ComCELL ™ GEOCELL CONFINEMENT SYSTEM FOR TREE ROOT PROTECTION

Comcell is a geocellular sub-base confinement system designed for the protection of tree roots where the construction of roads, car parks and access routes are required in the vicinity of trees and where Tree Preservation Orders (TPO) may be enforced. The structure confines and stabilises the sub-base stone ensuring that vehicle loads are dissipated, rutting and soil compaction is prevented and damage to tree roots is avoided. When installed as advised, Comcell will also allow the continued passage and circulation of air, water and nutrients to tree roots to sustain a healthy growing environment as recommended by the following 2 documents:

- British Standard BS5837: 'Trees in Relation to Construction' (2005).
- Arboricultural Advisory and Information Service: Practice Note 1 – 'Driveways Close to Trees' (APN1)

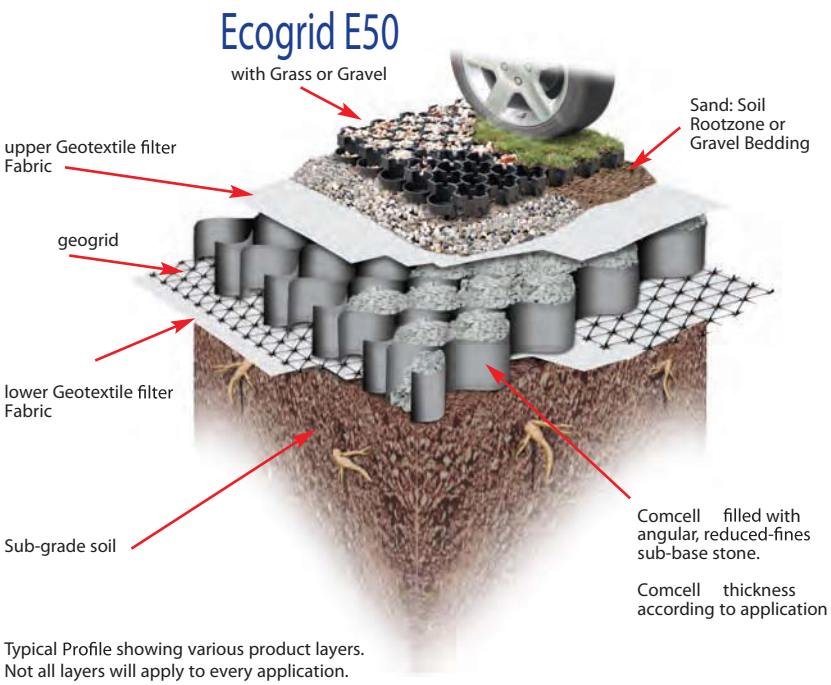
Comcell is supplied flat packed and opens to form a strong geocellular structure. It is simply pinned in place using metal fixing pins as described.

In this type of 'Reduced-Dig' or 'No-Dig' Tree Route Protection application, Comcell is intended for use in conjunction with a water and gas permeable SuDS (Sustainable Drainage System) compliant pavement surface product such as Ecogrid E50 or S50 cellular plastic paving, Concrete Porous Block Paving or Porous Asphalt surfaces. Although Comcell can be used by traffic in isolation for a very limited period when filled; it is not advised that Comcell ™ is used as the permanent surface finish for vehicle access routes. Exceptions may arise where Comcell is installed as a temporary haul road for example as a site access route and may be removed and disposed of or fully re-surfaced after use. Refer to installation method details for further information.

GENERAL INSTALLATION ADVICE FOR ALL APPLICATIONS

Prior to commencing works it is advisable to seek the professional opinion and approval of the Local Planning Department and Arboriculture Officer. Specific design limitations may be determined by Tree Officers, Engineers or Planners and must be closely adhered to. All applications will vary according to the site conditions and specific tree species involved. The ground and tree roots within the tree root protection zone must be protected from compaction and damage at all stages of the construction works. Works may involve varying degrees of excavation or build-up where edge retention is required, which must avoid root damage and soil compaction. The use of mechanical equipment or even low ground pressure machinery in the tree root protection zone must be avoided and hand tools may be the only method of excavation close to the root system.

Typical Profile



Typical Profile showing various product layers.
Not all layers will apply to every application.

SPECIFICA TIONS

PRODUCT	PANEL SIZE	CELL DIAMETER & DEPTH	PANEL WEIGHT	MATERIAL	LOADING APPLICATION	PART No.
Comcell 250/100	5m x 7m	250mm x 100mm	18kg	Non-woven Polypropylene	Pedestrians	051397
Comcell 250/150	5m x 7m	250mm x 150mm	25kg	Non-woven Polypropylene	Cars/Light vehicles	051403
Comcell 220/200	6m x 3m	220mm x 200mm	20kg	Non-woven Polypropylene	HGV's	051380

PRODUCT	MATERIAL	SIZE	UNIT	PART No.
Fixing J-Pin	Steel rod	550mm long x 8mm dia	Each	051038

ComCELL TREE ROOT PROTECTION GEOCELL

INSTALLATION METHOD FOR PERMANENT ACCESS ROUTES AND CAR PARKS

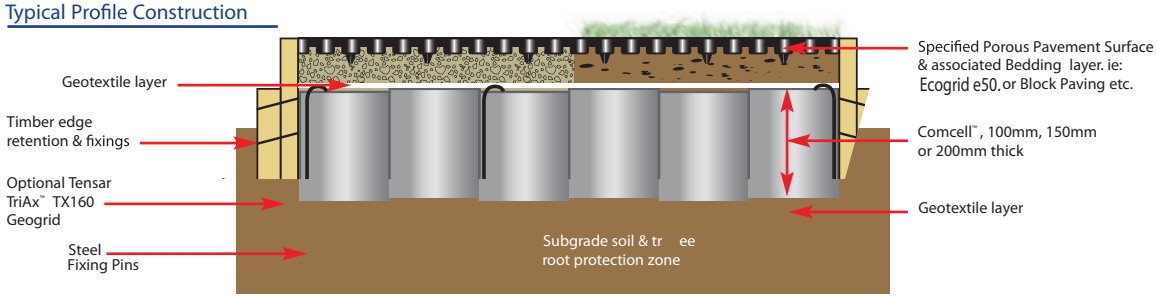
1. Obtain the approval of the Local Planning Department and Arboriculture Officer that this method of construction is appropriate and acceptable for the application and to determine the limits of construction and proximity to the tree.
2. Prepare the site by carefully removing all debris and reducing surface levels to the allowable reduced dig as appropriate to the specification, whilst strictly avoiding soil compaction and tree root damage. Build-up directly on the existing surface levels may be necessary.
3. Ensure that the prepared surface is reasonably even and fill any localised depressions with sharp sand to achieve an even surface profile. Do not roll or consolidate the area.
4. Install tanalised timber edging boards or other approved edge retention to the perimeter of the construction zone as appropriate to the total layer profile thickness. Avoid damage to tree roots when placing fixing posts and pegs. Concrete kerbs are unlikely to be appropriate or allowed.
5. Install a layer of Geotextile Fabric across the site, overlapping adjacent rolls by a minimum of 150mm. It may be necessary to lightly pin the Geotextile in place until the overlying layers are installed .
6. An optional layer of Tensar TX160 TriAx ™ Geogrid may be required at this stage, possibly determined by the site soil strengths (i.e. weak CBR% strength*), the proposed application and applied load such as HGV's. In some cases the TX160 layer may also aid the reduction of the required layer thickness ofComcell ™ where an extremely limited allowable excavation or build-up has been applied. Place the Geogrid layer over the Geotextile Fabric layer and fix down using steel pins to hold flat. Overlap adjacent rolls by minimum 150mm. Avoid tree root damage and soil compaction.
7. Open out and lay the specified layer thickness of Comcell™ (100mm/150mm/200mm deep) and pin in place between the edging boards. It may be necessary to cut the Comcell™ to size using a sharp knife or it can be left uncut and folded up against the edgings if preferred.
8. Pin theComcell ™ in place using Steel Fixing Pins or similar approved. The pins are generally used to maintain the cells in an open and fully expanded position whilst the cells are being filled and also to stop the structure from being pushed up by migrating aggregate during the filling process. Pin spacing will vary according to the site conditions, but will generally be required at 1m – 2m centres on flat surfaces, mainly placed around the perimeter of the area and where adjacent sections of Comcell ™ abut each other , with less in the middle of the area. Drive the pins in so that they are just touching the top of the cells but do not compress the fabric. Avoid tree root damage during the pinning process.
9. Fill the Comcell™ working toward the tree from the furthest point away and using the filled Comcell ™ as a platform. The cells must be filled with clean, open graded angular aggregate, normally in the particle size range of 5mm - 45mm. Not single sized or rounded aggregate. The project engineer may determine alternative fill materials such as clean 4/20 or 4/40 stone or a reduced-fines DoT Type 1X sub-base. It is not acceptable to use a standard DoT Type 1 Sub-base within the cells for tree root protection. Do not roll the surface, a light vibratory compaction plate (whacker) may be permitted to settle the stone into the cells, seek advice from the specifier or Tree Officer on this detail. Do not contaminate the filled cells with site debris, soil or mud.
10. Install the permeable pavement layer/wearing course i.e. Ecogrid E50 Block Paving, Porous Asphalt, on top of the Comcell™ according to the manufacturers recommendations. Each porous pavement layer will have a specific design layer requirement; therefore for example, where a sand or sand:soil bedding layer is specified or a contaminant filtration layer is required, then a layer of Geotextile Fabric shall be placed above the Comcell™ prior to the pavement bedding layer being installed and finished according to manufacturers instructions. The Geotextile will stop the pavement bedding layer from migrating down into the aggregate voids within the Comcell ™.

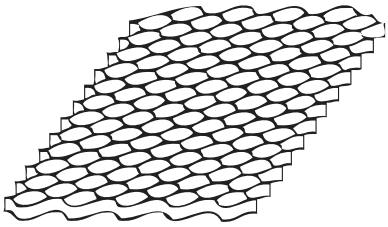
INSTALLATION METHOD FOR TEMPORARY ROADS AND SACRIFICIAL PAVEMENT LAYERS IN HAUL ROADS

In some applications Comcell may be installed as a temporary haul road base and completely removed after use. Alternatively it may have a sacrificial stone layer placed over it which is removed and replaced with a permanent permeable pavement solution when use of the haul road is complete.

1. Obtain the approval of the Local Planning Department and Arboriculture Officer that this method of construction is appropriate and acceptable for the temporary access and to determine the limits of construction and proximity to the tree.
2. Apply all construction detail as for items 2 to 9 above for 'Permanent Access Routes'.
3. Place a layer of Geotextile or greater strength Geotextile (i.e Terram 2000) onto the Comcell surface. The geotextile grade will be determined by the specific site design criteria and degree of haul road traffic proposed. This layer will be removed and replaced later if a porous pavement surface is being installed on the Comcell™.
4. Place a minimum 100mm thick layer of either clean graded stone or DoT Type 1 sub-base stone onto the surface. This will be the sacrificial pavement layer to be removed later. Aggregate specification will be determined by the project manager.
5. During use of the access route, routinely check for erosion of the surface and repair with stone as required to avoid exposure of the geotextile.
6. After the haul road use is completed, remove the sacrificial layer of stone and geotextile and replace with the preferred permeable pavement layer in accordance with manufacturers recommendations. Alternatively remove the entire construction profile to return the site to its original status. is critically important to avoid contamination of the remaining layer of open-graded stone within the Comcell™ where partial removal is carried out and at all times to avoid damage to tree roots and soil compaction during removal and disposal of the construction layers.
7. Where complete removal of Comcell™ is required, seek the specifiers' advice on renovation and restoration of the landscaped surfaces within the tree protection zone

Typical Profile Construction





Comcell Stabiliser

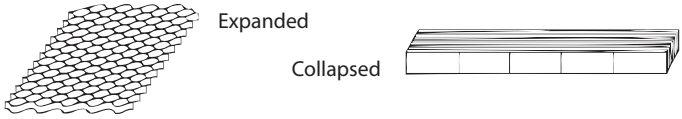
Comcell confines and stabilises the surface of weak soils by creating a honeycomb of interconnected polymer strips that form pockets to locate and strengthen the infill material.

DESCRIPTION

Comcell confines and stabilises the surface of weak soils by creating a honeycomb of interconnected polymer strips that form pockets to locate and strengthen the infill material. Comcell can be laid over stable slopes where the cell walls provide a tensile force increasing the strength of the material and acting as mini-weirs to reduce run off velocity and soil loss. On a slope Comcell is normally secured to the underlying material by frequent pinning, usually with steel pins. Where this is inadvisable or impossible, for instance when Comcell is installed over geomembrane, the webs should be secured to a high-strength looped geotextile (Punched Geotextile). Using this inexpensive system it is also possible to reduce foundation stone thickness under loaded areas by up to 50%. Earth retaining walls can be formed with horizontal layers of Comcell filled and placed one on another. A floral feature can be created by planting in the open front pockets.

CONSTRUCTION

Comcell is a honeycomb structure of polymer stripes securely bonded at the joints by ultrasonic welding. It is folded flat for transport and expanded on site. The honeycomb walls of Comcell RW are solid; the walls of Comcell RWX have a system of perforations which optimises the balance system between mechanical and hydraulic performance.



PROPERTIES

	RWX 100/300	RWX 150/300	RW 150/300	RW 200/300
Depth (mm)	100	150	150	200
Cell Size (mm)	300	300	300	300
Material	HDPE	HDPE	HDPE	HDPE
	Perforated - 15% open area		Unperforated	
Wall Thickness	1.2mm	1.2mm	1.2mm	1.2mm
Colour	Black	Black	Black	Black
Seam Tensile Strength	1200 N	1800 N	1800 N	2400 N
UV Stability	Excellent			
Standard Pin Length	400mm	400mm	400mm	500mm
Life Expectancy	120 years			

SPECIFICATION

The standard configuration of Comcell panels is a panel 6.0m x 4.0m (nominal) when expanded. The standard Comcell panel is specified by the depth and effective cell diameter.

DESIGN

Our Technical Department can offer advice and design proposals for the most economic use of the material. Design assistance is provided for selection, detailing and installation at no charge to the specifier or user.

SUPPLY

For transportation the collapsed dimensions of a standard panel are 9.0m x 0.10m x depth (0.1m or 0.15m); the collapsed panels are folder into a concertina shape and packed on a pallet for delivery.

CHEMICAL RESISTANCE

Comcell has excellent chemical resistance to a wide range of chemicals normally found in the ground. We will be pleased to advise on specific issues.

NOTES

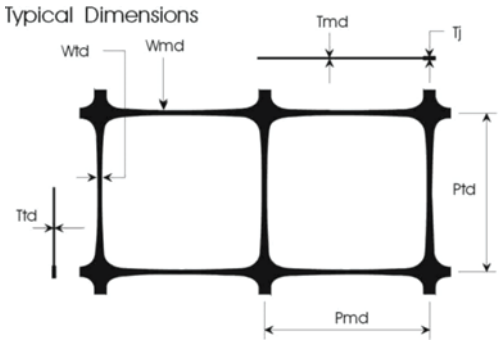
1. The values given are indicative and correspond to nominal results obtained in our laboratories and testing institutes.
2. In line with our policy of continuous improvement we reserve the right to make changes without notice.
3. Allowable tolerances ± 10% of the typical value.
4. The tensile strength of the web panel is inversely proportional to the cell diameter.
5. Please refer to separate sheet for fixing instructions including fixing density (number of pins).

E'Grid Biaxial Geogrid

E'grid Biaxial Polypropylene geogrids from GM can solve pavement problems by providing omni-axial reinforcement to granular sub-bases, capping layers and railway ballasts in areas of weak & variable soils.

When granular particles are compacted over these grids, they partially penetrate and project through the apertures to create a strong and positive interlock. The load dispersal effect from the interlocking mechanism increases shearing resistance within the soil, improving compaction and **allowing sub-base thickness to be reduced**, ultimately reducing construction time and cost.

Properties									Typical Dimensions						
		Tensile Strength		Tensile Load (KN/M)											
Product	Roll Size	(KN/m) (2)		2% Strain		5% Strain		Junction Efficiency %	Pmd	Ptd	Wmd	Wtd	Tj	Tmd	Ttd
	(m)	MD	TD	MD	TD	MD	TD								
E'GRID 2020	4 x 50	20	20	7.6	7.6	15.3	15.3	≥95	40	40	2	2.4	3.8	1.6	1.4
E'GRID 2020L	4 x 50	20	20	7.6	7.6	15.3	15.3	≥95	66	66	3.3	4	4	1.4	1.2
E'GRID 3030	4 x 50	30	30	11	11	21.6	21.6	≥95	40	40	2.2	2.7	4	2.4	1.8
E'GRID 3030L	4 x 50	30	30	12	12.5	24	25	≥95	66	66	3.3	4	4.5	2	1.4
E'GRID 4040	4 x 30	40	40	14.5	15	28	29	≥95	37	37	2.1	2.8	4.5	3.2	2
E'GRID 4040L	4 x 30	40	40	15	15	29	29	≥95	61	61	3.5	5	5.8	2.6	2.4



Note 1 In accordance with BS2782 Part 4, Method 452B, 1993.
Note 2 Measured in accordance with ISO10319 at 20 ± 2 °C; calculated as the 95% lower confidence limit in accordance with ISO2602 1980 (BS 2846 Part 2 1981).
Note 3 Other roll sizes are available to order
Note 4 Measured by comparing the results of tests in accordance with test methods GRI/GG2 and GRI/GG1

All E'Grid types are CE-certified by an independent notified body. E'Grid is a registered Trade Mark.

CE 3008

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