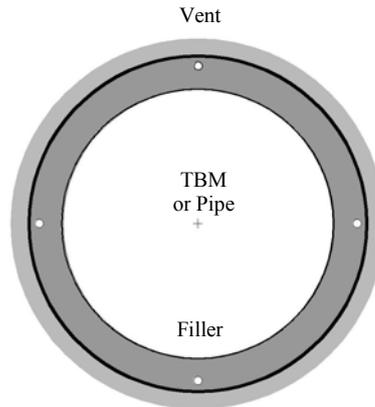


# Seals to Tunnels, Pipes and Cofferdams

## - using grout bag seals

### Ring Seals

Grout Bag Ring Seals are often used to Tunnel Boring Machines (TBM's) shaft entry or exits. They can also be used around pipes and linings. The condensed seal is pre-fixed to the outer perimeter before the TBM or Pipe is introduced. Seals can be protected using steel ring channels or 'cans' and multiple seals can be deployed – see standard detail B106. The seals are pump filled with neat cement grout.



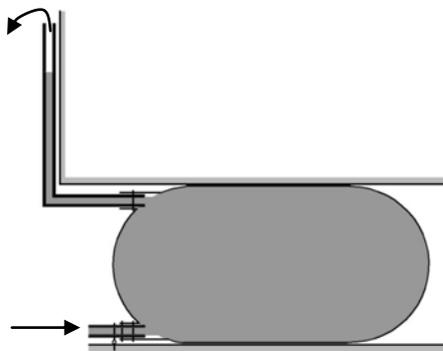
Ring Seal

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### Fabriform



Infill Seal

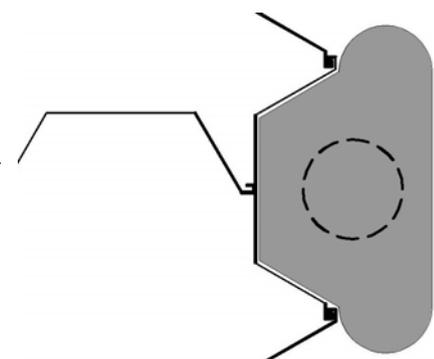
### Infill Seals to Tunnels and Pipes

Grouted fabric forms are commonly used to seal or block tunnels and pipes. The forms are purpose designed to suit the size of the tunnel plus access and grouting arrangements. Seals can be formed in the dry or underwater by divers. A top vent is usually provided to control pump filling. Single seals are often used to form stop ends for subsequent mass infill. Where a water tight or high pressure seal is required, 2 forms are often used with a non shrink grout or micro concrete infill.

### Cofferdam Seals

These are typically used to the vertical sides of sheet pile cofferdams often sealing up to existing walls or other sheet piling. Normally a sheet pile inpan, channel or I beam is arranged to form a recess to control the lowering and grout filling of the seal. The lowering installation pipe should be larger than the seal gap and is positioned inside the fabric form to aid lowering into place. The seals are tremi infilled with either grout, micro concrete or concrete. The seal at the bed can be enhanced by taking the seal below bed level and / or forming a local concrete tremi slab around the seal.

Grouted bag seals cope well with masonry and other undulating surfaces and provide effective temporary seals



Cofferdam Seals

### Fender Seals

Fender tube frameworks are often fed over smaller diameter jetty piles. To effect a seal for the structural infill with concrete, a short fabric sleeve is ratchet strapped to the tube and pile, An initial concrete plug seal is then cast before mass infill.



Fender Pile Seals