

Arboricultural Method Statement

Land at
Land at
22 Bryn Estyn Road
Phase 2

Ref:
AMS/BER/01/18

Date:
5th October 2018

Commissioned by:
Mr D. Edwards
On behalf of
Blueprint Architectural

Prepared by
S. Shields

Arboricultural Method Statement

&

Tree Protection Plan

For installation of Cellular Confinement System Access Drive

Land at

22 Bryn Estyn Road

Wrexham

This Arboricultural Method Statement & Tree Protection Plan has been prepared in accordance with the protocols, standards and procedures set out in BS 5837: 2012 'Trees in relation to design, demolition and construction'.

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Contents

1.0	Instruction
2.0	Site Description
3.0	Arboricultural Operations
4.0	Construction Performance Specification
5.0	Arboricultural Method Statement

Instruction

- 1.1 Shields Arboricultural Consultancy received instructions from Mr D. Edwards on behalf of Blueprint Architectural LTD to provide a site specific Tree Protection Plan and Arboricultural Method Statement covering all construction operations at the above site in connection with the conditionally approved planning permission ref: P/2018/0594. The client or their agents may copy and distribute this report as required for the purpose of applying for planning permission for or preparing any documents or plans for this or future applications at this site.
- 1.2 Full planning permission has been conditionally granted to construct two detached dwellings following the demolition of an existing dwelling and in accordance with the approved plans and particulars of application P/2018/0594.

Site description

- 2.1 The site is currently supports a detached dwelling and private garden, along with an additional area of land adjoining the garden to the south. Access to the site is off Bryn Estyn Road, which runs adjacent to the north boundary. The site also has boundaries with adjacent residential dwellings to the west and south and with agricultural land to the east.

Arboricultural Operations

Permission to remove any tree must be obtained from the Local Planning Authority and must not be undertaken until all pre-commencement conditions have been discharged.

- 3.1 Tree removal and pruning will be required to implement this development, as described in the Arboricultural Impact Assessment ref: AIA/BER/01/18/Rev A, forming part of the approved plans and particulars. It is recommended that the work should be undertaken by a suitably qualified person, holding public liability insurance for the sum of £5,000 000. All operators must hold relevant NPTC certificates. A site specific risk assessment must be prepared and operators must work to a health and safety method statement. The use of Arboricultural Association Approved Contractors www.trees.org.uk/find-a-professional/Directory-of-Tree-Surgeons is recommended.
- 3.2 The contractor undertaking the work is responsible for any loss or damage arising as a result of the operations and agrees to indemnify the owner against such occurrences.
- 3.3 All tree protection measure specified in the following section and shown on the accompanying TPP are to be fully installed prior to the commencement of the arboricultural works. Where access is required to the trees, then suitable ground protection must be used in lieu of the tree protection fences.

Construction Performance Specifications

No Dig CCS Driveway Specification

NB Where no dig construction is specified this must be installed prior to any machinery access in the area or an alternative temporary ground protection system must be used.

- 4.1 In order to access the new dwellings the approved plans indicate that a new driveway will be formed over an area of existing driveway and lawn, part of which is within the RPA of retained trees T1 & T2 and is indicated as a Precautionary Area on the Tree Protection Plan. The formation of the new drive has the potential to cause damage to the root system and soil environment which would be detrimental to the trees. To avoid this, it is specified that a no dig method of construction utilising the cell web TRP cellular confinement system (*Geosynthetics Limited, Fleming Road, Harrowbrook Ind Est, Hinckley, Leicestershire, LE10 3DU. Tel: 01455 617139*) is used to construct the driveway. For details of exact specification see technical specification ref: TR18-2753_RUR_CEL_BRW-09-18, appendix A.
- 4.2 Essentially no-dig CCS are installed over existing ground levels and without the need for compacting the sub-base. This ensures that the tree's root system is not damaged by excavation and the soil structure is maintained. Using a porous tarmac or other porous top surface such as gravel, ensures that water can permeate through the footpath to the root system and the exchange of gases and oxygen between the soil and the air is unaffected and is recommended. The CCS must be installed in accordance with the details provided in the AMS (see section 5).
- 4.3 In order to provide an even gradient access with the design of the no-dig CCS Driveway must take account of the Finished Floor Level of the new dwellings, the level of the existing drive, the height of the highest point of the existing ground level. The design will also need to consider surface transitions between the existing road and new driveway and the new driveway and the dwellings. In this case the heights between the existing and new driveway can be addressed through raising the levels of the existing surface without the need to disturb the underlying ground or through reducing ground levels outside the Precautionary Area where there would be no impact to the trees.

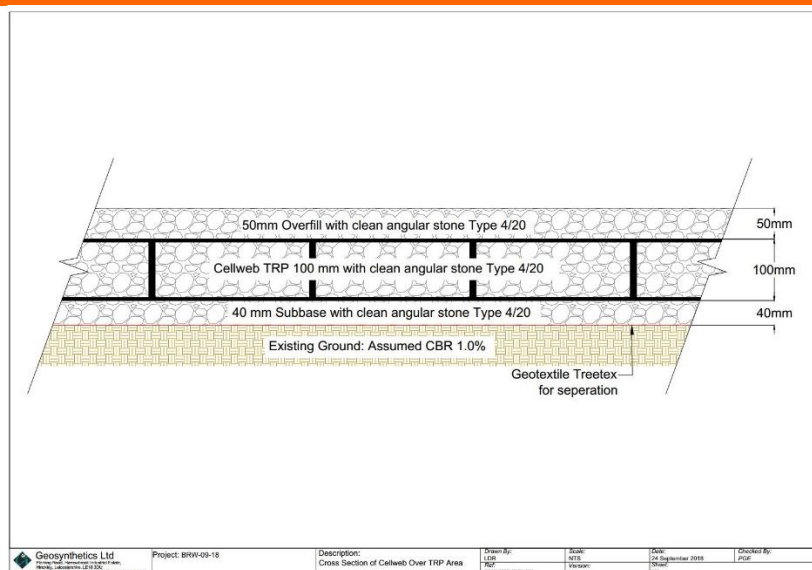
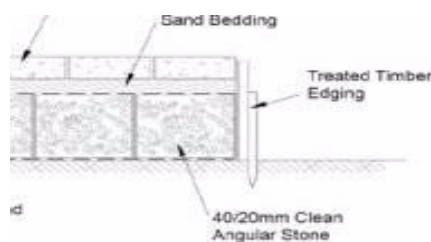


Figure 1 Cross Section Illustration of Cellweb TRP 100mm Cellular Confinement System

- 4.4 The CCS system is edged using treat timber boards held in place with short stakes. There a gap of 1m between the CCS and the base of any retained tree must be maintained. The edges of the CCS can be incorporated into the landscape using granular fill soil to create a graded edge.



N.B Appendix A provides Geosynthetic's recommended specifications for the no dig CCS driveway.

Arboricultural Method Statement

- 5.1 This arboricultural method statement (AMS) sets out the details of tree protection measures afforded to the retained trees on and adjacent to the site.
- 5.2 This AMS should be read in conjunction with the Tree Protection Plan (BER/TPP/OL/01/18). The TPP indicates the construction exclusion zone (CEZ) that must be maintained around each retained tree. These areas must remain undisturbed during the construction process and must be protected using suitable fencing or ground protection as specified.
- 5.3 Copies of the TPP & the AMS must be available on site and all tree protection requirements explained to all persons undertaking activities on the site during the site induction process.

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- 5.4 All general tree protection measures must be installed and inspected prior to bringing onto the site any plant, materials or equipment or undertaking any construction works or demolition or any arboricultural works. The LPA must be informed in writing once the tree protection measures are installed.
 - 5.5 The site is to be inspected by the consulting arboriculturalist in accordance with the schedule of inspections (see section 5.27).
 - 5.6 All measurements are given in metric using standard abbreviations.

Fencing and Ground Protection

- 5.7 The TPP indicates the position all protective fences.
- 5.8 Protective fencing will comprise herras fencing, securely fixed into place and braced to resist impact, or as otherwise agreed with the Local Planning Authority.
- 5.9 Ground protection is to be used within the Precautionary Area, identified on the TPP, during the construction phase of the development and will consist of a proprietary system such as Ground Guard protective plates which must extend over the entire PA indicated on the TPP and be securely fastened in place. The type of guard used must be suitable for loads up to 20 tonnes or more.
- 5.10 The protective fencing and ground protection must be inspected on installation and will remain in place until completion of the construction phase and then only removed with the consent of the LPA.
- 5.11 Other than works approved in writing by the LPA, no works including storage or dumping of materials shall take place within the exclusion zones defined by the protective fencing.

General Precautions

- 5.12 No materials that are likely to have an adverse effect on tree health such as oil, bitumen or cement will be stored or discharged within 10m of the trunk of a tree that is to be retained or within any part of the CEZ. Spills kits, suitable for the type fluids, fuels and chemicals stored on site must be available on site and site operatives must have training in their use.
- 5.13 No fires will be lit within 20m of the trunk of any tree that is to be retained.
- 5.14 Storage and mixing areas, contactor parking and all site huts must be outside the CEZ.
- 5.15 Access to the work area is via the main site entrance and must not traverse the CEZ.
- 5.16 All service and drainage routes, below or above ground must avoid the CEZ. All services are to be installed in accordance with NJUG volume 4 Guidelines.

Working within Precautionary Area

- 5.17 This section sets out the specific requirements when working within the Precautionary Area and should be read in conjunction with Tree Protection Plan ref: BER/TPP/OL/01/18/01. A pre-commencement meeting is to take place between site operatives and an arboriculturist from Shields Arboricultural Consultancy. This meeting will discuss the tree protection requirements.
- 5.18 Ground protection must be installed across the PA during all operations to construct the dwellings and garages. This ground protection must be retained in position unless it is removed to facilitate the installation of the access driveway or service as detailed below,
- 5.19 All services and drains for the new dwelling and garages are to be installed in accordance with NJUG volume 4 Guidelines. It is recommended that the service ducts and drains are situated outside the PA, where this is not possible they must be installed using a broken trench technique excavated by an airspade and following a route as far as possible from the RPA of any tree. .
- 5.20 The service trench is to be excavated to the required depth using an airspade or similar. Prior to undertaking the trenching operation, a trial pit is to be dug to the required depth to allow the assessment of the prevalent soil profile to establish the depth of the topsoil. Once this is completed excavation should commence in layers allowing the topsoil to be removed and stored separately to the sub soil.
- 5.21 No roots over 25mm in diameter are to be severed and, if encountered, will be wrapped in damp Hessian sacking and preserved. Minor roots are to be cut back to the nearest appropriate branching point using sharp secateurs.
- 5.22 Service pipe or duct is to be installed, taking care to thread through any retained roots. Once in place Hessian wrapping is to be removed from exposed roots and the trench backfilled using excavated material, taking care not to bury topsoil beneath its previous depth. The backfill can be lightly tamped down by hand or allowed to settle naturally.

Construction of Access Driveway

- 5.23 In order to service the new dwellings, the a new driveway is to be constructed using a no dig CCS system as specified in section 4. The no-dig system is to be used across the Precautionary Area and should be marked out on the ground.
- 5.24 It is recommended that ground protection be used during the construction phase and the CCS be installed as part of the landscaping operations on the site. This will prevent any damage to the CCS by construction machinery. The ground protection should only be removed immediately prior to the installation of the CCS.
- 5.25 Initial preparations require any ground vegetation to be carefully removed from soft landscape areas and the basic levelling of the site. This should be undertaken using hand tools, preferably an airspade,

under the supervision of the arboriculturalist. Where small high points exist these can be levelled off and small low points filled with sharp sand to provide reasonably even ground on to which the cell web system is laid. Changes in levels should not exceed +/-50mm or exceed an area of 0.5m² and no significant roots (25mm+) are to be severed or damaged.

- 5.26 Once an even surface has been achieved the 3-dimensional CCS is to be installed in accordance with the manufacturer's instructions and details of the technical specification (see appendix A). This will require a layer porous of geo-textile (Geosynthetics Treetex) is placed over the ground beneath the CCS. On to this is laid the sub-base of 4/20 mm clean angular stone, this is **NOT** compacted, the 3-dimensional CCS grid is placed on top of this and pegged into place using proprietary pegs. The cells are then filled using 4/20 mm clean angular stone, of neutral pH, with no fines. This should occur from the outside edge working in and the charged cells used as a working platform. A second layer of geo-textile is then laid and the topped with the finished surface material. The sub-base, geo grid structure and surface layer are retained and edged using treated timber edging held in place by short wooden stakes. The edges can then be incorporated into the existing landscaped as required.
- 5.27 To ensure that all tree protection measures are properly installed and maintained the site shall be monitored by Shields Arboricultural Consultancy to the following schedule. Details of the findings and photographic evidence of the site inspection visits will be reported to the LPA by email within 24 hrs of the visit. All tree protection measures must remain in place until development work is completed and only removed after receiving written confirmation from the LPA.

Schedule of Inspection

1. On completion of erection of fencing and installation of ground protection prior to commencement of development works
 2. During installation of CCS driveway
 3. Monthly throughout the project
- 5.28 Prior to the commencement on site of any work, a competent person is to be appointed to monitor the day to day activities on site. In the case of a tree being damaged or where an unexpected event arises it will be for this person to contact Shields Arboricultural Consultancy to seek advice on contingency measures.

S.J.A. Shields

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5th October 2018

TECHNICAL RECOMMENDATION



APPLICATION
[11 RUR-CEL]

**Reinforcement of Roads
with Cellweb**

PROJECT:

BRW-09-18

DESIGNER / SPECIFIER:

Stephen Shields

CLIENT:

N. Copeland

PLANNING AUTHORITY:

Wrexham Council

Reference:

TR18-2753_RUR_CEL_BRW-09-18

Version:

V1

Location:

Bryn Estyn Road,
Wrexham

Date:

27 September 2018

PROJECT DESCRIPTION

Construction of a reinforced Cellweb car park area on an existing drive for a project located in Bryn Estyn Road, Wrexham. Cellweb is a no dig tree root protection measure and it is recommended that no excavation be performed without prior approval and guidance from the tree officer.

This document TR18-2753 V1 provides the calculation of the reinforced area over Tree Root protection zone, according to email and information delivered by Steve Shields on 24/09/2018.

- **Ground conditions:**
 - Soil info; Cohesive assumed.
 - CBR = 1% assumed.
- **Area (approx.):**
 - To Be Confirmed.
- **Traffic Information**
 - Cars Only, as per client details.
 - Maximum Gross Vehicle Weight GVW = Max 3,000 kg
 - Assumed maximum axle load = 20 kN/axle.
 - Wheel Load = 10KN/wheel.
- **Infill material for Cellweb:**
 - 4mm to 20mm clean angular stone, Type 4/20 due to tree root protection requirement. Specification according to BS7533-13
- **Surface:**
 - Loose Gravel Type 4/20 Clean Angular Stone.

OBJECTIVE

To propose a technical solution of reinforcement using the minimum required thickness of subbase Type 4/20 and Cellweb TRP and non-woven Geotextile Treetex for separation.

Due to tree root protection requirements, the solution has to be a no-dig and no-compaction system to protect tree roots. The Cellweb TRP with subbase Type 4/20 provides a stable structure to distribute the loads and reduce the pressure at the ground level. The system promotes the migration of water and nutrients, maintaining the soil bulk density at levels that are suitable for tree root growth.

DESIGN METHOD

The methodology used is based on the design methods of reinforcement of unpaved roads proposed by Webster (1981). The first step in the design of a Cellweb reinforced pavement is to consider the ultimate bearing capacity of the pavement system under the greatest wheel load that it will have to support. This is undertaken following the guidance provided by Webster which uses conventional bearing capacity analysis to determine the applied and allowable pressure below the road pavement. The equations were derived for unpaved road design and make no allowance for the surfacing over the Cellweb. They are therefore considered to be conservative when permanent surfacing is placed over the Cellweb reinforced sub-base.

When additional sub-base is required beneath Cellweb the depth of this material may be reduced by placement of surfacing material above. If the thickness of surfacing is equal to or greater than the required sub-base, then the sub-base may be omitted.

PARAMETERS AND CONSIDERATIONS

In order to perform the calculations, we used the methodology for reinforcement of unpaved roads, not taking account of any permanent surfacing that may be provided.

Standards and Specifications according to application:

- BS5837:2012
- APN 12
- BS7533-13:2009 for infill material

In the following tables, we present the parameters and assumptions used for the preliminary calculation. All parameters need to be verified by the client for final design.

SOIL PROPERTIES

SUBGRADE SOIL

Soil Type:	<i>Granular as per client detail</i>
CBR:	1% assumed
Undrained shear strength C_u :	23 kPa
Internal friction angle, ϕ_u :	0 deg
Unit weight, γ :	18 kN/m ³

FILL MATERIAL: CELLWEB AND SUBBASE

Soil Type:	Clean Angular Stone
Type BS7533-13:	Type 4/20
Internal friction angle, ϕ'_{pk} :	35 deg
Unit weight, γ :	18 kN/m ³
Particle size:	4 mm to 20 mm

TRAFFIC DESIGN

Type of Traffic:	Cars, as per client detail
Gross Vehicle Weight GVW:	< 3,000 kg
Max Axle load:	20 kN/axle
Wheel load, P:	10 kN/wheel
Tire inflation Pressure, p:	250.00 kPa

SOLUTION OVER TREE ROOT PROTECTION AREA

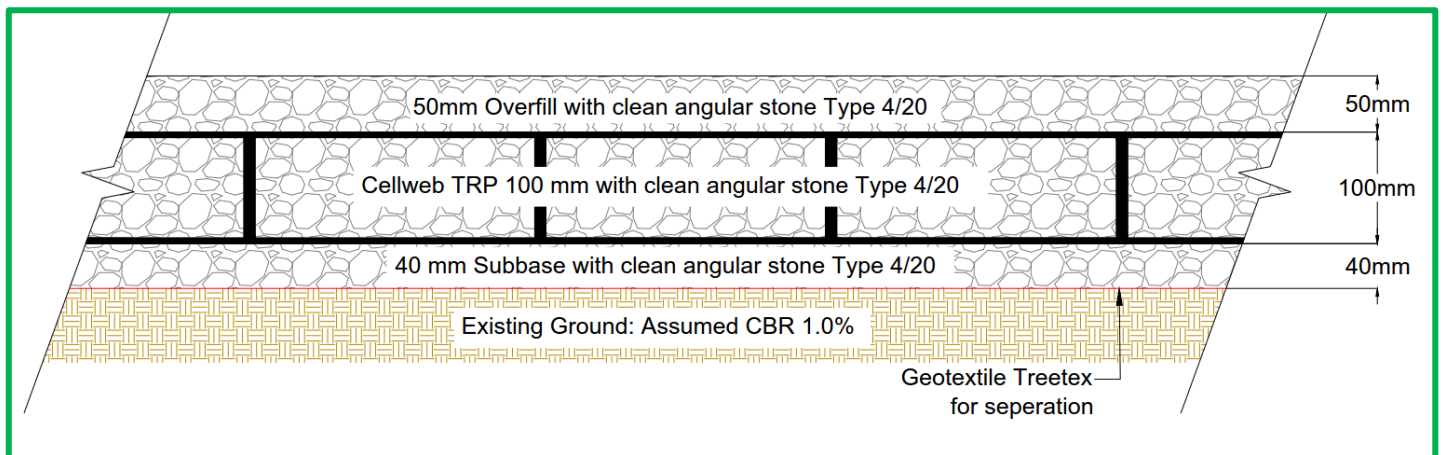
Surface: (design by others accordingly to the appropriate standard)	50mm Clean Angular Stone 4/20, Overfill, as per client details.
Separation: above overfill	None.
Overfill: above Cellweb: clean angular stone Type 4/20	None, due to surfacing option by client.
Cellweb TRP: fill with 4 to 20mm clean angular stone Type 4/20:	Cellweb TRP: 100mm
Subbase: 4 to 20mm clean angular stone Type 4/20	Structural Purpose: 40mm subbase
Separation: beneath Cellweb or Subbase	1 Layer Geotextile Treetex

Note: Loose Gravel surface:

Particle sizes, gradation and thickness to be specified by others according to the appropriate specification of the project.

Regular use will cause movement and displacement of granular particles, giving as a result superficial deformation (rutting) and settlement of the surface. Therefore regular maintenance is very important when using loose gravel surface, including the replacement of gravel to keep the required minimum thickness of the surface.

CROSS-SECTION: CELLWEB OVER TREE ROOT PROTECTION AREA



RECOMMENDATIONS

Granular Fill: Clean angular stone Type 4/20. Please refer to BS7533-13:2009 and to the Design Manual for Roads and Bridges (DMRB), Volume 4 Geotechnics and Drainage, Section 1 Earthworks, HA44/91, Volume 7 – IAN 73/06 Design Guidance for road pavement foundations and Manual of Contract Documents for Highway Works (MCHW), Volume 1 Specification for Highway Works for the construction and maintenance of the fill material.

Soil Properties: All the properties of the soils have been assumed in order to perform the calculations. It is necessary to check the properties with the actual soil test results and the actual soils at the project site, so as to refine the calculations.

Traffic information: The traffic information has been extracted from the information sent by the client and the values have been assumed in order to perform the calculations. It is necessary to check the information with the actual traffic at the project site, so as to refine the calculations.

Drainage systems: Appropriate drainage systems need to be advised if applicable by the client/designer prior to final design. If drainage systems are required those needs to be designed and specified by others. Geosynthetics should be advised on the results of the drainage assessment, so it can be taking into account in the layout of the Cellweb System.

Geotextile for separation: we recommend the installation of a Non-Woven Geotextile Treetex under the Cellweb or under subbase if installed.

Geotextile: Overlapping between adjacent rolls of Geotextile: CBR > 3%: 300mm minimum, CBR between 1% and 3%: 500mm minimum, CBR ≤ 1%: 750mm minimum.

Herbicide: According to BS5837:2012 “The use of herbicides in the vicinity of existing trees should be appropriate for the type of vegetation to be killed, and all instructions, warnings and other relevant information from the manufacturers should be strictly observed and followed. Care should be taken to avoid any damaging effects upon existing plants and trees to be retained, species to be introduced, and existing sensitive habitats, particularly those associated with aquatic or drainage features.”

Loose Gravel surface: Particle sizes, gradation and thickness to be specified by others according to the appropriate specification of the project. Regular use will cause movement and displacement of granular particles, giving as a result superficial deformation (rutting) and settlement of the surface. Therefore regular maintenance is very important when using loose gravel surface, including the replacement of gravel to keep the required minimum thickness of the surface.

CONTACT INFORMATION

For further information, please contact our technical department

DISCLAIMER

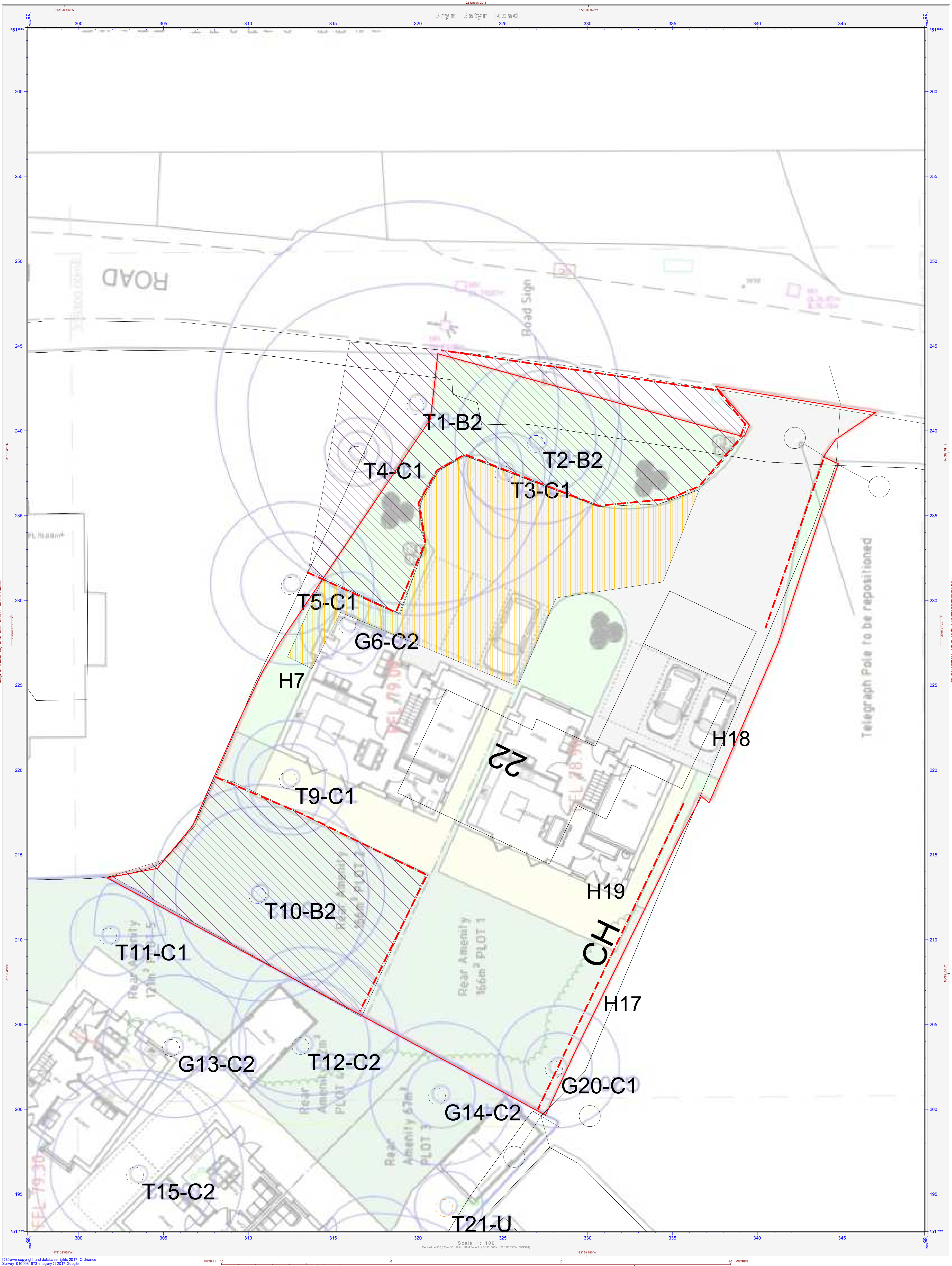


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Shields Arboricultural Consultancy
Tree & Woodland Management Solutions

Tree Protection Plan
Overlay
22 Bryn Estyn Road
Wrexham

- Legend
- Tree Cat A
 - Tree Cat B
 - Tree Cat C
 - CEZ
 - Precautionary Area
 - Tree Protection Fencing

Drawing No: BER/TPP/OL/01/18/01
Drawn By: S. Shields
Scale: 1:100 @ A1
Date: 22nd January 2018
Revision:

Do not scale from this drawing all dimensions to be checked on site
Drawing is colour coded and a monochrome copy should not be relied upon

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