

For purely cohesive (frictionless) soils, the upward resistance from the backfill is commonly taken as being controlled by a prism of soil directly over the pipeline and limited to the undrained strength along the sides of the prism. Figure 7.16 shows the geometry of this scenario.

The applicable equation in PRCI (2004) is:

$$Q_{u\max} = 2c_u H < 10c_u D \tag{7.24}$$

and the applicable equation in ALA (2001) is:

$$Q_u = c_u N_{cv} D \tag{7.25}$$

where 
$$N_{cv} = 2 \frac{H}{D} \leq 10$$

When the  $N_{cv}$  value is substituted into equation 7.25 it is seen the equation is the same as equation 7.24.

The full equation provided in ALA (2001) is the sum of equation 7.23 and equation 7.25:

$$Q_{u\max} = cN_{cv}D + \gamma' H N_{qv} D \tag{7.26}$$

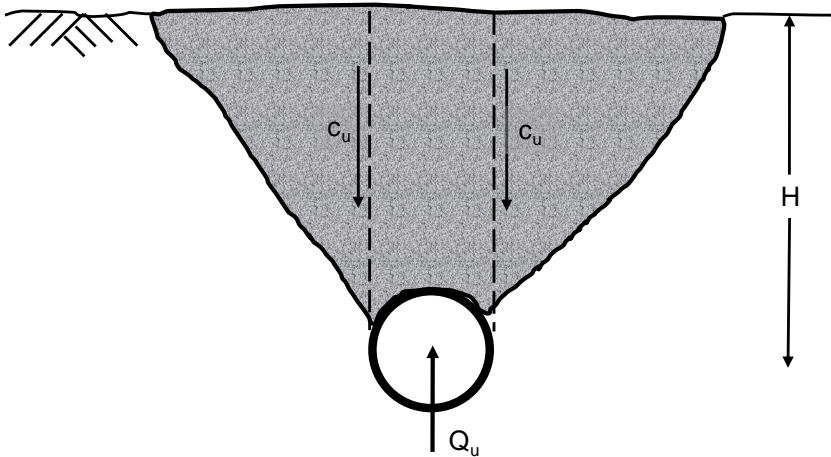


Figure 7.16 Schematic of soil prism overlying pipeline that resists upward pipeline movement in cohesive, non frictional soils (Not to scale).