HAMPS VALLEY LIMITED

# BS 5837:2012 Tree Survey Report

# & Arboricultural Impact Assessment

Location;

Leekbrook to Leek
Railway reinstatement,
Staffordshire

Date of Inspection;

September 2017

Commissioned by;

Staffordshire Moorlands D.C & High Peak B.C

Survey carried out by;

Kristian Turner. FdSc Arb. Tech Arbor A
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# Contents

## 1.0:Summary

1.1: Hamps Valley Ltd Tree Experts was commissioned in September 2017 by Staffordshire Moorlands D.C & High Peak B.C to conduct a preliminary tree survey under the guidelines of **BRITISH STANDARDS 5837:2012** *Recommendations for trees in relation to design, demolition and construction.* (BS5837) and an Arboricultural Impact Assessment (AIA) of the proposed reinstatement of the railway line between Leekbrook and Leek, Staffordshire.

1.2: The primary purpose of this report is to make an appraisal of the trees that stand on the afore mentioned land. This report evaluates the condition and amenity value of the trees assesses any constraints they may impose on re-development proposals. This report provides information on any tree that should be removed and how the trees being retained should be protected during the development process.

1.3: The tree survey of the application site was carried out by Kristian Turner (of Hamps Valley Ltd) in the September 2017 during daylight hours.

1.4: The appraisal found that the tree and scrub cover along the 1.3km (approx) stretch of disused railway track contained no trees of a standard that they should be considered a constraint on planning. There are a handful of mature Pines and Silver Birch but for the most the trees are Semi mature or younger. As it is still unclear as to the exact locations of fencing and communication channels, this report is based on estimated ground usage requirements.

Any trees to be retained should be protected taking into account the minimum distances for tree protection barriers advocated in BS5837:2012. See Fig 3 for the extent of such protective barriers required around each of the retained trees.

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## 2.0:Introduction

### 2.1: Background and commission

Hamps Valley Ltd Tree Experts was commissioned in July 2017 by Staffordshire Moorlands D.C & High Peak B.C to conduct a preliminary tree survey under the guidelines of **BRITISH STANDARDS 5837:2012** *Recommendations for trees in relation to design, demolition and construction.* (BS5837) and an Arboricultural Impact Assessment (AIA) of the proposed reinstatement of the railway line between Leekbrook and Leek, Staffordshire.

Our current understanding of the proposed development is that it will include:

- Site clearance works including tree removal.
- Initial scrape of the area for the track laying.
- Relaying and levelling of track bed.
- Excavation for signalling cables and possible drainage along side track.
- Erecting fencing along the track.
- Possible works on sewers.

### 2.2: Aims of the survey

This arboricultural assessment aims to

- evaluate the condition and amenity value of the trees on site.
- advise on how the trees are likely to impact on the proposed development.
- advise on how the proposed development is likely to impact upon the trees.
- provide information on any trees that should be removed.
- provide information on how those trees being retained should be protected during development process.

### 2.3: Site Context

The site is a disused railway track that runs between Leekbrook (South) and Leek (North). Its current use is a footpath. At the Northwest end of the track is Barnfields Industrial Estate, heading towards Leekbrook along the West edge of the track, it turns from industrial estate into fields with the river Churnet meandering roughly parallel before reaching the sewer works at the end of the site. The East side of the track, from Leek, starts at the cattle market, runs along the bottom of Birchall playing fields and past Birchall Golf Club. The track is bordered with trees or woody shrubs for most of its length along the site requiring the appraisal. Some areas of track are raised from the surrounding land.


Fig 1: Location of site. Disused railway line, Leekbrook to Leek. (Map supplied by SMDC & HPBC 2017)

## 3.0: Survey Methodology, Collection and Assessment of Data

3.1: Survey Methodology

The site was surveyed by Kristian Tuner, September 2017. The inspection only consists of a visual tree assessment, no decay detection or other specialised equipment was used. The survey was carried out from ground level. The weather during the survey was overcast with intermittent spells of sunshine.. Visibility was good, although occasionally impeded by the low morning sun.

3.2: Tree height, crown spread and canopy height were not measured for this survey as the locations for the trees is estimated such measurements are of no use. However some of the trees and tree groups have had average measurements estimated as an example of the tree landscape along the site.

Data was collected to comply with the recommendations of BS5837:2012 *Trees in relation to construction* (BS5837).

3.3: Trees are dynamic living organisms and although their health and structure can be assessed, an absolutely safe assessment is not realistic as unpredictable failure can never be ruled out. Trees are also susceptible to climatic conditions and more extreme weather, including high winds, drought and snow. These conditions can cause healthy trees to fail. Hamps Valley Ltd cannot be held liable for any such failures. It would be advisable to re-inspect after any period of severe weather. Therefore this report is only valid in relation too; the weather, the condition of the trees and the condition of the site on the day of the investigation.

3.4: No soil samples were taken for analysis on this investigation.

3.5: Any site information, history or legal descriptions given are taken as accurate.

3.6: The report is only valid as a whole, any alterations or omissions invalidate it entirely. The report is valid for six months only. Any legal matters that arise from this report are not the responsibility of Hamps Valley Ltd and the consultant is not required for any further testimony or investigations unless relevant new arrangements are made.

3.7: **Survey personnel**. Kristian Turner has 14 years experience working with trees in the Arboricultural industry. He currently holds a FdSc in Arboriculture after studying at the Central University of Lancashire, is a Technician grade member of the Arboricultural Association and is a Professional Tree Inspector through the Arboricultural Association.

## 4.0: Data Collection

The tree location plan is shown appendix 1.

4.1: The trees are plotted as groups. The groups were selected either for the similar tree species or for geographical reasons.

## 4.2: Key to report

4.3: Reference number

4.4: Species name is given as the common

4.5: The height is the measurement from ground level to the highest point of the tree to the nearest meter, as an average for the group.

4.6: The age of the tree as categorised in one of the following age brackets;

Young (Y), Semi-mature (SM),

Mature (M), Over mature (OM), Veteran (V).

4.7: General observations of the structure and physiological condition.

4.8: Estimated remaining contribution, in years, less than 10 years <10 or greater than 10 years 10+

4.9: Category U or A to C grading (Table 1)

Table 1: Tree category chart





Table 1 Cascade chart for tree quality assessment

| Category and definition | Criteria (including subcategories where appropriate) | | | Identification on plan |
|---|---|---|---|---|
| **Trees unsuitable for retention** (see Note) | | | | |
| **Category U**<br>Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years | • Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning)<br>• Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline<br>• Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality<br>*NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7.* | | | See Table 2 |
| | **1 Mainly arboricultural qualities** | **2 Mainly landscape qualities** | **3 Mainly cultural values, including conservation** | |
| **Trees to be considered for retention** | | | | |
| **Category A**<br>**Trees of high quality** with an estimated remaining life expectancy of at least 40 years | Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue) | Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features | Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture) | See Table 2 |
| **Category B**<br>**Trees of moderate quality** with an estimated remaining life expectancy of at least 20 years | Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation | Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality | Trees with material conservation or other cultural value | See Table 2 |
| **Category C**<br>**Trees of low quality** with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm | Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories | Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits | Trees with no material conservation or other cultural value | See Table 2 |

 

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*Table 2: Category Grading of Trees on Site*

| Abbreviation | Description | Category | Colour Code |
|---|---|---|---|
| U | Trees which should be removed irrespective of any development proposal | Fell | Dark red |
| A | Trees of high quality whose retention is most desirable | High | Light |
| B | Trees of moderate quality whose retention is desirable | Moderate | Mid blue |
| C | Trees of low quality which could be retained | Low | Grey |

## 5.0: Tree Survey

### 5.1: General observations

The British Standard BS5837:2012 *Trees in Relation to Design, Demolition and Construction - Recommendations'* gives recommendations and guidance of the principals that should be applied during the development process to achieve a satisfactory juxtaposition of trees with structures. With regard to the design issues and the assessment of trees on development sites, BS 5837 recognises in section 5.1.1 that:

> *"The constraints imposed by trees, both above and below ground (see Note to 5.2.1) should inform the site layout design, although it is recognized that the competing needs of development mean that trees are only one factor requiring consideration. Certain trees are of such importance and sensitivity as to be major constraints on development or to justify its substantial modification. However, care should be taken to avoid misplaced tree retention; attempts to retain too many or unsuitable trees on a site can result in excessive pressure on the trees during demolition or construction work, or post-completion demands for their removal."*

5.2: BS5837 also adds in 5.1.2 that:

> *"As trees can affect and be affected by many aspects of site operations, during the conception and design process the project arboriculturist should be involved in ongoing review of layout, architectural, engineering and landscape drawings. All members of the design team should be made aware of the requirements for the successful retention of the retained trees and should make provision for these throughout the development process."*

5.3: BS5837 advises that the physical size of trees can: dominate new development and give rise to concern about safety, cause obstruction of light and views, and incite objections about falling leaves and debris. These factors are most important when taking into consideration the juxtaposition of trees and new development, and usually this can only be resolved by allowing sufficient space for the trees or by removing the trees.

### 5.4: The Trees

5.5: The trees along the site are mostly self set with the exception of a couple of rows of Maples that look too liner and uniform to be self set. The tree cover has only grown since the track was dismantled in the 1970's. The trees for the most are young or semi-mature. There a handful of mature trees, Pine and Silver Birch, however they are only just mature. There is a cover of brambles and scrub except along the well worn footpath. Hawthorn, some smaller Willow species, other smaller trees and shrubs create a multi stemmed, scruffy undergrowth along a lot of the track. All of the trees along the site have been categorised as C such as:-

*"Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150mm"*

*"Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories"*

*"Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits"*

*"Trees with no material conservation or other cultural value"*

There are some trees that have fallen or are leaning into other trees that would be classed as U within the guidelines however under its current use they are not a danger and so haven't been specified or marked.

5.6: For this appraisal the trees along the site have been grouped by either similar size and species of tree or for geographical reasons such as footpaths or breaks in the cover. There are 17 Tree Groups (TG).

5.7 The survey started at the North (Leek) end of the track and studied the East side, running along Birchall playing fields and golf club first. It then came back up the West side from the sewerage works along the fields with the river Churnet up to Barnfields Industrial Estate.

5.8: TG1, scrub cover. Brambles with Young/Semi-mature Willow and Hawthorn.

5.9: TG2, semi-mature, with a few mature, average height 15m, average DBH 250mm, Pine and Silver Birch. The trees are crowded. Growing from the footpath down to the field.

5.10: TG3, semi-mature, with a few mature, average height 15m, average DBH 250mm, Pine and Silver Birch. The trees are crowded. Growing from the footpath down to the field.

5.11: TG4, semi-mature, with a few mature, average height 17m, average DBH 250mm, Silver birch with scrub undergrowth. This group is located at the bottom of Birchall playing fields. The trees are slightly more spaced out in this group.

5.12: TG5, semi mature, average height 14m, average DBH 300mm, Norway Maples that look like they have been planted in a line with even spaces. This group is on the Southern edge of the playing fields.

5.13: TG6, young, scrub cover with young trees, Ash, Oak, Poplars, Hawthorn. Starting along Birchall golf course.

5.14 TG7, semi-mature, average height 19, average DBH 300mm, Poplars, This section of the site is quite open with a scrub cover and a few Silver Birch. The Poplars are actually located in the golf course.

5.15: TG8, young semi-mature, average height 10m, scrub cover with Hawthorn, Oak, Silver Birch and Willow spp. Trees growing up the cutting into the tunnel and over the tunnel.

5.16: TG9, young semi-mature, average height 10m, scrub cover with Hawthorn, Sycamore and Willow. Trees growing up the cutting into the tunnel and over the tunnel. Last group on the East side before heading North along the West side.

5.17: TG10, young semi-mature, average height 15m average DBH 240mm, Oak, Silver Birch growing along bank up to the woodland. Some of the ground on the cutting by the tunnel is very steep with the rock face visible in places indicating shallow rooting. First group on the West heading North from Leekbrook, next to the sewerage works.

5.18: TG11, young, Silver Birch and Willow, growing on the cutting from the tunnel.

5.19: TG12, semi-mature less than 10m height, Hawthorn bushes.

5.20: TG13, semi-mature, average height 15m, average DBH 260mm, a row of Maples and Sycamores, growing near the electric cables. Again they look a bit too uniform to be self set. This group is located at the start of the fields.

5.21: TG14, semi-mature, average height 18m, average DBH 280mm, Pines. Grown in a rough liner pattern, this group has similar characteristics to woodland trees. Some trees have fallen into others, trees have grown dependent upon each other and so have misshapen crowns and will probably have poor wind resistant roots individually. Most have poor form.

5.22: TG15, semi-mature, average height 15m, average DBH 260mm, Maple, Sycamore and scrub cover, similar to the other groups of Maples.

5.23: TG16, Scrub cover, Pine and Sycamore. A very poor section of trees, several windblown and damaged with masses of undergrowth and scrub cover , bordered by a swampy area of the fields with very wild tree cover.

5.24: TG17, young semi-mature, average height 12m. Oak, Sycamore, Willow and scrub cover. This is a narrow section of the site between the footpath and a metal fence along the industrial estate.

## 6.0: Barriers and Surfaces

### 6.1: Protective barriers

Barriers for the protection of trees on development sites should be fit for the purpose of excluding construction activity and be appropriate to the type and proximity of the work. In particular, attention should be paid to ensure that such barriers remain rigid and complete during all phases of development. In most instances, barriers should consist of rigid framework comprising vertical post and horizontal rails well braced to resist impacts. An appropriate fence type should then be securely fixed to this framework with clamps or wire. . The protection of the subject trees and their subsequent health and future potential is totally dependent upon all persons operating within the site. Communications are vitally important to ensure that all parties understand the reasons for tree protection and the existence of the barriers.

6.2: It is imperative that these barriers, as specified in British Standard BS 5837 2012 '*Trees in Relation to Design, Demolition and Construction - Recommendations'*, should be put up around the retained trees prior to the commencement of any construction operations. It is expected that the erection of tree protection barriers will be conditional on on the approval of a planning application that calls for their use. To avoid any ambiguity the precise location of the tree protective barriers should be agreed on site with the local authority arboricultural officer and then marked out clearly on the ground.

6.3: Location of protective barriers: British Standard BS 5837 advocates the use of "root protection areas" (RPAs), formed by calculating a circle 12x the stem diameter for single-stem trees . For trees with multiple stems one of two calculations should be used

a) For trees with two to five stems. the combined stem diameter should be calculated as follows:

$$\sqrt{(\text{stem diameter 1})^2 + (\text{stem diameter 2})^2 \ldots + (\text{stem diameter 5})^2}$$

b) For trees with more than five stems, the combined stem diameter should be calculated as follows:

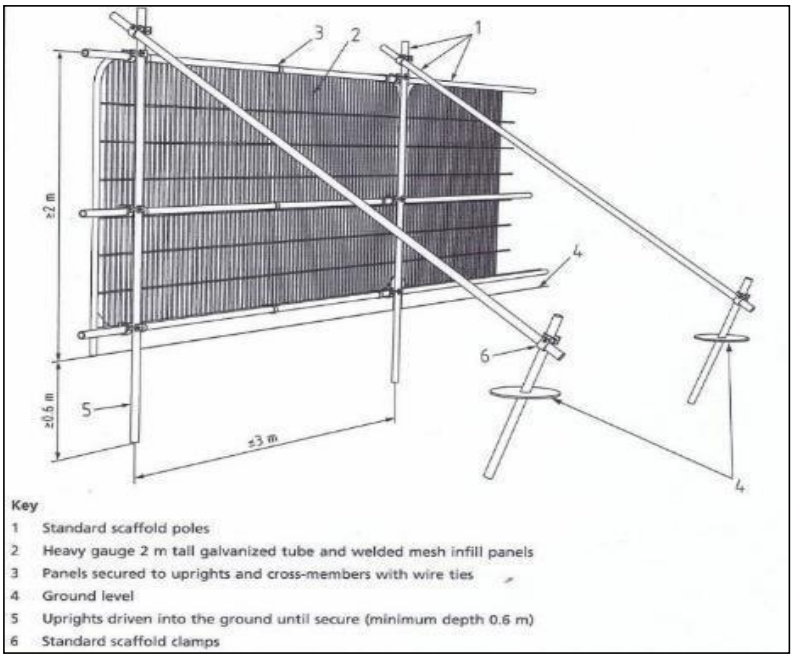
$$\sqrt{(\text{mean stem diameter})^2 \times \text{number of stems}}$$

Table 3: example RPA dimensions from BS5837:2012

| Single stem diameter mm | Radius of nominal circle m | RPA m² | Single stem diameter mm | Radius of nominal circle m | RPA m² |
|---|---|---|---|---|---|
| 75 | 0.90 | 3 | 675 | 8.10 | 206 |
| 100 | 1.20 | 5 | 700 | 8.40 | 222 |
| 125 | 1.50 | 7 | 725 | 8.70 | 238 |
| 150 | 1.80 | 10 | 750 | 9.00 | 255 |
| 175 | 2.10 | 14 | 775 | 9.30 | 272 |
| 200 | 2.40 | 18 | 800 | 9.60 | 290 |
| 225 | 2.70 | 23 | 825 | 9.90 | 308 |
| 250 | 3.00 | 28 | 850 | 10.20 | 327 |
| 275 | 3.30 | 34 | 875 | 10.50 | 346 |
| 300 | 3.60 | 41 | 900 | 10.80 | 366 |
| 325 | 3.90 | 48 | 925 | 11.10 | 387 |
| 350 | 4.20 | 55 | 950 | 11.40 | 408 |
| 375 | 4.50 | 64 | 975 | 11.70 | 430 |
| 400 | 4.80 | 72 | 1 000 | 12.00 | 452 |
| 425 | 5.10 | 81 | 1 025 | 12.30 | 475 |
| 450 | 5.40 | 92 | 1 050 | 12.60 | 499 |
| 475 | 5.70 | 102 | 1 075 | 12.90 | 519 |
| 500 | 6.00 | 113 | 1 100 | 13.20 | 547 |
| 525 | 6.30 | 124 | 1 125 | 13.50 | 573 |
| 550 | 6.60 | 137 | 1 150 | 13.80 | 598 |
| 575 | 6.90 | 150 | 1 175 | 14.10 | 625 |
| 600 | 7.20 | 163 | 1 200 | 14.40 | 652 |
| 625 | 7.50 | 177 | 1 225 | 14.70 | 679 |
| 650 | 7.80 | 191 | 1 250+ | 15.00 | 707 |

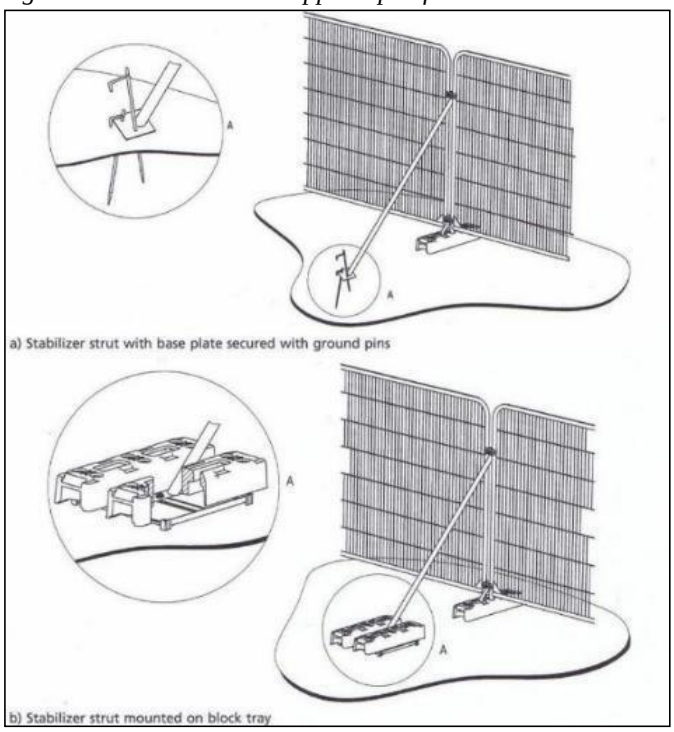
6.4: Specification for the tree protection barriers: The default specification for tree protection barriers should normally consist of a vertical and horizontal scaffold framework, well braced to resist vehicle impacts. The vertical tubes should be spaced at a maximum interval of 3m and driven securely into the ground. Onto this framework, proprietary welded mesh panels ('heras') should be securely fixed. Care should be exercised when locating the vertical poles to avoid underground services and, in the case of the bracing poles, also to avoid contact with structural roots. The general specification for the protective barriers is outlined in Fig 3:

*Fig6: Specification for protective barriers*




6.5: In this case, the site circumstances may not necessitate the default level of protection and it may be possible to agree an alternative specification with the local planning authority. For example, 2m tall 'Heras' panels on rubber or concrete feet would provide an adequate level of protection from cars, vans, pedestrians and manually operated plant machinery in certain areas. The fence panels could be joined together using anti-tamper couplers, installed so that they can only be removed from inside the fence. The panels should be supported on the inner side by stabilizer struts, which should normally be attached to a base plate secured with ground pins

*Figures 7a and 7b- Panel support specifications*




6.6: Whatever the level of protection utilised, no storage of materials or any construction operations should occur within any of the fenced off areas. Ideally, a notice similar to that shown below should be attached to the barriers.


*Figure 8: Example of notice to be erected*

6.7: Prohibited Activities

The following activities shall not be carried out under any circumstances:

a. no fires to be lit on site within 10m of the nearest point of the canopy of any retained tree on or adjacent to the proposal site;

b. no equipment, signage, fencing etc. shall be attached to or be supported by any retained tree on or adjacent to the application site;

c. no temporary access within designated RPA without the prior written approval of the LPA;

d. no mixing of cement, dispensing of fuels or chemicals within 10 metres of the tree stem of any retained tree on or adjacent to the application site;

e. no soakaways to be routed within the RPA of any retained tree on or adjacent to the application site;

f. no stripping of topsoil, excavations or changing of levels to occur within the RPA of any retained tree on or adjacent to the application site;

g. no topsoil, building materials or other to be stored within the RPA of any retained tree on or adjacent to the application site; and

h. no alterations or variations of the approved works or tree protection schemes shall be carried out without the prior written approval of the district planning authority.

6.8: Methodology - excavation with RPAs

To avoid damage to tree roots, the existing ground levels should be retained within the RPAs of all trees. The ground within the RPAs of the trees should not be disturbed, and the topsoil should remain. Consequently, it may be necessary to undertake any excavation works within RPAs by hand. As a general rule, tree roots with a diameter of 25 mm or less can be severed cleanly (by use of a handsaw or sharp secateurs) without any detrimental effect to the health and stability to the tree. However, if roots of a diameter greater than 25 mm are encountered, the local authority Arboricultural Officer and/or Arboricultural Consultant should be consulted as to implications their severance would present to the health and stability of the tree. If this method is employed, it would be prudent to prepare a simple method statement based on the enclosed guidance taken from National Joint Utilities Group (NJUG) Publication Volume 4: 2007 '*Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees.*

6.9: Methodology - temporary ground protection within RPAs -

It may be impossible for installation of the new vehicular access. Any such access may result in changes to the existing soil structure with corresponding damage to the health and condition of the tree's root system. Section 9.3 of BS5837:2012 makes provision for such situations by recommending that access/working zones within the protection areas may be acceptable when created by using a combination of barriers and appropriate ground protection: In this instance steel road plates or an alternative system such as 'Groundtrax' should be utilised.

6.10: Methodology - special surfaces

When the proposed driveway is installed in the vicinity of it is possible that roots may be encountered. Within the RPAs of these trees any possible root injury can be mitigated by the utilisation of 'special surfaces' incorporating a 'no dig' methodology as recommended in Arboricultural Practice Note 12: 2007 "Through the Trees to Development " (APN 12). Cellular confinement systems such as 'Geoweb' and 'Cellwebb' can be used to implement the principals of APN 12 (Figure 9).

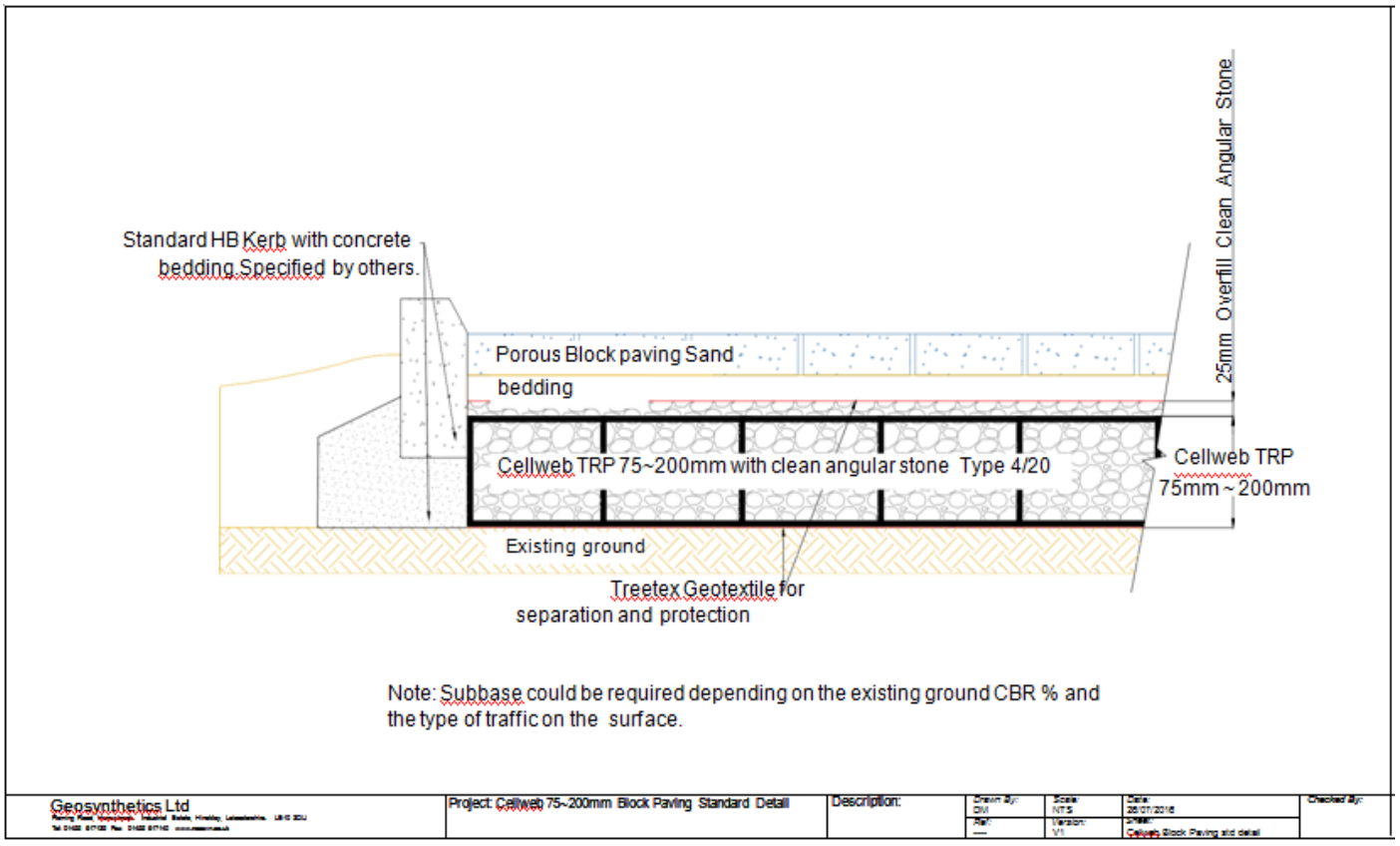



*Figure 9 – Example special surface*

| Depth of Cellweb® TRP | Unit | Gross Vehicle Weight (GVW) | Application |
|---|---|---|---|
| 200 mm | Kg | < 60,000 | HGV & Unusual – Crane / piling rig |
| 200 mm | Kg | < 50,000 | Heavy Construction Traffic |
| 150-200 mm | Kg | < 30,000 | Standard Construction Traffic & Refuse vehicle |
| 150 mm | Kg | < 16,000 | Emergency Access & Tractors |
| 100-150 mm | Kg | < 9,000 | Delivery Vans |
| 100-150 mm | Kg | < 6,000 | Car Park: Cars & Light van |
| 100 mm | Kg | < 3,000 | Domestic Traffics: Cars |
| 75 mm | Kg | < 1,000 | Pedestrians (with cyclist) path |

Note: This is a general guidance for the depth of Cellweb® TRP according to Gross Vehicle Weight for a firm and stable subgrade (CBR>3%). If the ground conditions are poor and/or unstable please contact Geosynthetics Ltd to provide a site specific design.

Figure 10: weight capabilities of ground protection. The Cellweb can be used alone as tempory ground protection.

6.11: When utilised correctly with free draining aggregates and a permeable surface, these cellular confinement systems provide a shallow and free draining base that support the passage of vehicles whilst allowing water and oxygen to permeate down to tree roots. This enables a 'no dig' construction technique to be used avoiding the severance of trees roots and preventing soil compaction around tree. This method of surface construction is specifically designed for use within the RPAs of retained trees.

6.12: Please note it is important not to treat the example above as finalised specification. It is provided as an indication of construction methods suitable for use to reduce damage to the root systems of retained trees by soil compaction and direct mechanical injury. It is therefore recommended that a qualified and competent engineer assess the suitability of the recommended specifications and finalise the details prior to commencement of any works.

6.13: Scaffolding

The erection of any scaffolding within the RPA of any tree must be verified with the architect after agreement with the local planning authority. The weight and downward pressure during use of any scaffolding within the RPA of any tree must be supported on bearers of a sufficient size, such as scaffolding boards. The aim of the bearers is to spread the working load across the RPA. The access point for the scaffolding should be outside the RPA.

## 7.0: Structural Damage

7.1: The potential risk for any direct or indirect structural damage to the proposed development being associated with the trees on and adjacent to the site is dependent on diverse factors, such as: tree species and age, soil type, foundation depth, climate, etc. This complex interaction of tree, soil, building and other influencing factors is so inherently unpredictable, that any accurate prediction of such incidence is impractical without detailed investigation and is outside the remit of this report and it is recommended that a structural engineer be consulted on this matter. Further information on this can be found in the following papers:

(i) National House Building Council (NHBC) Standards Chapter 4.2 Building near trees,

(ii) Building Research Establishment (BRE) Digest 63 Soils and foundations: 1,

(iii) Building Research Establishment (BRE) Digest 64 Soils and foundations: 2,

(iv) Building Research Establishment (BRE) Digest 67 Soils and foundations: 3,

(v) Building Research Establishment (BRE) Digest 240 Low-rise buildings on shrinkable clay soils: Part 1,

(vi) Building Research Establishment (BRE) Digest 241 Low-rise buildings on shrinkable clay soils: Part 2,

(vii) Building Research Establishment (BRE) Digest 242, Low-rise buildings on shrinkable clay soils: Part 3 and;

Building Research Establishment (BRE) Digest 298 Low-rise building foundations; the influence of trees in clay soil

## 8.0: Conclusions and Tree Protection Plan

8.1: No trees along the survey site should be considered a restriction on the proposed reinstatement of the railway. Taking the largest space required case scenario, it is required that all the vegetation be removed between the track boundary fences. Although this sounds extreme, in the long term plan it actually is a good recommendation. Trying to pick out individual tree that are worthy of retention will be difficult as the trees have grown as groups. This means the crowns will be misshapen due to group pressure, trees will have grown depending on others for wind breaks and trying to work around trees and RPAs will cause major issues in the work plan. Removing all trees and having a replanting plan following completed works will allow for a better planned tree landscape giving longevity to the trees.

8.2: Trees growing outside the track fencing should be retained where possible, the most notable are along the playing fields and golf course. These trees should be retained and protected.

8.3: **Tree work recommendation,** all trees and scrub cover be removed between the boundary fences. TG7, Poplars located in the golf course will be crown raised to 6m and cut back to the boundary fence. Any trees located outside the boundary fence but over hanging will be cut back to the fence line.

8.4: **The Arboricultural Impact Assessment**

8.5: The removal of trees from site negates any impact on the reinstatement of the rail line. The impact of the reinstatement on the trees is the loss of all trees along the track. Depending on the location of the channel created for signal wires, this may have some affect on nearby trees. However it is impossible to comment as it is not clear as to the exact location.

8.6: **Tree Protection Plan,** As all trees will be removed from site and the site access is through pre existing routes there is no need for tree protection barriers. Digging the channel for signal lines on the Western side of the track will keep the RPA of the Poplars in TG7 intact, keeping the channel as close to the centre of the track as possible will keep it as far away from trees along the boundary as possible.

8.7: It would be prudent to have a follow up survey of the trees after the tree felling operations to assess the remaining trees along the boundary for damage and stability.

8.8: Once the location of the channel to be dug and works required on any sewers have been decided it is recommended to have the areas surveyed by an Arboricultural consultant to assess RPAs and possible conflicts with ground works and trees.

8.9: The comments in this brief Tree Protection Plan should be used to create an Arboricultural Method Statement. Until more is known about the site and possible works it is impossible to be more defined or specified as to future actions to help prevent damage to trees or RPAs

8.10: Having a planting scheme proposed in the planning application can help the LPA to visualise the finished project.
For advice on suitable planting species and locations please use a professional arboricultural consultant working to BS 5837:2012

8.11: Any recommended tree work should be carried out by fully insured and qualified arborists to the British Standards for tree work BS: 3998. 2010.

8.12: Running some of the length of the West side of the site are electric power lines. Before any tree work comences on this side it is necessary to liaise with Weston power as to power shut downs .

## 9.0: Other Considerations

### 9.1: Trees Subject to Statutory Controls

Certain trees on the site are may be covered by a Council Tree Preservation Order It will be necessary to check this before work commences The works specified above are necessary for reasonable management and should be acceptable to the local authority. However, tree owners/ managers should appreciate that they may take an alternative point of view and have the option to refuse consent.

### 9.2: Felling Licence

The felling of trees in the United Kingdom is controlled by the Forestry Commission under the Forestry Act 1967. A 'felling licence' from the Forestry Commission is normally required to fell growing trees, although in any calendar quarter up to 5 cubic metres in any quarter can be felled without licence providing not more than 2 cubic metres are sold. However, certain types of felling are exempt such as the removal of trees that are dead, dying, dangerous and or causing a nuisance.

### 9.3: Trees outside the Property

Full co-operation and liaison with tree owners will be required to conduct the recommended works on any trees included in this report that are not within the ownership of the applicant. The implications of non-cooperation requires legal interpretation and are beyond the scope of this report. By common law, branches from trees on adjacent properties extending over boundaries can be pruned back to the boundary line without the permission of the owners. However, the material belongs to the tree owner and the same guidance on statutory controls apply, as discussed in section 5.1.

### 9.4: Implementation of Tree Work

When appointing a tree contractor, only suitably qualified and experienced companies should be used. Always ensure that the contractor carries adequate Public and Products Liability Insurance, along with appropriate Employer's Liability Insurance. The contractor should carry out all tree works to BS 3998:1991 *Recommendations for Tree Work*, as modified by more recent research findings.

## 9.5: Replacement Trees

Ideally, replacement trees should be planted in mitigation for any being lost and to supplement those existing. For the most effective impact these trees should be 'Extra Heavy Standard Trees' conforming to British Standard 'Nursery Stock BS 3936: Part 1 1992, with a stem girth of 14 to 16 cm at 1m from ground level and a minimum height of 350 cm. They should be secured with twin stakes and cross strut, with tie and flat back spacer. Ideally, an irrigation/aeration pipe should be installed and the soil surface mulched at a radius of 0.5 m from the base of the tree.

## 9.6: Wildlife

All operations should take account of wildlife needs and be planned to take advantage of weather conditions and season for minimum damage and disturbance.

## 9.7: Bats

Specific consideration should be given to the possible presence of roosting bats, which are protected under British law by the Wildlife and Countryside Act (WCA) 1981 (as amended), and bats are classified as European Protected Species under The Conservation (Natural Habitats, &c.) Regulations 2010. This makes it an offence to kill, injure or disturb a bat and to destroy any place used for rest or shelter by a bat. The Countryside and Rights of Way Act (CRoW) 2000 strengthens protection given by the WCA and covers 'reckless' damage or disturbance to a bat roost.

## 9.8: Breeding Birds

Any proposed tree removal should be carried out outside the bird nesting season (which runs approximately from March to September inclusive) to avoid adverse impacts to any nests present. Any proposed works that cannot be timetabled out with the bird nesting season must be immediately preceded by a check for active nests immediately prior to works commencing – this should be undertaken by a suitably-experienced bird ecologist. Clearance works should only take place once this ecologist has confirmed that no active bird nests will be affected by the works. If active nests were found then working restrictions would be put in place until all chicks had fledged. All wild birds and their nests, whilst in use, are protected under the WCA 1981 (as amended) from harm or destruction during the nesting season.

## 9.9: Future considerations

The remaining trees should be inspected on a regular basis by a qualified arboriculturist. Trees are living organisms whose health and condition can change rapidly. The conclusions and recommendations of this report are valid only for a period of one year. This period of validity maybe reduced in the case of any change in conditions to, or in proximity to, the trees.

## 10.0: Bibliographical References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**Appendix 1**

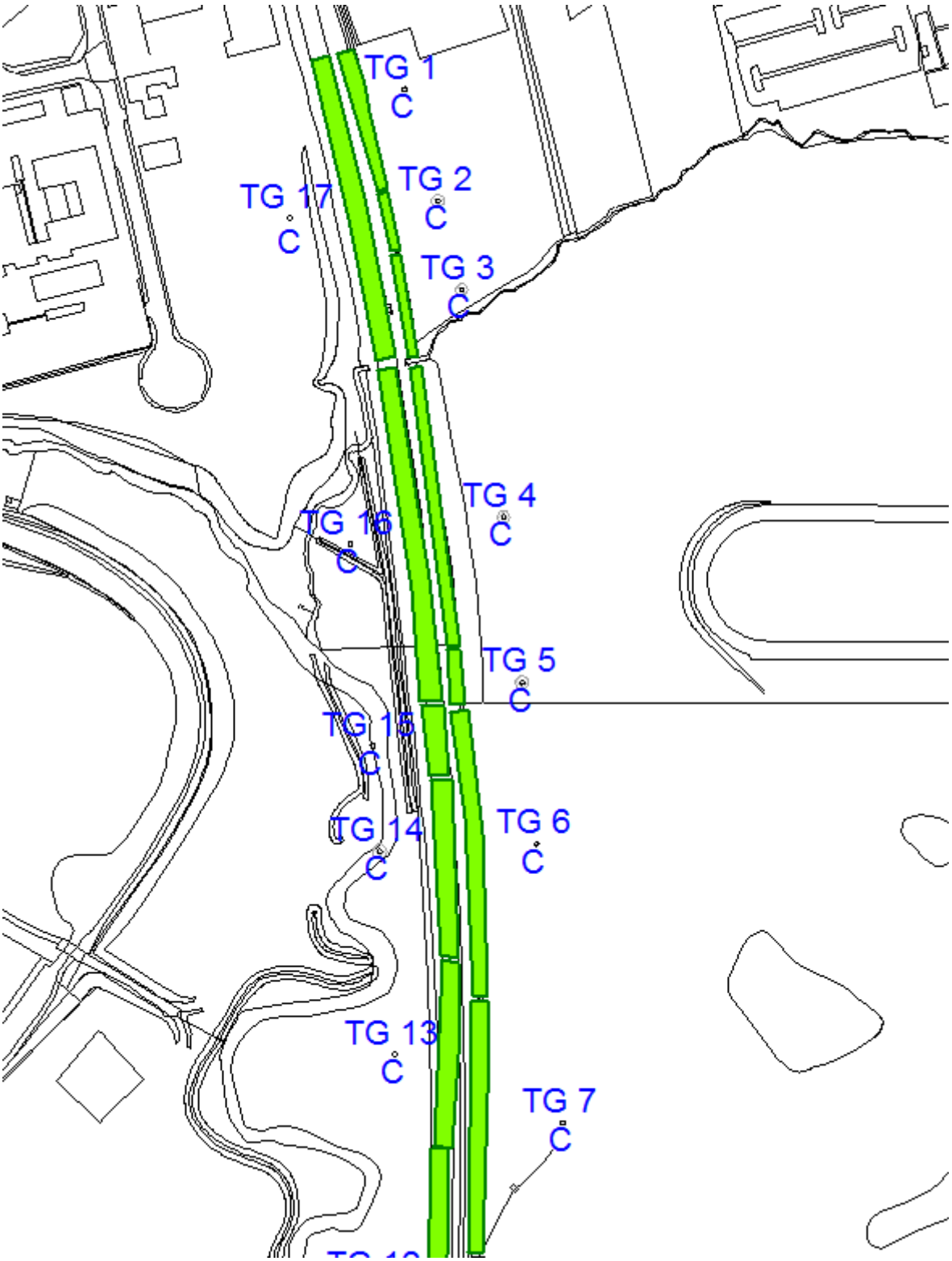


Fig 11: North end of site: Areas of tree groups shown in green boxes. Top left corner of map shows the turning circle outside Beswicks Scrap Yard. Middle right shows the athletics track on Birchall playing field.

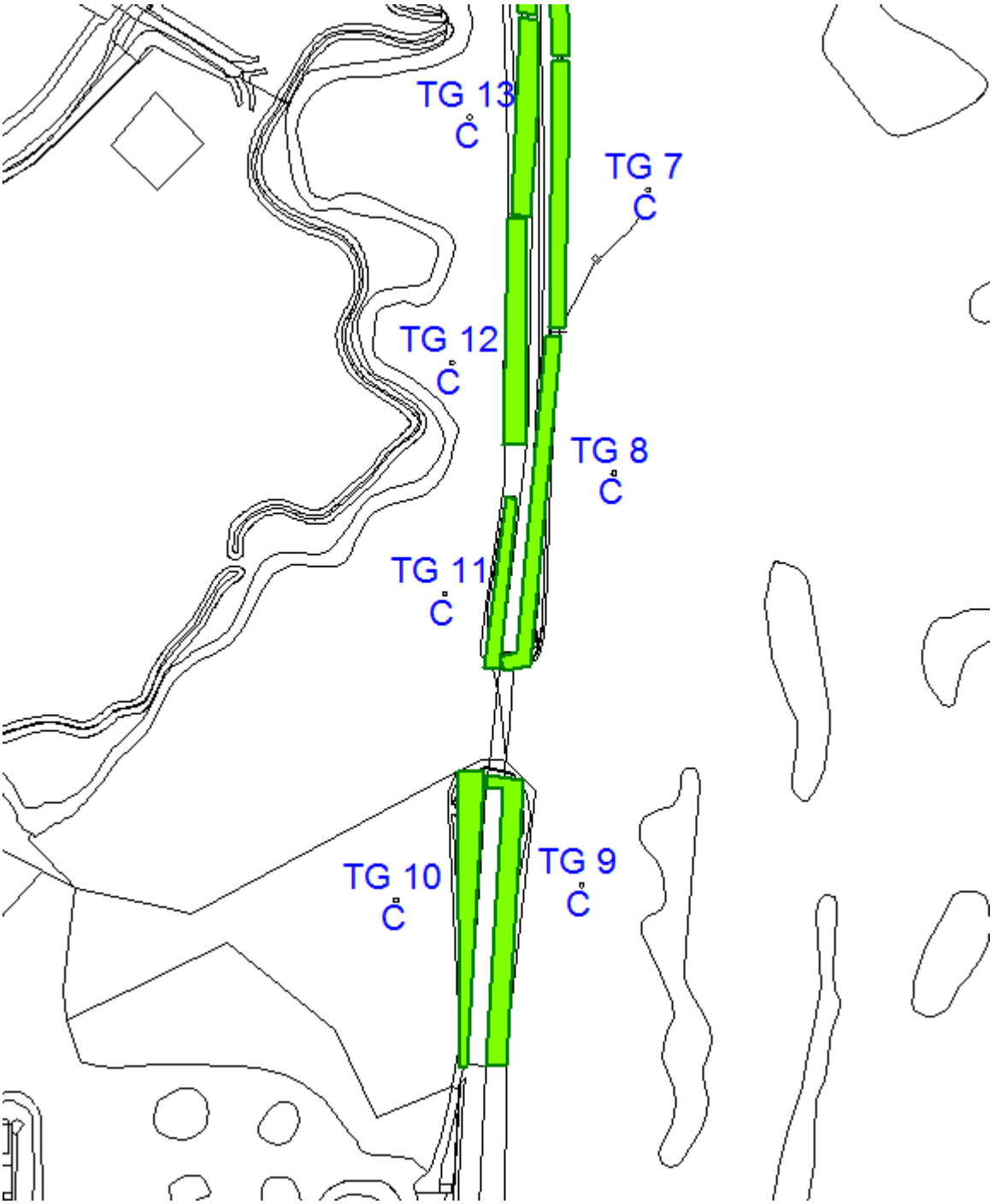

Fig 12: South end of site: Showing the gap between TG8 and TG9 where the tunnel is located. Middle bottom shows the track to the sewerage works.

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