

Cavidrain Invert - Tunnel Invert Drainage

General Advice

These instructions should be read in conjunction with the contract specification and drawings. They are intended to provide guidance in normal installation situations. If there are any questions related to the design, unusual installation challenges, or any doubt, consult ABG for further advice. In all situations, responsibility for installation remains with the Installer.

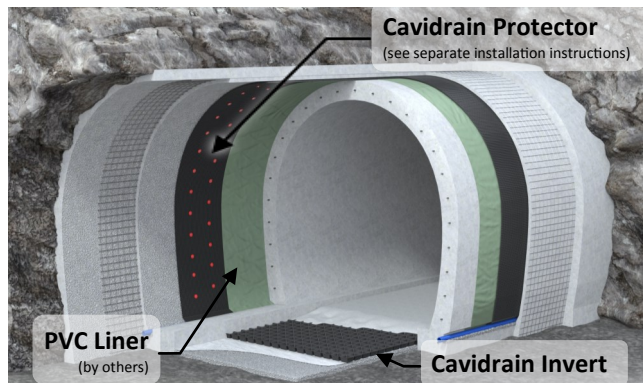


Fig. 1: Cavidrain Invert cut-away diagram

Description

Cavidrain Invert is a pre-formed drainage layer comprising of a large cusped HDPE core with large selvedges developed specifically for the drainage of tunnel inverts. **Cavidrain Invert** is a collector and transporter of water and replaces an invert drainage trench.

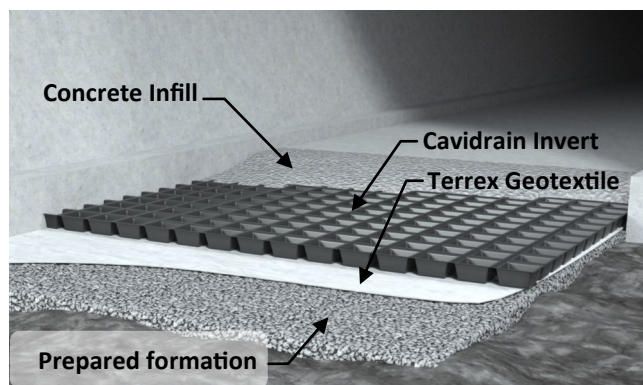


Fig. 2: Cavidrain Invert general layout

Products Supplied

- **Cavidrain Invert**
- **Terrex** (geotextile)
- **Abseal Butyl Tape**

Equipment Required

- Sharp knife
- Spreader boards

Preparation for Laying and Storage

Cavidrain Invert is supplied in panels which may be sized to suit the tunnel width. The panels are supplied stacked on pallets and should be stored on a flat dry surface and covered with a tarpaulin. Individual panels weigh approx. 2.2kg/m² and maneuvered by hand. They should not be dragged across surfaces. Pallets should be moved using mechanical plant such as a crane or a fork lift.



Fig. 3: Use spreader boards during installation

Installing Cavidrain Invert

Step 1.1

Choose the starting point and direction of laying (usually the downstream end). Consider the intended

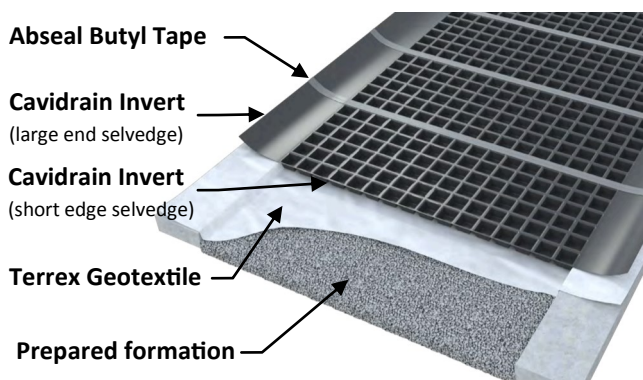


Fig. 4: Cavidrain Invert installation detail

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access point for placing the concrete infill to avoid any unnecessary need to traffic directly over **Cavidrain Invert** panels. Spreader boards should be used for foot traffic over panels (**Fig. 3**). Temporary diversion of any significant water flow may be required.

Step 1.2

Formation should be levelled with crushed aggregate or lean mixed concrete as necessary.

Step 1.3

Place a layer of **Terrex** geotextile on the formation to prevent fines migrating up into the flow channels of **Cavidrain Invert**.

Step 1.4

Lay the first **Cavidrain Invert** panel transversally between the concrete haunches, allowing the large end selvages to extend over the haunches (**Fig. 4**).

Step 1.5

Lay the next panel of **Cavidrain Invert** with the selvages of adjacent panels abutted or overlapped as required^{NOTE 1}.

Step 1.6

Once a bay of panels is laid out the joints can be taped and sealed with **Abseal Butyl Tape** (**Fig. 5**). Note: The **Cavidrain Invert** panels should be wiped dry and the tape warmed to achieve a satisfactory bond.

Step 1.7

Inspect finished joints between panels ensuring no voids exist through which wet concrete can escape.

Preparation of Formwork and Concreting Base

Step 2.1

Place the transverse stop end formwork on top of a **Cavidrain** rib to ensure concrete does not flow below the formwork (**Fig. 6**). Where necessary, fold the **Terrex** geotextile over the stop end formwork to prevent debris from getting under the **Cavidrain**.

Step 2.2

Carefully pour the concrete to fill to 25mm above the cusps. This ensures the cusps are filled and prevents movement of the panels.



Fig 5: Cavidrain Invert installed ready for concrete infill



Fig 6: Formwork placed along rib of Cavidrain Invert

Step 2.3

Place any steel if specified and top up to finished slab level.

Notes

1. Jointing details will vary depending on the specific project requirements. Contact ABG Technical Department for further guidance.

Terms and Conditions

Site specific engineering design should be carried out after site investigation has provided all the necessary information.

The assessment of suitable safety factors in relation to each particular project must always remain the responsibility of the design engineer.