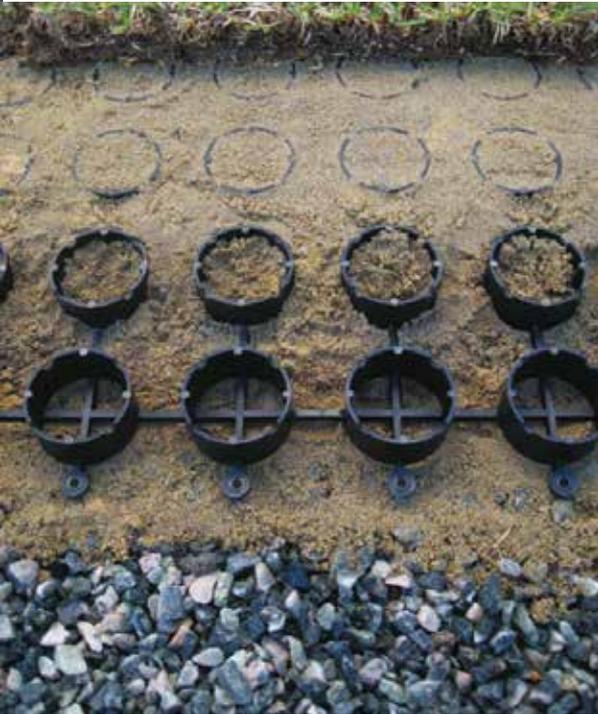


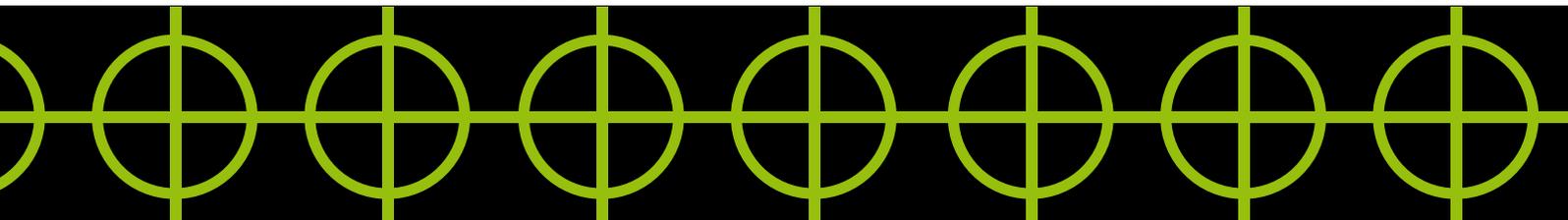


# Grassrings®

Carparks | Service Access Areas | Golf Courses  
Caravan Parks | Footpaths



**Turf Reinforcement System**



# GRASSRINGS

## Turf reinforcement system

The grass reinforcing rings concept has been quickly accepted internationally to increase and maintain a green environment in the rapidly expanding urban spread.

Grassrings is a 100% recycled injection moulded plastic structural grid system used to stabilise and reinforce grass, to prevent the compaction of the root zone, providing a luxuriant trafficable surface.

Studies show that compaction of the top 35mm of soil underneath grass must be prevented. If this layer becomes compacted grass roots are unable to obtain necessary oxygen, moisture and nutrients from the soil, causing the grass to suffocate and die. Grassrings prevent this compaction.

Grassrings' design maximises the root development of the grass (over 90% root development area) and is invisible once installed.

The grid of rings is immensely strong, capable of supporting fire trucks, aeroplanes, helicopters and other heavy low volume traffic.

### BENEFITS

- Open grid provides over 90% root development area and 100% grass cover.
- Grid is flexible – will follow undulations.
- Manufactured from 100% recycled chemical resistant, UV stabilised impact resistant polymer.
- Easy and fast to install including cutting around borders, trees etc.
- Provides storm water drainage and retention onsite.
- The ring design is the strongest shape for grass paving in that it has no weak corners. Grassrings will meet and exceed all loading criteria.
- Can be supplied in custom size rolls for fast installation.
- Porous surface generally provides greater percolation rate to the natural ground.



Port Coogee, Western Australia



Service vehicle access, installed using Grassrings turf-reinforcement



Note how the grass roots develop into the porous base course



Grassrings can withstand loadings in excess of highway maximums



Recreation area and parking at Point-Fraser  
Swan River Foreshore, Perth, Western Australia



# GRASSRINGS

## Turf reinforcement system



Melbourne Exhibition Centre during installation



Melbourne Exhibition Centre after completion



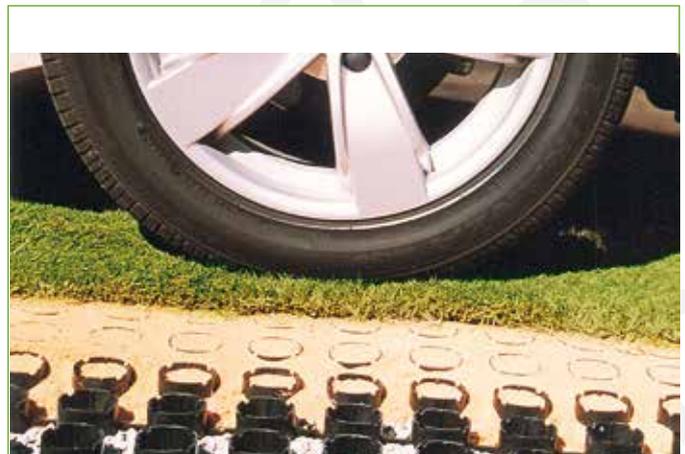
Ashdale Senior High School



Private residence front grassed driveway and extra parking



Golf course cart paths and drainage of low lying areas and bunkers



Private resident extra parking



Fire hydrant and service access areas



### Fire Authority Approval

Most Fire Authority departments would know of this grass paving system and it is recommended to submit plans and specifications showing full details to gain approval. Our technical department is able to assist with the specification documentation.

### FIRELANES AND SERVICE ACCESS LANES

Fire Authorities require access lanes capable of supporting heavy vehicles to and around hydrant points within a building complex. GRASSRINGS trafficable turf system has been designed and proven to provide a stable road construction for this purpose yet still maintaining maximum green landscape area over against the installation of hardstand paving. Very heavy fire vehicles have been tested (12-30-tonne) on the GRASSRINGS system by Fire Authorities and found to be successful in withstanding loads imposed. In all cases the access lane needs to be marked out clearly with built in markers or shrubs to show extent of lane, with emphasis on visibility at night time.

### Firelane Installation

Due to the heavy loads expected on firelanes and the need for base stability in spreading the load it is recommended that a woven geotextile fabric be laid onto the base soil before base course gravel is placed. This will prevent the gravel base course from pumping into the base soil, and thus losing the locking effect of the sharp gravel. The geotextile fabric should have a minimum tensile strength of 80kN/metre. After the gravel base course has been spread and levelled on the above fabric and clean course sharp sand washed into gravel it is recommended that a non woven geotextile fabric be layered over the levelled gravel and sand base course followed by the GRASSRINGS mat, fertiliser, polymer water absorbing crystals, sand topsoil and turf.

The purpose of this top geotextile is to prevent the movement of base course gravel to surface when fire tenders empty large quantities of water from the tank. This geotextile is only required within 20 metres radius of the hydrant. Grass roots will penetrate this geotextile which should be minimum 120 g.s.m. weight.

### Firelane Marking

There are many ways of marking lane boundaries and will be dependent on designers and property owners requirements, however, markers must be clearly seen from fire vehicle both day and night.

A white plastic dome marker insert can be supplied with the GRASSRINGS and placed within 300mm of the edge of the firelane. Concrete block markers with reflective paint are also available. Shrubs or trees can be grown along the side of the lane or concrete or brick paved kerbing strip can be installed.

# GRASSRINGS

## Turf reinforcement system

### STORM WATER

#### Detain it! Retain it! Reuse it!

As time progresses urban drainage systems are being more and more challenged by the increased run-off that is generated by increased urban densities. Approximately 15% of rainwater that falls on natural surfaces finds its way into waterways, but almost 90% of rainwater that falls on the house roofs and paved driveways finds its way into the local drainage system. The water volume that would otherwise be directed to ground water or natural stream flow is vastly diminished and our environment is being severely degraded.

As driveways are extended, outbuildings may be added, barbecue areas are developed and grassed areas may be replaced by feature paving. The impervious fraction of a residential site increases. Only a few decades ago, designers of residential drainage systems expected approximately 40% of rainwater that fell on a house site would find its way into their drain.

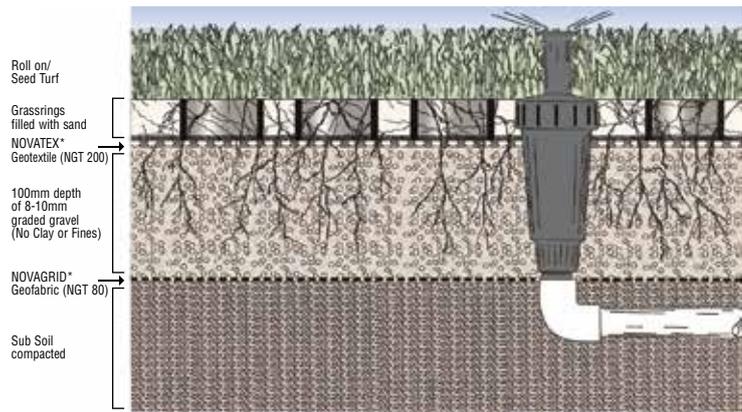
By installing stormwater detention systems on site we can protect the drainage infrastructure. Approximately 85% of the rainwater that falls onto open ground percolates into the soil. A significant portion of this makes its way to the water table, but our ground water reserves are being depleted because urbanisation reduces the inflow and the increased use of bores that are sunk to enable the watering of gardens, parks, playing fields and golf links.

Captured run-off may be used to water your own garden or shared with neighbours and can be circulated through the toilet flushing systems these are further options.

Grassrings systems retain the permeability of natural surfaces. The trafficable area installed does not increase run-off when Grassrings systems is installed over a base of coarse gravel, the interception rate will be higher than that of the open fields.

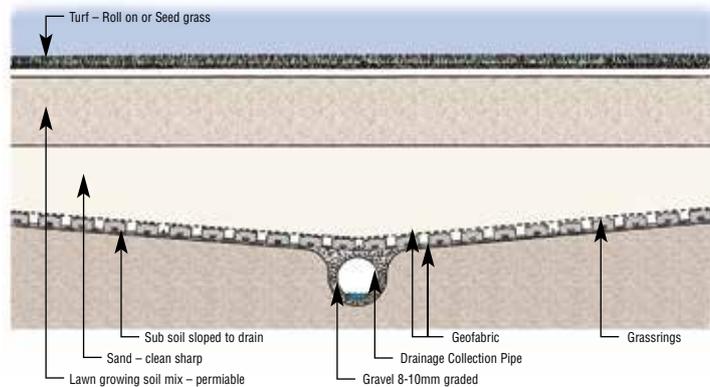
The DRAINWELL system may be installed as part of a stormwater detention or retention system. The stormwater interception may be allowed to drain into the subsoil and released at a slower rate to the local drainage system or it may be captured for reuse, being stored in the DRAINWELL structural storage system can also be used for rain water harvesting.

This system of stormwater storage may be designed to capture excess run-off.

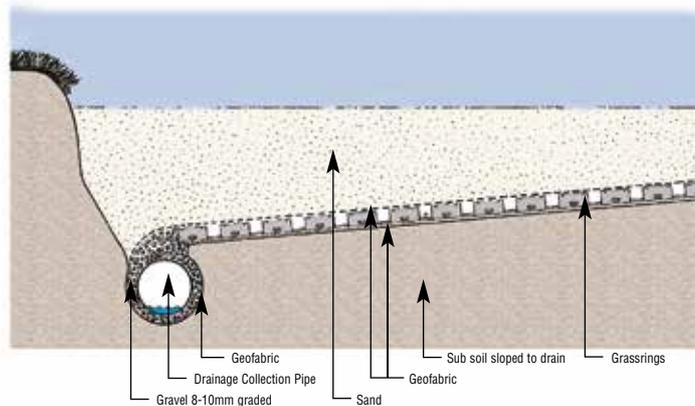


\* Novatex and Novagrid geofabrics stabilise the base course which reduces the depth of graded gravel required and is necessary on firelanes and heavy traffic service areas

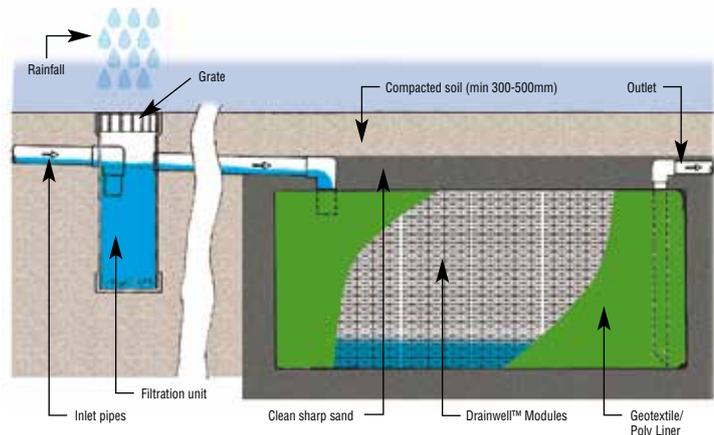
**GRASSRINGS INSTALLATION – SECTION DETAIL**



**GRASSRINGS DRAINAGE SYSTEM FOR SITE OR SPORTS**



**GRASSRINGS DRAINAGE SYSTEM FOR GOLF BUNKER**



**DRAINWELL STORAGE TANK**

# INSTALLATION INSTRUCTIONS

## GRASSRINGS Turf reinforcement system

STEP  
**1**



STEP  
**6**



STEP  
**2**



STEP  
**7**



STEP  
**3**



STEP  
**8**



STEP  
**4**



STEP  
**9**



STEP  
**5**



STEP  
**10**



### TYPICAL INSTALLATION SPECIFICATION

**Step 1:** Remove depth of soil to thickness of base course plus 35mm.

**Step 2:** Level and compact area to engineer's requirements.

**Step 3 (if required):** Subject to geotechnical requirements additional base course stability can be achieved by installation of NOVAGRID geomesh below the base course material. Used also to reduce base course depth.

**Step 4:** Add graded blue metal (10-12mm) base course to designed thickness.

**Step 5:** Compact to test requirements.

**Step 6:** Assemble Grassrings onto prepared base.

**Step 7:** After laying Grassrings, cut around valve boxes, sprinklers, trees or curbing using cutting pliers or secateurs. Spread fertilisers over sand (NPK blue or any grass starter).

**Step 8:** Apply clean sharp sand of suitable growing pH value to fill rings using large broom to leave top of ring exposed, on to which roll on turf is laid. A further 15mm of top soil for seeding and hydro-mulching.

*Important Note: Top soil must not be inclusive of any clay or fines.*

**Step 9:** For quick lawn establishment – Roll on Grass is recommended. On warm days the sand should be wet to reduce temperature and provide moist base for the roots of the grass.

**Step 10:** Roll compact lawn with heavy roller to remove all air pockets around roots ensuring that the roots are set into the sand layer in the rings. Water and fertilise to suit weather conditions. Must not be trafficked before roots are established.

### BASE COURSE DEPTH GUIDE



Dimension A – Traffic Type
75-100mm – Pedestrian
100-150mm – Cars
200-300mm – Trucks

*Note: Base course design will be relative to the vehicle loads, traffic volume and existing soil conditions.*

*In commercial installations a civil or geotechnical engineer should be consulted to determine the requirements for the gravel base course with regard to depth and any need for geotextiles.*

*This information is provided as a guide only and is not to be taken as the manufacturer's advice for any particular project. Detailed installation instructions are available.*

## Grassrings reinforce the case for parking on grass

## The environmentally friendly turf reinforcement module

### AIRFIELDS



### ACCESS AREAS



### GOLF CART PATHS



### CARAVAN/CAMPING



### FOOTPATHS



Grassrings are moulded from recycled plastic containers etc., turning what would have been environmentally unfriendly rubbish into a product that enhances the environment.



### Environmental benefits

- Reduces the need for hard surfaces
- Waterway contamination reduced
- Increases the green environment
- Storm-water run-off reduced
- Tree roots protected
- 100% recycled plastic
- Erosion control
- Recycling of plastic keeps it out of landfill
- Retention and stabilisation of soil surfaces
- Include it in your sustainable urban drainage scheme (SUDs)



### Product specification

Injection moulded panels nom. 500mm x 500mm x 27mm high rings with hook and hole connection for joining into rolls or easy site laying. Colour: black

These suggestions and data are based on information we believe to be reliable. They are offered in good faith, but without guarantee, as conditions and methods of use of our products are beyond our control. We recommend that the prospective user determine the suitability of our materials and suggestions before adopting them on a commercial scale.

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