\psi_{ed,N} = 0.7 + 0.3 \frac{c_{a,min}}{1.5h_{ef}}, c_{a,min} < 1.5h_{ef} \text{ 이므로}$$

$$\psi_{ed,N} = 0.7 + 0.3 \frac{150}{1.5(80)} = 1.075$$

$$\psi_{c,N} = 1.0 \text{ 사용하중하에서 콘크리트 균열이 발생하는 경우 } (f_t > f_{\ell})$$

$$\psi_{cp,N} = 1.0 \text{ 사용하중하에서 콘크리트 균열이 발생하는 경우 } (f_t > f_{\ell})$$

$$A_{Nco} = 9h_{ef}^2 = 9 \times (80)^2 = 57600 \text{ mm}^2$$

$$A_{Nc} = (c_{a1} + 1.5h_{ef}) (2 \times 1.5h_{ef}) = (150 + 1.5 \times 80)(2 \times 1.5 \times 80) = 64800 \text{ mm}^2$$

$$\frac{A_{Nc}}{A_{Nco}} = \frac{64800}{57600} = 1.125$$

$$\therefore N_{cb} = 1.075 \times 1.125 \times 1.0 \times 1.0 \times 7 \times \sqrt{27} \times (80)^{1.5} = 31475.735 \text{ N}$$

$$\therefore \phi N_{cb} = 0.55 \times 31475.735 = 17311.654 \text{ N} > 7404.699 \text{ N} \quad \therefore \text{O.K}$$

6) 앵커뿔힘강도

$$\phi N_{pn} > N_{ua}$$

$$N_{pn} = \psi_{c,p} N_p$$

∴ “앵커가 범주2 (즉, 중간설치 민감도와 중간신뢰도), 콘크리트조개짐을 제어하기위한 별도의 보조철근이 없는 것으로 가정” 이때 강도감소계수 $\phi=0.55$ 로 적용

또한 $N_p = N_{p,cr} = 13.930\text{kN}$ 로 한다.(콘크리트 구조기준해설(2012)- 부록 II.26 참조

“II.26 - 콘크리트용 앵커 설계법 및 예제집 P 141 참조) 매입깊이가 80mm 로 매입깊이가 65mm 와 90mm의 중간값으로 적용함

$$\psi_{c,p} = 1$$

$\phi N_{pn} =$ 사용하중하에서 콘크리트 균열이 발생하는 경우 ($f_t > f_t$)

$$\phi N_{pn} = 0.55 \times 13930 = 7661.500 \text{ N} > 7404.699 \text{ N}$$

6) 인장하중 하에서 모든 파괴 형태 확인

인장에 대한 파괴 형태별 설계강도 요약

구 분	계산결과	비고
앵커강재 파괴	50323.500 N	
콘크리트 파괴	17311.654 N	
앵 커 뿔 힘	7661.500 N	지배강도

7) 전단하중 하에서 강재강도

$$\phi V_{sa} \geq V_{ua}$$

$$V_{sa} = n \times 0.6 \times A_{se} f_{uta}$$

$$\phi n \times 0.6 \times A_{se} f_{uta} \geq V_{ua} = 2104.792 \text{ N}$$

연성강재요소의 강도에 지배되는 경우 강도감소계수 $\phi=0.65$ 이고 단일앵커이므로 $n = 1$ 이다.

$$\phi V_{sa} = 0.65 \times 0.6 \times 84.4 \times 795 = 26168.220 \text{ N} > 2104.792 \text{ N} \quad \therefore \text{O.K}$$

강재의 직경 12mm 앵커의 강재강도는 전단하중에 적합함

8) 전단하중 하에서 콘크리트 파괴강도

$$\phi V_{cb} \geq V_{ua}$$

∴ “전단하중에 대하여 콘크리트파괴가 지배적인 경우 강도감소계수 $\phi=0.70$ 로 적용
(조건 B 보조철근이 없는 것으로 가정)

$$V_{cb} = \frac{A_{Vc}}{A_{Vco}} \psi_{ed,V} \psi_{c,V} V_b$$

$$V_b = 0.6 \left[\frac{l_e}{d_0} \right]^{0.2} \sqrt{d_0} \sqrt{f_{ck}} (c_{a1})^{1.5} \geq V_{ua}$$

$$\phi V_{cb} = \phi \frac{A_{Vc}}{A_{Vco}} \psi_{ed,V} \psi_{c,V} 0.6 \left[\frac{l_e}{d_0} \right]^{0.2} \sqrt{d_0} \sqrt{f_{ck}} (c_{a1})^{1.5} \geq V_{ua} = 2104.792 \text{ N}$$

$$\frac{A_{Vc}}{A_{Vco}} = 1 \text{ 그리고 } c_{a1} = 150\text{mm (연단거리)}$$

c_{a2} 는 c_{a1} 에 수직인 방향으로 앵커중심으로부터 콘크리트 가장자리까지 거리

$c_{a2} = 625\text{mm}$ 이므로 거리가 $1.5 h_{ef} = 1.5 \times 80 = 120\text{mm}$ 이상이다.

$\psi_{ed,V} = 1.0$ $c_{a2} > 1.5c_{a1}$ 인 경우

$\psi_{c,V} = 1.0$ 사용하중하에서 콘크리트 균열이 발생하는 경우 ($f_t > f_t$)

$$d_0 = 12\text{mm}$$

$$l_e = h_{ef} = 80 \text{ mm 그러나 } l_e \leq 8d_0 ; 8d_0 = 8 \times 12 = 96\text{mm}$$

$$l_e = 80 \text{ mm 적용}$$

$$\phi V_{cb} = 0.7 \times 1.0 \times 1.0 \times 1.0 \times 0.6 \times \left(\frac{80}{12} \right)^{0.2} \times \sqrt{12} \times \sqrt{27} \times (150)^{1.5} = 20297.401 \text{ N}$$

$$\therefore \phi V_{cb} \geq V_{ua} = 20297.401 \text{ N} > 2104.792 \text{ N} \quad \therefore \text{O.K}$$

9) 콘크리트 프라이아웃강도

$$\phi V_{CP} > V_{ua}$$

$$V_{cp} = k_{cp} N_{cb}$$

∴ “전단하중에 대하여 콘크리트파괴가 지배적인 경우 강도감소계수 $\phi=0.70$ 로 적용
(조건 B 보조철근이 없는 것으로 가정)

또한 $k_{cp} = 2.0$, $h_{ef} = 80\text{mm} > 65\text{mm}$ 인 경우 $N_{cb} = 31475.735 \text{ N}$ (인장하중검토참조)

$$\Phi V_{cp} = 0.7 \times 2.0 \times 31475.735 = 44066.029 \text{ N} > 2104.792 \text{ N}$$

10) 전단 하중 하에서 모든 파괴 형태 확인

인장에 대한 파괴 형태별 설계강도 요약

구 분	계산결과	비고
앵커강재 파괴	26168.220 N	
콘크리트 파괴	20297.401 N	지배강도
콘크리트 프라이아웃	44066.029 N	

11) 인장 - 전단 상관 작용 검토

- $V_{ua} \leq 0.2 \Phi V_n$ 인 경우 앵커는 인장강도로 지배
- $N_{ua} \leq 0.2 \Phi N_n$ 인 경우 앵커는 전단강도로 지배

$V_{ua} \leq 0.2 \Phi V_n$ 인 경우, 전체 인장강도를 사용할 수 있음 : $\Phi N_n \geq N_{ua}$

$$0.2 \Phi V_n = 0.2 \times 20297.401 \text{ N} = 4059.480 \text{ N} > 2104.792 \text{ N} \quad \therefore \text{조건에 만족}$$

$N_{ua} \leq 0.2 \Phi N_n$ 인 경우, 전체 전단강도를 사용할 수 있음 : $\Phi V_n \geq V_{ua}$

$$0.2 \Phi N_n = 0.2 \times 7661.500 \text{ N} = 1532.300 \text{ N} < 7404.699 \text{ N} \quad \therefore \text{조건에 미흡}$$

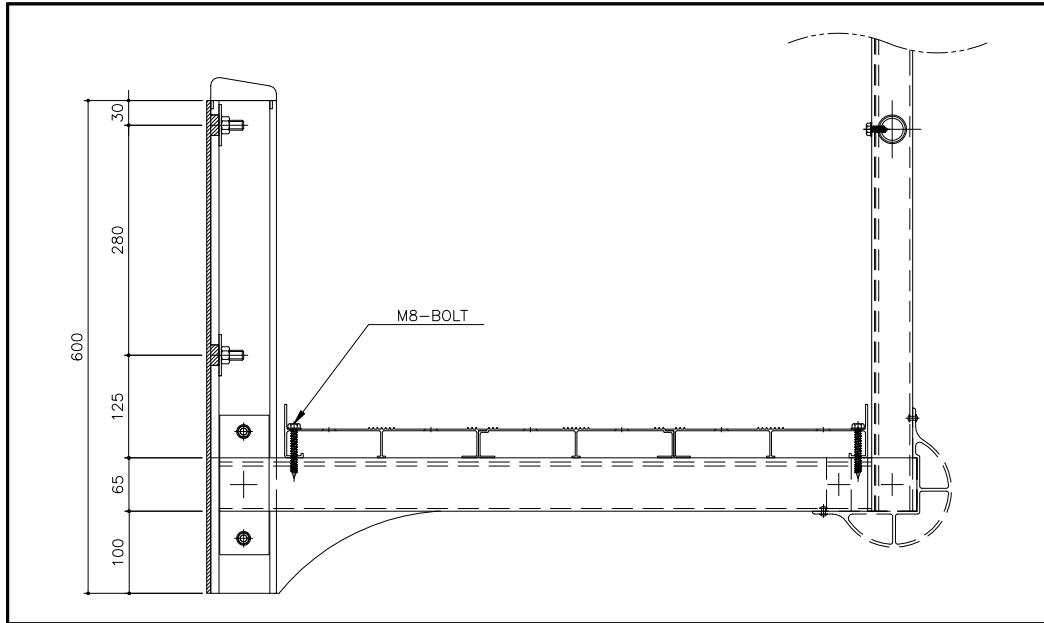
$V_{ua} \leq 0.2 \Phi V_n$ 이고 $N_{ua} \geq 0.2 \Phi N_n$ 이므로 인장과 전단 상관 작용을 검토 하여야 한다.

$$\frac{N_{ua}}{\Phi N_n} + \frac{V_{ua}}{\Phi V_n} \leq 1.2$$

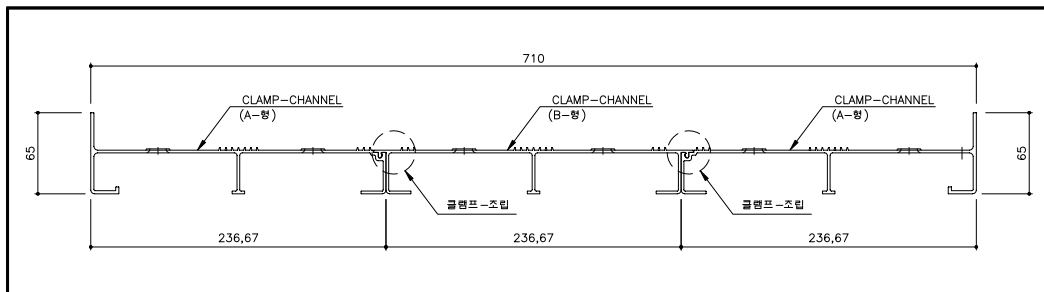
$$\frac{7404.699}{7661.500} + \frac{2104.792}{20297.401} = 1.070 \leq 1.2 \quad \therefore \text{O.K}$$

7. 점검통로 바닥판 구성요소 해석

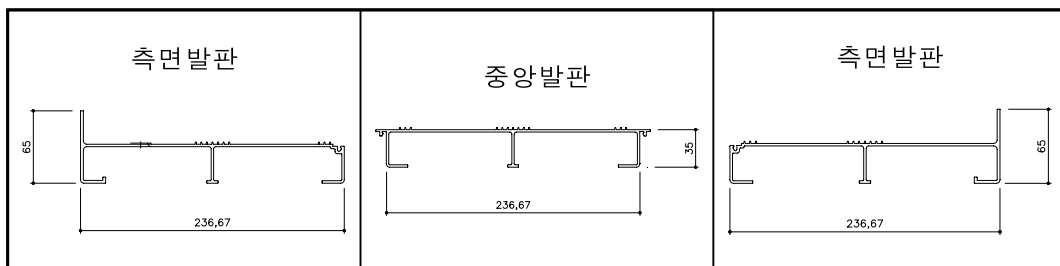
1) 설치 정면도



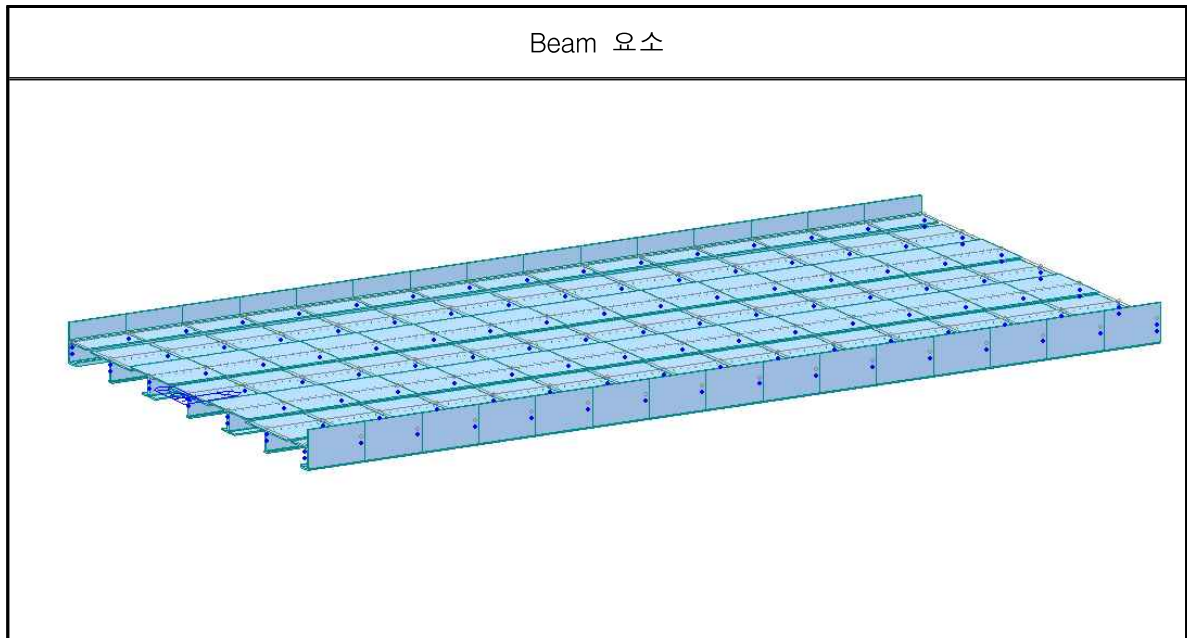
2) 설치 단면도



3) 설치 상세도



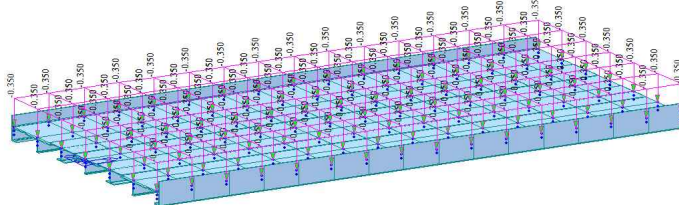
4) 모델링



5) 하중산정 및 하중재하

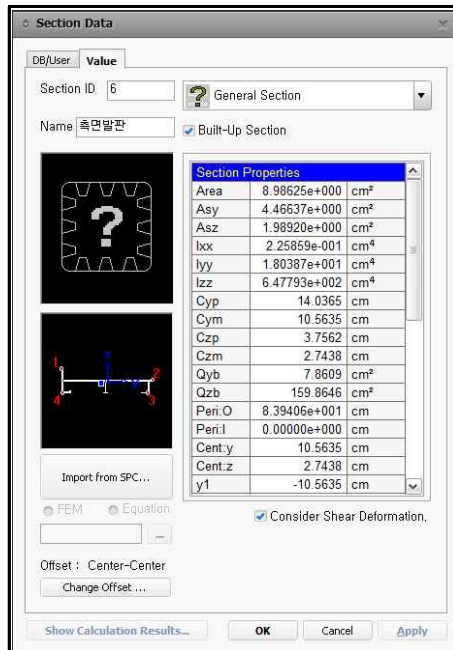
1.바닥판 하중

- 상재하중은 1.5m 로 모델링 하여 등분포하중으로 재하
- 자중 : 구조물 자중은 프로그램 자동재하하며 작업하중은 상부 판요소로 가부재로 선정하여 재하함.



작업하중 : $WL = 3.5 \times 10^{-3} MPa$

2) 단면제원



$$- A_s = 8.986 \text{ cm}^2$$

$$- A_{web} = 6.25 \times 0.25 + 3.1 \times 0.2 \times 2EA = 2.802 \text{ cm}^2$$

$$- I_y = 18.0387 \text{ cm}^4$$

$$- Z_{yu} = I_y / Y_u = 18.0387 / 3.7562 = 4.802 \text{ cm}^3$$

$$- Z_{yL} = I_y / Y_L = 18.0387 / 2.7438 = 6.574 \text{ cm}^3$$

3) 응력검토

· 전단응력검토

$$\begin{aligned} - v &= V_A / A_{WEB} \\ &= 398.929 / 2.802 \\ &= 142.372 \text{ N/cm}^2 = 1.423 \text{ MPa} < v_a = 35 \text{ MPa} \quad \therefore \text{O.K} \end{aligned}$$

· 휨응력검토

$$\begin{aligned} - f_t &= P_A / A_s + M_A / Z_{yu} \\ &= 0.000 / 3.255 + 16654.603 / 4.802 \\ &= 0.000 \text{ N/cm}^2 + 3468.263 \text{ N/cm}^2 \end{aligned}$$

$$- f_t = 3468.263 \text{ N/cm}^2 = 34.683 \text{ MPa} < f_{ta} = 60 \text{ MPa} \quad \therefore \text{O.K}$$

$$\begin{aligned} - f_c &= P_A / A_s + M_A / Z_{yL} \\ &= 0.000 / 3.255 + 16654.603 / 6.574 \\ &= 0.000 \text{ N/cm}^2 + 2533.404 \text{ N/cm}^2 \end{aligned}$$

$$- f_c = 2533.404 \text{ N/cm}^2 = 25.334 \text{ MPa} < f_{ca} = 60 \text{ MPa} \quad \therefore \text{O.K}$$

· 합성응력검토

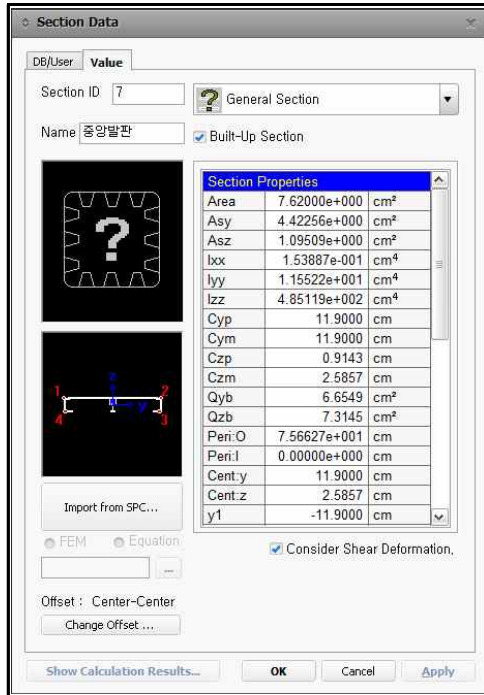
$$\left(\frac{f_b}{f_{ba}} \right)^2 + \left(\frac{v}{v_a} \right)^2 \leq 1.2$$

$$\left(\frac{34.683}{60} \right)^2 + \left(\frac{1.423}{35} \right)^2 \leq 1.2$$

$$= 0.336 \leq 1.2 \quad \therefore \text{O.K}$$

$$\therefore P_A = 0.000\text{N} \quad \therefore V_A = 398.929\text{N} \quad \therefore M_A = 16654.603\text{N} \cdot \text{cm}$$

2) 단면제원



- $A_s = 7.620 \text{ cm}^2$
- $A_{web} = 3.1 \times 0.2 \times 3EA = 1.860 \text{ cm}^2$
- $I_y = 11.552 \text{ cm}^4$
- $Z_{yu} = I_y / Y_u$
 $= 11.552 / 0.9143 = 12.634 \text{ cm}^3$
- $Z_{yL} = I_y / Y_L$
 $= 11.552 / 2.5857 = 4.468 \text{ cm}^3$

3) 응력검토

· 전단응력검토

$$\begin{aligned}
 - v &= V_A / A_{WEB} \\
 &= 398.929 / 1.860 \\
 &= 214.477 \text{ N/cm}^2 = 2.144 \text{ MPa} < v_a = 35 \text{ MPa} \quad \therefore \text{O.K}
 \end{aligned}$$

· 휨응력검토

$$\begin{aligned}
 - f_t &= P_A / A_s + M_A / Z_{yu} \\
 &= 0.000 / 3.255 + 16654.603 / 12.634 \\
 &= 0.000 \text{ N/cm}^2 + 1318.236 \text{ N/cm}^2 \\
 - f_t &= 1318.236 \text{ N/cm}^2 = 13.182 \text{ MPa} < f_{ta} = 60 \text{ MPa} \quad \therefore \text{O.K} \\
 - f_c &= P_A / A_s + M_A / Z_{yL} \\
 &= 0.000 / 3.255 + 16654.603 / 4.468 \\
 &= 0.000 \text{ N/cm}^2 + 3727.529 \text{ N/cm}^2 \\
 - f_c &= 3727.529 \text{ N/cm}^2 = 37.275 \text{ MPa} < f_{ca} = 60 \text{ MPa} \quad \therefore \text{O.K}
 \end{aligned}$$

· 합성응력검토

$$\begin{aligned}
 \left(\frac{f_b}{f_{ba}} \right)^2 + \left(\frac{v}{v_a} \right)^2 &\leq 1.2 \\
 \left(\frac{37.525}{60} \right)^2 + \left(\frac{2.144}{35} \right)^2 &\leq 1.2 \\
 &= 0.395 \leq 1.2 \quad \therefore \text{O.K}
 \end{aligned}$$

7.3 연결볼트 검토

1) 볼트의 허용하중 (STS 304)

- M12 (STS 304)

- 인장강도 : 500MPa - KSB 0241 P 7 참조
- 항복강도 : 210MPa - KSB 0241 P 7 참조
- 허용인발하중 : 12.00kN - 원진화스닝 P 24 참조
- 허용전단하중 = 10.60kN - 원진화스닝 P 24 참조

- M10(STS 304)

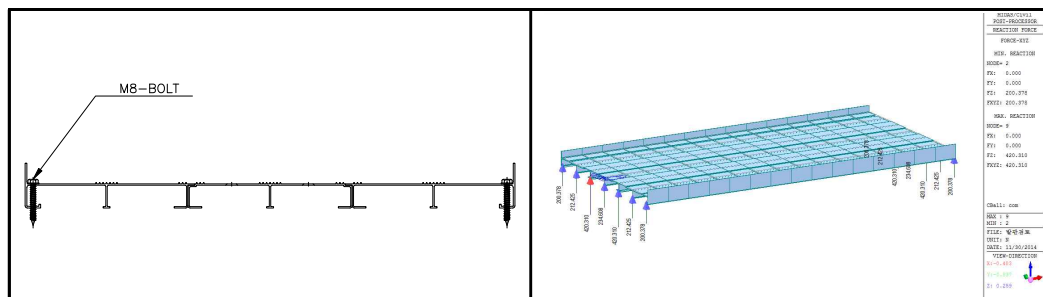
- 인장강도 : 500MPa - KSB 0241 P 7 참조
- 항복강도 : 210MPa - KSB 0241 P 7 참조
- 허용인발하중 : 7.60kN - 원진화스닝 P 24 참조
- 허용전단하중 = 7.90kN - 원진화스닝 P 24 참조

- M8 (STS 304)

- 인장강도 : 500MPa - KSB 0241 P 7 참조
- 항복강도 : 210MPa - KSB 0241 P 7 참조
- 허용인발하중 : 5.00kN - 원진화스닝 P 24 참조
- 허용전단하중 = 4.60kN - 원진화스닝 P 24 참조

2) 발판 연결볼트 검토 - M8 (STS 304)

◎발판볼트 설치도



· M 8 볼트검토 및 볼트너트

작용하중은 수직력으로 인발 및 전단검토

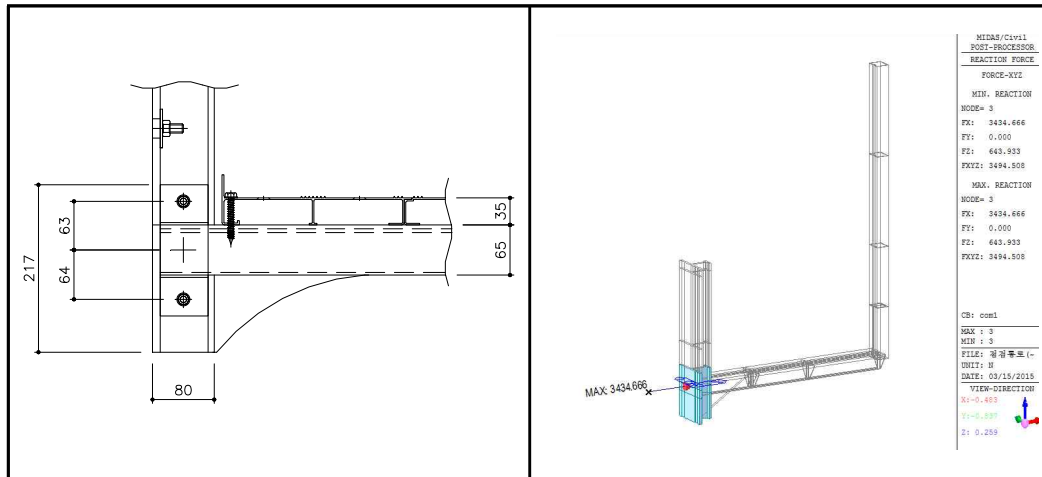
수직전단력 볼트(M8) 검토

- $$\begin{aligned}
 - F_z &= 420.310\text{N} \text{ (설치단면 인발하중 작용)} \\
 &= 420.310\text{N/EA} = 0.420\text{kN/EA} \\
 &< F_a(\text{허용인장하중}) = 5.0\text{kN/EA} \quad \therefore \text{O.K}
 \end{aligned}$$

- $$\begin{aligned} - F_z &= 420.310\text{N} \text{ (설치단면 전단하중 작용)} \\ &= 420.310\text{N/EA} = 0.420\text{kN/EA} \\ &< V_a(\text{허용전단하중}) = 4.60\text{kN/EA} \quad \therefore \text{O.K.} \end{aligned}$$

3) 메인 포스트 연결볼트 검토 - M10 (STS 304)

◎메인 POST 볼트 설치도



- M 10 볼트검토

수평 인장력

$$- F_y = 3434.666 \text{ N}$$

$$= 3434.666 \text{ N/EA} = 3.434 \text{ kN/EA}$$

$$< F_a(\text{허용인장하중}) = 7.60 \text{ kN/EA} \quad \therefore \text{O.K}$$

수직 전단력

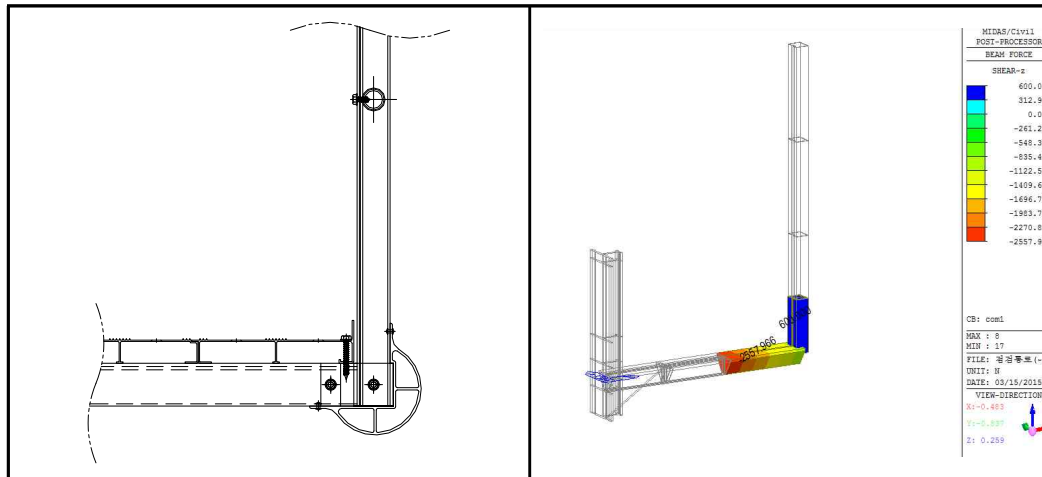
$$- F_z = 643.933 \text{ N}$$

$$= 643.933 \text{ N/EA} = 0.643 \text{ kN/EA}$$

$$< V_a(\text{허용전단하중}) = 7.90 \text{ kN/EA} \quad \therefore \text{O.K}$$

4) 난간 포스트 연결볼트 검토 - M10 (STS 304)

◎메인 POST 볼트 설치도



- M 10 볼트검토

포스트에 작용하는 전단력

$$- F_y = 600.0N$$

$$= 600.0N/EA = 0.600kN/EA$$

$$< F_a(\text{허용인장하중}) = 7.60kN/EA \quad \therefore \text{O.K}$$

지지보에 작용하는 전단력

$$- F_z = 2557.966N$$

$$= 2557.966N/EA = 2.557kN/EA$$

$$< V_a(\text{허용전단하중}) = 7.90kN/EA \quad \therefore \text{O.K}$$

§8. 결 론

상기 검토내용과 같이 점검통로의 각 부재별 응력 및 작용하중은 허용치를 초과하지 않으며 소요안전도를 충분히 확보하였으므로 이 점검통로의 Main post 및 각 부재는 구조적으로 적절한 안전도를 갖는 단면인 것으로 사료됨.

검토자 : 토목구조기술사 김 달 성



§9. 부 록

- 입력자료

```
-----
: MIDAS/Civil Text(MCT) File.
: Date : 2015/3/15
-----
*VERSION
8.1.5
*UNIT : Unit System
: FORCE, LENGTH, HEAT, TEMPER
N , CM, KCAL, C
*PROJINFO : Project Information

*REBAR-MATL-CODE : Rebar Material Code
: CONC_CODE, CONC_MDB, SRC_CODE, SRC_MDB
KS01-Civil(RC), SD300, KS01-Civil(RC), SD300
*NODE : Nodes
: INO, X, Y, Z
1, 0, 0, -13.25
2, 0, 0, -3.25
3, 0, 0, 0
7, 79, 0, 0
8, 0, 0, 6.45
9, 0, 0, 15.75
10, 79, 0, 20
11, 79, 0, 43.25
12, 0, 0, 43.75
13, 0, 0, 46.75
14, 79, 0, 78.25
15, 79, 0, 113.25
16, 23.5, 0, 0
17, 48.4, 0, 0
18, 24.6, 0, 0
*ELEMENT : Elements
: iEL, TYPE, iMAT, iPRO, iN1, iN2, ANGLE, iSUB, EXVAL, iOPT(EXVAL2) : Frame Element
: iEL, TYPE, iMAT, iPRO, iN1, iN2, ANGLE, iSUB, EXVAL, EXVAL2, bLMT : Comp/Tens Truss
: iEL, TYPE, iMAT, iPRO, iN1, iN2, iN3, iN4, iSUB, iWID : Planar Element
: iEL, TYPE, iMAT, iPRO, iN1, iN2, iN3, iN4, iN5, iN6, iN7, iN8 : Solid Element
: iEL, TYPE, iMAT, iPRO, iN1, iN2, REF, RPX, RPY, RPZ, iSUB, EXVAL : Frame(Ref. Point)
1, BEAM , 1, 2, 1, 2, 0
2, BEAM , 1, 2, 2, 3, 0
7, BEAM , 1, 2, 3, 8, 0
8, BEAM , 1, 9, 10, 7, 180
9, BEAM , 1, 2, 8, 9, 0
10, BEAM , 1, 2, 9, 12, 0
11, BEAM , 1, 1, 11, 10, 180
12, BEAM , 1, 2, 12, 13, 0
13, BEAM , 1, 1, 14, 11, 180
14, BEAM , 1, 1, 15, 14, 180
15, BEAM , 1, 7, 3, 16, 0
16, BEAM , 1, 3, 16, 18, 0
17, BEAM , 1, 3, 17, 7, 0
18, BEAM , 1, 3, 18, 17, 0
*GROUP : Group
: NAME, NODE_LIST, ELEM_LIST, PLANE_TYPE
발판 , 3 7, 0
main post , 1to3 8 9 12 13, 1 2 7 9 10 12, 0
난간post , 7 11 14 15, 8 11 13 14, 0
*MATERIAL : Material
: iMAT, TYPE, MNAME, SPHEAT, HEATCO, PLAST, TUNIT, bMASS, DAMPRATIO, [DATA1] : STEEL, CONC, USER
: iMAT, TYPE, MNAME, SPHEAT, HEATCO, PLAST, TUNIT, bMASS, DAMPRATIO, [DATA2], [DATA2] : SRC
: [DATA1] : 1, DB, NAME, CODE
: [DATA1] : 2, ELAST, POISN, THERMAL, DEN, MASS
: [DATA1] : 3, Ex, Ey, Ez, Tx, Ty, Tz, Sxy, Sxz, Syz, Pxy, Pxz, Pyz, DEN, MASS : Orthotropic
: [DATA2] : 1, DB, NAME, CODE or 2, ELAST, POISN, THERMAL, DEN, MASS
1, USER , A6063S-T5 , 0, 0, , C, YES, 0, 2, 6.8941e+006, 0.3, 1.2000e-005, 0.0274586, 2.80176e-005
2, USER , STS , 0, 0, , C, YES, 0, 2, 1.9700e+007, 0.3, 1.2000e-005, 0.0793, 8.08e-005
*MATL-COLOR
: iMAT, W_R, W_G, W_B, HF_R, HF_G, HF_B, HE_R, HE_G, HE_B, bBLEND, FACT
1, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
2, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
*SECT-PSCVALUE : PSC Value, General Section, Composite PC, Composite General
: SECT=ISEC, TYPE, SNAME, [OFFSET], bSD, SHAPE, bBU, bEQ : 1st line
: [STIFF1] : 2nd line
: [STIFF2] : 3rd line
: [STIFF3] : 4th line
: T1, T2, BT, HT : 5th line(PSC)
: bSHEARCHK, [SCHK], [WT] : 6th line(PSC)
: SW, GN, CTC, Bc, Tc, Hh, EsEc, DsDc, Ps, Pc : 7th line(COMPOSITE-PC)
: OPOLY=X1, Y1, X2, Y2, ..., Xn, Yn : Outer Polygon(PLANE)
: IPOLY=X1, Y1, X2, Y2, ..., Xn, Yn : Inner Polygon(PLANE)
: ...
: IPOLY=X1, Y1, X2, Y2, ..., Xn, Yn : Inner Polygon(PLANE)
: VERTEX=X1, Y1, X2, Y2, ..., Xn, Yn : Vertex(General-LINE)
: LINE=V11, VJ1, dTHIK1, iALIGN1 : Line(General-LINE)
: ...
: LINE=V1n, VJn, dTHIKn, iALIGNn : Line(General-LINE)
: LOOP=COUNT1, LIX11, LIX12, ..., LIXn : Line(General-LINE)
: ...
: LOOP=COUNTn, LIXn1, LIXn2, ..., LIXnn : Line(General-LINE)
SECT=ISEC, TYPE, SNAME, [OFFSET2], bSD, SHAPE, iyVAR, izVAR, bEQ : 1st line - TAPERED
: [STIFF1-I] : 2nd line
: [STIFF2-I] : 3rd line
: [STIFF3-I] : 4th line
: [STIFF1-J] : 5th line
: [STIFF2-J] : 6th line
: [STIFF3-J] : 7th line
: T1-I, T2-I, BT-I, HT-I, T1-J, T2-J, BT-J, HT-J : 8th line(PSC)
: bSHEARCHK, [SCHK-I], [WT-I], [SCHK-J], [WT-J] : 9th line(PSC)
: OPOLY=bl, X1, Y1, X2, Y2, ..., Xn, Yn : Outer Polygon(PLANE)
: IPOLY=bl, X1, Y1, X2, Y2, ..., Xn, Yn : Inner Polygon(PLANE)
: ...
: IPOLY=bl, X1, Y1, X2, Y2, ..., Xn, Yn : Inner Polygon(PLANE)
: VERTEX=bl, X1, Y1, X2, Y2, ..., Xn, Yn : Vertex(General-LINE)
: LINE=bl, V11, VJ1, dTHIK1, iALIGN1 : Line(General-LINE)
: ...
: LINE=bl, V1n, VJn, dTHIKn, iALIGNn : Line(General-LINE)
: LOOP=bl, COUNT1, LIX11, LIX12, ..., LIXn : Line(General-LINE)
: ...
```

```

; LOOP=bl, COUNTn, LIXn1, LIXn2, ..., LIXnn ; Line(General-LINE)
SECT=SEC, TYPE, SNAME, [OFFSET1], bSD, SHAPE, bBU, bEQ, BPRT : 1st line - COMPOSITE-GEN
; [PART1] ; 2nd line
; [PART2] ; 3rd line
; ...
SECT=SEC, TYPE, SNAME, [OFFSET2], bSD, SHAPE, iyVAR, izVAR, bEQ, PARTNUM : 1st line - COMPOSITE-GEN(TAPERED)
; [PART1]-I ; 2nd line
; [PART2]-I ; next lines
; ...
; [PART1]-J ; next lines
; [PART2]-J ; next lines
; ...
[OFFSET] : OFFSET, ICENT, IREF, IHORZ, HUSER, IVERT, VUSER
[OFFSET2]: OFFSET, ICENT, IREF, IHORZ, HUSERI, HUSERJ, IVERT, VUSERI, VUSERJ
[STIFF1] : AREA, ASy, ASz, lxx, lyy, lzz
[STIFF2] : Cyp, Cym, Czp, Czm, Qyb, Qzb, PERI_OUT, PERI_IN, Cy, Cz
[STIFF3] : Y1, Y2, Y3, Y4, Z1, Z2, Z3, Z4
[SCHK] : Z1, Z3, bAUTO_QY1, QY1, bAUTO_QY2, QY2, bAUTO_QY3, QY3
[WT] : TOR, bAUTO_SHR1, SHR1, bAUTO_SHR2, SHR2, bAUTO_SHR3, SHR3
[PART] : PART=part_num
; [STIFF1]
; [STIFF2]
; [STIFF3]
; [STIFF1] ; [STIFF1] of Part Sum.
; [STIFF2] ; [STIFF2] of Part Sum.
; [STIFF3] ; [STIFF3] of Part Sum.
; OPOLY=(bl-Tapered), X1, Y1, X2, Y2, ..., Xn, Yn ; Outer Polygon(PLANE)
; IPOLY=(bl-Tapered), X1, Y1, X2, Y2, ..., Xn, Yn ; Inner Polygon(PLANE)
; ...
; IPOLY=(bl-Tapered), X1, Y1, X2, Y2, ..., Xn, Yn ; Inner Polygon(PLANE)
; VERTEX=(bl-Tapered), X1, Y1, X2, Y2, ..., Xn, Yn ; Vertex(General-LINE)
; LINE=(bl-Tapered), V1I, VJ1, dTHIK1, iALIGN1 ; Line(General-LINE)
; ...
; LINE=(bl-Tapered), VIn, VJn, dTHIKn, iALIGNn ; Line(General-LINE)
; LOOP=(bl-Tapered), COUNT1, LIX11, LIX12, ..., LIXn ; Line(General-LINE)
; ...
; LOOP=(bl-Tapered), COUNTn, LIXn1, LIXn2, ..., LIXnn ; Line(General-LINE)
SECT= 1, VALUE, 난간post, CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
7.56, 3.42662, 2.5699, 45.4869, 27.8972, 36.8154
3, 3, 2.43519, 2.56481, 9.62217, 10.7425, 23, 20.2, 3, 2.56481
-3, 3, 3, -3, 2.43519, 2.43519, -2.56481, -2.56481
OPOLY=-3, 2.43519, -3, -2.56481, 3, -2.56481, 3, 2.43519, 0.5, 2.43519, 0.5, 1.93519
-0.5, 1.93519, -0.5, 2.43519
IPOLY=-2.65, 2.08519, -0.85, 2.08519, -0.85, 1.58519, 0.85, 1.58519, 0.85, 2.08519
2.65, 2.08519, 2.65, -2.21481, -2.65, -2.21481
SECT= 2, VALUE, main post, CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
23.4, 12.7565, 6.12917, 7.14343, 169.578, 265.75
7.5, 7.5, 5.62479, 2.37521, 27.2537, 3.65064, 53.2, 0, 7.5, 2.37521
-2, 2, 7.5, -7.5, 5.62479, 5.62479, -2.37521, -2.37521
OPOLY=-7.5, -1.37521, -7.5, -2.37521, -6, -2.37521, -6, -2.17521, -4, -2.17521
-4, -2.37521, 4, -2.37521, 4, -2.17521, 6, -2.17521, 6, -2.37521
7.5, -2.37521, 7.5, -1.37521, 0.5, -1.37521, 0.5, 4.82479
2, 4.82479, 2, 5.62479, 0.5, 5.62479, 0.5, 5.42479, -0.5, 5.42479
-0.5, 5.62479, -2, 5.62479, -2, 4.82479, -0.5, 4.82479
-0.5, -1.37521
SECT= 3, VALUE, 발판지지, CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
13.9943, 4.0037, 7.1979, 36.4584, 61.8553, 77.8026
5, 5, 2.39444, 4.10556, 8.82775, 26.2277, 39.9019, 33.001, 5, 4.10556
-5, 5, 1.35, -1.35, 2.39444, 2.39444, -4.10556, -4.10556
OPOLY=-5, 2.39444, -5, 1.39444, -1.35, -4.10556, -0.5, -4.10556, -0.5, 1.39444
0.5, 1.39444, 0.5, -4.10556, 1.35, -4.10556, 5, 1.39444
5, 2.39444, 0.5, 2.39444, 0.5, 1.89444, -0.5, 1.89444
-0.5, 2.39444
IPOLY=-4.8, 1.89444, -1, 1.89444, -1, -3.76552, -1.33563, -3.76552, -4.8, 1.45477
IPOLY=1, 1.89444, 4.8, 1.89444, 4.8, 1.45477, 1.33563, -3.76552, 1, -3.76552
SECT= 6, VALUE, 발판, CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
29.4943, 6.85781, 18.5621, 81.7551, 669.244, 79.0943
5, 5, 5.73445, 10.7656, 23.5753, 0.940709, 48.9019, 33.001, 5, 10.7656
-5, 5, 0.5, -0.5, 5.73445, 5.73445, -10.7656, -10.7656
OPOLY=-5, 5.73445, -5, 4.73445, -1.35, -0.765555, -0.5, -0.765555, -0.5, -10.7656
0.5, -10.7656, 0.5, -0.765555, 1.35, -0.765555, 5, 4.73445
5, 5.73445, 0.5, 5.73445, 0.5, 5.23445, -0.5, 5.23445
-0.5, 5.73445
IPOLY=-4.8, 5.23445, -1, 5.23445, -1, -0.425515, -1.33563, -0.425515, -4.8, 4.79478
IPOLY=1, 5.23445, 4.8, 5.23445, 4.8, 4.79478, 1.33563, -0.425515, 1, -0.425515
SECT= 7, TAPERED, 변단면, CT, 1, 0, 0, 0, 0, 1, 3.34, 0, YES, GEN, 1, 1, YES
29.4943, 6.85781, 18.5621, 81.7551, 669.244, 79.0943
5, 5, 5.73445, 10.7656, 23.5753, 0.940709, 48.9019, 33.001, 5, 10.7656
-5, 5, 0.5, -0.5, 5.73445, 5.73445, -10.7656, -10.7656
13.9943, 4.0037, 7.1979, 36.4584, 61.8553, 77.8026
5, 5, 2.39444, 4.10556, 8.82775, 26.2277, 39.9019, 33.001, 5, 4.10556
-5, 5, 1.35, -1.35, 2.39444, 2.39444, -4.10556, -4.10556
OPOLY=YES, -5, 5.73445, -5, 4.73445, -1.35, -0.765555, -0.5, -0.765555, -0.5, -10.7656
0.5, -10.7656, 0.5, -0.765555, 1.35, -0.765555, 5, 4.73445
5, 5.73445, 0.5, 5.73445, 0.5, 5.23445, -0.5, 5.23445
-0.5, 5.73445
IPOLY=YES, -4.8, 5.23445, -1, 5.23445, -1, -0.425515, -1.33563, -0.425515, -4.8, 4.79478
IPOLY=YES, 1, 5.23445, 4.8, 5.23445, 4.8, 4.79478, 1.33563, -0.425515, 1, -0.425515
OPOLY=NO, -5, 2.39444, -5, 1.39444, -1.35, -4.10556, -0.5, -4.10556, -0.5, 1.39444
0.5, 1.39444, 0.5, -4.10556, 1.35, -4.10556, 5, 1.39444
5, 2.39444, 0.5, 2.39444, 0.5, 1.89444, -0.5, 1.89444
-0.5, 2.39444
IPOLY=NO, -4.8, 1.89444, -1, 1.89444, -1, -3.76552, -1.33563, -3.76552, -4.8, 1.45477
IPOLY=NO, 1, 1.89444, 4.8, 1.89444, 4.8, 1.45477, 1.33563, -3.76552, 1, -3.76552
SECT= 8, VALUE, 바닥판, CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
19.4943, 6.5884, 11.1524, 76.4183, 82.975, 78.261
5, 5, 2.77689, 3.72311, 7.1461, 2.30023, 28.9019, 33.001, 5, 3.72311
-5, 5, 1.35, -1.35, 2.77689, 2.77689, -3.72311, -3.72311
OPOLY=-5, 2.77689, -5, 1.77689, -1.35, -3.72311, 1.35, -3.72311, 5, 1.77689
5, 2.77689, 0.5, 2.77689, 0.5, 2.27689, -0.5, 2.27689
-0.5, 2.77689
IPOLY=-4.8, 2.27689, -1, 2.27689, -1, -3.38307, -1.33563, -3.38307, -4.8, 1.83722
IPOLY=1, 2.27689, 4.8, 2.27689, 4.8, 1.83722, 1.33563, -3.38307, 1, -3.38307
SECT= 9, VALUE, 난간 post-1, CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
16.05, 7.52645, 7.53538, 79.652, 47.5571, 64.042
3, 3, 2.46963, 2.53037, 6.82768, 3.11437, 23, 22.3, 3, 2.53037
-3, 3, 3, -3, 2.46963, 2.46963, -2.53037, -2.53037
OPOLY=-3, 2.46963, -3, -2.53037, 3, -2.53037, 3, 2.46963, 0.5, 2.46963, 0.5, 1.96963
-0.5, 1.96963, -0.5, 2.46963
IPOLY=-2.25, 1.71963, -1.25, 1.71963, -1.25, 1.21963, -0.175, 1.21963
-0.175, -1.78037, -2.25, -1.78037
IPOLY=0.175, 1.21963, 1.25, 1.21963, 1.25, 1.71963, 2.25, 1.71963, 2.25, -1.78037
0.175, -1.78037
SECT= 10, VALUE, main post-1, CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
26.74, 13.5539, 6.53663, 10.5674, 249.617, 277.898
7.5, 7.5, 5.3193, 2.9807, 37.4287, 3.74283, 54.4, 0, 7.5, 2.9807

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-2.3, 2.3, 7.5, -7.5, 5.3193, 5.3193, -2.9807, -2.9807
OPOLY=-7.5, -1.9807, -7.5, -2.9807, -6, -2.9807, -6, -2.8307, -4, -2.8307
-4, -2.9807, 4, -2.9807, 4, -2.8307, 6, -2.8307, 6, -2.9807
7.5, -2.9807, 7.5, -1.9807, 0.5, -1.9807, 0.5, 3.9193, 2.3, 3.9193
2.3, 5.3193, -2.3, 5.3193, -2.3, 3.9193, -0.5, 3.9193
-0.5, -1.9807
SECT= 11, VALUE , 지지보(165) , CC, 0, 0, 0, 0, 0, 0, YES, GEN, YES, YES
32.8903, 8.16941, 19.5136, 92.1479, 695.916, 83.6111
5, 5, 5.48618, 11.0138, 20.023, 1.06276, 48.9019, 31.801, 5, 11.0138
-5, 5, 0.500002, -0.499998, 5.48618, 5.48618, -11.0138, -11.0138
OPOLY=-5, 5.48618, -5, 4.48618, -1.35, -1.01382, -0.499998, -1.01382
-0.499998, -11.0138, 0.500002, -11.0138, 0.500002, -1.01382
1.35, -1.01382, 5, 4.48618, 5, 5.48618, 0.500002, 5.48618
0.500002, 4.98618, -0.499998, 4.98618, -0.499998, 5.48618
IPOLY=-4.8, 4.98618, -1.3, 4.98618, -1.3, -0.673781, -1.33562, -0.673781
-4.8, 4.54651
IPOLY=1.3, 4.98618, 4.8, 4.98618, 4.8, 4.54651, 1.33563, -0.673781, 1.3, -0.673781
SECT= 12, VALUE , 지지보(65) , CC, 0, 0, 0, 0, 0, 0, YES, GEN, YES, YES
17.3903, 4.12695, 9.97328, 36.994, 73.3131, 82.3194
5, 5, 2.57713, 3.92287, 7.59759, 30.1333, 39.9019, 31.801, 5, 3.92287
-5, 5, 1.35, -1.35, 2.57713, 2.57713, -3.92287, -3.92287
OPOLY=-5, 2.57713, -5, 1.57713, -1.35, -3.92287, -0.499996, -3.92287
-0.499996, 1.57713, 0.500004, 1.57713, 0.500004, -3.92287
1.35, -3.92287, 5, 1.57713, 5, 2.57713, 0.500004, 2.57713
0.500004, 2.07713, -0.499996, 2.07713, -0.499996, 2.57713
IPOLY=-4.8, 2.07713, -1.3, 2.07713, -1.3, -3.58283, -1.33562, -3.58283, -4.8, 1.63746
IPOLY=1.3, 2.07713, 4.8, 2.07713, 4.8, 1.63746, 1.33563, -3.58283, 1.3, -3.58283
SECT= 13, VALUE , 메인 post-2 , CC, 0, 0, 0, 0, 0, 0, YES, GEN, YES, YES
29.1, 14.24, 6.78224, 14.9387, 298.498, 285.275
7.5, 7.5, 5.13918, 3.36082, 43.7277, 3.87794, 55.6, 0, 7.5, 3.36082
-2.5, 2.5, 7.5, -7.5, 5.13918, 5.13918, -3.36082, -3.36082
OPOLY=-7.5, -2.36082, -7.5, -3.36082, -6, -3.36082, -6, -3.21082, -4, -3.21082
-4, -3.36082, 4, -3.36082, 4, -3.21082, 6, -3.21082, 6, -3.36082
7.5, -3.36082, 7.5, -2.36082, 0.5, -2.36082, 0.5, 3.33918
2.5, 3.33918, 2.5, 5.13918, -2.5, 5.13918, -2.5, 3.33918
-0.5, 3.33918, -0.5, -2.36082
SECT= 14, VALUE , 지지보(80) , CC, 0, 0, 0, 0, 0, 0, YES, GEN, YES, YES
16.004, 3.55005, 9.13781, 46.4021, 107.867, 84.1838
4.99999, 5.00001, 3.05347, 4.94653, 12.7087, 28.9423, 45.4889, 38.5579, 5.00001, 4.94653
-5.00001, 4.99999, 1.34999, -1.35001, 3.05347, 3.05347, -4.94653, -4.94653
OPOLY=-5.00001, 3.05347, -5.00001, 2.05347, -1.35001, -4.94653, -0.500005, -4.94653
-0.500005, 2.05347, 0.499995, 2.05347, 0.499995, -4.94653
1.34999, -4.94653, 4.99999, 2.05347, 4.99999, 3.05347
0.499995, 3.05347, 0.499995, 2.55347, -0.500005, 2.55347
-0.500005, 3.05347
IPOLY=-4.80001, 2.55347, -1.00001, 2.55347, -1.00001, -4.60649, -1.30176, -4.60649
-4.80001, 2.10248
IPOLY=0.999995, 2.55347, 4.79999, 2.55347, 4.79999, 2.10248, 1.30173, -4.60649
0.999995, -4.60649
SECT= 15, VALUE , 지지보(165-80) , CC, 0, 0, 0, 0, 0, 0, YES, GEN, YES, YES
31.504, 6.4172, 21.255, 107.049, 673.703, 85.4755
5, 5, 5.85617, 10.6438, 24.5858, 1.02554, 48.4889, 38.5579, 5, 10.6438
-5, 5, 0.500003, -0.499997, 5.85617, 5.85617, -10.6438, -10.6438
OPOLY=-5, 5.85617, -5, 4.85617, -1.35, -2.14383, -0.499997, -2.14383
-0.499997, -10.6438, 0.500003, -10.6438, 0.500003, -2.14383
1.35, -2.14383, 5, 4.85617, 5, 5.85617, 0.500003, 5.85617
0.500003, 5.35617, -0.499997, 5.35617, -0.499997, 5.85617
IPOLY=-4.8, 5.35617, -0.999997, 5.35617, -0.999997, -1.80379, -1.30174, -1.80379
-4.8, 4.90518
IPOLY=1, 5.35617, 4.8, 5.35617, 4.8, 4.90518, 1.30175, -1.80379, 1, -1.80379
SECT= 16, VALUE , 지지보(80-5.5) , CC, 0, 0, 0, 0, 0, 0, YES, GEN, YES, YES
16.8614, 3.6841, 9.81713, 47.7426, 112.897, 87.4458
5, 5, 3.09098, 4.90902, 12.4797, 30.2331, 45.4889, 37.9162, 5, 4.90902
-5, 5, 1.35, -1.35, 3.09098, 3.09098, -4.90902, -4.90902
OPOLY=-5, 3.09098, -5, 2.09098, -1.35, -4.90902, -0.5, -4.90902, -0.5, 2.09098
0.5, 2.09098, 0.5, -4.90902, 1.35, -4.90902, 5, 2.09098
5, 3.09098, 0.5, 3.09098, 0.5, 2.59098, -0.5, 2.59098
-0.5, 3.09098
IPOLY=-4.7, 2.59098, -1.05, 2.59098, -1.05, -4.50902, -1.33302, -4.50902
-4.7, 1.94821
IPOLY=1.05, 2.59098, 4.7, 2.59098, 4.7, 1.94821, 1.33302, -4.50902, 1.05, -4.50902
SECT= 17, VALUE , 지지보(165-5.5) , CC, 0, 0, 0, 0, 0, 0, YES, GEN, YES, YES
32.3614, 6.75074, 21.6514, 111.693, 681.85, 88.7376
5, 5, 5.80146, 10.6985, 24.0124, 1.06588, 48.4889, 37.9162, 5, 10.6985
-5, 5, 0.500002, -0.499998, 5.80146, 5.80146, -10.6985, -10.6985
OPOLY=-5, 5.80146, -5, 4.80146, -1.35, -2.19854, -0.499998, -2.19854
-0.499998, -10.6985, 0.500002, -10.6985, 0.500002, -2.19854
1.35, -2.19854, 5, 4.80146, 5, 5.80146, 0.500002, 5.80146
0.500002, 5.30146, -0.499998, 5.30146, -0.499998, 5.80146
IPOLY=-4.7, 5.30146, -1.05, 5.30146, -1.05, -1.79854, -1.33301, -1.79854
-4.7, 4.65869
IPOLY=1.05, 5.30146, 4.7, 5.30146, 4.7, 4.65869, 1.33302, -1.79854, 1.05, -1.79854
SECT= 18, VALUE , 지지보(80-8) , CC, 0, 0, 0, 0, 0, 0, YES, GEN, YES, YES
20.4114, 3.79479, 12.8266, 48.4063, 130.507, 92.3655
5, 5, 3.25778, 4.74222, 11.1153, 34.4043, 45.4889, 36.9162, 5, 4.74222
-5, 5, 1.35, -1.35, 3.25778, 3.25778, -4.74222, -4.74222
OPOLY=-5, 3.25778, -5, 2.25778, -1.35, -4.74222, -0.5, -4.74222, -0.5, 2.25778
0.5, 2.25778, 0.5, -4.74222, 1.35, -4.74222, 5, 2.25778
5, 3.25778, 0.5, 3.25778, 0.5, 2.75778, -0.5, 2.75778
-0.5, 3.25778
IPOLY=-4.7, 2.75778, -1.3, 2.75778, -1.3, -4.34222, -1.33302, -4.34222, -4.7, 2.11501
IPOLY=1.3, 2.75778, 4.7, 2.75778, 4.7, 2.11501, 1.33302, -4.34222, 1.3, -4.34222
SECT= 19, VALUE , 지지보(165-8) , CC, 0, 0, 0, 0, 0, 0, YES, GEN, YES, YES
35.9114, 7.99727, 23.3563, 125.206, 706.577, 93.6574
5, 5, 5.62832, 10.8717, 21.2171, 1.19623, 48.4889, 36.9162, 5, 10.8717
-5, 5, 0.500002, -0.499998, 5.62832, 5.62832, -10.8717, -10.8717
OPOLY=-5, 5.62832, -5, 4.62832, -1.35, -2.37168, -0.499998, -2.37168
-0.499998, -10.8717, 0.500002, -10.8717, 0.500002, -2.37168
1.35, -2.37168, 5, 4.62832, 5, 5.62832, 0.500002, 5.62832
0.500002, 5.12832, -0.499998, 5.12832, -0.499998, 5.62832
IPOLY=-4.7, 5.12832, -1.3, 5.12832, -1.3, -1.97168, -1.33301, -1.97168, -4.7, 4.48555
IPOLY=1.3, 5.12832, 4.7, 5.12832, 4.7, 4.48555, 1.33302, -1.97168, 1.3, -1.97168
SECT= 20, VALUE , 지지보(80-8-8) , CC, 0, 0, 0, 0, 0, 0, YES, GEN, YES, YES
22.4514, 4.90768, 12.7697, 49.2353, 143.135, 112.691
5, 5, 3.02083, 4.97917, 12.2605, 40.5243, 45.4889, 35.7162, 5, 4.97917
-5, 5, 1.35, -1.35, 3.02083, 3.02083, -4.97917, -4.97917
OPOLY=-5, 3.02083, -5, 2.02083, -1.35, -4.97917, -0.5, -4.97917, -0.5, 2.02083
0.5, 2.02083, 0.5, -4.97917, 1.35, -4.97917, 5, 2.02083
5, 3.02083, 0.5, 3.02083, 0.5, 2.52083, -0.5, 2.52083
-0.5, 3.02083
IPOLY=-4.7, 2.22083, -1.3, 2.22083, -1.3, -4.57917, -1.33302, -4.57917, -4.7, 1.87806
IPOLY=1.3, 2.22083, 4.7, 2.22083, 4.7, 1.87806, 1.33302, -4.57917, 1.3, -4.57917
SECT= 21, VALUE , 지지보(165-8-8) , CC, 0, 0, 0, 0, 0, 0, YES, GEN, YES, YES
37.9514, 10.3387, 23.8271, 127.704, 754.433, 113.983
5, 5, 5.36072, 11.1393, 22.6281, 1.38748, 48.4889, 35.7162, 5, 11.1393
-5, 5, 0.500002, -0.499998, 5.36072, 5.36072, -11.1393, -11.1393
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OPOLY=-5, 5.36072, -5, 4.36072, -1.35, -2.63928, -0.499998, -2.63928
-0.499998, -11.1393, 0.500002, -11.1393, 0.500002, -2.63928
1.35, -2.63928, 5, 4.36072, 5, 5.36072, 0.500002, 5.36072
0.500002, 4.86072, -0.499998, 4.86072, -0.499998, 5.36072
IPOLY=-4.7, 4.56072, -1.3, 4.56072, -1.3, -2.23928, -1.33301, -2.23928, -4.7, 4.21795
IPOLY=1.3, 4.56072, 4.7, 4.56072, 4.7, 4.21795, 1.33302, -2.23928, 1.3, -2.23928
SECT= 22, VALUE , 지지보-85 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
24.8903, 8.03389, 16.5929, 89.4, 133.21, 82.9444
5, 5, 3.23187, 5.26813, 8.05758, 2.00052, 32.9019, 31.801, 5, 5.26813
-5, 5, 0.500003, -0.499997, 3.23187, 3.23187, -5.26813, -5.26813
OPOLY=-5, 3.23187, -5, 2.23187, -1.35, -3.26813, -0.499997, -3.26813
-0.499997, -5.26813, 0.500003, -5.26813, 0.500003, -3.26813
1.35, -3.26813, 5, 2.23187, 5, 3.23187, 0.500003, 3.23187
0.500003, 2.73187, -0.499997, 2.73187, -0.499997, 3.23187
IPOLY=-4.8, 2.73187, -1.3, 2.73187, -1.3, -2.92809, -1.33562, -2.92809, -4.8, 2.2922
IPOLY=1.3, 2.73187, 4.8, 2.73187, 4.8, 2.2922, 1.33563, -2.92809, 1.3, -2.92809
SECT= 23, VALUE , 지지보-100 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
26.3903, 8.05972, 17.9594, 89.9144, 184.73, 83.0694
5, 5, 3.57393, 6.42607, 9.54612, 1.70438, 35.9019, 31.801, 5, 6.42607
-5, 5, 0.500002, -0.499998, 3.57393, 3.57393, -6.42607, -6.42607
OPOLY=-5, 3.57393, -5, 2.57393, -1.35, -2.92607, -0.499998, -2.92607
-0.499998, -6.42607, 0.500002, -6.42607, 0.500002, -2.92607
1.35, -2.92607, 5, 2.57393, 5, 3.57393, 0.500002, 3.57393
0.500002, 3.07393, -0.499998, 3.07393, -0.499998, 3.57393
IPOLY=-4.8, 3.07393, -1.3, 3.07393, -1.3, -2.58603, -1.33562, -2.58603, -4.8, 2.63426
IPOLY=1.3, 3.07393, 4.8, 3.07393, 4.8, 2.63426, 1.33563, -2.58603, 1.3, -2.58603
SECT= 24, VALUE , 지지보(100-80단면) , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
25.004, 6.33759, 17.0465, 104.832, 203.096, 84.9338
5, 5, 3.93408, 6.06592, 12.6284, 1.64169, 35.4889, 38.5579, 5, 6.06592
-5, 5, 0.500003, -0.499997, 3.93408, 3.93408, -6.06592, -6.06592
OPOLY=-5, 3.93408, -5, 2.93408, -1.35, -4.06592, -0.499997, -4.06592
-0.499997, -6.06592, 0.500003, -6.06592, 0.500003, -4.06592
1.35, -4.06592, 5, 2.93408, 5, 3.93408, 0.500003, 3.93408
0.500003, 3.43408, -0.499997, 3.43408, -0.499997, 3.93408
IPOLY=-4.8, 3.43408, -0.999997, 3.43408, -0.999997, -3.72588, -1.30174, -3.72588
-4.8, 2.98309
IPOLY=1, 3.43408, 4.8, 3.43408, 4.8, 2.98309, 1.30175, -3.72588, 1, -3.72588
SECT= 25, VALUE , 단면 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
18.9411, 8.86947, 5.43042, 148.005, 333.176, 206.038
5.99897, 6.00103, 5.00426, 4.99692, 62.8494, 28.2995, 61.9801, 28.9279, 6.00103, 4.99692
-6.00103, 5.99897, 5.99897, -6.00098, 5.00426, 5.00426, -4.99574, -4.99692
OPOLY=-6.00103, 5.00426, -6.00103, 4.50426, -3.66101, 4.50426, -3.76656, 4.33142
-3.83098, 4.09818, -3.6793, 3.9465, -3.03651, 4.51148
-2.60729, 4.26072, -2.53651, 4.00426, -3.03651, 3.50426
-3.18651, 3.52729, -3.18651, -3.51877, -3.00494, -3.49673
-2.53651, -3.99574, -2.61895, -4.27077, -3.03651, -4.49574
-3.6793, -3.93797, -3.83098, -4.08965, -3.66101, -4.49574
-6.00103, -4.49574, -6.00098, -4.99692, 5.99897, -4.99574
5.99897, -4.49574, 3.659, -4.49574, 3.77247, -4.30462
3.82897, -4.08965, 3.69921, -3.93956, 3.0345, -4.49574
2.61694, -4.27077, 2.5345, -3.99574, 3.0345, -3.49574
3.1845, -3.51877, 3.1845, 3.52729, 3.0345, 3.50426
2.5345, 4.00426, 2.61694, 4.2793, 3.0345, 4.50426
3.69921, 3.94809, 3.82897, 4.09818, 3.659, 4.50426
5.99897, 4.50426, 5.99897, 5.00426
IPOLY=-2.88651, 3.21845, -2.28599, 3.7273, -2.23651, 4.0771, -2.41201, 4.50426
2.41, 4.50426, 2.2345, 4.00426, 2.28397, 3.7273, 2.8845, 3.21845
2.8845, -3.20992, 2.24659, -3.71877, 2.24659, -4.1343
2.41, -4.49574, -2.41201, -4.49574, -2.23651, -3.99574
-2.28599, -3.71877, -2.88651, -3.20992
SECT= 26, VALUE , 165-100-70 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
31.3414, 8.7587, 18.6162, 125.466, 667.38, 103.231
5, 5, 5.79349, 10.7065, 24.3268, 1.13936, 51.4018, 34.8253, 5, 10.7065
-5, 5, 0.5, -0.5, 5.79349, 5.79349, -10.7065, -10.7065
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SECT= 27, VALUE , 65-100-70 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
15.8415, 4.11057, 7.84181, 66.9139, 89.0081, 101.94
4.99999, 5.00001, 2.90071, 3.59929, 12.0631, 32.5848, 42.4018, 34.8253, 5.00001, 3.59929
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0.499994, 2.90071, 0.499994, 2.40071, -0.500006, 2.40071
-0.500006, 2.90071
IPOLY=-4.80001, 2.40071, -1.00001, 2.40071, -1.00001, -3.09929, -3.42907, -3.09929
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0.999994, -3.09929
SECT= 28, VALUE , 165-100-80 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
31.7783, 9.23388, 18.6277, 135.893, 667.189, 113.29
5, 5, 5.80333, 10.6967, 24.44, 1.20537, 52.1803, 35.5398, 5, 10.6967
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OPOLY=-5, 5.80333, -5, 4.80333, -4, -0.696665, -0.5, -0.696665, -0.5, -10.6967
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-0.5, 5.80333
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SECT= 29, VALUE , 65-100-80 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
16.2783, 4.21616, 7.86475, 74.5526, 94.1331, 111.998
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OPOLY=-5, 2.99756, -5, 1.99756, -4, -3.50244, -0.5, -3.50244, -0.5, 1.99756
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IPOLY=1, 2.49756, 4.8, 2.49756, 4.8, 2.01559, 3.88763, -3.00244, 1, -3.00244
SECT= 30, VALUE , 80-100-60 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
16.864, 3.68614, 9.75404, 74.6845, 130.178, 101.003
5, 5, 3.3461, 4.6539, 14.7918, 32.8555, 47.5602, 40.5534, 5, 4.6539
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OPOLY=-5, 3.3461, -5, 2.3461, -3, -4.6539, -0.5, -4.6539, -0.5, 2.3461, 0.5, 2.3461
0.5, -4.6539, 3, -4.6539, 5, 2.3461, 5, 3.3461, 0.5, 3.3461
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IPOLY=1, 2.8461, 4.8, 2.8461, 4.8, 2.37412, 2.88915, -4.31386, 1, -4.31386
SECT= 31, VALUE , 165-100-60 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
32.364, 7.1901, 21.4356, 148.203, 676.356, 102.295
5, 5, 5.93417, 10.5658, 25.3356, 1.14783, 50.5602, 40.5534, 5, 10.5658
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IPOLY=1, 5.43417, 4.8, 5.43417, 4.8, 4.96219, 2.88915, -1.72579, 1, -1.72579
SECT= 32, VALUE , 80-100-60-페할 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
17.2041, 5.94595, 9.86182, 135.79, 136.882, 101.031
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IPOLY=-0.5, 2.43472, 0.5, 2.43472, 0.5, -4.22524, -0.5, -4.22524
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SECT= 33, VALUE , 165-100-60-페할 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
32.364, 7.19004, 21.4404, 148.204, 676.355, 102.294
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SECT= 34, VALUE , 165(90)-100-80 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
33.4229, 8.03416, 22.3045, 171.691, 683.761, 129.255
5, 5, 6.3544, 10.1456, 30.1195, 1.35372, 55.5908, 44.3041, 5, 10.1456
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2.70104, -2.1456, 0.85, -2.1456
SECT= 35, VALUE , 90-100-80 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
17.9229, 2.98895, 8.95072, 83.0517, 207.557, 127.963
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SECT= 36, VALUE , 165-110-100 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
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SECT= 37, VALUE , 90-110-100 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
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SECT= 38, VALUE , 165-100-90 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
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SECT= 39, VALUE , 90-100-90 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
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SECT= 40, VALUE , p-150-80-60 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
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SECT= 41, VALUE , p-150-80-70 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
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7.44139, -3.03733, 7.49997, -2.89591, 7.49997, -2.29591
7.44139, -2.15449, 7.29997, -2.09591, 0.499967, -2.09591
0.499967, 3.40409, 0.806107, 3.7697, 1.26364, 3.90409
3.29997, 3.90409, 3.44139, 3.96267, 3.49997, 4.10409
3.49997, 4.70409, 3.44139, 4.84551, 3.29997, 4.90409
-3.30003, 4.90409, -3.44145, 4.84551, -3.50003, 4.70409
-3.50003, 4.10409, -3.44145, 3.96267, -3.30003, 3.90409
-1.25003, 3.90409, -0.800473, 3.76593, -0.500033, 3.40409
-0.500033, -2.09591, -7.30003, -2.09591, -7.44145, -2.15449
SECT= 42, VALUE , p-150-81-70 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
28.261, 15.3165, 6.45765, 10.5756, 275.208, 294.969
7.49997, 7.50003, 4.88146, 3.21854, 41.2255, 4.19096, 57.4298, 0, 7.50003, 3.21854
-3.44145, 3.44139, 7.44139, -7.44145, 4.82288, 4.82288, -3.15996, -3.15996
OPOLY=-7.50003, -2.41854, -7.50003, -3.01854, -7.44145, -3.15996, -7.30003, -3.21854
-6.00003, -3.21854, -6.00003, -3.06854, -4.00003, -3.06854
-4.00003, -3.21854, 3.99997, -3.21854, 3.99997, -3.06854
5.99997, -3.06854, 5.99997, -3.21854, 7.29997, -3.21854
7.44139, -3.15996, 7.49997, -3.01854, 7.49997, -2.41854
7.44139, -2.27712, 7.29997, -2.21854, 0.499968, -2.21854
0.499968, 3.28146, 0.806108, 3.64707, 1.26364, 3.78146
3.29997, 3.78146, 3.44139, 3.84004, 3.49997, 3.98146
3.49997, 4.68146, 3.44139, 4.82288, 3.29997, 4.88146
-3.30003, 4.88146, -3.44145, 4.82288, -3.50003, 4.68146
-3.50003, 3.98146, -3.44145, 3.84004, -3.30003, 3.78146
-1.25003, 3.78146, -0.800472, 3.6433, -0.500032, 3.28146
-0.500032, -2.21854, -7.30003, -2.21854, -7.44145, -2.27712
SECT= 43, VALUE , p-150-80-80 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
28.461, 16.1918, 6.30323, 9.89464, 275.058, 306.012
7.49997, 7.50003, 4.7664, 3.2336, 41.4752, 4.45381, 59.4298, 0, 7.50003, 3.2336
-3.94145, 3.94139, 7.44139, -7.44145, 4.70782, 4.70782, -3.17502, -3.17502
OPOLY=-7.50003, -2.4336, -7.50003, -3.0336, -7.44145, -3.17502, -7.30003, -3.2336
-6.00003, -3.2336, -6.00003, -3.0836, -4.00003, -3.0836
-4.00003, -3.2336, 3.99997, -3.2336, 3.99997, -3.0836
5.99997, -3.0836, 5.99997, -3.2336, 7.29997, -3.2336
7.44139, -3.17502, 7.49997, -3.0336, 7.49997, -2.4336
7.44139, -2.29218, 7.29997, -2.2336, 0.499968, -2.2336
0.499968, 3.2664, 0.806108, 3.63201, 1.26364, 3.7664
3.79997, 3.7664, 3.94139, 3.82498, 3.99997, 3.9664
3.99997, 4.5664, 3.94139, 4.70782, 3.79997, 4.7664
0.499968, 4.7664, 0.499968, 4.6664, -0.500032, 4.6664
-0.500032, 4.7664, -3.80003, 4.7664, -3.94145, 4.70782
-4.00003, 4.5664, -4.00003, 3.9664, -3.94145, 3.82498
-3.80003, 3.7664, -1.25003, 3.7664, -0.800472, 3.62824
-0.500032, 3.2664, -0.500032, -2.2336, -7.30003, -2.2336
-7.44145, -2.29218
*SECTION ; Section
; ISEC, TYPE, SNAME, [OFFSET], bSD, SHAPE, [DATA1], [DATA2] ; 1st line - DB/USER
; ISEC, TYPE, SNAME, [OFFSET], bSD, SHAPE, BLT, D1, ..., D8, iCEL ; 1st line - VALUE
; AREA, ASy, ASz, lxx, lyy, lzz ; 2nd line
; CyP, CyM, CzP, CzM, QyB, QzB, PERI_OUT, PERI_IN, Cy, Cz ; 3rd line
; Y1, Y2, Y3, Y4, Z1, Z2, Z3, Z4, Zyy, Zzz ; 4th line
; ISEC, TYPE, SNAME, [OFFSET], bSD, SHAPE, ELAST, DEN, POIS, POIC, SF ; 1st line - SRC
; D1, D2, [SRC] ; 2nd line
; ISEC, TYPE, SNAME, [OFFSET], bSD, SHAPE, 1, DB, NAME1, NAME2, D1, D2 ; 1st line - COMBINED
; ISEC, TYPE, SNAME, [OFFSET], bSD, SHAPE, 2, D11, D12, D13, D14, D15, D21, D22, D23, D24 ; 2nd line
; ISEC, TYPE, SNAME, [OFFSET2], bSD, SHAPE, iyVAR, izVAR, STYPE ; 1st line - TAPERED
; DB, NAME1, NAME2 ; 2nd line(STYPE=DB)
; [DIM1], [DIM2] ; 2nd line(STYPE=USER)
; D11, D12, D13, D14, D15, D16, D17, D18 ; 2nd line(STYPE=VALUE)
; AREA1, ASy1, ASz1, lxx1, lyy1, lzz1 ; 3rd line(STYPE=VALUE)
; CyP1, CyM1, CzP1, CzM1, QyB1, QzB1, PERI_OUT1, PERI_IN1, Cy1, Cz1 ; 4th line(STYPE=VALUE)
; Y11, Y12, Y13, Y14, Z11, Z12, Z13, Z14, Zyy1, Zyy2 ; 5th line(STYPE=VALUE)
; D21, D22, D23, D24, D25, D26, D27, D28 ; 6th line(STYPE=VALUE)
; AREA2, ASy2, ASz2, lxx2, lyy2, lzz2 ; 7th line(STYPE=VALUE)
; CyP2, CyM2, CzP2, CzM2, QyB2, QzB2, PERI_OUT2, PERI_IN2, Cy2, Cz2 ; 8th line(STYPE=VALUE)
; Y21, Y22, Y23, Y24, Z21, Z22, Z23, Z24, Zyy2, Zzz2 ; 9th line(STYPE=VALUE)
; OPT1, OPT2, [JOINT] ; 2nd line(STYPE=PSC)
; ELAST, DEN, POIS, POIC ; 2nd line(STYPE=PSC-CMPW)
; bSHEARCHK, [SCHK-I], [SCHK-J], [WT-I], [WT-J], WI, WJ, bSYM, bSIDEHOLE ; 3rd line(STYPE=PSC)
; bSHEARCHK, bSYM, bHUNCH, [CMPWEB-I], [CMPWEB-J] ; 3rd line(STYPE=PSC-CMPW)
; bUSERDEFMESH SIZE, MESH SIZE, bUSERINPSTIFF, [STIFF-I], [STIFF-J] ; 4th line(STYPE=PSC)
; [SIZE-A]-I ; 5th line(STYPE=PSC)
; [SIZE-B]-I ; 6th line(STYPE=PSC)
; [SIZE-C]-I ; 7th line(STYPE=PSC)
; [SIZE-D]-I ; 8th line(STYPE=PSC)

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: [SIZE-A]-j : 9th line(STYPE=PSC)
: [SIZE-B]-j : 10th line(STYPE=PSC)
: [SIZE-C]-j : 11th line(STYPE=PSC)
: [SIZE-D]-j : 12th line(STYPE=PSC)
: GN, CTC, Bc, Tc, Hh, EsEc, DsDc, Ps, Pc, bMULTI, EsEc-L, EsEc-S : 2nd line(STYPE=CMP-B/I)
: SW_j, Hw_j, tw_j, B_j, Bf1_j, tf1_j, B2_j, Bf2_j, tf2_j : 3rd line(STYPE=CMP-B/I)
: SW_j, Hw_j, tw_j, B_j, Bf1_j, tf1_j, B2_j, Bf2_j, tf2_j : 4th line(STYPE=CMP-B/I)
: N1, N2, Hr, Hr2, tr1, tr2 : 5th line(STYPE=CMP-B)
: GN, CTC, Bc, Tc, Hh, EgdEsb, DgdDsb, Pgd, Psb, bSYM, SW_j, SW_j : 2nd line(STYPE=CMP-CI/CT)
: OPT1, OPT2, [JOINT] : 3rd line(STYPE=CMP-CI/CT)
: [SIZE-A]-i : 4th line(STYPE=CMP-CI/CT)
: [SIZE-B]-i : 5th line(STYPE=CMP-CI/CT)
: [SIZE-C]-i : 6th line(STYPE=CMP-CI/CT)
: [SIZE-D]-i : 7th line(STYPE=CMP-CI/CT)
: [SIZE-A]-j : 8th line(STYPE=CMP-CI/CT)
: [SIZE-B]-j : 9th line(STYPE=CMP-CI/CT)
: [SIZE-C]-j : 10th line(STYPE=CMP-CI/CT)
: [SIZE-D]-j : 11th line(STYPE=CMP-CI/CT)
: ISEC, TYPE, SNAME, [OFFSET], bSD, STYPE1, STYPE2 : 1st line - CONSTRUCT
: SHAPE, ...(same with other type data from shape) : Before (STYPE1)
: SHAPE, ...(same with other type data from shape) : After (STYPE2)
: ISEC, TYPE, SNAME, [OFFSET], bSD, SHAPE : 1st line - COMPOSITE-SB
: Hw, tw, B, Bf1, tf1, B2, Bf2, tf2 : 2nd line
: N1, N2, Hr, Hr2, tr1, tr2 : 3rd line
: SW, GN, CTC, Bc, Tc, Hh, EsEc, DsDc, Ps, Pc, bMulti, Elong, Esh : 4th line
: ISEC, TYPE, SNAME, [OFFSET], bSD, SHAPE : 1st line - COMPOSITE-SI
: Hw, tw, B, tf1, B2, tf2 : 2nd line
: SW, GN, CTC, Bc, Tc, Hh, EsEc, DsDc, Ps, Pc, bMulti, Elong, Esh : 3rd line
: ISEC, TYPE, SNAME, [OFFSET], bSD, SHAPE : 1st line - COMPOSITE-CI/CT
: OPT1, OPT2, [JOINT] : 2nd line
: [SIZE-A] : 3rd line
: [SIZE-B] : 4th line
: [SIZE-C] : 5th line
: [SIZE-D] : 6th line
: SW, GN, CTC, Bc, Tc, Hh, EgdEsb, DgdDsb, Pgd, Psb : 7th line
: ISEC, TYPE, SNAME, [OFFSET], bSD, SHAPE : 1st line - PSC
: OPT1, OPT2, [JOINT] : 2nd line
: bSHEARCHK, [SCHK], [WT], WIDTH, bSYM, bSIDEHOLE : 3rd line
: bUSERDEFMESH SIZE, MESH SIZE, bUSERINPSTIFF, [STIFF] : 4th line
: [SIZE-A] : 5th line
: [SIZE-B] : 6th line
: [SIZE-C] : 7th line
: [SIZE-D] : 8th line
: [DATA1] : 1, DB, NAME or 2, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10
: [DATA2] : CCSHAPE or ICEL or iN1, iN2
: [SRC] : 1, DB, NAME1, NAME2 or 2, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, iN1, iN2
: [DIM1], [DIM2] : D1, D2, D3, D4, D5, D6, D7, D8
: [OFFSET] : OFFSET, iCENT, iREF, iHORZ, HUSER, iVERT, VUSER
: [OFFSET2] : OFFSET, iCENT, iREF, iHORZ, HUSER, iVERT, VUSER, VUSER, VUSER
: [JOINT] : 8(1CELL, 2CELL), 13(3CELL), 9(PSCM), 8(PSCH), 9(PSCT), 2(PSCB), 0(nCELL), 2(nCEL2)
: [SIZE-A] : 6(1CELL, 2CELL), 10(3CELL), 10(PSCM), 6(PSCH), 8(PSCT), 10(PSCB), 5(nCELL), 11(nCEL2)
: [SIZE-B] : 6(1CELL, 2CELL), 12(3CELL), 6(PSCM), 6(PSCH), 8(PSCT), 6(PSCB), 8(nCELL), 18(nCEL2)
: [SIZE-C] : 10(1CELL, 2CELL), 13(3CELL), 9(PSCM), 10(PSCH), 7(PSCT), 8(PSCB), 0(nCELL), 11(nCEL2)
: [SIZE-D] : 8(1CELL, 2CELL), 13(3CELL), 6(PSCM), 7(PSCH), 8(PSCT), 5(PSCB), 0(nCELL), 18(nCEL2)
: [STIFF] : AREA, ASy, ASz, lxx, lyy, lzz
: [SCHK] : bAUTO_Z1, Z1, bAUTO_Z3, Z3
: [WT] : bAUTO_TOR, TOR, bAUTO_SHR1, SHR1, bAUTO_SHR2, SHR2, bAUTO_SHR3, SHR3
: [CMPWEB] : EFD, LRF, A, B, H, T
: 4, DBUSER, bZ1, pipe(43x2.5), CC, 0, 0, 0, 0, 0, 0, YES, P, 2, 4.3, 0.25, 0, 0, 0, 0, 0, 0, 0
: 5, DBUSER, bZ2, pipe(31.8x2.5), CC, 0, 0, 0, 0, 0, 0, YES, P, 2, 3.18, 0.25, 0, 0, 0, 0, 0, 0, 0
*SECT-COLOR
: ISEC, W_R, W_G, W_B, HF_R, HF_G, HF_B, HE_R, HE_G, HE_B, bBLEND, FACT
1, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
2, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
3, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
4, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
5, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
6, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
7, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
8, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
9, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
10, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
11, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
12, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
13, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
14, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
15, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
16, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
17, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
18, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
19, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
20, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
21, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
22, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
23, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
24, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
25, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
26, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
27, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
28, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
29, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
30, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
31, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
32, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
33, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
34, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
35, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
36, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
37, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
38, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
39, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
40, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
41, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
42, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
43, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
*DGN-SECT
: ISEC, TYPE, SNAME, [OFFSET], bSD, SHAPE, [DATA1], [DATA2] : 1st line - DB/USER
: ISEC, TYPE, SNAME, [OFFSET], bSD, SHAPE, BLT, D1, ..., D8, ICEL : 1st line - VALUE
: AREA, ASy, ASz, lxx, lyy, lzz : 2nd line
: CyP, CyM, CzP, CzM, QyB, QzB, PERI_OUT, PERI_IN, Cy, Cz : 3rd line
: Y1, Y2, Y3, Y4, Z1, Z2, Z3, Z4, Zyy, Zzz : 4th line
: ISEC, TYPE, SNAME, [OFFSET], bSD, SHAPE, ELAST, DEN, POIS, POIC, SF : 1st line - SRC
: D1, D2, [SRC] : 2nd line
: ISEC, TYPE, SNAME, [OFFSET], bSD, SHAPE, 1, DB, NAME1, NAME2, D1, D2 : 1st line - COMBINED
: ISEC, TYPE, SNAME, [OFFSET], bSD, SHAPE, 2, D11, D12, D13, D14, D15, D21, D22, D23, D24 : 1st line - COMBINED
: ISEC, TYPE, SNAME, [OFFSET2], bSD, SHAPE, iyVAR, izVAR, STYPE : 1st line - TAPERED

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:      DB, NAME1, NAME2 ; 2nd line(STYPE=DB)
:      [DIM1], [DIM2] ; 2nd line(STYPE=USER)
:      D11, D12, D13, D14, D15, D16, D17, D18 ; 2nd line(STYPE=VALUE)
:      AREA1, ASy1, ASz1, lxx1, lyy1, lzz1 ; 3rd line(STYPE=VALUE)
:      CyP1, CyM1, CzP1, CzM1, QyB1, QzB1, PERI_OUT1, PERI_IN1, Cy1, Cz1 ; 4th line(STYPE=VALUE)
:      Y11, Y12, Y13, Y14, Z11, Z12, Z13, Z14, Zyy1, Zyy2 ; 5th line(STYPE=VALUE)
:      D21, D22, D23, D24, D25, D26, D27, D28 ; 6th line(STYPE=VALUE)
:      AREA2, ASy2, ASz2, lxx2, lyy2, lzz2 ; 7th line(STYPE=VALUE)
:      CyP2, CyM2, CzP2, CzM2, QyB2, QzB2, PERI_OUT2, PERI_IN2, Cy2, Cz2 ; 8th line(STYPE=VALUE)
:      Y21, Y22, Y23, Y24, Z21, Z22, Z23, Z24, Zyy2, Zzz2 ; 9th line(STYPE=VALUE)
:      OPT1, OPT2, [JOINT] ; 2nd line(STYPE=PSC)
:      ELAST, DEN, POIS, POIC ; 2nd line(STYPE=PSC-CMPW)
:      bSHEARCHK, [SCHK-I], [SCHK-J], [WT-I], [WT-J], Wl, WJ, bSYM, bSIDEHOLE ; 3rd line(STYPE=PSC)
:      bSHEARCHK, bSYM, bHUNCH, [CMPWEB-I], [CMPWEB-J] ; 3rd line(STYPE=PSC-CMPW)
:      bUSERDEFMESH SIZE, MESH SIZE, bUSERINPSTIFF, [STIFF-I], [STIFF-J] ; 4th line(STYPE=PSC)
:      [SIZE-A]-I ; 5th line(STYPE=PSC)
:      [SIZE-B]-I ; 6th line(STYPE=PSC)
:      [SIZE-C]-I ; 7th line(STYPE=PSC)
:      [SIZE-D]-I ; 8th line(STYPE=PSC)
:      [SIZE-A]-J ; 9th line(STYPE=PSC)
:      [SIZE-B]-J ; 10th line(STYPE=PSC)
:      [SIZE-C]-J ; 11th line(STYPE=PSC)
:      [SIZE-D]-J ; 12th line(STYPE=PSC)
:      GN, CTC, Bc, Tc, Hh, EsEc, DsDc, Ps, Pc, bMULTI, EsEc-L, EsEc-S ; 2nd line(STYPE=CMP-B/I)
:      SW_I, Hw_I, tw_I, B_I, Bf1_I, tf1_I, B2_I, Bf2_I, tf2_I ; 3rd line(STYPE=CMP-B/I)
:      SW_J, Hw_J, tw_J, B_J, Bf1_J, tf1_J, B2_J, Bf2_J, tf2_J ; 4th line(STYPE=CMP-B/I)
:      N1, N2, Hr, Hr2, tr1, tr2 ; 5th line(STYPE=CMP-B)
:      GN, CTC, Bc, Tc, Hh, EgdEsb, DgdDsb, Pgd, Psb, bSYM, SW_I, SW_J ; 2nd line(STYPE=CMP-CI/CT)
:      OPT1, OPT2, [JOINT] ; 3rd line(STYPE=CMP-CI/CT)
:      [SIZE-A]-I ; 4th line(STYPE=CMP-CI/CT)
:      [SIZE-B]-I ; 5th line(STYPE=CMP-CI/CT)
:      [SIZE-C]-I ; 6th line(STYPE=CMP-CI/CT)
:      [SIZE-D]-I ; 7th line(STYPE=CMP-CI/CT)
:      [SIZE-A]-J ; 8th line(STYPE=CMP-CI/CT)
:      [SIZE-B]-J ; 9th line(STYPE=CMP-CI/CT)
:      [SIZE-C]-J ; 10th line(STYPE=CMP-CI/CT)
:      [SIZE-D]-J ; 11th line(STYPE=CMP-CI/CT)
: ISEC, TYPE, SNAME, [OFFSET], bSD, STYPE1, STYPE2 ; 1st line - CONSTRUCT
:      SHAPE, ... (same with other type data from shape) ; Before (STYPE1)
:      SHAPE, ... (same with other type data from shape) ; After (STYPE2)
: ISEC, TYPE, SNAME, [OFFSET], bSD, SHAPE ; 1st line - COMPOSITE-SB
:      Hw, tw, B, Bf1, tf1, B2, Bf2, tf2 ; 2nd line
:      N1, N2, Hr, Hr2, tr1, tr2 ; 3rd line
:      SW, GN, CTC, Bc, Tc, Hh, EsEc, DsDc, Ps, Pc, bMulti, Elong, Esh ; 4th line
: ISEC, TYPE, SNAME, [OFFSET], bSD, SHAPE ; 1st line - COMPOSITE-SI
:      Hw, tw, B, tf1, B2, tf2 ; 2nd line
:      SW, GN, CTC, Bc, Tc, Hh, EsEc, DsDc, Ps, Pc, bMulti, Elong, Esh ; 3rd line
: ISEC, TYPE, SNAME, [OFFSET], bSD, SHAPE ; 1st line - COMPOSITE-CI/CT
:      OPT1, OPT2, [JOINT] ; 2nd line
:      [SIZE-A] ; 3rd line
:      [SIZE-B] ; 4th line
:      [SIZE-C] ; 5th line
:      [SIZE-D] ; 6th line
:      SW, GN, CTC, Bc, Tc, Hh, EgdEsb, DgdDsb, Pgd, Psb ; 7th line
: ISEC, TYPE, SNAME, [OFFSET], bSD, SHAPE ; 1st line - PSC
:      OPT1, OPT2, [JOINT] ; 2nd line
:      bSHEARCHK, [SCHK], [WT], WIDTH, bSYM, bSIDEHOLE ; 3rd line
:      bUSERDEFMESH SIZE, MESH SIZE, bUSERINPSTIFF, [STIFF] ; 4th line
:      [SIZE-A] ; 5th line
:      [SIZE-B] ; 6th line
:      [SIZE-C] ; 7th line
:      [SIZE-D] ; 8th line
: [DATA1] : 1, DB, NAME or 2, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10
: [DATA2] : CCSHAPE or ICEL or IN1, IN2
: [SRC] : 1, DB, NAME1, NAME2 or 2, D1, D2, D3, D4, D5, D6, D7, D8, D9, D10, IN1, IN2
: [DIM1], [DIM2] : D1, D2, D3, D4, D5, D6, D7, D8
: [OFFSET] : OFFSET, ICENT, IREF, IHORZ, HUSER, IVERT, VUSER
: [OFFSET2] : OFFSET, ICENT, IREF, IHORZ, HUSER, HUSERJ, IVERT, VUSERI, VUSERJ
: [JOINT] : 8(1CELL, 2CELL), 13(3CELL), 9(PSCM), 8(PSCI), 9(PSCT), 2(PSCB), 0(nCELL), 2(nCEL2)
: [SIZE-A] : 6(1CELL, 2CELL), 10(3CELL), 10(PSCM), 6(PSCI), 8(PSCT), 10(PSCB), 5(nCELL), 11(nCEL2)
: [SIZE-B] : 6(1CELL, 2CELL), 12(3CELL), 6(PSCM), 6(PSCI), 8(PSCT), 6(PSCB), 8(nCELL), 18(nCEL2)
: [SIZE-C] : 10(1CELL, 2CELL), 13(3CELL), 9(PSCM), 10(PSCI), 7(PSCT), 8(PSCB), 0(nCELL), 11(nCEL2)
: [SIZE-D] : 8(1CELL, 2CELL), 13(3CELL), 6(PSCM), 7(PSCI), 8(PSCT), 5(PSCB), 0(nCELL), 18(nCEL2)
: [STIFF] : AREA, ASy, ASz, lxx, lyy, lzz
: [SCHK] : bAUTO_Z1, Z1, bAUTO_Z3, Z3
: [WT] : bAUTO_TOR, TOR, bAUTO_SHR1, SHR1, bAUTO_SHR2, SHR2, bAUTO_SHR3, SHR3
: [CMPWEB] : EFD, LRF, A, B, H, T
:      4, DBUSER, bPIPE(43x2.5), CC, 0, 0, 0, 0, 0, 0, YES, P, 2, 4.3, 0.25, 0, 0, 0, 0, 0, 0, 0
:      5, DBUSER, bPIPE(31.8x2.5), CC, 0, 0, 0, 0, 0, 0, YES, P, 2, 3.18, 0.25, 0, 0, 0, 0, 0, 0, 0
: *DGN-SECT-PSCVALUE : Design Section of PSC Value
: SECT=ISEC, TYPE, SNAME, [OFFSET], bSD, SHAPE, bBU, bEQ ; 1st line
:      [STIFF1] ; 2nd line
:      [STIFF2] ; 3rd line
:      [STIFF3] ; 4th line
:      T1, T2, BT, HT ; 5th line(PSC)
:      bSHEARCHK, [SCHK], [WT] ; 6th line(PSC)
:      SW, GN, CTC, Bc, Tc, Hh, EsEc, DsDc, Ps, Pc ; 7th line(COMPOSITE-PC)
:      OPOLY=X1, Y1, X2, Y2, ..., Xn, Yn ; Outer Polygon(PLANE)
:      IPOLY=X1, Y1, X2, Y2, ..., Xn, Yn ; Inner Polygon(PLANE)
:      ... ; Inner Polygon(PLANE)
:      VERTEX=X1, Y1, X2, Y2, ..., Xn, Yn ; Vertex(General-LINE)
:      LINE=V11, VJ1, dTHIK1, iALIGN1 ; Line(General-LINE)
:      ... ;
:      LINE=VIn, VJn, dTHIKn, iALIGNn ; Line(General-LINE)
:      LOOP=COUNT1, LIX11, LIX12, ..., LIXn ; Line(General-LINE)
:      ... ;
:      LOOP=COUNTn, LIXn1, LIXn2, ..., LIXnn ; Line(General-LINE)
: SECT=ISEC, TYPE, SNAME, [OFFSET2], bSD, SHAPE, iyVAR, izVAR, bEQ ; 1st line - TAPERED
:      [STIFF1-I] ; 2nd line
:      [STIFF2-I] ; 3rd line
:      [STIFF3-I] ; 4th line
:      [STIFF1-J] ; 5th line
:      [STIFF2-J] ; 6th line
:      [STIFF3-J] ; 7th line
:      T1-I, T2-I, BT-I, HT-I, T1-J, T2-J, BT-J, HT-J ; 8th line(PSC)
:      bSHEARCHK, [SCHK-I], [WT-I], [SCHK-J], [WT-J] ; 9th line(PSC)
:      OPOLY=bl, X1, Y1, X2, Y2, ..., Xn, Yn ; Outer Polygon(PLANE)
:      IPOLY=bl, X1, Y1, X2, Y2, ..., Xn, Yn ; Inner Polygon(PLANE)
:      ... ; Inner Polygon(PLANE)
:      VERTEX=bl, X1, Y1, X2, Y2, ..., Xn, Yn ; Vertex(General-LINE)
:      LINE=bl, V11, VJ1, dTHIK1, iALIGN1 ; Line(General-LINE)
:      ... ;
:      LINE=bl, VIn, VJn, dTHIKn, iALIGNn ; Line(General-LINE)
:      LOOP=bl, COUNT1, LIX11, LIX12, ..., LIXn ; Line(General-LINE)

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...
LOOP=bl, COUNTn, LIXn1, LIXn2, ..., LIXnn          ; Line(General-LINE)
SECT=SEC, TYPE, SNAME, [OFFSET], bSD, SHAPE, bBU, bEQ, BPRT ; 1st line - COMPOSITE-GEN
[PART1]          ; 2nd line
[PART2]          ; 3rd line
...
SECT=SEC, TYPE, SNAME, [OFFSET2], bSD, SHAPE, iyVAR, izVAR, bEQ, PARTNUM ; 1st line - COMPOSITE-GEN(TAPERED)
[PART1]-I        ; 2nd line
[PART2]-I        ; next lines
...
[PART1]-J        ; next lines
[PART2]-J        ; next lines
...
[OFFSET] : OFFSET, ICENT, IREF, IHORZ, HUSER, IVERT, VUSER
[OFFSET2]: OFFSET, ICENT, IREF, IHORZ, HUSERI, HUSERJ, IVERT, VUSERI, VUSERJ
[STIFF1] : AREA, ASy, ASz, lxx, lyy, lzz
[STIFF2] : Cyp, Cym, Czp, Czm, Qyb, Qzb, PERI_OUT, PERI_IN, Cy, Cz
[STIFF3] : Y1, Y2, Y3, Y4, Z1, Z2, Z3, Z4
[SCHK]   : Z1, Z3, bAUTO_QY1, QY1, bAUTO_QY2, QY2, bAUTO_QY3, QY3
[WT]     : TOR, bAUTO_SHR1, SHR1, bAUTO_SHR2, SHR2, bAUTO_SHR3, SHR3
[PART]   : PART=part_num
          : [STIFF1]
          : [STIFF2]
          : [STIFF3]
          : [STIFF1] ; [STIFF1] of Part Sum.
          : [STIFF2] ; [STIFF2] of Part Sum.
          : [STIFF3] ; [STIFF3] of Part Sum.
          : OPOLY=(bl-Tapered), X1, Y1, X2, Y2, ..., Xn, Yn ; Outer Polygon(PLANE)
          : IPOLY=(bl-Tapered), X1, Y1, X2, Y2, ..., Xn, Yn ; Inner Polygon(PLANE)
          : ...
          : IPOLY=(bl-Tapered), X1, Y1, X2, Y2, ..., Xn, Yn ; Inner Polygon(PLANE)
          : VERTEX=(bl-Tapered), X1, Y1, X2, Y2, ..., Xn, Yn ; Vertex(General-LINE)
          : LINE=(bl-Tapered), V11, VJ1, dTHIK1, iALIGN1 ; Line(General-LINE)
          : ...
          : LINE=(bl-Tapered), Vln, VJn, dTHIKn, iALIGNn ; Line(General-LINE)
          : LOOP=(bl-Tapered), COUNTn, LIXn1, LIXn2, ..., LIXnn ; Line(General-LINE)
          : ...
          : LOOP=(bl-Tapered), COUNTn, LIXn1, LIXn2, ..., LIXnn ; Line(General-LINE)
SECT= 1, VALUE , 난간 post , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
7.56, 3.42662, 2.5699, 45.4869, 27.8972, 36.8154
3, 3, 2.43519, 2.56481, 9.62217, 10.7425, 23, 20.2, 3, 2.56481
-3, 3, 3, -3, 2.43519, 2.43519, -2.56481, -2.56481
OPOLY=-3, 2.43519, -3, -2.56481, 3, -2.56481, 3, 2.43519, 0.5, 2.43519, 0.5, 1.93519
-0.5, 1.93519, -0.5, 2.43519
IPOLY=-2.65, 2.08519, -0.85, 2.08519, -0.85, 1.58519, 0.85, 1.58519, 0.85, 2.08519
2.65, 2.08519, 2.65, -2.21481, -2.65, -2.21481
SECT= 2, VALUE , main post , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
23.4, 12.7565, 6.12917, 7.14343, 169.578, 265.75
7.5, 7.5, 5.62479, 2.37521, 27.2537, 3.65064, 53.2, 0, 7.5, 2.37521
-2, 2, 7.5, -7.5, 5.62479, 5.62479, -2.37521, -2.37521
OPOLY=-7.5, -1.37521, -7.5, -2.37521, -6, -2.37521, -6, -2.17521, -4, -2.17521
-4, -2.37521, 4, -2.37521, 4, -2.17521, 6, -2.17521, 6, -2.37521
7.5, -2.37521, 7.5, -1.37521, 0.5, -1.37521, 0.5, 4.82479
2, 4.82479, 2, 5.62479, 0.5, 5.62479, 0.5, 5.42479, -0.5, 5.42479
-0.5, 5.62479, -2, 5.62479, -2, 4.82479, -0.5, 4.82479
-0.5, -1.37521
SECT= 3, VALUE , 발판지치 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
13.9943, 4.0037, 7.1979, 36.4584, 61.8553, 77.8026
5, 5, 2.39444, 4.10556, 8.82775, 26.2277, 39.9019, 33.001, 5, 4.10556
-5, 5, 1.35, -1.35, 2.39444, 2.39444, -4.10556, -4.10556
OPOLY=-5, 2.39444, -5, 1.39444, -1.35, -4.10556, -0.5, -4.10556, -0.5, 1.39444
0.5, 1.39444, 0.5, -4.10556, 1.35, -4.10556, 5, 1.39444
5, 2.39444, 0.5, 2.39444, 0.5, 1.89444, -0.5, 1.89444
-0.5, 2.39444
IPOLY=-4.8, 1.89444, -1, 1.89444, -1, -3.76552, -1.33563, -3.76552, -4.8, 1.45477
IPOLY=-1, 1.89444, 4.8, 1.89444, 4.8, 1.45477, 1.33563, -3.76552, 1, -3.76552
SECT= 6, VALUE , 발판 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
29.4943, 6.85781, 18.5621, 81.7551, 669.244, 79.0943
5, 5, 5.73445, 10.7656, 23.5753, 0.940709, 48.9019, 33.001, 5, 10.7656
-5, 5, 0.5, -0.5, 5.73445, 5.73445, -10.7656, -10.7656
OPOLY=-5, 5.73445, -5, 4.73445, -1.35, -0.765555, -0.5, -0.765555, -0.5, -10.7656
0.5, -10.7656, 0.5, -0.765555, 1.35, -0.765555, 5, 4.73445
5, 5.73445, 0.5, 5.73445, 0.5, 5.23445, -0.5, 5.23445
-0.5, 5.73445
IPOLY=-4.8, 5.23445, -1, 5.23445, -1, -0.425515, -1.33563, -0.425515, -4.8, 4.79478
IPOLY=-1, 5.23445, 4.8, 5.23445, 4.8, 4.79478, 1.33563, -0.425515, 1, -0.425515
SECT= 7, TAPERED , 변단면 , CT, 1, 0, 0, 0, 0, 1, 3.34, 0, YES, GEN, 1, 1, YES
29.4943, 6.85781, 18.5621, 81.7551, 669.244, 79.0943
5, 5, 5.73445, 10.7656, 23.5753, 0.940709, 48.9019, 33.001, 5, 10.7656
-5, 5, 0.5, -0.5, 5.73445, 5.73445, -10.7656, -10.7656
13.9943, 4.0037, 7.1979, 36.4584, 61.8553, 77.8026
5, 5, 2.39444, 4.10556, 8.82775, 26.2277, 39.9019, 33.001, 5, 4.10556
-5, 5, 1.35, -1.35, 2.39444, 2.39444, -4.10556, -4.10556
OPOLY=YES, -5, 5.73445, -5, 4.73445, -1.35, -0.765555, -0.5, -0.765555, -0.5, -10.7656
0.5, -10.7656, 0.5, -0.765555, 1.35, -0.765555, 5, 4.73445
5, 5.73445, 0.5, 5.73445, 0.5, 5.23445, -0.5, 5.23445
-0.5, 5.73445
IPOLY=YES, -4.8, 5.23445, -1, 5.23445, -1, -0.425515, -1.33563, -0.425515, -4.8, 4.79478
IPOLY=YES, 1, 5.23445, 4.8, 5.23445, 4.8, 4.79478, 1.33563, -0.425515, 1, -0.425515
OPOLY=NO, -5, 2.39444, -5, 1.39444, -1.35, -4.10556, -0.5, -4.10556, -0.5, 1.39444
0.5, 1.39444, 0.5, -4.10556, 1.35, -4.10556, 5, 1.39444
5, 2.39444, 0.5, 2.39444, 0.5, 1.89444, -0.5, 1.89444
-0.5, 2.39444
IPOLY=NO, -4.8, 1.89444, -1, 1.89444, -1, -3.76552, -1.33563, -3.76552, -4.8, 1.45477
IPOLY=NO, 1, 1.89444, 4.8, 1.89444, 4.8, 1.45477, 1.33563, -3.76552, 1, -3.76552
SECT= 8, VALUE , 바닥판 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
19.4943, 6.5884, 11.1524, 76.4183, 82.975, 78.261
5, 5, 2.77689, 3.72311, 7.1461, 2.30023, 28.9019, 33.001, 5, 3.72311
-5, 5, 1.35, -1.35, 2.77689, 2.77689, -3.72311, -3.72311
OPOLY=-5, 2.77689, -5, 1.77689, -1.35, -3.72311, 1.35, -3.72311, 5, 1.77689
5, 2.77689, 0.5, 2.77689, 0.5, 2.27689, -0.5, 2.27689
-0.5, 2.77689
IPOLY=-4.8, 2.27689, -1, 2.27689, -1, -3.38307, -1.33563, -3.38307, -4.8, 1.83722
IPOLY=-1, 2.27689, 4.8, 2.27689, 4.8, 1.83722, 1.33563, -3.38307, 1, -3.38307
SECT= 9, VALUE , 난간 post-1 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
16.05, 7.52645, 7.53538, 79.652, 47.5571, 64.042
3, 3, 2.46963, 2.53037, 6.82768, 3.11437, 23, 22.3, 3, 2.53037
-3, 3, 3, -3, 2.46963, 2.46963, -2.53037, -2.53037
OPOLY=-3, 2.46963, -3, -2.53037, 3, -2.53037, 3, 2.46963, 0.5, 2.46963, 0.5, 1.96963
-0.5, 1.96963, -0.5, 2.46963
IPOLY=-2.25, 1.71963, -1.25, 1.71963, -1.25, 1.21963, -0.175, 1.21963
-0.175, -1.78037, -2.25, -1.78037
IPOLY=-0.175, 1.21963, 1.25, 1.21963, 1.25, 1.71963, 2.25, 1.71963, 2.25, -1.78037
0.175, -1.78037
SECT= 10, VALUE , main post-1 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
26.74, 13.5539, 6.53663, 10.5674, 249.617, 277.898

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7.5, 7.5, 5.3193, 2.9807, 37.4287, 3.74283, 54.4, 0, 7.5, 2.9807
-2.3, 2.3, 7.5, -7.5, 5.3193, 5.3193, -2.9807, -2.9807
OPOLY=-7.5, -1.9807, -7.5, -2.9807, -6, -2.9807, -6, -2.8307, -4, -2.8307
-4, -2.9807, 4, -2.9807, 4, -2.8307, 6, -2.8307, 6, -2.9807
7.5, -2.9807, 7.5, -1.9807, 0.5, -1.9807, 0.5, 3.9193, 2.3, 3.9193
2.3, 5.3193, -2.3, 5.3193, -2.3, 3.9193, -0.5, 3.9193
-0.5, -1.9807
SECT= 11, VALUE , 지지보(165) , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
32.8903, 8.16941, 19.5136, 92.1479, 695.916, 83.6111
5, 5, 5.48618, 11.0138, 20.023, 1.06276, 48.9019, 31.801, 5, 11.0138
-5, 5, 0.500002, -0.499998, 5.48618, 5.48618, -11.0138, -11.0138
OPOLY=-5, 5.48618, -5, 4.48618, -1.35, -1.01382, -0.499998, -1.01382
-0.499998, -11.0138, 0.500002, -11.0138, 0.500002, -1.01382
1.35, -1.01382, 5, 4.48618, 5, 5.48618, 0.500002, 5.48618
0.500002, 4.98618, -0.499998, 4.98618, -0.499998, 5.48618
IPOLY=-4.8, 4.98618, -1.3, 4.98618, -1.3, -0.673781, -1.33562, -0.673781
-4.8, 4.54651
IPOLY=1.3, 4.98618, 4.8, 4.98618, 4.8, 4.54651, 1.33563, -0.673781, 1.3, -0.673781
SECT= 12, VALUE , 지지보(65) , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
17.3903, 4.12695, 9.97328, 36.994, 73.3131, 82.3194
5, 5, 2.57713, 3.92287, 7.59759, 30.1333, 39.9019, 31.801, 5, 3.92287
-5, 5, 1.35, -1.35, 2.57713, 2.57713, -3.92287, -3.92287
OPOLY=-5, 2.57713, -5, 1.57713, -1.35, -3.92287, -0.499996, -3.92287
-0.499996, 1.57713, 0.500004, 1.57713, 0.500004, -3.92287
1.35, -3.92287, 5, 1.57713, 5, 2.57713, 0.500004, 2.57713
0.500004, 2.07713, -0.499996, 2.07713, -0.499996, 2.57713
IPOLY=-4.8, 2.07713, -1.3, 2.07713, -1.3, -3.58283, -1.33562, -3.58283, -4.8, 1.63746
IPOLY=1.3, 2.07713, 4.8, 2.07713, 4.8, 1.63746, 1.33563, -3.58283, 1.3, -3.58283
SECT= 13, VALUE , 메인 post-2 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
29.1, 14.24, 6.78224, 14.9387, 298.498, 285.275
7.5, 7.5, 5.13918, 3.36082, 43.7277, 3.87794, 55.6, 0, 7.5, 3.36082
-2.5, 2.5, 7.5, -7.5, 5.13918, 5.13918, -3.36082, -3.36082
OPOLY=-7.5, -2.36082, -7.5, -3.36082, -6, -3.36082, -6, -3.21082, -4, -3.21082
-4, -3.36082, 4, -3.36082, 4, -3.21082, 6, -3.21082, 6, -3.36082
7.5, -3.36082, 7.5, -2.36082, 0.5, -2.36082, 0.5, 3.33918
2.5, 3.33918, 2.5, 5.13918, -2.5, 5.13918, -2.5, 3.33918
-0.5, 3.33918, -0.5, -2.36082
SECT= 14, VALUE , 지지보(80) , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
16.004, 3.55005, 9.13781, 46.4021, 107.867, 84.1838
4.99999, 5.00001, 3.05347, 4.94653, 12.7087, 28.9423, 45.4889, 38.5579, 5.00001, 4.94653
-5.00001, 4.99999, 1.34999, -1.35001, 3.05347, 3.05347, -4.94653, -4.94653
OPOLY=-5.00001, 3.05347, -5.00001, 2.05347, -1.35001, -4.94653, -0.500005, -4.94653
-0.500005, 2.05347, 0.499995, 2.05347, 0.499995, -4.94653
1.34999, -4.94653, 4.99999, 2.05347, 4.99999, 3.05347
0.499995, 3.05347, 0.499995, 2.55347, -0.500005, 2.55347
-0.500005, 3.05347
IPOLY=-4.80001, 2.55347, -1.00001, 2.55347, -1.00001, -4.60649, -1.30176, -4.60649
-4.80001, 2.10248
IPOLY=0.999995, 2.55347, 4.79999, 2.55347, 4.79999, 2.10248, 1.30173, -4.60649
0.999995, -4.60649
SECT= 15, VALUE , 지지보(165-80) , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
31.504, 6.4172, 21.255, 107.049, 673.703, 85.4755
5, 5, 5.85617, 10.6438, 24.5858, 1.02554, 48.4889, 38.5579, 5, 10.6438
-5, 5, 0.500003, -0.499997, 5.85617, 5.85617, -10.6438, -10.6438
OPOLY=-5, 5.85617, -5, 4.85617, -1.35, -2.14383, -0.499997, -2.14383
-0.499997, -10.6438, 0.500003, -10.6438, 0.500003, -2.14383
1.35, -2.14383, 5, 4.85617, 5, 5.85617, 0.500003, 5.85617
0.500003, 5.35617, -0.499997, 5.35617, -0.499997, 5.85617
IPOLY=-4.8, 5.35617, -0.999997, 5.35617, -0.999997, -1.80379, -1.30174, -1.80379
-4.8, 4.90518
IPOLY=1, 5.35617, 4.8, 5.35617, 4.8, 4.90518, 1.30175, -1.80379, 1, -1.80379
SECT= 16, VALUE , 지지보(80-5.5) , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
16.8614, 3.6841, 9.81713, 47.7426, 112.897, 87.4458
5, 5, 3.09098, 4.90902, 12.4797, 30.2331, 45.4889, 37.9162, 5, 4.90902
-5, 5, 1.35, -1.35, 3.09098, 3.09098, -4.90902, -4.90902
OPOLY=-5, 3.09098, -5, 2.09098, -1.35, -4.90902, -0.5, -4.90902, -0.5, 2.09098
0.5, 2.09098, 0.5, -4.90902, 1.35, -4.90902, 5, 2.09098
5, 3.09098, 0.5, 3.09098, 0.5, 2.59098, -0.5, 2.59098
-0.5, 3.09098
IPOLY=-4.7, 2.59098, -1.05, 2.59098, -1.05, -4.50902, -1.33302, -4.50902
-4.7, 1.94821
IPOLY=1.05, 2.59098, 4.7, 2.59098, 4.7, 1.94821, 1.33302, -4.50902, 1.05, -4.50902
SECT= 17, VALUE , 지지보(165-5.5) , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
32.3614, 6.75074, 21.6514, 111.693, 681.85, 88.7376
5, 5, 5.80146, 10.6985, 24.0124, 1.06588, 48.4889, 37.9162, 5, 10.6985
-5, 5, 0.500002, -0.499998, 5.80146, 5.80146, -10.6985, -10.6985
OPOLY=-5, 5.80146, -5, 4.80146, -1.35, -2.19854, -0.499998, -2.19854
-0.499998, -10.6985, 0.500002, -10.6985, 0.500002, -2.19854
1.35, -2.19854, 5, 4.80146, 5, 5.80146, 0.500002, 5.80146
0.500002, 5.30146, -0.499998, 5.30146, -0.499998, 5.80146
IPOLY=-4.7, 5.30146, -1.05, 5.30146, -1.05, -1.79854, -1.33301, -1.79854
-4.7, 4.65869
IPOLY=1.05, 5.30146, 4.7, 5.30146, 4.7, 4.65869, 1.33302, -1.79854, 1.05, -1.79854
SECT= 18, VALUE , 지지보(80-8) , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
20.4114, 3.79479, 12.8266, 48.4063, 130.507, 92.3655
5, 5, 3.25778, 4.74222, 11.1153, 34.4043, 45.4889, 36.9162, 5, 4.74222
-5, 5, 1.35, -1.35, 3.25778, 3.25778, -4.74222, -4.74222
OPOLY=-5, 3.25778, -5, 2.25778, -1.35, -4.74222, -0.5, -4.74222, -0.5, 2.25778
0.5, 2.25778, 0.5, -4.74222, 1.35, -4.74222, 5, 2.25778
5, 3.25778, 0.5, 3.25778, 0.5, 2.75778, -0.5, 2.75778
-0.5, 3.25778
IPOLY=-4.7, 2.75778, -1.3, 2.75778, -1.3, -4.34222, -1.33302, -4.34222, -4.7, 2.11501
IPOLY=1.3, 2.75778, 4.7, 2.75778, 4.7, 2.11501, 1.33302, -4.34222, 1.3, -4.34222
SECT= 19, VALUE , 지지보(165-8) , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
35.9114, 7.99727, 23.3563, 125.206, 706.577, 93.6574
5, 5, 5.62832, 10.8717, 21.2171, 1.19623, 48.4889, 36.9162, 5, 10.8717
-5, 5, 0.500002, -0.499998, 5.62832, 5.62832, -10.8717, -10.8717
OPOLY=-5, 5.62832, -5, 4.62832, -1.35, -2.37168, -0.499998, -2.37168
-0.499998, -10.8717, 0.500002, -10.8717, 0.500002, -2.37168
1.35, -2.37168, 5, 4.62832, 5, 5.62832, 0.500002, 5.62832
0.500002, 5.12832, -0.499998, 5.12832, -0.499998, 5.62832
IPOLY=-4.7, 5.12832, -1.3, 5.12832, -1.3, -1.97168, -1.33301, -1.97168, -4.7, 4.48555
IPOLY=1.3, 5.12832, 4.7, 5.12832, 4.7, 4.48555, 1.33302, -1.97168, 1.3, -1.97168
SECT= 20, VALUE , 지지보(80-8-8) , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
22.4514, 4.90768, 12.7697, 49.2353, 143.135, 112.691
5, 5, 3.02083, 4.97917, 12.2605, 40.5243, 45.4889, 35.7162, 5, 4.97917
-5, 5, 1.35, -1.35, 3.02083, 3.02083, -4.97917, -4.97917
OPOLY=-5, 3.02083, -5, 2.02083, -1.35, -4.97917, -0.5, -4.97917, -0.5, 2.02083
0.5, 2.02083, 0.5, -4.97917, 1.35, -4.97917, 5, 2.02083
5, 3.02083, 0.5, 3.02083, 0.5, 2.52083, -0.5, 2.52083
-0.5, 3.02083
IPOLY=-4.7, 2.22083, -1.3, 2.22083, -1.3, -4.57917, -1.33302, -4.57917, -4.7, 1.87806
IPOLY=1.3, 2.22083, 4.7, 2.22083, 4.7, 1.87806, 1.33302, -4.57917, 1.3, -4.57917
SECT= 21, VALUE , 지지보(165-8-8) , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
37.9514, 10.3387, 23.8271, 127.704, 754.433, 113.983
5, 5, 5.36072, 11.1393, 22.6281, 1.38748, 48.4889, 35.7162, 5, 11.1393

-5, 5, 0.500002, -0.499998, 5.36072, 5.36072, -11.1393, -11.1393
OPOLY=-5, 5.36072, -5, 4.36072, -1.35, -2.63928, -0.499998, -2.63928
-0.499998, -11.1393, 0.500002, -11.1393, 0.500002, -2.63928
1.35, -2.63928, 5, 4.36072, 5, 5.36072, 0.500002, 5.36072
0.500002, 4.86072, -0.499998, 4.86072, -0.499998, 5.36072
IPOLY=-4.7, 4.56072, -1.3, 4.56072, -1.3, -2.23928, -1.33301, -2.23928, -4.7, 4.21795
IPOLY=1.3, 4.56072, 4.7, 4.56072, 4.7, 4.21795, 1.33302, -2.23928, 1.3, -2.23928
SECT= 22, VALUE , 지치보-85 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
24.8903, 8.03389, 16.5929, 89.4, 133.21, 82.9444
5, 5, 3.23187, 5.26813, 8.05758, 2.00052, 32.9019, 31.801, 5, 5.26813
-5, 5, 0.500003, -0.499997, 3.23187, 3.23187, -5.26813, -5.26813
OPOLY=-5, 3.23187, -5, 2.23187, -1.35, -3.26813, -0.499997, -3.26813
-0.499997, -5.26813, 0.500003, -5.26813, 0.500003, -3.26813
1.35, -3.26813, 5, 2.23187, 5, 3.23187, 0.500003, 3.23187
0.500003, 2.73187, -0.499997, 2.73187, -0.499997, 3.23187
IPOLY=-4.8, 2.73187, -1.3, 2.73187, -1.3, -2.92809, -1.33562, -2.92809, -4.8, 2.2922
IPOLY=1.3, 2.73187, 4.8, 2.73187, 4.8, 2.2922, 1.33563, -2.92809, 1.3, -2.92809
SECT= 23, VALUE , 지치보-100 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
26.3903, 8.05972, 17.9594, 89.9144, 184.73, 83.0694
5, 5, 3.57393, 6.42607, 9.54612, 1.70438, 35.9019, 31.801, 5, 6.42607
-5, 5, 0.500002, -0.499998, 3.57393, 3.57393, -6.42607, -6.42607
OPOLY=-5, 3.57393, -5, 2.57393, -1.35, -2.92607, -0.499998, -2.92607
-0.499998, -6.42607, 0.500002, -6.42607, 0.500002, -2.92607
1.35, -2.92607, 5, 2.57393, 5, 3.57393, 0.500002, 3.57393
0.500002, 3.07393, -0.499998, 3.07393, -0.499998, 3.57393
IPOLY=-4.8, 3.07393, -1.3, 3.07393, -1.3, -2.58603, -1.33562, -2.58603, -4.8, 2.63426
IPOLY=1.3, 3.07393, 4.8, 3.07393, 4.8, 2.63426, 1.33563, -2.58603, 1.3, -2.58603
SECT= 24, VALUE , 지치보(100-80단면) , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
25.004, 6.33759, 17.0465, 104.832, 203.096, 84.9338
5, 5, 3.93408, 6.06592, 12.6284, 1.64169, 35.4889, 38.5579, 5, 6.06592
-5, 5, 0.500003, -0.499997, 3.93408, 3.93408, -6.06592, -6.06592
OPOLY=-5, 3.93408, -5, 2.93408, -1.35, -4.06592, -0.499997, -4.06592
-0.499997, -6.06592, 0.500003, -6.06592, 0.500003, -4.06592
1.35, -4.06592, 5, 2.93408, 5, 3.93408, 0.500003, 3.93408
0.500003, 3.43408, -0.499997, 3.43408, -0.499997, 3.93408
IPOLY=-4.8, 3.43408, -0.999997, 3.43408, -0.999997, -3.72588, -1.30174, -3.72588
-4.8, 2.98309
IPOLY=1, 3.43408, 4.8, 3.43408, 4.8, 2.98309, 1.30175, -3.72588, 1, -3.72588
SECT= 25, VALUE , 단면 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
18.9411, 8.86947, 5.43042, 148.005, 333.176, 206.038
5.99897, 6.00103, 5.00426, 4.99692, 62.8494, 28.2995, 61.9801, 28.9279, 6.00103, 4.99692
-6.00103, 5.99897, 5.99897, -6.00098, 5.00426, 5.00426, -4.99574, -4.99692
OPOLY=-6.00103, 5.00426, -6.00103, 4.50426, -3.66101, 4.50426, -3.76656, 4.33142
-3.83098, 4.09818, -3.6793, 3.9465, -3.03651, 4.51148
-2.60729, 4.26072, -2.53651, 4.00426, -3.03651, 3.50426
-3.18651, 3.52729, -3.18651, -3.51877, -3.00494, -3.49673
-2.53651, -3.99574, -2.61895, -4.27077, -3.03651, -4.49574
-3.6793, -3.93797, -3.83098, -4.08965, -3.66101, -4.49574
-6.00103, -4.49574, -6.00098, -4.99692, 5.99897, -4.99574
5.99897, -4.49574, 3.659, -4.49574, 3.77247, -4.30462
3.82897, -4.08965, 3.69921, -3.93956, 3.0345, -4.49574
2.61694, -4.27077, 2.5345, -3.99574, 3.0345, -3.49574
3.1845, -3.51877, 3.1845, 3.52729, 3.0345, 3.50426
2.5345, 4.00426, 2.61694, 4.2793, 3.0345, 4.50426
3.69921, 3.94809, 3.82897, 4.09818, 3.659, 4.50426
5.99897, 4.50426, 5.99897, 5.00426
IPOLY=-2.88651, 3.21845, -2.28599, 3.7273, -2.23651, 4.0771, -2.41201, 4.50426
2.41, 4.50426, 2.2345, 4.00426, 2.28397, 3.7273, 2.8845, 3.21845
2.8845, -3.20992, 2.24659, -3.71877, 2.24659, -4.1343
2.41, -4.49574, -2.41201, -4.49574, -2.23651, -3.99574
-2.28599, -3.71877, -2.88651, -3.20992
SECT= 26, VALUE , 165-100-70 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
31.3414, 8.7587, 18.6162, 125.466, 667.38, 103.231
5, 5, 5.79349, 10.7065, 24.3268, 1.13936, 51.4018, 34.8253, 5, 10.7065
-5, 5, 0.5, -0.5, 5.79349, 5.79349, -10.7065, -10.7065
OPOLY=-5, 5.79349, -5, 4.79349, -3.5, -0.706507, -0.5, -0.706507, -0.5, -10.7065
0.5, -10.7065, 0.5, -0.706507, 3.5, -0.706507, 5, 4.79349
5, 5.79349, 0.5, 5.79349, 0.5, 5.29349, -0.5, 5.29349
-0.5, 5.79349
IPOLY=-4.8, 5.29349, -1, 5.29349, -1, -0.206507, -3.42906, -0.206507, -4.8, 4.82027
IPOLY=1, 5.29349, 4.8, 5.29349, 4.8, 4.82027, 3.42906, -0.206507, 1, -0.206507
SECT= 27, VALUE , 65-100-70 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
15.8415, 4.11057, 7.84181, 66.9139, 89.0081, 101.94
4.99999, 5.00001, 2.90071, 3.59929, 12.0631, 32.5848, 42.4018, 34.8253, 5.00001, 3.59929
-5.00001, 4.99999, 3.49999, -3.50001, 2.90071, 2.90071, -3.59929, -3.59929
OPOLY=-5.00001, 2.90071, -5.00001, 1.90071, -3.50001, -3.59929, -0.500006, -3.59929
-0.500006, 1.90071, 0.499994, 1.90071, 0.499994, -3.59929
3.49999, -3.59929, 4.99999, 1.90071, 4.99999, 2.90071
0.499994, 2.90071, 0.499994, 2.40071, -0.500006, 2.40071
-0.500006, 2.90071
IPOLY=-4.80001, 2.40071, -1.00001, 2.40071, -1.00001, -3.09929, -3.42907, -3.09929
-4.80001, 1.9275
IPOLY=0.999994, 2.40071, 4.79999, 2.40071, 4.79999, 1.9275, 3.42904, -3.09929
0.999994, -3.09929
SECT= 28, VALUE , 165-100-80 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
31.7783, 9.23388, 18.6277, 135.893, 667.189, 113.29
5, 5, 5.80333, 10.6967, 24.44, 1.20537, 52.1803, 35.5398, 5, 10.6967
-5, 5, 0.5, -0.5, 5.80333, 5.80333, -10.6967, -10.6967
OPOLY=-5, 5.80333, -5, 4.80333, -4, -0.696665, -0.5, -0.696665, -0.5, -10.6967
0.5, -10.6967, 0.5, -0.696665, 4, -0.696665, 5, 4.80333
5, 5.80333, 0.5, 5.80333, 0.5, 5.30333, -0.5, 5.30333
-0.5, 5.80333
IPOLY=-4.8, 5.30333, -1, 5.30333, -1, -0.196665, -3.88763, -0.196665, -4.8, 4.82136
IPOLY=1, 5.30333, 4.8, 5.30333, 4.8, 4.82136, 3.88763, -0.196665, 1, -0.196665
SECT= 29, VALUE , 65-100-80 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
16.2783, 4.21616, 7.86475, 74.5526, 94.1331, 111.998
5, 5, 2.99756, 3.50244, 12.703, 34.6968, 43.1803, 35.5398, 5, 3.50244
-5, 5, 4, -4, 2.99756, 2.99756, -3.50244, -3.50244
OPOLY=-5, 2.99756, -5, 1.99756, -4, -3.50244, -0.5, -3.50244, -0.5, 1.99756
0.5, 1.99756, 0.5, -3.50244, 4, -3.50244, 5, 1.99756, 5, 2.99756
0.5, 2.99756, 0.5, 2.49756, -0.5, 2.49756, -0.5, 2.99756
IPOLY=-4.8, 2.49756, -1, 2.49756, -1, -3.00244, -3.88763, -3.00244, -4.8, 2.01559
IPOLY=1, 2.49756, 4.8, 2.49756, 4.8, 2.01559, 3.88763, -3.00244, 1, -3.00244
SECT= 30, VALUE , 80-100-60 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
16.864, 3.68614, 9.75404, 74.6845, 130.178, 101.003
5, 5, 3.3461, 4.6539, 14.7918, 32.8555, 47.5602, 40.5534, 5, 4.6539
-5, 5, 3, -3, 3.3461, 3.3461, -4.6539, -4.6539
OPOLY=-5, 3.3461, -5, 2.3461, -3, -4.6539, -0.5, -4.6539, -0.5, 2.3461, 0.5, 2.3461
0.5, -4.6539, 3, -4.6539, 5, 2.3461, 5, 3.3461, 0.5, 3.3461
0.5, 2.8461, -0.5, 2.8461, -0.5, 3.3461
IPOLY=-4.8, 2.8461, -1, 2.8461, -1, -4.31386, -2.88915, -4.31386, -4.8, 2.37412
IPOLY=1, 2.8461, 4.8, 2.8461, 4.8, 2.37412, 2.88915, -4.31386, 1, -4.31386
SECT= 31, VALUE , 165-100-60 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
32.364, 7.1901, 21.4356, 148.203, 676.356, 102.295
5, 5, 5.93417, 10.5658, 25.3356, 1.14783, 50.5602, 40.5534, 5, 10.5658
-5, 5, 0.5, -0.5, 5.93417, 5.93417, -10.5658, -10.5658

OPOLY=-5, 5.93417, -5, 4.93417, -3, -2.06583, -0.5, -2.06583, -0.5, -10.5658
0.5, -10.5658, 0.5, -2.06583, 3, -2.06583, 5, 4.93417, 5, 5.93417
0.5, 5.93417, 0.5, 5.43417, -0.5, 5.43417, -0.5, 5.93417
IPOLY=-4.8, 5.43417, -1, 5.43417, -1, -1.72579, -2.88915, -1.72579, -4.8, 4.96219
IPOLY=1, 5.43417, 4.8, 5.43417, 4.8, 4.96219, 2.88915, -1.72579, 1, -1.72579
SECT= 32, VALUE , 80-100-60-페할 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
17.2041, 5.94595, 9.86182, 135.79, 136.882, 101.031
5, 5, 3.43472, 4.56528, 15.3603, 19.6065, 33.5602, 55.8733, 5, 4.56528
-5, 5, 3, -3, 3.43472, 3.43472, -4.56528, -4.56528
OPOLY=-5, 3.43472, -5, 2.43472, -3, -4.56528, 3, -4.56528, 5, 2.43472, 5, 3.43472
0.5, 3.43472, 0.5, 2.93472, -0.5, 2.93472, -0.5, 3.43472
IPOLY=-4.8, 2.93472, -1, 2.93472, -1, -4.22524, -2.88915, -4.22524, -4.8, 2.46274
IPOLY=-0.5, 2.43472, 0.5, 2.43472, 0.5, -4.22524, -0.5, -4.22524
IPOLY=1, 2.93472, 4.8, 2.93472, 4.8, 2.46274, 2.88915, -4.22524, 1, -4.22524
SECT= 33, VALUE , 165-100-60-페할 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
32.364, 7.19004, 21.4404, 148.204, 676.355, 102.294
5, 5, 5.93417, 10.5658, 25.3356, 1.14783, 50.5602, 40.5534, 5, 10.5658
-5, 5, 0.5, -0.5, 5.93417, 5.93417, -10.5658, -10.5658
OPOLY=-5, 5.93417, -5, 4.93417, -3, -2.06583, -0.5, -2.06583, -0.5, -10.5658
0.5, -10.5658, 0.5, -2.06583, 3, -2.06583, 5, 4.93417, 5, 5.93417
0.5, 5.93417, 0.5, 5.43417, -0.5, 5.43417, -0.5, 5.93417
IPOLY=-4.8, 5.43417, -1, 5.43417, -1, -1.72579, -2.88915, -1.72579, -4.8, 4.96218
IPOLY=1, 5.43417, 4.8, 5.43417, 4.8, 4.96218, 2.88915, -1.72579, 1, -1.72579
SECT= 34, VALUE , 165(90)-100-80 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
33.4229, 8.03416, 22.3045, 171.691, 683.761, 129.255
5, 5, 6.3544, 10.1456, 30.1195, 1.35372, 55.5908, 44.3041, 5, 10.1456
-5, 5, 0.5, -0.5, 6.3544, 6.3544, -10.1456, -10.1456
OPOLY=-5, 6.3544, -5, 5.3544, -3.14323, -1.83307, -3.13529, -1.8956
-3.18764, -2.04868, -3.38529, -2.1456, -4.3, -2.1456
-4.44142, -2.20418, -4.5, -2.3456, -4.5, -2.4456
-4.44142, -2.58702, -4.3, -2.6456, -0.5, -2.6456, -0.5, -10.1456
0.5, -10.1456, 0.5, -2.6456, 4.3, -2.6456, 4.44142, -2.58702
4.5, -2.4456, 4.5, -2.3456, 4.44142, -2.20418, 4.3, -2.1456
3.38529, -2.1456, 3.18764, -2.04868, 3.13529, -1.8956
3.14324, -1.83307, 5, 5.3544, 5, 6.3544, 0.5, 6.3544, 0.5, 5.8544
-0.5, 5.8544, -0.5, 6.3544
IPOLY=-4.8, 5.8544, -0.85, 5.8544, -0.85, -2.1456, -2.70103, -2.1456
-2.8235, -2.10372, -2.89467, -1.99562, -4.8, 5.37982
IPOLY=-0.85, 5.8544, 4.8, 5.8544, 4.8, 5.37982, 2.89468, -1.99562, 2.8235, -2.10372
2.70104, -2.1456, 0.85, -2.1456
SECT= 35, VALUE , 90-100-80 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
17.9229, 2.98895, 8.95072, 83.0517, 207.557, 127.963
5, 5, 4.28264, 4.71736, 25.0232, 39.4441, 56.5908, 44.3041, 5, 4.71736
-5, 5, 4.44142, -4.44142, 4.28264, 4.28264, -4.65878, -4.65878
OPOLY=-5, 4.28264, -5, 3.28264, -3.14323, -3.90482, -3.13529, -3.96736
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3.14324, -3.90482, 5, 3.28264, 5, 4.28264, 0.5, 4.28264
0.5, 3.78264, -0.5, 3.78264, -0.5, 4.28264
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2.70104, -4.21736, 0.85, -4.21736
SECT= 36, VALUE , 165-110-100 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
34.787, 9.11153, 22.3405, 171.794, 707.064, 159.579
5.50006, 5.49994, 6.3082, 10.1918, 31.0475, 1.54523, 59.6745, 44.8819, 5.49994, 10.1918
-5.49994, 5.50006, 0.500062, -0.499938, 6.3082, 6.3082, -10.1918, -10.1918
OPOLY=-5.49994, 6.3082, -5.49994, 5.3082, -2.79109, -1.50713, -2.75573, -1.6918
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-0.499938, 6.3082
IPOLY=-5.29994, 5.8082, -0.849938, 5.8082, -0.849938, -2.1918, -2.16801, -2.1918
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2.28044, -2.1573, 2.16814, -2.1918, 0.850062, -2.1918
SECT= 37, VALUE , 90-110-100 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
19.287, 3.30007, 8.74536, 83.4332, 230.053, 158.287
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-0.499888, 4.34585
IPOLY=-5.29989, 3.84585, -0.849888, 3.84585, -0.849888, -4.15415, -2.16796, -4.15415
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SECT= 38, VALUE , 165-100-90 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
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SECT= 39, VALUE , 90-100-90 , CC, 0, 0, 0, 0, 0, YES, GEN, YES, YES
18.5472, 2.83015, 9.18536, 76.5093, 213.189, 128.761

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SECT= 40, VALUE , p-150-80-60 , CC, 0, 0, 0, 0, 0, 0, YES, GEN, YES, YES
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SECT= 42, VALUE , p-150-81-70 , CC, 0, 0, 0, 0, 0, 0, YES, GEN, YES, YES
28.261, 15.3165, 6.45765, 10.5756, 275.208, 294.969
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SECT= 43, VALUE , p-150-80-80 , CC, 0, 0, 0, 0, 0, 0, YES, GEN, YES, YES
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*THICKNESS ; Thickness
; ITHK, TYPE, bSAME, THIK-IN, THIK-OUT, bOFFSET, OFFTYPE, VALUE ; TYPE=VALUE
; ITHK, TYPE, SUBTYPE, RPOS, WEIGHT ; TYPE=STIFFENED, SUBTYPE=VALUE
; SHAPE, THIK-IN, THIK-OUT, HU, HL ; for yz section
; SHAPE, THIK-IN, THIK-OUT, HU, HL ; for xz section
; ITHK, TYPE, SUBTYPE, RPOS, PLATETHIK ; TYPE=STIFFENED, SUBTYPE=USER
; bRIB {, SHAPE, DIST, SIZE1, SIZE2, ..., SIZE6} ; for yz section
; bRIB {, SHAPE, DIST, SIZE2, SIZE2, ..., SIZE6} ; for xz section
; ITHK, TYPE, SUBTYPE, RPOS, PLATETHIK, DBNAME ; TYPE=STIFFENED, SUBTYPE=DB
; bRIB {, SHAPE, DIST, SNAME} ; for yz section
; bRIB {, SHAPE, DIST, SNAME} ; for xz section
; 1, VALUE, YES, 0.25, 0, NO, 0, 0
*THIK-COLOR
; ITHK, W_R, W_G, W_B, HF_R, HF_G, HF_B, HE_R, HE_G, HE_B, bBLEND, FACT
; 1, 255, 0, 0, 0, 255, 0, 0, 0, 255, NO, 0.5
*STLDCASE ; Static Load Cases
; LCNAME, LCTYPE, DESC
; 자중, USER,
; 난간수직하중, USER,
; 난간수평하중, USER,
; 작업하중, USER,
; WD1, USER,
; WD2, USER,
; WD3, USER,
*SPRING ; Point Spring Supports
; NODE_LIST, Type, SDx, SDy, SDz, SRx, SRy, SRz, GROUP, FROMTYPE, EFFAREA, Kx, Ky, Kz ; LINEAR
; NODE_LIST, Type, Direction, Vx, Vy, Vz, Stiffness, GROUP, FROMTYPE, EFFAREA ; COMP, TENS
; NODE_LIST, Type, Multi-Linear Type, Direction, Vx, Vy, Vz, ax, ay, bx, by, cx, cy, dx, dy, ex, ey, fx, fy, GROUP, FROMTYPE, EFFAREA ; MULTI
; 9, LINEAR, 64.902, 64.902, 64.902, 0, 0, 0, 1, 2797.5, 0.0232, 0.0232, 0.0232

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3, LINEAR, 16.878, 16.878, 16.878, 0, 0, 0, , 1, 727.5, 0.0232, 0.0232, 0.0232
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*USE-STLD, 자중
; *SELFWEIGHT, X, Y, Z, GROUP
; *SELFWEIGHT, 0, 0, -1,
; End of data for load case [자중] -----
*USE-STLD, 난간수직하중
*CONLOAD      : Nodal Loads
; NODE_LIST, FX, FY, FZ, MX, MY, MZ, GROUP
; 15, 0, 0, -900, 0, 0, 0,
; End of data for load case [난간수직하중] -----
*USE-STLD, 난간수평하중
*CONLOAD      : Nodal Loads
; NODE_LIST, FX, FY, FZ, MX, MY, MZ, GROUP
; 15, 600, 0, 0, 0, 0, 0,
; End of data for load case [난간수평하중] -----
*USE-STLD, 작업하중
*BEAMLOAD      : Element Beam Loads
; ELEM_LIST, CMD, TYPE, DIR, bPROJ, [ECCEN], [VALUE], GROUP
; ELEM_LIST, CMD, TYPE, TYPE, DIR, VX, VY, VZ, bPROJ, [ECCEN], [VALUE], GROUP
; [VALUE]      : D1, P1, D2, P2, D3, P3, D4, P4
; [ECCEN]      : bECCEN, ECCDIR, I-END, J-END, bJ-END
; [ADDITIONAL] : bADDITIONAL, ADDITIONAL_I-END, ADDITIONAL_J-END, bADDITIONAL_J-END
; 15, BEAM      , UNILOAD, LZ, NO , NO, aDir[1], , , 0, -52.5, 1, -52.5, 0, 0, 0, 0, , NO, 0, 0, NO
; 16, BEAM      , UNILOAD, LZ, NO , NO, aDir[1], , , 0, -52.5, 1, -52.5, 0, 0, 0, 0, , NO, 0, 0, NO
; 17, BEAM      , UNILOAD, LZ, NO , NO, aDir[1], , , 0, -52.5, 1, -52.5, 0, 0, 0, 0, , NO, 0, 0, NO
; 18, BEAM      , UNILOAD, LZ, NO , NO, aDir[1], , , 0, -52.5, 1, -52.5, 0, 0, 0, 0, , NO, 0, 0, NO
; End of data for load case [작업하중] -----
*USE-STLD, WD1
*BEAMLOAD      : Element Beam Loads
; ELEM_LIST, CMD, TYPE, DIR, bPROJ, [ECCEN], [VALUE], GROUP
; ELEM_LIST, CMD, TYPE, TYPE, DIR, VX, VY, VZ, bPROJ, [ECCEN], [VALUE], GROUP
; [VALUE]      : D1, P1, D2, P2, D3, P3, D4, P4
; [ECCEN]      : bECCEN, ECCDIR, I-END, J-END, bJ-END
; [ADDITIONAL] : bADDITIONAL, ADDITIONAL_I-END, ADDITIONAL_J-END, bADDITIONAL_J-END
; 15, BEAM      , UNILOAD, LZ, NO , NO, aDir[1], , , 0, -0.377, 1, -0.377, 0, 0, 0, 0, , NO, 0, 0, NO
; End of data for load case [WD1] -----
*USE-STLD, WD2
*BEAMLOAD      : Element Beam Loads
; ELEM_LIST, CMD, TYPE, DIR, bPROJ, [ECCEN], [VALUE], GROUP
; ELEM_LIST, CMD, TYPE, TYPE, DIR, VX, VY, VZ, bPROJ, [ECCEN], [VALUE], GROUP
; [VALUE]      : D1, P1, D2, P2, D3, P3, D4, P4
; [ECCEN]      : bECCEN, ECCDIR, I-END, J-END, bJ-END
; [ADDITIONAL] : bADDITIONAL, ADDITIONAL_I-END, ADDITIONAL_J-END, bADDITIONAL_J-END
; 16, BEAM      , UNILOAD, LZ, NO , NO, aDir[1], , , 0, -0.32, 1, -0.32, 0, 0, 0, 0, , NO, 0, 0, NO
; 18, BEAM      , UNILOAD, LZ, NO , NO, aDir[1], , , 0, -0.32, 1, -0.32, 0, 0, 0, 0, , NO, 0, 0, NO
; End of data for load case [WD2] -----
*USE-STLD, WD3
*BEAMLOAD      : Element Beam Loads
; ELEM_LIST, CMD, TYPE, DIR, bPROJ, [ECCEN], [VALUE], GROUP
; ELEM_LIST, CMD, TYPE, TYPE, DIR, VX, VY, VZ, bPROJ, [ECCEN], [VALUE], GROUP
; [VALUE]      : D1, P1, D2, P2, D3, P3, D4, P4
; [ECCEN]      : bECCEN, ECCDIR, I-END, J-END, bJ-END
; [ADDITIONAL] : bADDITIONAL, ADDITIONAL_I-END, ADDITIONAL_J-END, bADDITIONAL_J-END
; 17, BEAM      , UNILOAD, LZ, NO , NO, aDir[1], , , 0, -0.377, 1, -0.377, 0, 0, 0, 0, , NO, 0, 0, NO
; End of data for load case [WD3] -----
*LOADCOMB      : Combinations
; NAME=NAME, KIND, ACTIVE, bES, ITYPE, DESC, ISERV-TYPE, nLCOMTYPE      : line 1
;      ANAL1, LCNAME1, FACT1, ...                                     : from line 2
;      NAME=com1, GEN, ACTIVE, 0, 0, , 0, 0
;      ST, 난간수직하중, 1, ST, 난간수평하중, 1, ST, 작업하중, 1, ST, WD1, 1
;      ST, WD2, 1, ST, WD3, 1, ST, 자중, 1
*LC-COLOR      : Diagram Color for Load Case
; ANAL, LCNAME, iR1(ALL), iG1(ALL), iB1(ALL), iR2(MIN), iG2(MIN), iB2(MIN), iR3(MAX), iG2(MAX), iB2(MAX)
; ST, 자중, 78, 0, 255, 192, 128, 0, 0, 128, 57
; ST, 난간수직하중, 0, 128, 255, 0, 192, 128, 0, 128, 192
; ST, 난간수평하중, 212, 160, 255, 255, 255, 255, 210, 210, 210
; ST, 작업하중, 0, 128, 192, 0, 192, 192, 0, 128, 128
; CB, com1, 146, 0, 255, 146, 0, 255, 0, 128, 128
; ST, WD3, 192, 192, 192, 0, 128, 57, 0, 192, 128
; ST, WD1, 255, 0, 192, 255, 192, 87, 0, 128, 192
; ST, WD2, 192, 128, 0, 0, 128, 128, 128, 192, 0
*SECTION MANAGER-GROUP & PART      : Section Manager - Group & Part
; SECT = NO, bSAMEJ
;      GRPDISIZE, GRPDJSIZE, PARTISIZE, PARTJSIZE
;      ; line 1
;      ; line 2
;      ;
;      LOOP UTIL (GRPDISIZE, GRPDJSIZE)
;      GROUPID, GROUPNAME, GROUPTYPE
;      ; line n
;      ;
;      LOOP UTIL (PARTISIZE, PARTJSIZE)
;      PARTTYPE, GROUPID, PARTNAME, PARTSHAPE, bSTIFFENER
;      LINESIZE, LINEINDEX[i].....
;      ; line n
;      ;
; SECT=1, YES
; 0, 0, 0, 0
; SECT=2, YES
; 0, 0, 0, 0
; SECT=3, YES
; 0, 0, 0, 0
; SECT=6, YES
; 0, 0, 0, 0
; SECT=7, YES
; 0, 0, 0, 0
; SECT=8, YES
; 0, 0, 0, 0
; SECT=9, YES
; 0, 0, 0, 0
; SECT=10, YES
; 0, 0, 0, 0
; SECT=11, YES
; 0, 0, 0, 0
; SECT=12, YES
; 0, 0, 0, 0
; SECT=13, YES
; 0, 0, 0, 0
; SECT=14, YES
; 0, 0, 0, 0
; SECT=15, YES
; 0, 0, 0, 0
; SECT=16, YES
; 0, 0, 0, 0
; SECT=17, YES
; 0, 0, 0, 0
; SECT=18, YES
; 0, 0, 0, 0
; SECT=19, YES

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SECT=29, YES
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SECT=30, YES
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SECT=41, YES
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SECT=42, YES
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SECT=43, YES
0, 0, 0, 0
*SECTION MANAGER-STIFFENER ; Section Manager - Stiffener
; SECT = NO, bSAMEJ ; line 1
; STFNISIZE, STFNJSIZE ; line 2
; ..... ;
; LOOP UTIL (STFNISIZE, STFNJSIZE) ;
; TYPE, Z, STANDREF, POSLINE, STANDREFL, NUM, CTC ; line n
; STIFFTYPE, dSIZE(0 ~ 20) ; line n
; LINESIZE, LINEINDEX[i]..... ; line n
; ..... ;
SECT=1, YES
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SECT=2, YES
0, 0
SECT=3, YES
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SECT=6, YES
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SECT=7, YES
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SECT=8, YES
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SECT=9, YES
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SECT=27, YES
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SECT=29, YES
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SECT=31, YES
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SECT=32, YES
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SECT=40, YES
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SECT=41, YES
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SECT=42, YES
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SECT=43, YES
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*ENDDATA