



## Stormwater management on retaining walls

### All about drainage

Since most earth retaining walls are semi-impervious, which means water cannot easily pass through the wall itself, efficient drainage is crucial.

When drainage is not addressed, hydrostatic pressure can build up behind the wall and cause damage such as bulging or cracking, or even collapse.

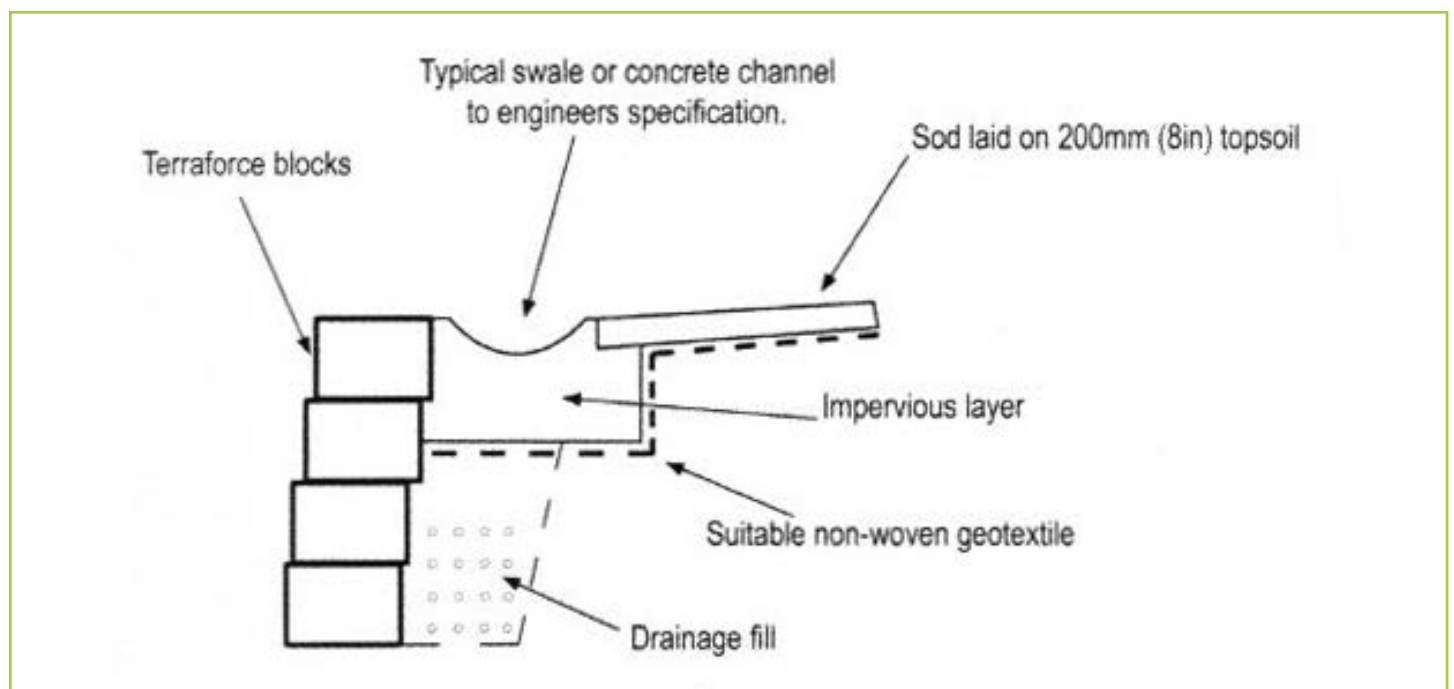
### How important is the drainage layer?

**To put it simply - very:** The retaining wall design itself and the foundation are important, but the drainage layer is at least as important.

It should consist of a layer of coarse, well-draining material of not less than 300mm (1ft) behind the blocks as shown in our typical cross-sections, and be well-compacted.

In most situations, an engineer must also specify a permeable drainage pipe above foundation level. It is also crucial to channel surface water away from the top of the wall in an open channel or swale

### Typical drawing of draining in a Terraforce retaining wall:

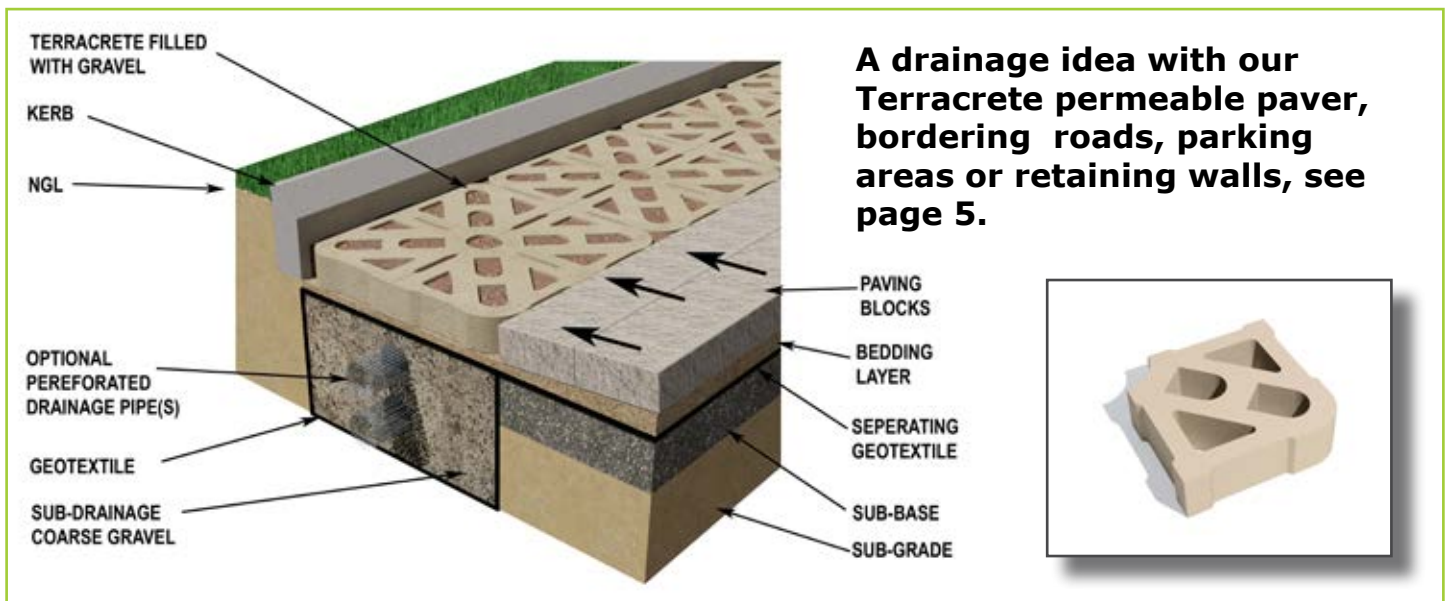


## Below are some examples of drainage systems that could potentially be required in Terraforce retaining walls:

1. **Fin drains** also known as wick drains installed at an angle of 45° to 60° at predetermined intervals against the cut face.

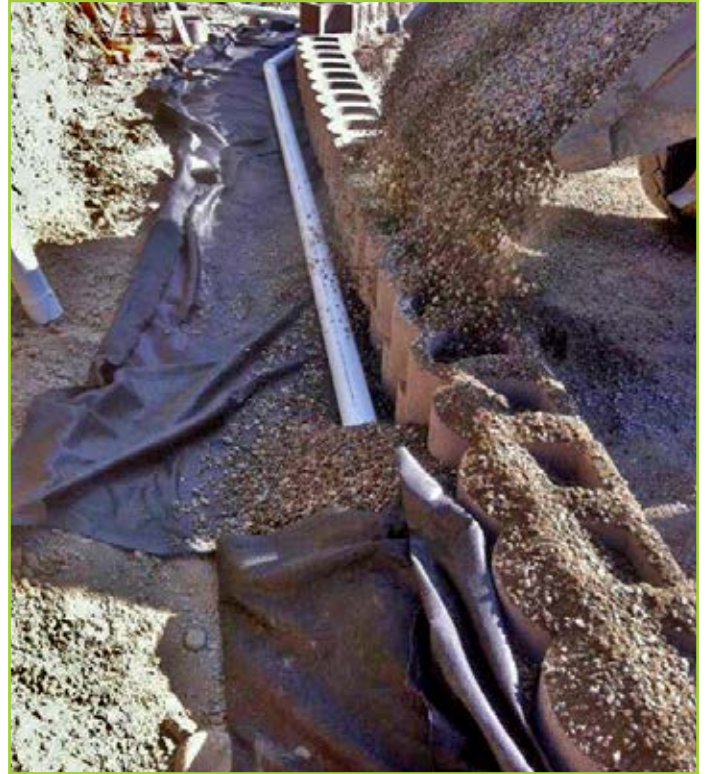


Idea Book



- 2. Subsurface drains** also known as subsoil drains are specified behind the bottom row of blocks.

**Top tip:** Slotted or drilled drainage pipes should be installed within a gravel bed, wrapped in filter fabric to prevent clogging with fine particles from the backfill. This may be waived in some conditions.



### 3. Drainage outlets through the wall and at the end of the wall.

**Top tip:** Wrapping the open end of the outlet pipe, in this instance for a horizontal drainage conduit, with plastic mesh to prevent spillage of gravel.



#### 4. Open drainage channels above the wall.

**Top tip:** you can also use a permeable paver such as Terracrete, installed on an impermeable plastic sheet.



5. **In and outlets** over and through the wall.

**Top tip:** precast elements work well both over and through the wall.



## Notes on drainage

### **SANS 10400: Part R stormwater disposal**

This SANS section describes in essence:

- A landowner is allowed to discharge natural, unconcentrated stormwater run-off onto the lower laying land.
- Upgrades in the form of buildings of impervious areas add a responsibility, namely to accumulate and convey the excess run-off to the nearest municipal stormwater system, at their own expense and over neighbouring property if necessary. The owner of neighbouring land must allow access for the installation of such a conveyance route.

The designer of such a system should be suitably qualified and must consider the entire potential flood volume of the properties in question and must also stipulate a regular maintenance programme.

A few failure reports that we have seen in recent years, unfortunately suggest that some forensic investigators tasked with assessing such failures are not fully aware of the stormwater challenges and issues involved.

### **A note on maintenance**

All buildings and associated structures must be maintained regularly. Stormwater management systems are no exception. Open channels, inlet structures, as well as subsoil water outlets must be inspected at regular intervals. Vegetation and siltation removed, blockages cleared and the general functionality tested.

### **In conclusion**

**It is probably fair to say that by following these guidelines, you will gain peace of mind and maintenance of value, that insurance providers will be happy to cover.**

