

BS5837:2012 -Trees in relation to design, demolition and construction. AIA, AMS & TPP in relation to trees at Dorcette House, Whaplode.

Prepared by: East Midlands Tree Surveys Ltd.

Date: 10/07/2023

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1. Instructions

This report was commissioned by Oglesby & Limb in relation to trees at St Norbert's Catholic Primary School, Crowle with instruction to provide the following in line with *BS5837:2012 Trees in relation to design, demolition and construction - Recommendations*.

- An Arb Impact Assessment along with an Arb Method Statement and Tree Protection details.
- This document should be read in conjunction with the Tree Constraints report dated 19/06/23

2. Arboricultural Impact Assessment.

See Appendix 1 for the Impact Assessment plans, Root Protection Areas in grey, crown spread in green along with shade pattern.

The proposed additional parking shows that NT1 Norway Spruce and H3 needs to be removed.

NT1 has no public visual amenity.

H3 is in poor condition being overgrown with Ivy which in fact forms the majority of the hedge in reality.

Replacement planting will be provided in mitigation.

The proposed extension to the off-site parking is within the RPAs of NT4, NT6 & NT10.

Discussions were had as to whether or not to remove these 2 Ash but concerns around stability for the remaining trees along that boundary were recognised.

Equally whilst NT10 is not a particularly good specimen, the preference is to retain it.

The proposed changes are however within the existing hard standing which comprises compacted gravel which appears to have been in situ for many years.

It is suggested that the existing surface is removed and replaced with a shallow no-dig solution which would in theory improve the current rooting situation. Finish to be porous.

There will be no impact on H1, H2, G1 or G2 subject to tree protection measures being adhered to.

The Site Construction Manager is to assess clearances in terms of trees at the proposed off-site parking bays with regards to plant machinery and materials.

If any lower limbs are restricting works/access, these will be tied back where possible, any pruning will be agreed with EMTS/LPA.



3. Arboricultural Method Statement & Tree Protection detail.

3.1 Sequenced Methods of Demolition, Construction and Tree Protection

With reference to relevant published guidance, the methodology of this statement follows a logical sequence essential to the efficacy of the protection measures. Reference may include: British Standard BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations; British Standard BS3998:2010 Tree Work. It is essential to the successful implementation of the principles set out in this document that effective supervision and enforcement are put in place from the outset.

3.2 Phase 1 - Undertake Arboricultural Works

Remove NT1 & H3.

Tree work requires skilled operators to perform pruning tasks in order to maintain the health and safe useful life expectancy of the trees, it is strongly recommended that construction staff DO NOT carry out any tree works.

Additional to this, a legal Duty of Care requires that all works specified should be carried out by qualified arboricultural contractors who have been competency tested to determine their suitability for such works in line with Health and Safety Executive guidelines. All works should be carried out in accordance with British Standard BS3998:2010 Recommendations for Tree Work.

Particular care needs to be addressed in dealing with legally protected species such as nesting birds and roosting bats which are protected under the Wildlife and Countryside Act 1981 (as amended) from intentional harm and killing and applies to roosting and hibernating bats and active bird nests. The protection of bird nests applies between mid-February to August inclusive.

3.3 Phase 2 - Tree Protection Fencing

The Tree Protection Plan can be found at Appendix 2.

The fencing shall be positioned as per the distances in red and to remain in place throughout construction and be removed only after completion of each phase.

The default specification as per figure 2 of BS 5837:2012 will be used within the garden area, and as per Figure 3 at the off-site parking area - see Appendix 3 in order to minimise the risk of damage to roots.

Within the fenced zone, no materials or chemicals should be stored at any time, no fires should be lit, no pedestrian or vehicle traffic, and level changes within these areas should be kept to an absolute minimum. Every effort should be taken to protect a maximum possible area of the root system.

It is not envisaged that the storage of materials during the construction Phase will be an issue due to the size of the site.

Clear notices are to be fixed to the outside of the fencing with words such as

‘TREE PROTECTION AREA – NO ACCESS OR WORKING WITHIN THIS AREA’.



See Appendix 4. These notices shall be A3 in size, laminated and fixed to the fencing using suitable aids such as tie wires.

The No-dig design will be installed as per the area identified on the AIA plan as per the 30mm Geopave specification at Appendix 5. The existing compacted gravel will be removed by hand along with any sub-base, this should provide the necessary depth for the install. Roots <25mm can be cleanly severed, if any roots greater than 25mm are encountered, EMTS are to be contacted to advise.

The site agent, all contractors and other relevant personnel are to be informed of the role of the Tree Protection Fencing and their importance. A copy of the Tree Protection Plan will be displayed on site at all times during construction.

A copy of the Tree protection Plan & Method Statement to be kept on site at all times.

An arboriculturist should be consulted where required during the construction process to address any issues that might arise regarding tree retention, protection, and management. It is the responsibility of the site owner, manager, and main contractor to ensure that any tree protection or other relevant planning conditions, or TPO's are adhered to. A breach of a planning condition or TPO may result in enforcement action by the LA.

It will be necessary to supervise the operation of tall or wide machinery such as booms or jibs during the installation work in proximity to the canopies of retained trees.

It is recommended that a pre-commencement meeting be arranged with the contractors who may be operating the machinery to address/overcome any concerns about close by branches and to organize further mitigating pruning if required.

NHBC guidelines on foundation depth in proximity to trees should still be followed. This will be determined by a structural engineer but should be guided by information in this report and appropriate sampling to determine soil profiles at the site.

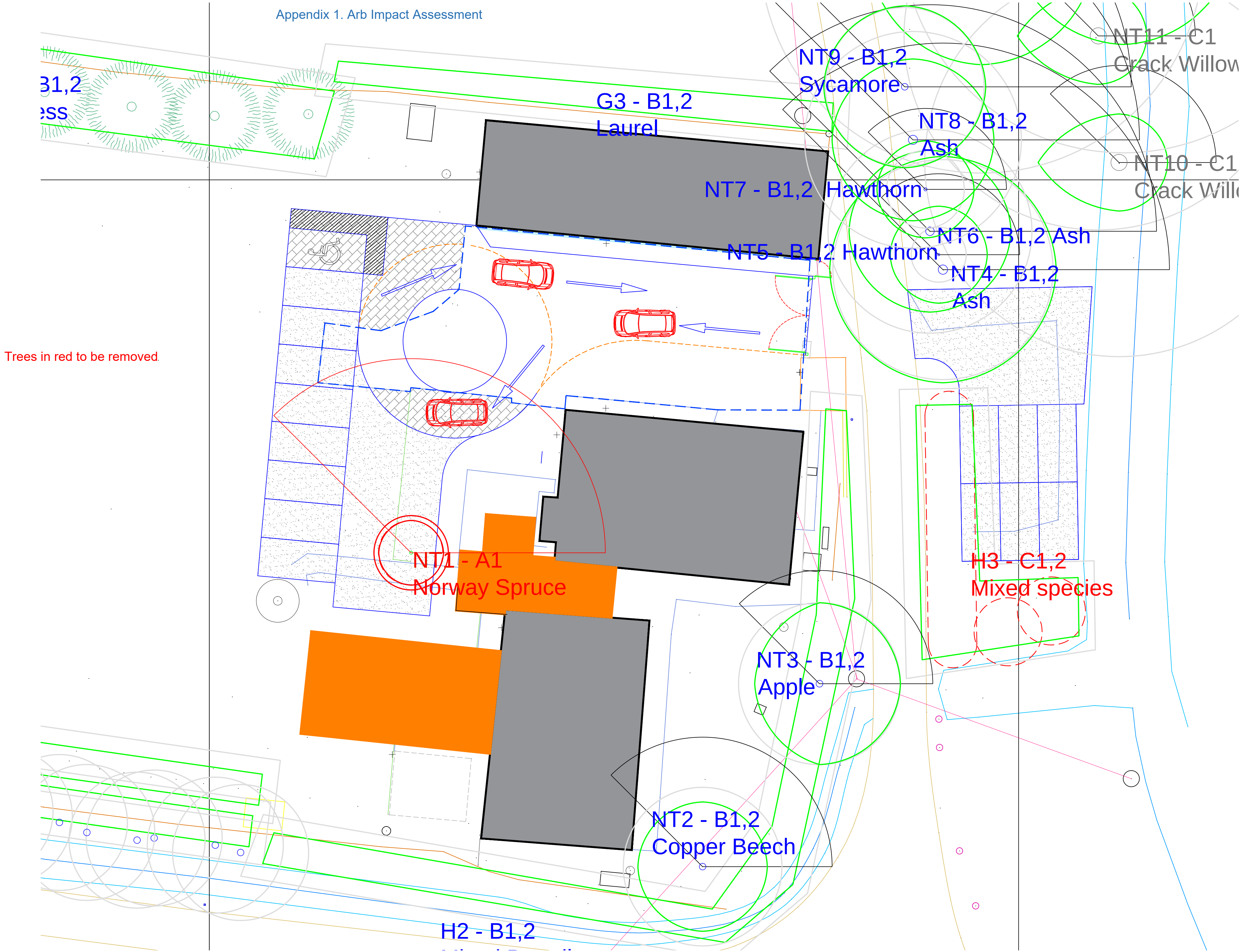


John Wilcockson – Director, East Midlands Tree Surveys LTD.

Tech Cert (Arbor A), NDF For

10/12/20





Fence positioned against trunk of NT4 and to extend to drain edge

No-dig design surface.

Fence
positioned
2m from
hedge
centre

Fence positioned 5.5m from hedge centre

H1 - B1,2 Beech

G1 - B1,2
Lombardy Poplar

H2 - B1,2
Mixed Broadleaves

NT9 - B1,2
Sycamore

G3 - B1,2
Laurel

NT8 - B1,2
Ash

NT7 - B1,2 Hawthorn

NT5 - B1.2 Hawthorn

NT6 - B1,2 Ash

~~NT4-B1,2~~
Ash

NT11 - C1
Crack Willow

NT10 - C1
Crack Will

NT3 - B1,2
Apple

NT2 - B1,2
Copper Beech

NT11 - C1
Crack Willow

NT10 - C1
Crack Willow

Fence position against of NT4 extend edge

No-dig surface

Appendix 3. Fence specification.

Figure 2 Default specification for protective barrier

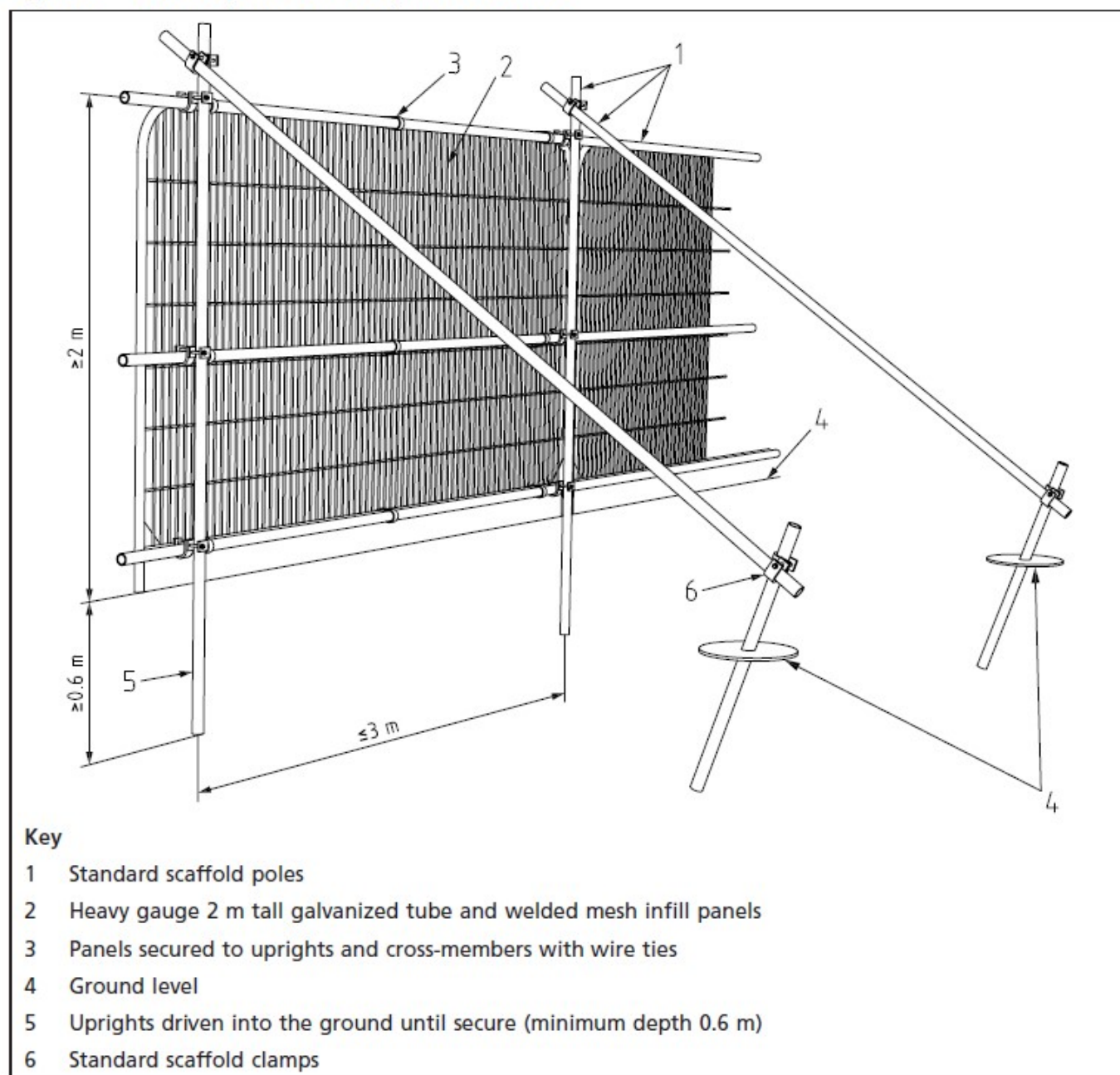
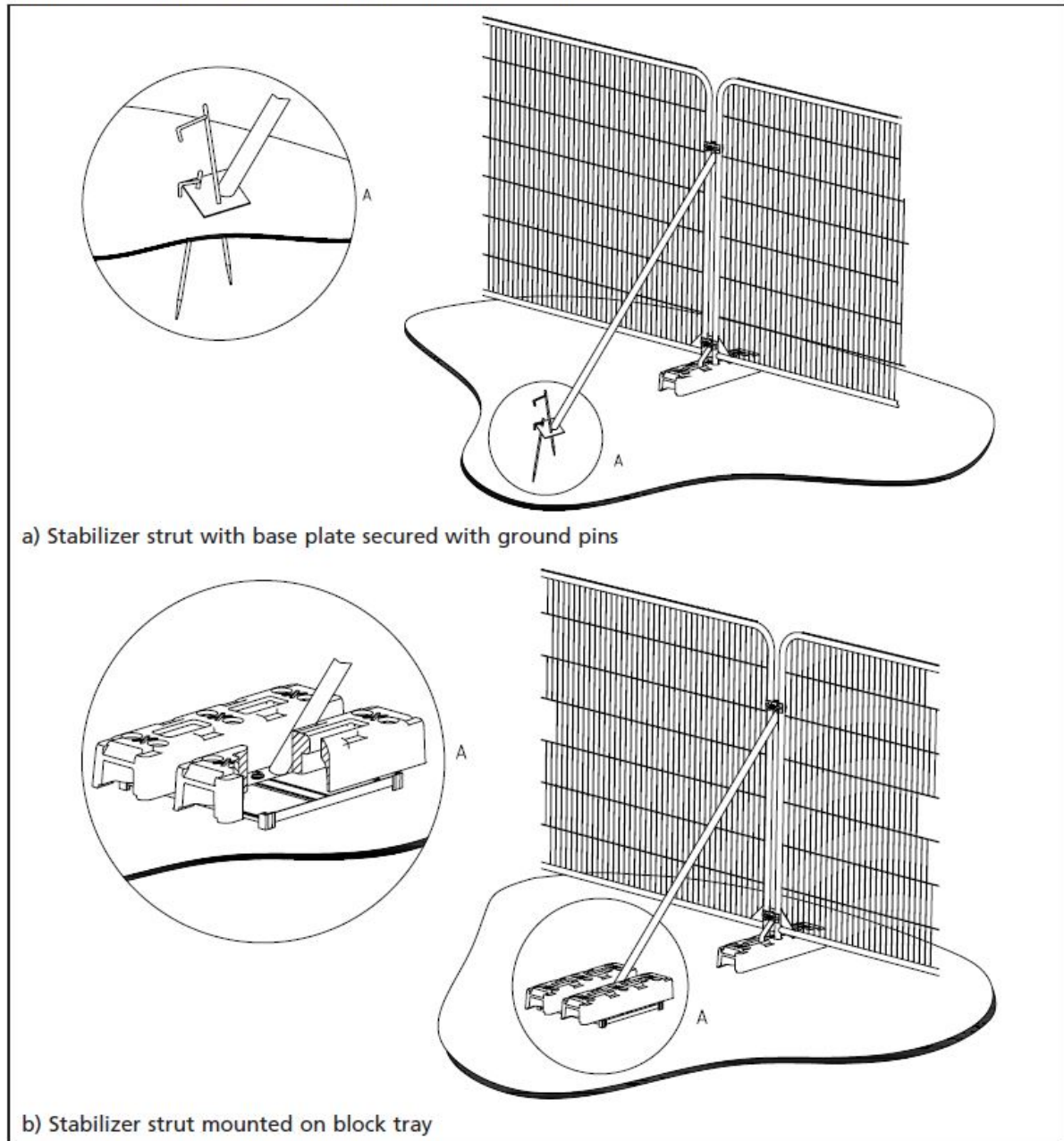


Figure 3 Examples of above-ground stabilizing systems



Appendix 4. Signs.



PRESTO



porous pavement solutions

RIGID PAVERS

GEOBLOCK[®]
grass pavers



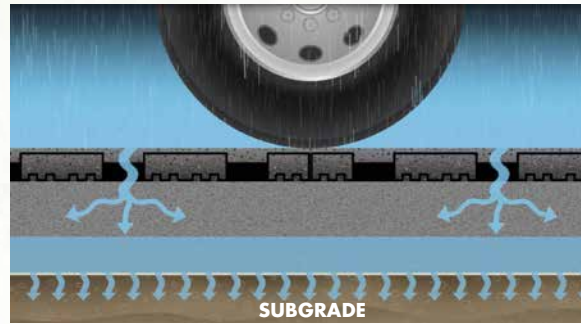
GEOPAVE[®]
aggregate pavers



GEOBLOCK® & GEOPAVE® POROUS PAVEMENT SYSTEMS

RIGID PAVERS DELIVER PERFORMANCE.

Environmental regulations that control and limit stormwater runoff, reduce impervious surface, and increase green space have resulted in the growth of permeable pavements for traffic areas. Presto manufactures two high-quality rigid pavers that offer numerous environmental and performance benefits over hard surface pavements.



POROUS PAVEMENT OPTIONS

Presto's GEOBLOCK® and GEOPAVE® systems are both rigid porous pavements designed to handle the most demanding load support requirements while promoting natural stormwater infiltration, reducing runoff, and reducing the need for detention or retention ponds.

GEOBLOCK® GRASS PAVERS

Robust design delivers exceptional protection to turf, resistance to torsional loading stresses and support for optimal growing medium.



GEOPAVE® AGGREGATE PAVERS

Molded mesh bottom design spreads loads and keeps highly-permeable aggregate confined for maximum stormwater infiltration and on-site storage.

Shown with SNAP delineators.





COMMON POROUS PAVEMENT APPLICATIONS

- Access Roads: Emergency, Maintenance & Utility Vehicles
- Roadways: Shoulders, Pull-off Areas
- Parking Areas: Daily, Overflow
- Trails & Walkways: Pedestrian Trails, Greenways, Barrier-Free Access
- Golf Courses: Cart Pathways & Edging, Tee Areas
- Residential: Driveways, Parking Areas, Camper & Boat Bays
- General: Event Areas, Pedestrian

AREAS OF USE:

- Condominiums & Housing Complexes
- Commercial Buildings
- Educational Campuses
- Parks & Nature Preserves
- Hospitals & Medical Centers
- Shopping Centers
- Sports Facilities
- Golf Courses
- Churches
- Residential





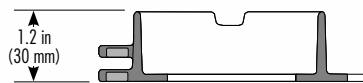
GEOBLOCK® & GEOBLOCK®5150

GRASS PAVERS FOR OCCASIONAL TRAFFIC

The industry's strongest and most proven, high-performance turf protection systems address all vehicle loading and stormwater requirements. The GEOBLOCK® & GEOBLOCK®5150 systems' engineered base material supports loading up to H-20, is highly permeable to maximize stormwater percolation and, with topsoil infill, offers an optimal growing medium for vegetation.

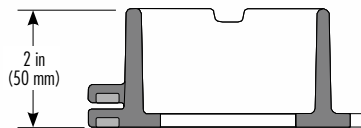


GEOBLOCK®
1.2" wall height

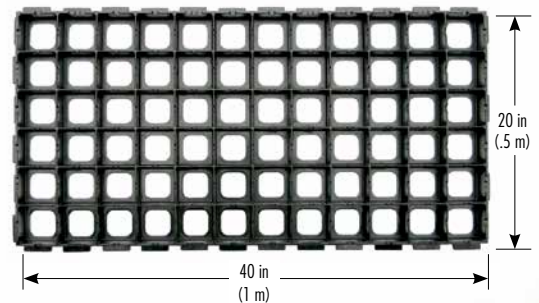


GEOBLOCK®

GEOBLOCK®5150
2" wall height



GEOBLOCK®5150



GEOBLOCK® & GEOBLOCK®5150 PERFORMANCE POINTS

High Load Transfer & Flexural Strength

The large, rigid surface area with interconnected cell walls and strong interlocking connections offers the highest load transfer and flexural strength in the industry.

Resistance to Torsional Loads

The rigid design with shared walls and strong interlocking connections resists movement or breakage from vehicle turning stresses and torsional loading.

Resistance to Rutting

Interconnected cell walls spread point loads across the paver system with minimal 'flexing', eliminating potential for concentrated drive lane rutting.

Turf Performance

Deep, interconnected cells protect topsoil and grass from damage caused by repeated loading. Topsoil infill supports healthy grass that establishes faster, remains hardier, and performs better than systems with sand infill. The engineered base material contributes to good percolation, healthy grass growth, and long-term performance.

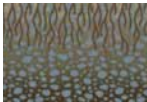
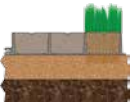
Low Base Requirements

Strong unit strength lowers installation costs by requiring less base depth than lighter-weight or rolled systems to achieve H-20 loading.



**GEOBLOCK® RIGID grass pavers offer
SUPERIOR PERFORMANCE BENEFITS**

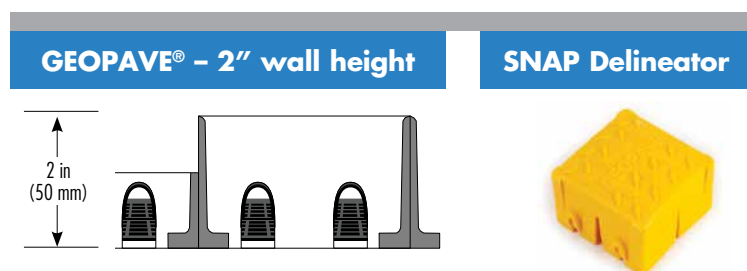
GEOBLOCK® & GEOBLOCK®5150 PERFORMANCE COMPARISON TO ROLLED PRODUCTS

							
Performance Point	Load Distribution & Resistance to Torsional Loads	Resistance to Concentrated Rutting	Base Requirements	Medium for Vegetative Growth	Turf Protection	Turf Performance	Stormwater Infiltration
GEOBLOCK® Rigid Pavers	✓ Contiguous pavement with shared walls offers highest load distribution and resistance to vehicle loading stresses.	✓ Interconnected cell walls spread point loads across the paver system for a high resistance to concentrated rutting.	✓ Higher paver strength results in higher performance with less base material. Less base = less excavation cost and less land disturbance. Paver units can even be driven on unfilled.	✓ Engineered base mix of clear stone/topsoil offers high percolation rate and an ideal medium for vegetative root growth. Grass establishes faster and remains hardier without additives.	✓ Deep, interconnected cell walls encapsulate and protect topsoil and grass from damage caused by repeated loading for optimal turf protection.	✓ Good turf protection, and topsoil infill and engineered base offer high percolation to support healthy grass. Grass establishes faster, remains hardier, requires less maintenance and performs better long term.	✓ Topsoil infill and engineered base offer a 5-10X faster percolation rate and better water storage capacity.
Flexible Rolled Systems	Disjointed cell walls flex under loading, offering lower load distribution and resistance to torsional stresses.	Flexible rolled systems flex upon loading, making them extremely prone to rutting.	Flexible rolled systems rely on sand infill and deeper base (up to 2X more) for strength.	Flexible systems require sand infill and roadbase to achieve strength—both poor growing mediums for vegetation.	The gaps between cells allow the pavement to flex under wheel loading, resulting in less protection to the turf.	Sand infill and road gravel base cannot sustain vegetation long term.	Sand infill and road gravel base offer a lower infiltration rate and storage capacity.



GEOPAVE® AGGREGATE PAVERS FOR EVERYDAY TRAFFIC

The industry's only aggregate paver system designed from the ground up for aggregate infill. The GEOPAVE® system's structural framework holds highly-permeable, open-graded base course in place through a unique herringbone cell pattern and monolithic mesh bottom. Strong connections create one contiguous pavement that is highly resistant to traffic loading and torsional stresses. The herringbone surface offers a paver-stone aesthetic and allows colored stone for design options and area differentiation. GEOPAVE® pavements are a natural way to infiltrate and store stormwater on-site.



GEOPAVE®

PERFORMANCE POINTS

High Load Distribution

A shared wall system, strong connection clips and load-spreading mesh bottom (snow-shoe effect) offers an industry-high load transfer capability.

Resistance to Torsional Loads

A shared wall system and strong connection clips create a contiguous framework that resists movement or breakage from vehicle turning stresses and torsional loads.

Resistance to Rutting

Interconnected cell walls spread point loads across the paver system with minimal 'flexing', eliminating potential for concentrated drive lane rutting.

Aggregate Containment

A monolithic mesh bottom design keeps aggregate infill contained and prevents the 'lifting' effect from granular fill downward migration.

Low Base Requirements

Strong paver strength lowers installation costs by requiring less base depth than lighter-weight or rolled systems to achieve H-20 loading.



**GEOPAVE® RIGID aggregate pavers offer
SUPERIOR PERFORMANCE BENEFITS**

GEOPAVE®

PERFORMANCE COMPARISON TO ROLLED PRODUCTS

Performance Point	 Load Distribution	 Resistance to Torsional Loading	 Resistance to Concentrated Rutting	 Aggregate Containment	 Base Requirements	 Storm water Infiltration
GEOPAVE® Rigid Pavers	 Contiguous pavement with shared walls, strong connection clips, and load-spreading mesh bottom offers high distribution of vehicle loads.	 A shared wall system and strong connections create a framework highly resistant to movement or breakage from vehicle turning stresses and torsional loads.	 A shared wall system and strong connections distribute point loads laterally and is highly resistant to concentrated rutting even in high traffic areas.	 An integral mesh bottom keeps aggregate contained, preventing the 'lifting' effect from granular fill downward migration.	 Interconnected cell walls and strong connections create a robust paver structure with low base requirements for structural strength.	 Highly-permeable open-graded aggregate infill infiltrates stormwater exceptionally fast.
Flexible Rolled System	Disjointed cell walls that 'flex' and shallow cells do not effectively spread loading across the pavement surface.	Disjointed cell walls and weak connection points are susceptible to movement and breakage under vehicle torsional loads.	Disjointed cell walls that 'flex' under loading allow for deep rutting over time in wheel lanes.	Flexible rolled systems are typical with glued-on fabric bottoms, which are susceptible to tearing, allowing aggregate to push through the bottom.	Shallow cell walls and cell wall gaps have lower load-spreading capability, creating need for higher base requirements for structural strength.	Rolled systems with glued fabric bottoms clog and percolate much more slowly.

STORMWATER & ENVIRONMENTAL BENEFITS

Achieve your green building and stormwater goals by incorporating the proven **GEOBLOCK® & GEOPAVE®** porous pavements in your landscape plans.

HIGH PERMEABILITY

Highly permeable systems increase groundwater recharge and decrease surface runoff associated with stormwater discharge from paved areas.

Our systems minimize site disruption and the development footprint by reducing or eliminating the need for larger, on-site stormwater ponds.

STORMWATER STORAGE

GEOPAVE® pavements function as a stormwater detention/retention layer storage 'basin' and can complement underground storage systems. Depth of base can be increased when additional stormwater storage is required.

IMPROVES STORMWATER QUALITY

Both pavements increase natural water infiltration, filter contaminants and reduce non-point source pollution.

RECYCLED MATERIAL CONTENT

GEOBLOCK® and GEOPAVE® pavers are manufactured from up to 97% recycled polyethylene.

COOLER SURFACE

Grass and aggregate are cooler pavements that reduce the heat island effect associated with traditional hard pavements.

ENHANCE THE BUILT ENVIRONMENT.

Design long-lasting, permeable pavements that perform to stringent loading and stormwater requirements and minimize environmental impacts.



CONTRIBUTIONS TO GREEN INFRASTRUCTURE (GI) & LOW IMPACT DEVELOPMENT (LID) DESIGN

GEOBLOCK® and GEOPAVE® solutions are suitable for green infrastructure (GI) and low impact development (LID) land planning. Both systems promote stormwater infiltration and reduce environmental impact through their permeable pavement surfaces to effectively manage stormwater runoff at its source.

Contributions to U.S. Green Building LEED® Credits

Both the GEOBLOCK® and GEOPAVE® systems offer contributions to USGBC LEED® credits in these categories:

- Reduced Site Disturbance
- Stormwater Management
- Reduced Heat Island Effect
- Recycled Content

Many prestigious LEED® projects have included GEOBLOCK® and GEOPAVE® porous pavements because of their numerous credit contributions and the systems' sustainability and performance.

DESIGN RESOURCES

SPECIFICATION & PLANNING TOOLS

Presto offers comprehensive and easy-to-use resources and tools for designing GEOBLOCK®, GEOBLOCK®5150 and GEOPAVE® porous pavements. CSI-specifications, CAD details, design resources and videos are available for each product.

Presto SPECMaker® Specification Tool

Our online SPECMaker® specification program lets designers build custom 3-part CSI specifications in 5 minutes or less.

Industry Standard Resources

Presto's product specifications, CAD details and BIM models are available in industry-standard formats on ARCAT.com and CADDetails.com, leading providers of manufacturer-specific building product information for architects, engineers and contractors.



Depth of Engineered BASE Recommendation

DESCRIPTION	GEOBLOCK®		GEOBLOCK®5150		GEOPAVE®	
	VEGETATED SURFACES Topsoil Infill Topsoil/Aggregate Base		VEGETATED SURFACES Topsoil Infill Topsoil/Aggregate Base		AGGREGATE SURFACES Aggregate Infill Aggregate Base	
	CBR ¹ 2-4	CBR >4	CBR ¹ 2-4	CBR >4	CBR ¹ 2-4	CBR >4
Heavy Fire Truck & H-20 Loading Typical 110 psi, 80,000 lb Single axle loading of 32 kips, tandem axle loading of 48 kips	14 in (350 mm)	10 in (250 mm)	6 in (150 mm)	4 in (100 mm)	6 in (150 mm)	6 in (150 mm)
	Infrequent Passes		Infrequent Passes		Normal Traffic	
Light Fire Truck & H-15 Loading Typical 85 psi, 60,000 lb Single axle loading of 24 kips	10 in (250 mm)	6-10 in (150-250 mm)	4 in (100 mm)	2 in (50 mm)	6 in (150 mm)	4 in (100 mm)
	Infrequent Passes		Infrequent Passes		Normal Traffic	
Utility/Delivery Truck & H-10 Loading Typical 60 psi, 40,000 lb Single axle loading of 16 kips	6-10 in (150-250 mm)	4-8 in (100-200 mm)	2 in (50 mm)	2 in (50 mm)	4 in (100 mm)	2 in (50 mm)
	Infrequent Passes		Infrequent Passes		Normal Traffic	
Cars & Pickup Truck Access Typical 45 psi, 8,000 lb Single axle loading of 4 kips	4-8 in (100-200 mm)	2-4 in (50-100 mm)	None	None	2 in (50 mm)	None ²
	Occasional Passes		Occasional Passes		Normal Traffic	
Trail Use: Surface Stabilization <1,000 lb Loading for ATVs, golf carts, campers, boats, equestrian, motorcycle, bicycle, pedestrian, wheelchairs	2-4 in (50-100 mm)	0-2 in (0-50 mm)	None	None	None	None

¹ For CBR<2, contact Presto Products Company for recommendations. CBR is the abbreviation for California Bearing Ratio.

² A minimum of 2 inches of aggregate base should be placed below the GEOPAVE units as a drainage layer and an infiltration storage area. Greater depth may be required depending upon design rainfall requirements and subbase permeability.

The Engineer of Record shall be responsible for the design and stability of the open graded base course.



SITE PLANNING & DESIGN

CREATE YOUR DESIGN VISION

Enhance your site plans with two unique porous pavement solutions that will define your design vision. Include GEOBLOCK® and GEOPAVE® systems in your landscape plan for optimal performance and stormwater benefits—as well as to make unique aesthetic design statements.





PRESTO GEOSYSTEMS'®
COMMITMENT — *To provide the
 highest quality products and solutions.*

Presto GEOSYSTEMS® is committed to helping you apply the best solution to your porous pavement requirements. Rely on the leaders in the industry when you need a solution that is right for your application.

Contact Presto GEOSYSTEMS® or their network of knowledgeable distributors/representatives for assistance with your permeable pavement needs.

CONSTRUCTION RESOURCES

INSTALLATION TOOLS

GEOBLOCK® and GEOPAVE® systems are designed for easy installation—requiring less site preparation, less subgrade improvement, less excavation and less structural base than other porous pavement systems.

The paver units are easily cut with ordinary hand or power tools for installing around obstructions and contours, as well as irrigation systems. Their easy-to-handle size minimizes the quantity of units required on a given job, reducing labor and installation costs.

Product is shipped in cubes that allow stacking for maximum shipping efficiency.

GEOBLOCK® and GEOPAVE® pavers can be driven on when unfilled, facilitating construction equipment for installation of the topsoil infill.

Site Evaluation and On-Site Installation Support

A qualified manufacturer's representative may be contracted to assist with pre-construction site evaluation, construction training or on-site supervision.

Contact Presto GEOSYSTEMS® for details.





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