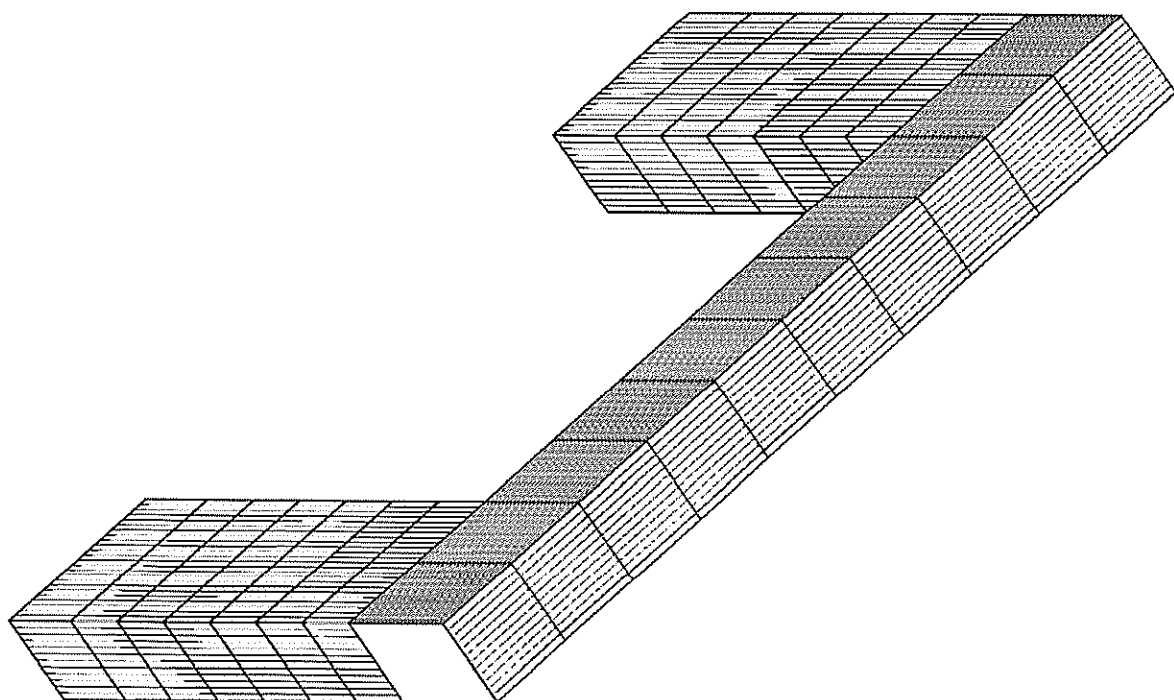
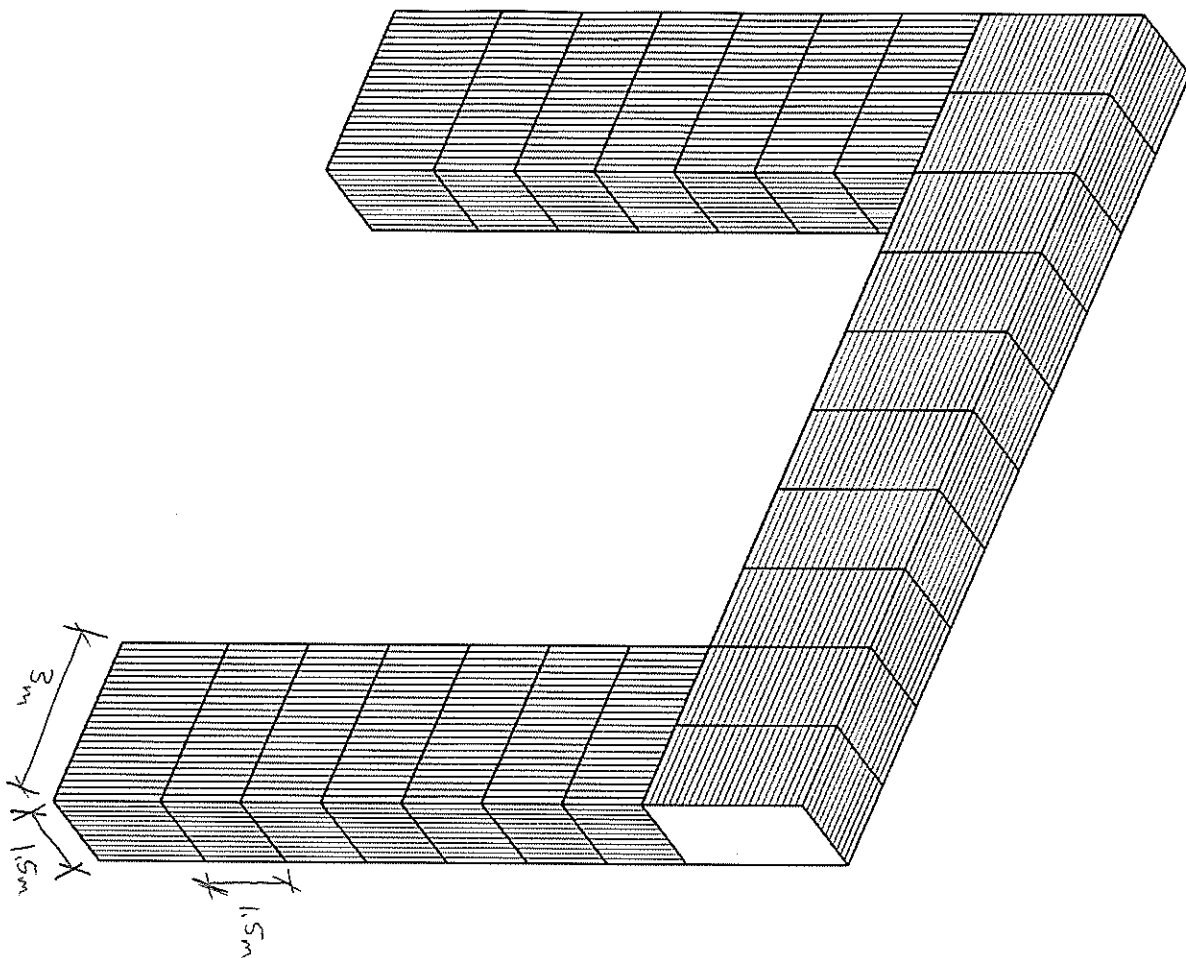




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Project Faawm

Subject Water shield

Job No.

Calc. BDZ

Chkd.

Sheet 2

Date 12/13/09

Date

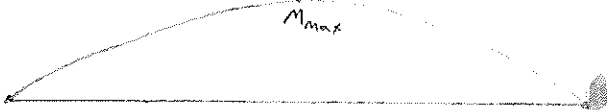
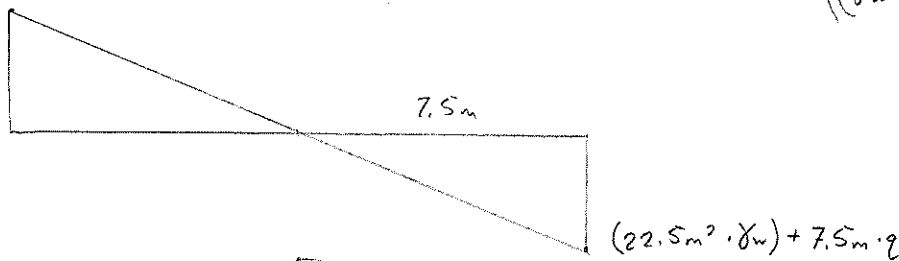
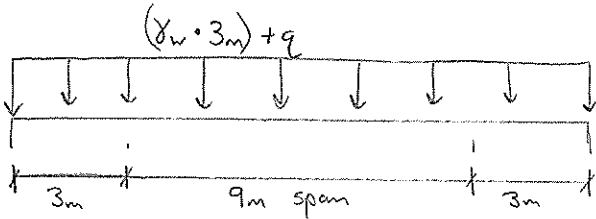
X-section (9m span) roof

$$\gamma_w = 9.8 \text{ kN/m}^3 \cdot 1.5 \text{ m} = 14.7 \text{ kN/m}^2$$

$q \equiv$ live load on roof

Shear at $x=0$

$$((\gamma_w \cdot 3 \text{ m}) + q) \cdot 1.5 \text{ m} \cdot \frac{1}{2} = 22.5 \text{ m}^2 \gamma_w + 7.5 \text{ m} \cdot q$$



$M_{max} =$ area of 1 triangle of SFD

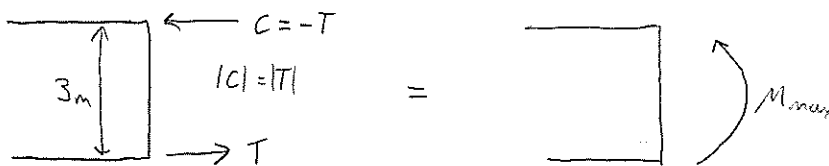
$$M_{max} = 7.5 \text{ m} \cdot \frac{1}{2} (22.5 \text{ m}^2 \gamma_w + 7.5 \text{ m} \cdot q)$$

$$M_{max} = 84.38 \text{ m}^3 \gamma_w + 28.13 \text{ m}^2 \cdot q$$

Assume $q \approx 0 \Rightarrow \cancel{M_{max} = 84.38 \text{ m}^3 \cdot 9.8 \text{ kN/m}^3 = 827 \text{ kN}}$

$$V_{max} = 330.8 \text{ kN}$$

$$M_{max} = 1240 \text{ kN-m} / 1.5 \text{ m}$$



$$M_{max} = 1.5 T + 1.5 C$$

$$1240 \text{ kN-m} = 3T \Rightarrow T = 413 \text{ kN} / 1.5 \text{ m} = 92.85 \text{ kips} / 4.92 \text{ ft} = 18.8 \text{ k/ft}$$

thickness	Stress
2.5mm = 0.1 in	15.7 ksi
0.2 in	7.83 ksi

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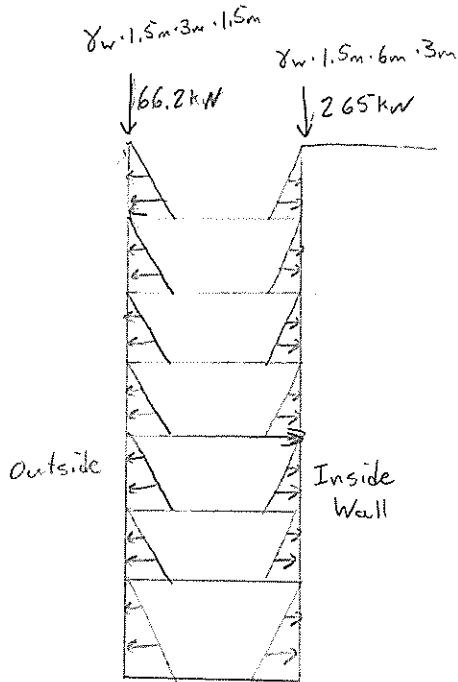
Chkd.

Sheet 3

Date 12/23/09

Date

Wall



$$265 \text{ kN} / 1.5 \text{ m} = \frac{59.58 \text{ kips}}{4.92 \text{ ft}} = 12.1 \text{ k/ft}$$

for 0.1m thickness 10.1 ksi

Axial force with water

$$\frac{1}{2} \cdot \frac{1}{2} \cdot 3 \text{ m} \cdot \gamma_w \cdot 1.5 \text{ m} \cdot 1.5 \text{ m} = 16.55 \text{ kN}$$

$$16.55 \text{ kN} \cdot 6 + 22.07 \text{ kN} = 121.3 \text{ kN} / 1.5 \text{ m} = \frac{27.3 \text{ kips}}{4.92 \text{ ft}}$$

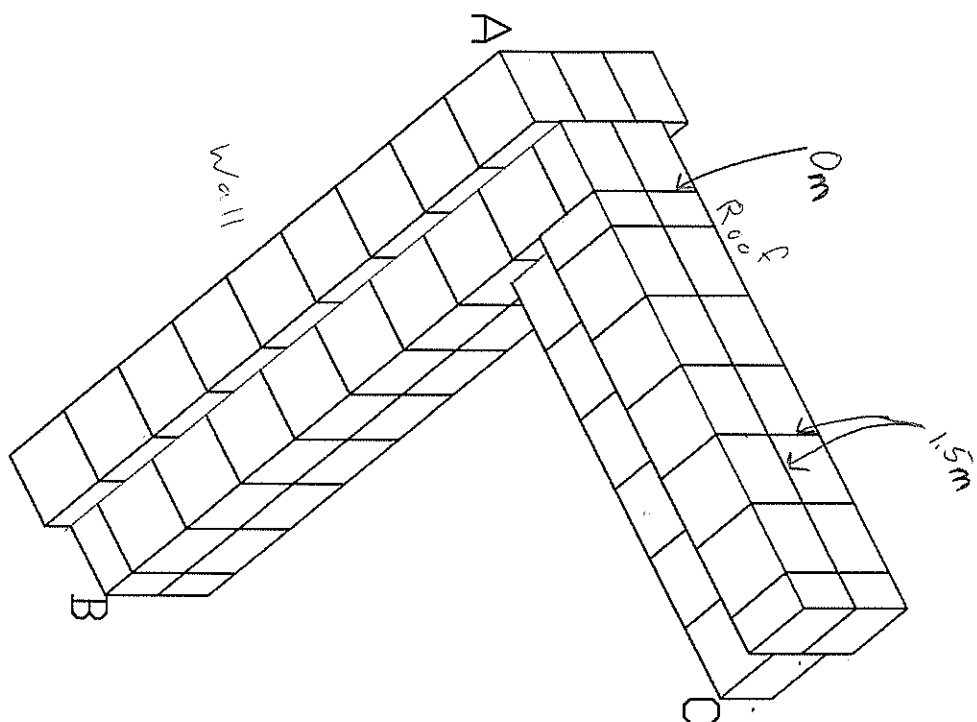
$$\text{Total axial} = \frac{27.3 + 59.58 \text{ kips}}{4.92 \text{ ft}} =$$

for 0.1m thickness $\Rightarrow 14.7 \text{ ksi}$

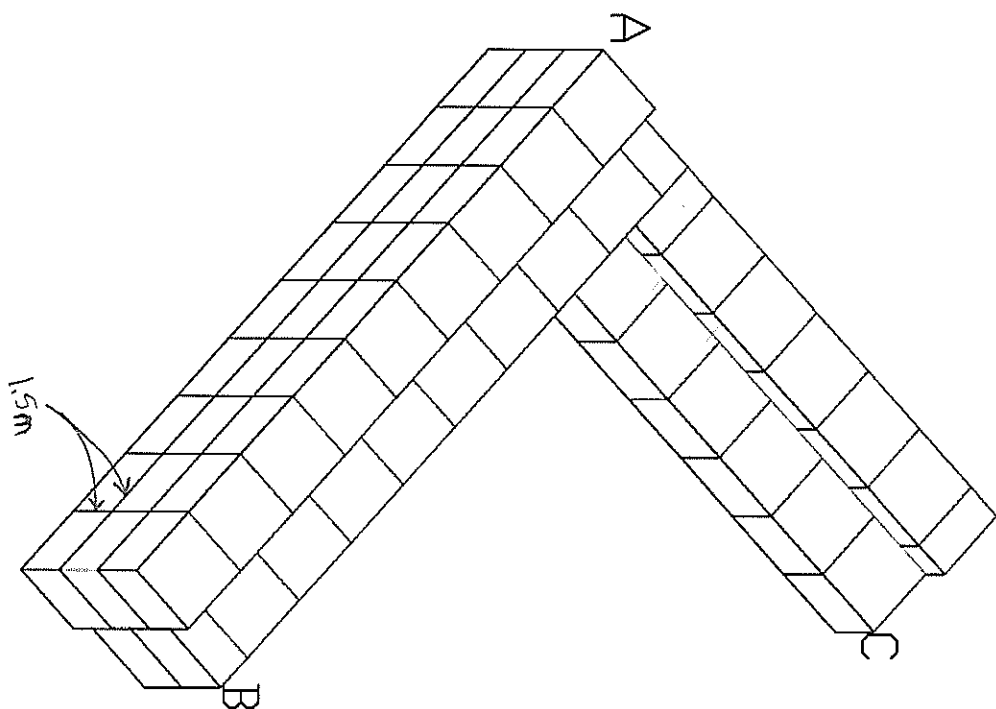
Poisson's effect during filling due to stresses and distortions

degassing internal water high/low point

- fill/empty simultaneous
- hydraulic geometry
- corrugation - close air gaps
make metal thinner
- Is metal a blocker
- double walls/layering with offset joints



right wall not shown



Hot cell design also
has $\approx 1/2$ of water paths

