

Ref: 105951

Date: 15 May 2019

UNI-PIER AUSTRALIA

**SUB-FLOOR FRAMING USING
STEEL UNI-PIERS
CALCULATIONS**

Calculations are for unfactored working loads.

Refer also to attached detail.

Piers - SHS 75 x 75 x 2.5 grade C350 steel
 Z_{xx} = $16.4 \times 10^3 \text{mm}^3$
 Maximum BM = $16.4 \times 350 \times 0.6 / 1000 = 3.44 \text{ kNm}$ in x-x/y-y axis
 Max lateral force at top = $3.44 / 0.9 = 3.82 \text{ kN}$

Z_{nn} = $12.0 \times 10^3 \text{mm}^3$
 Maximum BM = $12.0 \times 350 \times 0.6 / 1000 = 2.52 \text{ kNm}$ in n-n axis
 Max lateral force at top = $2.52 / 0.9 = 2.8 \text{ kN}$

Top extension - SHS 65 x 65 x 2
 Extension above main pier = 100mm
 Z_{xx} = $9.94 \times 10^3 \text{mm}^3$
 Maximum BM = $9.94 \times 350 \times 0.6 / 1000 = 2.09 \text{ kNm}$ in x-x/y-y axis
 Max lateral force at top = $2.09 / 0.15 = 13.9 \text{ kN}$

Z_{nn} = $7.29 \times 10^3 \text{mm}^3$
 Maximum BM = $7.29 \times 350 \times 0.6 / 1000 = 1.53 \text{ kNm}$ in n-n axis
 Maximum lateral force at top = $1.53 / 0.15 = 10.2 \text{ kN}$

Check shear in screws

#12 screws max allowable shear force = 8.5 kN

Screws @ 50mm crs, 2 screws each side

With a maximum lateral force at top = 2.8 kN

shear in each screw = $2.8 \times 0.15 / 0.05 \times 2 = 4.2 \text{ kN}$

This ignores contribution of screws on other two faces

In summary

SHS 75 x 75 x 2.5 steel Uni-Pier with a 900mm projection above top of footing has a lateral load capacity of 2.8 kN in any direction.

Lateral loads above this will require bracing between piers



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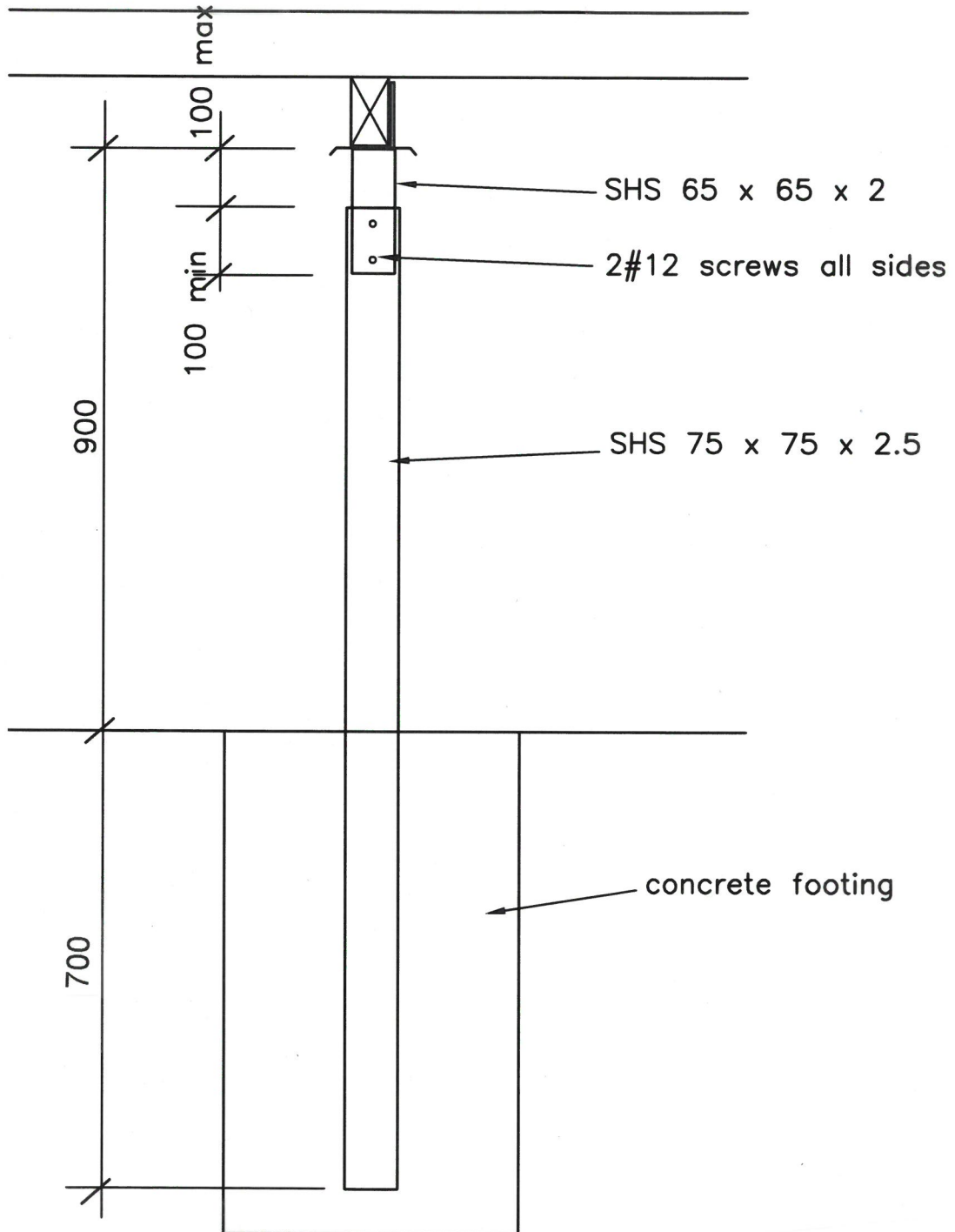
Consulting Engineers

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**STEEL SUB-FLOOR UNI-PIERS
 DETAIL OF SHS 75 x 75 x 2.5 UNI-PIER
 900mm EXTENSION ABOVE TOP OF FOOTING PAD
 700mm EMBEDMENT**



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