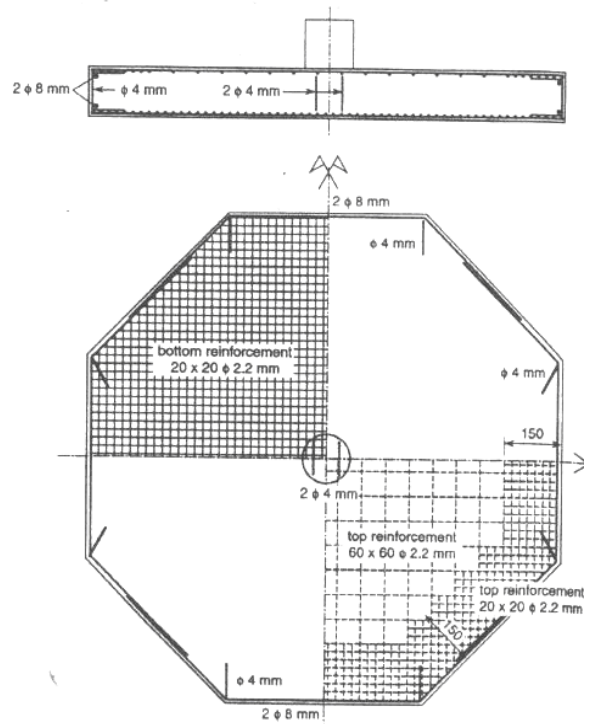
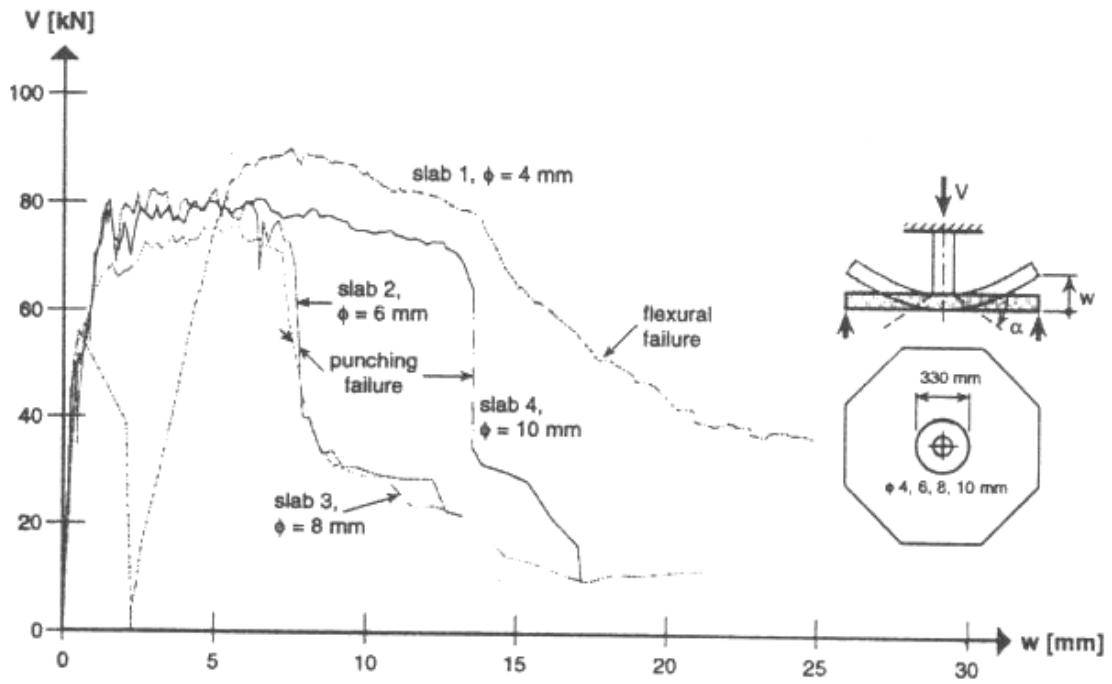


(a) 幾何形狀與邊界條件

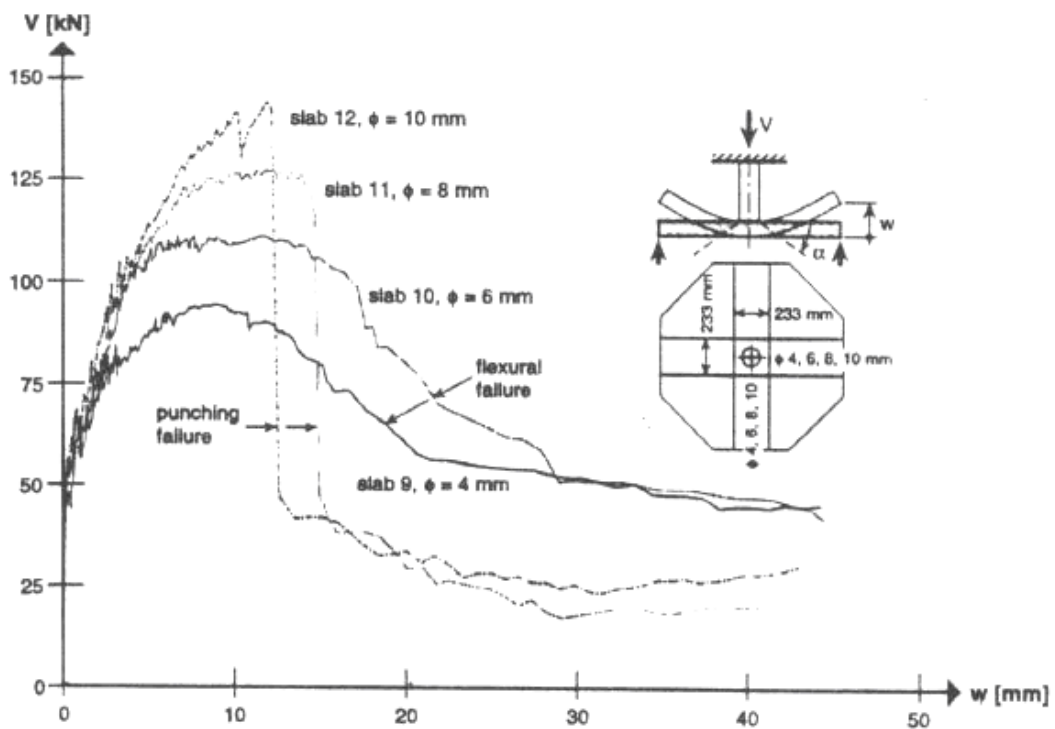


(b) 最小鐵絲網配置

圖 2-1 八角版貫穿試體配置圖【5】



(a) 環狀配筋



(b) 雙向配筋

圖 2-2 八角版載重-變位關係圖【5】

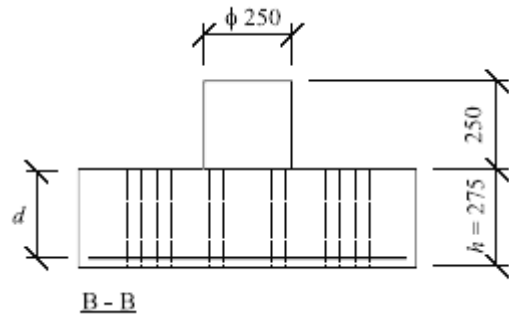
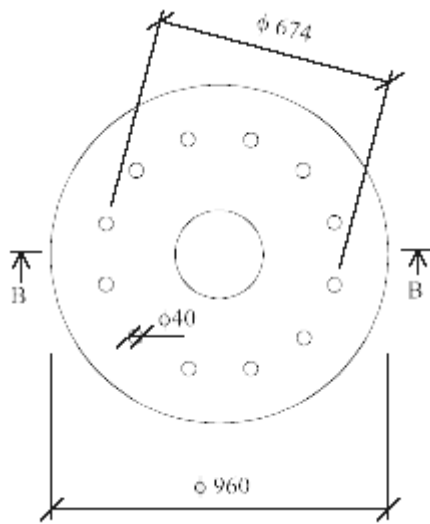


圖 2-3 圓形基礎貫穿試體上視圖【6】 圖 2-4 圓形基礎貫穿試體側視圖【6】

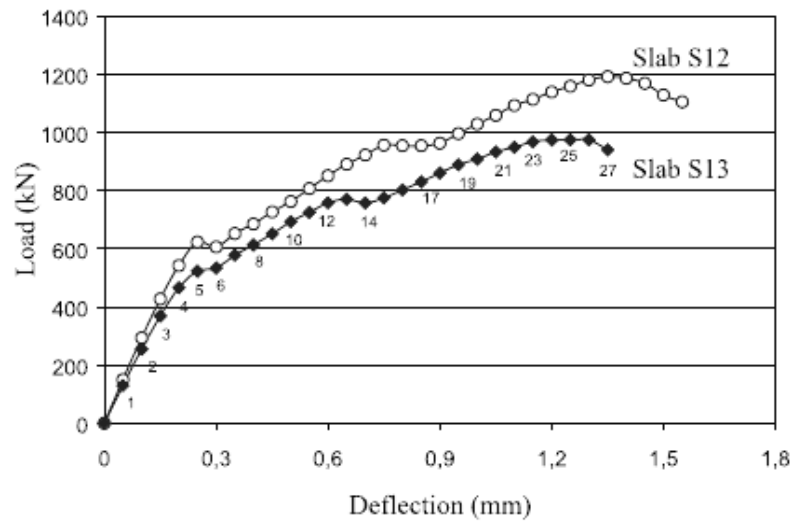


圖 2-5 圓形基礎版不同混凝土強度之載重-變位圖【6】

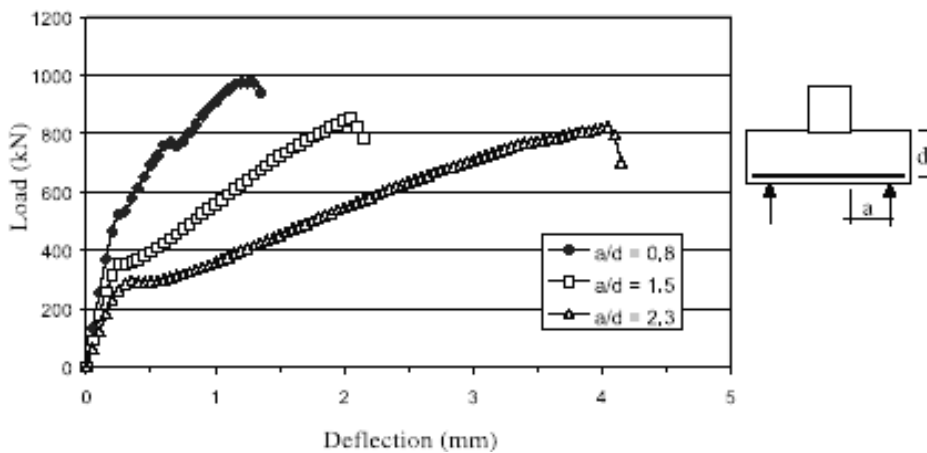


圖 2-6 圓形基礎版不同剪跨比-深度比之載重-變位圖【6】

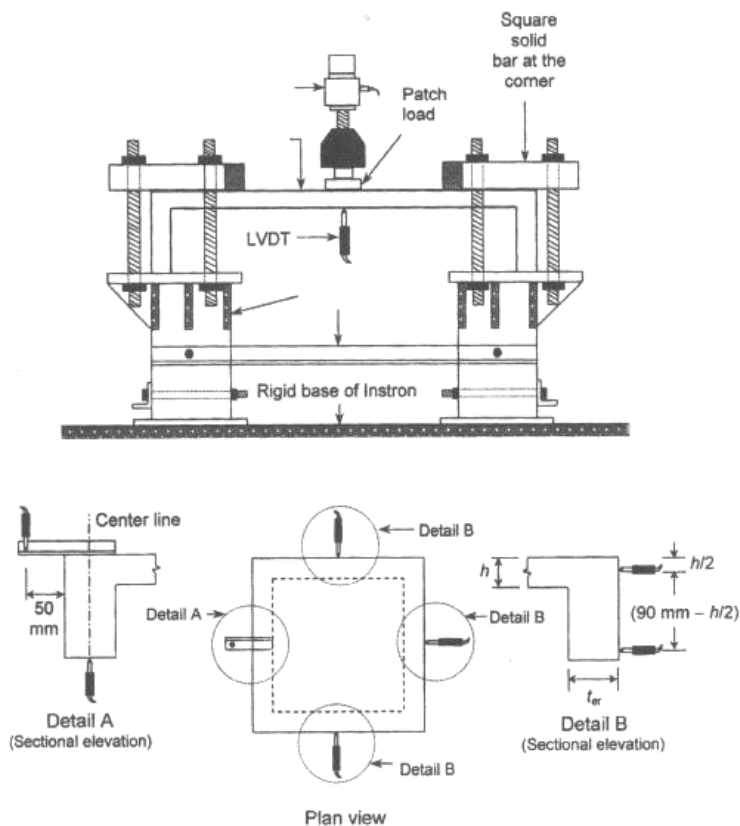


圖 2-7 矩形版貫穿剪力試驗配置圖【9】

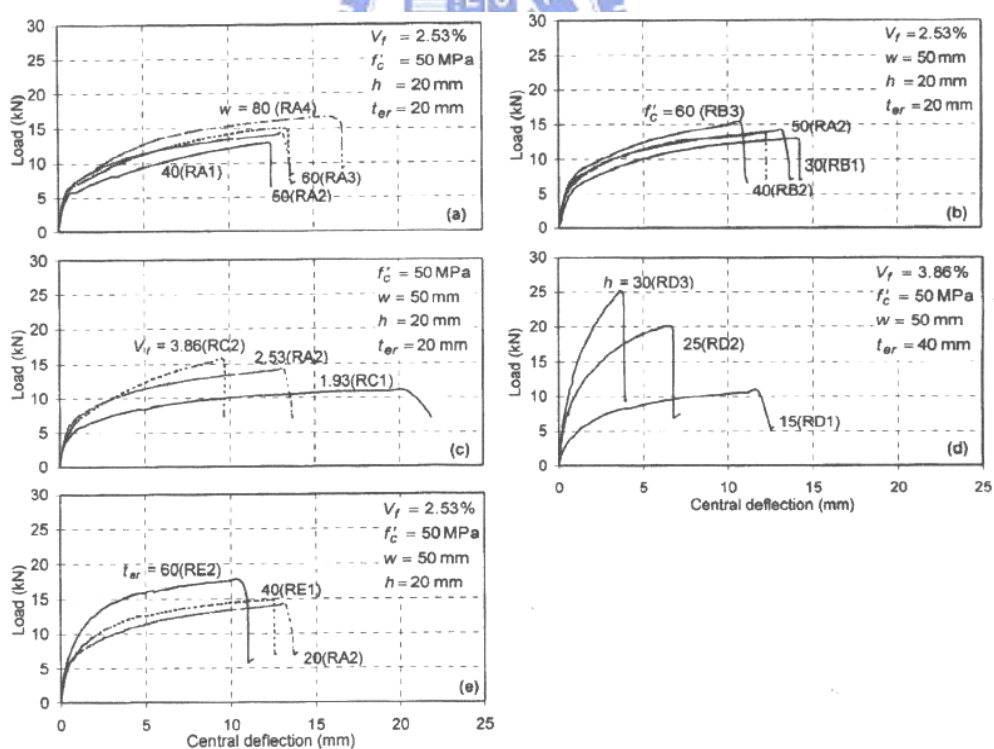
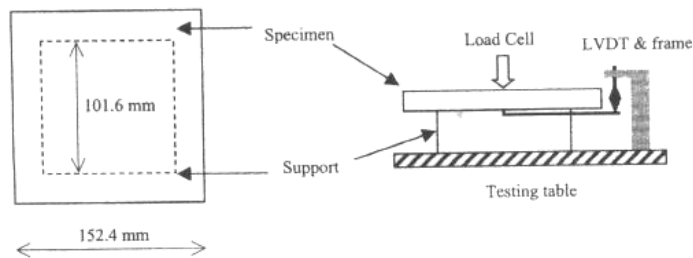
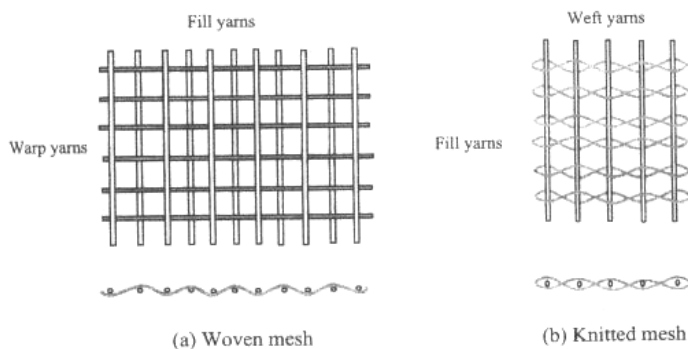


圖 2-8 矩形版之載重-變位圖(a)載重大小面積(b)混凝土抗壓強度 f'_c (c)鋼筋數

V_f (d)版厚度 h 和(e)邊緣支撐之厚度 t_{er} 【9】



(A) Test setup for two-way bending of glass concrete slab.



(B) Structures of fabric mesh.

圖 2-9 玻璃纖維矩形版貫穿試驗配置圖【10】

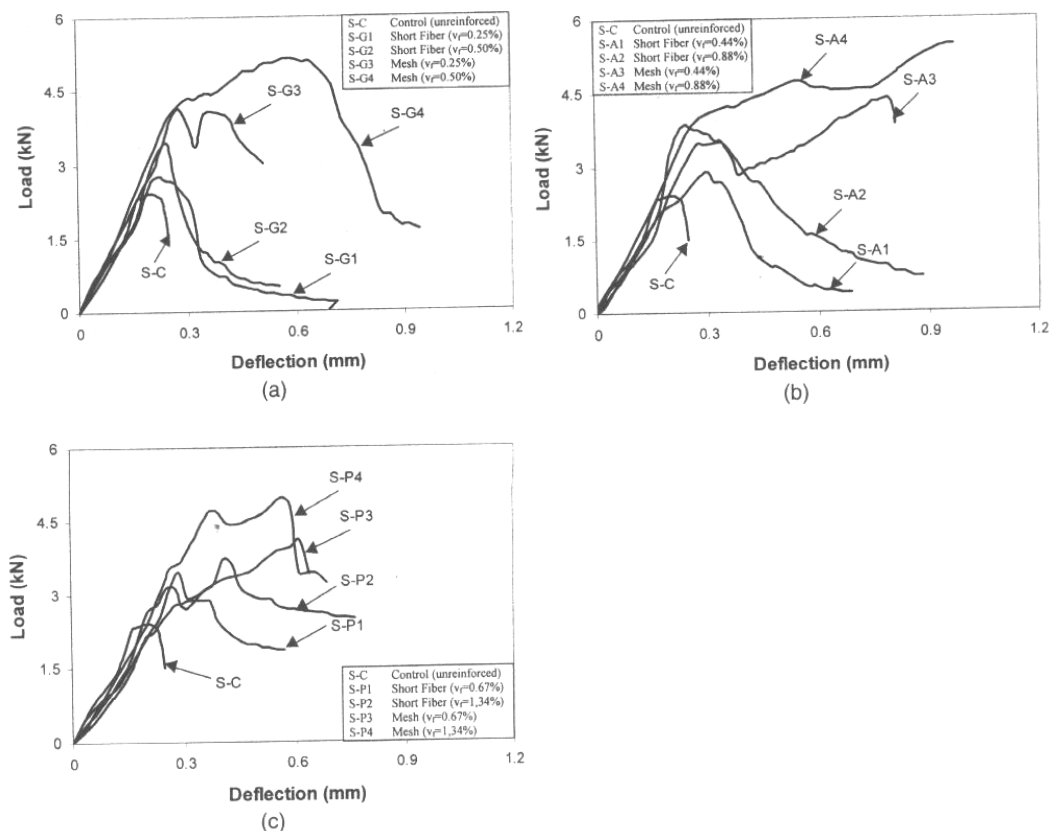


圖 2-10 矩形版之 P- Δ 之曲線圖(撓曲載重)

(a)AR-玻璃纖維(b)PVA 纖維(c)聚丙稀之纖維【10】

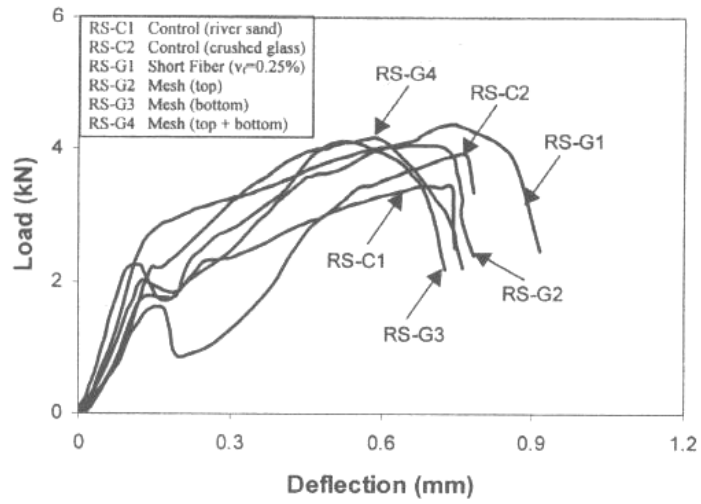


圖 2-11 矩形版之 P- Δ 之曲線圖(貫穿剪力行為)【10】

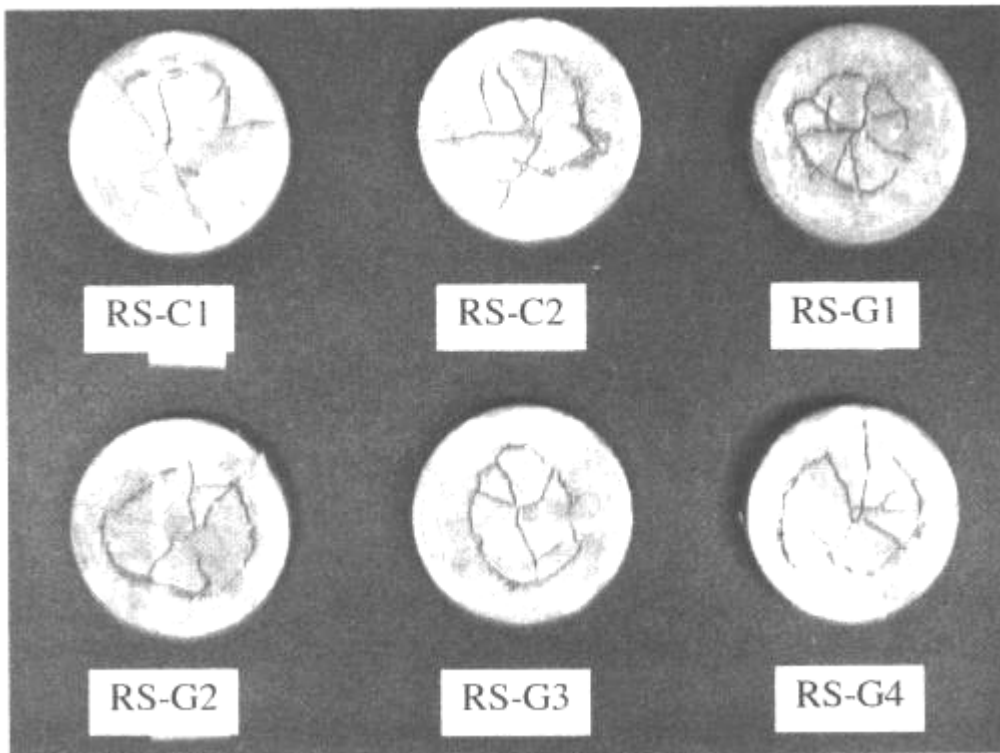


圖 2-12 圓形版在貫穿剪力作用下試體底部開裂型式圖【10】

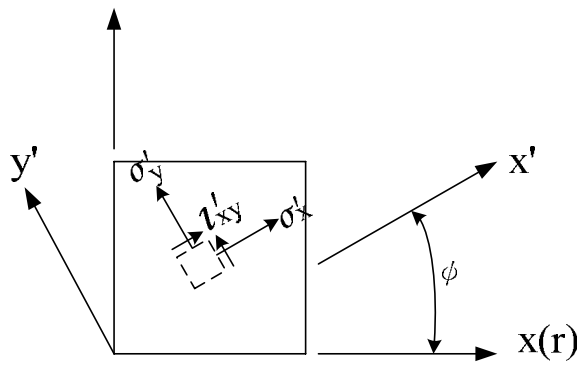


圖 2-13 開裂前內部應力關係圖

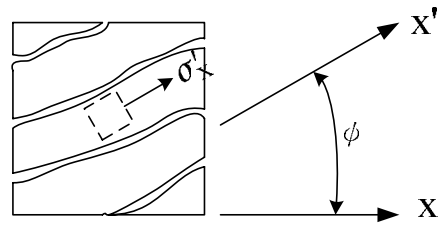
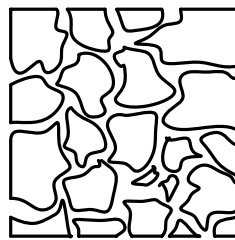


圖 2-14 開裂後內部應力關係圖



curshing

圖 2-15 壓碎破壞內部關係圖

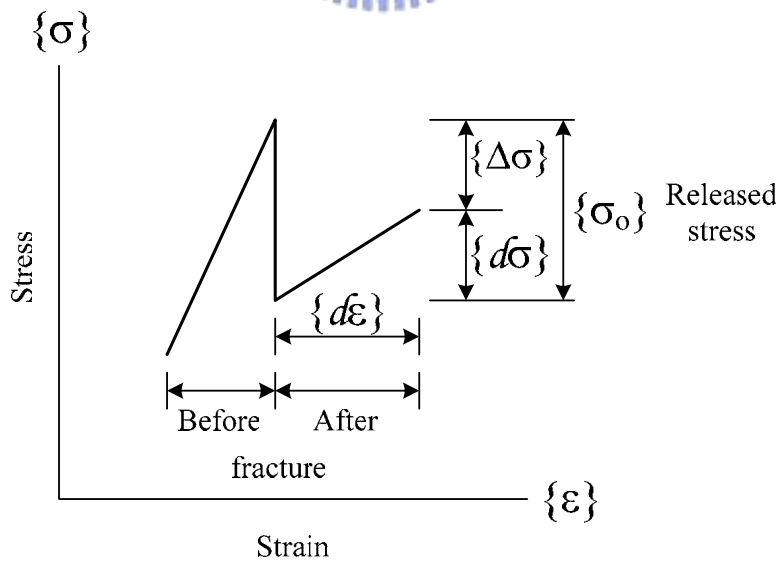


圖 2-16 壓碎破壞之應力-應變行為圖

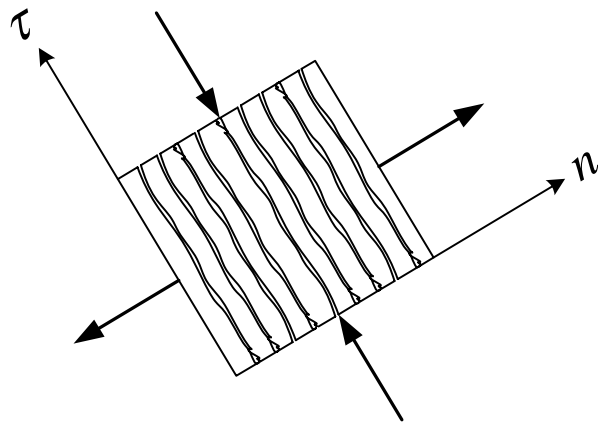


圖 2-17 理想化之混凝土切面關係圖

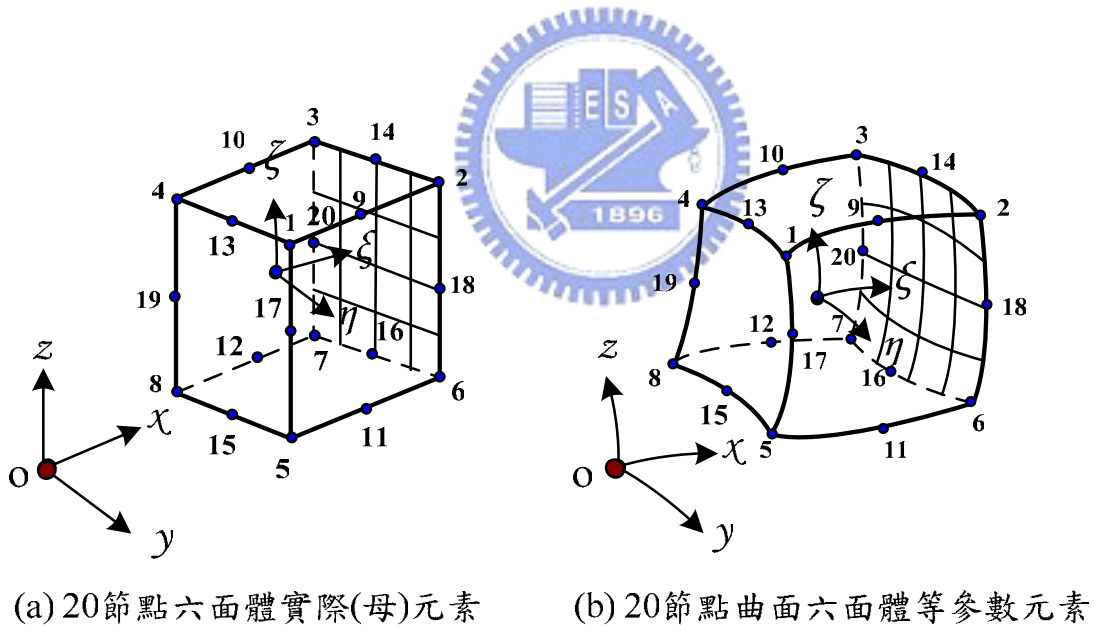


圖 2-18 二十個節點六面體等參數元素關係圖

Concrete reinforcement beam

$E_c = 3.2719 \times 10^4 \text{ Mpa}$ $f_c' = 48.5 \text{ Mpa}$ $f_y = 48.5 \text{ Mpa}$
 $E_s = 2.0 \times 10^5 \text{ Mpa}$ $f_s = 460 \text{ Mpa}$
 $A_c = 2\text{-}\#6 \text{ \& } 1\text{-}\#4$ $A_t = 2\text{-}\#8 \text{ \& } 1\text{-}\#7$
 $A_{hoop} = \#3 @ 120\text{mm}$
 Mesh typical= CHX60

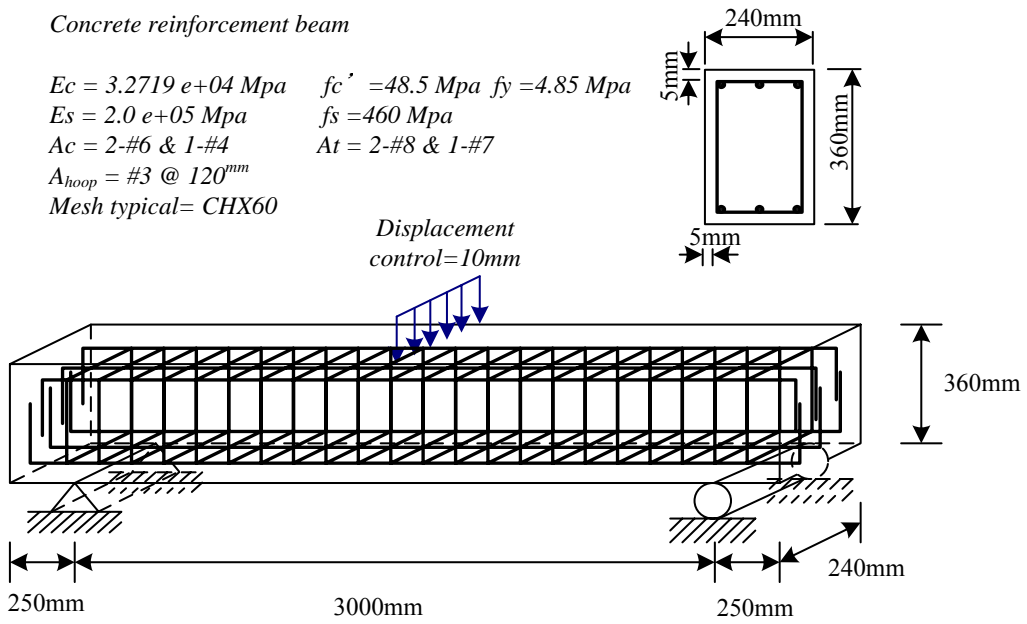


圖 3-1 鋼筋混凝土樑之試體斷面圖

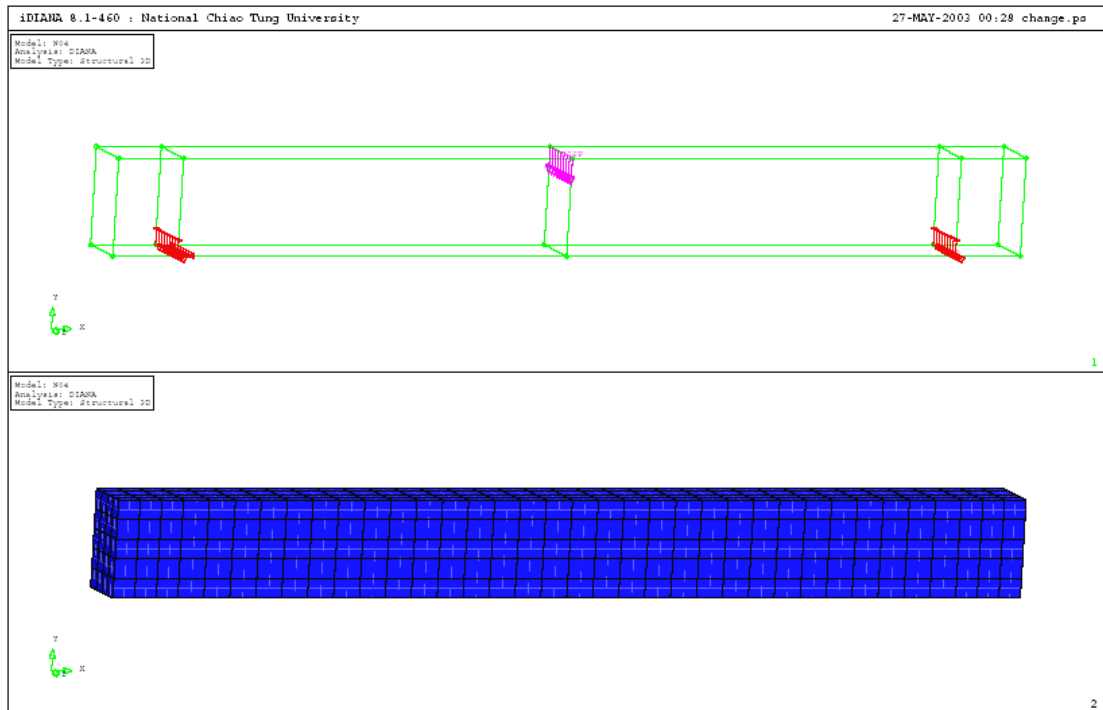


圖 3-2 模擬鋼筋混凝土樑之網格圖

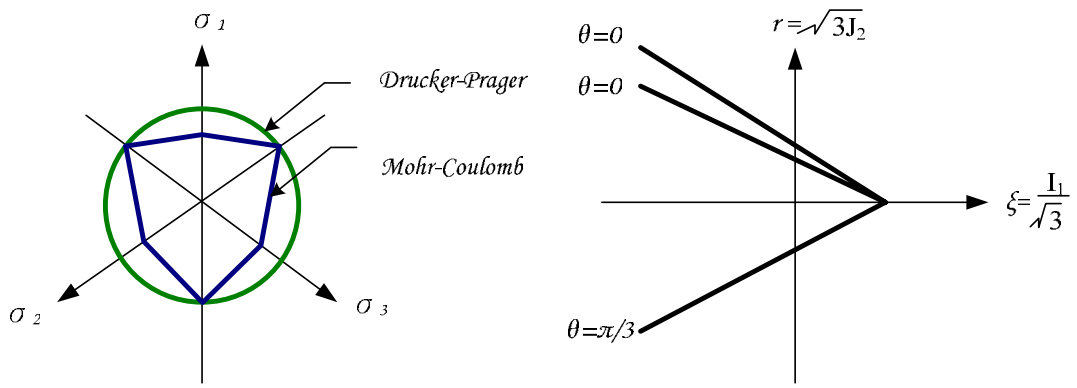


圖 3-3 Drucker-Prager 降服準則

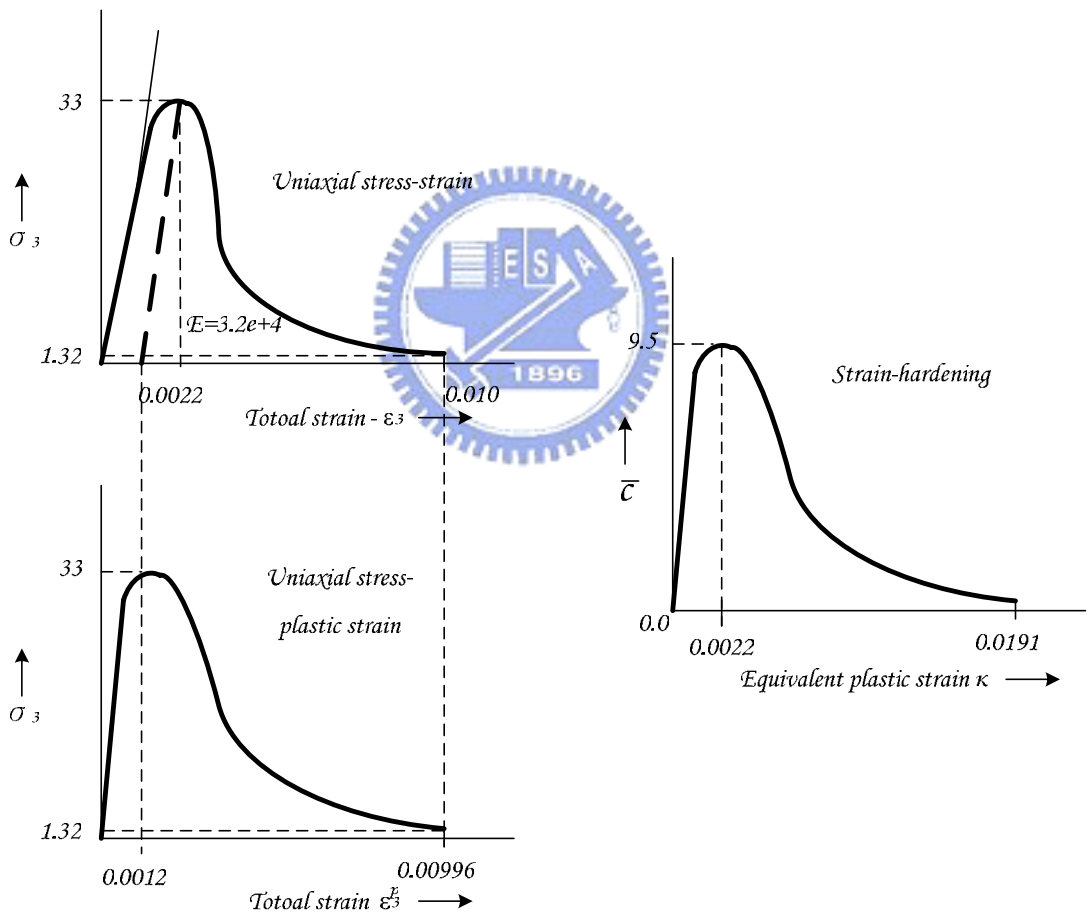


圖 3-4 Drucker-Prager 應變硬化準則

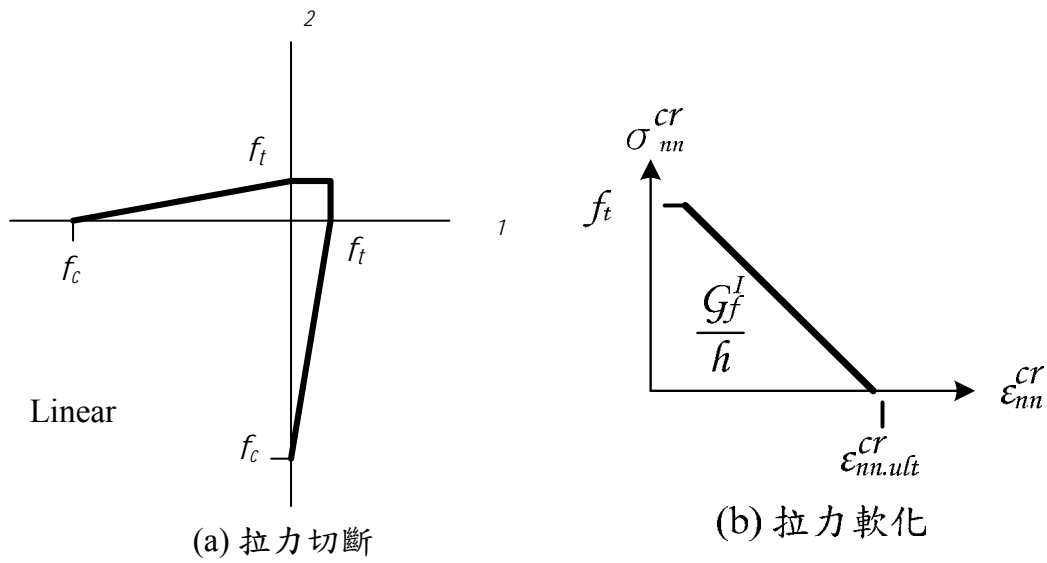


圖 3-5 混凝土拉力破壞模式

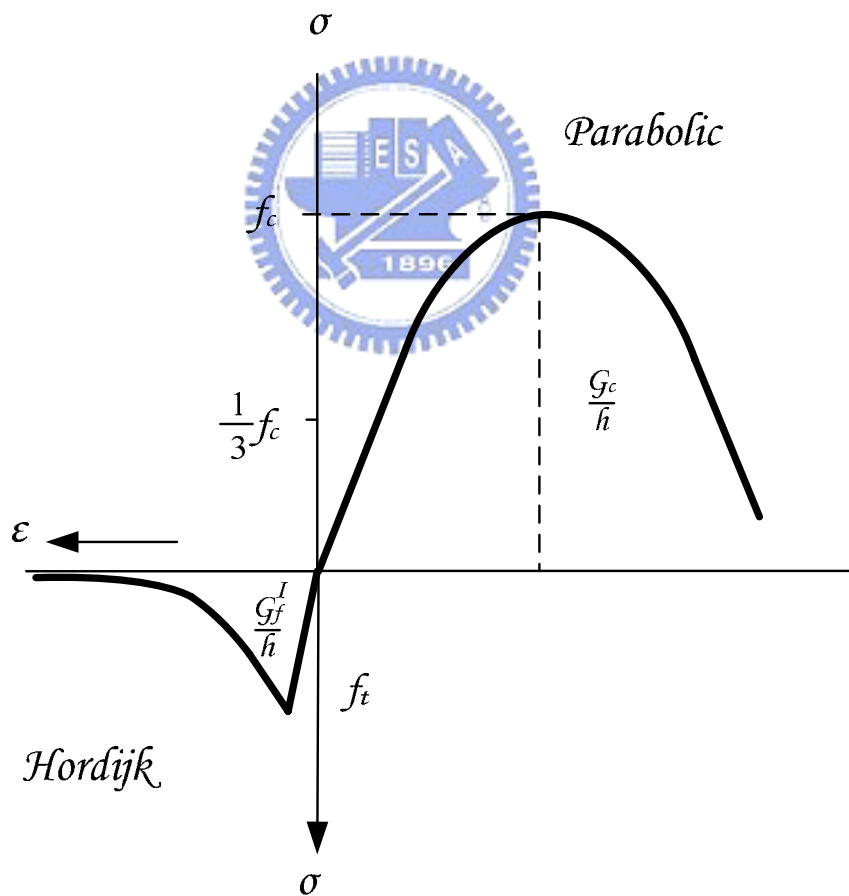


圖 3-6 拋物線統合之應力-應變模式關係圖

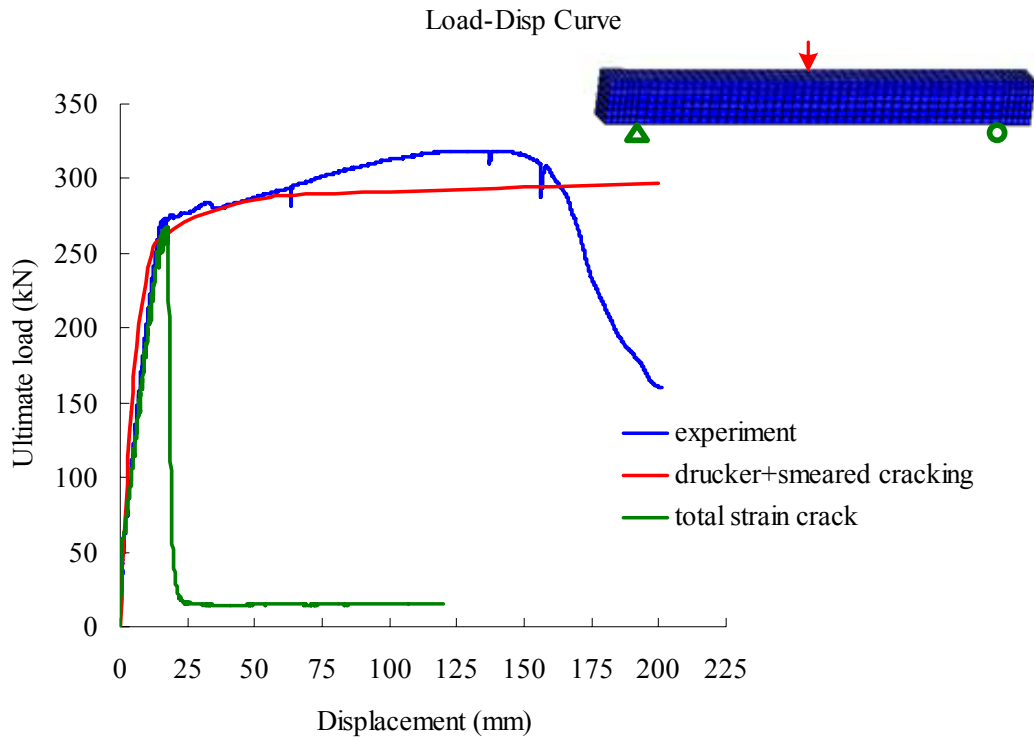


圖 3-7 鋼筋混凝土樑之載重-變位圖(數值分析與實驗比較)

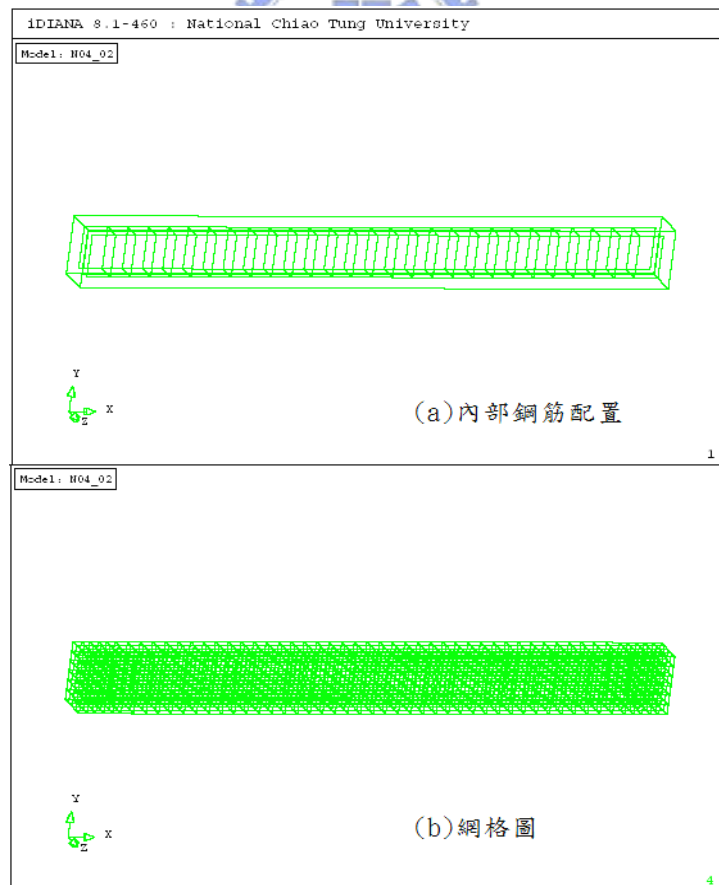


圖 3-8 鋼筋混凝土樑分析模式圖

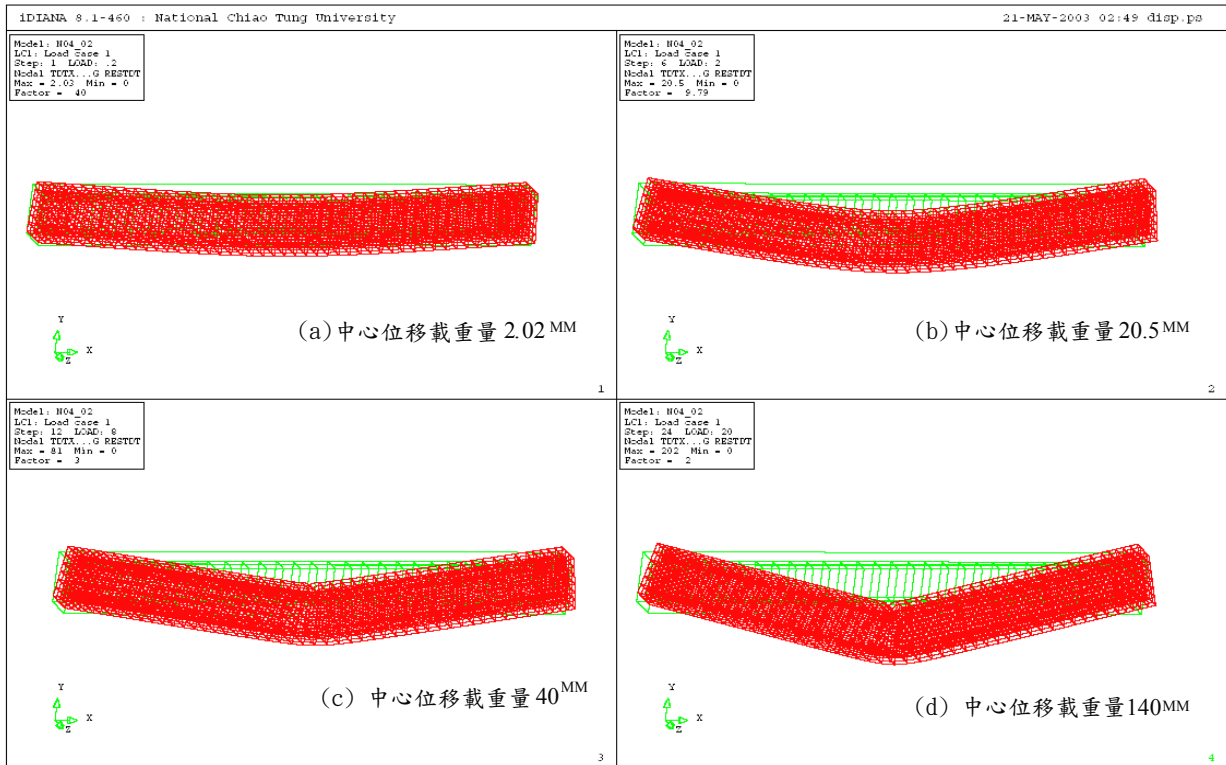


圖 3-9 簡支梁變形圖

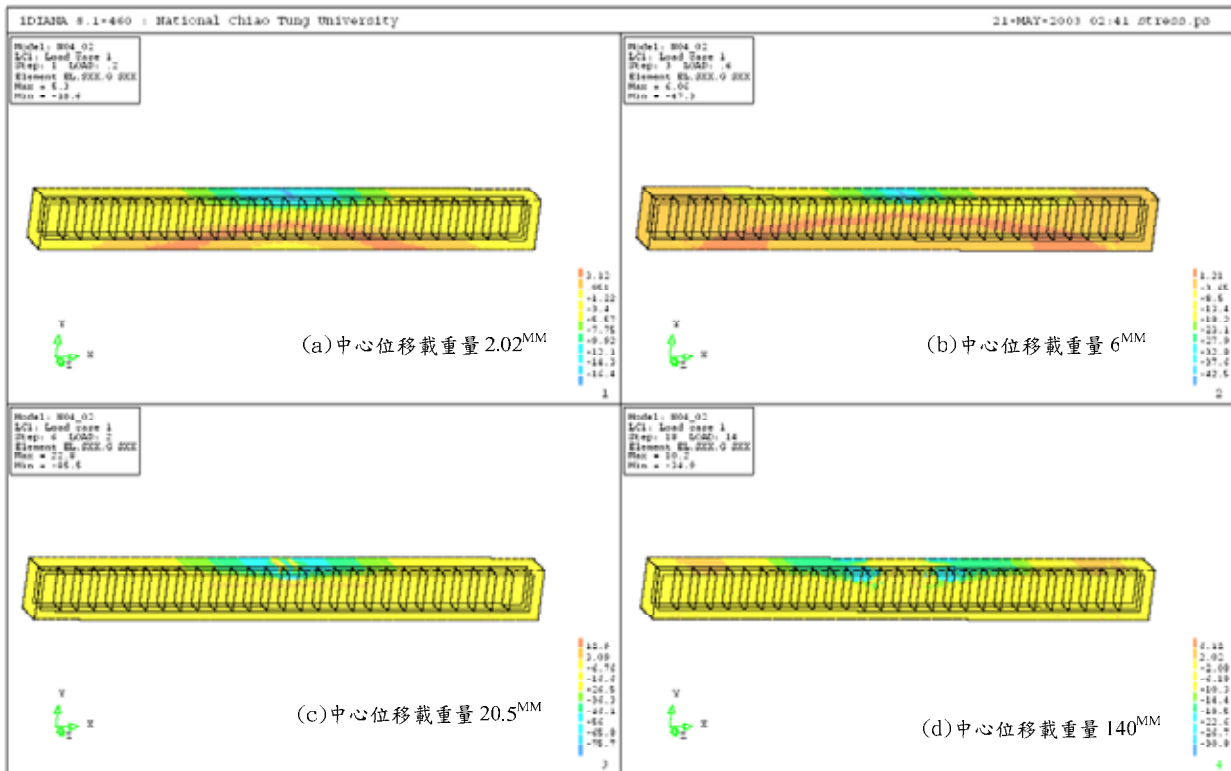


圖 3-10 混凝土之應力分佈圖

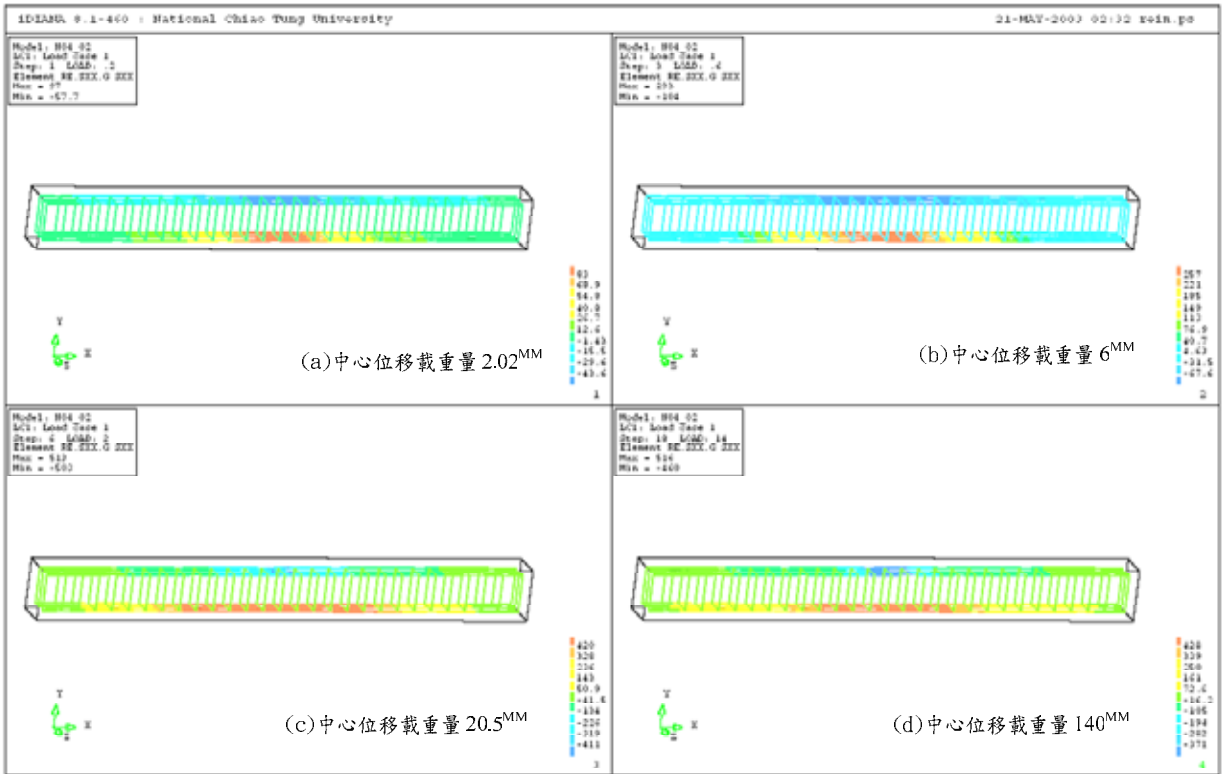
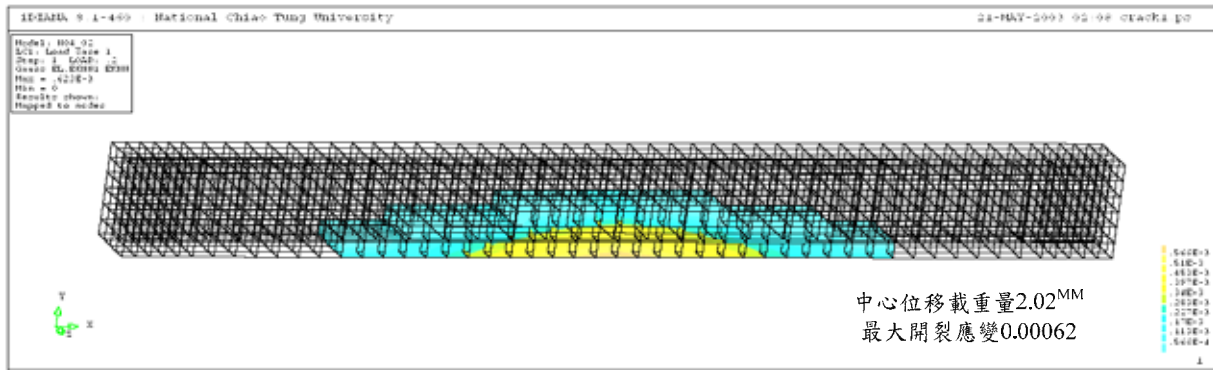


圖 3-11 鋼筋之應力分佈圖





圖

3-12 線彈性階段之應變分佈圖

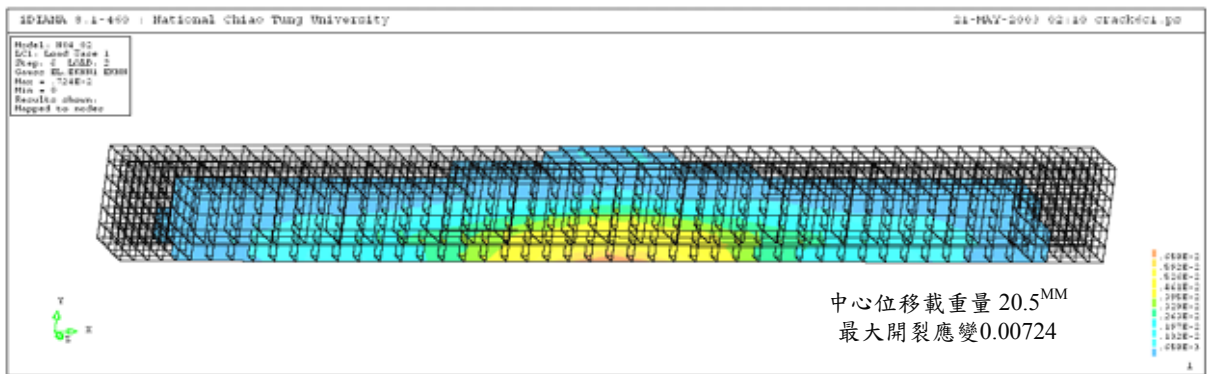


圖 3-13 混凝土達初始開裂之應變分佈圖

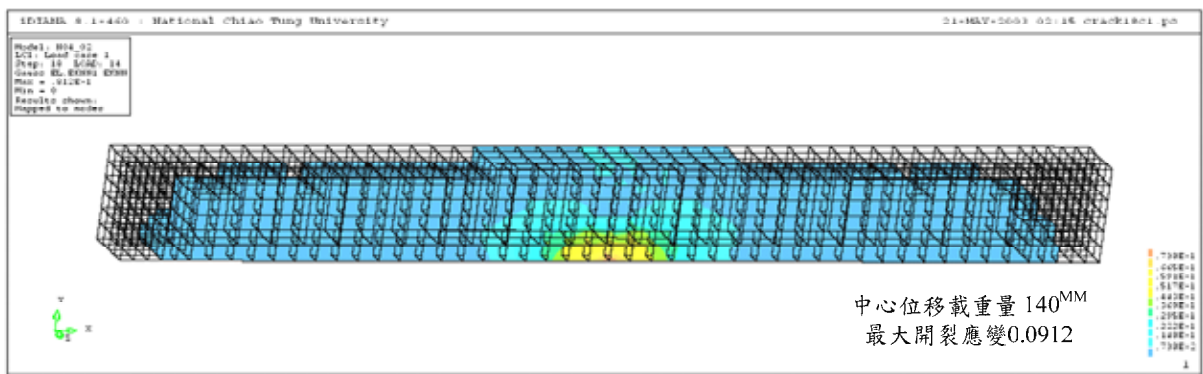


圖 3-14 混凝土達極限承载力之應變分佈圖

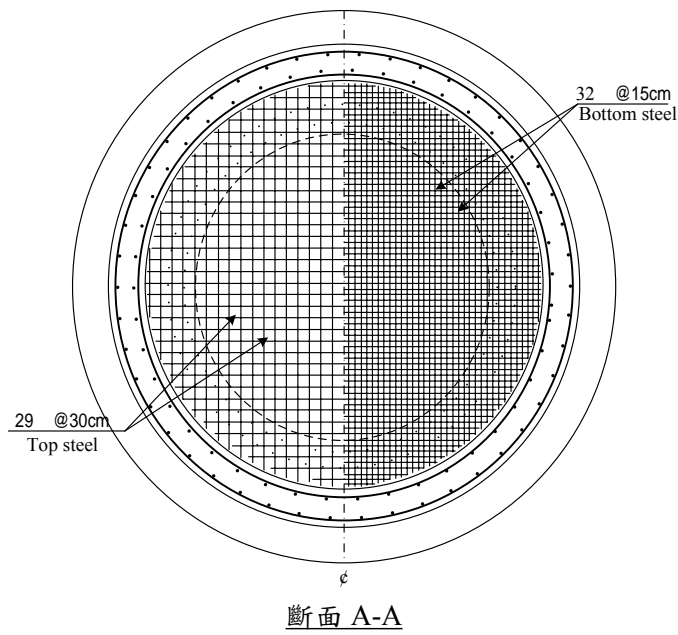


圖 3-15 沉箱頂版設計平面圖

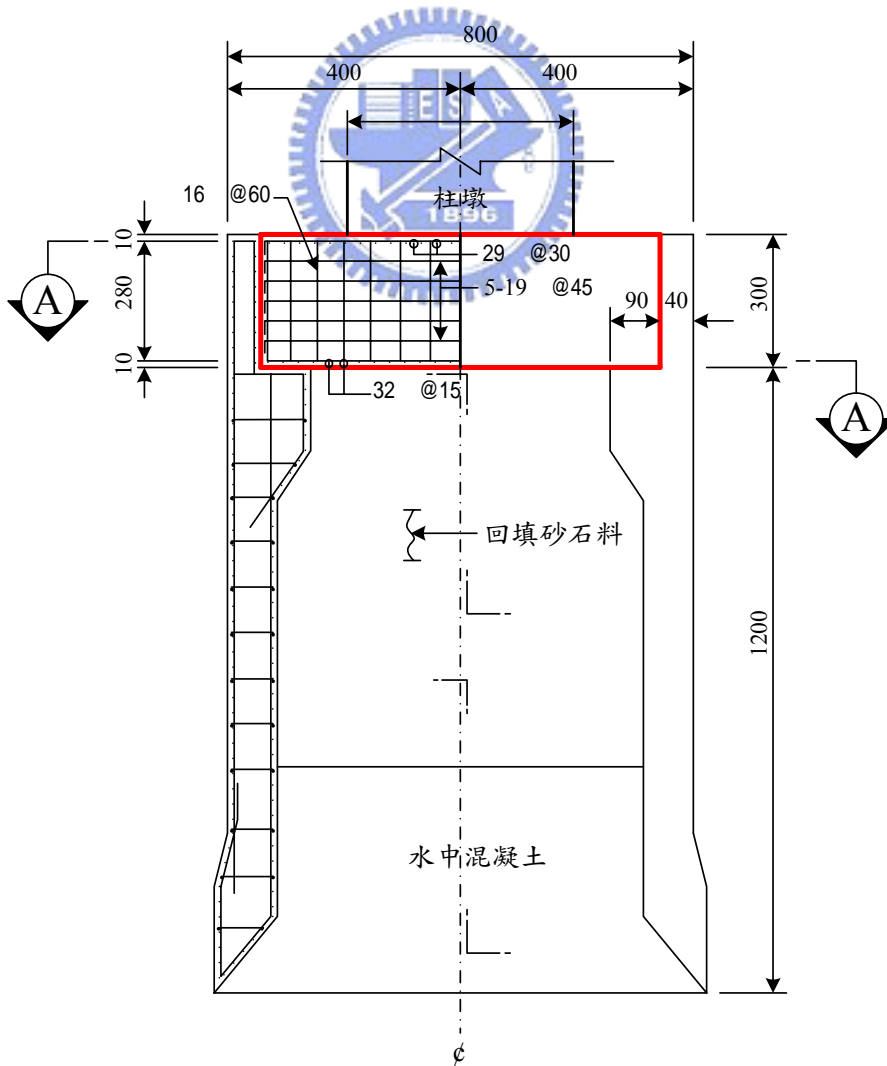


圖 3-16 沉箱頂版設計立面圖

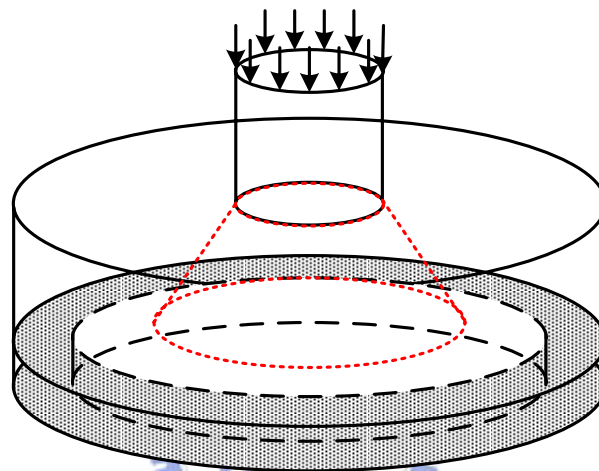
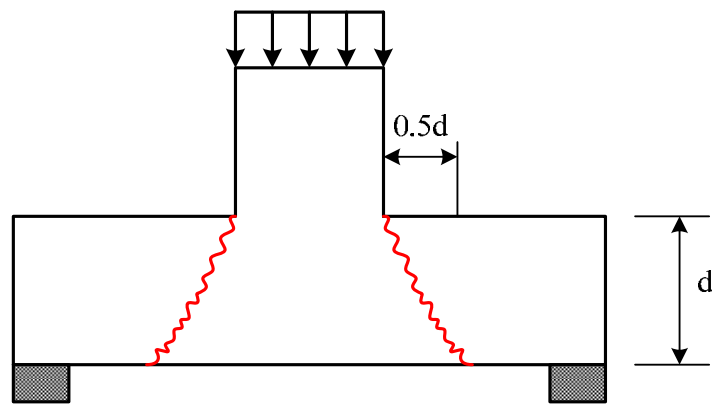


圖 3-17 Punching shear 破壞示意圖

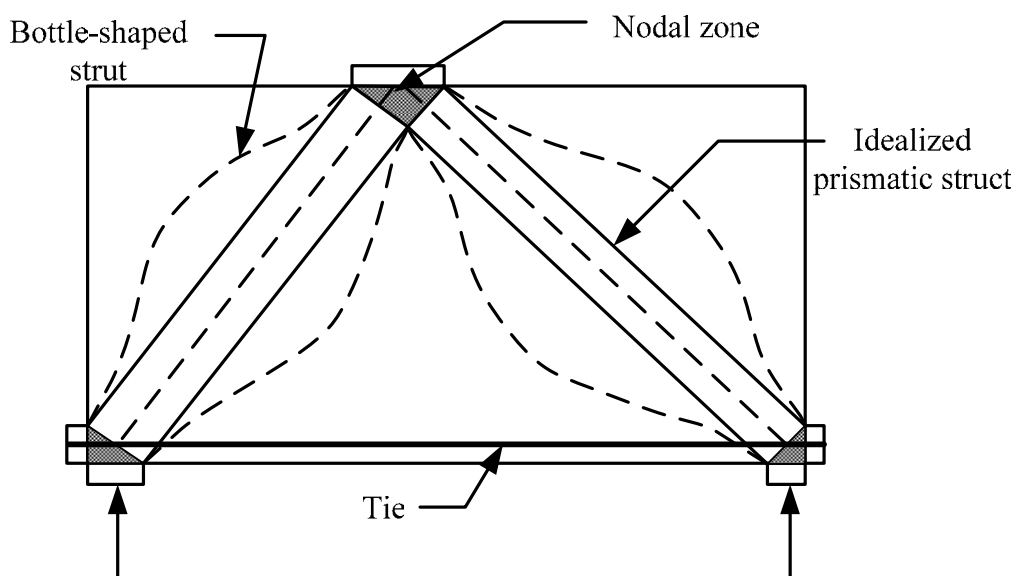


圖 3-18 壓拉模式示意圖

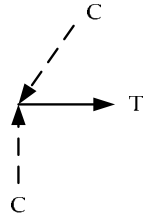


圖 3-19 C-C-T 節點示意圖

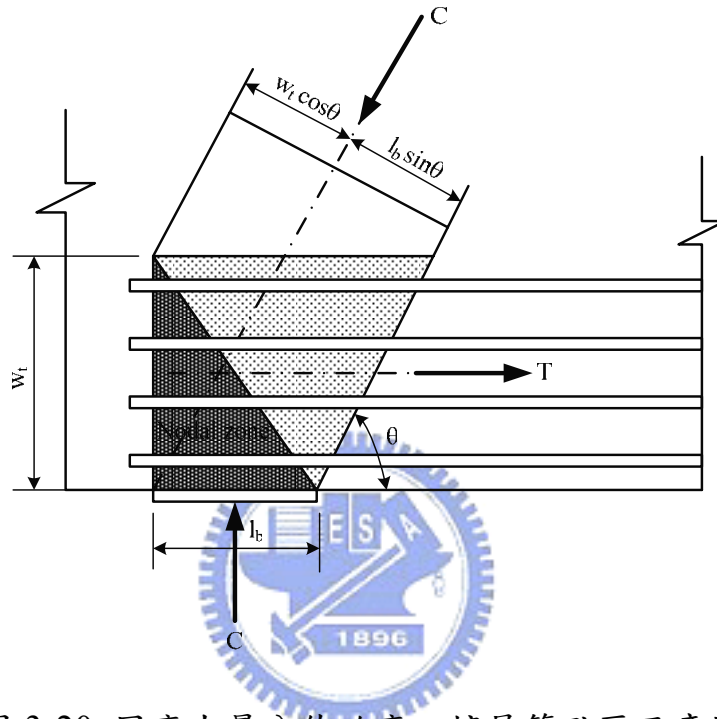


圖 3-20 因應力量分佈效應之擴展節點區示意圖

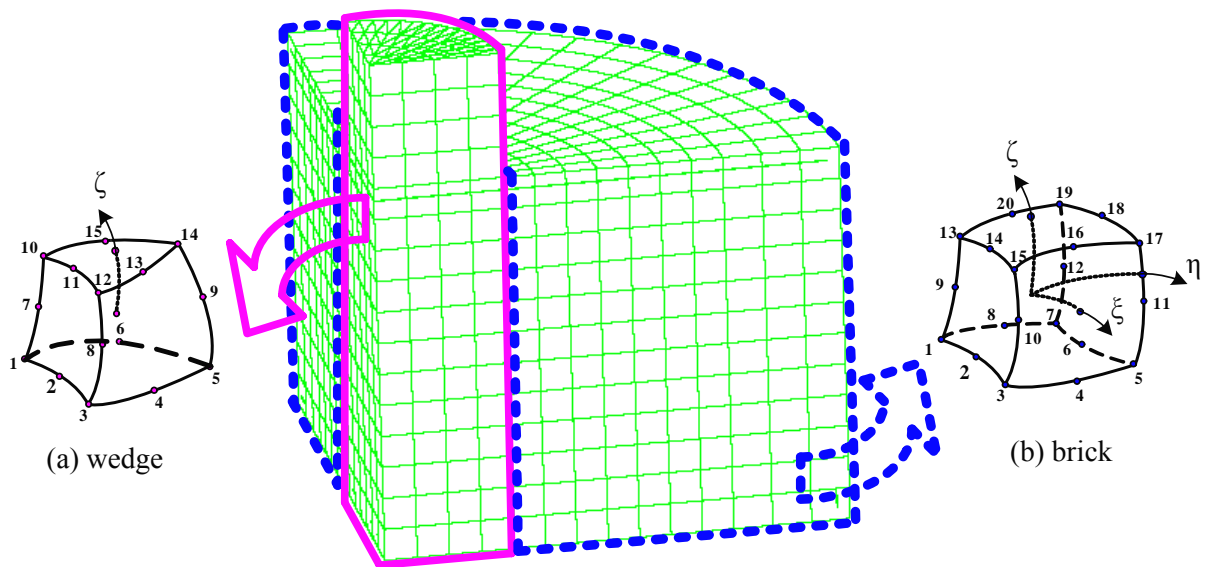


圖 3-21 1/4之沉箱頂版網格模式圖

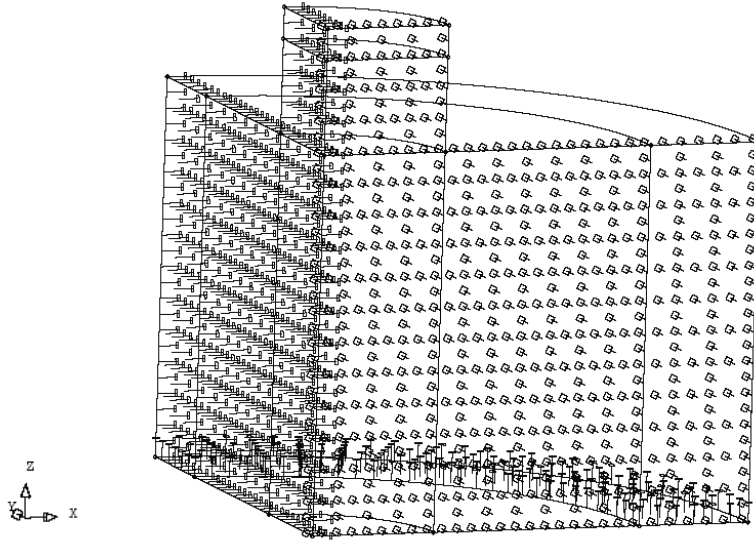


圖 3-22 四分之一的沉箱頂版邊界條件示意圖

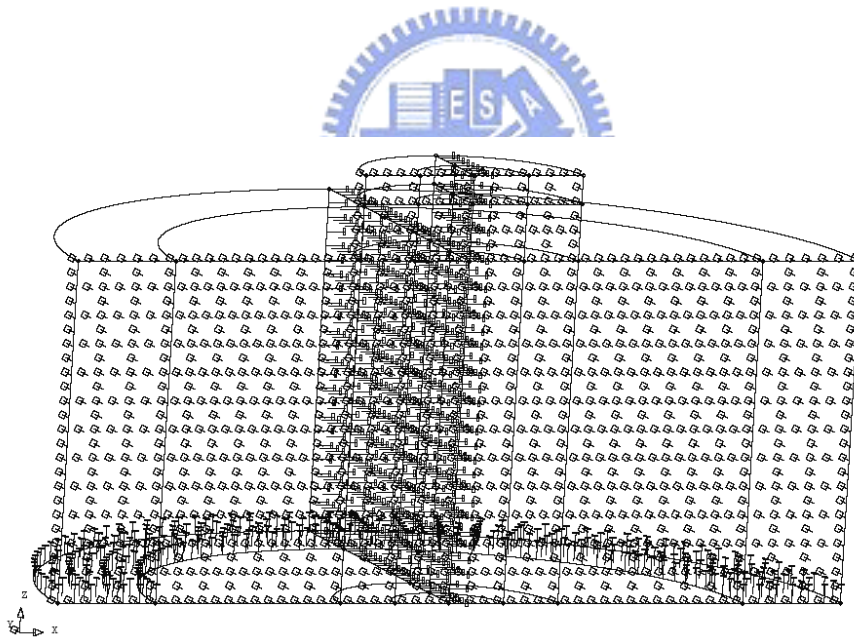


圖 3-23 二分之一的沉箱頂版邊界條件示意圖

Mesh size for ultimate load converge

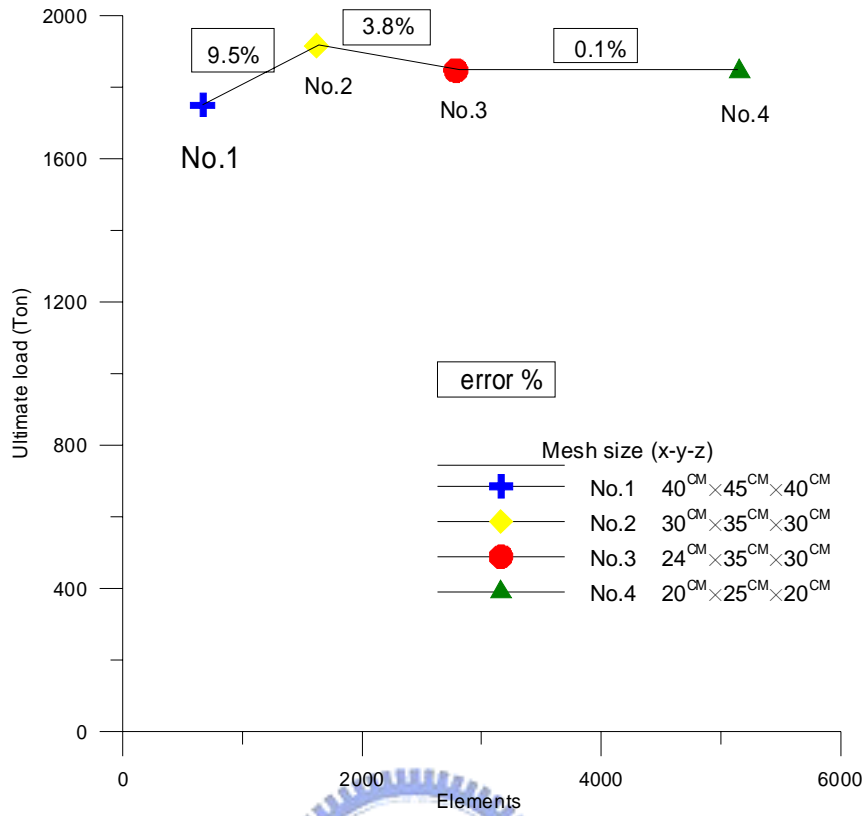


圖 3-24 切割元素大小之收斂分析圖

Displacement load size converge

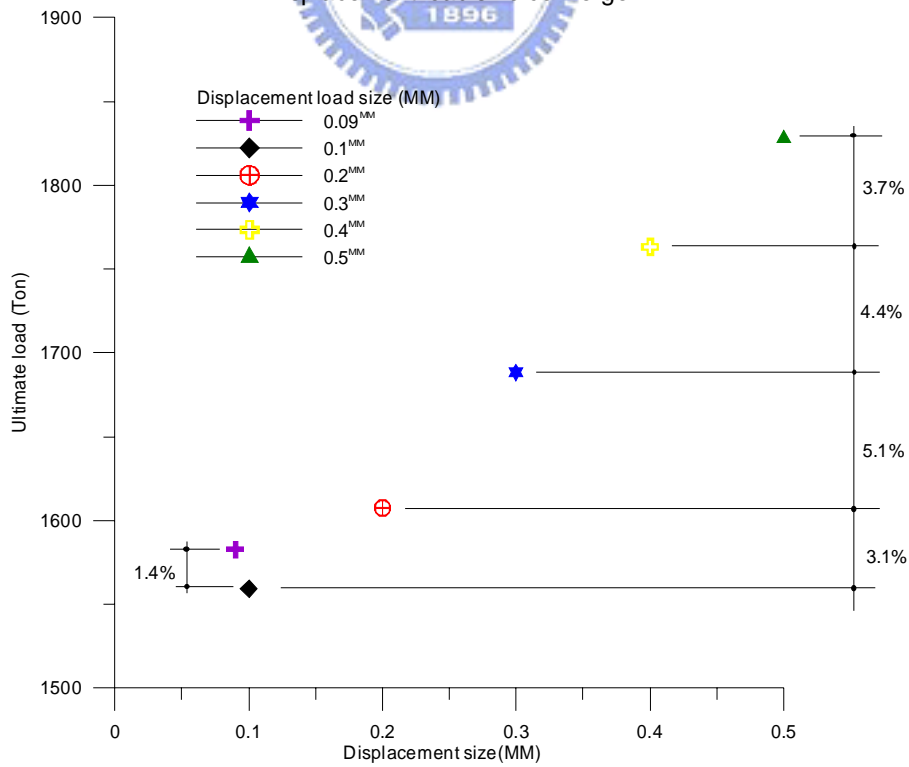


圖 3-25 步伐控制係數之收斂分析圖

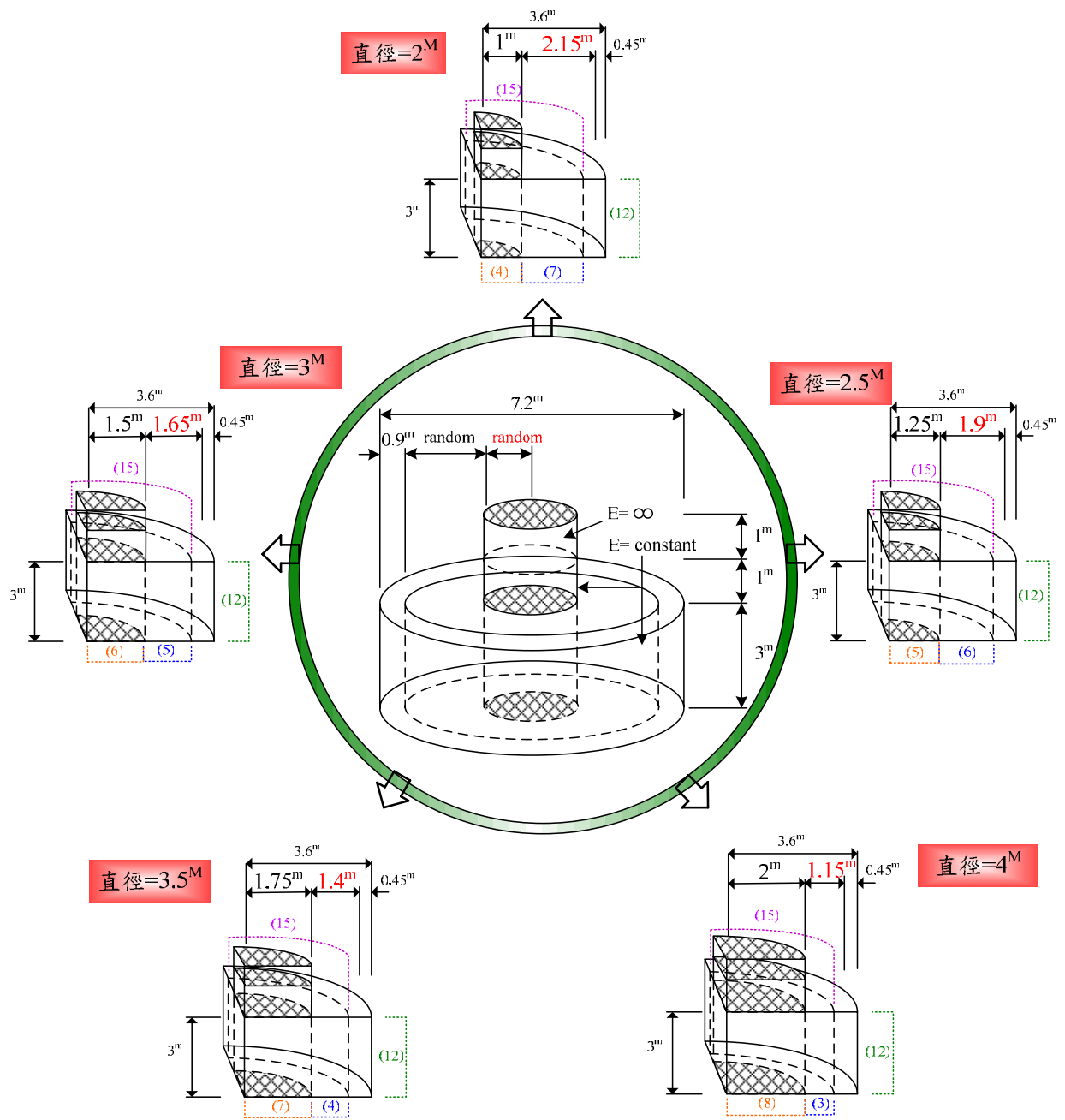


圖 4-1 不同柱半徑-剪跨距示意圖

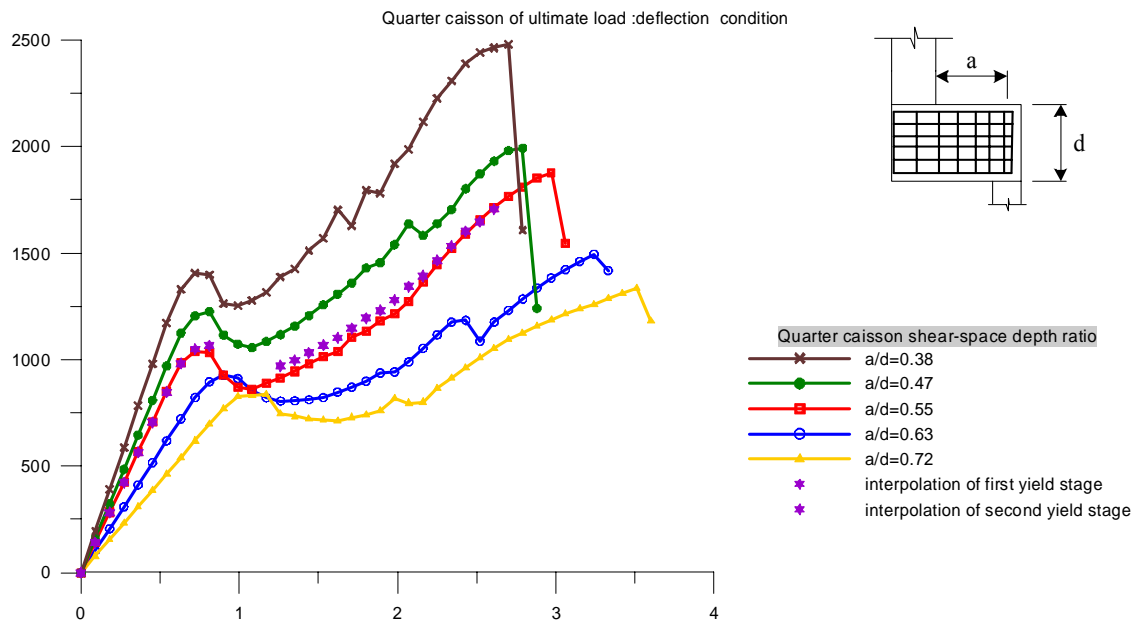


圖 4-2 不同剪跨-有效深度比之極限載重變位圖

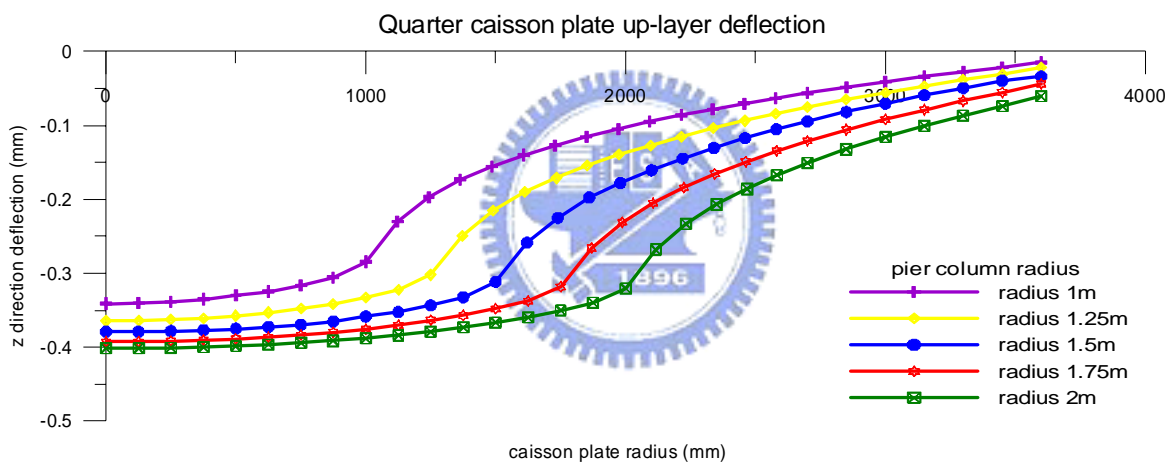


圖 4-3 不同柱徑之頂版頂面徑向變形圖 (垂直位移載重)

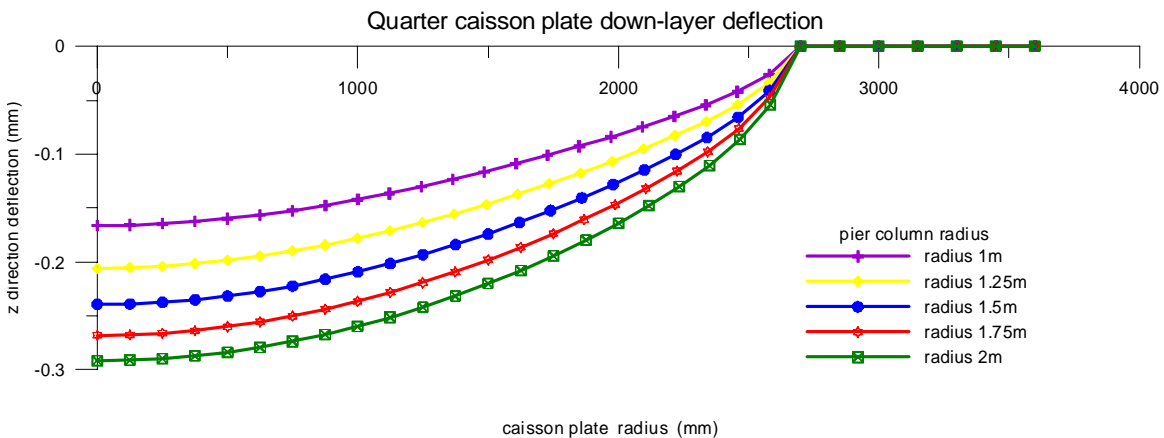


圖 4-4 不同柱徑下之頂版底面徑向變形圖(垂直位移載重)

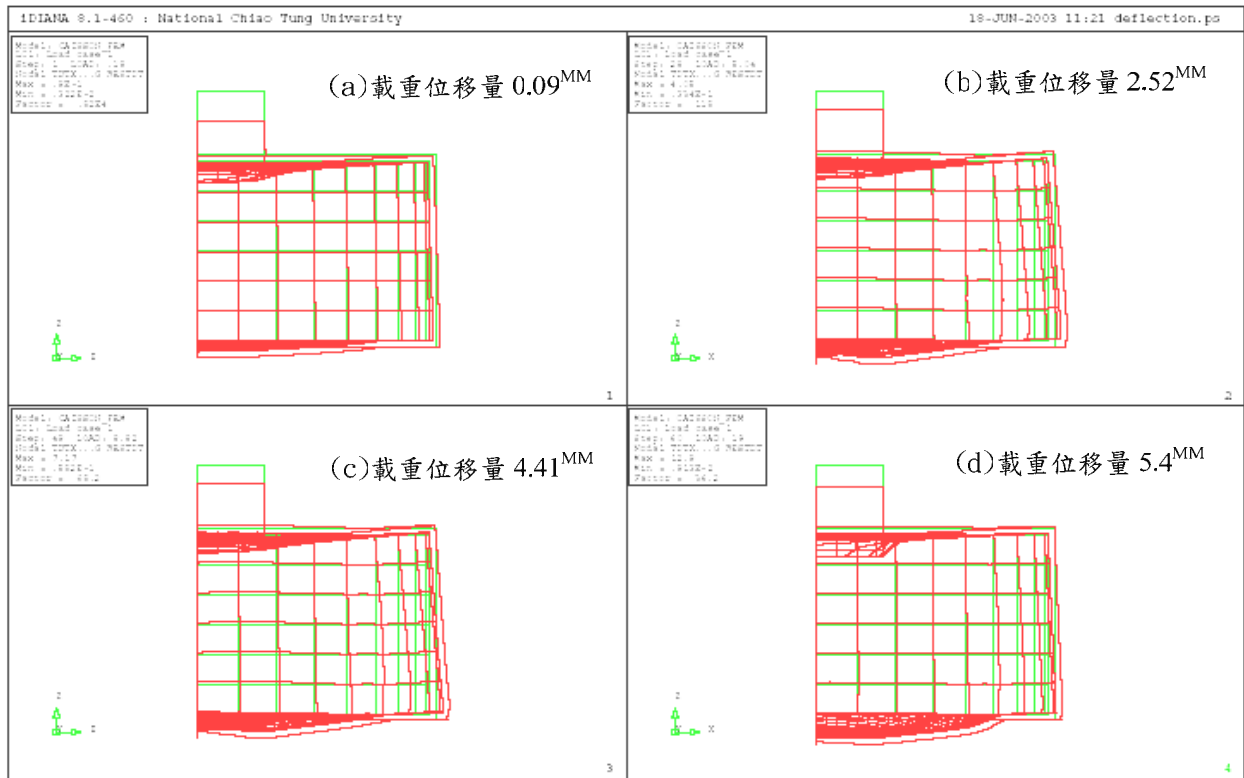


圖 4-5 柱半徑 1m 之不同位移載重之徑向斷面變位示意圖



Caisson plate top-face deflection

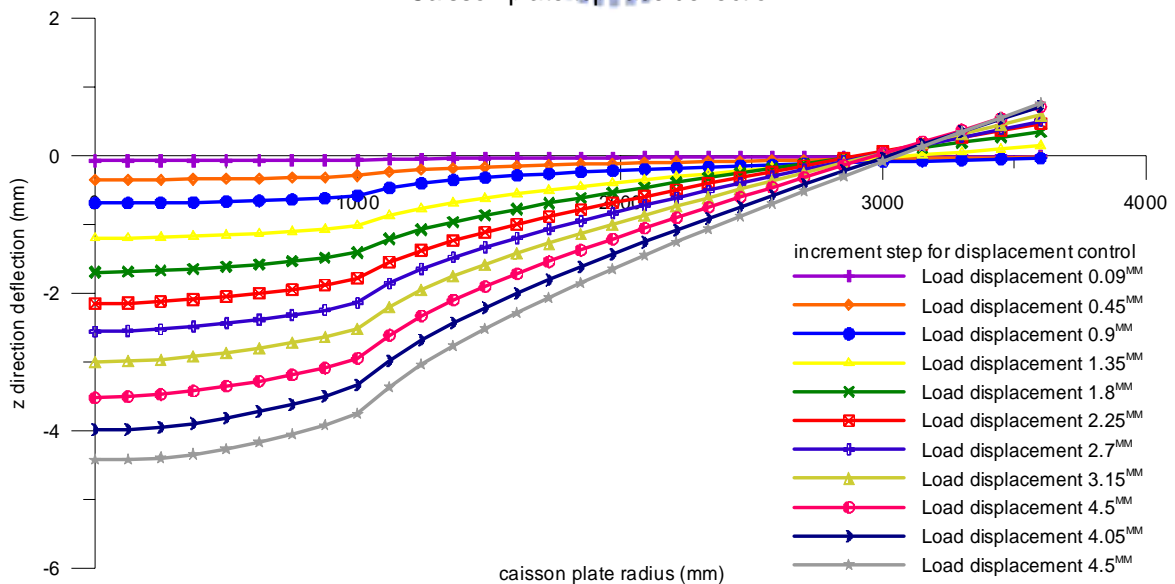


圖 4-6 頂版頂面受不同垂直載重變位量之變形圖

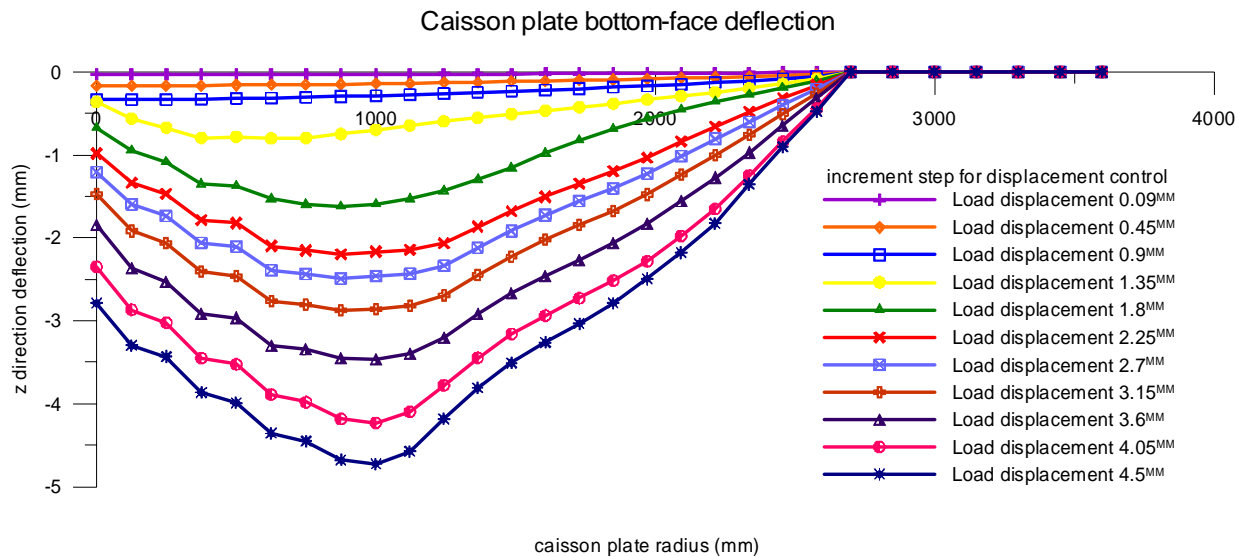


圖 4-7 頂版底面不同垂直載重變位量之變形圖

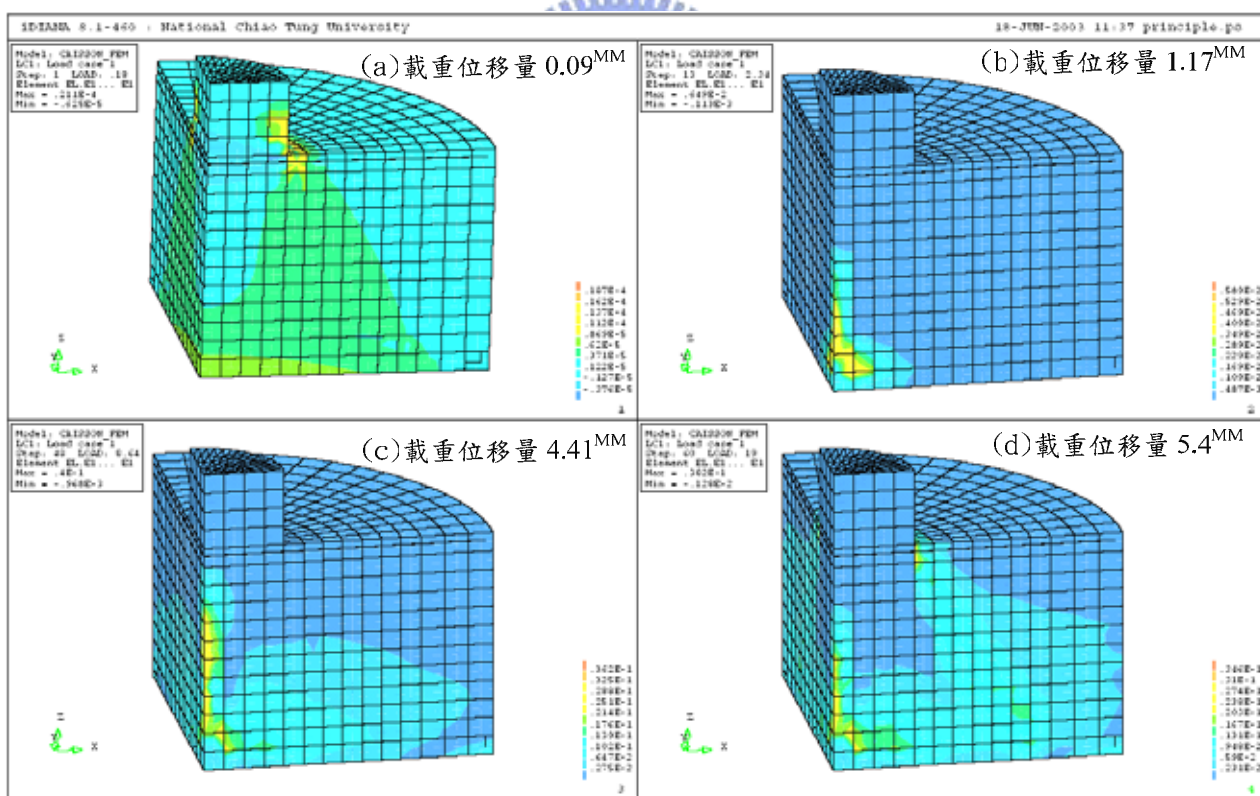


圖 4-8 頂版混凝土主應變分佈圖

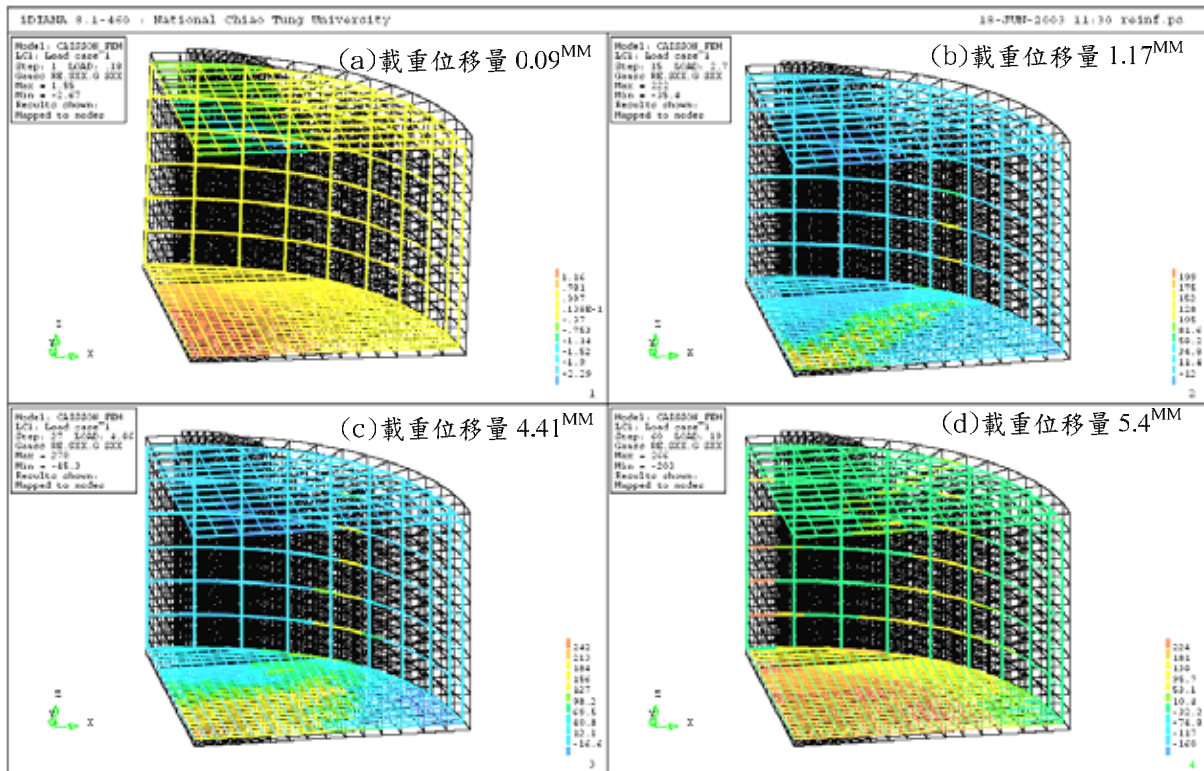
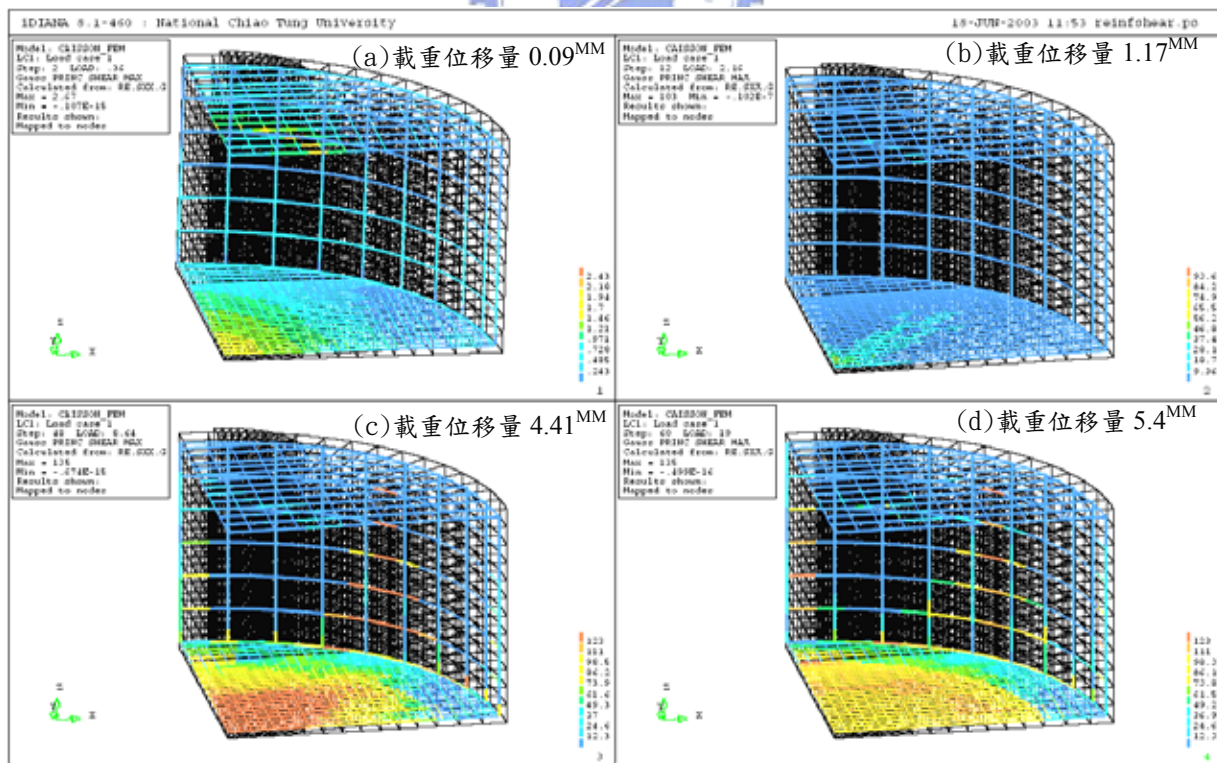


圖 4-9 頂版鋼筋應力分佈圖



圖

4-10 鋼筋主要剪應力分佈圖

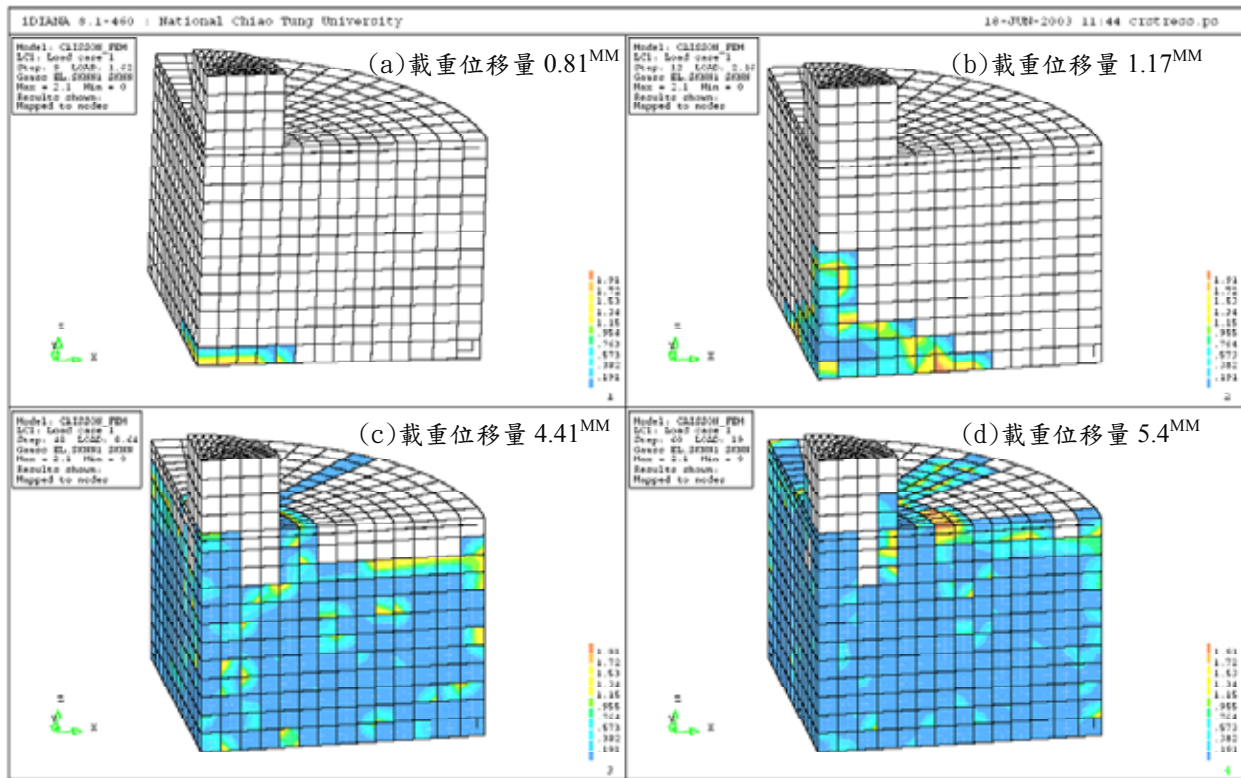


圖 4-11 開裂應力分佈圖

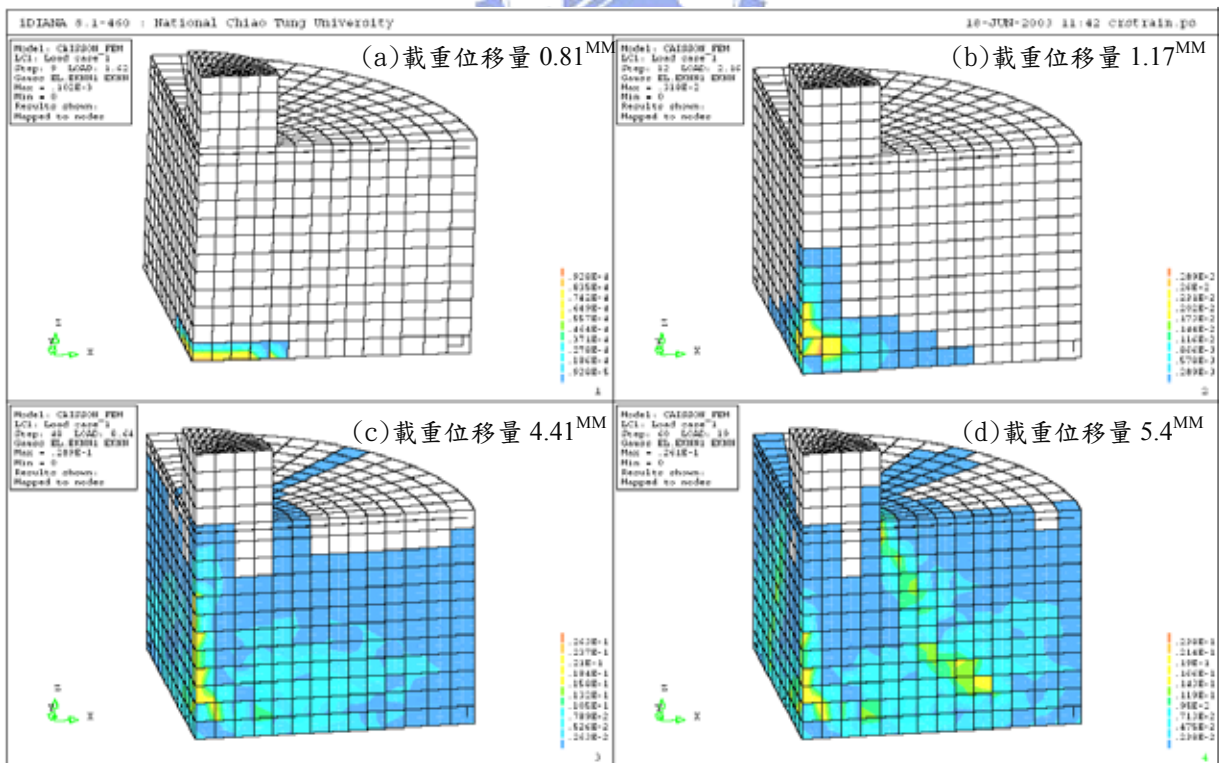


圖 4-12 開裂應變分佈圖

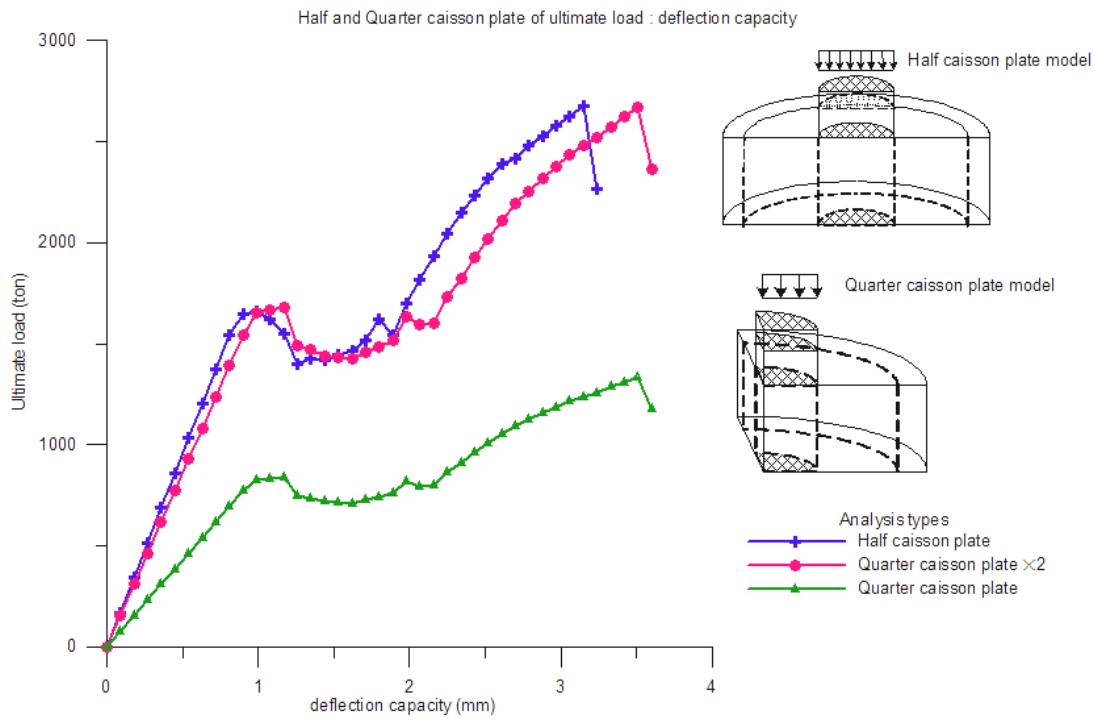


圖 4-13 $\frac{1}{2}$ & $\frac{1}{4}$ 的沉箱頂版之載重-變位圖(垂直位移載重)

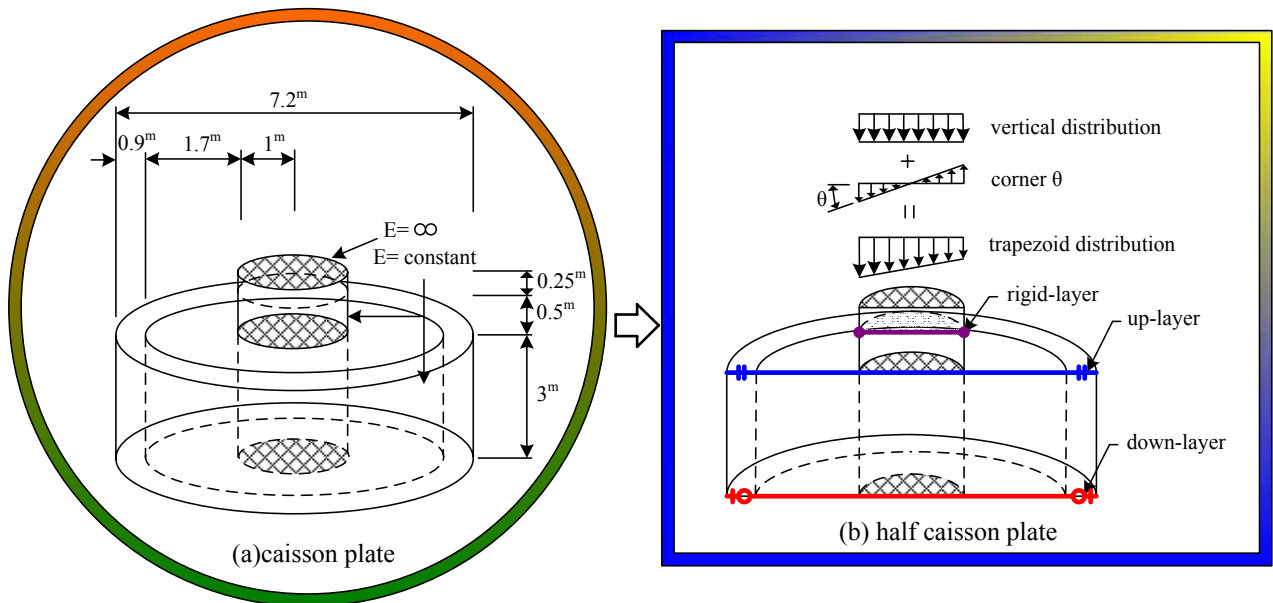


圖 4-14 $\frac{1}{2}$ 沉箱頂版示意圖

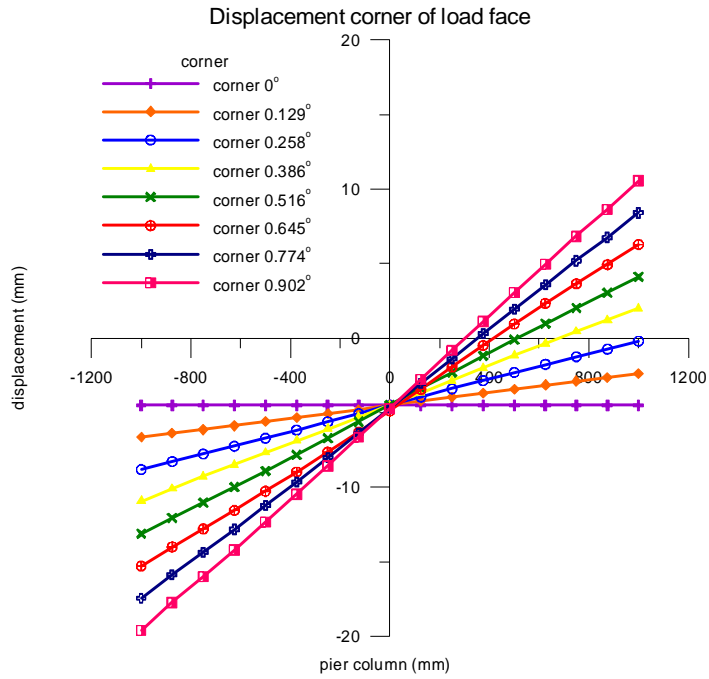


圖 4-15 受力層變位圖(梯形位移載重)

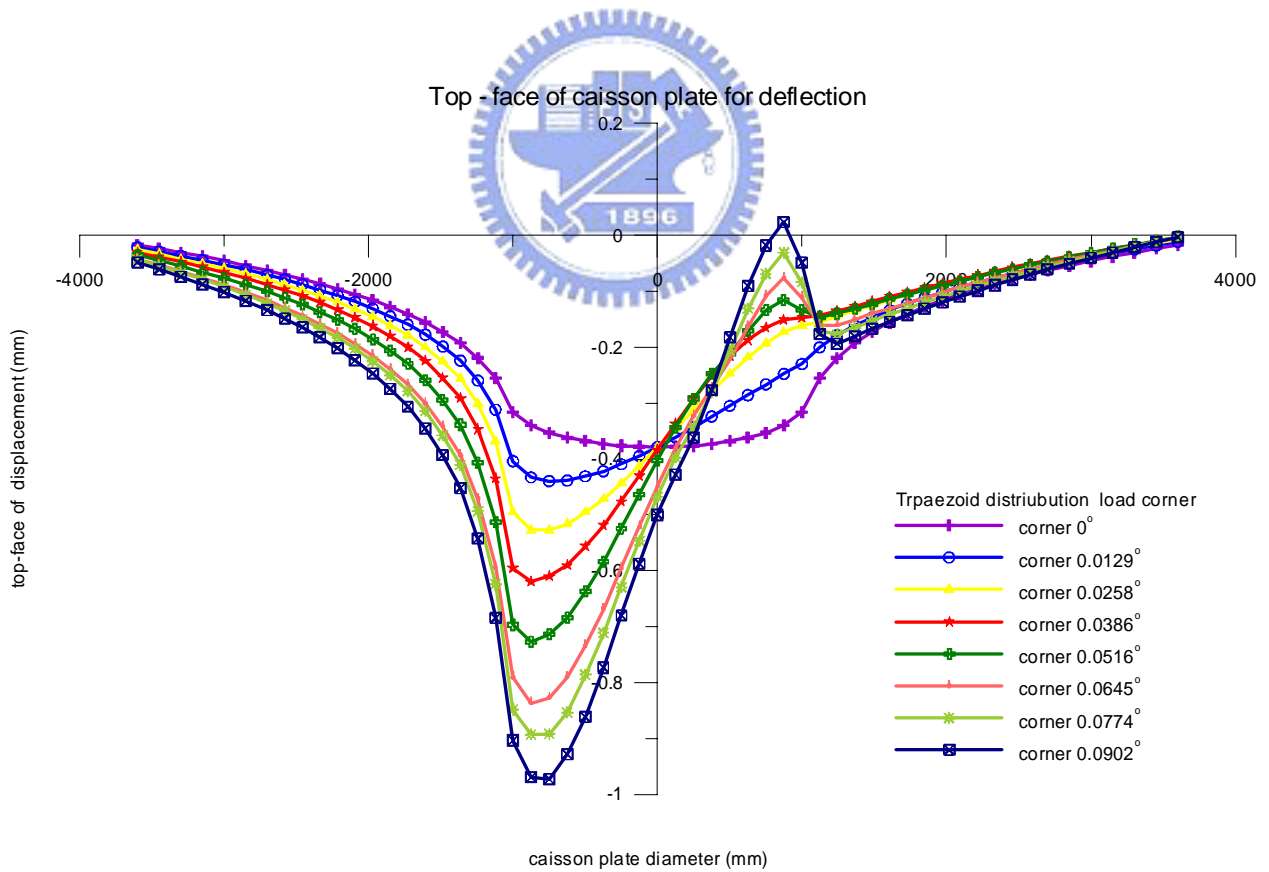


圖 4-16 沉箱頂版頂面變位圖(梯形位移載重)

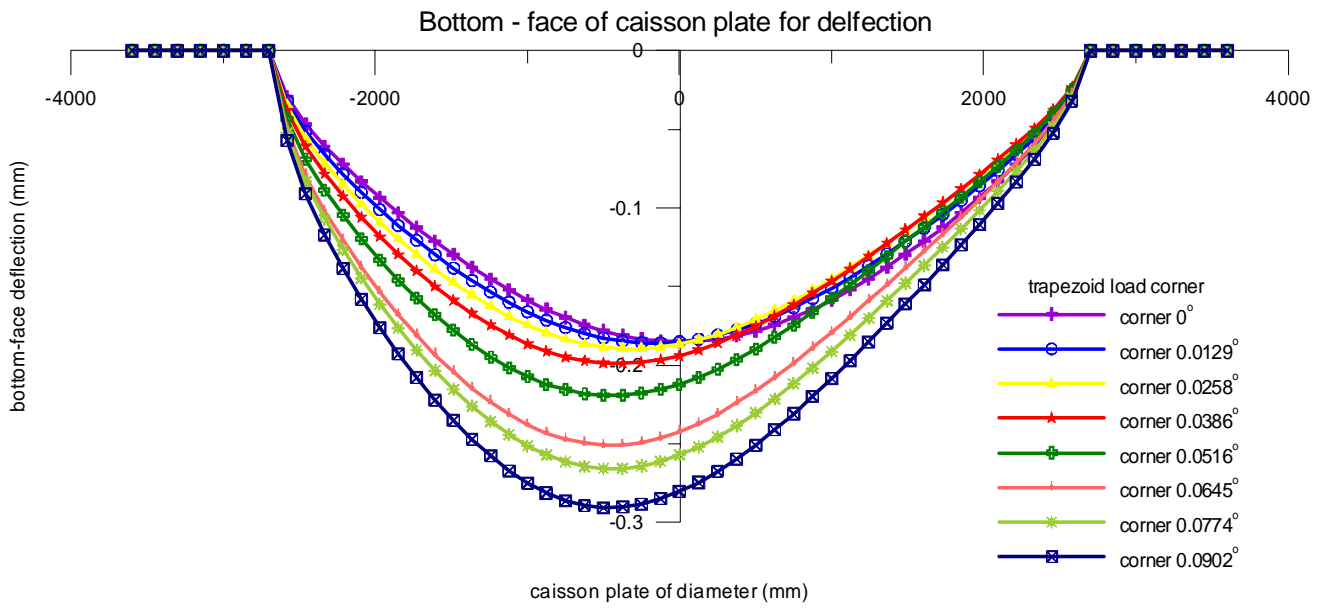


圖 4-17 沉箱頂版底面變位圖(梯形位移載重)

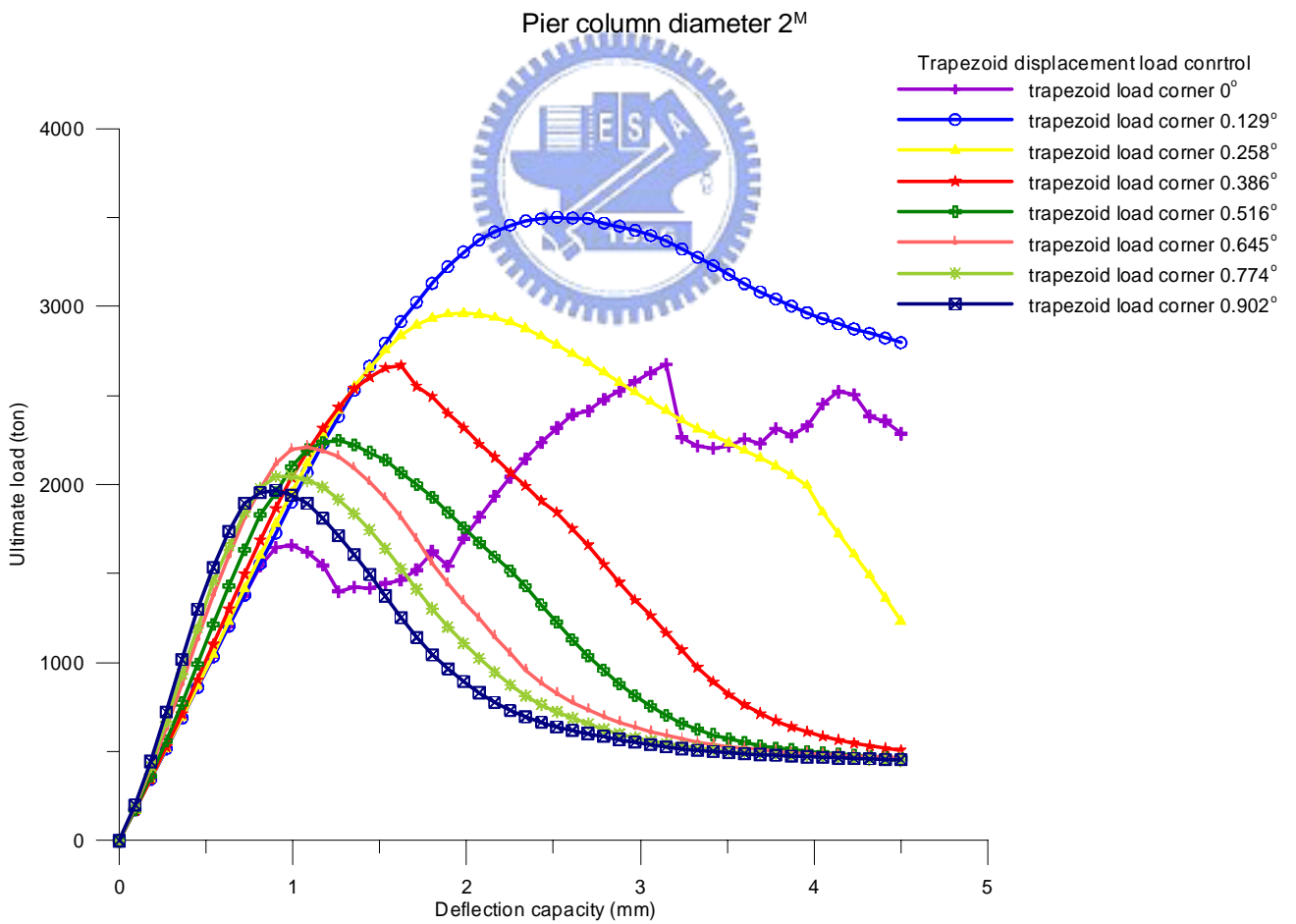


圖 4-18 墩柱直徑 2^M 之載重-變位圖

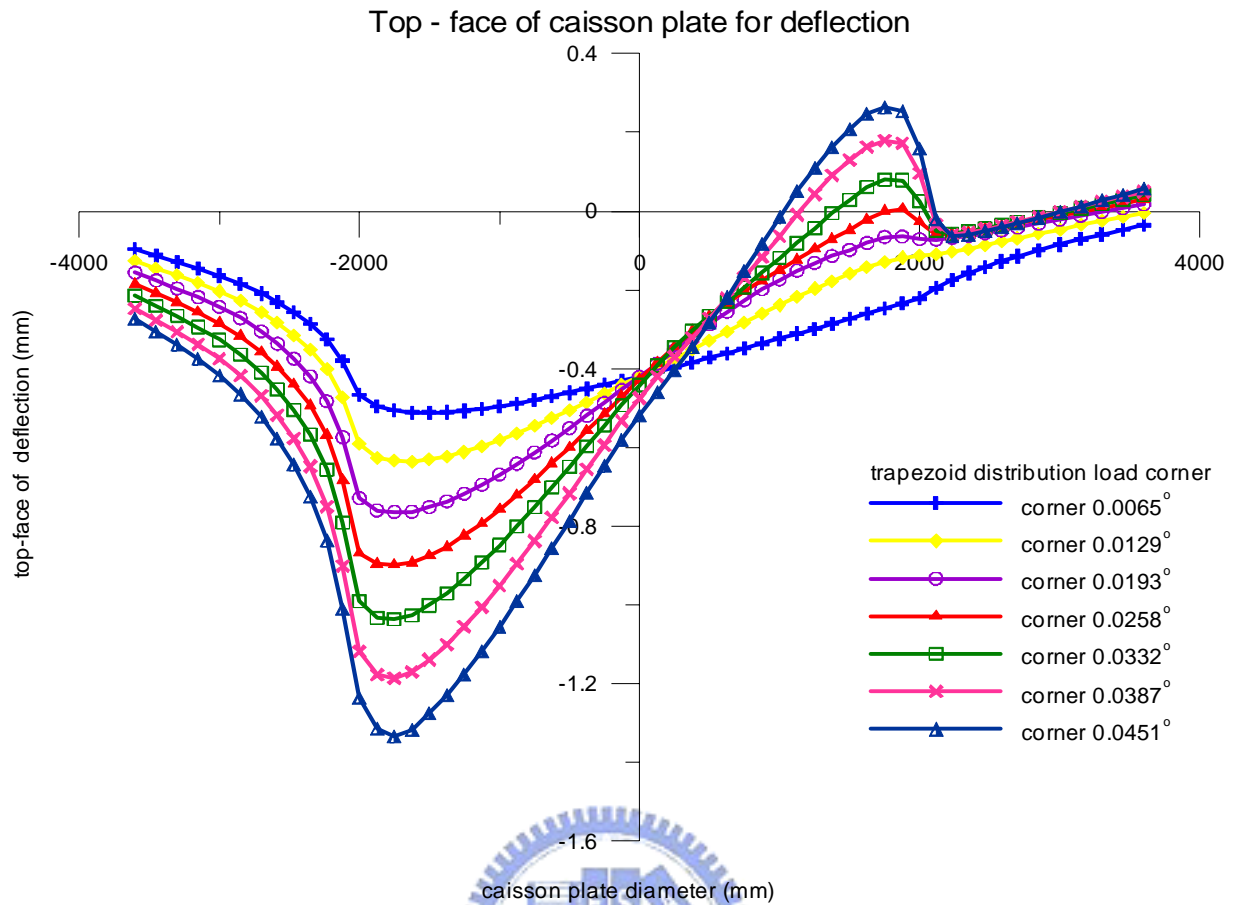


圖 4-19 沉箱頂版頂面變位圖(梯形位移載重)

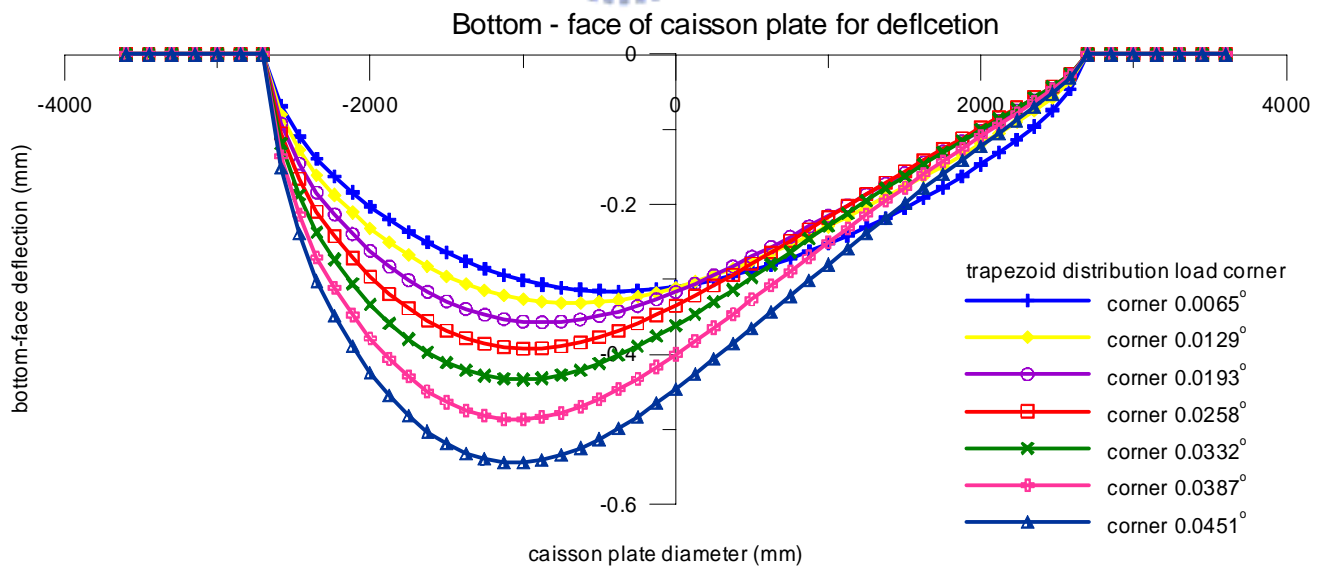
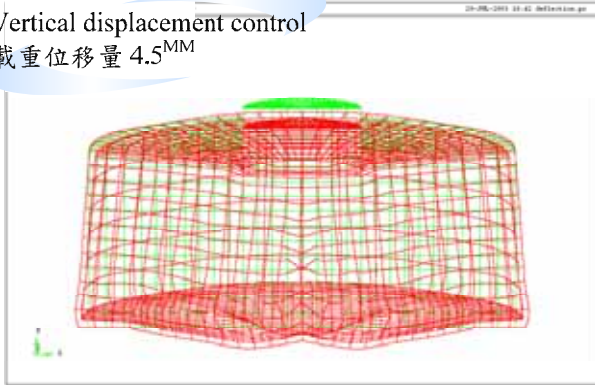


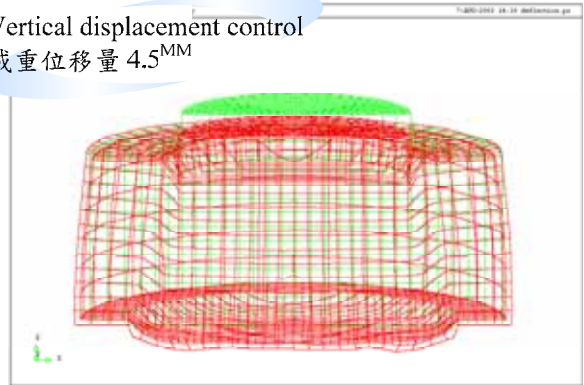
圖 4-20 沉箱頂版底面變位圖(梯形位移載重)

Vertical displacement control
載重位移量 4.5^{MM}



(a)墩柱直徑 1^m

Vertical displacement control
載重位移量 4.5^{MM}

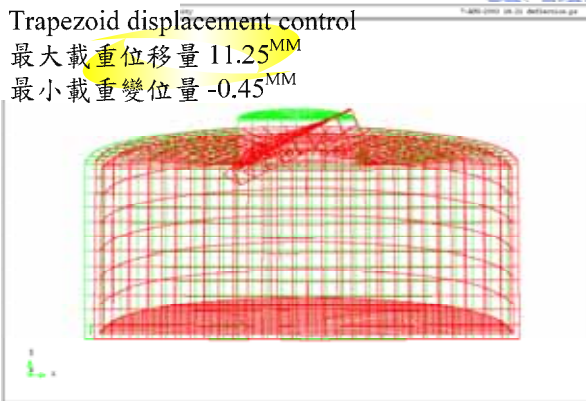


(b)墩柱直徑 2^m

圖 4-21 $\frac{1}{2}$ 頂版受垂直位移載重之變形圖

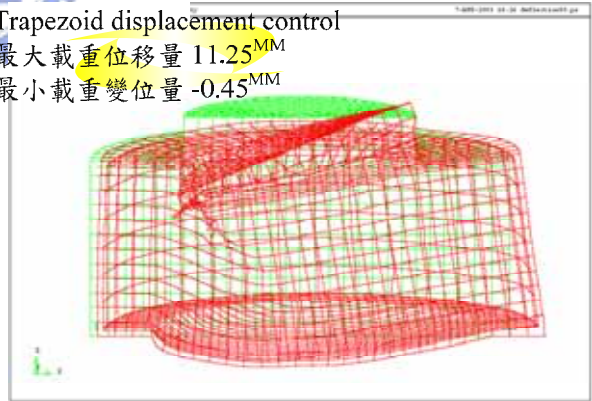


Trapezoid displacement control
最大載重位移量 11.25^{MM}
最小載重變位量 -0.45^{MM}



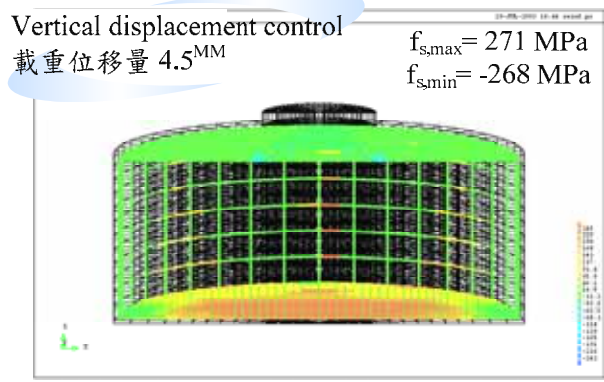
(a)墩柱直徑 1^m

Trapezoid displacement control
最大載重位移量 11.25^{MM}
最小載重變位量 -0.45^{MM}

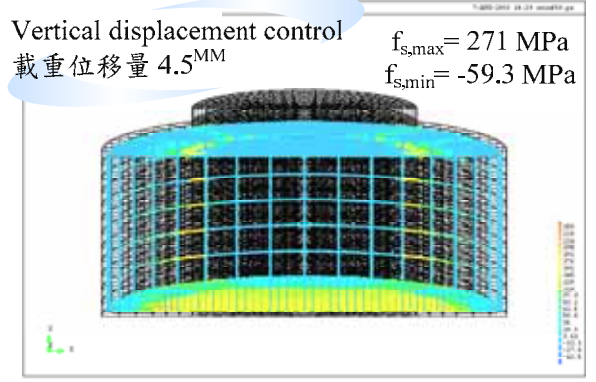


(b)墩柱直徑 2^m

圖 4-22 $\frac{1}{2}$ 頂版受梯形位移載重之變形圖

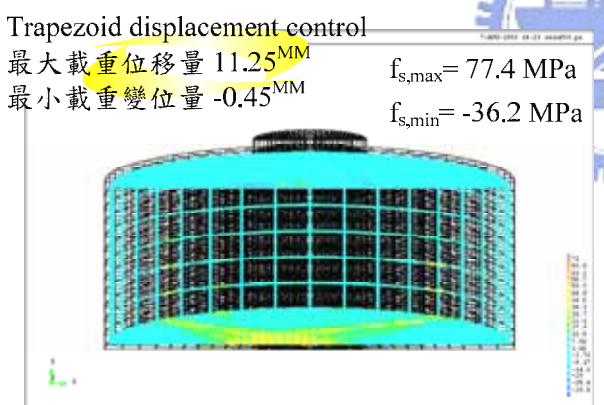


(a)墩柱直徑 1^m

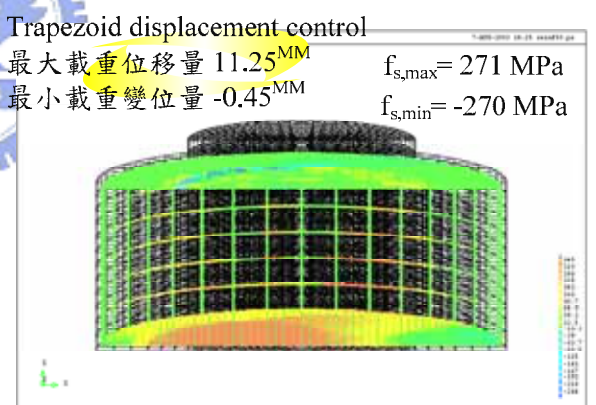


(b)墩柱直徑 2^m

圖 4-23 $\frac{1}{2}$ 頂版受垂直位移載重之鋼筋應力圖



(a)墩柱直徑 1^m



(b)墩柱直徑 2^m

圖 4-24 $\frac{1}{2}$ 頂版受梯形位移載重之鋼筋應力圖

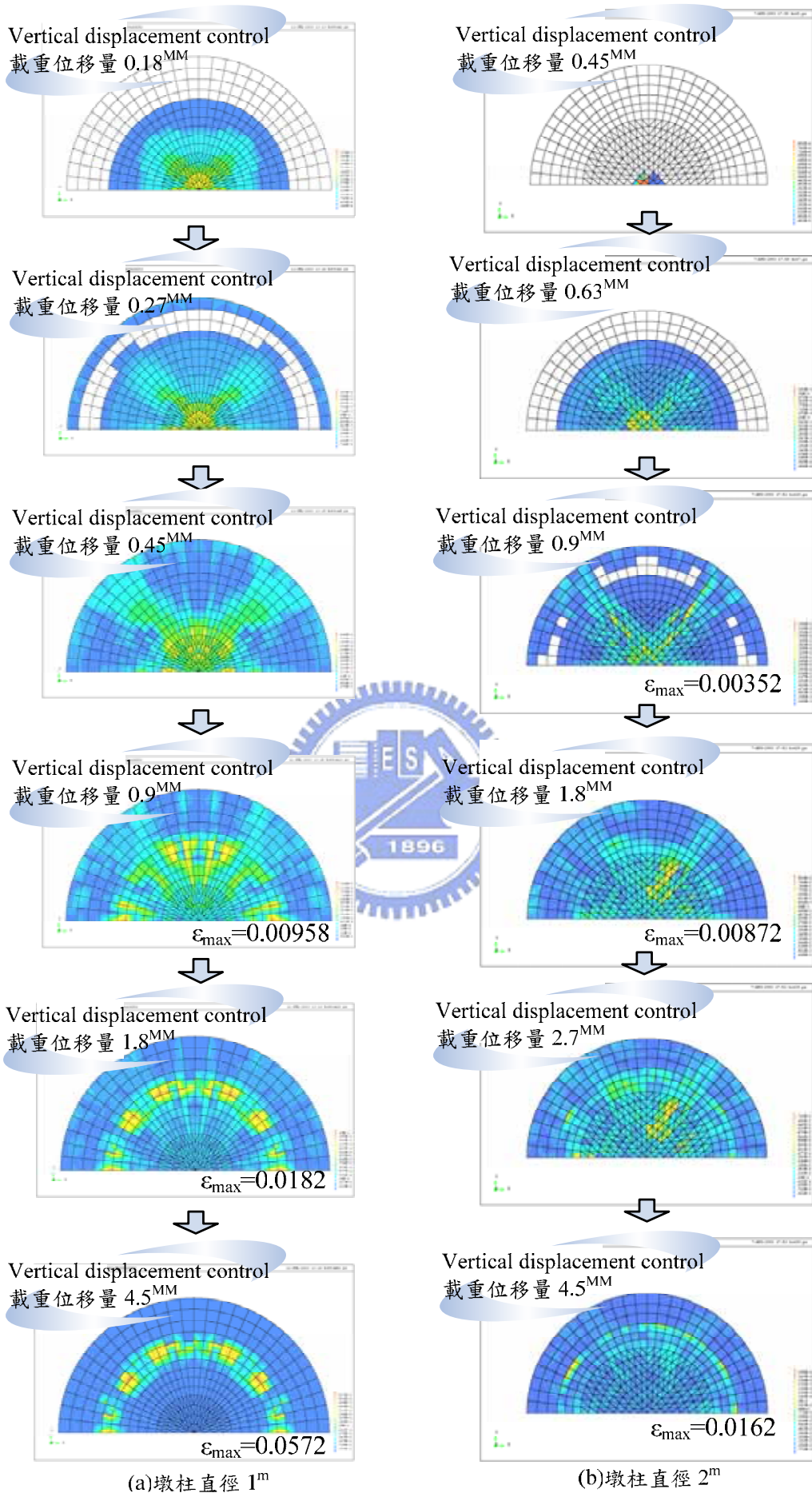
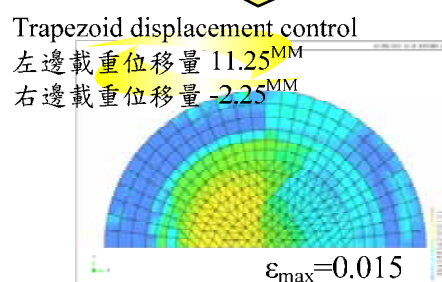
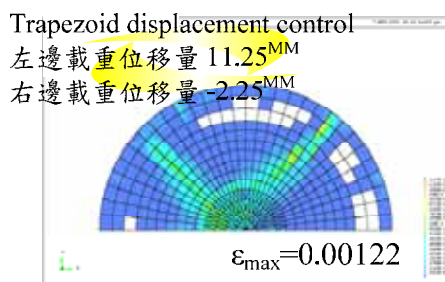
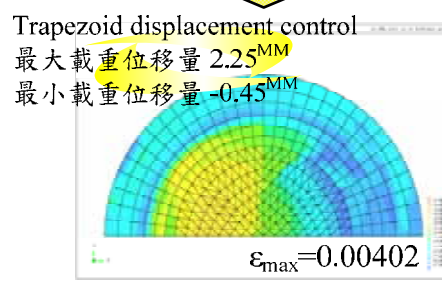
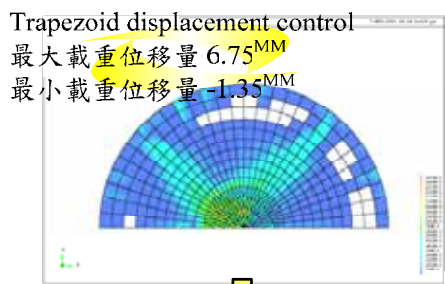
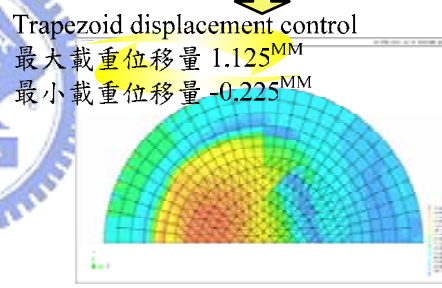
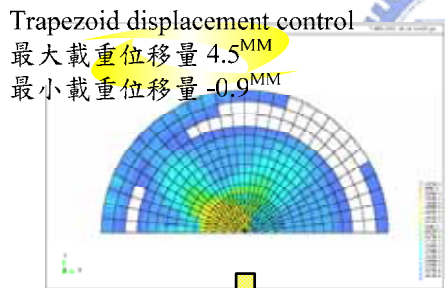
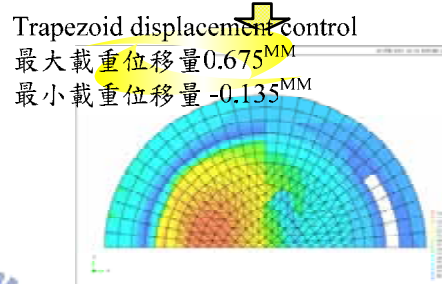
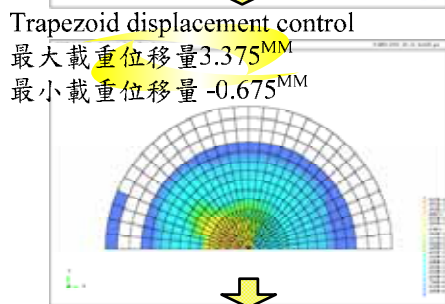
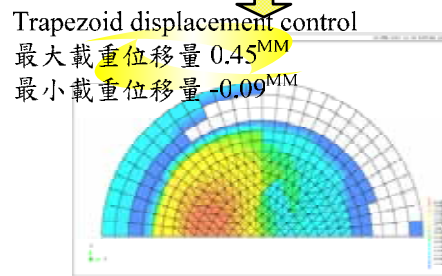
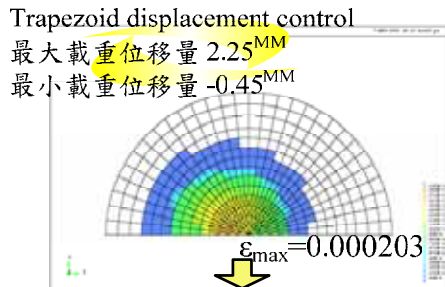
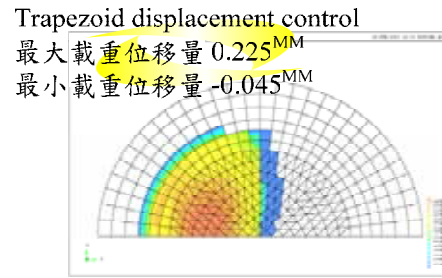
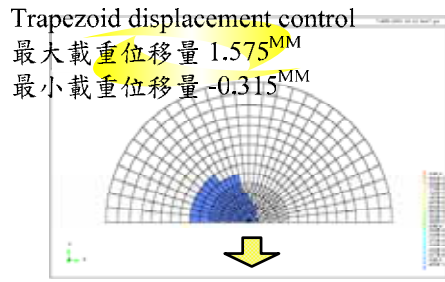


圖 4-25 頂版底面受垂直位移載重之應變變化圖



(a) 樁柱直徑 1^m

(b) 樁柱直徑 2^m

圖 4-26 頂版底面受梯形位移載重之應變變化圖

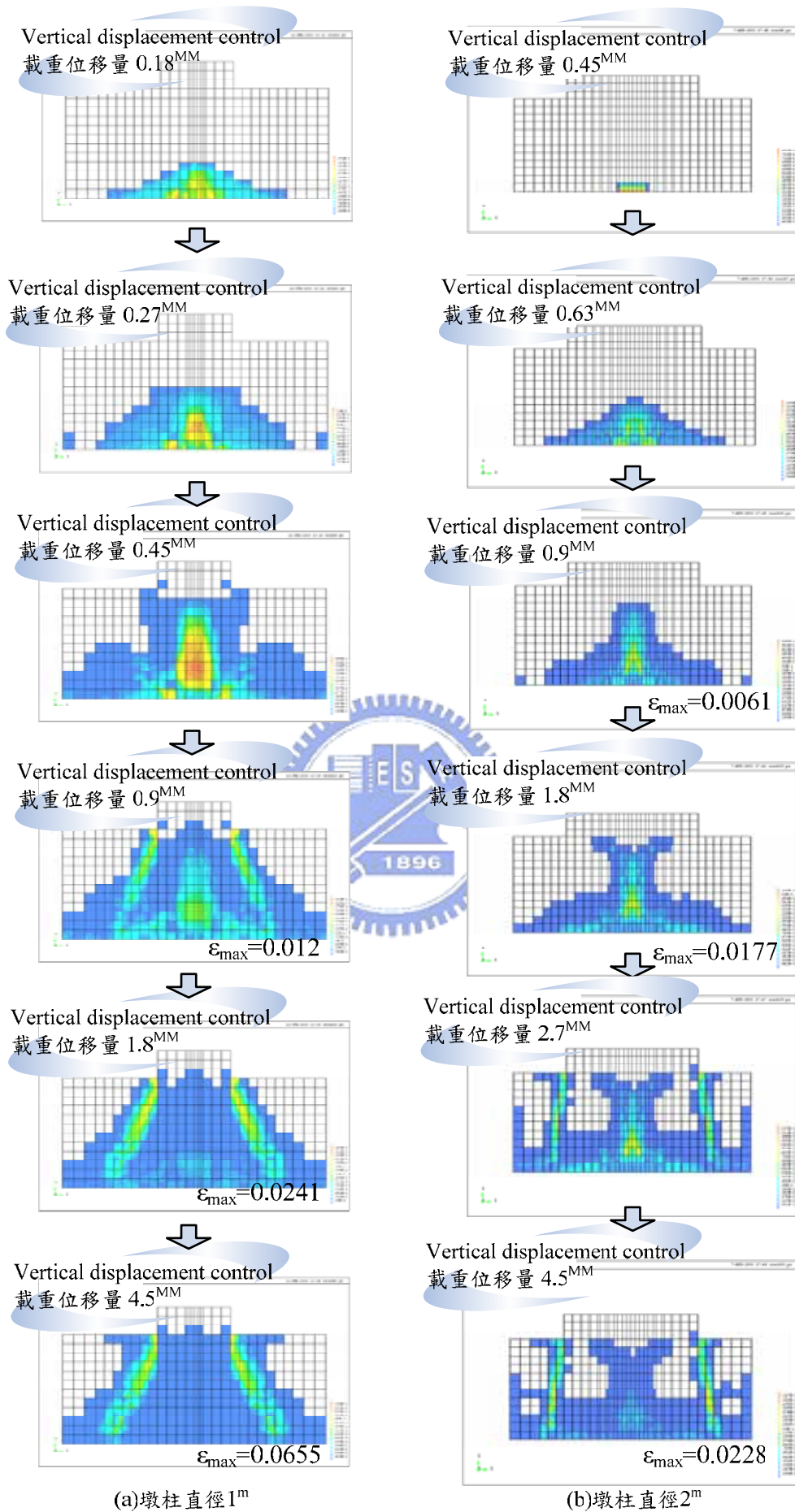
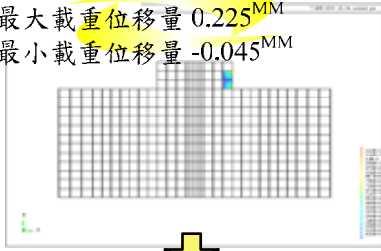


圖 4-27 頂版斷面受垂直位移載重之應變變化圖

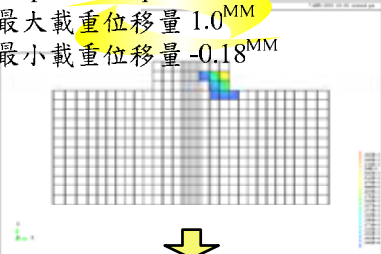
Trapezoid displacement control

最大載重位移量 0.225^{MM}
最小載重位移量 -0.045^{MM}



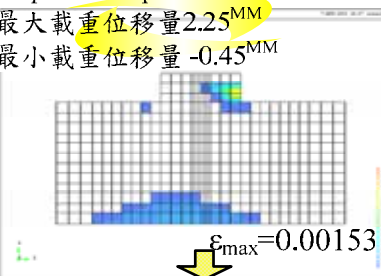
Trapezoid displacement control

最大載重位移量 1.0^{MM}
最小載重位移量 -0.18^{MM}



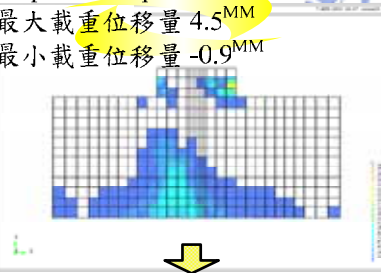
Trapezoid displacement control

最大載重位移量 2.25^{MM}
最小載重位移量 -0.45^{MM}



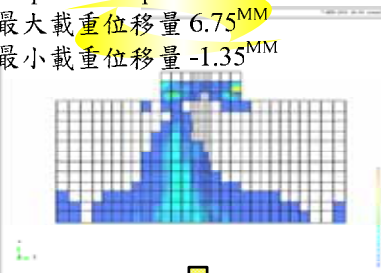
Trapezoid displacement control

最大載重位移量 4.5^{MM}
最小載重位移量 -0.9^{MM}



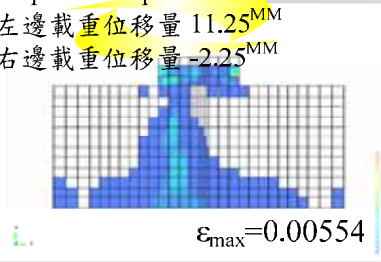
Trapezoid displacement control

最大載重位移量 6.75^{MM}
最小載重位移量 -1.35^{MM}



Trapezoid displacement control

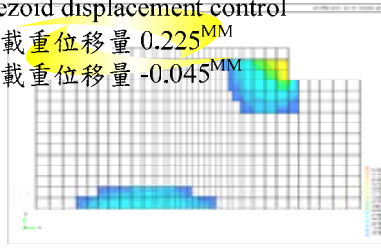
左邊載重位移量 11.25^{MM}
右邊載重位移量 -2.25^{MM}



(a) 墩柱直徑 1^m

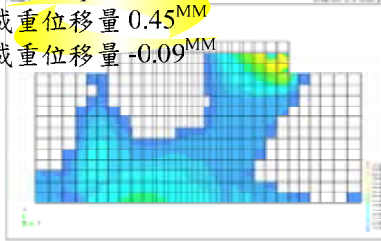
Trapezoid displacement control

最大載重位移量 0.225^{MM}
最小載重位移量 -0.045^{MM}



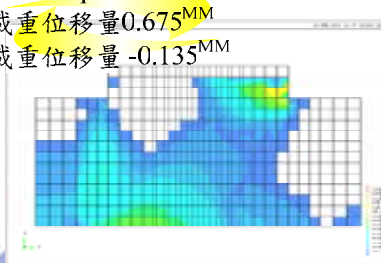
Trapezoid displacement control

最大載重位移量 0.45^{MM}
最小載重位移量 -0.09^{MM}



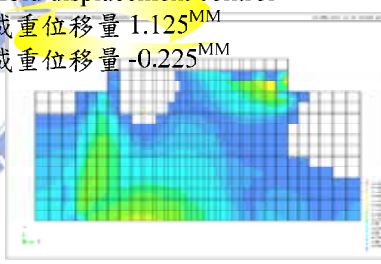
Trapezoid displacement control

最大載重位移量 0.675^{MM}
最小載重位移量 -0.135^{MM}



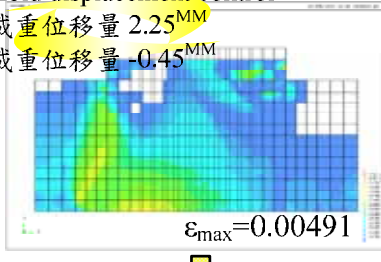
Trapezoid displacement control

最大載重位移量 1.125^{MM}
最小載重位移量 -0.225^{MM}



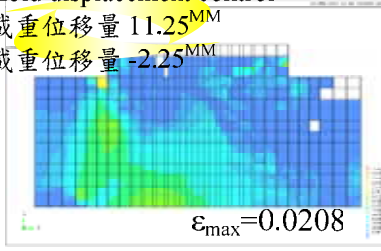
Trapezoid displacement control

最大載重位移量 2.25^{MM}
最小載重位移量 -0.45^{MM}



Trapezoid displacement control

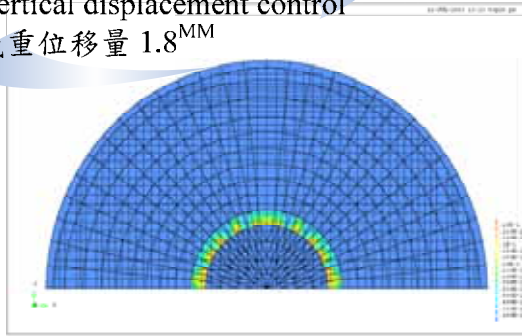
左邊載重位移量 11.25^{MM}
右邊載重位移量 -2.25^{MM}



(b) 墩柱直徑 2^m

圖 4-28 頂版斷面受梯形位移載重之應變變化圖

Vertical displacement control
載重位移量 1.8^{MM}

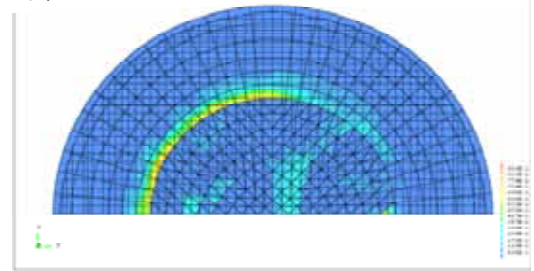


(a) 垂直位移加載

Trapezoid displacement control

最大載重位移量 4.5^{MM}

最小載重變位量 -0.09^{MM}



(b) 梯形位移加載

圖 4-29 頂版頂面開裂應變之變化圖

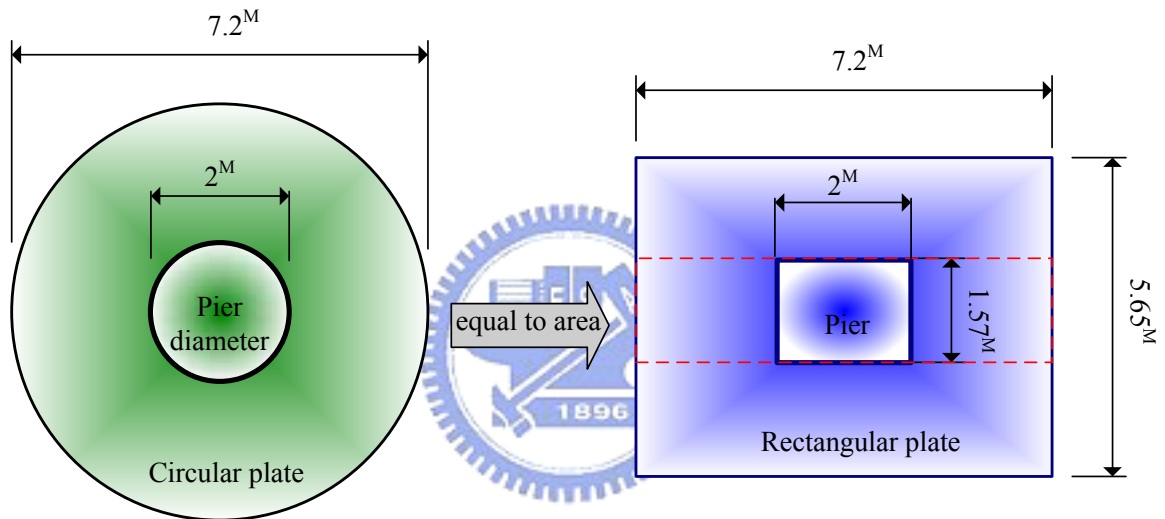


圖 4-30 等效斷面示意圖

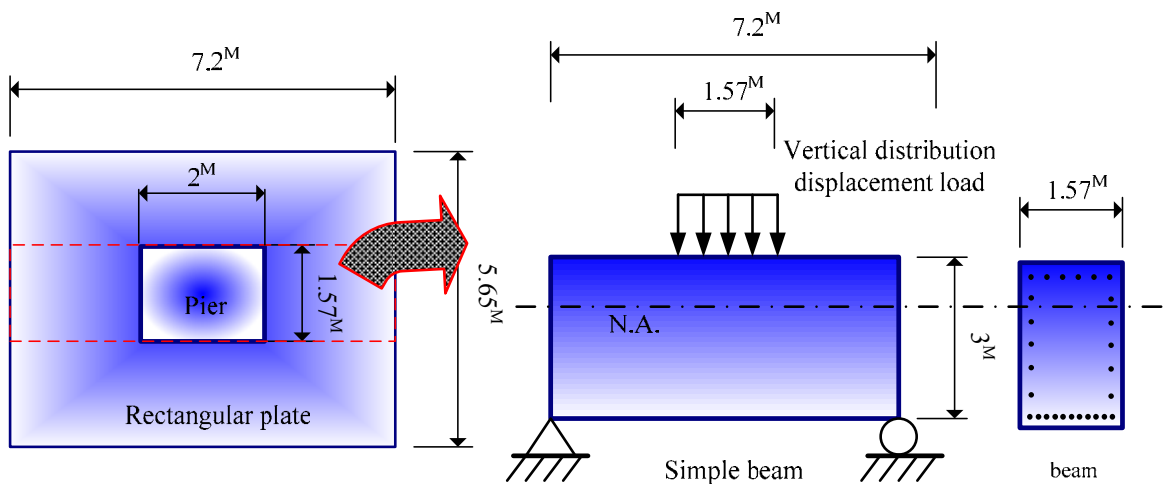


圖 4-31 簡支樑斷面示意圖