

Answers to 3D1, 2012

1. (a) 0.375 mm  
(c) (i) 0.097 m (ii) 3.1 years
2. (a) 15.5%, 73%  
(c) 0.03, 0.20, 85 kPa  
(d) 0.63 m settlement  
(e) 16 mm heave
3. (a) (i)  $2 + 2\pi$  (ii)  $2 + 3\pi$   
(b) multiply by 1.18
4. (a)  $\sin(2\psi - \delta) = \sin \delta / \sin \phi$   
(b)  $\frac{\sigma_f}{\sigma_o} = \frac{(1 + \sin \phi \cos 2\psi)}{(1 - \sin \phi)} \exp[(\pi - 2\psi) \tan \phi]$   
(c) 33.3 reduces to 14 as  $\delta \rightarrow 20^\circ$ , a reduction factor of 0.42  
whereas the factor derived from the Databook formula is 0.48