

Extradosed PSC

A Study on the Effective Transfer Length of Cable Forces for Extradosed Prestressed Concrete Bridges

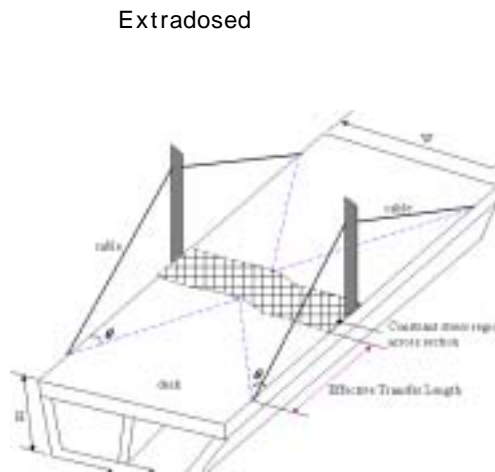
Lew, Young Cho, Jung Sik Kim, Dong Keun Yoo, Woong Suk

1.

Extradosed 가 . Extradosed 가
 , Extradosed (prestress)
 . Extradosed 가
 . Extradosed (廣幅) ,
 3D FEM
 . Extradosed
 2 Extradosed
 (), ,
 parameter study 가

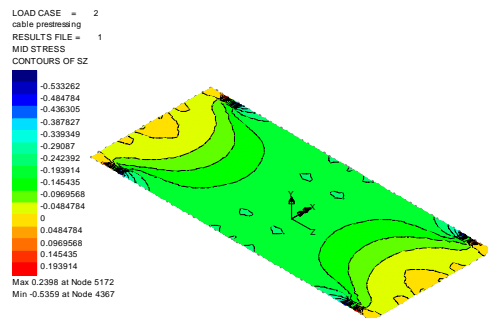
2.

1



1.

2

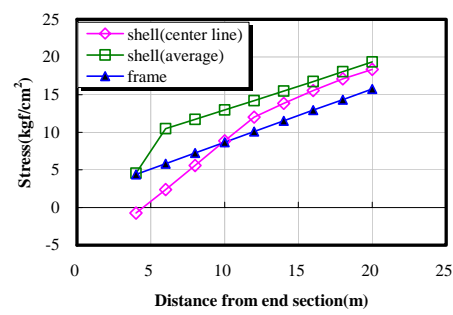
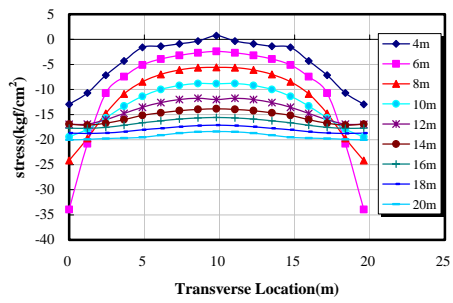


2.

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가
가
(Effective Transfer Length)
 θ
2D shell 3D
1 2 4 10m 16m 4m

(center line)
(Coefficient of variation) 5%
가 5% 가
3 가 5.01% 가
12m 가



3.

4. 2D 3D

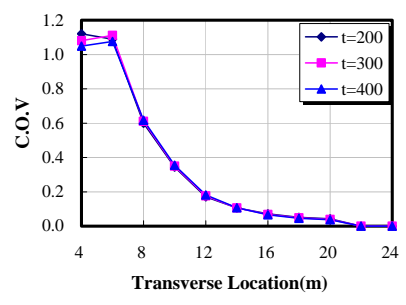
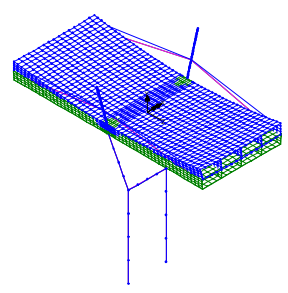
1.

| | 4m | 6m | 8m | 10m | 12m | 14m | 16m | 18m | 20m |
|--|--------|---------|---------|---------|---------|---------|---------|---------|---------|
| | -4.578 | -10.478 | -11.715 | -12.959 | -14.184 | -15.485 | -16.743 | -18.051 | -19.345 |
| | 4.741 | 10.507 | 6.611 | 3.955 | 2.084 | 1.254 | 0.839 | 0.626 | 0.611 |
| | 1.036 | 1.003 | 0.564 | 0.305 | 0.147 | 0.081 | 0.0501 | 0.035 | 0.032 |

3.

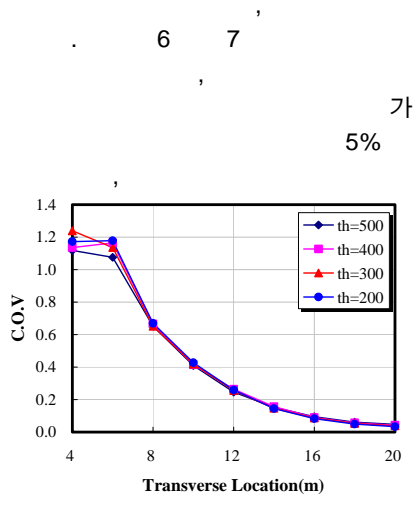
parameter study

5 Extradosed PSC shell (6.4m×4.0m) 2 (=65.0+120.0+65.0) bar (constraint effect)

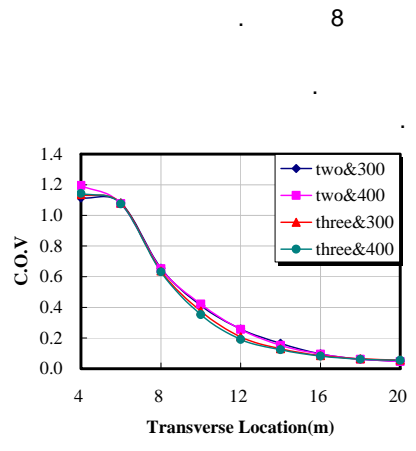


5.

6.



7.



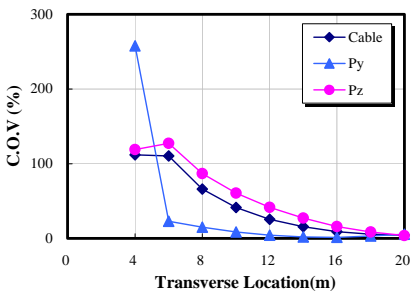
8.

x(), y(), z()
(Py) 가

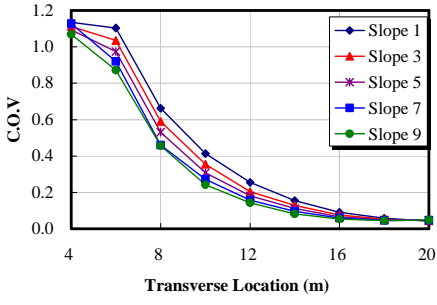
5 가
(Pz) 가
Pz 9

가 Extradosed slope 1

Py 가 10
8.5~35°
8.5°, slope 9 24.0°



9.



10.

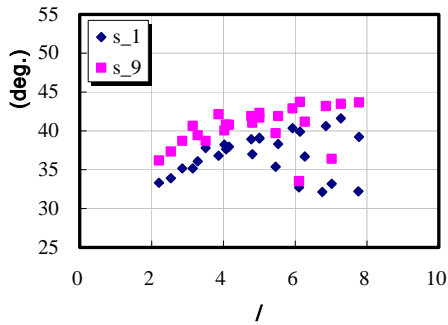
(= /)
2~5
2.7m, 3.35m, 3.85m) 9 가 (8.5~28.5m, @2.5m)
9(24°)

Extradosed 4 가 (2.2m, s_1(8.5°) s_1(θ)
1 θ 30~45°

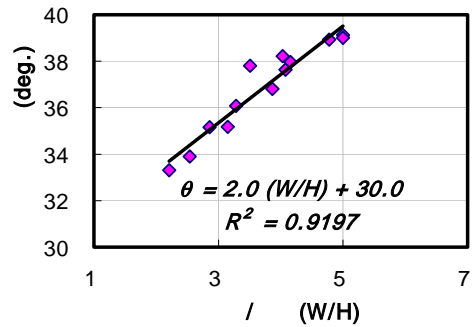
s_1 30°

(/ =2~5)

가 s_1 / 가 2~5



11. (degree)



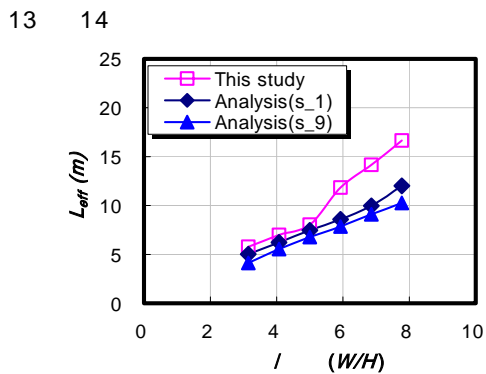
12.

12 / (= W/H)가 2~5
(1)

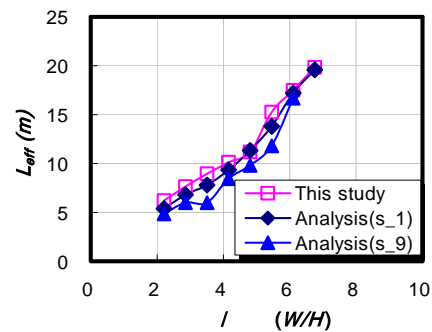
(L_{eff}) / (= W/H)가 5
가

$$L_{eff} = \frac{W}{2} \cdot \cot\left(2 \cdot \frac{W}{H} + 30.0\right) \quad \left(2 \leq \frac{W}{H} \leq 5\right) \quad (1)$$

$$L_{eff} = \frac{W}{2} \cdot \cot\left(40.0 - \frac{W}{H}\right) \quad \left(\frac{W}{H} > 5\right) \quad (2)$$



13. (H=2.7m)



14. (H=3.85m)

4.

Extradosed PSC

1. Extradosed

2.

가

가

가

3. 3D FEM

2

Extradosed

/

가 5

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2. 菊池 稔, 三原 英之, 石精 精一, 立花 勝利, 蟹澤大橋의 設計と施工, prestrest 콘크리트, Vol.39, No.2, Mar. 1997