# Water Management Details

# Grasscrete

CAD

GrassConcrete

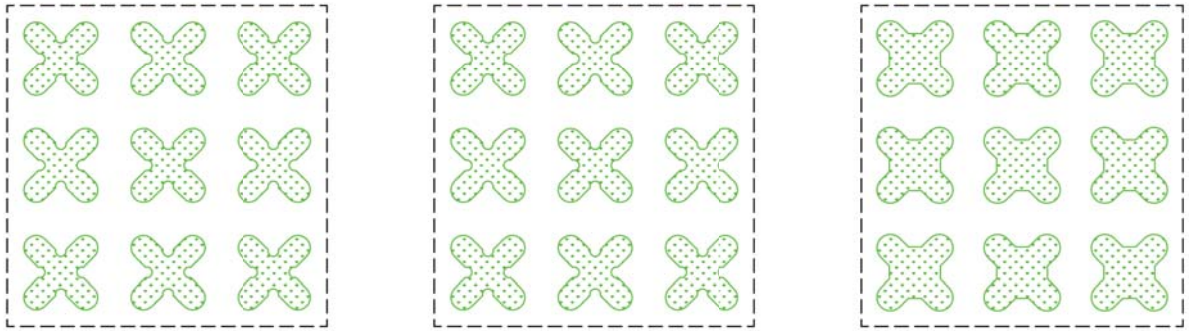
The following information is issued solely as an aid to design and does not assume liability in the final design. Information detailed is subject to change without notice.

## Flow rate

| Velocity ** | Grasscrete Type | Reinforcement | Typical Weight * (with Soil) |
|---|---|---|---|
| ≤ 4.5m/sec | GC3 : 76mm Thick | BS4483 A193 - 200x200x7mmØ | 135 Kg/m² |
| ≤ 6.0m/sec | GC1 : 100mm Thick | BS4483 A193 - 200x200x7mmØ | 180 Kg/m² |
| ≤ 9.0m/sec | GC2 : 150mm Thick | BS4483 A252 - 200x200x8mmØ | 270 Kg/m² |
| * This figure is indicative only and may be influenced by local material characteristics | | | |

** The selection of grass species should take account of water flow during periods of impounding where the grass should be of a type that will be flattened by the flow. This helps to form a smoother surface over the concrete and can reduce the Mannings 'n' value to as low as 0.03, bringing benefit to the overall dimensions of application such as drainage channels.

## Plan: Void former - upper surface



GC3 GC1 GC2

Scale 1:10

Grasscrete 600 x 600mm styrene void former
(GC3 Shown)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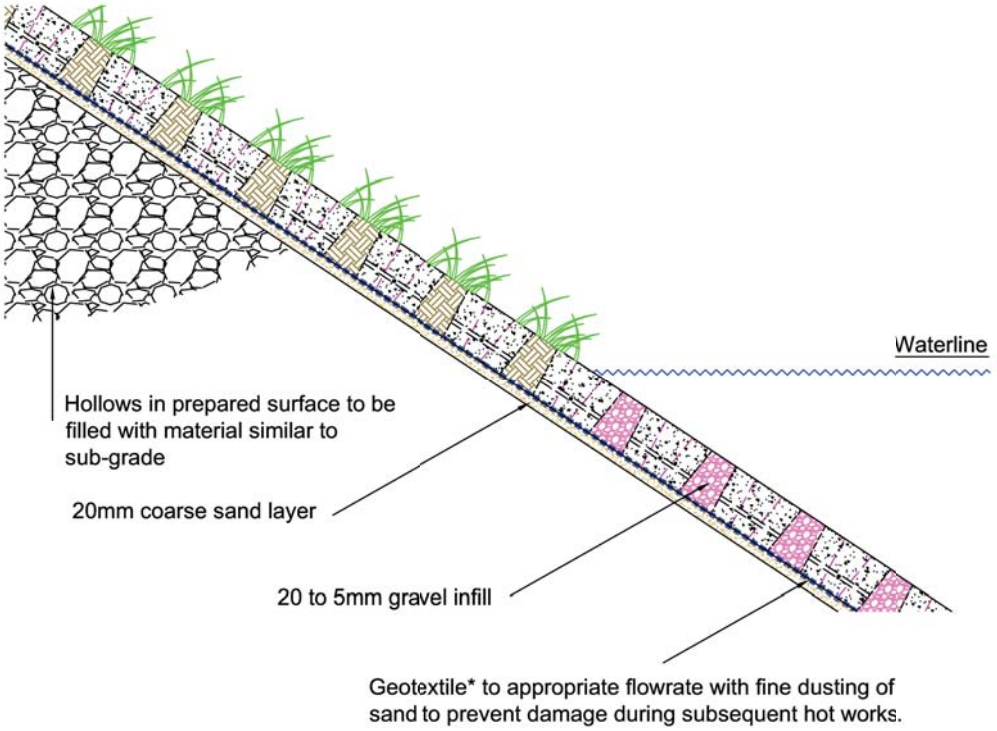
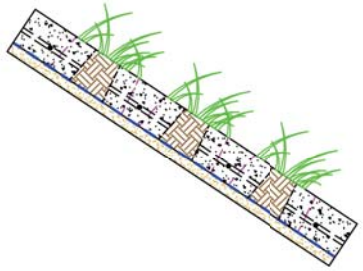
|---|---|
| Client | N/A |
| Client Address | |
| Site Details | N/A |
| Site Address | |
| Revision History | |
| Drawn By | D Moorhouse |
| Date | 27.01.2011 |
| Checked By | REH |
| Scale | As Shown @ A3 |
| Project Reference | |
| Project Title | Typical Grasscrete Water Environment Details - Criteria |
| Drawing Number | GC-CAD-0014 |
| Revision | - |

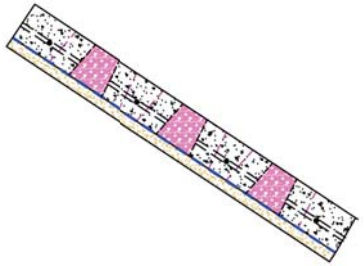


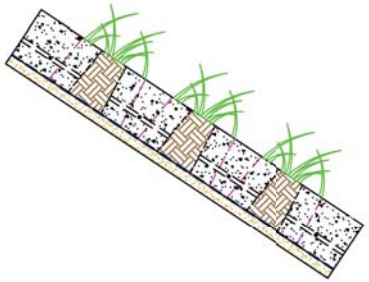

Paving above waterline

Paving below waterline

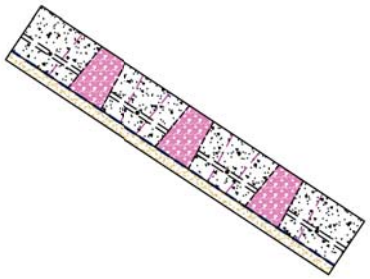


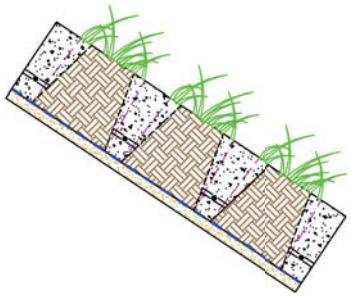
GC3



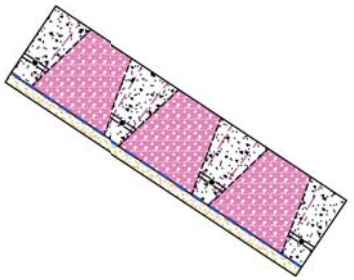


GC1





GC2



## Gradient **

| | |
|---|---|
| 1 in 1 | - Extreme application, rope access by specialists. |
| 1 in 1½ | - Access using lanyards. |
| 1 in 2 | - Access with care. |
| 1 in >2 | - General access possible. |
| 1 in 3 | - Amenity access available. |

## Notes:

* To achieve skin friction for placement of sand dust layer over Grasscrete void formers, we recommend that geotextiles with a smooth low-grip surface are avoided.

** As the gradient increases, the surface of the Grasscrete will naturally become more textured with the lowering of the concrete slump. This helps to increase the surface slip resistance.

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Client: N/A

Client Address

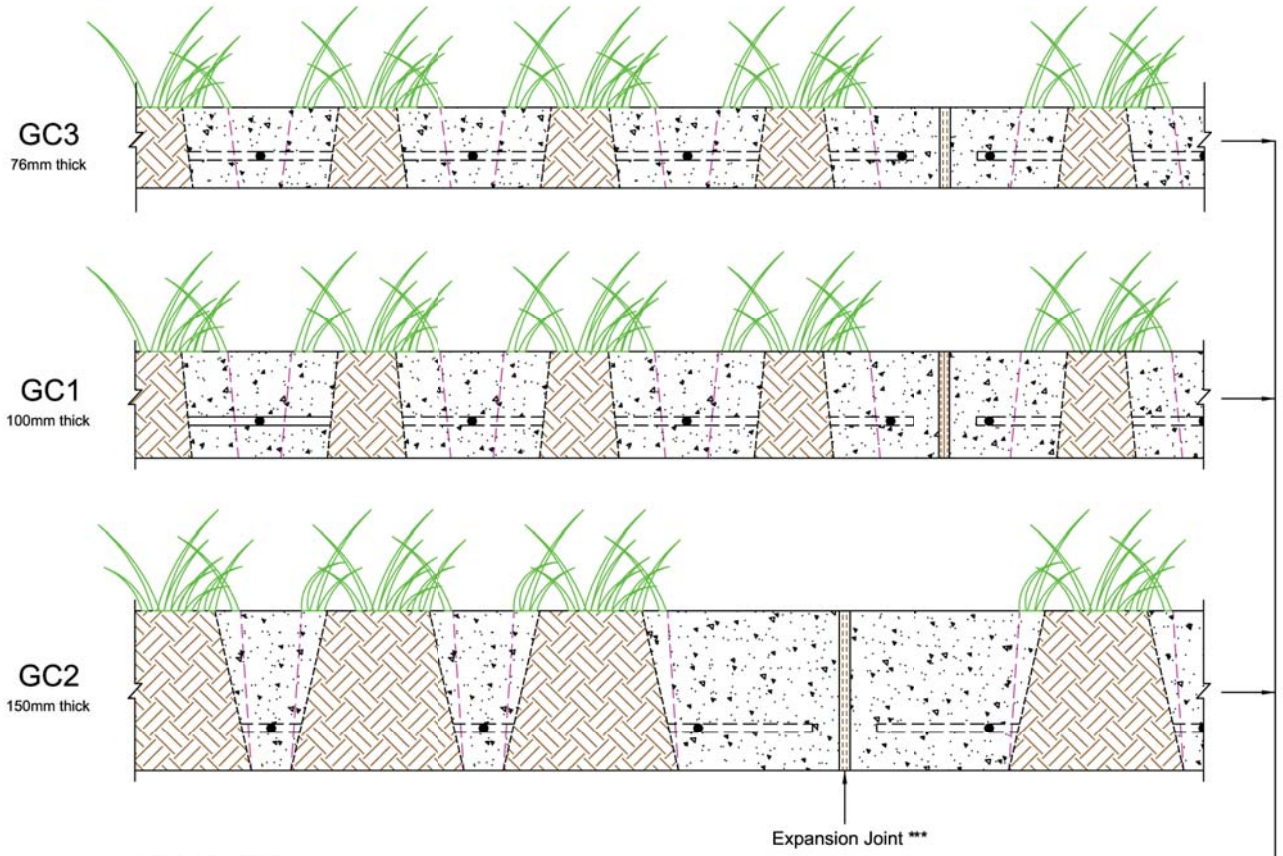
Site Details: N/A

Site Address

Revision History

| | |
|---|---|
| Drawn By | D Moorhouse |
| Date | 21.01.2011 |
| Checked By | REH |
| Scale | 1 : 10 @ A3 |
| Project Reference | |
| Project Title | Typical Grasscrete Water Environment Details - Slope Design |
| Drawing Number | GC-CAD-0015 |
| Revision | - |

## Paving



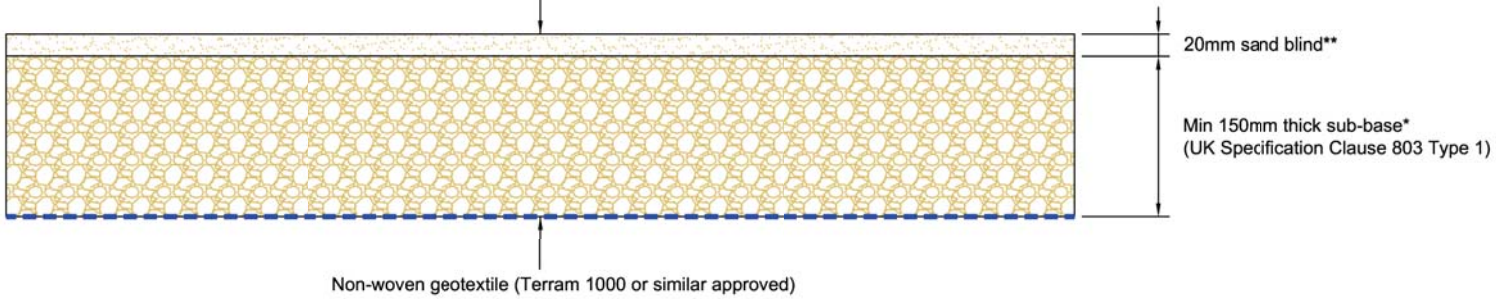

* For traffic applications the structural design of Grasscrete assumes an allowable ground bearing of 45 kN/m². For typical sub-grades the following guidlines can be considered for sub-base depth:

| | |
|---|---|
| CBR 4%+ | 150mm Thick |
| CBR 2 - 4% | 250 - 200mm Thick |
| CBR <2% | 300mm + Thick min. |

** In this application, we show the geotextile below the sub-base. Where the installation is to a fast flowing channel bed, we would recommend this be positioned above the sub-base for slope armouring.

*** The standard expansion joint detail is a 25mm wide pre-soaked softwood filler. No sealant is incorporated with this detail. Where filler material such as PE foam is used, a 20mm wide joint should be specified with a 20x20mm sealant to maintain the filler in position and avoid dust and due impregnation.

## Preparation





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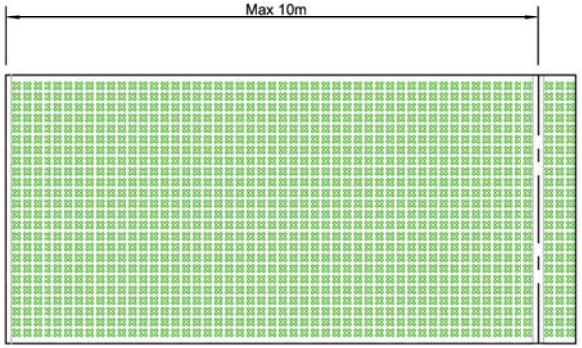
| Revision History | |
| Drawn By | D Moorhouse |
| Date | 28.01.2011 |
| Checked By | REH |
| Scale | 1:5 @ A3 |
| Project Reference | |
| Project Title | Typical Grasscrete Water Environment Details - Trafficked Slabs |
| Drawing Number | GC-CAD-0016 |
| Revision | - |

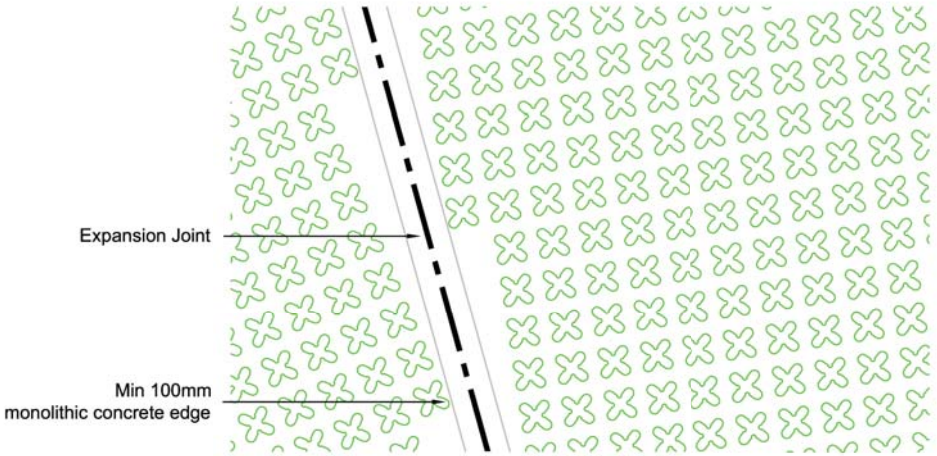
## Layout to curve

Scale 1:100

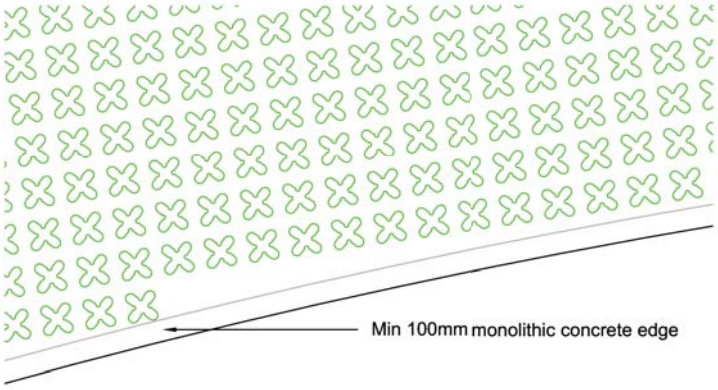

## Layout to straight

Scale 1:100




## Detail 1

Scale 1:25




## Detail 2

Scale 1:25

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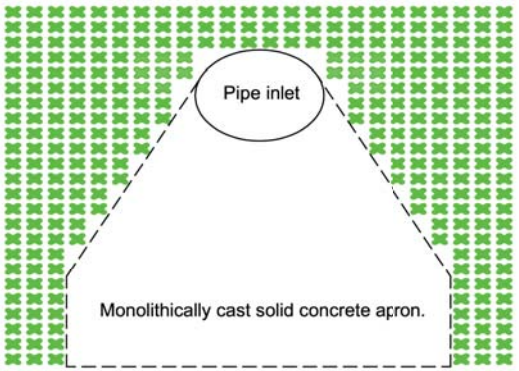
| Drawn By | D Moorhouse |
| Date | 28.01.2011 |
| Checked By | REH |
| Scale | As Shown @ A3 |
| Project Reference | |
| Project Title | Typical Grasscrete Water Environment Details - Slope Layouts |
| Drawing Number | GC-CAD-0017 |
| Revision | - |




## Inlet Detail

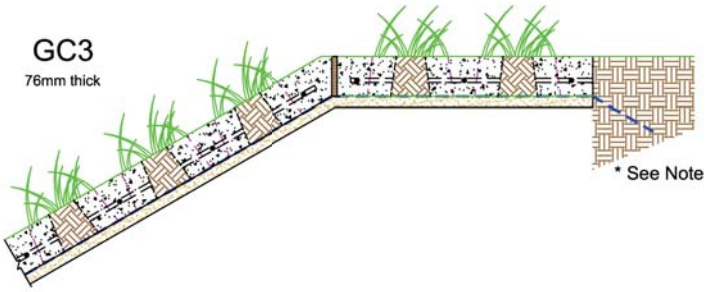
Scale 1:50

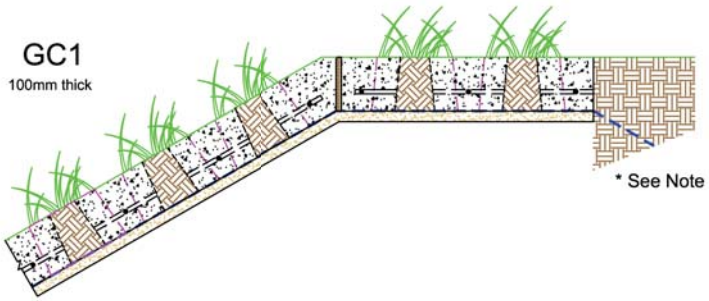
## Notes:

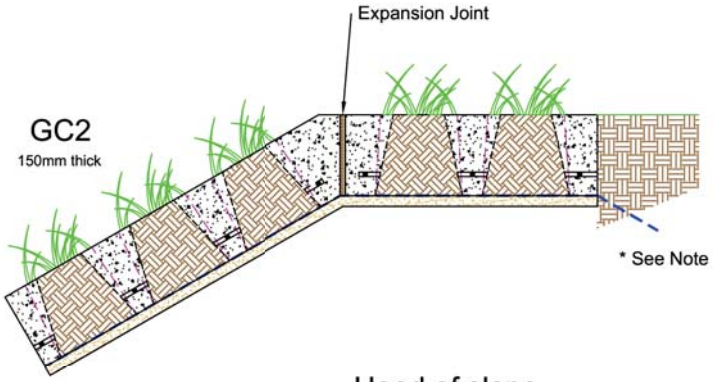
* Geotextile dug into sub-grade at head of slope to bisect potential surface runners from ground to rear.

** For design of toe consider:

1. Rate of water flow if any.
2. Competance of sub-grade.
3. Water migration.
4. Large toe beams will need to be cast separately to avoid creating a pressure head during pouring.

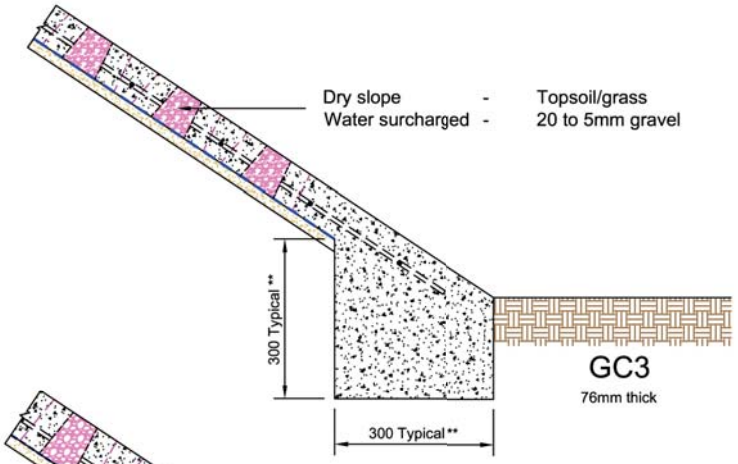


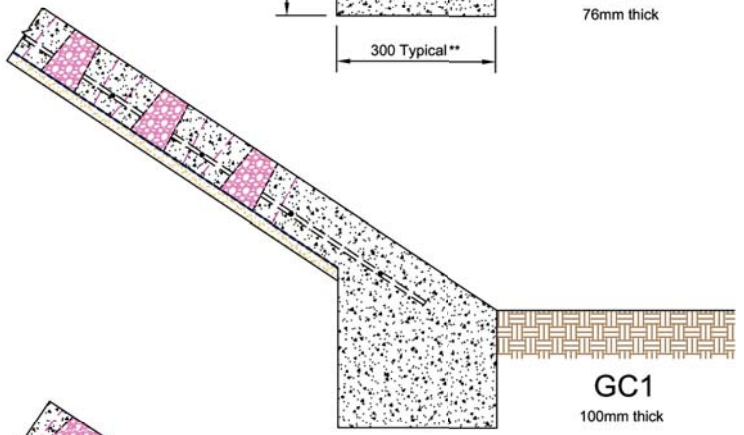



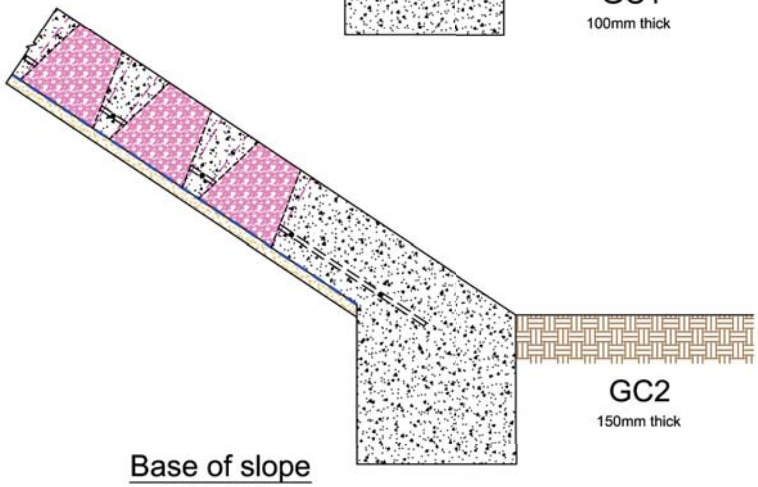




## Head of slope

Scale 1:10




## Base of slope

Scale 1:10

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| Drawn By | D Moorhouse |
| Date | 31.01.2011 |
| Checked By | REH |
| Scale | As Shown @ A3 |
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| Project Title | Typical Grasscrete Water Environment Details - Slope Details |
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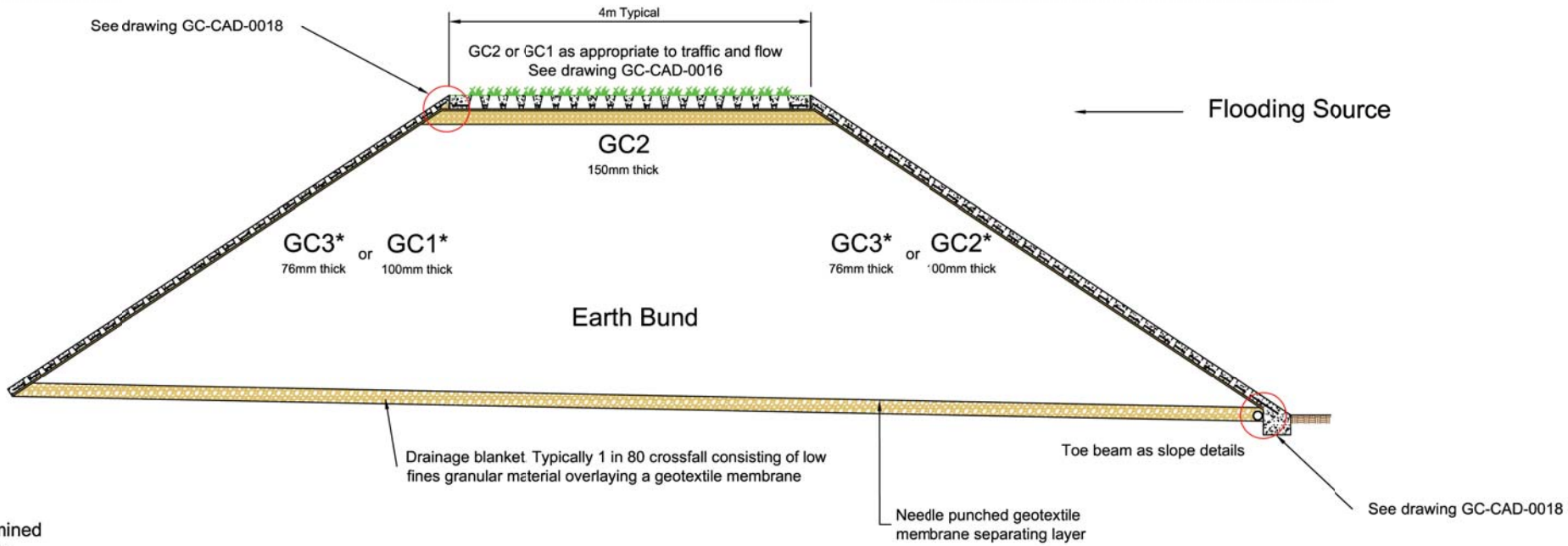


* System type determined by wave and flow data.

## Typical Flood Bund Detail

Scale 1:50


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| Revision History | |
| Drawn By | D Moorhouse |
| Date | 31.01.2011 |
| Checked By | REH |
| Scale | 1 : 50 @ A3 |
| Project Reference | |
| Project Title | Typical Grasscrete Water Environment Details - Flood Bunds |
| Drawing Number | GC-CAD-0019 |
| Revision | - |