

Cordrain Drainage Blanket

Designing with Cordrain



1. Applications and Benefits

Cordrain is a geocomposite vertical drainage blanket which consists of a cusped inner core, wrapped with a non-woven geotextile filter fabric. The fabric is bonded to one side only. **Cordrain** is designed to reduce hydrostatic pressure behind walls by providing a drainage path for rapid transportation of water to the base drain or weepholes.

Applications	Design Benefits	Economic Benefits
<p>Cordrain is used as a vertical drainage blanket for</p> <ul style="list-style-type: none"> • Basements and cellars • Retaining walls • Bridge abutments • Culverts • Tunnel linings 	<p>Cordrain reduces hydrostatic pressure behind structural walls.</p> <p>Cordrain eliminates the need for aggregate backfills in most soils.</p> <p>Cordrain also provides an airlock between the wall and the soil layer.</p> <p>Cordrain protects the waterproofing membrane.</p>	<p>Cordrain reduces installed costs by eliminating the need for importing free draining backfill.</p> <p>Cordrain is lightweight, flexible, easy to handle and quick to install.</p> <p>Cordrain reduces the cost of protecting the waterproofing membrane.</p>

2. How Cordrain Works

Cordrain is wrapped with a non-woven geotextile and in the vast majority of soils, the geotextile ensures stable filtration of the adjacent soil.

A soil filter develops within the first few millimetres between the soil mass and the geotextile. As water passes from the original soil into the drain, it washes a few small particles for a short period of time after installation.

As the small particles are washed through, a bridging network of larger particles builds up against the geotextile. This network prevents further small particles from being washed through, stabilising the soil and allowing only water to pass through the system.

By retaining the backfill and only allowing water through, Cordrain reduces the hydrostatic pressure on the wall.

3. Backfill Material

Care must be taken in the selection of the backfill material. In most instances, the excavated material can be used as backfill (except where clays are encountered).

Backfilling with clays will impair drainage efficiency as clays have a low flow conductivity. In this case, a free draining material should be used as backfill.

Large angular stone backfill which can physically damage the geotextile should not be used.

Compaction equipment is to be kept 100mm from the face of the **Cordrain** to prevent any damage.



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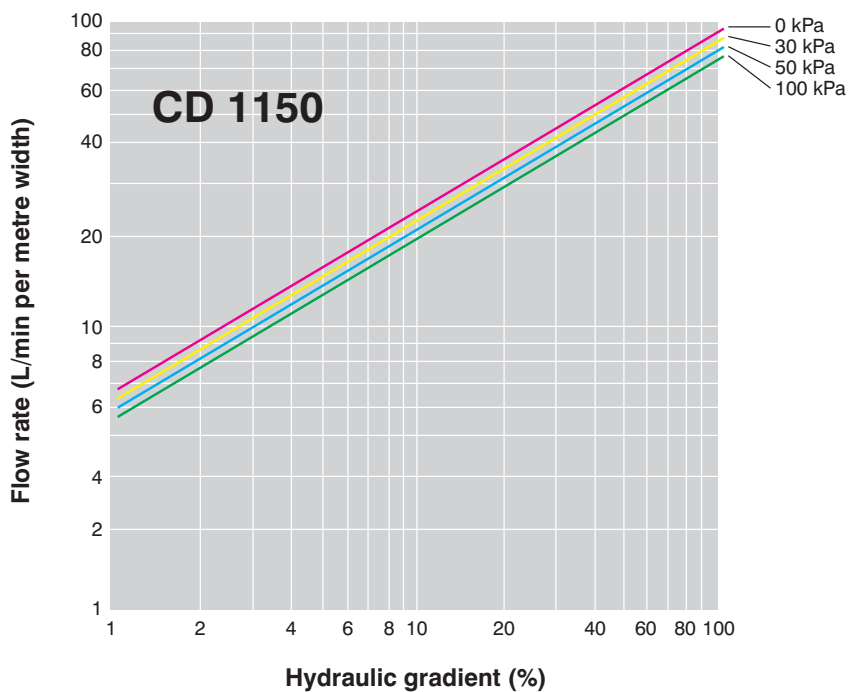
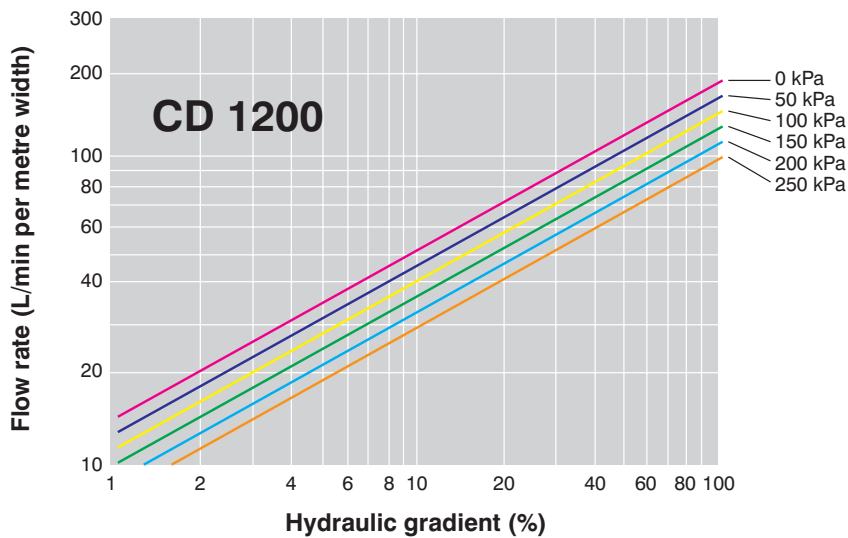
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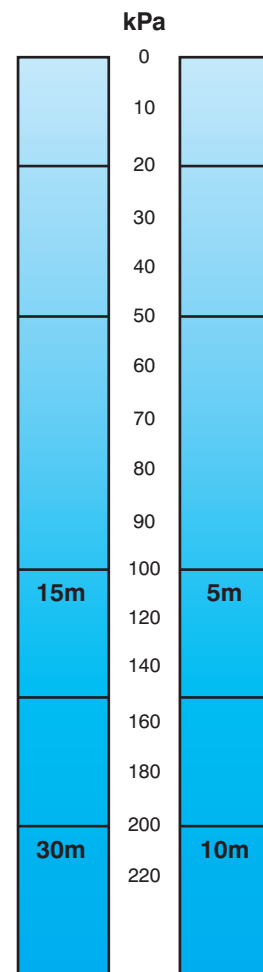
Flow Rates Vs. Hydraulic Gradient (at various pressures)



RELATIONSHIP OF LATERAL EARTH PRESSURE TO DEPTH IN SOILS (Indicative only)

Depth of
clean dry
sand (m)

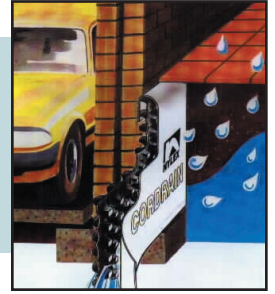
Depth of
saturated
clay (m)



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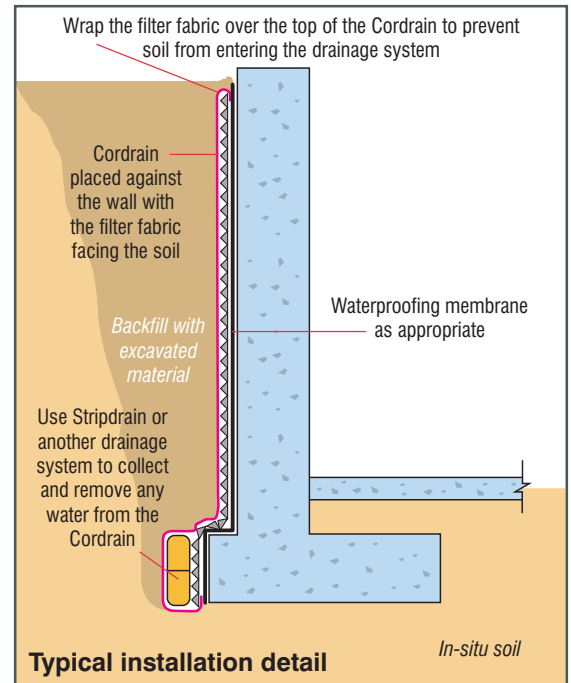
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Cordrain Drainage Blanket Installation Suggestions



Installing **Cordrain** correctly requires the following items to be considered:

1. always face the filter fabric to the soil.
2. do not walk or place heavy materials on the **Cordrain**, as this may damage the filter fabric.
3. keep the **Cordrain** wrapped until ready to use, and bury as soon as possible, as this minimises damage from UV exposure. Once installed, do not leave exposed for more than 1-2 weeks.
4. **Cordrain** is easily cut with most available cutting blades, such as a Stanley knife.
5. **Cordrain** can be fixed either horizontally or vertically to the structure in 3 alternative ways -
 - a. fix with masonry nails through a 50x50mm pad of plywood (or other suitable material) at 1m centres.
 - b. if waterproofing materials have already been applied to the wall, fix the **Cordrain** to the wall with a contact adhesive covering 4-6 tips at 1m centres.
 - c. butyl mastic tape strips of lengths approx 25mm long, at 1m centres.
6. **Cordrain** can be jointed via -
 - a. join sheets horizontally by overlapping the top core layer over the lower one by 75-100mm. The top geotextile is then lapped over the lower geotextile fabric and taped.
 - b. vertical joints are made similarly by overlapping the cores and geotextile wraps, and taping the top geotextile wrap.
 - c. top edges must be sealed to prevent soil entering the drainage system. **At the top of the Cordrain, the geotextile wrap must be turned over the top of the core or secured against the wall** (this will prevent soil from entering the **Cordrain**).
 - d. side edges are to be sealed similarly, with 100mm of core cut away and the geotextile wrap turned around onto the inside of the core or taped to the structure
7. **Cordrain** can withstand the lateral load applied by compaction equipment up to 100mm from the face. Machinery exhausts from compaction equipment are to be pointed away from the **Cordrain**, as excessive heat causes damage.
8. should the geotextile be cut, then it should be taped over to ensure that no soil can enter the drain. If a large area of geotextile is torn, a patch of geotextile should be placed over the the area and taped, allowing an overlap of 100mm.
9. backfilling is to commence around the base of the drain. Care is to be taken to prevent damage to **Cordrain** during backfilling. It is advisable to temporarily protect the **Cordrain** with a plywood sheet that is raised as work proceeds. Do not backfill with sharp stones or rocks.
10. for retaining walls using weep holes, the cusped core at the base must have cutouts of 50x12mm at 1m centres (aligned with the weep holes). For this application, do not cut the filter fabric. For applications where weep holes are not used, **Stripdrain** can be inserted under the **Cordrain** geotextile as a base drain (Refer **Stripdrain** brochure for termination details).



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Cordrain Drainage Blanket Technical Data



Cordrain is a geocomposite drainage blanket, which consists of a plastic cusped inner core (cusping on both sides) over wrapped with a non-woven geotextile filter fabric. The filter fabric is bonded on one side only. **Cordrain** is typically used for vertical drainage applications, such as behind bridge abutments or basement walls.

Cordrain is designed to reduce hydrostatic pressure behind walls by providing a drainage path for rapid transportation of water to the base drain or weepholes. **Cordrain** eliminates the need for importing sand or free draining backfill.

Properties	Test Method	Cordrain CD1150	Cordrain CD1200
Physical Properties			
Core Thickness		12 mm	18 mm
Roll Width		1.15 m	1.20 m
Roll Length		30 m	25 m
Crush Strength	ASTM D1621	100 kPa	250 kPa
Max Soil Depth		2.5 m	10 m
Roll Weight		30 kg	32 kg
Geotextile Filter			
G Rating	Austroads	> 900 (Q value)	
Permittivity	AS 3706.9	> 50 l/m².s	
Pore Size	AS 3706.7	> 120 µm	
Grab Tensile	AS 2001.2.3. (b)	> 500 N (Q value)	
Trapezoidal Tear	AS 3706.3	> 180 N (Q value)	
HDPE Plastic Core			
Core Profile		Raised cusps on both sides (square shaped)	
Mass		720 g/m²	900 g/m²
Colour		Black	Black
Fungus Resistance		Excellent	Excellent

Notes

1. crush strength stated will withstand static lateral soil pressures in most soils for each given depth when installed vertically.
2. an approximate factor of safety of 2:1 has been used to determine the recommended maximum soil depth.
3. the filter fabric meets NSW RTA R63, Qld MRD MRS 11.27 and Transit NZ F/7 strength class A and filtration class 1.
4. the above values are a guide only – it is up to the designer to calculate the in-situ backfill properties.
5. Q value (or characteristic value) is calculated in accordance with NSW RTA R63, Qld MRD MRS 11.27 and Transit NZ F/7, that being $Q = \text{Mean} - (0.83 \times \text{Standard Deviation})$.

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