JS24/07-05-13

7th May 2013

81 Fountain Street
Manchester M2 2EE
T: +44 (0)8449 02 03 04
F: +44 (0)161 956 4009

gva.co.uk

Direct Line 0161 956 4244
Email: james.sheppard@gva.co.uk

Dan Hudson
South Lakeland District Council
South Lakeland House
Lowther Street
Kendal
Cumbria
LA9 4DQ

Dear Mr Hudson,

South Lakeland 'Land Allocations Development Plan Document' (DPD) Main Modifications to Submission Edition 2012

Representation by GVA on behalf of the Leven's Estate

SITE: Scroggs Wood, Kendal

Ref. MM002 – Para 1.23A

The new supporting text added by way of Para 1.23A is in accordance with Section 14 of the National Planning Policy Framework (NPPF) that states a Presumption in Favour of Sustainable Development.

There is a demonstrable need for the provision of 36ha of employment land within South Lakeland over the plan period, as stated in the updated Employment Land Review 2012. NPPF Section 14 requires that Council's should `positively seek opportunities to meet the development needs for their area'. This intention is now clearly stated within the plan (MM002), adding that the `Local Plan is strongly supportive of economic growth and the creation of high value jobs in particular'.

Ref: MM009 – Para 2.27A

GVA, representing the Bagot Family (Leven's Estate), have taken part in consultations relating to the recently prepared viability study. Representations were submitted to the Council in respect of this study.

For completeness, an independent detailed assessment was undertaken by the Bagot Family in respect of Scrogg's Wood. This sought to supplement the information gathered, and assumptions made, by the Council's viability consultants (HDH Planning and Development). This site specific Development Statement has been submitted as an

appendix to this representation for consideration. The Development Statement provides further evidence as to how the site can be delivered for employment use (B1(a-c), B2 and B8) in a sympathetic way, taking into full account the environmental constraints of the site, including importantly, the site's contribution to a high quality landscape.

Ref: MM021 – Para 2.42

As stated above, based upon existing take up rates, there is a need for around 36 ha of employment land across the Borough. Scrogg's Wood is ideally placed to provide a sustainable location for approximately 11ha (based upon net developable area) of employment land.

Ref: MM024 – Para 2.67

It is hereby confirmed that a 'Complex Development Brief' will be prepared, by way of comprehensive engagement with South Lakeland District Council, for adoption by March 2014.

Ref: MM035 – Para 3.35

The Development Statement, submitted as an appendix to this representation, fully accords and takes into account the required landscaped and permanently fenced buffer zone of 10m, consisting of a hedgerow between Scroggs Wood and any development. In addition, the illustrative masterplan has paid full regard to development being set back by at least 15m from Scroggs Wood.

The detailed assessments undertaken to inform the Development Statement have confirmed that the site can accommodate 11ha net developable area, when considering requirements for landscaping, biodiversity mitigation, sustainable drainage attenuation and green infrastructure.

Ref: MM036 – Policy LA2.9

As has been stated above, and confirmed in the appended Development Statement, a substantial buffer of native vegetation of at least 10m to Scroggs Wood can be fully accommodated as part of any future employment development on the site.

Yours sincerely

James Sheppard
Principal Planner

For and on behalf of GVA Ltd

cc. Damian Law, South Lakeland District Council

enc. Development Statement – Scroggs Wood

Development Statement

GVA
81 Fountain Street
Manchester
M2 2EE

Scrogg's Wood, Milnthorpe Road, Kendal – (Levens Estate)

Development Statement

May 2013

Contents

Appendices

Prepared By . ..... Status.. .....Date .....

Reviewed By ..... Status.. .....Date .....

For and on behalf of GVA Grimley Ltd

1. Executive Summary

1.1 This statement has been prepared by GVA, on behalf of the Bagot Family, to support the promotion of land at Scrogg's Wood, Milnthorpe Road, Kendal, for a strategic employment site. It forms the basis for ongoing engagement with the local community and other key stakeholders, as well as to inform the 'Land Allocations Development Plan Document' (DPD). The aim of this proposal is to create a high quality development that delivers community-wide economic and social benefits for all, whilst taking into full consideration the high landscape value of the area.

1.2 The proposed allocation site is located to the east of Milnthorpe Road, to the south of Kendal. It is approximately 2km south of the heart of Kendal town centre, which is accessible by public transport and major transport routes. A range of local services and facilities are located close by.

1.3 The Scroggs' Wood Site could provide in the region of 46,000 sq m of new employment development, based upon the Illustrative Masterplan (See Appendix VIII), and the indicative mix of uses, as set out in the Indicative Floorspace Schedule (See Appendix X). The development proposals are firmly aligned with the principles of sustainable development.

1.4 This statement seeks to justify the development proposals on the basis of local employment need, wider community benefits, high quality development and full consideration of environmental constraints, particularly landscape quality.

1.5 The local economic and social benefits, which highlight the need for the site, can be summarised as follows:

- The development could sustain 53 direct additional (net) jobs and 11 indirect jobs during an estimated construction period of 10 years, alongside 1,032 (net) additional direct jobs and a further 206 (net) additional indirect jobs during the operational phase;
- The completed development will have wider economic impacts in terms of additional GVA generated within the economy. This could be as much as £60m additional GVA annually;
- The additional employment associated with the completed development will generate a number of indirect economic benefits including the purchase of local goods and services, creating important knock-on benefits for Kendal.

2. Introduction

2.1 This statement has been prepared by GVA, on behalf of the Bagot Family, to support the promotion of land at Scrogg's Wood, Milnthorpe Road, Kendal, for employment allocation within the 'Land Allocations DPD'.

2.2 The proposed development site, which totals approximately 18 hectares (gross), is considered available, suitable and achievable for employment led development. Against this background, this statement will seek to address a number of aspects, demonstrating that:

- The site could provide in the region of 46,000 sq m of B1(a)(b)(c), B2, and B8 uses, therefore assisting in **meeting the Borough's employment land needs**;
- A high quality employment development in this location would be **sensitive to the character of the local landscape** in terms of scale, design, layout building style and facing materials;
- Development at this location can **respond to all other site constraints** including ecology, flood risk, drainage, utilities and access;
- The site is a **sustainable location** for employment development , being in close proximity to public transport links, transport routes and a range of shops, services, homes and community facilities;
- The provision of employment development will **benefit Kendal's economy** and help to sustain existing services in the town;

2.3 The suitability of the site for employment development is supported by the following suite of assessments, which have informed the preparation of the illustrative scheme layout plan:

- Topographical Survey (by Survey and Engineering Projects Ltd)
- Ecological Assessment (by SK Environmental Solutions Ltd)
- Tree Survey (by Treescapes Consultancy Ltd)
- Drainage Strategy (by Curtins)
- Flood Risk Assessment (by Curtins)
- Utilities Assessment (by Curtins)

- Landscape Assessment (by Damson Design)
- Transport and Access Study (by Curtins)

2.4 The summary findings of these assessments are presented within this statement.

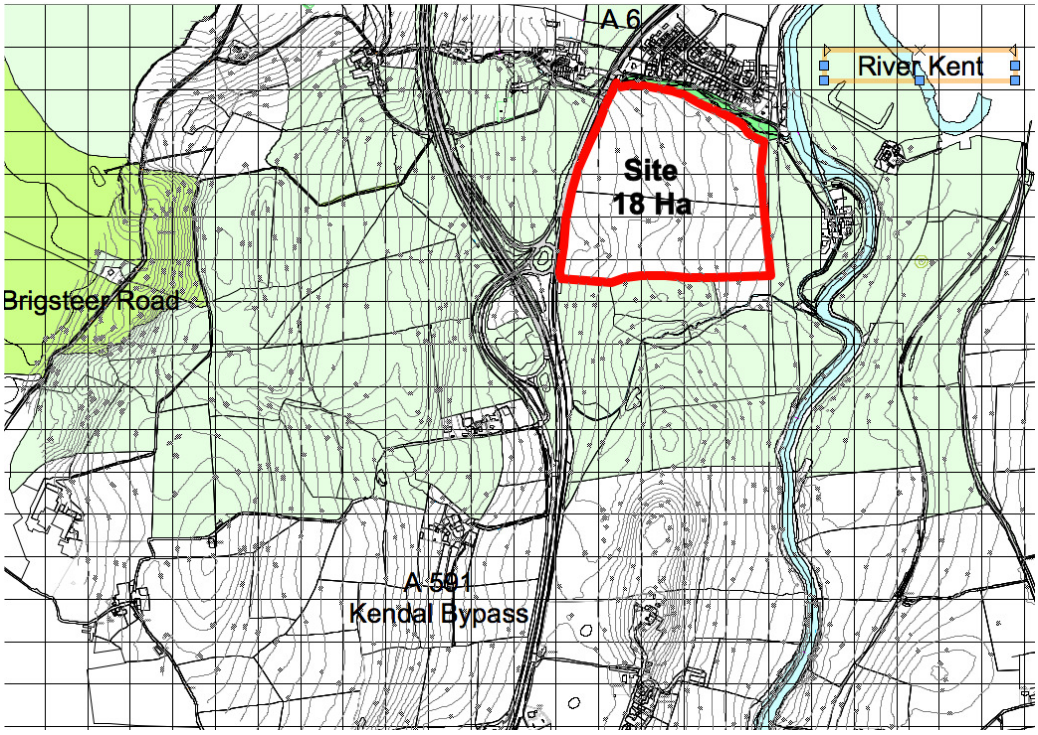
2.5 The Core Strategy and Land Allocations DPD (Submission edition May 2012) are both informed by the evidence base. This evidence base, including the updated Employment Land Review 2012, states a demonstrable need for approximately 36ha of employment land to be provided throughout the plan period. This Development Statement provides evidence that Scroggs Wood is the best placed site to accommodate employment development; thereby helping to ensure that need is fully addressed through the plan period.

2.6 Aside from the economic, social and sustainability benefits of development at Scroggs Wood, there is a clear market preference towards an employment site in this location. In particular the site is:

- Located directly adjacent to the Principal Town of Kendal thereby allowing easy access to shops, services and homes;
- Within close proximity to the wider road network and public transport provision;
- Able to accommodate a high quality, landscaped business park, attractive to employees and therefore business.

3. Site Context

SITE CONTEXT PLAN (Figure 3.1)



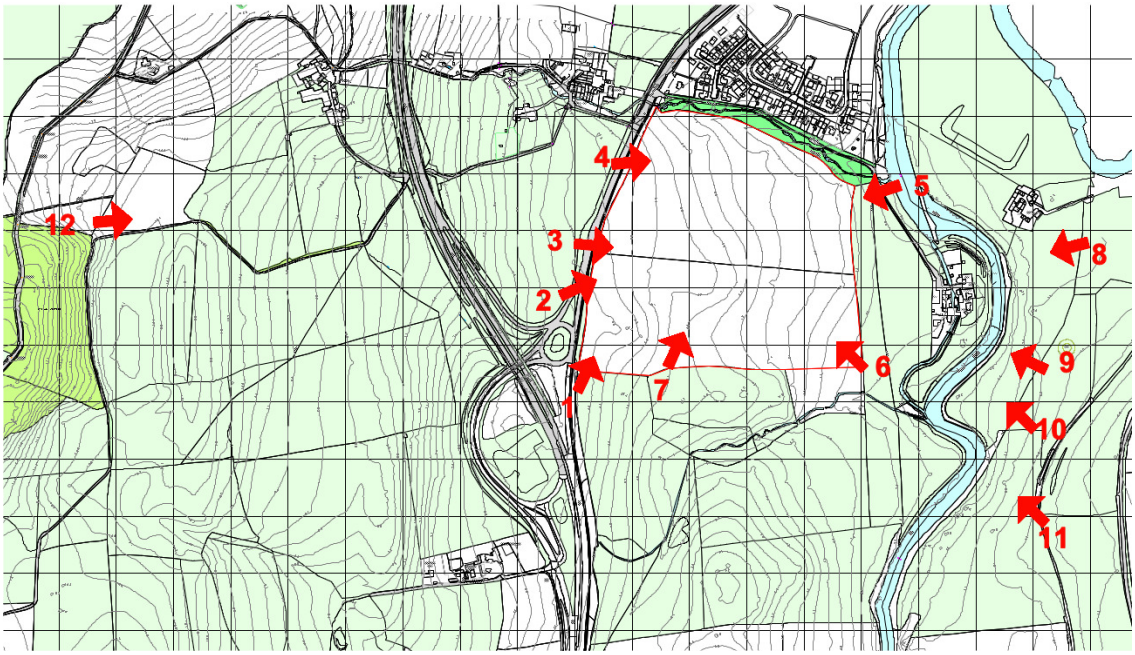
3.1 The site lies immediately adjacent to the southern boundary of Kendal adjacent to the A6, the main trunk road into Kendal from the south.

3.2 The site is easily accessed from the M6 as well as from Kendal town centre by private and public transport and is therefore strategically well positioned to provide future employment land for South Lakeland.

3.3 The Scroggs Wood site comprises approximately 18ha (gross) of undulating greenfield land, and is currently used for agricultural purposes (sheep grazing). The surrounding landscape comprises as established residential area to the north, beyond Scroggs Wood, the A6 (Milnthorpe Road) to the West, the River Kent to the East and greenfield, agricultural land to the South.

Visual Appraisal

KEY VIEWPOINTS (Figure 3.2)



Key to show photograph locations (photographs taken during early Spring)

- **1**. Looking north east from SW corner of site to show drumlin forms in foreground;
- **2**. Looking northeast from A6 with site to the right and Scroggs Wood to the north boundary;
- **3**. Looking east along hedge line to be retained;
- **4**. Looking east with Scroggs Wood on left;
- **5**. Looking west from the river end of Scroggs Wood. The steep rise from the riverside conceals the site from this close view point;
- **6**. Looking west from the south east corner of the site looking towards the bypass;
- **7**. Looking north-east from the southern boundary. Scroggs Wood to left behind drumlin;
- **8**. Looking west towards site with Scroggs Wood on the right and Helsington Mills to the foreground;

- **9**. Looking west from public footpath above river to east: Much of the site is concealed behind the dense wooded area to the left of the view;
- **10**. Looking west from public footpath above river to east (further south than previous photo) where trees conceal much of the site;
- **11**. Site viewed from an opening further south-east in the elevated footpath. Site views broken by trees;
- **12**. Looking east from Brigsteer Road. The site is hidden by the undulating forms of the nearby hill.

Photo 1: Looking north east from SW corner of site to show drumlin forms in foreground

Photo 2: Looking northeast from A6 with site to the right and Scroggs Wood to the north boundary

Photo 3: Looking east along hedge line to be retained

Photo 4: Looking east with Scroggs Wood on left.

Photo 5: Looking west from the river end of Scroggs Wood. The steep rise from the riverside conceals the site from this close view point.

Photo 6: Looking west from the south east corner of the site looking towards the bypass.

Photo 7: Looking north-east from the southern boundary. Scroggs Wood to left behind drumlin.

Photo 8: Looking west towards site with Scroggs Wood on the right and Helsington Mills to the foreground.

Photo 9: Looking west from public footpath above river to east: Much of the site is concealed behind the dense wooded area to the left of the view.

Photo 10: Looking west from public footpath above river to east further south than previous photo where trees conceal much of the site.

Photo 11: Site viewed from an opening further south-east in the elevated footpath. Site views broken by trees.

Photo 12: Looking east from Brigsteer Road. The site is hidden by the undulating forms of the nearby hill.

4. Vision Statement

4.1 *"**High quality employment premises in a sustainable location, sympathetic to the local high quality landscape, supporting the on-going social and economic needs of the area"***

4.2 The vision for the site is therefore underpinned by the following goals:

- Delivering high quality and well designed employment premises, which are sensitive to the distinctive character of the surrounding area;
- Promoting ecological conservation through the use of Green Infrastructure and ponds to encourage ecological habitat formation;
- Environmentally, Economically and Socially Sustainable designed to cope with anticipated climate changes;
- Supporting the community by ensuring access to jobs for local people;
- Providing a wide mix of types of employment space, focusing on quality of development;
- Introduction of quality landscaping and Green Infrastructure to protect the high quality landscape of the local area, and particularly of this important gateway site into Kendal.

5. Planning Policy

Introduction

5.1 This section seeks to demonstrate that the Scrogg's Lane site meets the relevant national and local policies (current and emerging), which are relevant to the allocation of the proposed site for employment uses.

National Policy

National Planning Policy Framework (NPPF)

5.2 The NPPF stresses the importance of the *presumption in favour of sustainable development*. The allocation of the proposed site for B1 (a-c), B2 and B8 uses represents sustainable development in terms of its location. This is due to the site's location – the proximity to local facilities / services, adjacency to the A6 and adjoining the urban area of Kendal.

5.3 The presumption in favour of sustainable development also emphasises the need for Councils and local communities to plan positively, including for housing and employment growth. This is linked to the Government's commitment to securing economic growth (*Building a strong, competitive economy,* Para. 18, NPPF) in order to generate jobs and prosperity. The NPPF stresses the need for the planning system to support economic growth. The allocation of the proposed site for employment would provide a mixture of uses and a range of unit sizes, with potential for a proportion of the site to provide SME starter units.

5.4 The NPPF encourages development which *promotes sustainable transport*. The location of the Scrogg's Wood site is well positioned in terms of providing realistic alternatives to the private car. The site is within walking distance of residential areas, located to the north of Scrogg's Wood. Bus routes serve bus stops located within 300m of the site, and provide links to Keswick, Kendal, Arnside and Grange.

5.5 The NPPF emphasises the importance of *Requiring Good Design* – developments should be high quality, inclusive, safe, visually attractive and responsive to local character. This Development Statement demonstrates that good design principles have been taken into account, showing the potential for the creation of a sustainable employment site which respects the surrounding landscape and residential properties.

5.6 The NPPF states the importance of meeting the *challenges of climate change, flooding and coastal change*. Where possible, developments should utilise low carbon or renewable energy sources. Furthermore, developments should avoid areas at high risk of flooding and sites at risk of flooding should be subjected to a Sequential Test, and Exception Test if necessary. The flood risk at the proposed site at Scroggs Wood has been taken into account and the majority of the site is located in Flood Zone 1.

5.7 The NPPF also highlights the need to *Conserve and enhance the natural environment.* This includes minimising the loss of biodiversity and providing net gains in biodiversity, where possible. The development of the site at Scrogg's Wood will incorporate landscaping, green infrastructure and attenuation ponds that will help to encourage and enhance on site habitats and bio-diversity.

Development Plan Policy

Local Development Framework

Core Strategy

5.8 The Council adopted the Core Strategy in October 2010. *Policy CS1.1* outlines the principles of sustainable development, which should be adhered to. This includes:

- Addressing flood risk and protecting the countryside;
- High quality design;
- Locating development within existing service centres, where there are adequate services and infrastructure capacity;
- Developments should help to meet the social and economic needs of local communities; and
- A focus to grow the local economy – including fostering local business development and attracting new investment.

5.9 *CS2 Kendal Strategy* states that 21ha of employment development should be provided in Kendal between 2010 and 2025. New employment development should be accessible from residential areas, via cycling, walking and public transport, and should also have good connections to the strategic network, without detrimental impact on the town centre. The site is located on the other side of Scrogg's Lane from residential areas and is within walking distance for future employees. The site borders the A6, which links to the A591, the A590 (leading to Ulverston and Barrow) and joins the M6 at junction 36. The

site's position to the south of Kendal allows access to the strategic road network whilst reducing the traffic impact upon the town centre.

5.10 Policy *CS2 Kendal Strategy* also encourages a focus on renewable energy and knowledge-based industries within Kendal.

5.11 *Policy CS7.1*outlines the district's need for around 4ha of employment land per annum, between 2010 and 2025. Kendal is a focus for development, as a Principal Service Centre in the spatial hierarchy, outlined in *Policy CS1.2.* The Council will also provide a rolling 5 year supply of high quality, unconstrained employment land. Development of greenfield land for employment uses should be phased to allow the prioritisation of Previously Developed Land. However, the Council does recognise that there is currently a lack of unconstrained and available employment land in the district. The development of the proposed site for employment uses would provide approximately 11ha of employment space, in a priority area, which would contribute significantly towards meeting the employment land needs of the district during the plan period.

5.12 *Policy CS8.1* promotes the provision of Green Infrastructure in new developments, particularly where it can be used to mitigate the negative impacts of development. Trees and woodlands should be protected and enhanced, where possible. *Policy CS8.2* states that development proposals should be sympathetic to the local distinctiveness and existing features of the area. The proposed site will be designed to incorporate existing and additional landscaping features, in order to minimise any adverse impacts which may arise from development at Scrogg's Lane.

5.13 Sites at risk of flooding will only be developable if the flood risk has been managed, surface water is managed sustainably and the benefits of the development outweigh the flood risk (as detailed in *Policy CS8.8*). The site at Scrogg's Lane will be subject to a detailed Flood Risk Assessment and the site layout will be responsive to differing flood risk levels across the site. Surface water is proposed to be managed in a sustainable way by use of attenuation ponds.

5.14 The development will be designed in line with *Policy CS8.10*, which requires developments to maintain or enhance the local landscape / townscape quality. Landscaping will be used to protect views and appropriate materials will be incorporated into the design, where possible.

5.15 In line with *Policy CS9.2*, the proposed development will provide developer contributions, following discussions with the Council at later stages of the development process.

5.16 In line with *Policy CS10.2*, an application for employment uses at Scrogg's Lane would be accompanied by a Transport Assessment and Travel Plan, to demonstrate that the site is safely served by the highway network, provides safe and convenient access on foot /

cycle and the expected nature and volume of traffic generated could be accommodated by the existing road network. Transport and Access has been assessed later in the Development Statement.

Land Allocations DPD (Submission edition 2012)

5.17 The Land Allocations DPD was submitted to the Secretary of State in May 2012. The hearings to discuss the Inspector's Matters and Issues are anticipated to recommence in June 2013. Following this, if the Inspector finds the DPD to be sound, the Council will adopt the Land Allocations DPD.

5.18 The proposed site has been identified in the Land Allocations DPD (site E4M) as a site of 17.9ha for employment uses B1 (b and c), B2, B8 and ancillary B1a (*Policy LA1.6, Land Allocations DPD Submission Version May 2012*). The site is seen as a more sustainable option, compared with the M6 Junction 36 site, which was considered as part of the Land Allocations process. The site at Scrogg's Wood has been identified in the South Lakeland Knowledge Based Employment Land Search and Assessment (2007) as being suitable for employment uses, in terms of its location, deliverability, size, availability, infrastructure capacity, market considerations and environmental capacity.

5.19 *Policy LA2.9* of the Land Allocations DPD states that employment development at Scrogg's Lane should include the following:

- A landscape and Green Infrastructure framework, incorporating a 10m buffer of native vegetation from Scrogg's Wood. Biodiversity mitigation, compensation and enhancement alongside provision of green infrastructure, protection of hedgerows and the protection of drumlins;
- Avoidance of development in the south-eastern portion of the site, close to the River Kent;
- Use of SuDS;
- Production of a Travel Plan and Transport Assessment;
- Provision of cycle and pedestrian routes throughout the site and towards the town centre;
- A high quality design; and
- Protection of the setting of the Watercrook Roman Fort, the Helsington Laithes and Snuff Mill Grade 2 Listed Building.

5.20 The aforementioned 10m buffer is an addition following the main modifications made to the Land Allocations DPD, which states that Scroggs Wood should be allowed to expand

into the buffer zone by natural re-vegetation. Furthermore, any new development should be set back at least 15m from the boundary of Scrogg's Wood. Following these landscaping requirements, a developable area of 11ha has been applied to the site.

5.21 Policy LA2.11 of the main modifications version states that land to the south and east of the A6 should include a substantial, high quality landscape frontage to the road. Existing tree groups should be reinforced alongside the provision of a habitat survey and safeguarding / reinforcing areas of biodiversity interest.

5.22 Sustainability is a key criterion for allocations in the DPD. The Site Allocations DPD states that sites should be proximate to local services, consider scope for renewable energy and local energy networks, review flood risk and contamination, and assess air quality issues and exposure to noise and smells. A planning application for the site at Scrogg's Lane site will consider all aspects of sustainability detailed in the Allocations DPD. The site's proximity to the residential area of Kendal clearly demonstrates its sustainability in terms of providing alternative means of transport to the car. Furthermore, the site's location to the south of Kendal will alleviate traffic and air quality issues to the north of the settlement.

5.23 In addition, the Allocations DPD states that biodiversity and geodiversity considerations should be taken into account when assessing sites, alongside heritage considerations. The masterplan indicates that extensive landscaping will be provided to screen the development from the nearby residential areas and the A6; which in turn will create additional habitats. The scheme will be designed to a high quality to reduce impact upon local heritage assets and landscape features.

5.24 The Land Allocations DPD states that a small number of allocated sites have been found to be situated within areas at risk of flooding. This Development Statement recognises the flood risk and has ensured that inappropriate development does not occur in areas of high flood risk. In addition, SuDS systems will be employed to sustainably manage surface water run-off.

5.25 As well as assessing the environmental sustainability and historic impact of site allocations, the Council have also carried out viability assessments on certain sites. This viability assessment has considered the costs of any requirements likely to be applied to development, including infrastructure, the cost of development and mitigation, whilst also ensuring that the development provides competitive returns to a willing land owner / developer. A viability study has also been carried out on the site at Scrogg's Wood, to inform this Development Statement, which has generated similar results to that of the Council. Both assessments have shown that in order to produce a high quality scheme which incorporates all mitigation measures, the site at Scrogg's Wood will be viable with additional gap funding.

5.26 Future work towards the submission of a planning application for this site, will adhere to the Council guidance listed under Policy LA2.9 and demonstrate that a sustainable employment site can be delivered in this location, without having an adverse impact upon the surrounding landscape or habitats on site.

5.27 A Development Brief will be created by the Council to shape future development at Scrogg's Lane, incorporating the views of the local community. A complex brief of the site is to be adopted by the Council by March 2014. This demonstrates the Council's support, in principle, concerning development of the site for employment uses. Future development on the site will adhere to the guidance within this brief.

South Lakeland District Council's Employment Land Need

5.28 The Employment Land Review (2012) has forecast that there will be an increase in demand for jobs within the district, specifically in the knowledge and service based sectors. Population increases will increase requirements for sufficient jobs to be delivered in the future.

5.29 The Employment Land Review found that over the past 10 years, there has been an average employment land take-up of 1.54ha p.a. To account for choice and competition, required provision could increase to 2.4ha of employment land p.a. or 36ha for the plan period (2010-2025).

South Lakeland District Council's Employment Land Supply

5.30 The Employment Land Review (2012) has found that South Lakeland's current supply (outside of the National Park) equates to 16.04ha of allocated / committed employment land over 0.25ha, relating to 12 sites. There is an evident lack of quantity and choice in employment land for the future plan period.

5.31 The proposed development site at Scrogg's Lane, site E4M, is identified as a potential strategic employment site, suitable for B1b and c, B2 and B8 development. The Council recognises that a new access road will be required from the A6, but the site has good access to the regional highway network and the area does not suffer from the congestion issues which are associated with the north of the town. Overall, the site was rated as 'Green' in the Employment Land Review, demonstrating that it is an attractive site in the market, with limited constraints.

Summary

5.32 This section has demonstrated that the allocation of the proposed development site at Scrogg's Lane for employment uses is policy compliant, with regards to national and local adopted policies. Furthermore, the allocation of the site for B1(a-c), B2 and B8 uses will

contribute towards meeting the Council's required employment land supply over the plan period, considering its current identified shortfall.

5.33 The site is supported for the development of employment uses within the submission version of the Allocations DPD and represents a sustainable site, adjoining Kendal and adjacent to the strategic road network. The site has potential to accommodate a range of employment uses and is preferable to other alternative sites, which have been proposed during the Site Allocations DPD process.

6. Suitability of the Site for Development

Location and Accessibility

Transport

6.1 As detailed later in this section, the Scroggs Wood site is well-served by public transport with bus stops located along the A6 (Milnthrope Road) and Kendal Train Station located approximately 2km to the North, thereby providing excellent accessibility to the site from Kendal and neighbouring districts. The site is also accessible on foot and by cycle.

Housing

6.2 Being located on the southern boundary of Kendal, there is a density of population in the immediate vicinity of the site. Employment development at Scroggs Wood opens up employment opportunities for local people.

Retail

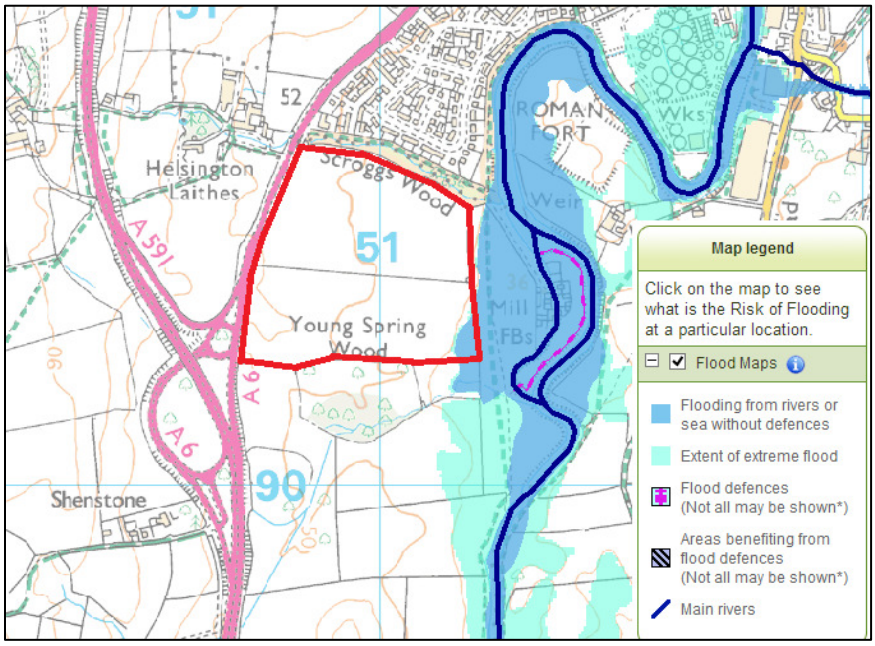
6.3 There are numerous shops and services within Kendal Town Centre. These shops and services will benefit from employment development at Scroggs Wood, due to the increased local spend from employees. This sustainable location will benefit the local area socially and economically.

Site Technical Analysis

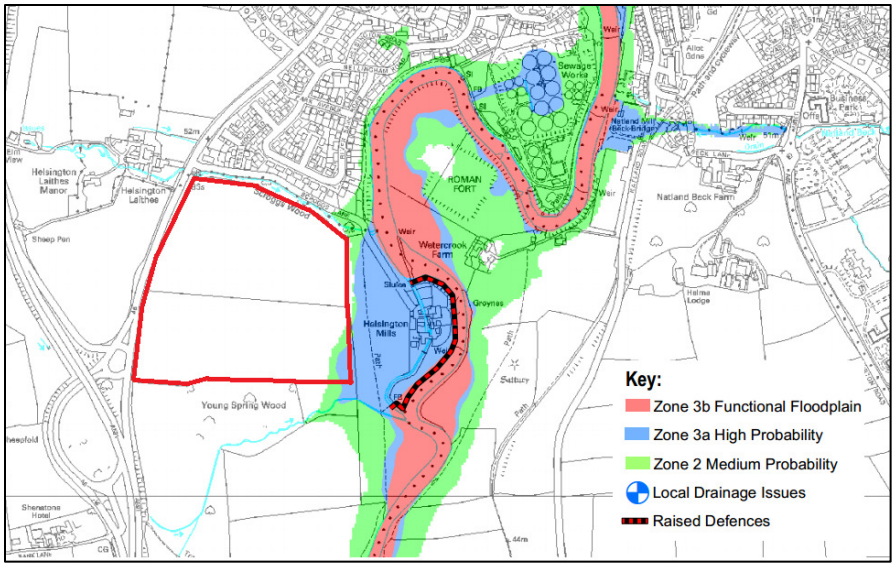
Flood Risk

6.4 In March 2012 the Department of Communities and Local Government published National Planning Policy Framework document (NPPF), which provides technical guidance on how flood risk should be assessed during the planning and development process.

6.5 The Environment Agency Flood Mapping identifies the approximate Flood Zones for the site. It can be seen from this data that the site (Shown edged red) is almost entirely indicated as being in a Flood Zone 1 with an isolated area of Flood Zone 3A (blue).



6.6 A Strategic Flood Risk Assessment (SFRA) for South Lakeland District Council was also used to identify the Flood Zones in the area (shown below); this generally concurs with the Environment Agency flood maps with the majority of the site falling within Flood Zone 1, however this map shows the south east corner of the site to fall within Flood Zones 2 and 3a.



6.7 Zone 3a is assessed as having a less than 1 in 75 annual probability of river or sea flooding in any year (1.3%) but greater than a 1 in 200 annual probability (0.5%) and therefore in this zone highly vulnerable uses should not be permitted in this zone and more vulnerable and essential infrastructure should only be permitted if the Exception Test is passed. Zone 2 is assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% - 01%) in any year.

6.8 Based on the site use proposals for employment, the development would be classed as `less vulnerable' use and therefore would be considered as appropriate development within Flood Zones 1, 2 and 3a, as illustrated by the compatibility table below.

Table 3: Flood risk vulnerability and flood zone 'compatibility'

Flood risk vulnerability classification (see table 2)		Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Flood zone (see table 1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	×	Exception Test required	✓
	Zone 3b functional floodplain	Exception Test required	✓	×	×	×

Key: ✓ Development is appropriate.
× Development should not be permitted.

6.9 A detailed Flood Risk Assessment (FRA) has been carried out to support the future development of the site for employment use (see Appendix II).

6.10 As detailed above, almost the entire site is within Flood Zone 1, except for a small parcel of the site located in the south-eastern corner. The majority of the site is therefore within an area considered to have a low risk of flooding.

6.11 As such, there are no flooding constraints preventing the site coming forward for employment uses.

6.12 A drainage strategy (See Appendix II) has been prepared to accompany the FRA, containing information on existing and proposed foul water and surface water drainage arrangements; the findings of the drainage strategy are summarised later in this chapter.

Ecology

6.13 A field survey and desktop studies were undertaken to inform the ecological assessment, which sets out baseline information regarding features of conservation value (such as species habitats) at the Scroggs Wood site and within 2km of the site boundary.

6.14 The assessment confirmed that the site is not covered by any statutory or non-statutory designated conservation site(s) which could constrain development. There are two statutory designated sites and seven non-statutory designated sites within 2km of Scroggs Wood site, namely:

- The River Kent SAC / SSSI;
- Scout and Cunswick Scars SSSI
- Warriner's Wood County Wildlife Site;
- Scout and Cunswick Scars Site of Invertebrate Significance;
- River Kent, Natland, Site of Invertebrate Significance;
- Hawes Wood (Natland) County Wildlife Site;
- Lancaster Canal County Wildlife Site; and
- Serpentine Wood and Kendal Fell County Wildlife Site.

6.15 The River Kent SAC/SSSI is located approximately 60m north east of the site as its closest point. However, two tributaries of the River Kent are located in close proximity of the site, flowing in parallel to both the northern and southern boundaries. To prevent impact on these tributaries the Phase I Habitat Study recommends best practice guidelines be followed, along with a number of mitigation measures to ensure they are not adversely affected.

6.16 It is not anticipated that any of the other statutory or non-statutory sites or habitat features will be affected by the proposed development.

6.17 The proposed development will **not result in the loss of any important habitats on site**. The only habitat to be lost will be the species poor semi improved grassland fields, which are considered to be of low importance for nature conservation.

6.18 The proposed development would result in **net gains in biodiversity for the site**, through the planting up of the existing hedgerows and additional woodland planting along the northern site boundary, which will act as a buffer for Scroggs Wood. All the mature trees identified during the Extended Phase 1 Habitat Survey will be retained as part of the

development scheme. Areas of additional tree planting are also proposed across the site. This will result in a net gain in tree cover as a result of the development scheme.

6.19 Two new waterbodies proposed as part of the SUDS scheme could also be enhanced for biodiversity.

6.20 As part of the proposed development for the site there are also a number of areas of green infrastructure where meadow grassland would be sown. This species rich habitat would be of benefit to invertebrates, birds and bats. The meadow grassland should comprise native species of local provenance.

6.21 The assessment also indicated that a number of active/potential badger setts were identified within the site and the adjacent Scroggs Wood. A full badger survey would be undertaken to inform an appropriate mitigation scheme.

6.22 It is not anticipated that the proposed development would result in any adverse impacts to local bat or bird populations.

Landscape and Visual

6.23 The site is located to the southern edge of Kendal in a landscape characterised by undulating hillocks called drumlins. The drumlin field runs from Cowan Head to near Kirkby Lonsdale running parallel with the Kendal by-pass and crossing the M6. These are glacial deposits of boulder clay formed when the ice sheet deposited the "lake District Drift" into the striking drumlin pattern which is such a feature of this landscape. The drumlins have rounded tops with steep sides. The landscape has high hedges and stone walls forming strong boundaries, with streams and wet hollows in the valleys and dips between drumlins. Farms and developments often nestle in intersecting valleys. The drumlins are mainly covered in pastoral fields divided by thick hedges and walls. Small broadleaved woods and hedgerow trees are a characteristic of this landscape.

6.24 The proposed development site is bounded to the north by Scroggs Wood which is an example of such a broadleaf wood. Scroggs wood forms a boundary between the built up residential edge of Kendal and the open fields towards the south. The wood encompasses a stream which drops from the higher land to the west to the River Kent to the east. Scroggs Wood is a narrow strip of mature woodland and forms a distinctive screen to the residential area of southern Kendal beyond.

6.25 The west of the site is bounded by the A6 which is the main trunk road access into Kendal from the south. The A6 is connected to the M6 via the Kendal bypass, and the by-pass intersection lies immediately to the south-west of the development site. Beyond the bypass the land rises more steeply onto the limestone ridge to the west.

6.26 The east of the site has an undulating profile, and whilst it rises steeply to the north-east, the site generally falls away to the River Kent just beyond the eastern boundary.

6.27 The southern part of the site is defined by a field boundary of drystone limestone walling which follows the undulating topography of the land. Beyond the southern boundary to the south lies an area of Parkland character called Young Spring Wood. The land undulations are more dramatic further south.

6.28 The site itself comprises two grazing fields and is generally of open aspect with a crossfall in excess of 30m from the west to the east, with steeper areas associated with the drumlins, and flatter sections between. A fenced hedgerow forms a separation between the two fields in a west to east direction. The southern field is generally more undulating than the northern field and the area to the south-west, nearest to the A6/ A591 junction has the greatest height and level changes. It is considered that this more extreme drumlin landforms should remain undisturbed by the site development.

6.29 The open landscape to the east looks towards the fells beyond Oxenholme station and the south-eastern boundaries of Kendal are visible from the site. The Clarks shoe factory is a strong built form in this direction, and the chimney from the Westmorland General Hospital is visible above the trees. However, the long views are broken up by the landforms and particularly by wooded areas. Adjacent to the site are Helsington Mills, a mixed industrial development by the river. Adjacent to the mills are stone and rendered converted farm buildings.

6.30 There are views onto the site from the east, most notably from the public footpaths which run along the eastern banks of the River Kent. Photos 8-11 show views from various points along these paths. The views onto the site are interrupted with existing tree screening and topography.

6.31 A slightly more elevated view of the site is achieved from the disused railway line from Kendal to Natland, although many of these views are screened by hedgerows and trees (photo 11).

6.32 Views onto the site from the south are restricted by the drumlin landforms. The most notable views are from the A6 and By-pass junction where the road is elevated and there are views to the north with the site visible to the north-east (photos 2 and 3).

6.33 The site is visible from the public footpaths on the higher land to the west, although again these views are intermittent and often obscured by the landforms. Higher up the hill runs the Kendal to Brigsteer Road and only parts of the site can be glimpsed in very few places, as the site is obscured by the undulations of the landforms and woodland (photo 12).

6.34 There are no views onto the site from the north as the line of Scroggs Wood provides a visual barrier. The view onto the site from the north-east near the River Kent is cut off by the raised land to the north east corner of the site (photo 5). Views from the Roman Fort are likewise concealed mostly by topography.

6.35 Within the site itself, the development will provide drainage ponds to the low part of the site which will not only provide surface water drainage attenuation, but opportunities for further wildlife habitats.

6.36 Within the site will be opportunities for footpaths, cycle paths, and recreation areas for employees and visitors.

6.37 Ultimately, with the retention of drumlin features, the natural sloping topography of the site, the implementation of a comprehensive green framework along with the existence of established tree groupings surrounding the site, views will be partially screened and mitigated. The proposed high quality of the development would also lessen any impact of the proposed development upon the landscape.

6.38 The characteristic landscape with drumlin features and small woodlands will be integrated into the development brief for the site.

Transport and Highways

6.39 The proposed site is situated to the south of Kendal approximately 2.2km from the town centre.

6.40 The site is bound by the A6 Milnthorpe Road to the west, Scroggs Lane to the north with residential properties further north and open fields to the east and south. The River Kent flows in a southerly direction to the east of the site.

6.41 The A6 Milnthorpe Road provides a direct route north from the site into the central areas of Kendal. In the vicinity of the site, the A6 is approximately 10m wide with single lanes running in both directions and a wide central hatched lane between the north and southbound lanes. At the south western corner of the site, the A6 joins with the A591 via a complex gyratory arrangement. The speed limit along the A6 changes at a point midway along the site frontage from 40mph to the north to/from Kendal to a derestricted limit on approach to the A591.

6.42 Along the site frontage the A6 provides some pedestrian facilities, with a footway existing along the eastern side of the carriageway only. Footways are provided along both sides of the carriageway to the north beyond the junction with Scroggs Lane.

6.43 The A591 is a strategic route which bypasses Kendal and provides a link to the south Lakeland areas from Junction 36 of the M6; which is situated approximately 9.4km to the

southeast of the site. The road is subject to a derestricted speed limit and provides access to surrounding built up areas and through the Lake District National Park.

Sustainable Modes of Travel

6.44 A key element of national, regional and local policy is to ensure that new developments are located in areas where alternative modes of travel are available. It is important to ensure that developments are not isolated but are located close to complementary land uses. This supports the aims of integrating planning and transport, providing more sustainable transport choices, and reducing overall travel and car use.

6.45 The site is not isolated, although it is situated in a predominantly rural area there is a significant residential area immediately to the north. The proposed land allocation would be supportive of NPPF policies to promote a prosperous rural economy. In this light, the Government recognises that "…different policies and measures will be required in different communities and opportunities to maximise sustainable transport solutions will vary from urban to rural areas." (Paragraph 29, NPPF).

Pedestrian Accessibility

6.46 As the site is situated at the southern edge of Kendal, there are existing pedestrian facilities to the north of the site through the built-up residential areas. These consist of an unlit single-carriageway on the northern border of the site; Scroggs Lane, and a network of residential roads which provide pedestrian footways and street lighting throughout. There is also a network of footpaths which run alongside the River Kent which the proposed development will link into to enhance pedestrian access to the site from neighbouring areas.

6.47 Scroggs Lane loosely runs along the northern and eastern boundaries of the site until it reaches the River Kent. To the south, there are open fields, with no public rights of way. Pedestrians would not have access to the site from the south.

6.48 To the west, the A6 Milnthorpe Road borders the site. There is a pedestrian footway provided along the eastern side of the carriageway only which is separated by an area of grassed verge.

6.49 Research has indicated that acceptable walking distances depend on a number of factors, including the quality of the development, the type of amenity offered, the surrounding area, and other local facilities. The Chartered Institution for Highways and Transportation (CIHT) document entitled 'Providing for Journeys on Foot' suggests walking distances which are relevant to this planning application. These are reproduced in Table 6.1.

Table 6.1: CIHT Suggested Acceptable Walking Distances

	Town Centres (m)	Commuting/School/ Sightseeing (m)	Elsewhere/Local Services (m)
Desirable	200	500	400
Acceptable	400	1000	800
Preferred Maximum	800	2000	1200

6.50 To assist in summarising the accessibility of the site by foot, an indicative pedestrian catchment plan has been produced. TRN 001 shows distances of 1,000m and 2,000m which are termed 'Acceptable' and the 'Preferred Maximum' by the CIHT for commuting/school/sightseeing trips.

6.51 Within the 1,000m pedestrian catchment, there are a number of residential properties to the north, for example along Bellingham Road and Kent Park Avenue.

6.52 Within 2,000m, there is an additional number of residential properties and a number of hotels/bed & breakfasts. To the south, there is a petrol filling station with a convenience store, and to the north lie further residential properties, Vicarage Park CoE Primary School, Dean Gibson Catholic Primary School, and Kendal College. There are also some independent shops, take-aways, convenience stores, and drinking establishments as pedestrians travel from the site into the centre of Kendal.

6.53 In conclusion, there are a number of services available within the preferred maximum walking distance from the site.

Accessibility by Cycle

6.54 To assist in assessing the accessibility of the site by cycle, a 5km cycle catchment has been assumed for the site. This distance equates to a journey time of around 25 minutes, while cycling at a leisurely speed of 12 kilometres per hour.

6.55 The 5km catchment encompasses Kendal in its entirety, and a number of smaller neighbouring areas including; Oxenholme, Natland, Sedgwick and Brigsteer.

6.56 There are no cycle lanes or cycle routes directly to the site. However, much of the surrounding road network to the north of the site is residential, and assumed to be suitable for cycling. Northbound from the junction with the A591, the A6 has a national speed limit before it reaches a 40mph speed restriction along the western site boundary. This road, in

terms of catering for cycle trips to and from Kendal, is therefore considered suitable for cycling.

6.57 There is also a path which runs south from Bellinghham Road to the site between properties on River Bank Road, and the River Kent. This provides a viable link to Kendal for cyclists.

6.58 National Cycle Route 6 (Preston to Keswick) runs north/south approximately 750m to the east of the site. However this lies to the east of the River Kent and as a consequence access is restricted to certain points.

6.59 In conclusion, cycling is considered to be a realistic alternative to people accessing the site from the north; predominantly residents from areas in Kendal.

Accessibility by Bus

6.60 There are bus stops on either side of the carriageway along Milnthorpe Road approximately 715m walk from the site's centre. Although these existing stop locations are not likely to be within the recommended 400m walk distance from the site entrance set out in the Chartered Institution of Highways and Transportation (CIHT) document `Guidelines for Planning for Public Transport in Development', they are still considered to be accessible.

6.61 There is currently one bus service which frequently uses these aforementioned stops, although such a land allocation and subsequent development may prompt service providers to undertake a positive review of the service provision. Table 6.2 gives the details of this service:

Table 6.2: Local Bus Services Peak Frequencies

Bus Service	Route	Peak Frequency			
		AM	PM	Sat	Sun
46	**Kendal – Wattsfield**	**Hourly**	**Hourly**	**Hourly**	**-**

6.62 There are additional services operating along the A6 Milnthorpe Road such as the 530 between Kendal and Cartmel and the 552 between Kendal and Arnside, and whilst they are relatively infrequent they would still provide a suitable service for some commuters travelling to/from the proposed site.

6.63 In conclusion, the site can be accessed from the centre of Kendal with relative ease for a rural location. Users of the site traveling further afield can then continue their journeys on from Kendal, as it is well connected by public transport to most areas across Cumbria.

Accessibility by Rail

6.64 Both Kendal and Oxenholme Railway Stations are accessible from the site.

6.65 Although they are not considered within walking distance from the site, both stations are comfortably within the 5km cycle catchment and the aforementioned 46 bus service links Kendal centre to the site leaving Kendal station a short walk away.

6.66 From Oxenholme, passengers can reach Lancaster, Preston, Carlisle, and Edinburgh, as well as London, Manchester Airport and Glasgow by direct trains. Again, these destinations could be reached from the site by means of a multi-modal trip involving rail.

6.67 In conclusion, it is considered that rail has the potential to be a viable transport choice for some people accessing the site as part of a multi-modal trip including cycling or buses.

Accessibility Summary

6.68 The current bus service provision along Milnthorpe Road would provide a realistic and viable travel choice, linking the site to the wider areas of Kendal and neighbouring built up areas.

6.69 The site has been considered in its context within a rural area of the country. When this is taken into account, the site is relatively well connected. There is already an established bus route which passes the site, and such development could prompt a positive commercial reaction from the service operators.

6.70 Both Kendal and Oxenholme station are accessible from the site, and these provide links to a variety of locations nationally.

6.71 It is therefore concluded that the site is adequately connected for the proposed development.

Access Proposals

6.72 The development of the A6 Milnthorpe Road site has been previously considered at a high level as part of a transport assessment on the deliverability of the proposed growth in Kendal to form part of the evidence base for the emerging Local Development Framework.

6.73 During this initial assessment it was determined that a simple priority controlled junction would not be sufficient to cater for the volume of traffic leaving the site during the

evening peak hour period, and a signalised junction would be required to stop the flow of traffic on Milnthorpe Road to allow vehicles to turn in and out of the site.

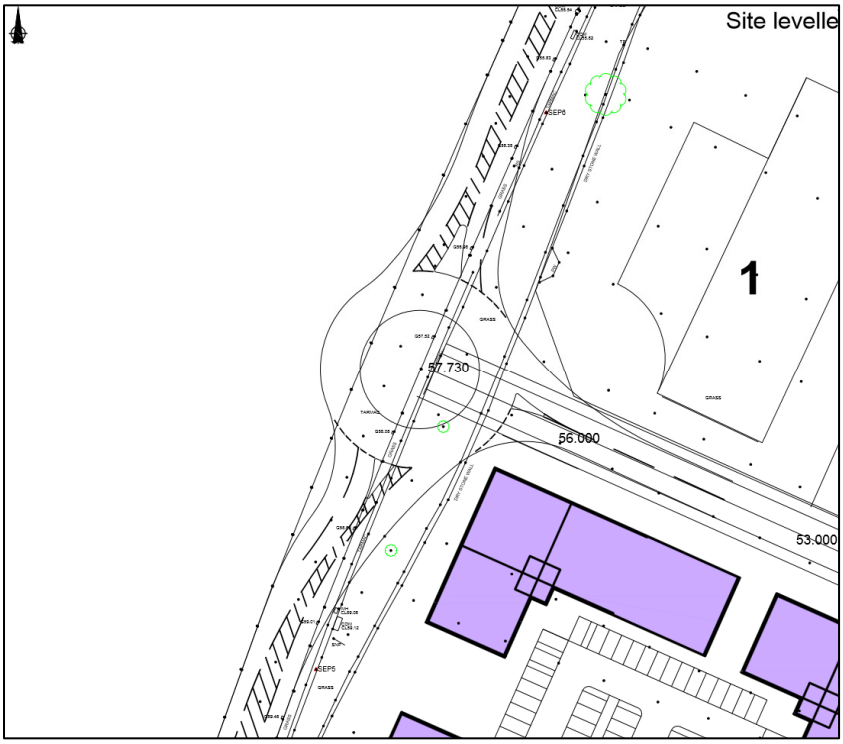
6.74 It is accepted that a priority controlled junction on Milnthorpe Road may be insufficient to cater for future traffic demand of the entire site, and signal controlled junction would offer a viable solution in junction operation terms.

6.75 However, it should be recognised that a signal controlled junction would also continue to stop mainline traffic flows on Milnthorpe Road throughout the day, outside of the peak hour periods when demand from the proposed development is not as significant . This could therefore create unnecessary delays for through traffic on Milnthorpe Road.

6.76 On the above basis, whilst the option to deliver a signal controlled access junction is not being dismissed it is considered that a three arm roundabout access junction would provide sufficient capacity to accommodate AM and PM peak hour traffic demand whist also maintaining flow along Milnthorpe Road during quieter times of the day.

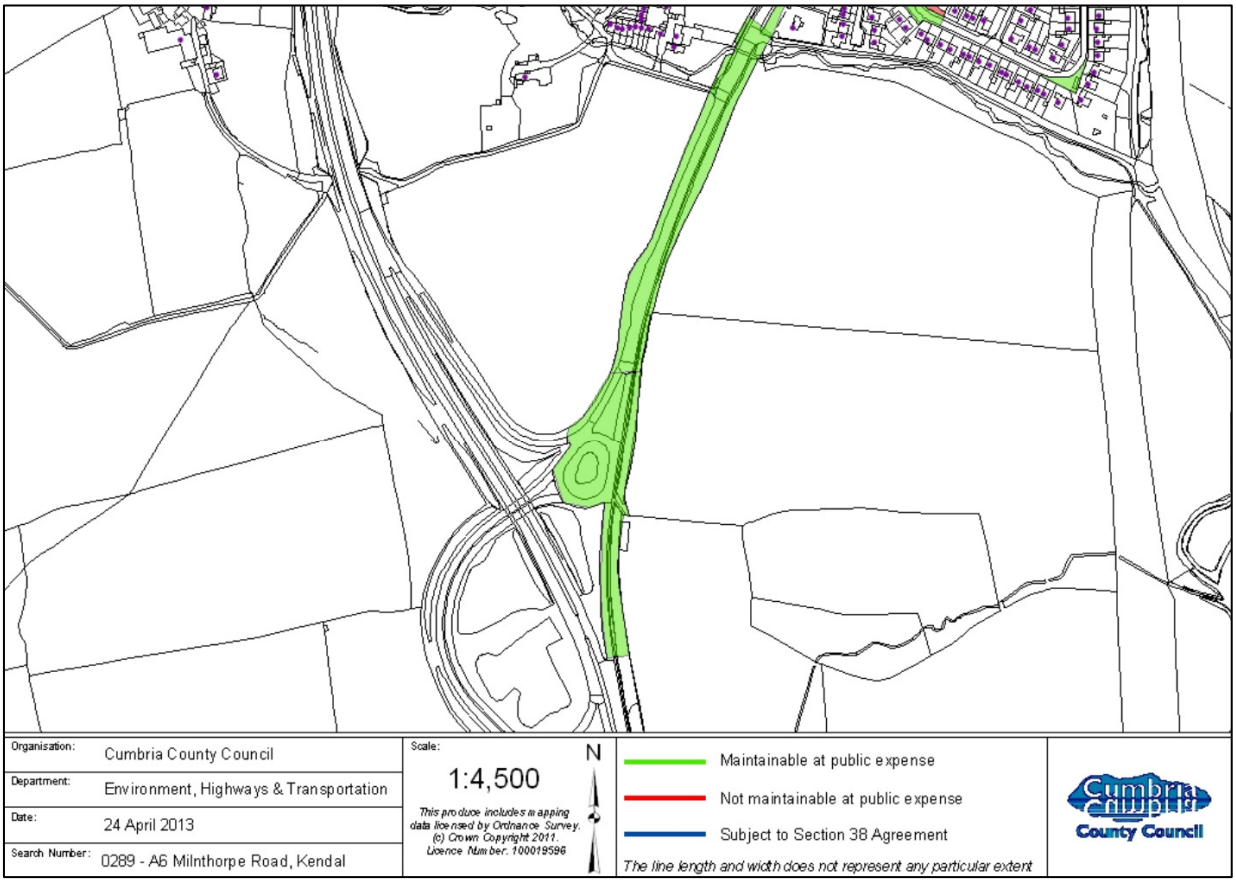
6.77 In order to provide maximum spacing between the proposed roundabout and the A6/A591 junction, the site access has been located towards the north-eastern corner of the site with sufficient distance maintained between the existing farm access road on the western side of Milnthorpe Road. The farm access would therefore be unaffected by the proposals and continue to operate as a priority junction with ghost island right turn facility.

TRN 003: Proposed Site Access Roundabout Layout



6.78 The drawing TRN 003 above presents the proposed site access roundabout layout. The junction has been designed to avoid any third party land and can be delivered entirely within the adopted highway and development land. The adopted highway boundary is shown below in drawing TRN 004:

TRN 004: Adopted Highway, Data from Cumbria County Council



6.79 The proposed access junction is also located in the vicinity of where the speed limit on the A6 Milnthorpe Road changes between 40mph and derestricted (60mph). It is recommended that the new roundabout is used to create a more formal point for the change of speed limit, on Milnthorpe Road, creating a gateway arrival point for Kendal.

6.80 The three arm roundabout has been designed in accordance with guidance and recommendations set out within the Design Manual for Roads and Bridges (DMRB).

6.81 The Milnthorpe Road northbound and southbound lanes increase from a single lane to two lanes on approach to the roundabout with the site access creating a single lane flared approach to the junction.

Traffic Impact

6.82 Existing traffic flow data has been obtained for the A6 Milnthorpe Road during the AM and PM peak hour periods.

6.83 It has been determined that the morning peak hour period occurs between 08:00 and 09:00 with the evening peak hour period occurring between 17:00 and 18:00. The recorded traffic flows along the A6 Milnthorpe Road are set out below:

AM Peak Hour

Northbound 1032 vehicles

Southbound 808 vehicles

Two-way 1840 vehicles

PM Peak Hour

Northbound 787 vehicles

Southbound 859 vehicles

Two-way 1646 vehicles

6.84 In order to determine the level of traffic which will be generated by the comprehensive redevelopment of the site, reference has been made to the TRICS national database. TRICS is the industry recognised tool for calculating traffic flows associated with new developments. The database contains traffic survey information for a wide variety of land uses with a mix of sizes. By selecting relevant criteria such as location, land use and gross floor areas (GFA) the TRICS database produces a trip rate which can be applied to a proposed development scheme GFA to determine future traffic flows.

6.85 It is envisaged that the site could accommodate a mix of employment uses ranging from B1 office, B2 industrial (small/medium enterprises) and B8 warehousing.

6.86 It is believed that the site could accommodate circa 45,293sqm GFA of B1, B2 and B8 uses. Based on these figures the TRICS database has been interrogated for Business Park sites with the resultant trip rates and trip generations summarised below.

Table 6.3: Trip Generation Summary

	Trip Rate			Trip Generation		
	Arrivals	Departures	Two-way	Arrivals	Departures	Two-way
Business Park (per sqm)						
AM Peak Hour	0.505	0.257	0.762	229	116	345
PM Peak Hour	0.282	0.442	0.724	128	200	328

6.87 Table 6.3 indicates that the redevelopment of the site could generate in the order of 345 and 328 additional two-way trips on the highway network during the AM and PM peak hour periods respectively.

6.88 In terms of impact on the A6 Milnthorpe Road the additional trips would represent an increase of 19% and 20% in the AM and PM peak hour periods respectively.

AM Peak Hour

Existing two-way traffic flow 1840 vehicles

Development two-way traffic flow 345 vehicles

Percentage Increase 18.76%

PM Peak Hour

Existing two-way traffic flow 1646 vehicles

Development two-way traffic flow 328 vehicles

Percentage Increase 19.92%

6.89 In order to determine the operational impact of the proposed development on the highway network the proposed site access roundabout junction has been assessed using the ARCADY computer programs. ARCADY refers to the Ratio of Flow to Capacity (RFC) and queuing predicted on each approach arm of a junction. An RFC of 1.00 indicates that an arm is operating at its theoretical capacity while an RFC of 0.85 or less suggests that the arm is operating within its practical capacity. Queue lengths indicate the maximum predicted queue during the peak hour.

6.90 The operation of the junction has been assessed for a base year of 2013 and a future year of 2023. TEMPRO defined an AM growth rate of 9.4% and a PM growth rate of 10.3%, both of which were assumed in the capacity assessments.

6.91 The results of the ARCADY assessment have been summarised in Table 6.4.

Table 6.4: ARCADY Assessment Summary

	2013 Base plus Development				2023 Base plus Development			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Max RFC	Max Queue	Max RFC	Max Queue	Max RFC	Max Queue	Max RFC	Max Queue
A6 Milnthorpe Road (North)	0.72	3	0.67	2	0.78	4	0.74	3
Proposed Site Access	0.19	0	0.32	0	0.20	0	0.34	1
A6 Milnthorpe Road (South)	0.76	3	0.55	1	0.83	5	0.60	1

6.92 The assessment results summarised in Table 6.4 confirm that the proposed site access roundabout would operate within practical capacity limits with limited queuing taking place on the A6 Milnthorpe Road approach arms into a 2023 future year.

6.93 The maximum RFC of 0.83 occurs on the A6 Milnthorpe Road southern approach arm with a corresponding queue of 5 vehicles during the 2023 AM peak hour.

6.94 Based on the above it is considered that the introduction of a new three arm roundabout on the A6 Milnthorpe Road would not result in any significant delays to existing users and the proposals would have no severe traffic impact on the local highway network in line with the guidance set out in NPPF.

Traffic Management

6.95 It is proposed to influence travel behaviour at the site through the implementation of a detailed Travel Plan.

6.96 A Travel Plan (TP) is a package of practical measures aimed at reducing the transportation and traffic impact of a development. A TP is intended to encourage individuals to choose alternative modes over single occupancy car use and where possible reduce the need to travel at all. The TP will be tailored to suit the needs of the site and include a range of measures that are likely to have a positive impact.

6.97 The National Planning Policy Framework promotes the use of TPs and states that they are a key tool to promote sustainable transport opportunities.

6.98 TPs are also referred to in Department for Transport's (DfT's) "Guidance on Transport Assessment" (GTA), published in March 2007. This states that TPs are an important component of a planning application and an "increasingly important tool in the delivery of sustainable outcomes".

6.99 In line with Central Government Policies and Guidance, the aims of the TP are to:

- Reduce the need to travel;
- Discourage the use of unsustainable modes of transport and enable users of the development to make travel choices that benefit themselves and their community;
- Maximise social inclusion by making the development accessible to all members of the community; and
- Raise awareness of alternative modes of transport and thus encourage a shift towards more sustainable modes of travel.

6.100 The most easily identifiable benefits are those that are directly related to reductions in vehicle use; namely less congestion, noise, air pollution and road accidents. However, there is also a broader range of more intangible benefits that can occur from the implementation of TP initiatives.

6.101 Wider benefits of TPs include:

- Improved health (i.e. increased fitness and reduced stress and obesity);
- A reduction in travel costs;
- A cleaner local environment;
- Improved accessibility to local services;
- Increased road safety;
- Reduced travel times;
- Improved travel choice;
- Reduced congestion and demand for parking spaces; and
- A reduction in the need to travel.

6.102 A package of measures and initiatives will be developed for staff and visitors to the proposed site. It is envisaged that these will be implemented following further consultation with the Local Authority.

6.103 A TP is a constantly evolving document and the Local Authority along with staff will be heavily involved throughout the development of the Plan.

6.104 In order to ensure year on year progress is being made a set of annual modal shift targets will be agreed and monitored on a regular basis. The results of the monitoring exercise will inform whether further initiatives will need to be adopted in order to influence travel behaviour and reduce travel to/from the site by single occupancy private car journeys.

6.105 The above analysis demonstrates that the potential increase in traffic arising from the development proposals would lead to a limited impact on the operation on the surrounding highway network and its junctions. It further demonstrates that the site access will operate satisfactorily.

6.106 There are no transport, highways or access constraints preventing the site coming forward to employment uses.

Drainage and Sewerage

Foul Drainage Strategy

6.107 Foul Drainage should be discharged into the existing public sewers located to the north of the development site. There are various locations which could potentially provide a connection point and are as follows;

- 150mm diameter foul sewer in Kentwood Road(Manhole reference (9800)
- 150mm diameter foul sewer in Kent Park Avenue (Manhole reference (0904)
- 150mm diameter foul sewer in Milnthorpe Road (Manhole reference 0901).

6.108 An initial enquiry has been submitted to United Utilities requesting confirmation of the possibility to connect into their existing network and their preferred location.

6.109 The foul drainage from site will be drained via a network of drainage pipes which will be directed towards the northern site boundary to a pumping station. The site levels are as low as such that a gravity system to the public sewer will not be possible and therefore a rising main will be located along the northern boundary and pumped up towards Milnthorpe Road and to the preferred United Utilities location at an agreed discharge rate.

Surface Water Drainage Strategy

6.110 In following the standard hierarchy of drainage solutions, consideration should firstly be given to the discharge of surface water runoff by sustainable methods such as infiltration. On this basis it is envisaged that Sustainable Urban Drainage Systems (SUDS) will be provided on site if possible. These measures should be incorporated to efficiently and sustainably remove surface water from the proposed site, whilst at the same time minimising pollution and managing the impact on water quality.

6.111 Based on the assumption that SUDS may not be suitable on the site, it is anticipated that the surface water arising from the site will be collected from the proposed buildings by a networks of pipes located suitably to utilise the existing ground topography, which will outfall into the existing stream to the south of the site.

6.112 The proposed surface water drainage network shall be designed to not surcharge for a 1 in 30 year storm event plus climate change and flood water generated from a 1 in 100 year plus climate change rainfall event shall be constrained within areas on site so not to cause damage to buildings, essential services or adjoining developments and services.

6.113 The existing site is approximately 18.2 hectares, it is currently unoccupied and therefore the existing Greenfield run off rates for the site have been calculated using Micro-Drainage modelling software. The Greenfield run-off rate would equate to;

Storm Event	Greenfield Run-off Rate (l/s)
2 Year	58.1 l/s
30 Year	105.7 l/s
100 Year	129.6 l/s

6.114 The proposed drainage has been modelled on Micro-Drainage modelling software. The outfall is located to the south of the site and will be restricted via a hydro-brake flow control to 58.1 l/s for a 1 in 2 year storm event, 105.7 l/s for a 1 in 30 year storm event and 129.6 l/s for a 1 in 100 year plus 20% climate change. A hydro-brake flow control will also be required mid-way through the system approximately between plots 3 and 9 to retain some of the surface water higher up in the system.

6.115 The system will require approximately 7000m³ of storage to the east of plot 3 and can be provided by a pond which is 4000m² on plan by 1.75 metres deep. Isolated flooding occurred between plots 3 and 9 and therefore an additional 75m³ of storage is required here, which could be provided by additional pipework, a tank or small pond/swale. The system will also require approximately of 1225m³ of storage to the east of plot 4 and can be provided by a pond approximately 700m² by 1.75 metres deep. Refer to the Curtins Drainage Strategy layout ref TPMA1025-SK003.

6.116 The final design of the storm water network needs to be in accordance with legislation set by the Environment Agency, Cumbria County Council, South Lakeland District Council and United Utilities.

Utilities

6.117 A baseline utilities survey has been undertaken (See Appendix III)

Electricity Supply

6.118 A HV point of connection has been identified by Electricity North West Ltd.

Gas Supply

6.119 The nearest suitable main identified is a 125mm PE LP main located on the opposite side of Milnthorpe Road. In order to provide the above connection it will be necessary to facilitate a crossing of Milnthorpe Road together with the Scroggs Wood watercourse.

Water Supply

6.120 A 6" diameter main runs the length of Milnthorpe Road on the opposite side to the proposed development site.

7. Deliverability: Development Parameters

Key Design Considerations

Existing Site Features

7.1 The main site characteristics are the open aspect and gradient interspersed with drumlin hillocks which create an undulating landscape with steep slopes to part and flat areas in between.

7.2 The hedgerow which divides the site provides a strong linear feature which would be retained and strengthened to acknowledge the original field pattern.

7.3 The south western part of the site is the highest part of the site with significant level changes created by the drumlins and it is proposed to retain these features and restrain built development to behind these drumlins.

7.4 Scroggs Wood presently forms a strong visual barrier to the north. It is proposed to strengthen the woodland with additional tree planting to the south. This would nominally increase the woodland by 10m into the site, although the southern edge would be of a meandering form to avoid an unnatural straight edge. There is scope to allow the woodland further penetration into the site associated with the changes in level as part of the green infrastructure.

7.5 Small clumps of woodland are distinctive features in this landscape, and the creation of additional copses would be consistent with the area, as well as providing some visual screening to the development site.

7.6 The east of the site is low lying and here there are poorly drained areas. It is proposed to use these areas to provide ponds and swales which will provide a sustainable approach to attenuating surface water drainage.

7.7 The approach to developing the site is to create a series of linked development platforms stepping down the slope of the hill between drumlin features. The drumlins will mask some of the built form and their retention will retain the appearance of the natural landscape.

7.8 Additional groups of indigenous trees would be a natural landscape feature and provide further masking of the built form so buildings appear as glimpses between trees and the drumlins.

Safe Highway Access

7.9 In order to provide maximum spacing between the proposed roundabout and the A6/A591 junction, the site access has been located towards the north-eastern corner of the site with sufficient distance maintained between the existing farm access road on the western side of Milnthorpe Road. The farm access would therefore be unaffected by the proposals and continue to operate as a priority junction with ghost island right turn facility.

7.10 The proposed access junction is also located in the vicinity of where the speed limit on the A6 Milnthorpe Road changes between 40mph and derestricted (60mph). It is considered appropriate that the new roundabout is used to create a more formal point for change of speed limit, on Milnthorpe Road, creating a gateway arrival point for Kendal.

Provision of Green Infrastructure (See Appendix IX)

7.11 The overall site is 18Ha, of which it is proposed to develop approximately 11 Ha for Employment land. The remainder contributes to creating green infrastructure to retain natural landforms and maintain the undulating character of the site.

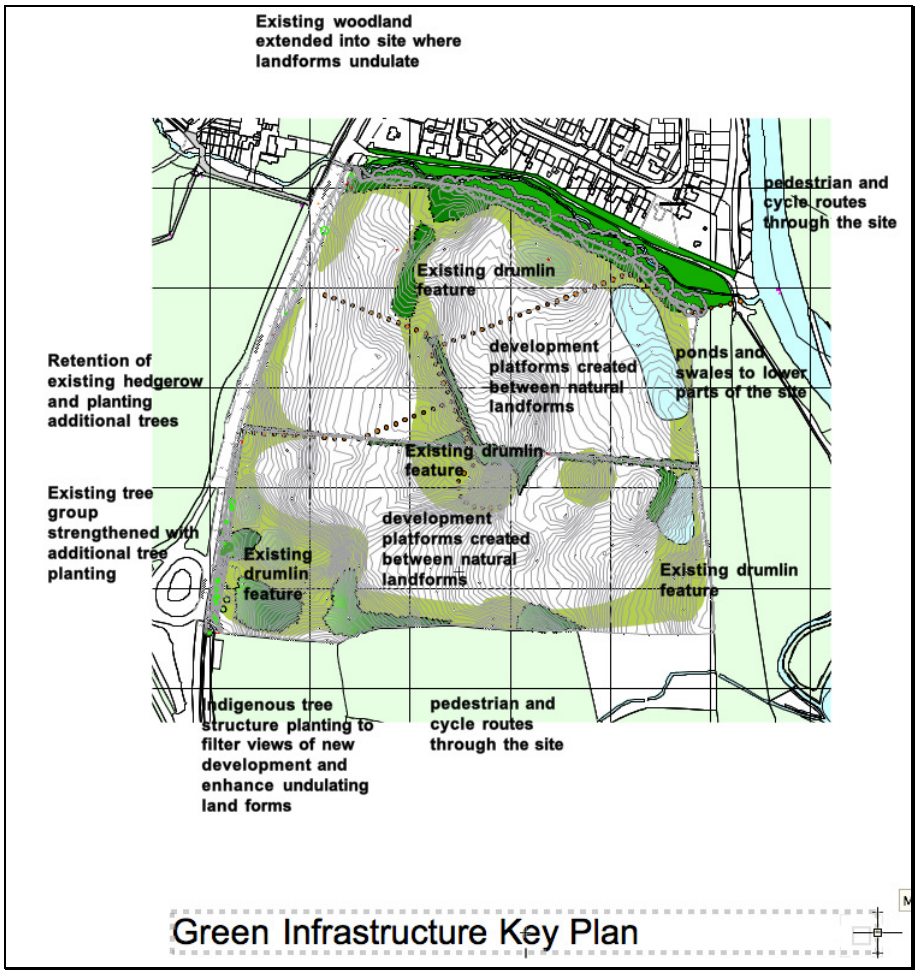
7.12 It is proposed to retain the drumlin characteristics as part of the green infrastructure. The cut and fill process of creating development platforms will in some places increase the gradients and level changes.

7.13 The green infrastructure allows Scroggs Wood to be extended into the site as well as facilitating additional pockets of woodland planting indigenous trees similar to those in Scroggs Wood. This will soften the hard southern edge of Scroggs Wood and allow the woodland to become part of the development site, and consequently increasing opportunities for wildlife habitats and biodiversity.

7.14 Open green areas would be planted with wildflower meadow grass and maintained within the overall site management regime. These areas can be accessed with public footpaths and cycle routes which connect to the A6 and to the river, and provide attractive footpaths within the site.

7.15 The Green Infrastructure will form an integral part of the proposed masterplan.

FIGURE 7.1: Green infrastructure Plan



Integration with the Surroundings

7.16 The retention of the drumlin features and extension of the wooded areas into the site respect and reinforce the natural landforms. This integrates the larger building forms associated with employment sites into the natural forms of the landscape. The drumlins and trees and level changes will soften the hard edges of the built forms and provide interruptions to views onto the site.

7.17 The illustrative masterplan respects the existing topography and open views through the site.

Urban Form and Building Design

7.18 The proposed infrastructure within a wooded and green environment would provide opportunities for high quality sustainable design. Buildings would be designed to meet BREEAM standards and beyond, and achieve low carbon design. The built forms would be designed to provide broad streets exploiting views over the site into the countryside beyond.

7.19 It would be proposed that Places Matter! be invited to assist and inform the Development brief for the site. Places Matter! partners with CABE, the Design Council and the RIBA to promote excellence in design. The character and design of the gateway site into Kendal would be enhanced by input from Places Matter!.

7.20 Two-storey B1 office buildings would be sited along the A6 and would be designed to high quality utilising modern materials but referenced to local vernacular with the use of natural materials to areas of walling. However the opportunities should be offered for high quality sustainable and contemporary design providing an attractive and exemplary gateway into Kendal. The buildings would be designed within a landscape with trees and meadow to emphasise its semi rural location.

7.21 Within the heart of the site there are proposed to be sited terraces of SME business units suitable for smaller start-up businesses with the opportunity to extend into adjacent units.

7.22 To the lower eastern part of the site there are opportunities for larger space users with larger sub-divisible employment units, along with opportunities for much larger units.

7.23 The table below gives an indication of floor areas which can be achieved with this approach.

Scroggs Wood Employment Site Preliminary Area Schedule (Indicative)

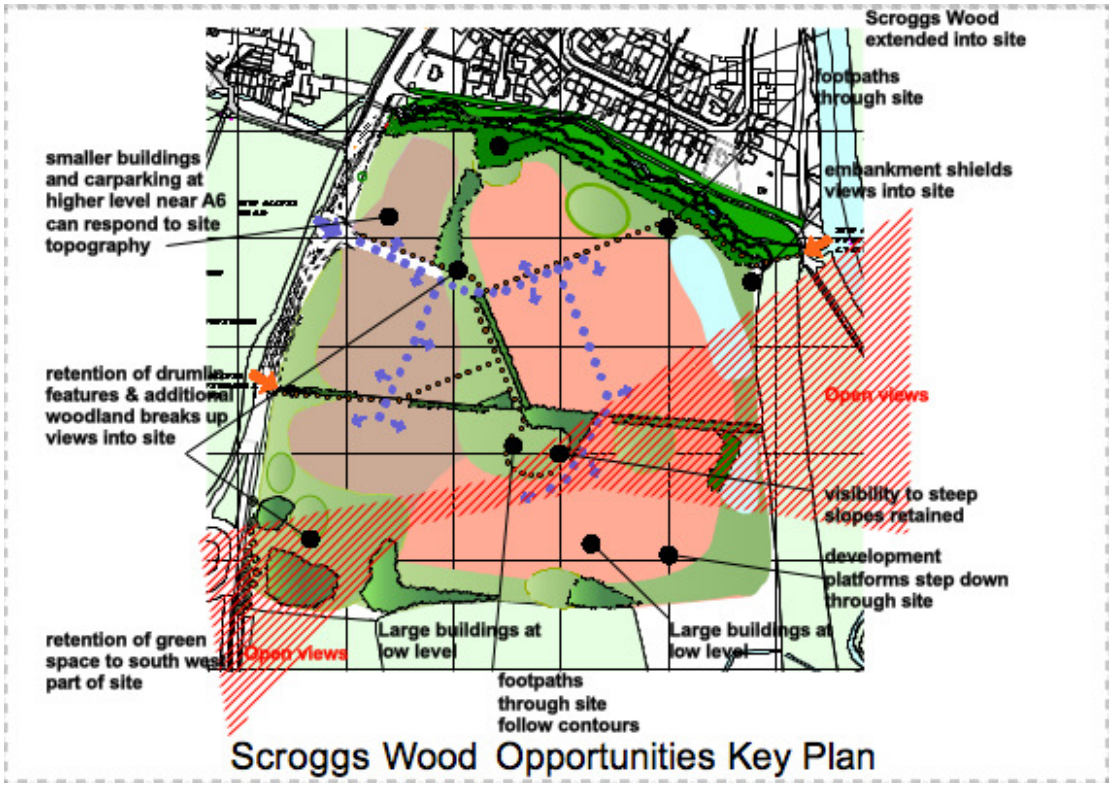
Site	Area sq m	Area Acres	Gross Indicative Building size	Use	B2 carparking	percentage cover
1	9,500	2.35	4,300	B1 Office	119	45%
2	5,150	1.27	1,844	B2/ SME	37	36%
3	6,178	1.53	2,054	B2/ SME	41	33%
4	13,800	3.41	5,870	B2/ B8	117	43%
5	21,366	5.28	8,071	B2/ B8	161	38%
6	9,335	2.31	4,130	B2/ B8	83	44%
7	8,611	2.13	3,280	B2/ B8	66	38%
8	6,900	1.71	1,844	B2/ SME	37	27%
9	7,100	2.13	3,000	B2/B8	60	42%
10	11,000	2.72	4,920	B1 Office	137	45%
11	12,500	3.09	5,980	B1 Office	166	48%
Total	111,440	28	45,293		1,024	40%
Developable site area Ha		11.14	Ha			
Total Site Area		18.00	Ha			
Total B1		**15200.00**	422			
Total B2/SME		**5742.00**				
Total B2/B8		**24351.00**				
Total		**45293.00**				

7.24 The ponds to the lower eastern part of the site provide recreation opportunities as well as wildlife habitats and attractive outlooks for those buildings at the lower part of the site facing east.

7.25 The roads have been considered as being 7.3m wide with 2m footpaths suitable for larger vehicles as well as private cars. Green travel plans associated with each employment unit as well as opportunities for bus stops to provide alternative travel opportunities.

7.26 Combining excellent building design with the green infrastructure and respect for landscaping, siting and topography will result in an exciting and viable business park for Kendal and the South lakes.

FIGURE 7.2: Site Analysis Plan (Opportunities Plan)



Developing a Masterplan for the Scroggs Wood

Vision

7.27 The vision for the masterplan is to integrate a business park into the distinctive topography of the Scroggs Wood site. The proposals provide development platforms of various sizes for a variety of different development opportunities throughout the site. These development platforms respond to the site gradients and create platforms between drumlins and steeper gradients.

7.28 The infrastructure will provide a network of easily legible roads, footpaths and cycle routes within the site in a well designed landscaped setting.

7.29 The site will promote energy, waste and resource efficiencies through the overall design, layouts and operations on site.

7.30 It is proposed that the employment (B1) units are located to the higher land to the west where floor levels can respond to variation in site contours. Carparking can also follow the topography and step down the slope of the ground.

7.31 Toward the centre of the site there is the opportunity to provide smaller business units of 70 sq m in terraces which can be joined together to form larger units as start up businesses expand.

7.32 The low eastern part of the site will be largely concealed by the higher land to the west, and provides opportunities for large space users. Employers who require larger buildings and sites have opportunities to develop this area of the site.

7.33 The road pattern allows the site development to be phased, so that the sites nearer to the site entrance off the A6 can be developed ahead of sites further within the development area.

Key Concepts of the Masterplan

7.34 The key concepts have been described above, and can be summarised:

- Retention of existing landforms (drumlins). Retention of drumlins to southwest corner to provide open aspect when viewing the site from the A6/ A591 junction
- Responding to natural site levels to create development platforms
- Smaller employment units to the west and larger units to the lower lying land to the east with SME units within the central cluster

- Opportunities for variety of building sizes to optimise employment opportunities;
- Legible landscape infrastructure with hierarchy of roads, cycle routes and footpaths through the site;
- Opportunities for sustainable development, compliance with BREEAM standards and use of contemporary design combined with traditional materials informed by high value design brief assisted by Places Matter!
- Green infrastructure comprising extension of woodland areas into the site, and meadowland, interspersed with cycle routes and footpaths
- Opportunities to improve biodiversity and enhanced wildlife habitats
- Natural drainage from west to east draining into ponds with outlet into the River Kent
- Foul drainage from west to east, with pumping station back to mains drainage systems
- Excellent pedestrian, cycle and bus links into Kendal

The Illustrative Masterplan (See Appendix VIII)

7.35 The illustrative masterplan highlights the ability to integrate built development within the green infrastructure.

7.36 The development platforms follow the site contours as the gradient drops from west to east

7.37 The retained drumlin land forms along with the planting of new groups of woodland provide screening to built forms so that the proposed buildings will appear between woodland and drumlins.

7.38 The Site Opportunity offers an attractive Gateway development into Kendal comprising a high quality business and employment park within a natural landscape setting incorporating buildings of high architectural quality.

A Safe and Legible Development Layout

7.39 The proposed site would be accessed from the A6 and will create a landscaped tree lined spine road through the site, with spurs off to the various development platforms.

7.40 The infrastructure layout will be legible with its hierarchy of roads, cycle routes and footpaths through the site.

7.41 The smaller office units located on the higher ground to the west would themselves be in a landscaped business park setting.

7.42 The medium sized SME units in the central platforms within the site would be accessed off the landscaped spine road.

7.43 The larger employment units to the lower part of the site sit at the eastern end of the landscaped spine road. The drainage ponds to the lower land to the east of these units will provide the opportunity of landscaped natural water features. Not only do these features provide an attractive outlook to these larger employment units, but the water features and associated landscaping will soften the visual impact of the larger buildings to the low part of the site.

Provision of an appropriate range, form and density of employment space

7.44 The proposed development structure provides the opportunity for a complete range of employment buildings from the small two storey office buildings through mid sized SME units, to the large bespoke employment buildings.

7.45 These buildings are all set within a natural landscape close to Kendal town centre.

Provision of a multi-functional green infrastructure network providing for sustainable drainage, greenspace and ecology

7.46 The green infrastructure not only provides additional wildlife habitats, but is seen as a completely integral part of the overall masterplan.

7.47 The green infrastructure utilises the natural landforms and these form the transitions between development platforms.

Protection of Existing Residential Amenity

7.48 The residential amenity to the north of the site is separated from the site by Scroggs Wood.

7.49 The proposals increase the depth of Scroggs Wood with additional tree planting. This provides a visual and ecological barrier between the residential areas and the employment site, penetrated only by the new footpaths and cycleway proposed from the end of Scroggs Wood into the site. The illustrative masterplan highlights the ability to integrate built development within the green infrastructure.

8. Deliverability: Commercial Viability of Development

8.1 This section explores the commercial viability of the proposed development. The viability appraisal undertaken has followed the broad principals agreed during the consultation process held with South Lakeland District Council.

8.2 The proposed scheme equates to approximately 163,611sqft (15,200sqm) of high quality B1 office space and 323,918sqft (30,093sqm) of B2/B8/SME space.

8.3 Delivery of the scheme has been phased over the 15 year plan period equating to an average of 32,502sqft (3,020sqm)per annum consisting of 10,907sqft (1,013sqm) of B1 office space and 21,595sqft (2,006sqm) of B2/B8/SME space.

8.4 From the date of a planning consent being obtained there is an allowance of 6 months to complete initial site preparation works(pre construction period), this will include the construction of the site access, upgrading of services, cut and fill works for initial phase(s) of development and the construction of approximately 350 liner meters of the internal estate roads which will have the ability to service approximately 275,362sqft (25,582sqm) of floor space, equal to approximately 8.5 years of development.

8.5 As previously mentioned the floor space is to be constructed over a 15 year period (180 months), with the disposal of completed units commencing after 12 months have elapsed of the construction period, or 18 months from the start of pre construction. The disposal process runs for 15 years (180 months).

8.6 The development appraisal assumes all floor space is sold freehold or on a long leasehold basis.

8.7 The sales value of the B1 office space is has been set at £140/sqft with a net to gross ratio of 90%. This is in line with the figures used within the South Lakeland Viability Study April 2013 and is lower than the asking prices currently being quoted for comparable space at Moss End Business Village, Milnthorpe, where we understand Unit 12 equating to 3,029sqft is available for £600,000 equal to £198/sqft and Unit 11 equating to 1,252sqft is available for £225,000 equating to £219/sqft (source EGI Property Link). This suggests that there may be scope to increase the values from the £140/sqft used with the viability appraisal; however at this stage we have adopted a cautious approach.

8.8 The B2/B8/SME space sales value has been set at £70/sqft which is again in line with the figures used within the South Lakeland Viability Study. We feel that this figure can be justified due to the lack of quality industrial space available to purchase within the locality, the sites sustainable and easy accessibility to the centre of Kendal and the

attractiveness of such product to owner occupiers looking to place property investments within SIPP's.

8.9 Base build costs have been based upon BCIS Cost codes as shown in the South Lakeland Viability Study. We have applied £94/sqft (£1,008/sqm) for the B1 office space and £40/sqft (£425/sqm) for the B2/B8/SME space.

8.10 Professional Fees and Contingencies have been set at 8% and 3.5% respectively, with standard agency and legal fees applied to both the land sale and the unit sales.

8.11 Costings for the new site access have been supplied by Curtins Consulting.

8.12 A cost of £1,200 per liner metre has been applied to the internal road infrastructure. This is in line with recent experience of similar scheme by GVA's in house building surveyors.

8.13 Allowances have been made for the undertaking of service upgrades, cut & fill works and landscaping.

8.14 A developers profit on cost of 20% has been applied as well as 7% finance rate. The developers profit is spread across the timescale of the development as each phase is built out.

8.15 A land value of £3,119,200 has been allowed for, this equates to approximately £111,000 per net developable acre (£275,000/ha) or £70,000 per gross acre (£173,000/ha). Net area equals 11.14ha, gross equals 18ha. The payment of the land is spread across the development timescale as phases are sold and developed.

Values

B1 Office Space - £20,614,986

B2/B8/SME Space - £22,674,260

Total Revenue - £43,289,246

Costs

Land Price - £3,119,200
Acquisition Costs - £171,556
Scheme Planning Costs - £294,035
Survey - £150,000

Total Acquisition and Planning Costs - £3,734,791

New Site Access - £225,000
Initial Cut& Fill - £500,000
Initial Services Upgrade - £250,000
Initial Road Infrastructure - £420,000

Total Initial Site Preparation Costs - £1,395,000

Base Build Costs - £28,336,154
Contingency - £991,765
Professional Fees - £2,364,234
Road Infrastructure - £396,000
Cut & Fill & Landscaping - £1,000,000

Total Construction Costs - £33,088,153

Sales Agent & Legal's - £649,339
Marketing - £100,000

Total Disposal Costs - £749,339

Total Finance Costs - £709,008

Total Scheme Development Costs - £39,676,291

Developers Profit - £7,935,258

Scheme Deficit = £4,322,303

8.16 A copy of the development appraisal can be found at Appendix XI.

8.17 As shown above the scheme has a total deficit of approximately £4,300,000. This is not unexpected for an employment led scheme within the North West in the current economic climate. However it has to be noted that the delivery of this site is expected over a 15 year period and potential improvements in market conditions have not been factored in at this stage, and as previously indicated there may be potential to improve the sales values applied thus far, especially in relation to the B1 office space.

8.18 Further more the subject site has the potential to offer development plots to the market on a design and build basis. The disposal of plots in this way will further decrease the deficit as the associated costs, such as professional fee's, finance etc are not borne by the developer but by the owner occupier as such reducing the levels of profit required as risk is reduced.

8.19 As discussed the delivery of the site over 15 years assumes an average build and sale rate of approximately 32,500sqft of B1/B2/B8/SME space per annum. Due to the acknowledge lack of good quality space currently available and the perceived latent demand it could be expected that the delivery rate could be improved in the early phases of the development and it is expected that this demand would come from not only companies

or organisations looking to relocate to the South Lakeland area, who have been unable to indentify suitable space or appropriate locations, but also those companies and organisations that currently operate within the locality but are in substandard accommodation or looking to expand but do not wish to move away from the area.

8.20 It is also envisaged that such a deficit can be someway eradicated through the application of a number of funding initiatives on both a national and regional level, which can come in the form of low cost or interest free loans and grants. This will have a highly significant effect on the scheme especially when considering the site preparation costs and the effect such costs have on the level of profit required. The potential funding mechanisms are discussed in more detail below.

Public Finance / Gap Funding

8.21 This chapter considers the potential availability of capital grants and repayable subsidies that could support the delivery of the subject site, looking at both current and emerging public funding programmes.

8.22 There are a range of public funding regimes in operation across England; these are looking to make investments in deliverable schemes that have the ability to unlock development and generate economic growth. The funds considered within the chapter include:

- European Regional Development Fund (2007 – 2013);
- Regional Growth Fund;
- Growing Places Fund;
- European Regional Development Fund (2014-2020); and
- Single Local Growth Fund

8.23 We do not profile all capital funding sources that may be available; additional smaller scale funding streams may be accessible from the Local Authority or other public sector bodies. Instead we have focused on large scale national initiatives, which can unlock infrastructure developments such as the proposed development.

8.24 Whilst the funds are considered in isolation, there may be opportunities to package different funds and products to maximise the support available, whilst still ensuring value for money to the public purse.

8.25 The funds discussed have been highlighted due to their strategic alignment with the provision of employment generating activity (B1, B2 and B8 uses); a number of the funds have eligibility restrictions and cannot therefore support alternative uses such as retail. These funds can contribute to both the direct provision of commercial floorspace and the upfront infrastructure requirements necessary to enable subsequent delivery.

Current funding regimes

European Regional Development Fund

8.26 European Regional Development Fund (ERDF) is a European structural fund that supports economic competitiveness, predominantly through the provision of grant funding to deliver both revenue and capital schemes, that demonstrate job creation and business growth opportunities. This is a seven year fund (running from 2007 – 2013), managed by the Department for Communities and Local Government via bespoke regional programmes.

8.27 The North West programme totals approximately £639m (dependent on the EU conversion rate), this includes a ring fenced allocation for Merseyside; schemes in the Cumbria sub region can access the 'Rest of the North West' allocation (c£378m).

8.28 The North West programme seeks to deliver against the following priorities:

- Priority 1 – Stimulating Enterprise and Supporting Growth;
- Priority 2 – Exploiting Knowledge and Innovation;
- Priority 3 – Creating the Conditions for Sustainable Growth; and
- Priority 4 –Growing and Accessing Employment

8.29 The proposed provision of employment uses on the Scroggs Wood site, aligns well to Priorities 3 and 4, which seek to deliver high quality commerical floorspace with the ability to generate job creation opportunities.

8.30 Following discussion with the North West ERDF delivery team, it has been confirmed that due to the programme expiration in December 2013, there is limited remaining budget available to accept new projects.

8.31 The only foreseeable way headroom could become available within the current programme is through under spend or slippage on existing projects; this is a high risk strategy to rely on. Should this occur, the programme will require well developed and deliverable schemes that can enter into a legal commitment by December 2013 and complete the works by June 2015.

Regional Growth Fund

8.32 The Regional Growth Fund (RGF) is a £2.6bn national fund, established to support projects and programmes that deliver job creation and a rebalancing of the economy. To date there have been four bidding rounds (the fourth round closed in March 2013). There has been no indication from government as to the likelihood of a further bidding round.

8.33 A number of Local Enterprise Partnerships (LEPs) have been allocated local RGF programmes; the Cumbria LEP has been awarded a £4m programme (under Round 3) to provide grant support of up to £1m per project.

8.34 The focus of the Cumbria programme is to support projects that enable the growth of small and medium sized businesses, particularly specialist manufacturing and businesses seeking to grow through export.

8.35 We are also aware that an extension application to the existing programme has been submitted under the Round 4 call for projects; the LEP has yet to be informed of the outcome of this bid. If successful, the headroom available for new applications could increase.

8.36 All funding available under the Round 3 Cumbria programme needs to be incurred by March 2015, and as such the LEP will be looking to support schemes that can deliver the works within this timeframe, that can demonstrate job creation opportunities and that lever in private sector investment.

Growing Places Fund

8.37 Growing Places Fund (GPF) is a £770m sustainable fund, offering repayable finance packages to unlock delivery of stalled capital development schemes. Each LEP has been provided with an allocation of the national pot to administer across their geography.

8.38 The Cumbria LEP has received a c£6.6m growing places fund programme called the `Cumbria Infrastructure Fund'; £1m of this fund is ring fenced for small business loans, with the remainder available for capital infrastructure works.

8.39 At the time of writing, we are informed that there is c£2m funding unallocated. Due to the current headroom and sustainable nature of the fund through recycled monies, the LEP are accepting new applications on a monthly basis.

8.40 The comprehensive spending review in June 2013 may include measures to extend the Growing Places Fund programme. Although speculative at this stage, this may provide an additional resource, which the development could access.

Expected New Programmes and Regimes

ERDF 2014 – 2020

8.41 It has been confirmed there will be a new ERDF programme, running from 2014 - 2020. It is expected that this will be predominantly allocated as grant funding to projects.

8.42 The European Commission has issued draft regulations confirming the core priorities for the ERDF strand to be:

- Low carbon;
- SME competitiveness; and
- Research and Innovation (including ICT)

8.43 The budget has yet to be set, however LEPs will have a critical role in determining detailed priorities and sourcing of projects. LEPs are now producing a local EU Investment Strategy.

8.44 On initial review, the site proposals could fit with all three priorities (particularly SME competitiveness), but this will be dependent on the local interpretation of these priorities.

8.45 Cumbria is expected to be confirmed as a 'transition region'. These areas will likely receive additional flexibilities in terms of spend allocation and can finance projects at a maximum rate of 60%.

Single Local Growth Fund

8.46 The Heseltine Review in 2012 – No Stone Unturned – recommended the establishment of a single fund (using consolidation of departmental funding streams).

8.47 The Governments response in March 2013, confirmed the intention to establish a new single local growth fund, operational from 2015. LEPs will be required to produce a single growth plan and government will allocate resources based on the merits of these plans.

Conclusions

8.48 There are a number of current funding regimes in operation that could support the delivery of development on the site. The funding available is both grant funding, which can be used to support non commercially viable schemes or abnormal costs, and repayable finance initiaives that can unlock development when access to finance is a barrier. Specific funds that align well to the site proposals are ERDF, RGF and GPF.

8.49 The current available funds are time dependent and with the exception of Growing Places Fund, require project delivery to have occurred between March and June 2015. Schemes that are well developed, with planning permission and site assembly issues resolved are likley to be prioritised against schemes that have to undertake lengthy development processes. This was seen in the recent ERDF Priority 3 call, which used `deliverability' as a key decision-making criteria for approval.

8.50 In addition to the immediately `accessible' funds, there is a wave of new funds coming into operation over the next 12-24 months. The largest emerging funds relevant to the Scroggs Wood site are ERDF 2014 – 2020 and the Single Local Growth Fund, with the potential to offer both grant and repayable finance packages. The Cumbria LEP will have responsibility for defining the spend activity for these programmes, but it is expected that this will include economic development activities and support for SMEs.

9. Associated Benefits of Development

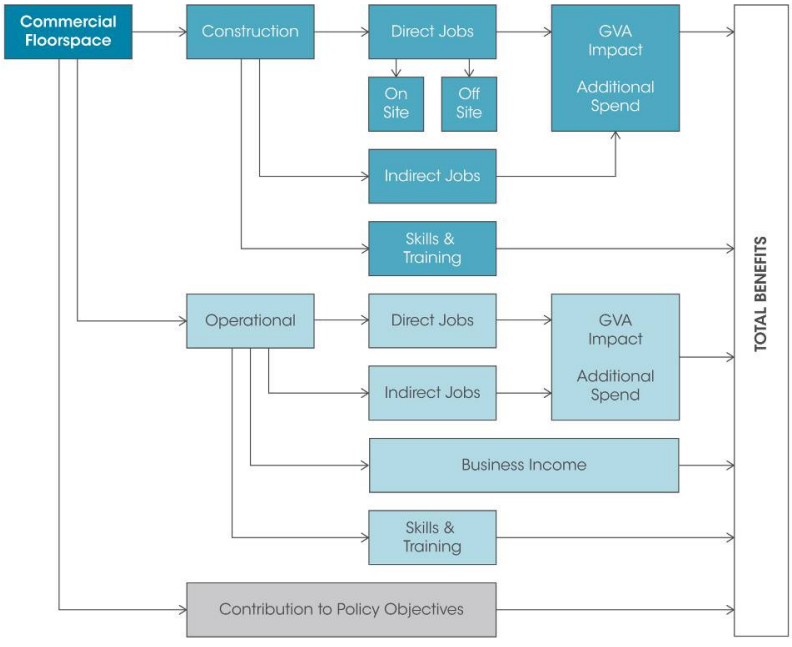
Introduction

9.1 The Government are committed, as stated within the National Planning Policy Framework (NPPF) to achieving sustainable development, including building a strong, responsive and competitive economy, by ensuring that sufficient land of the right type is available in the right places and at the right time to support growth and innovation; and co-ordinating development requirements, including the provision of infrastructure.

9.2 The proposed development at Scroggs Wood has the potential to deliver a number of socio-economic benefits to the local area, including directly and indirectly, and during the construction and operational phases of development.

9.3 Our approach to calculating socio-economic impacts associated with the proposed commercial development on the site follows national guidance in the form of the English Partnerships Additionality Guide[1] and HCA Employment Densities Guide[2]. It is not a Green Book assessment but does follow some basic Green Book techniques and principles. It is an approach based on applying nationally accepted standards and is therefore entirely appropriate for development proposals of this kind. This is set out in Figure 5 below.

Figure 9.1: Economic & Employment Benefits Model: Commercial Development



[1] English Partnerships Additionality Guide (3rd Edition) 2010

9.4 Given the early stage of the development proposal (pre-detailed site design) a full run of the model has not been undertaken. However, the calculations have been run against a set of assumptions to provide potential indicative benefits associated with the proposal.

9.5 The employment impacts have been considered in two stages:

- Stage 1 calculates the net employment opportunities (Full Time Equivalent, FTE jobs) generated during the construction phase; and
- Stage 2 calculates the net employment opportunities (FTE jobs) generated during the operational lifetime of the project (i.e. post-development).

9.6 In both assessments it is first necessary to calculate the total number of direct jobs to be created. This is referred to as the Gross Impact of the scheme. In order to calculate the number of FTE jobs created by the development an appropriate assumption for leakage, displacement and economic multiplier is then applied in line with guidance.

9.7 The proposed Development will also generate a number of economic benefits associated with both the uplift in resident population and the employment generated by the scheme:

- Indirect Economic Impacts: The scheme will generate indirect economic impacts generated by the increased expenditure within the local economy by staff both during the construction and operational phases. This is calculated in line with Eurest Lunchtime Report (2008), which found that on average workers spend £2.10 on lunch per day[3].
- Direct Economic Impacts: Additional Gross Value Added (GVA) is calculated applying the most recent GVA per head within South Lakeland to the net job creation calculated in the economic impacts step, again this figure is calculated for both the construction and operational phases of the proposed development.

Direct and Indirect Construction Employment and Economic Impacts

9.8 Based on an estimated construction budget of £22m for the proposed development, it is calculated that the proposed development could sustain **53 direct additional (net) jobs and 11 indirect jobs** based on a ten year construction period.

[2] HCA Employment Densities Guide (2nd Edition) 2010

[3] Eurest Services, Lunchtime Report, 2008

9.9 The employment created during the construction period will have wider economic impacts in terms of additional GVA generated within the economy. This could be as much as **£1.5m additional GVA annually** over the construction period.

9.10 This additional employment during the construction period will also generate a number of indirect economic benefits including the purchase of local goods and services by the operators and the spending of staff and visitors. Multiplying the jobs generated during construction with the £2.10 per day spend benchmark suggests that local spending by employees could be as much as **£31,315 additional spend per annum** (based on a 233 working day year – assuming a 4 week holiday entitlement and Bank Holidays) for the whole scheme.

Completed (Operational) Development Employment and Economic Impacts

9.11 The completed development including over 323,000 square feet of B2/B8/SME space (gross) and over 163,000 square feet of B1 space (net) has the potential to accommodate 568 and 1,267 jobs respectively. The total employment output associated with the proposed development once completed is therefore 1,835 additional jobs (gross), reducing to **1,032 net additional direct jobs and a further 206 net additional indirect jobs**.

9.12 The employment created during the construction period will have wider economic impacts in terms of additional GVA generated within the economy. This could be as much as **£60m additional GVA annually** following completion, based on average GVA per FTE across the North West (January 2013, based on 2009 prices).

9.13 This additional employment associated with the completed development will also generate a number of indirect economic benefits including the purchase of local goods and services by the operators and the spending of staff and visitors. Multiplying the jobs generated post completion with the £2.10 per day spend benchmark suggests that local spending by employees could be as much as **£605,750 additional spend per annum** (based on a 233 working day year – assuming a 4 week holiday entitlement and Bank Holidays) for the whole scheme.

10. Conclusions

Deliverability of Development

10.1 NPPF requires local planning authorities to identify sufficient specific deliverable employment sites for the plan period. This Development Statement has demonstrated that this is the most suitable site for employment development in and around Kendal.

10.2 The proposed development site, which totals approximately 18 hectares (gross) and 11hectares (net), is considered available, suitable and achievable for employment led development – on the following grounds:

Need:

- The site could provide in the region of 46,000 sq m of B1(a)(b)(c), B2, and B8 uses, therefore assisting in **meeting the Borough's employment land needs**;

Environmental Sensitivity:

- A high quality employment development in this location would be **sensitive to the character of the local landscape** in terms of scale, design, layout building style and facing materials. Quality will be secured and agreed by way of the preparation of a Complex Development Brief;

- Development at this location can **respond to all other site constraints** including ecology, flood risk, drainage, utilities and access;

Sustainable:

- The site is a **sustainable location** for employment development , being in close proximity to public transport links, transport routes and a range of shops, services, homes and community facilities;

Economy:

- The provision of employment development will directly **benefit Kendal's economy** and help to sustain existing services in the town;

Deliverability (Market Preference):

- Located directly **adjacent to the Principal Town of Kendal** thereby allowing easy access to shops, services and homes;

- Within close proximity to the wider road network and public transport provision;
- Able to accommodate a high quality, landscaped business park, attractive to employees, and therefore business;
- Deliverable over the plan period through improved market conditions and use of gap funding.

Report

Appendices

Report

Appendix 1

Drg No:	Rev:
TPMA1025 / 001	-

Project: SCROGGS WOOD, KENDAL

Drg Title: PEDESTRIAN CATCHMENT PLAN

Drawn: MF

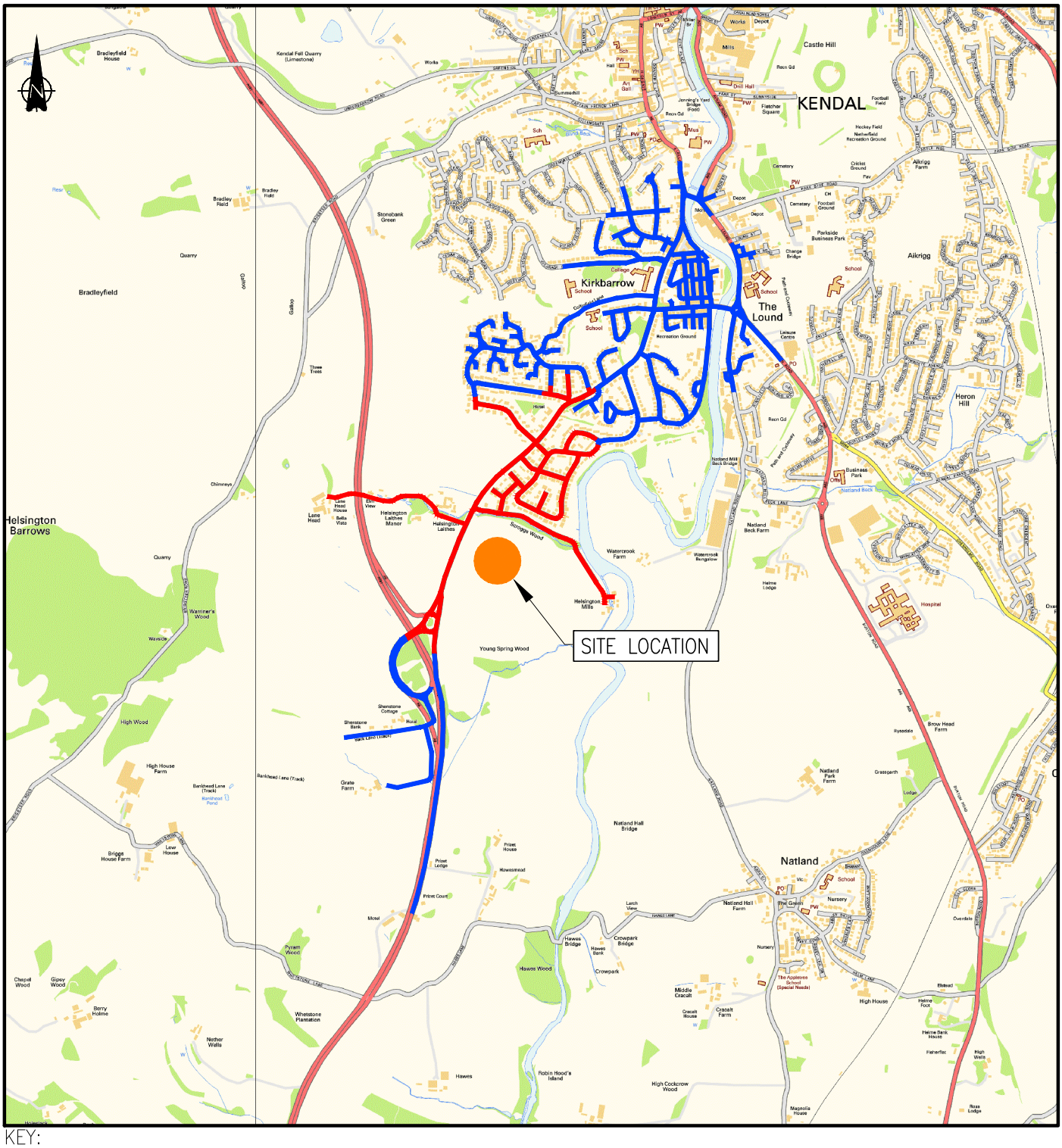
Checked: AT

Scale: NTS

curtins consulting

Curtins Consulting Ltd
10 Oxford Court, Bishopsgate, Manchester, M2 3WQ
t: 0161 236 2394
e: manchester@curtins.com www.curtins.com

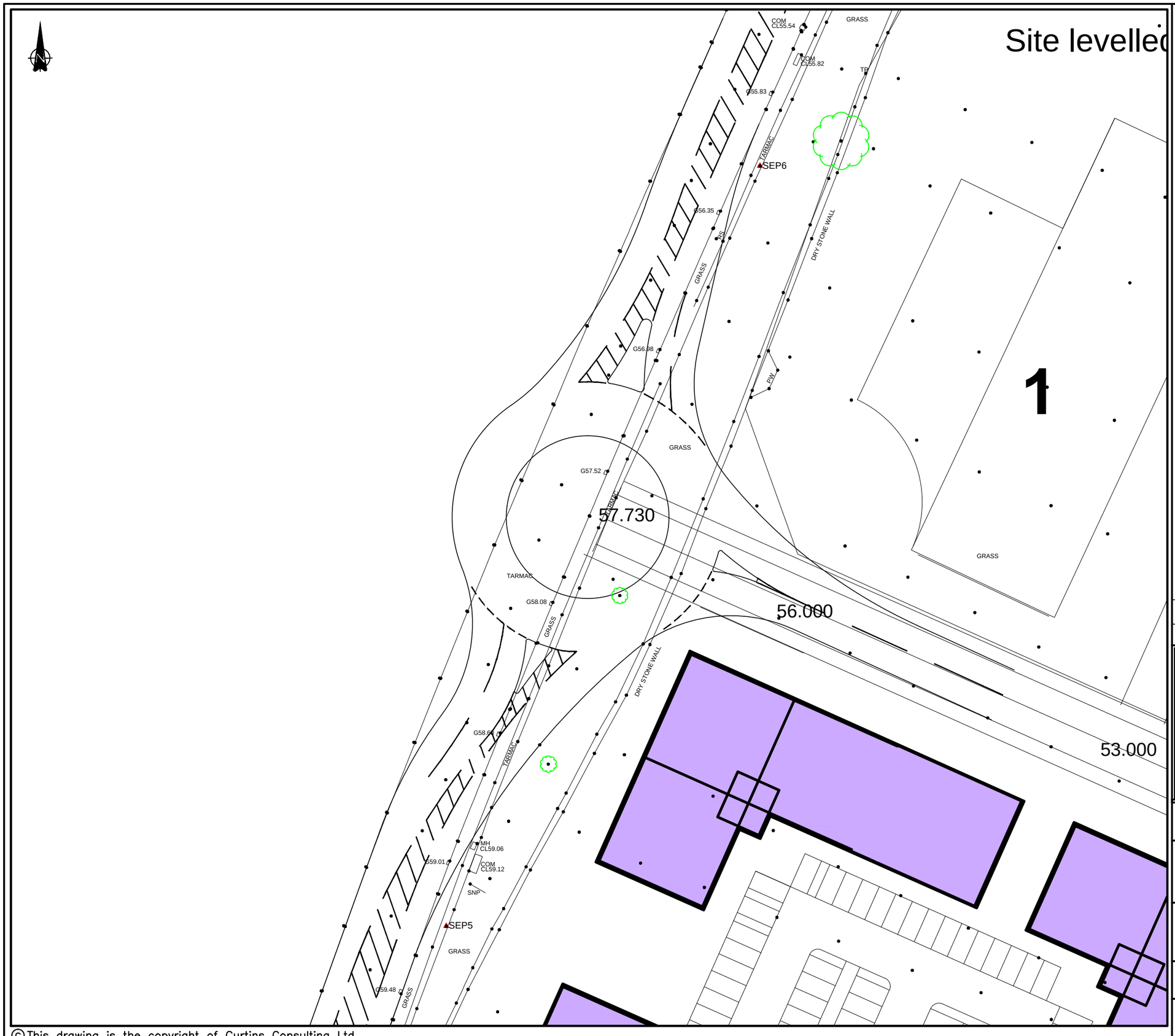
Structures • Civils • Environmental • Infrastructure • Transport Planning • Health & Safety • Dispute Resolution
Birmingham • Bristol • Cardiff • Douglas • Edinburgh • Kendal • Leeds • Liverpool • London • Manchester • Nottingham



KEY:

0m–1000m CATCHMENT

1000m–2000m CATCHMENT



NOTES:

Rev:	Description:	Date:	By:	Chkd:
A	LANES WIDENED TO INCREASE ROUNDABOUT CAPACITY	30.04.13	MF	KY

curtins consulting

Curtins Consulting Ltd
10 Oxford Court, Bishopsgate, Manchester, M2 3WQ
t: 0161 236 2394 f: 0161 228 7902
e: manchester@curtins.com www.curtins.com

Structures • Civils • Environmental • Infrastructure • Transport Planning • Health & Safety • Dispute Resolution
Birmingham • Bristol • Cardiff • Douglas • Edinburgh • Kendal • Leeds • Liverpool • London • Manchester • Nottingham

Status: PRELIMINARY

Project: SCROGGS WOOD KENDAL

Drg Title: PROPOSED SITE ACCESS ROUNDABOUT

Scale:	Size:	First Issue:	Drawn:	Checked:
1:500	A3	26.04.13	MF	KY

Drg No: TPMA1025_SK004

Rev: A

Report

Appendix 2

Flood Risk Assessment

National Planning Policy Framework
Development and Flood Risk

Flood Risk Assessment

For

Land at Scroggs Wood, Kendal

on behalf of

GVA

by

Curtins Consulting ltd
10 Oxford Court
Manchester
M2 3WQ

Tel: 0161 236 2394
manchester@curtins.com
www.curtins.com

TPIN1025/FRA
May 2013
Rev B

Contents

Appendices

Appendices

Appendix A - Plans-

Proposed Site Plan

Existing Public Sewer Records

Environment Agency Flood Level Maps

Environment Agency Flood Levels

Flood Level Plan SK002

Proposed Drainage Strategy SK003

Proposed Micro-Drainage Calculations

Revisions

Revision	Date	Description of Revision
/	26/04/13	First Issue
A	02/05/13	Surface Water Outfalls amended and remodelled
B	07/05/13	Proposed Site Plan updated
C		

1.0 Introduction

1.1 Project Background

1.1.1 Curtins Consulting was appointed by GVA to undertake a Flood Risk Assessment for the potential development of the unoccupied site located to the east of Milnthorpe Road, Kendal. The FRA provides information on the nature of flood risk at the site and follows Government guidance with regards to development and flood risk. The preliminary proposed site plan is included within Appendix A.

1.1.2 The report is based on currently available information and preliminary discussions.

1.1.3 Proposals contained or forming part of this report represent the design intent and maybe subject to alteration or adjustment in completing the detailed design for this project. Where such adjustments are undertaken as part of the detailed design and are deemed a material derivation from the intent contained in this document, prior approval shall be obtained from the relevant authority in advance of commencing such works.

1.1.4 Where the proposed works, to which this report refers, are undertaken more than twelve months following the issue of this report Curtins Consulting shall reserve the right to re-validate the findings and conclusions by undertaking appropriate further investigations at no cost to Curtins Consulting.

1.1.5 The main flood risk to the site is considered to be the fluvial flooding from the existing watercourse which is located approximately 75 metres to the east of the site.

1.2 Scope of Flood Risk Assessment

1.2.1 The assessment is to be undertaken in accordance with the standing advice and requirements of the Environment Agency for Flood Risk Assessments as outlined in the Communities and Local Governments Technical Guidance to the National Planning Policy Framework (NPPF).

1.2.2 Following scrutiny of the Environment Agency flood maps it has been identified that the existing site lies within an area classified as Flood Zone 1 and 3a. However the majority of the site lies within Flood Zone 1 (low risk) with only a minor isolated area along the eastern boundary situated within Flood Zone 3A.

1.3 Proposed Development

1.3.1 The development proposals broadly consist of:

- Various building units for commercial use classified as B2- General Industrial and B8-Storage or Distribution.
- Motor Vehicle Dealerships
- Associated Access Road and Parking Areas.

2.0 Existing Site Details

2.1 History and Current Use

2.1.1 The site is located approximately 2Km to the south of Kendal centre. The site is loosely bordered with unoccupied fields to the east and south, the A6 Milnthorpe Road to the west and Scrogg Lane with residential development to the north.

Figure 1: Aerial Photograph

2.2 Existing Watercourses

2.2.1 The River Kent is located approximately 50 metres to the east of the proposed development site.

2.2.2 There is an existing stream which runs along the northern boundary and discharges into the River Kent to the east of the site.

2.2.3 There is an existing stream approximately 40 metres to the south of the site, which discharges to the River Kent to the south-east of the site.

2.0 Existing Site Details

2.3 Existing Drainage

2.3.1 The nearest existing public sewers are located on the housing estate to the north of the development which are 150mm diameter foul and surface water sewers located on Kentwood Road and noted as manhole references 9800 and 9802.

2.3.2 There are additional 150mm diameter foul and surface water public sewers located further north of the site in Kent Park Road and noted as manhole references 0903 and 0904.

2.3.3 There is an additional 150mm diameter foul public sewer within Milnthorpe Road, noted as manhole reference 0901.

2.3.4 The existing public sewer records are enclosed in Appendix A.

2.3.5 No further sewers were observed in the vicinity of the proposed site.

2.4 Topography

2.4.1 A topographical survey has been carried out on the site; the levels vary significantly across the site with the lowest level on site approximately 34.000 AOD and the highest level on site approximately 61.000 AOD. The site generally falls from the west of the site to the east of the site.

Figure 2: Site Location Plan

3.0 Development and Flood Risk

3.1 National Planning Policy Framework

3.1.1 In March 2012 the Department of Communities and Local Government published National Planning Policy framework document (NPPF) which provides technical guidance on how flood risk should be assessed during the planning and development process.

3.2 Table D1 (extract NFFP) Flood Zone Classifications

Zone 1 Low Probability

Definition

This zone comprises land assessed as having a less than 1 in 1000 annual probability of river or sea flooding in any year (<0.1%)

Appropriate Uses

All uses of land are appropriate in this zone

Zone 2 Medium Probability

Definition

This zone comprises land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% - 01%) in any year.

Appropriate uses

The water-compatible, less vulnerable and more vulnerable uses of land and essential infrastructure in Table D2

Zone 3a High Probability

Definition

This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year

Appropriate uses

The water compatible and less vulnerable uses of land in table D2. The highly vulnerable uses should not be permitted and more vulnerable and essential infrastructure should only be permitted if the Exception Test is passed. Essential infrastructure permitted should be designed and constructed to remain operation and safe for users in times of flood.

Zone 3b The Functional Flood Plain

Definition

This zone comprises land where water has to flow or be stored in times of flood. SFRA's should identify this Flood Zone (land which would flood with an annual probability of 1 in 20 (5%) or greater in any year or is designed to flood in an extreme (0.1%) flood, or at another probability agreed between the LPA and EA, including water conveyance routes)

Appropriate uses

Only the water-compatible uses and essential infrastructure listed in table D2 that has to be there should be permitted in this zone. It should be designed and constructed to:

- remain operational and safe for users in flood
- result in no loss of flood plain storage
- not impede water flows, and
- not increase flood risk elsewhere

Essential infrastructure in this zone should not pass the Exception Test.

3.3 Table D2 (extract NPPF) Flood Risk Vulnerability Classification

Essential Infrastructure

Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk, and strategic utility infrastructure, e.g. primary substations and electricity generating power stations.

Highly Vulnerable

Police, Ambulance and Fire stations and command Centres and communications required during flooding.

Emergency dispersal points.

Basement dwellings, caravans, mobile homes and park homes for permanent residence.

Installations requiring hazardous substance consent.

More Vulnerable

Hospitals

Residential institutions

Buildings used for dwelling houses, student hall, hotels etc.

Non-residential for health services, nurseries and educational establishments

Landfill and sites used for waste management facilities or hazardous waste

Camping or caravans subject to specific warning and evacuation plan.

Less Vulnerable

Buildings used for shops, financial, professional and other services; restaurants, cafes, hot food takeaways, offices, general industry, storage and distribution, assembly and leisure.

Land and buildings for agriculture and forestry.

Waste treatment, except landfill and hazardous waste

Mineral working and processing (except sand and gravel working)

Water treatment plants and sewage treatment plants (if adequate pollution control measures are in place)

Figure 3: NPPF Flood Risk Zone compatibility

Table 3: Flood risk vulnerability and flood zone 'compatibility'

Flood risk vulnerability classification (see table 2)		Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Flood zone (see table 1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	×	Exception Test required	✓
	Zone 3b functional floodplain	Exception Test required	✓	×	×	×

Key: ✓ Development is appropriate.
× Development should not be permitted.

3.4 Site Specific NPPF Flood Risk Categorisation

3.4.1 To assess the NPPF flood risk classification for the site the first step was to inspect the Environment Agency web based flood mapping data (Extract shown Figure 4).

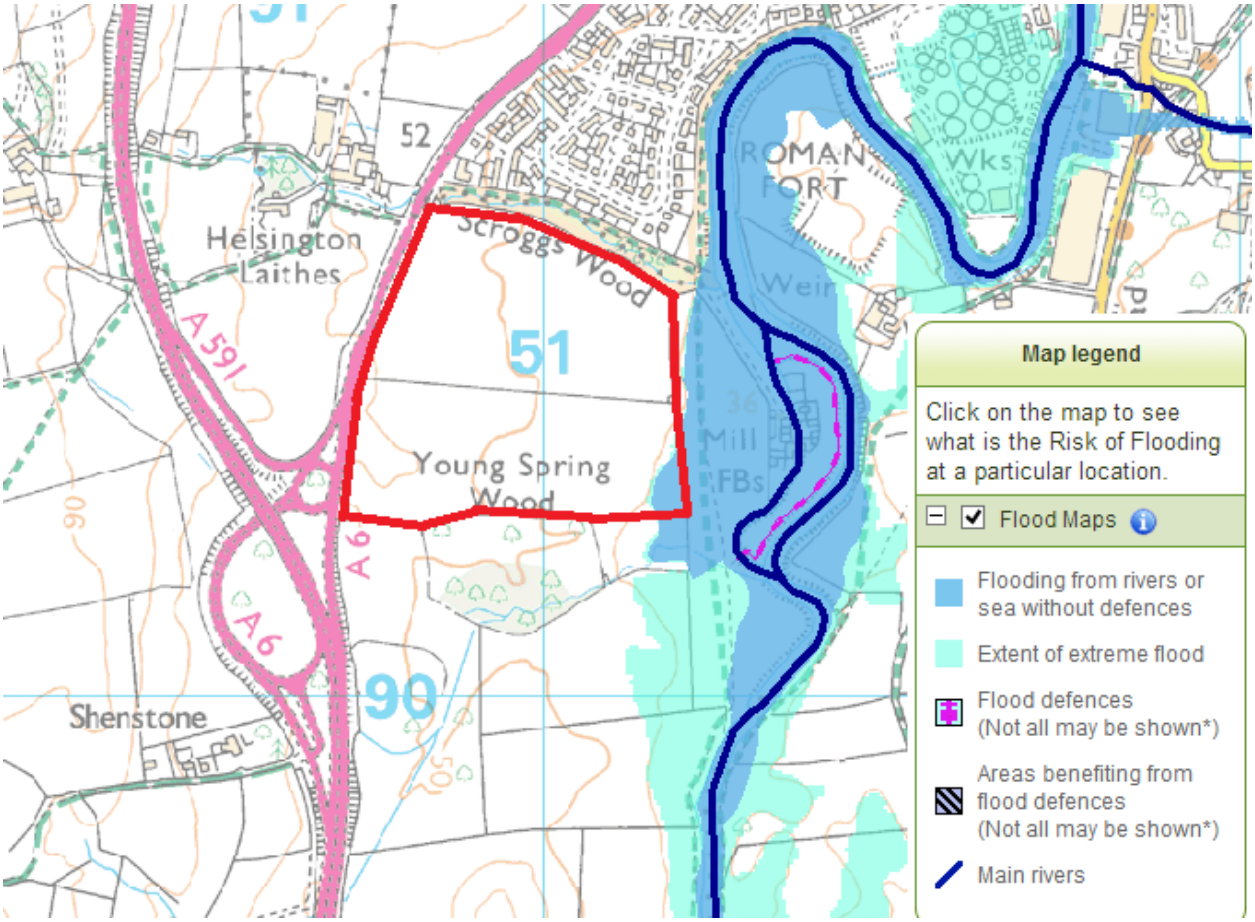
3.4.2 Where a site is located in the white (unshaded) areas shown on the Environment Agency web based flood mapping, it is generally deemed to be classified as Zone 1.

3.4.3 It can be seen from this data that the site (Shown edged red) site suffers from minor flooding problems and is almost entirely indicated as being in a Flood Zone 1 with an isolated area of Flood Zone 3A (blue).

3.4.4 Referring to table D1, Flood Zone Classifications from NPPF, this site comprises land in Zone 1and Zone 3a. Zone 3a is assessed as having a less than 1 in 75 annual probability of river or sea flooding in any year (1.3%) but greater than a 1 in 200 annual probability (0.5%) and therefore in this zone highly vulnerable uses should not be permitted in this zone and more vulnerable and essential infrastructure should only be permitted if the Exception Test is passed.

3.0 Development and Flood Risk

Figure 4: Environment Agency Flood Map



3.5 Strategic Flood Risk Assessment

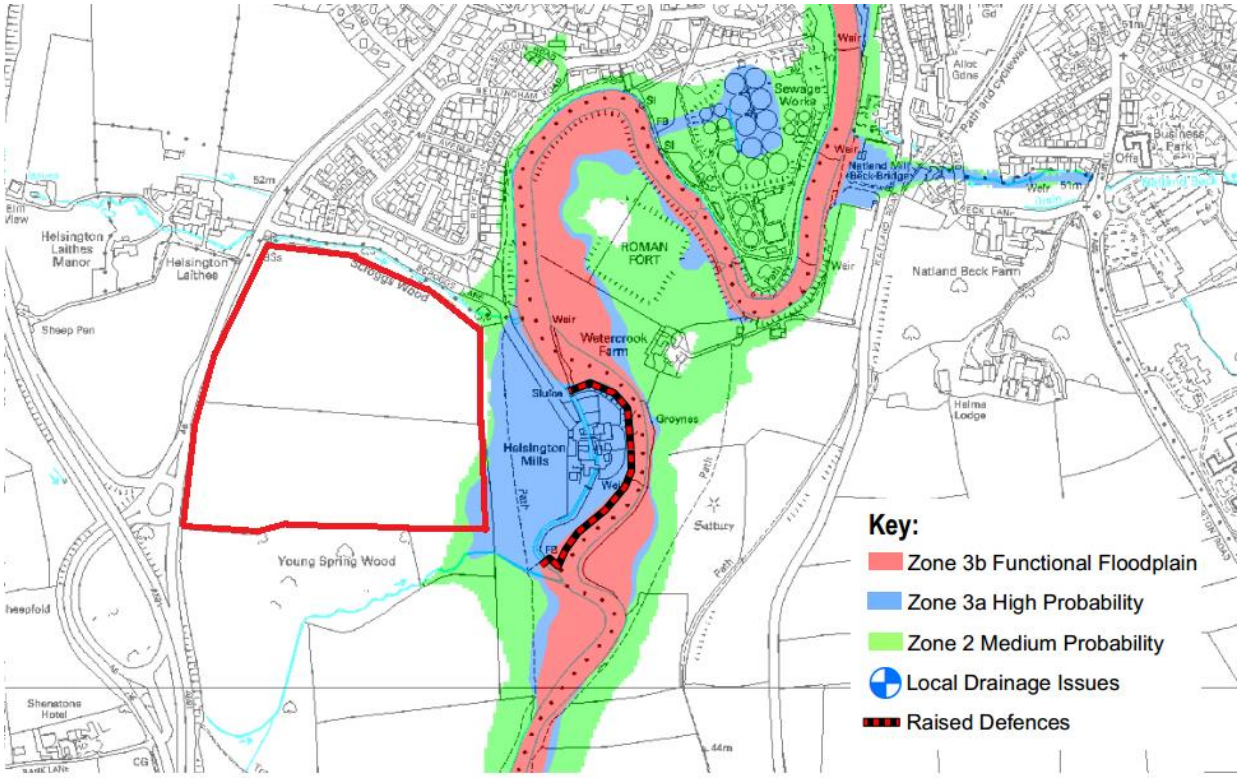
3.5.1 The SFRA undertaken for South Lakeland District Council provides a map with details of the Flood Zones in the area (shown in figure 5); this generally concurs with the Environment Agency flood maps with the majority of the site falling within Flood Zone 1, however this map shows the south east corner of the site to fall within Flood Zones 2 and 3a.

3.5.2 Zone 3a is assessed as having a less than 1 in 75 annual probability of river or sea flooding in any year (1.3%) but greater than a 1 in 200 annual probability (0.5%) and therefore in this zone highly vulnerable uses should not be permitted in this zone and more vulnerable and essential infrastructure should only be permitted if the Exception Test is passed. Zone 2 is assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% - 01%) in any year.

3.5.3 Based on the site use proposals of general industrial, storage and distribution, the development would be classed as 'less vulnerable' use and therefore would be considered as appropriate development within Flood Zones 1, 2 and 3a.

3.0 Development and Flood Risk

Figure 5: SFRA Flood Map



3.6 Additional Environment Agency Data

3.6.1 The Environment Agency guidance states that less vulnerable development in Flood Zone 2 and 3a will have to demonstrate that the redevelopment will avoid flood damage during the 1 in 100 annual probability river flood (1%); or 1 in 200 annual probability sea flood (0.5%) in any year (including an allowance for climate change) over the lifetime of the development.

3.6.2 We have obtained the flood level data for the River Kent from the Environment Agency; refer to the Flood Level Maps and Flood Levels enclosed in Appendix A.

3.6.3 The flood levels to the site for the 1 in 100 year storm event should be assessed based on the risk of flooding being for the River Kent. However as an allowance for climate change has not been included we have also considered the 1 in 200 year storm event flood levels. We have indicated the flood levels for the 1 in 100 year and the 1 in 200 year storm event on the Flood Level Plan SK002 enclosed in Appendix A.

4.0 Hydrological Assessment

4.1 Summary of Flood Risk

4.1.1 This study assesses the risk from different types of flooding to the development and the risk of flooding from the development, taking into consideration climate change as well as how flood risks should be managed. The main types of flooding that may apply to the proposed development site are as follows: fluvial (river) flooding and surface water flooding (from sewers or overland flows). Fluvial flooding from the River Kent is considered to be of risk due to the distance and topography of the surrounding land. The approach to assessing fluvial flood risk at the development site was set out in the NPPF in conjunction with the client and Environment Agency requirements.

4.2 Summary of Fluvial flood risk

4.2.1 A Strategic Flood Risk Assessment (SFRA) was carried out in October 2007 by Jacobs, which includes an assessment of flood risk in Kendal. The data and findings of the report along with data provided by the Environment Agency have been used for this assessment.

4.2.2 Due to the close proximity of the River Kent there is a high risk of tidal flooding to the south-east corner of the site. The allocated Flood Zones relate directly to the potential of flooding caused by the river. The majority of the site falls within Flood Zone 1, with minor areas classed as within Flood Zone 2 and Flood Zone 3a.

4.2.3 Flood resilience/resistance and emergency escape measures/procedures should be incorporated where possible. This applies to any part of a building that is situated below the 1 in 100 annual probability river flood (1%) level in any year including an allowance for climate change.

4.2.4 The current ground levels along the eastern boundary; nearest to the River Kent vary between 34.090m AOD an 52.540m AOD. The flood levels provided by the Environment Agency illustrate that the highest flood level for the undefended 1 in 100 (1%) annual probability with an allowance for climate change is 36.420m AOD at level reference EA01106KENT06_000u. The highest flood level for the undefended 1 in 200 (0.5%) annual probability with an allowance for climate change is 36.650m AOD at level reference EA01106KENT06_0000u.

4.2.5 The finished floor level within the proposed buildings on site will be set at a minimum of 600mm above the modelled 1 in 100 annual probability river flood (1%) in any year. The minimum floor level should therefore be set at no lower than 37.020m. This will also achieve a minimum of 370mm above the 1 in 200 (0.5%) annual probability flood level.

4.2.6 The existing area on site which is currently within flood zones 2 and 3a is bound by the extent of the 36.650 ground level which is the maximum 1 in 200 (0.5%) annual probability flood level. The proposed site layout has been arranged as such that landscaping will be within the flood zone and therefore this area can still be used for flood water during 1 in 100 and 1 in 200 year storm events.

4.3 Summary of Surface Water Flooding from the Site

4.3.1 Developers are responsible for ensuring that new development does not increase the flood risk elsewhere. The proposed surface water drainage network shall be designed to not surcharge for a 1 in 30 year storm event plus climate change and flood water generated from a 1 in 100 year plus climate change rainfall event shall be constrained within areas on site so not to cause damage to buildings, essential services or adjoining developments and services.

4.3.2 The existing site is approximately 18.2 hectares, it is currently unoccupied and therefore the existing Greenfield run off rates for the site have been calculated using Micro-Drainage modelling software. The Greenfield run-off rate would equate to;

Storm Event	Greenfield Run-off Rate (l/s)
2 Year	58.1 l/s
30 Year	105.7 l/s
100 Year	129.6 l/s

4.3.3 As there are no existing surface water sewers on site we propose to connect the surface water drainage into the existing stream to the south of the site. Initial discussions with the Environment Agency confirmed that discharge rates from the site should be limited to a rate less than or equal to the existing Greenfield run off rates.

4.3.4 As part of the proposed development and to coincide with current SUDS guidance we will look to attenuate a significant amount of surface water arising from the proposed development before discharging into the existing stream.

5.0 Mitigation

5.1 Fluvial Flooding to the Site Mitigation

5.1.1 Flood resilience/resistance and emergency escape measures/procedures should be incorporated where possible. This applies to any part of a building that is situated below the 1 in 100 annual probability river flood (1%) level in any year including an allowance for climate change.

5.1.2 The finished floor levels should therefore be set at no lower than 37.020m to ensure that there is a minimum of 600mm above the modelled 1 in 100 annual probability river flood (1%) in any year. This will also achieve a minimum of 370mm above the 1 in 200 (0.5%) annual probability flood level.

5.1.3 The existing area on site currently within flood zones 2 and 3a is bound by the extent of the 36.650 ground level which is the maximum 1 in 200 (0.5%) annual probability flood level. The proposed site layout has been arranged as such that landscaping will be within the flood zone and therefore this area can still be used for flood water during 1 in 100 and 1 in 200 year storm events.

5.2 Surface Water Flooding from the Site Mitigation

5.2.1 Any new development site drainage should be designed in accordance with current best practice to provide adequate capacity to convey flows and deal with the 100 year with climate change storm effectively on the site. Peak flows should be restricted to pre-development run-off rates and adequate attenuation should be provided to keep the stored volume of surface water safely on the site.

5.2.2 To minimise localised flooding within the site the drainage design should ensure that gullies, drainage channels and drains are all suitably sized to accommodate peak storm flows. Also, all inlet features should have suitably sized sumps to catch silts and should be subject to a documented routine maintenance and cleansing regime.

5.2.3 Flooding risk from the development site to the surrounding areas is therefore considered low.

6.0 Drainage Impact Assessment

6.1 Drainage Strategy

6.1.1 Foul drainage should be discharged into the existing public sewers located to the north of the development site. There are various locations which could potentially provide a connection point and are as follows;

- 150mm diameter foul sewer in Kentwood Road (Manhole reference 9800),
- 150mm diameter foul sewer in Kent Park Avenue (Manhole reference 0904)
- 150mm diameter foul sewer in Milnthorpe Road (Manhole reference 0901).

6.1.2 An initial enquiry has been submitted to United Utilities requesting confirmation of the possibility to connect to their existing network and their preferred location.

6.1.3 The foul drainage from site will be drained via a network of drainage pipes which will be directed towards the northern site boundary to a pumping station. The site levels are as low as such that a gravity system to the public sewer will not be possible and therefore a rising main will be located along the northern boundary and pumped up towards Milnthorpe Road and to the United Utilities preferred location at an agreed discharge rate. The indicative location is shown on the proposed Drainage Strategy enclosed in Appendix A.

6.1.4 In following the standard hierarchy of drainage solutions, consideration should firstly be given to the discharge of surface water runoff by sustainable methods such as infiltration. On this basis it is envisaged that Sustainable Urban Drainage Systems (SUDS) will be provided on site if possible. These measures should be incorporated to efficiently and sustainably remove surface water from the proposed site, whilst at the same time minimising pollution and managing the impact on water quality.

6.1.5 Based on the assumption that SUDS may not be suitable, the surface water will be collected from the proposed building by a network of pipes which will outfall into the existing stream to the south of the site.

6.1.6 The proposed surface water drainage network shall be designed to not surcharge for a 1 in 30 year storm event plus climate change and flood water generated from a 1 in 100 year plus climate change rainfall event shall be constrained within areas on site so not to cause damage to buildings, essential services or adjoining developments and services.

6.1.7 The proposed drainage has been modelled on Micro-Drainage modelling software. The outfall is located to the south of the site and will be restricted via a hydro-brake flow control to 58.1 l/s for a 1 in 2 year storm event, 105.7 l/s for a 1 in 30 year storm event and 129.6 l/s for a 1 in 100 year plus 20% climate change. A hydro-brake flow control will also be required mid-way through the system approximately between plots3 and 9 to retain some of the surface water higher up in the system.

6.1.8 The system will require approximately 7000m³ of storage to the east of plot 3 and can be provided by a pond which is 4000m² on plan by 1.75 metres deep. Isolated flooding occurred between plots 3 and 9 and therefore an additional 75m³ of storage is required here, which could be provided by additional pipework, a tank or small pond/swale. The system will also require approximately of 1225m³ of storage to the east of plot 4 and can be provided by a pond approximately 700m² by 1.75 metres deep. Refer to the Drainage Strategy layout SK003 enclosed in Appendix A.

6.0 Drainage Impact Assessment

6.1.8 The final design of the storm water network needs to be in accordance with legislation set by the Environment Agency, Cumbria County Council, South Lakeland District Council and United Utilities.

7.0 Conclusions and Recommendations

7.1 Conclusion and Recommendations

- A Flood Risk Assessment has been conducted for the proposed development of land to the east of Milnthorpe Road in Kendal. The FRA has been conducted in accordance with the requirements of NPPF.
- The EA flood map shows the majority of the site within flood zone 1; however there is an area to the south-east corner within flood zones 2 and 3a.
- SUDS should be incorporated into the design wherever possible.
- The finished floor levels should be set at no lower than 37.020m to ensure that there is a minimum of 600mm above the modelled 1 in 100 annual probability river flood (1%) in any year. This will also achieve a minimum of 370mm above the 1 in 200 (0.5%) annual probability flood level.
- The final design of the drainage networks shall be in accordance with the legislation set by the Environment Agency, Local Authority and United Utilities.
- A suitable maintenance strategy should be provided to ensure the drainage network is cleaned regularly.

Therefore, if the principles set out within the previous sections of this report are followed and developed at detailed design stage by the design engineer, the site can be considered:

- To have a low probability of suffering from any form of flooding.
- To be proved as not increasing the probability of flood risk to other properties within the local catchment area.

Appendix A

Site Plan

Proposed Site Plan

Existing Public Sewer Records

Environment Agency Flood Level Maps

Environment Agency Flood Levels

Flood Level Plan SK002

Proposed Drainage Strategy SK003

Proposed Micro-Drainage Calculations

Scroggs Wood

landscape screening

extended woodland

A6

Development platform

drumlin retention

Development platform

Pond

landscape screening

Development platform

Development platform

Development platform

drumlin retention

drumlin retention

drumlin retention

Development platform

landscape screening

N

0 10 20 30 40 50 60 70 80 90 100m

Scale 1:1000 at A1

SCROGGS WOOD SITE, KENDAL

United Utilites Water PLC
Property Searches
Ground Floor Grasmere House
Lingley Mere Business Park
Great Sankey
Warrington
WA5 3LP
DX 715568 Warrington
Telephone 0870 751 0101
Fax Number 0870 7510102
Property.searches@uuplc.co.uk

Your Ref:
Our Ref: 13/ 932117
Date: 19/04/2013

Curtins Consulting Engineers

10 Oxford Court
Bishopsgate
Manchester
M2 3WQ

FAO: C GRIMSLEY

Dear Sirs

Location: SCROGGS WOOD SCROGGS LANE KENDAL LA9 5RL

I acknowledge with thanks your request dated 16/04/13 for information on the location of our services.

Please find enclosed plans showing the approximate position of our apparatus known to be in the vicinity of this site.
I attach General Condition Information sheets, which details contact numbers for additional services (i.e. new supplies, connections, diversions) which we are unable to deal with at this office. In addition you should ensure they are made available to anyone carrying out any works which may affect our apparatus.

I trust the above meets with you requirements and look forward to hearing from you should you need anything further.

If you have any queries regarding this matter please telephone us on 0870 7510101.

Yours Faithfully,

S McManus.

Sue McManus
Operations Manager
Property Searches

TERMS AND CONDITIONS - WASTERWATER & WATER DISTRIBUTION PLANS

These provisions apply to the public sewerage, water distribution and telemetry systems (including sewers which are the subject of an agreement under Section 104 of the Water Industry Act 1991 and mains installed in accordance with the agreement for the self construction of water mains) (UUW apparatus) of United Utilities Water PLC ("UUW").

TERMS AND CONDITIONS:

1. This Map and any information supplied with it is issued subject to the provisions contained below, to the exclusion of all others and no party relies upon any representation, warranty, collateral contract or other assurance of any person (whether party to this agreement or not) that is not set out in this agreement or the documents referred to in it.

2. This Map and any information supplied with it is provided for general guidance only and no representation, undertaking or warranty as to its accuracy, completeness or being up to date is given or implied.

3. In particular, the position and depth of any UUW apparatus shown on the Map are approximate only. UUW strongly recommends that a comprehensive survey is undertaken in addition to reviewing this Map to determine and ensure the precise location of any UUW apparatus. The exact location, positions and depths should be obtained by excavation trial holes.

4. The location and position of private drains, private sewers and service pipes to properties are not normally shown on this Map but their presence must be anticipated and accounted for and you are strongly advised to carry out your own further enquiries and investigations in order to locate the same.

5. The position and depth of UUW apparatus is subject to change and therefore this Map is issued subject to any removal or change in location of the same. The onus is entirely upon you to confirm whether any changes to the Map have been made subsequent to issue and prior to any works being carried out.

6. This Map and any information shown on it or provided with it must not be relied upon in the event of any development, construction or other works (including but not limited to any excavations) in the vicinity of UUW apparatus or for the purpose of determining the suitability of a point of connection to the sewerage or other distribution systems.

7. No person or legal entity, including any company shall be relieved from any liability howsoever and whensoever arising for any damage caused to UUW apparatus by reason of the actual position and/or depths of UUW apparatus being different from those shown on the Map and any information supplied with it.

Conditions and information regarding wastewater network

These general conditions and precautions apply to the wastewater network of United Utilities.

Please ensure that a copy of these conditions is passed to your representative and contractor on site.

1. United Utilities provides the approximate locations of its sewers according to its records. These records are not necessarily accurate or complete nor do they normally show the positions of every sewer culvert or drain, private connections from properties to the public sewers or the particulars of any private system. No person or company shall be relieved from liability for any damage caused by reason of the actual positions and/or depths being different from those indicated. The records do indicate the position of the nearest known public sewer from which the likely length of private connections can be estimated together with the need for any off site drainage rights or easements.

2. Special requirements relative to our sewers may be indicated. United Utilities employees or its contractors will visit any site at reasonable notice to assist in the location of its underground sewers and advise any precautions that may be required to obviate any damage. To arrange a visit or for further information regarding new supplies, connections, diversions, costing, or any notification required under these General Conditions, please call us on **0845 746 2200**.

3. Where public sewers are within a site which is to be developed and do not take any drainage from outside the area, they are from an operational viewpoint redundant. The developer must identify all redundant sewers affected by the development and apply to United Utilities in writing for these sewers to be formally closed. The developer shall bear all related costs of the physical abandonment work.

4. Public sewers within the site that are still live outside the area will be subject to a “Restricted Building zone”. This would normally be a surface area equivalent to the depth of the sewer measured from the centre line of the sewer on either side. No construction will be permitted within that zone. The developer should also note that deep and wide rooted trees must not be planted in close proximity to live sewers. Access to public sewers must be maintained at all times and no interference to manholes will be permitted during construction work.

5. Where there is a public sewer along the line of a proposed development/building, arrangements shall be made by the developer at his cost to divert the sewer around the development. Where this is not possible and as a last resort, a “Building Over Agreement” will need to be completed under section 18 of the Building Act 1984. The developer shall design building foundations to ensure that no additional loading is transferred to the sewer and submit such details both to the Local Authority’s Building Control Officer and to United Utilities for approval/acceptance. United Utilities on a rechargeable basis would normally undertake all aspects of design work associated with the diversion of any part of the operational wastewater network. For further advice please call asset protection on **01925 678 306**

6. Where there is a non-main river watercourse/culvert passing through the site, the landowner has the responsibility of a riparian owner for the watercourse/culvert and is responsible for the maintenance of the fabric of the culvert and for all works involved in maintaining the unrestricted flow through it. Building over the watercourse/culvert is not recommended. The developer must contact the local authority before any works are carried out on the watercourse/culvert. Where it is necessary to discharge surface water from the site into the watercourse/culvert the developer shall make an assessment of the available capacity of the watercourse/culvert (based on a 1 in 50 year event) and ensure that the additional flow to be discharged into the watercourse/culvert will not cause any flooding. In appropriate cases, flooding may be prevented by on-site storage. The developer shall submit the relevant details required to substantiate his development proposals. Details of any outfall proposed shall also be submitted to the Environment Agency, PO Box 12, Richard Fairclough House, Knutsford Road, Warrington, Cheshire, WA4 1HT for their approval.

7. Where there is a main river watercourse/culvert passing through the site, the developer shall submit all proposals affecting the river to the Environment Agency at the address stated in paragraph 6 for approval/acceptance.

8. Your attention is drawn also to the following:

• Private drains or sewers which may be within the site. On 1 October 2011 all privately owned sewers and lateral drains which communicate with (that is drain to) an existing public sewer as at 1 July 2011 will become the responsibility of the sewerage undertaker. This includes private sewers upstream of pumping stations that have yet to transfer, but excludes lengths of sewer or drain that are the subject of an on-going appeal or which have been excluded from transfer as a result of an appeal or which are on or under land opted-out by a Crown body. The transfer specifically excludes sewers and lateral drains owned by a railway undertaker. Sewers upstream of such assets, however, are transferred. Such assets may not be recorded on the public sewer record currently as it was not a requirement to keep records of previously private sewers and drains.

• Applications to make connections to the public sewer. The developer must write to United Utilities requesting an application form that must be duly completed and returned. No works on the public sewer shall be carried out until a letter of consent is received from United Utilities.

• Sewers for adoption.
If an agreement for the adoption of sewers under Section 104 of the Water Industry Act 1991 is being contemplated, a submission in accordance with “Sewers for Adoption”, Seventh Edition, published by the Water Research Centre (2001) Plc, Henley Road, Medmenham, PO Box 16, Marlow, Buckinghamshire, SL7 2HD will be required, taking into consideration any departures from the general guide stipulated by United Utilities.

• Further consultation with United Utilities.
Developers wishing to seek advice or clarification regarding sewer record information provided should contact United Utilities to arrange an appointment. A consultation fee may be charged, details of which will be made available at the time of making an appointment.

9. Combined sewers, foul sewers, surface water sewers, and pumped mains. These are shown separately in a range of colours or markings to distinguish them on our drawings, which are extracts from the statutory regional sewer map. A legend and key is provided on each extract for general use, although not all types of sewer will be shown on every extract.

Combined sewers shown coloured red carries both surface water and foul sewage, especially in areas where there is no separate surface water sewerage system.

Foul sewers coloured brown may also carry surface water and there may be no separate surface water system indicated in the immediate area. Both combined and foul sewers carry wastewater to our treatment works before it can safely be returned to the environment.

Surface water sewers coloured blue on our drawings are intended only to carry uncontaminated surface water (e.g. rainfall from roofs, etc) and they usually discharge into local watercourses. It is important for the protection of the environment and water quality that only uncontaminated surface water is connected to the surface water sewers. Improper connections to surface water sewers from sink wastes, washing machines and other domestic use of water can cause significant pollution of watercourses.

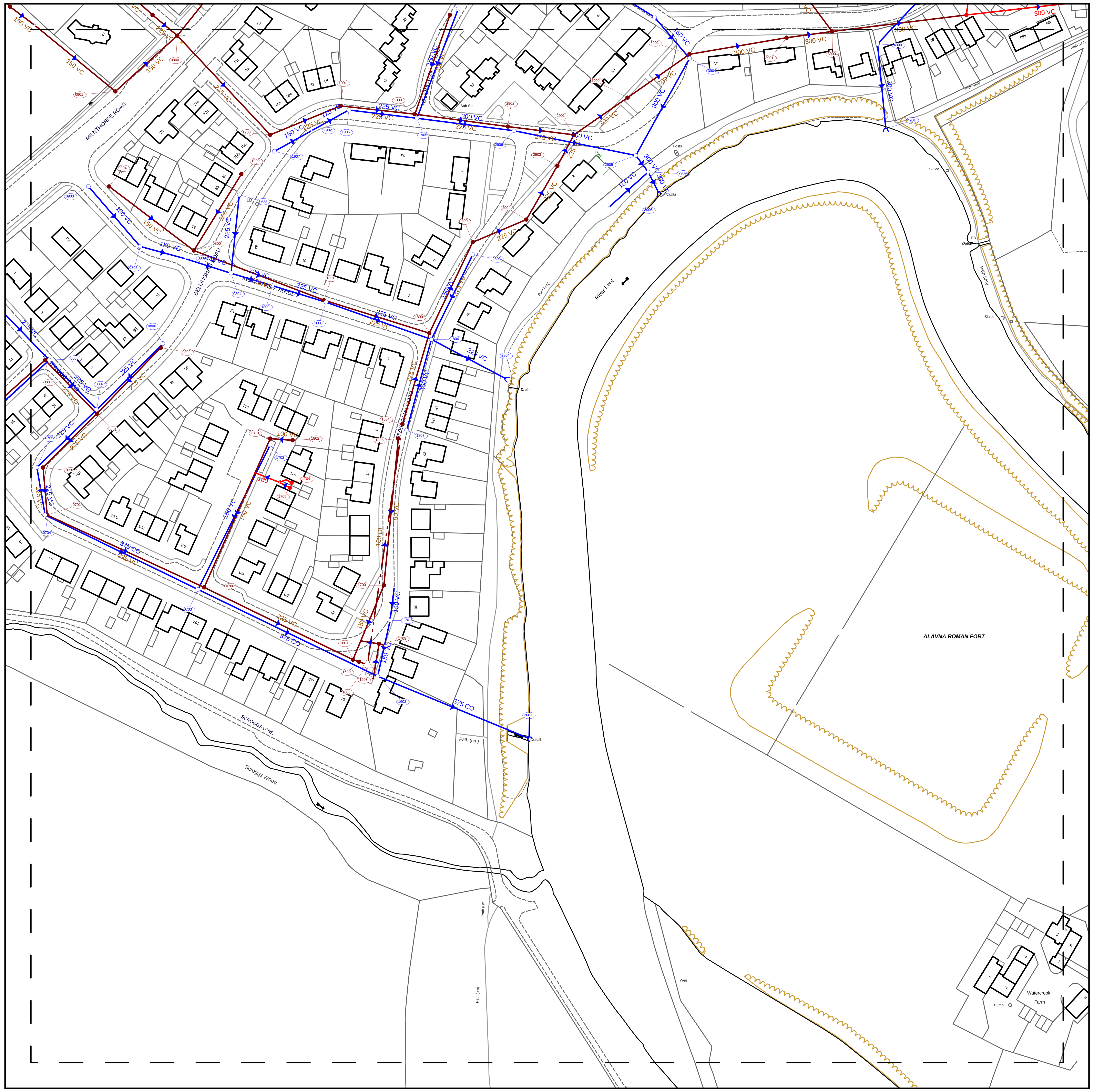
Pumped mains, rising mains and sludge mains will all be subject to pumping pressures and are neither suitable nor available for making new connections.

Highway drains, when included, show as blue and black dashed lines. Highway drains are not assets belonging to United Utilities and are the responsibility of local authorities.

10. For information regarding future proposals for construction of company apparatus please write to United Utilities, PO Box 453, Warrington, WA5 3QN.

11. For information regarding easements, deeds, grants or wayleaves please write to United Utilities Property Solutions, Coniston Buildings, Lingley Mere Business Park, Lingley Green Avenue, Great Sankey, Warrington WA5 3UU (**Tel: 01925 731 365**).

United Utilities Water PLC
Haweswater House, Lingley Mere Business Park,
Lingley Green Avenue, Great Sankey, Warrington WA5 3LP
www.unitedutilities.com
Registered in England and Wales Registered Number 2366678



OS Sheet No: SD5190NW

Scale 1:1250 Date: 19-Apr-2013

Printed by: Rob Payne

Refno	Cover	Func	Type	Invert	Size.x	Size.y	Shape	Matl	Grad	Length
0700	45.79	F	M	43.72	225		C	VC	28	80.06
0701	47.5	F	M	44.88	225		C	VC	73	83.67
0702	47.69	F	M	44.88	225		C	VC	-2309	23.09
0703	45.76	S	M	43.81	375		C	CO	30	96.61
0704	47.46	S	M	45.09	375		C	CO	155	82.29
0705	47.68	S	M	45.18	225		C	VC	195	23.35
0800	46.91	F	M	44.89	225		C	VC	32	67.42
0801	46.89	F	M	45.06	225		C	VC	216	36.77
0802	45.98	F	M	45.13	225		C	VC	636	44.55
0803	47.36	F	M	46.06	225		C	VC	36	36.07
0804	46.03	S	M	44.61	225		C	VC	22	20.88
0805	48.43	S	M	47.28	150		C	VC	17	22.8
0806	45.96	S	M	45.46	225		C	VC	266	45.25
0807	46.91	S	M	45.29	225		C	VC	366	40.31
0808	47.33	S	M	46.28	225		C	VC	34	33.24
0809		S	Q	45.97	225		C	VC	18	23.09
0900	53.94	F	M	52.02	225		C	VC	16	65.8
0901	54.14	F	M	53.16	150		C	VC	37	40.36
0903	52.25	S	M	51.05	150		C	VC	11	38.29
0904		F	M		150		C	VC		51.4
1600	42.44	F	M	40.55	225		C	VC		4.28
1601	42.51	F	M	40.68	225		C	VC	24	3.16
1602	42.42	S	M	40.54	375		C	CO	20	78.92
1603		F	P		100		C	DI		117.69
1604		F	3		100		C	VC		16.91
1700	42.03	F	M	41.05	150		C	VC	111	39
1701	42.04	S	M	40.89	150		C	VC	146	27.66
1702	45.17	S	M	44.31	150		C	VC	313	78.26
1703		S	G		150		C	VC		16.12
1704		C	M				C			6.47
1705		C	M		100		C			5.71
1706		C	Q		100		C			12.84
1707		F	J							
1708		F	M		100		C	VC		9
1709		F	Q		100		C	VC		2.72
1710		F	J							
1800	42.77	F	M	41.95	225		C	VC	187	48.75
1801	44.08	F	M	42.77	225		C	VC	65	53.45
1802		F	M		100		C	VC		10.85
1804	42.79	F	M	42.04	225		C	VC	655	45.88
1805	42.74	F	M	41.78	150		C	VC	98	71.34
1806	42.76	S	M	41.26	225		C	VC	19	40.71
1807	42.82	S	M	41.95	150		C	VC	240	45.61
1808	44.03	S	M	42.51	225		C	VC	43	54.08
1809	45.15	S	M	43.68	225		C	VC	23	27.2
1810	45.16	F	M	44.04	150		C	VC	343	78.79
1900	46.84	F	M	44.79	225		C	VC	24	45.4
1901	48.17	F	M	47	225		C	VC	16	36.22
1902		S	Q	46.97	225		C	VC	94	20.59
1903	49.09	F	M	47.96	225		C	VC	38	36.77
1905	46.81	S	M	45.22	300		C	VC	26	47.38
1906	48.09	S	M	46.69	225		C	VC	23	33.24
1907	48.33	S	M	47.18	150		C	VC	98	20.59
1908	47.7	S	M	46.14	225		C	VC	26	38.21
1909	48.53	F	M	47.5	150		C	VC	17	43.57
2601		S	F							
2800	42.63	F	M	41.69	225		C	VC	118	28.23
2803	42.59	S	M	41.48	150		C	VC	228	45.62
2804		S	F							
2900	44.02	F	M	41.17	300		C	VC	122	36.62
2901	43.44	F	M	41.39	300		C	VC	166	31.62
2902	45.73	F	M	42.93	225		C	VC	21	32.25
2903	43.12	F	M	41.42	225		C	VC	567	17
2904	42.04	F	M	41.45	225		C	VC	1001	30.02
2905	41.98	S	M	40.26	300		C	VC	20	10
2906	45.74	S	M	43.42	300		C	VC	19	60.21
2908		S	G		150		C	VC		25.5
2909	41.5	S	M	37.5	300		C	VC	13	11.18
3900	42.77	F	M	40.35	300		C	VC	193	65.49
3901	43.07	F	M	40.57	300		C	VC	101	22.2
3902	44.04	F	M	40.87	300		C	VC	159	47.68
3904	43.8	S	M	41.27	300		C	VC	64	53.71
3906		S	F							
4900	42.49	S	M	38.33	300		C	VC	9	41.19
4901		S	F							

WASTE WATER SYMBOLOGY

MANHOLE: FOUL, SURFACE, COMBINED, DUAL

SIDE ENTRY MANHOLE

FOUL, SURFACE, COMBINED: PUBLIC MAIN, PRIVATE MAIN, SECTION 104, PUMPING MAIN, HIGHWAY DRAIN, SLUDGE MAIN, ABANDONED

SITE TERMINATION, T-JUNCTION (SADDLE), AIRVALVE, LAMP HOLE, CASCADE, OIL INTERCEPTOR, CONTROL KIOSK, PENSTOCK, CONTROL VALVE, PUMP, EXTENT OF SURVEY, RODDING EYE, FLOW METER, SEA OUTFALL, GULLEY, SOAKAWAY, HATCHBOX, SUMMIT NODE, HEAD OF SYSTEM, TUMBLING BAY, HEADWALL, UNSPECIFIED, HYDROBRAKE, VALVE, INLET, VALVE CHAMBER, INSPECTION CHAMBER, WASHOUT

GHOST NODE (inc. GN - Rising Main & GN - Dual Function)

EXPEDIENCY NODE (CHANGE OF CHARACTERISTIC)

BIFURCATION, DROPSHAFT, CATCHPIT, FLOW CONTROL, CHAMBER, SCREEN CHAMBER POWERED, CONTAMINATED SURFACE WATER, SCREEN CHAMBER STATIC

PUMPING STATION, WASTE WATER TREATMENT WORKS, EJECTOR STATION, SEPTIC TANK, SLUDGE PUMPING STATION, TANK, SHEET EDGE, VENT COLUMN, SEWER OVERFLOW, DISCHARGE POINT (OUTFALL)

Note - ALL flow direction arrows are BLUE - colour not significant

NODE TABLE ABBREVIATIONS

MANHOLE FUNCTION

F Foul
S Surface
C Combined
T Transition
O Overflow
U Unspecified

MANHOLE / NODE TYPE

M Manhole
J Junction
L Lamphole
H Hatchbox
R Rodding Eye
F Outfall
V Combined Sewer Overflow
P Pumping Station
S Soakaway
D Dual Function Manhole
W Treatment Works
Z Ghost in Rising Main
C Cascade
Y Gulley
E Ejector
O Oil Injector
I Inlet
B Hydrobrake
T Vent Column
X Valve
U Unspecified
Q Expediency Node
G Ghost (to allow pipe bends)

SEWER SHAPE

C Circular
E Egg
O Oval
F Flat Top
R Rectangular
S Square
T Trapezoidal
A Arch
B Barrel
H Horseshoe
U Unspecified

SEWER MATERIAL

AC Asbestos Cement
BR Brick
CI Cast Iron
SI Spun (Grey) Iron
CO Concrete
CS Concrete Segments (Bolted)
CS Concrete Segments (Unbolted)
CC Concrete Box Culvert
DI Ductile Iron
GR Glass Reinforced Concrete
GR Glass Reinforced Plastic
PS Plastic / Steel Composite
PV Polyvinyl Chloride
PE Polyethylene
RP Reinforced Plastic Matrix
ST Steel
VC Vitrified Clay (All Clayware)
PP Polypropylene
PF Pitch Fibre
MA Masonry - In Regular Courses
MA Masonry - Randomly Coursed
U Unspecified

OS Sheet No: SD5190NW
Scale 1:1250 Date: 19-Apr-2013

75 Nodes

Sheet 1 of 1

SEWER RECORDS

There are no nodes in SD5090SE.

OS Sheet No: SD5090SE

Scale 1:1250 Date: 19-Apr-2013

Printed by: Rob Payne

WASTE WATER SYMBOLOGY

MANHOLE

FOUL SURFACE COMBINED DUAL — SIDE ENTRY MANHOLE

FOUL SURFACE COMBINED

PUBLIC MAIN
PRIVATE MAIN
SECTION 104
PUMPING MAIN
HIGHWAY DRAIN
SLUDGE MAIN
ABANDONED

SITE TERMINATION
AV AIRVALVE
CA CASCADE
CK CONTROL KIOSK
CO CONTROL VALVE
ES EXTENT OF SURVEY
FM FLOW METER
GU GULLEY
HB HATCHBOX
HS HEAD OF SYSTEM
HW HEADWALL
HY HYDROBRAKE
IN INLET
IC INSPECTION CHAMBER

T-JUNCTION (SADDLE)
LH LAMP HOLE
OI OIL INTERCEPTOR
PE PENSTOCK
PU PUMP
RE RODDING EYE
SF SEA OUTFALL
SO SOAKAWAY
SU SUMMIT NODE
TB TUMBLING BAY
UN UNSPECIFIED
VA VALVE
VC VALVE CHAMBER
WO WASHOUT

GHOST NODE (inc. GN - Rising Main & GN - Dual Function)
EXPEDIENCY NODE (CHANGE OF CHARACTERISTIC)

BIFURCATION
CATCHPIT
CHAMBER
CONTAMINATED SURFACE WATER
DROPSHAFT
FLOW CONTROL
SCREEN CHAMBER POWERED
SCREEN CHAMBER STATIC

PUMPING STATION
EJECTOR STATION
SLUDGE PUMPING STATION
SHEET EDGE
SEWER OVERFLOW
WASTE WATER TREATMENT WORKS
SEPTIC TANK
TANK
VENT COLUMN
DISCHARGE POINT (OUTFALL)

Note - ALL flow direction arrows are BLUE - colour not significant

NODE TABLE ABBREVIATIONS

MANHOLE FUNCTION

F	Foul	T	Transition
S	Surface	O	Overflow
C	Combined	U	Unspecified

MANHOLE / NODE TYPE

M	Manhole	Z	Ghost in Rising Main
J	Junction	C	Cascade
L	Lamphole	Y	Gulley
H	Hatchbox	E	Ejector
R	Rodding Eye	O	Oil Injector
F	Outfall	I	Inlet
V	Combined Sewer Overflow	B	Hydrobrake
		T	Vent Column
P	Pumping Station	X	Valve
S	Soakaway	U	Unspecified
D	Dual Function Manhole	Q	Expediency Node
		G	Ghost (to allow pipe bends)
W	Treatment Works		

SEWER SHAPE

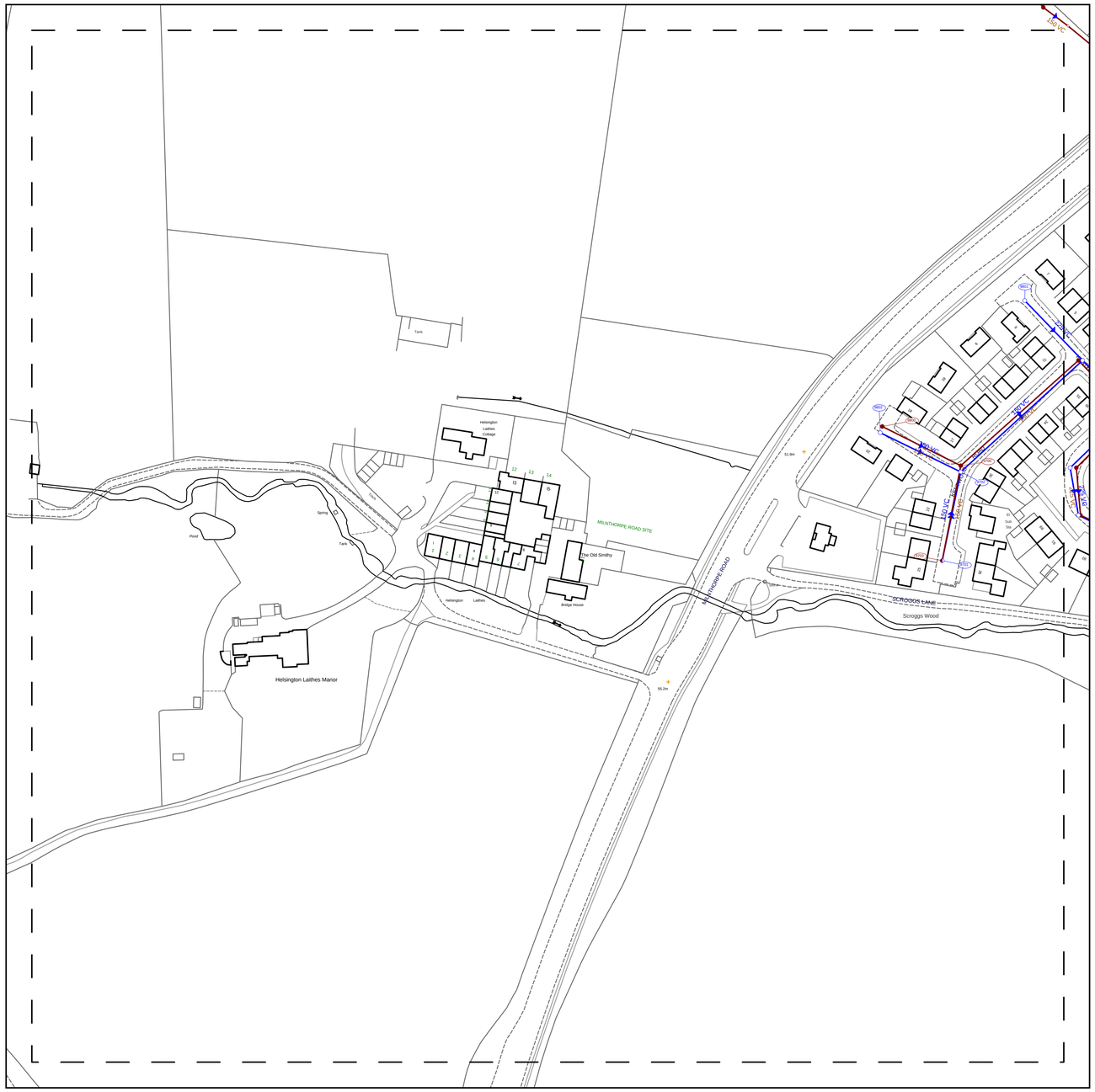
C	Circular	T	Trapezoidal
E	Egg	A	Arch
O	Oval	B	Barrel
F	Flat Top	H	Horseshoe
R	Rectangular	U	Unspecified
S	Square		

SEWER MATERIAL

AC	Asbestos Cement
BR	Brick
CI	Cast Iron
SI	Spun (Grey) Iron
CO	Concrete
CS	Concrete Segments (Bolted)
CS	Concrete Segments (Unbolted)
CC	Concrete Box Culvert
DI	Ductile Iron
GR	Glass Reinforced Concrete
GR	Glass Reinforced Plastic
PS	Plastic / Steel Composite
PV	Polyvinyl Chloride
PE	Polyethylene
RP	Reinforced Plastic Matrix
ST	Steel
VC	Vitrified Clay (All Clayware)
PP	Polypropylene
PF	Pitch Fibre
MA	Masonry - In Regular Courses
MA	Masonry - Randomly Coursed
U	Unspecified

OS Sheet No: SD5090SE
Scale 1:1250 Date: 19-Apr-2013
No Nodes
Sheet 1 of 1

United Utilities
SEWER RECORDS



Refno	Cover	Func	Type	Invert	Size.x	Size.y	Shape	Matl	Grad	Length
9700	48.78	F	M	46.79	150		C	VC	121	76.49
9701	48.9	S	D	47.82	150		C	VC	62	43.93
9702	48.79	S	M	47.11	150		C	VC	108	79.98
9703	48.9	F	D	47.51	150		C	VC	67	46.87
9800	50.22	F	M	48.83	150		C	VC	21	42.49
9801	49.5	S	M		225		C	VC		40.31
9802	50.22	S	M	48.48	150		C	VC	32	43.38

OS Sheet No: SD5090NE

Scale 1:1250 Date: 19-Apr-2013

Printed by: Rob Payne

WASTE WATER SYMBOLOGY

MANHOLE

FOUL SURFACE COMBINED DUAL — SIDE ENTRY MANHOLE

FOUL SURFACE COMBINED

PUBLIC MAIN
PRIVATE MAIN
SECTION 104
PUMPING MAIN
HIGHWAY DRAIN
SLUDGE MAIN
ABANDONED

SITE TERMINATION
AV AIRVALVE
CA CASCADE
CK CONTROL KIOSK
CV CONTROL VALVE
ES EXTENT OF SURVEY
FM FLOW METER
GU GULLEY
HB HATCHBOX
HS HEAD OF SYSTEM
HW HEADWALL
HY HYDROBRAKE
IN INLET
IC INSPECTION CHAMBER
T-JUNCTION (SADDLE)
LH LAMP HOLE
OI OIL INTERCEPTOR
PE PENSTOCK
PU PUMP
RE RODDING EYE
SE SEA OUTFALL
SO SOAKAWAY
SN SUMMIT NODE
TB TUMBLING BAY
UN UNSPECIFIED
VA VALVE
VC VALVE CHAMBER
WO WASHOUT

GHOST NODE (inc. GN - Rising Main & GN - Dual Function)
EXPEDIENCY NODE (CHANGE OF CHARACTERISTIC)

BIFURCATION
CATCHPIT
CHAMBER
CONTAMINATED SURFACE WATER
DROPSHAFT
FLOW CONTROL
SCREEN CHAMBER POWERED
SCREEN CHAMBER STATIC
PUMPING STATION
EJECTOR STATION
SLUDGE PUMPING STATION
SHEET EDGE
SEWER OVERFLOW
WASTE WATER TREATMENT WORKS
SEPTIC TANK
TANK
VENT COLUMN
DISCHARGE POINT (OUTFALL)

Note - ALL flow direction arrows are BLUE - colour not significant

NODE TABLE ABBREVIATIONS

MANHOLE FUNCTION

F Foul
S Surface
C Combined
T Transition
O Overflow
U Unspecified

MANHOLE / NODE TYPE

M Manhole
J Junction
L Lamphole
H Hatchbox
R Rodding Eye
F Outfall
V Combined Sewer Overflow
P Pumping Station
S Soakaway
D Dual Function Manhole
W Treatment Works
Z Ghost in Rising Main
C Cascade
Y Gulley
E Ejector
O Oil Injector
I Inlet
B Hydrobrake
T Vent Column
X Valve
U Unspecified
Q Expediency Node
G Ghost (to allow pipe bends)

SEWER SHAPE

C Circular
E Egg
O Oval
F Flat Top
R Rectangular
S Square
T Trapezoidal
A Arch
B Barrel
H Horseshoe
U Unspecified

SEWER MATERIAL

AC Asbestos Cement
BR Brick
CI Cast Iron
SI Spun (Grey) Iron
CO Concrete
CS Concrete Segments (Bolted)
CS Concrete Segments (Unbolted)
CC Concrete Box Culvert
DI Ductile Iron
GR Glass Reinforced Concrete
GR Glass Reinforced Plastic
PS Plastic / Steel Composite
PV Polyvinyl Chloride
PE Polyethylene
RP Reinforced Plastic Matrix
ST Steel
VC Vitrified Clay (All Clayware)
PP Polypropylene
PF Pitch Fibre
MA Masonry - In Regular Courses
MA Masonry - Randomly Coursed
U Unspecified

OS Sheet No: SD5090NE
Scale 1:1250 Date: 19-Apr-2013
7 Nodes
Sheet 1 of 1

United Utilities
SEWER RECORDS

There are no nodes in SD5190SW.

OS Sheet No: SD5190SW

Scale 1:1250 Date: 19-Apr-2013

Printed by: Rob Payne

WASTE WATER SYMBOLOGY

MANHOLE

FOUL SURFACE COMBINED DUAL SIDE ENTRY MANHOLE

FOUL SURFACE COMBINED

PUBLIC MAIN

PRIVATE MAIN

SECTION 104

PUMPING MAIN

HIGHWAY DRAIN

SLUDGE MAIN

ABANDONED

SITE TERMINATION

T-JUNCTION (SADDLE)

AV AIRVALVE

LH LAMP HOLE

CA CASCADE

OI OIL INTERCEPTOR

CK CONTROL KIOSK

PE PENSTOCK

CO CONTROL VALVE

PU PUMP

ES EXTENT OF SURVEY

RE RODDING EYE

FM FLOW METER

SE SEA OUTFALL

GU GULLEY

SO SOAKAWAY

HB HATCHBOX

SN SUMMIT NODE

HS HEAD OF SYSTEM

TB TUMBLING BAY

HW HEADWALL

UN UNSPECIFIED

HY HYDROBRAKE

VA VALVE

IN INLET

VC VALVE CHAMBER

IC INSPECTION CHAMBER

WO WASHOUT

GHOST NODE (inc. GN - Rising Main & GN - Dual Function)

EXPEDIENCY NODE (CHANGE OF CHARACTERISTIC)

BIFURCATION

DROPSHAFT

CATCHPIT

FLOW CONTROL

CHAMBER

SCREEN CHAMBER POWERED

CONTAMINATED SURFACE WATER

SCREEN CHAMBER STATIC

PUMPING STATION

WASTE WATER TREATMENT WORKS

EJECTOR STATION

SEPTIC TANK

SLUDGE PUMPING STATION

TANK

SHEET EDGE

VENT COLUMN

SEWER OVERFLOW

DISCHARGE POINT (OUTFALL)

Note - ALL flow direction arrows are BLUE - colour not significant

NODE TABLE ABBREVIATIONS

MANHOLE FUNCTION

F	Foul	T	Transition
S	Surface	O	Overflow
C	Combined	U	Unspecified

MANHOLE / NODE TYPE

M	Manhole	Z	Ghost in Rising Main
J	Junction	C	Cascade
L	Lamphole	Y	Gulley
H	Hatchbox	E	Ejector
R	Rodding Eye	O	Oil Injector
F	Outfall	I	Inlet
V	Combined Sewer Overflow	B	Hydrobrake
		T	Vent Column
P	Pumping Station	X	Valve
S	Soakaway	U	Unspecified
D	Dual Function Manhole	Q	Expediency Node
		G	Ghost (to allow pipe bends)
W	Treatment Works		

SEWER SHAPE

C	Circular	T	Trapezoidal
E	Egg	A	Arch
O	Oval	B	Barrel
F	Flat Top	H	Horseshoe
R	Rectangular	U	Unspecified
S	Square		

SEWER MATERIAL

AC	Asbestos Cement
BR	Brick
CI	Cast Iron
SI	Spun (Grey) Iron
CO	Concrete
CS	Concrete Segments (Bolted)
CS	Concrete Segments (Unbolted)
CC	Concrete Box Culvert
DI	Ductile Iron
GR	Glass Reinforced Concrete
GR	Glass Reinforced Plastic
PS	Plastic / Steel Composite
PV	Polyvinyl Chloride
PE	Polyethylene
RP	Reinforced Plastic Matrix
ST	Steel
VC	Vitrified Clay (All Clayware)
PP	Polypropylene
PF	Pitch Fibre
MA	Masonry - In Regular Courses
MA	Masonry - Randomly Coursed
U	Unspecified

OS Sheet No: SD5190SW

Scale 1:1250 Date: 19-Apr-2013

No Nodes

Sheet 1 of 1

United Utilities

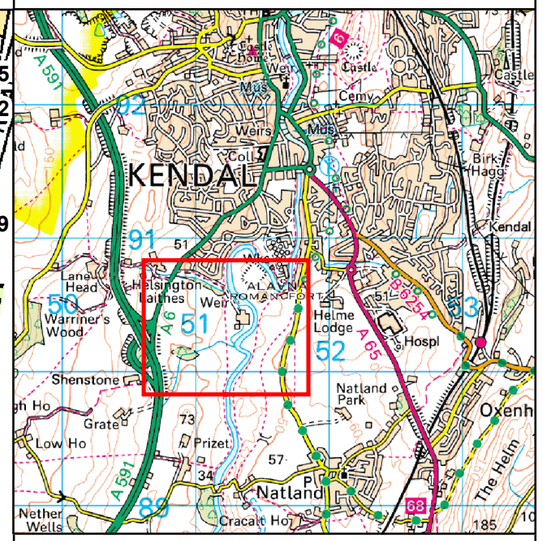
SEWER RECORDS

River Kent Model Node Locations

Environment Agency

EA01106KENT06_0236_defended EA01106KENT06_0236
EA01106KENT06_07.10 EA01106KENT06_1125
EA01106KENT06_07.10_defended EA01106KENT06_1102
EA01106KENT06_0788_defended EA01106KENT06_0788
EA01106KENT06_0157_defended EA01106KENT06_0157
EA01106KENT06_1029_defended EA01106KENT06_1029
EA01106KENT06_0867_defended EA01106KENT06_0867
EA01106KENT06_0946_defended EA01106KENT06_0946
EA01106KENT06_0081d EA01106KENT06_0081u
EA01106KENT06_0081u_defended
EA01106KENT06_0081d_defended
EA01106KENT05_1703d EA01106KENT06_0000u
EA01106KENT05_1634_defended EA01106KENT05_1634
EA01106KENT05_1556_defended EA01106KENT05_1556
EA01106KENT05_1479_defended EA01106KENT05_1479
EA01106KENT05_1399_defended EA01106KENT05_1399
EA01106KENT05_1320_defended EA01106KENT05_1320
EA01106KENT05_1242_defended EA01106KENT05_1242
EA01106KENT05_1163_defended EA01106KENT05_1163
EA01106KENT05_1085_defended EA01106KENT05_1085
EA01106KENT05_1006_defended EA01106KENT05_1006
EA01106KENT05_0928_defended EA01106KENT05_0928
EA01106KENT05_0849_defended EA01106KENT05_0849

Helsington Laithes
BSs
Scroggs Wood
SCROGGS LANE
KENT WOOD
ROMAN FORT
Outfall
Weir
Watercrook
Watercrook Bungalow
Groynes
Helsington Mills
Path
Sattury
FB
Young Spring Wood
A6
A591
52m
44m

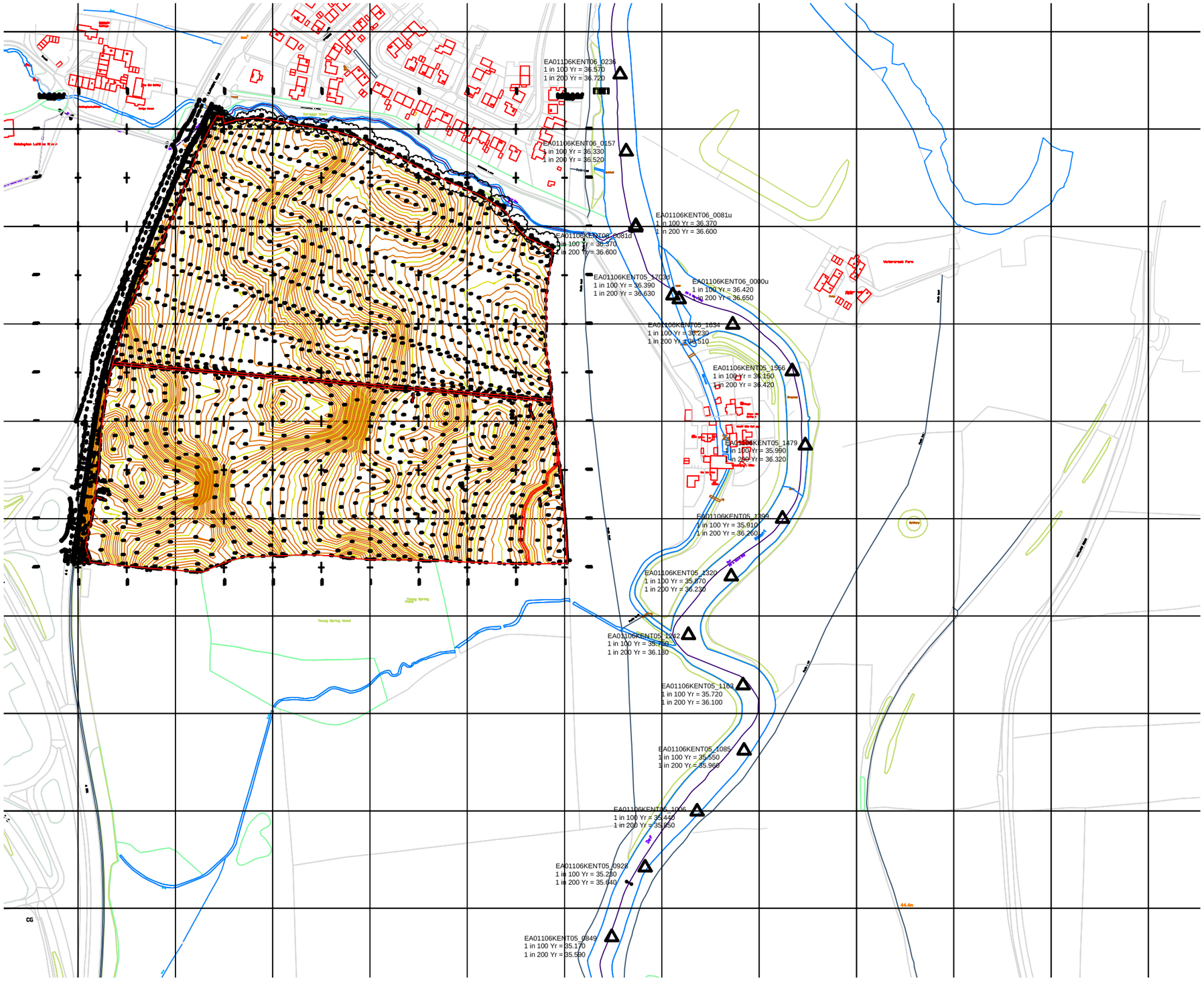


Legend

▲ Node Point

0 50 100 150 200
Metres

N W E S



NOTES:

1. FLOOD LEVELS TAKEN FROM ENVIRONMENT AGENCY DATA .

HIGHEST FLOOD LEVEL RECORDED ADJACENT TO THE SITE IS LOCATED AT POINT:

EA01106KENT06_0000u
1 in 100 Year = 36.420
1 in 200 Year = 36.650

Rev:	Description:	Date:	By:	Chkd:

curtins consulting

Curtins Consulting Ltd
10 Oxford Court, Bishopsgate, Manchester, M2 3WQ
t: 0161 236 2394 f: 0161 228 7902
e: manchester@curtins.com www.curtins.com

Structures • Civils • Environmental • Infrastructure • Transport Planning • Health & Safety • Dispute Resolution
Birmingham • Bristol • Cardiff • Douglas • Edinburgh • Kendal • Leeds • Liverpool • London • Manchester • Nottingham

Status: PRELIMINARY

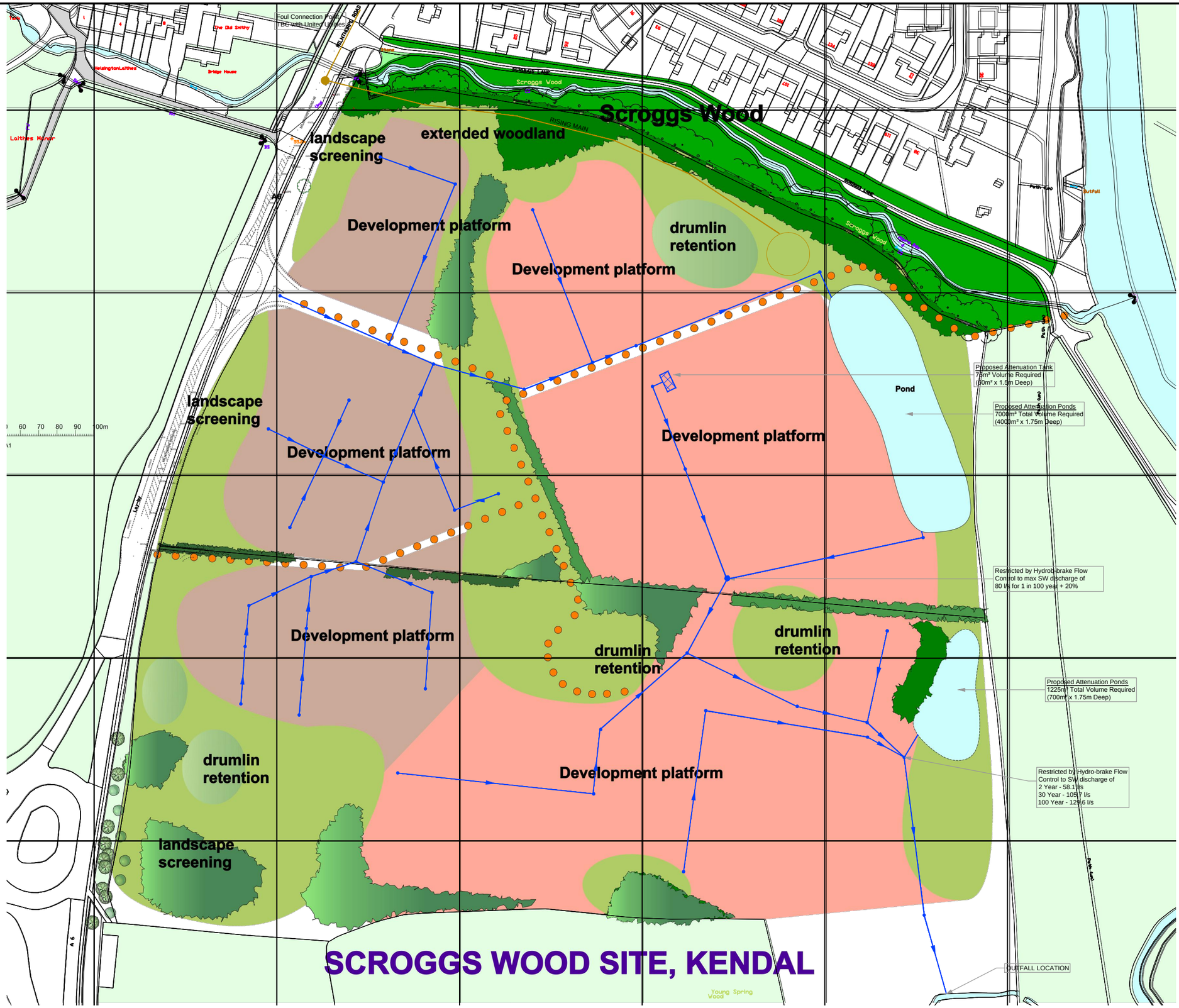
Project: Scroggs Wood
Kendal

Drg Title: Flood Levels

Scale:	Size:	First Issue:	Drawn:	Checked:
1:2000	A1	25.04.13	CG	GE

Drg No: TPMA1025-SK002

Rev: /



NOTES:

1. FLOOD LEVELS TAKEN FROM ENVIRONMENT AGENCY DATA .

KEY

Proposed Site
Approx. Impermeable Area -18.200 Hectares

Proposed Total Surface Water Discharge
2 Year - 58.1 l/s
30 Year - 105.7 l/s
100 Year +20% cc - 129.6 l/s

Rev:	Description:	Date:	By:	Chkd:
B	Updated to suit new Architects Layout	07.05.13	CG	GE
A	Drainage Remodelled with one outfall for SW	02.05.13	CG	GE

curtins consulting
Curtins Consulting Ltd
10 Oxford Court, Bishopsgate, Manchester, M2 3WQ
t: 0161 236 2394 f: 0161 228 7902
e: manchester@curtins.com www.curtins.com
Structures • Civils • Environmental • Infrastructure • Transport Planning • Health & Safety • Dispute Resolution
Birmingham • Bristol • Cardiff • Douglas • Edinburgh • Kendal • Leeds • Liverpool • London • Manchester • Nottingham

Status: PRELIMINARY

Project: Scroggs Wood Kendal

Drg Title: Drainage Strategy

Scale:	Size:	First Issue:	Drawn:	Checked:
1:2000	A1	25.04.13	CG	GE

Drg No: TPMA1025-SK003 Rev: B

Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	4
Number of Online Controls	2	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.250
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	19.100	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0	DVD Status	OFF
Analysis Timestep	Fine	Inertia Status	OFF
DTS Status	ON		

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440, 2160, 2880, 4320, 5760, 7200, 8640, 10080
Return Period(s) (years)	1, 30, 100
Climate Change (%)	0, 0, 20

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
1.000	30 Winter	100	+20%					
1.001	30 Winter	100	+20%	100/15 Winter				
1.002	30 Winter	100	+20%	100/15 Summer				
2.000	15 Winter	100	+20%	100/15 Summer				
2.001	15 Winter	100	+20%	100/15 Summer				
1.003	30 Winter	100	+20%	30/15 Summer				
3.000	15 Winter	100	+20%	100/15 Summer				
3.001	15 Winter	100	+20%	100/15 Summer				
1.004	15 Winter	100	+20%	30/15 Summer				
4.000	15 Winter	100	+20%	100/15 Summer				
5.000	15 Winter	100	+20%	100/15 Summer				
6.000	15 Winter	100	+20%	100/15 Summer				
4.001	15 Winter	100	+20%	100/15 Summer				
1.005	15 Winter	100	+20%	30/15 Summer				
7.000	15 Winter	100	+20%	100/15 Summer				
7.001	15 Winter	100	+20%					
1.006	30 Winter	100	+20%					
8.000	15 Winter	100	+20%					
8.001	15 Winter	100	+20%					
1.007	15 Winter	100	+20%					
9.000	15 Winter	100	+20%					
1.008	15 Winter	100	+20%					

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	Storm	Return Period	Climate Change	First X Surcharge	First Y Flood	First Z Overflow	O/F Act.	Lvl Exc.
1.009	600 Winter	100	+20%	100/60 Summer				
1.010	600 Winter	100	+20%	30/240 Winter				
10.000	30 Winter	100	+20%	30/15 Summer				
10.001	15 Winter	100	+20%	30/15 Summer				
1.011	480 Winter	100	+20%	30/120 Winter	100/360 Winter			1
11.000	15 Winter	100	+20%	30/15 Summer				
11.001	15 Winter	100	+20%					
1.012	15 Winter	100	+20%					
1.013	30 Winter	100	+20%					
12.000	15 Winter	100	+20%					
1.014	15 Winter	100	+20%					
1.015	360 Winter	100	+20%	100/15 Summer				
13.000	15 Winter	100	+20%					
13.001	15 Winter	100	+20%					
13.002	360 Winter	100	+20%	100/60 Summer				
1.016	360 Winter	100	+20%	30/60 Winter				

PN	US/MH Name	Water Level (m)	Surch'ed Depth (m)	Flooded Volume (m³)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
1.000	1	52.016	-0.084	0.000	0.25	0.0	106.7	OK
1.001	2	51.996	0.146	0.000	0.48	0.0	203.4	SURCHARGED
1.002	3	51.958	0.358	0.000	0.31	0.0	195.1	SURCHARGED
2.000	4	52.275	0.475	0.000	1.23	0.0	90.9	SURCHARGED
2.001	5	52.029	0.479	0.000	0.59	0.0	172.0	SURCHARGED
1.003	6	51.920	0.870	0.000	0.73	0.0	312.5	SURCHARGED
3.000	7	52.459	0.659	0.000	1.20	0.0	85.6	SURCHARGED
3.001	8	51.991	0.591	0.000	0.63	0.0	175.8	SURCHARGED
1.004	9	51.797	0.997	0.000	1.25	0.0	459.7	SURCHARGED
4.000	10	51.867	0.067	0.000	1.10	0.0	81.4	SURCHARGED
5.000	11	51.867	0.067	0.000	1.10	0.0	81.4	SURCHARGED
6.000	12	51.867	0.067	0.000	1.10	0.0	81.4	SURCHARGED
4.001	13	51.665	0.115	0.000	0.64	0.0	293.9	SURCHARGED
1.005	14	51.302	0.802	0.000	1.90	0.0	695.4	SURCHARGED
7.000	15	51.873	0.073	0.000	1.12	0.0	82.6	SURCHARGED
7.001	16	51.307	-0.243	0.000	0.42	0.0	164.8	OK
1.006	17	50.042	-0.158	0.000	0.89	0.0	800.0	OK
8.000	18	51.357	-0.093	0.000	0.90	0.0	157.9	OK
8.001	19	50.989	-0.161	0.000	0.72	0.0	342.9	OK
1.007	20	48.860	-0.240	0.000	0.67	0.0	1057.4	OK
9.000	21	43.833	-0.267	0.000	0.55	0.0	202.9	OK
1.008	22	43.445	-0.130	0.000	0.97	0.0	1299.9	OK
1.009	23	41.326	0.226	0.000	0.61	0.0	205.2	SURCHARGED
1.010	24	41.318	0.468	0.000	0.25	0.0	83.6	SURCHARGED
10.000	26	42.831	1.031	0.000	1.61	0.0	90.5	FLOOD RISK
10.001	26	42.839	1.289	0.000	1.28	0.0	162.3	FLOOD RISK
1.011	27	43.500	2.600	1.783	0.08	0.0	71.2	FLOOD
11.000	28	45.997	1.697	0.000	2.55	0.0	143.2	FLOOD RISK
11.001	29	43.949	-0.101	0.000	0.75	0.0	171.5	OK
1.012	30	40.183	-0.167	0.000	0.84	0.0	280.0	OK

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Water Level (m)	Surch'ed Depth (m)	Flooded Volume (m^3)	Flow / Cap.	O'flow (l/s)	Pipe Flow (l/s)	Status
1.013	31	39.780	-0.320	0.000	0.44	0.0	331.8	OK
12.000	32	40.164	-0.136	0.000	0.56	0.0	83.7	OK
1.014	33	38.557	-0.293	0.000	0.51	0.0	449.8	OK
1.015	34	37.624	0.524	0.000	0.58	0.0	194.5	SURCHARGED
13.000	35	40.330	-0.270	0.000	0.54	0.0	180.5	OK
13.001	36	39.979	-0.371	0.000	0.30	0.0	366.8	OK
13.002	37	37.594	0.494	0.000	0.18	0.0	74.6	SURCHARGED
1.016	38	37.589	0.739	0.000	0.30	0.0	129.5	SURCHARGED

Report

Appendix 3

Land at Scroggs Wood, Kendal
Initial Utility Information

curtins consulting

For GVA

By Curtins Consulting Ltd
May 2012

Contents

Client:	GVA
Project:	Land at Scroggs Wood, Kendal
Report Type:	Initial Utility Information
Report Reference:	TPMA1025
Revision:	-
Report Status:	**DRAFT**
Date:	May 2013

Report Author(s)	**Signature**	**Date**
Chloe Grimsley Graduate Engineer		2nd May 2013

Checked	**Signature**	**Date**
Garry Eyres Senior Engineer		2nd May 2013

Authorised	**Signature**	**Date**
Keith York Associate		2nd May 2013

For and on behalf of **Curtins Consulting Ltd**

Contents

1.0 Introduction

Introduction

1.1 Curtins Consulting has been appointed on behalf of GVA to collate the existing Statutory Undertakers information, predicted demand loadings and potential modifications required to serve the development of land at Scroggs Wood, Kendal (Shown in Image 1).

Image 1

1.2 The proposed development is to consist of:

1.3 The information has been gathered on our behalf by a third party (Aptus Utilities) and calculations carried out by them to predict the loading requirements for such a development.

1.3 Point of Connection applications have been submitted by Aptus Utilities to National Grid Gas, Electricity North west and United Utilities Water. Until the formal responses are received, the study is based on assumed Points of Connection.

1.0 Introduction

1.4 The Town and Country Planning (Use Classes) Order 1987 (as amended) puts uses of land and buildings into various categories known as 'Use Classes'. Shown below:

- **A1 Shops -** Shops, retail warehouses, hairdressers, undertakers, travel and ticket agencies, post offices (but not sorting offices), pet shops, sandwich bars, showrooms, domestic hire shops, dry cleaners, funeral directors and internet cafes.
- **A2 Financial and professional services -** Financial services such as banks and building societies, professional services (other than health and medical services) including estate and employment agencies and betting offices.
- **A3 Restaurants and cafés -** For the sale of food and drink for consumption on the premises - restaurants, snack bars and cafes.
- **A4 Drinking establishments -** Public houses, wine bars or other drinking establishments (but not night clubs).
- **A5 Hot food takeaways -** For the sale of hot food for consumption off the premises.
- **B1 Business -** Offices (other than those that fall within A2), research and development of products and processes, light industry appropriate in a residential area.
- **B2 General Industrial -** Use for industrial process other than one falling within class B1 (excluding incineration purposes, chemical treatment or landfill or hazardous waste).
- **B8 Storage or distribution -** This class includes open air storage.
- **C1 Hotels -** Hotels, boarding and guest houses where no significant element of care is provided (excludes hostels).
- **C2 Residential institutions -** Residential care homes, hospitals, nursing homes, boarding schools, residential colleges and training centres.
- **C2A Secure Residential Institution** - Use for a provision of secure residential accommodation, including use as a prison, young offenders institution, detention centre, secure training centre, custody centre, short term holding centre, secure hospital, secure local authority accommodation or use as a military barracks.
- **C3 Dwelling houses -** this class is formed of 3 parts:
    - C3(a) covers use by a single person or a family (a couple whether married or not, a person related to one another with members of the family of one of the couple to be treated as members of the family of the other), an employer and certain domestic employees (such as an au pair, nanny, nurse, governess, servant, chauffeur, gardener, secretary and personal assistant), a carer and the person receiving the care and a foster parent and foster child.
    - C3(b): up to six people living together as a single household and receiving care e.g. supported housing schemes such as those for people with learning disabilities or mental health problems.
    - C3(c) allows for groups of people (up to six) living together as a single household. This allows for those groupings that do not fall within the C4 HMO definition, but which fell within the previous C3 use class, to be provided for i.e. a small religious community may fall into this section as could a homeowner who is living with a lodger.
- **C4 Houses in multiple occupation** - small shared houses occupied by between three and six unrelated individuals, as their only or main residence, who share basic amenities such as a kitchen or bathroom.
- **D1 Non-residential institutions -** Clinics, health centres, crèches, day nurseries, day centres, schools, art galleries (other than for sale or hire), museums, libraries, halls, places of worship, church halls, law court. Non residential education and training centres.

- **D2 Assembly and leisure -** Cinemas, music and concert halls, bingo and dance halls (but not night clubs), swimming baths, skating rinks, gymnasiums or area for indoor or outdoor sports and recreations (except for motor sports, or where firearms are used).

1.5 The current identified use classes across the proposed site are identified as:

- **B1 Business -** Offices (other than those that fall within A2), research and development of products and processes, light industry appropriate in a residential area.
- **B2 General Industrial -** Use for industrial process other than one falling within class B1 (excluding incineration purposes, chemical treatment or landfill or hazardous waste).
- **B8 Storage or distribution -** This class includes open air storage.

2.0 Gas

Gas

Gas ï The following loading requirements have been based on a development Mix including the following:

The assumptions are;
15,200m2 of B1 development ï Offices
5742m2 of B2 development ï General Industrial
24,351m2 of B2/B8 development ï Storage and distribution

The nearest suitable main identified at this time has been identified as the 125mm PE LP main located on the opposite side of Milnthorpe Road (Shown in Image 2)

In order to provide the above connection it will be necessary to facilitate a crossing of Milnthorpe Road together with the Scroggs Wood watercourse to the north of the proposed site (shown in Image 3). Further investigation will be necessary to establish the most appropriate engineering method to make the required crossing together with the final agreed location.

It is not possible to supply standard space heating off a low pressure main however no medium pressure apparatus has been observed in the wider area.

Indicative Costs

In order to provide the requisite apparatus to the proposed site, over a distance initially noted as being approximately 175m, dependant on the agreed access into the development, a budget figure of £17,500 should be anticipated excluding civils works across the Scroggs Wood Watercourse.

The anticipated route of services on site is not yet known however a budget figure of £100 per linear metre should be anticipated at this stage.

As the potential point of connection for the site is already identified as low pressure no further apparatus is required on site.

2.0 Gas

Image 2

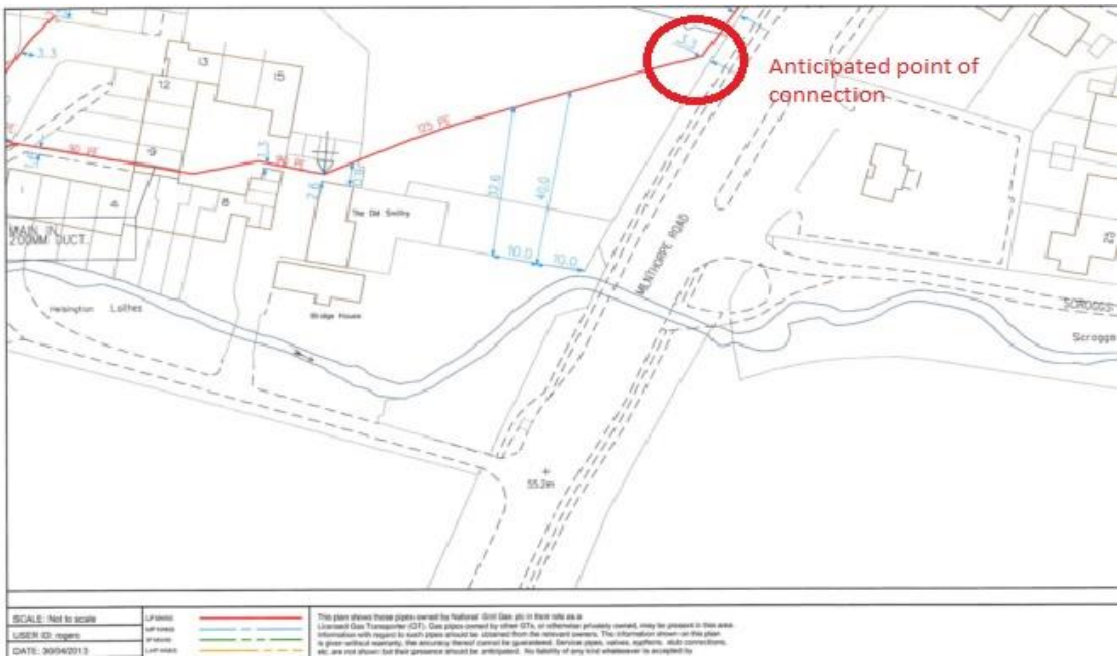
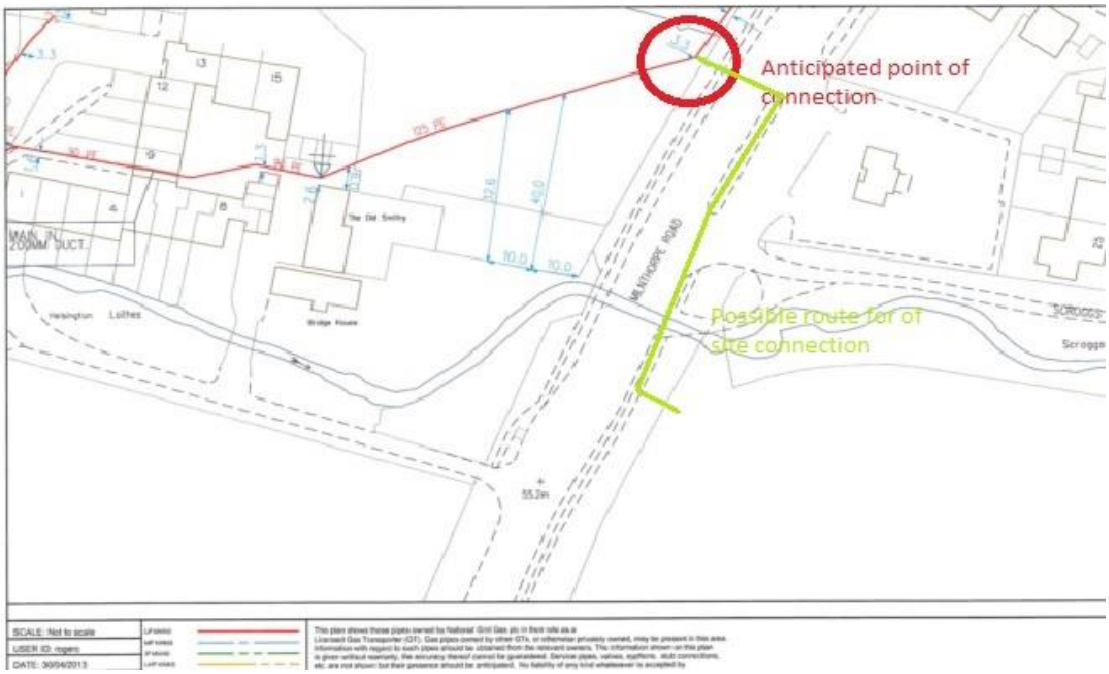


Image 3



3.0 Electricity

Electricity

Electricity ï The following loading requirements have been based on a development Mix including the following:

The assumptions are;
15,200m2 of B1 development ï Offices
5742m2 of B2 development ï General Industrial
24,351m2 of B2/B8 development ï Storage and distribution

An application has been made to obtain a HV Point of connection off the 95 (11kv) cable (Shown in Image 4).

The maximum potential loading for the site has been identified as 625kva.

The site will require its own substation and HV supply from the 11kv cable crossing Milnthorpe Road and passing above the Scroggs Wood watercourse before entering the site.

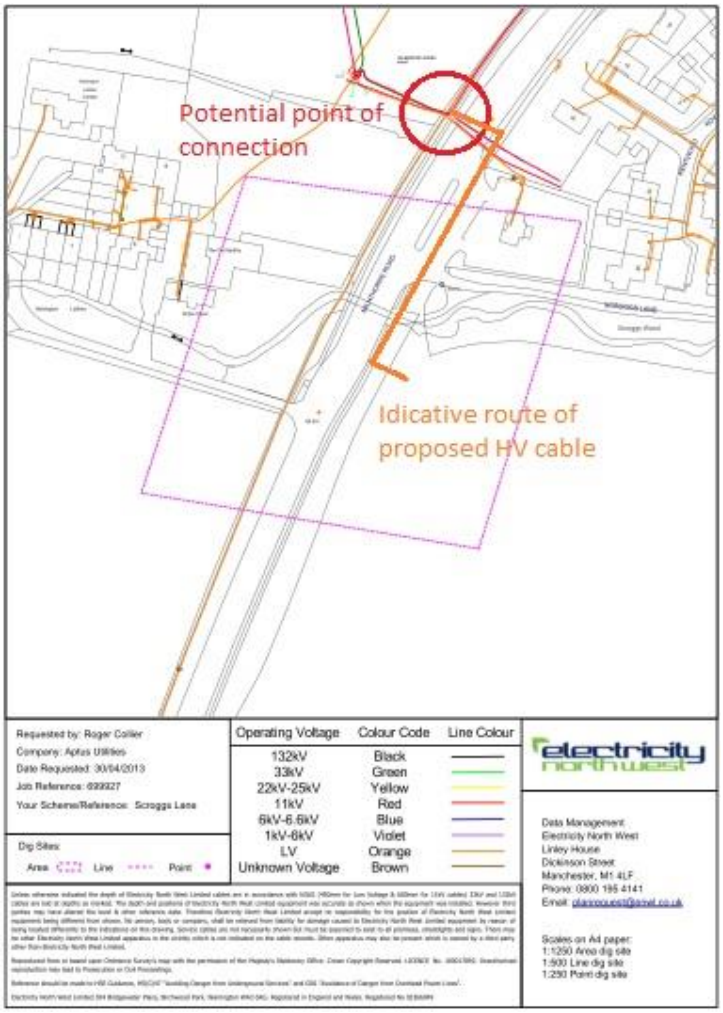
Indicative Costs

In order to provide the requisite 11kv cable to the proposed site, over a distance initially noted as being approximately 175m, dependant on the agreed access into the development, a budget figure of £26,250 should be anticipated excluding civils works across the Scroggs Wood Watercourse.

The anticipated route of services on site is not yet known however a budget figure of £125-£150 per linear metre should be anticipated at this stage.

It is noted that a substation is necessary to facilitate the development of the proposed site, the exact location is not yet known, however a figure of around £45,000 to £60,000 should be anticipated.

3.0 Electricity



5.0 Water

Water ï The following loading requirements have been based on a development Mix including the following:

The assumptions are;
15,200m2 of B1 development ï Offices
5742m2 of B2 development ï General Industrial
24,351m2 of B2/B8 development ï Storage and distribution

It is noted that a 6ò diameter main runs the length of Milnthorpe Road on the opposite side to the proposed development site (Shown in Image 5). A suitable location for point of connection will have to be agreed once a fixed access layout is approved

An existing 1.5ò main is also identified as connecting into the 6ò main before crossing Milnthorpe Road in the direction of the development site before terminating under an area identified as verge.

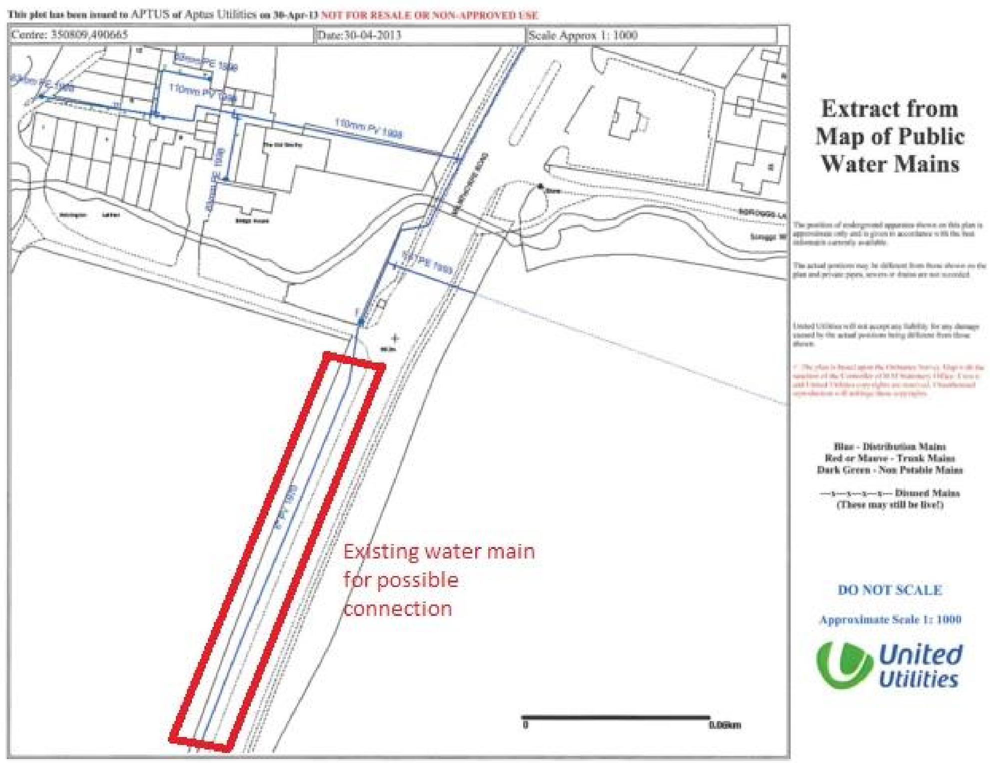
A new Road Crossing will be necessary to facilitate the proposed development the exact location of the connection is to be agreed.

Indicative Costs

Due to the proximity of the existing main to the proposed site, it will be necessary to provide a road crossing at the anticipated access point in the development. In order to facilitate the road crossing a figure of £5000 should be anticipated.

The anticipated route of services on site is not yet known however a budget figure of £100-£125 per linear metre should be anticipated at this stage.

The potential for each of the units to be metred should be anticipated, a figure of approximately £300 for installation of the meter and connection to the propose main should be provided as a budget figure.



This plot has been issued to APTUS of Aptus Utilities on 30-Apr-13 NOT FOR RESALE OR NON-APPROVED USE
Centre: 350809,490665
Date:30-04-2013
Scale Approx 1: 1000
110mm PV 1998
Existing water main
for possible
connection
0
0.06km
Extract from
Map of Public
Water Mains
Blue - Distribution Mains
Red or Mauve - Trunk Mains
Dark Green - Non Potable Mains
—x—x—x—x— Disused Mains
(These may still be live!)
DO NOT SCALE
Approximate Scale 1: 1000
United Utilities

5.0 Summary and Conclusions

1 Summary

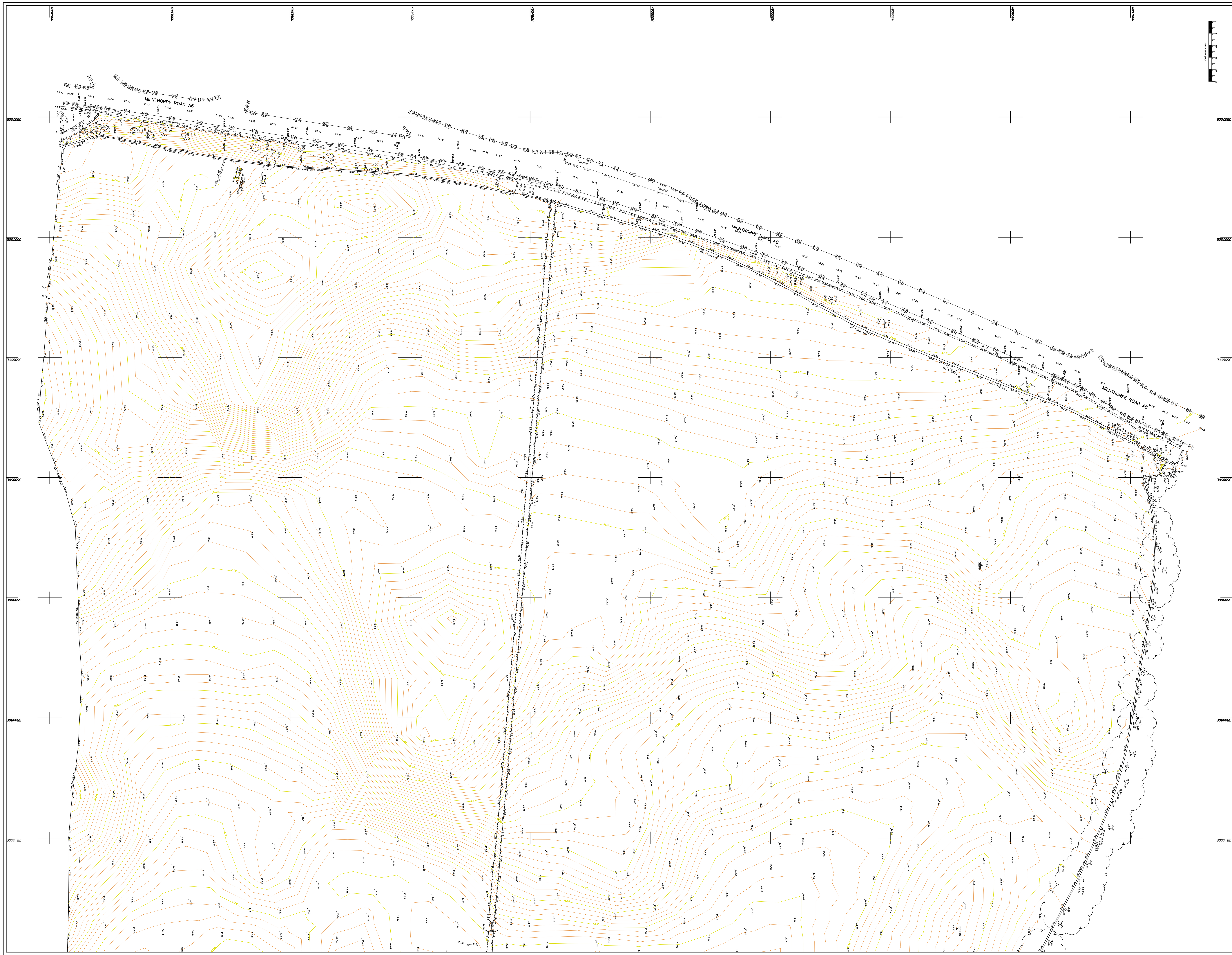
The purpose of this report was to collate the existing Statutory Undertakers information, predicted demand loadings and potential modifications required to serve the redevelopment of land at Scroggs Wood Kendal.

2 Conclusion

Further information together with robust reinforcement costs will be provided once formal Points of Connection responses have been received.

Report

Appendix 4



PLAN GRID NORTH

LEGEND

AV	AIR VALVE	
BOL	BOLLARD	
BH	BORE HOLE	
BIN	BIN	
	BUSH	
BS	BUS STOP	
CTV	CABLE TV COVER	
CB	CONTROL BOX	
DR	DRAIN	
	DRIP LINE	
ER	EARTH ROD	
EL	EAVES LEVEL	
EIC	ELEC INSPECTION COVER	
EP	ELECTRICITY POLE	
FH	FIRE HYDRANT	
FP	FLAG POLE	
GSV/T	GAS VALVE/TAP	
	GATE	
GP	GATE POST	
G	GULLY	
IC	INSPECTION COVER	
IL	INVERT LEVEL	
KO	KERB OUTLET	
LP	LAMP POST	
LBY	LIFEBUOY	
MH	MANHOLE	
MH	MANHOLE	
MH	MANHOLE	
MKR	MARKER	
MS	MILE STONE	
MP	MONITORING POINT	
N/P	NAME PLATE	
PT	POST	
PB	POST OFFICE BOX	
RWP	RAINWATER PIPE	
RL	RIDGE LEVEL	
RS	ROAD SIGN	
RE	RODDING EYE	
SP	SIGN POST	
SEP	STATION	
BT	TELECOM COVER	
TP	TELEGRAPH POLE	
TCB	TELEPHONE CALL BOX	
TIE	TIE WIRE	
TB	TRAFFIC BOLLARD	
TL	TRAFFIC LIGHT	
TLB	TRAFFIC LIGHT BOX	
	TREE	
G0.8	TREE GIRTH	
WM	WATER METER	
WO	WATER OUTLET	
WSV/T	WATER STOP VALVE/TAP	
PALISADE	PALISADE	
W/M	WIRE MESH	
B/W	BARBED WIRE	
C/P	CONC PANEL	
P/W	POST AND WIRE	
P/R	POST AND RAIL	
I/R	IRON RAIL	
C/B	CLOSE BOARDED	
CH/L	CHAIN LINK	
	WATER COURSE	
	KERB	
	FENCE	
	SURFACE CHANGE	
D.C.	DRAINAGE CHANNEL	
	WALL	
	TOP BANK	
	BOTTOM BANK	
	BUILDING	
	BUILDING CANOPY	
OHE	OVER HEAD ELECTRICAL	
OHT	OVER HEAD TELECOM	
	HEDGE	

SURVEY STATIONS

Name	Easting	Northing	Height
SEP1	350697.102	490263.402	63.360
SEP2	350702.240	490301.284	63.045
SEP3	350709.750	490349.642	62.609
SEP4	350725.536	490443.373	61.610
SEP5	350761.929	490552.617	59.320
SEP6	350803.596	490653.565	56.263
SEP7	350830.358	490706.570	54.166
SEP8	350841.409	490699.363	53.122
SEP9	350886.500	490637.983	51.982
SEP10	351037.778	490627.723	47.835

All levels relate to O.S Datum, Established using the Leica Smartnet GPS Network.
Orientation to a OS Grid.

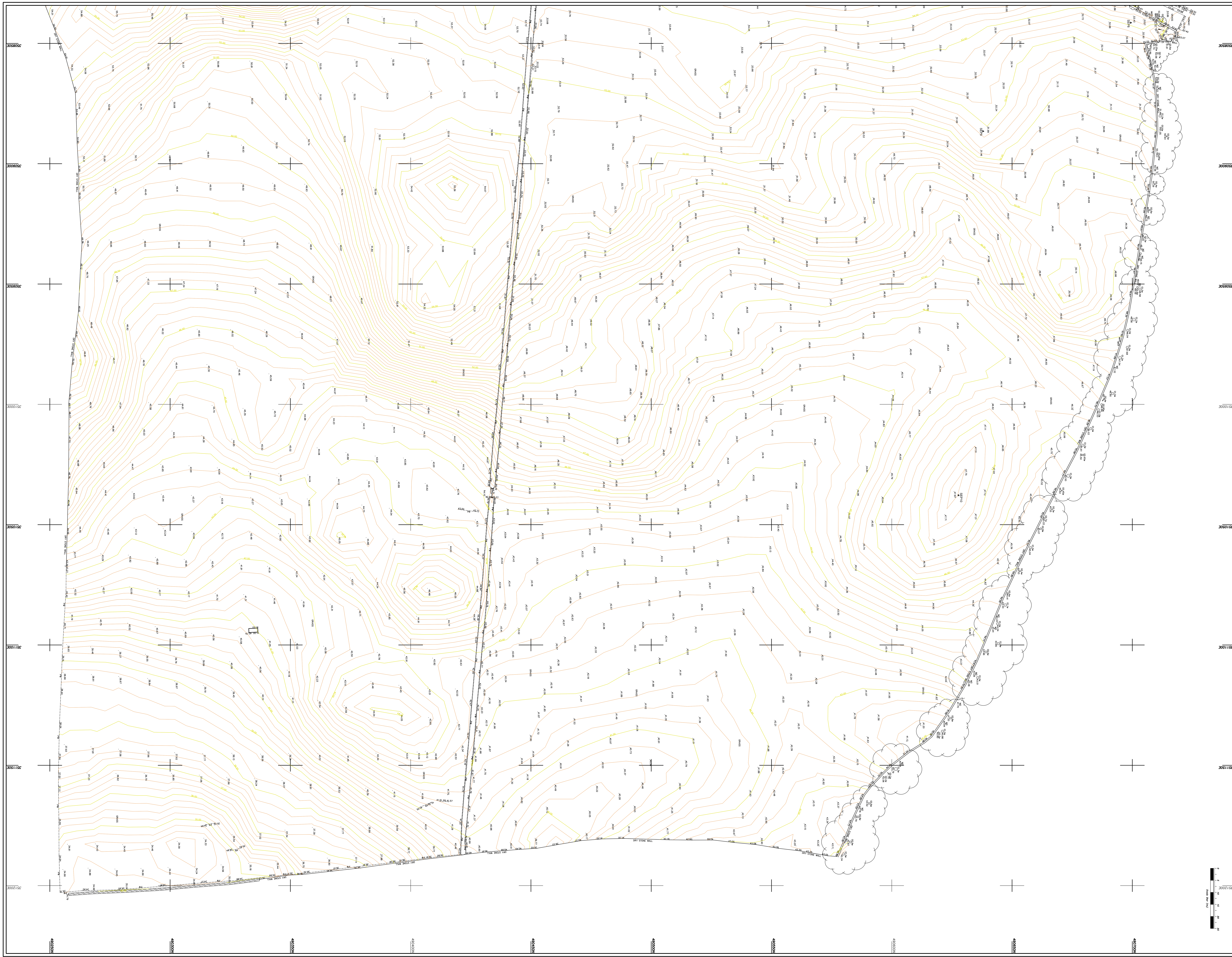
SITE ENGINEERING PERSONNEL ltd
SURVEY & ENGINEERING PROJECTS
LAND SURVEYING • ENGINEERING SURVEYING • LASER SCANNING
BUILDING SURVEYING • SITE ENGINEERING • UTILITY SURVEYING

Client
DAMSON DESIGN LIMITED
THE STABLES
LEVENS HALL
KENDAL

Project Title
TOPOGRAPHICAL SURVEY:
SITE E4M
MILNTHORPE ROAD
KENDAL

Scale	Date	Job No
1:500@A0	APRIL 2013	07983–T–01
Surveyed	Drawn	Checked
DF/TC	RW	*****

Survey & Engineering Projects, 33 Sandy Lane, Skelmersdale, Lancashire, WN8 8LA
T. (01695) 729835 F. (01695) 725566 W. www.sepltd.com E. info@sepltd.com



PLAN GRID NORTH

LEGEND

AV	AIR VALVE	MH	MANHOLE
BOL	BOLLARD	MKR	MARKER
BH	BORE HOLE	MS	MILE STONE
BIN	BIN	MP	MONITORING POINT
	BUSH	N/P	NAME PLATE
BS	BUS STOP	PT	POST
CTV	CABLE TV COVER	PB	POST OFFICE BOX
CB	CONTROL BOX	RWP	RAINWATER PIPE
DR	DRAIN	RL	RIDGE LEVEL
	DRIP LINE	RS	ROAD SIGN
ER	EARTH ROD	RE	RODDING EYE
EL	EAVES LEVEL	SP	SIGN POST
EIC	ELEC INSPECTION COVER	SEP	STATION
EP	ELECTRICITY POLE	BT	TELECOM COVER
FH	FIRE HYDRANT	TP	TELEGRAPH POLE
FP	FLAG POLE	TCB	TELEPHONE CALL BOX
GSV/T	GAS VALVE/TAP	TIE	TIE WIRE
	GATE	TB	TRAFFIC BOLLARD
GP	GATE POST	TL	TRAFFIC LIGHT
G	GULLY	TLB	TRAFFIC LIGHT BOX
IC	INSPECTION COVER		TREE
IL	INVERT LEVEL		
KO	KERB OUTLET	G0.8	TREE GIRTH
LP	LAMP POST	WM	WATER METER
LBY	LIFEBUOY	WO	WATER OUTLET
MH	MANHOLE	WSV/T	WATER STOP VALVE/TAP
MH	MANHOLE		

PALISADE	PALISADE
W/M	WIRE MESH
B/W	BARBED WIRE
C/P	CONC PANEL
P/W	POST AND WIRE
P/R	POST AND RAIL
I/R	IRON RAIL
C/B	CLOSE BOARDED
CH/L	CHAIN LINK
	WATER COURSE
	KERB
	FENCE
	SURFACE CHANGE
D.C.	DRAINAGE CHANNEL
	WALL
	TOP BANK
	BOTTOM BANK
	BUILDING
	BUILDING CANOPY
OHE	OVER HEAD ELECTRICAL
OHT	OVER HEAD TELECOM
	HEDGE

SURVEY STATIONS			
Name	Easting	Northing	Height
SEP1	350697.102	490263.402	63.360
SEP2	350702.240	490301.284	63.045
SEP3	350709.750	490349.642	62.609
SEP4	350725.536	490443.373	61.610
SEP5	350761.929	490552.617	59.320
SEP6	350803.596	490653.565	56.263
SEP7	350830.358	490706.570	54.166
SEP8	350841.409	490699.363	53.122
SEP9	350886.500	490637.983	51.982
SEP10	351037.778	490627.723	47.835

All levels relate to O.S Datum, Established using the Leica Smartnet GPS Network.
Orientation to a OS Grid.

SITE ENGINEERING PERSONNEL ltd
SURVEY & ENGINEERING PROJECTS
LAND SURVEYING • ENGINEERING SURVEYING • LASER SCANNING
BUILDING SURVEYING • SITE ENGINEERING • UTILITY SURVEYING

Client
DAMSON DESIGN LIMITED
THE STABLES
LEVENS HALL
KENDAL

Project Title
TOPOGRAPHICAL SURVEY:
SITE E4M
MILNTHORPE ROAD
KENDAL

Scale	Date	Job No
1:500@A0	APRIL 2013	07983-T-02
Surveyed	Drawn	Checked
DF/TC	RW	*****

Survey & Engineering Projects, 33 Sandy Lane, Skelmersdale, Lancashire, WN8 8LA
T. (01695) 729835 F. (01695) 725566 W. www.sepltd.com E. info@sepltd.com

Appendix 5

SCROGGS MEADOW SITE
KENDAL

Pre-development Arboricultural Report

Prepared for:

Levens Hall Estate

On:

02 May 2013

By:

Alistair Hearn

HND (Urb.For.), RFS (Cert.Arb.), M.Arbor.A.

Treescapes Consultancy Ltd.

Reference No. AH/AIA/290413

CONTENTS

PLANS

APPENDICES

1 INTRODUCTION

1.1 Instruction

Damson Design Ltd, on behalf of Levens Hall Estate, have instructed me to inspect the significant trees at the Scroggs meadow site, Kendal, and provide a pre-development report on the arboricultural impacts of the development proposals. I have compiled this report in accordance with the British Standard: BS 5837, *Trees in relation to design, demolition and construction – Recommendations* (2012) and where necessary, followed this guidance when suggesting solutions to implement the proposals.

1.2 Qualifications and Experience

I have based this report on my site observations and the information provided, and reached my conclusions in light of my experience. Appendix 1 lists details of my arboricultural experience and qualifications.

1.3 Documents and Provided Information

Damson Design Ltd provided me with a topographic survey (Ref. Nos.07983-T-01 & 02) for the existing site layout and a plan of the proposed site layout, dated 29 April 2013.

1.4 Development Proposal

The proposal is to build commercial properties on the green field site that has been highlighted in the Local Development Plan.

Plan 1 shows the existing site layout and Plan 2 shows the proposed site layout

1.5 Report Limitations

This report:

- is only concerned with assessing the condition of the trees on, or adjacent to, the site affected by the development proposals;
- does not take account of whether the trees could affect the soil in the area and cause tree related subsidence damage;
- is based on the documents provided and the information collected during the site visit;
- contains recommendations concerning work that should be carried out to responsibly manage the risks posed to and by the trees, and where necessary, reduce those risks to an acceptable level. However, even after carrying out the recommended work, there is a risk failure could still occur, especially during extreme weather conditions and/or if there are major hidden defects;
- does not take into account the possibility of extreme weather events;
- cannot account for future outbreaks of pests or diseases;
- does not take into account mechanical operations carried out in the vicinity of the trees which could affect their health and stability; and
- does not contain data collected with technical decay detection equipment

2 SITE VISIT AND OBSERVATIONS

2.1 Site Visit

I carried out a site visit on 29 April 2013, where I observed the trees from ground level, without detailed investigations and estimated all dimensions unless otherwise indicated. I inspected the trees outside the site boundary in the same way as trees on the site. The weather during my survey was clear, dry, and still, with good visibility.

2.2 Tree Identification and Location

Plans 1 and 2 show the locations of the significant trees on the site and on adjacent properties. Damson Design has based their plans on a topographic survey carried out by Site and Engineering Personnel Ltd, who plotted the locations of the trees and hedges.

These plans are for illustrative purposes only and not for directly scaling measurements. All the relevant information on the trees is contained within this report.

2.3 Tree Observations

I surveyed the trees and groups visually and recorded information on their species, dimensions, and retention category.

Cohesive groups of trees with similar attributes, both aerodynamically and visually, generally have a greater aesthetic value, so I have recorded the data as one record in the schedule.

Appendix 5 contains the schedule of the trees and groups.

3 REFERENCES, PLANNING POLICY AND GUIDANCE

3.1 National Policy

Section 197 in the Town and Country Planning Act 1990 makes it the duty of local planning authorities, 'in the interests of amenity,' to protect trees, when granting planning permission, by imposing conditions or serving Tree Preservation Orders (TPOs). Planning Policy Statements (PPS) also provide guidance on the acceptability of proposed development.

3.2 British Standard: BS 5837, *Trees in relation to design, demolition and construction – Recommendations* (2012)

The British Standard: BS 5837, *Trees in relation to design, demolition and construction – Recommendations* (2012) contains guidance on how to assess trees in or close to proposed development sites and what information to include in a pre-development arboricultural report for submission with a planning application. Appendix 2 contains relevant extracts from BS 5837 (2012).

3.3 South Lakeland Local Plan 2006: Policy C11 – Tree Preservation Orders

'Development proposals which may cause significant damage or destruction to a tree or woodland protected by a Tree Preservation Order will only be permitted where:

(a) no alternative site is available;

(b) there is an overriding need for the proposal which outweighs the need to preserve the tree or woodland;

(c) mitigating measures are available to minimise damage and secure worthwhile replacement planting'

4 TREE CONSTRAINTS

4.1 Tree Retention Category – BS 5837 (2012)

Using the guidance given in Table 1 of BS 5837 (2012), I have assessed the quality of the trees for retention and recorded the results in the schedule at Appendix 5. Appendix 3 contains a copy of Table 1 from BS 5837 (2012).

The following colour scheme represents the tree retention categories on the Plans:

Red: Retention Category U –	Those trees 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
Green: Retention Category A –	Trees of high quality with an estimated remaining life expectancy of at least 40 years
Blue: Retention Category B –	Trees of moderate quality with an estimated remaining life expectancy of at least 20 years
Grey: Retention Category C –	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

4.2 Tree Constraints – Above Ground

Plan 1 shows the existing site layout, the locations of the trees and their crowns. If retained, tree canopies are the vertical constraints to development. Pruning in accordance with good arboricultural practice can sometimes provide adequate clearance to implement the development proposals.

4.3 Tree Constraints – Below Ground

Plan 1 also shows the root protection areas (RPAs) of the trees. This is the minimum area of soil required by the roots to maintain healthy growth and is a development constraint. In some locations, altering this area is necessary to reflect the topography of the site and the adjacent land.

Root damage is often not visible from the surface and can create safety issues with tree stability. Damaged roots and compacted soil can restrict the amount of moisture and nutrients available to the tree and possibly lead to a premature decline in tree health.

5 ARBORICULTURAL IMPACT ASSESSMENT

5.1 Above Ground – Tree Trunk and Crown Structure

Plan 2 shows the proposed layout and the locations of the trees.

The trees are not growing within the development proposal footprint or infrastructure routes.

5.2 Below Ground – The Roots and Soil

Plan 2 also shows the root protection areas (RPAs) and their proximity to the proposed layout.

The existing trees and their RPAs do not conflict the proposed development or infrastructure routes.

Constructing the development without due regard to the RPAs of the retained trees could have a detrimental effect on their health and longevity.

5.3 Site Access

Vehicles and plant equipment operating or parking on unprotected soil within the tree's RPAs could compact and/or contaminate the soil. This could have a detrimental effect on the health and longevity of the trees. Vehicle movements under tree crowns could cause physical damage to trunks and/or branches, possibly creating a safety hazard.

5.4 Storage of Materials and Equipment

Storing equipment and materials close to trees increases the likelihood of physical damage to trunks and branches. Fuel spillages and cement-mixer washings are detrimental to the soil and root systems. Storage of materials and plant equipment should be on existing hard-standing areas, ideally outside the RPAs. If there is no alternative, adequately protect any nearby trees and protect the soil to minimise any harmful impacts.

6 RECOMMENDATIONS

6.1 General Precautions

The following general precautions should ensure the health and longevity of the trees. I suggest enforcing these general precautions within the RPAs during the construction phase and in locations where new trees are to be established:

- No soil disturbance, including compaction
- No change in the soil level, by stripping or filling
- No excavation, without prior discussion with the Arboricultural Consultant and/or the Local Planning Authority
- No redirection of surface water runoff into or out of the RPA
- No temporary buildings, sheds, or offices, without prior discussion with the Arboricultural Consultant and/or the Local Planning Authority
- No storage of materials or fuel
- No dumping of materials, whether into a skip or onto the ground
- No fires within 10m of the RPA or tree canopy, whichever is greater
- No vehicles, including parking
- No operation of plant equipment, without prior discussion with the Arboricultural Consultant and/or the Local Planning Authority
- No refuelling of mechanical equipment
- No storage or mixing of cement
- No washing of cement mixers within or uphill of the RPA
- Follow the guidance contained within the National Joint Utilities Group Volume 4 (Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees (Issue 2, 2007); www.njug.org.uk) when installing underground services within the RPA of a tree.

If necessary, we can provide a site monitoring role to ensure adequate tree protection measures are employed at critical stages of the construction process and in accordance with BS 5837 (2012).

6.2 Tree Work Recommended for Construction

Some tree-safety work may be required if the site usage changes, but at this stage none is required. I recommend making decisions regarding the tree work requirements for a developed site nearer the construction date, as trees are dynamic organisms and their health and stability can change over time.

6.2.1 Implementing the Tree Work

I recommend using a suitably qualified, competent, experienced, and insured contractor to carry out the tree work. The contractor should carry out their work in accordance with current industry safety standards and the recommendations contained in the British Standard – BS 3998, *Tree work – Recommendations* (2010) – as modified by research that is more recent.

Where necessary, we can organise prospective contractors to submit tenders for the proposed tree work. We can also provide a supervisory role to ensure the works comply with current safety standards and BS 3998 (2010) and current best practice.

6.3 Design and Construction Considerations

The construction process and site operations can adversely affect trees in many ways. Consequently, all members of the design team will need to be aware of the tree protection requirements and make provision for them throughout the development process. To avoid unnecessary damage to the retained trees during the construction process, I recommend involving the project arboriculturist during the architectural, engineering and landscape design processes.

Where necessary, we can provide feedback at each stage of the architectural, engineering and landscape design processes. We can also provide a site supervisory role to ensure the retained trees have adequate protection during the construction process.

6.4 Tree Management – Future Inspections

Due to the size of a number of the trees and their proximity to the proposed development, I recommend a suitably qualified, experienced, and insured arboriculturist inspect the trees every two years and after strong winds.

7 LEGAL CONSIDERATIONS

7.1 Protected Trees

I have not made enquiries with the Local Planning Authority (LPA) to establish if statutory regulations protect any of the trees on this site.

Where a Tree Preservation Order protects these trees, or they are located in a conservation area, or protected by planning conditions, it will be necessary to obtain permission from the LPA before carrying out any work. Certain exemptions require five days notification to the LPA apart from in extremely dangerous circumstances.

Full planning consent allows the minimum work required to implement the development proposals to be carried out to protected trees.

7.2 Wildlife Conservation Legislation

Most birds' nests have legal protection while in use; also, bats and their roosts have legal protection whether in use or not. Tree surgeons should be aware of their duties under the legislation to protect wildlife and should carry out their site assessment and work accordingly. If you suspect bats use the area, consult English Nature.

The Forestry Commission produce a useful leaflet called: *Woodland Management for Bats.* This document is available to download from www.forestry.gov.uk/forestry/INFD-6K3CXY (viewed 02/05/13).

Page 14 of this publication states:

> *'The Wildlife and Countryside Act 1981 makes it an offence to disturb, damage or destroy bats or their roosts (even if bats are not present in the roost at the time of any incident). The Act applies in both England and Wales, and requires consultations with the appropriate Statutory Nature Conservation Organisation* [English Nature or The Countryside Council for Wales] *before carrying out activities which might harm or disturb bats or their roosts (even if unoccupied).'*
>
> *'The Act is amended by the Countryside and Rights of Way Act 2000 in England and Wales. This adds 'reckless' to the offence of damaging or destroying a place a bat uses for shelter or rest, or disturbing a bat while using a roost. Under EU Regulations damaging or destroying a breeding site or resting place is an absolute offence, regardless of whether the act of doing so may be considered reckless or deliberate.'*

7.3 Neighbouring Trees

Under common law, you, or a neighbour, can prune overhanging branches back to the boundary line without the owner's permission. However, the material belongs to the tree owner and the same guidance on statutory controls applies, as discussed above.

8 CONCLUSIONS

Based on the above discussions, and provided all the technical recommendations in this report are followed, I consider the proposed development can be carried out in accordance with the guidance in the British Standard: BS 5837, *Trees in relation to design, demolition and construction – Recommendations* (2012), with a minimal impact on the retained trees.

I recommend involving the project arboriculturist during the architectural, engineering and landscape design processes, to ensure the trees around the boundary of the site are adequately protected and integrated into the proposed development.

Alistair Hearn HND(Urb.For.), Cert.Arb.(RFS), M.Arbor.A.

9 REFERENCES

Anon, 2005. *Woodland Management for Bats.* Forestry Commission, Wetherby. 15 pp.

BS 5837:2012, *Trees in relation to design, demolition and construction - Recommendations*

BS 3998:2010, *Trees work - Recommendations*

Approximate tree location and ID number

Red = Category U
Green = Category A
Blue = Category B
Grey = Category C

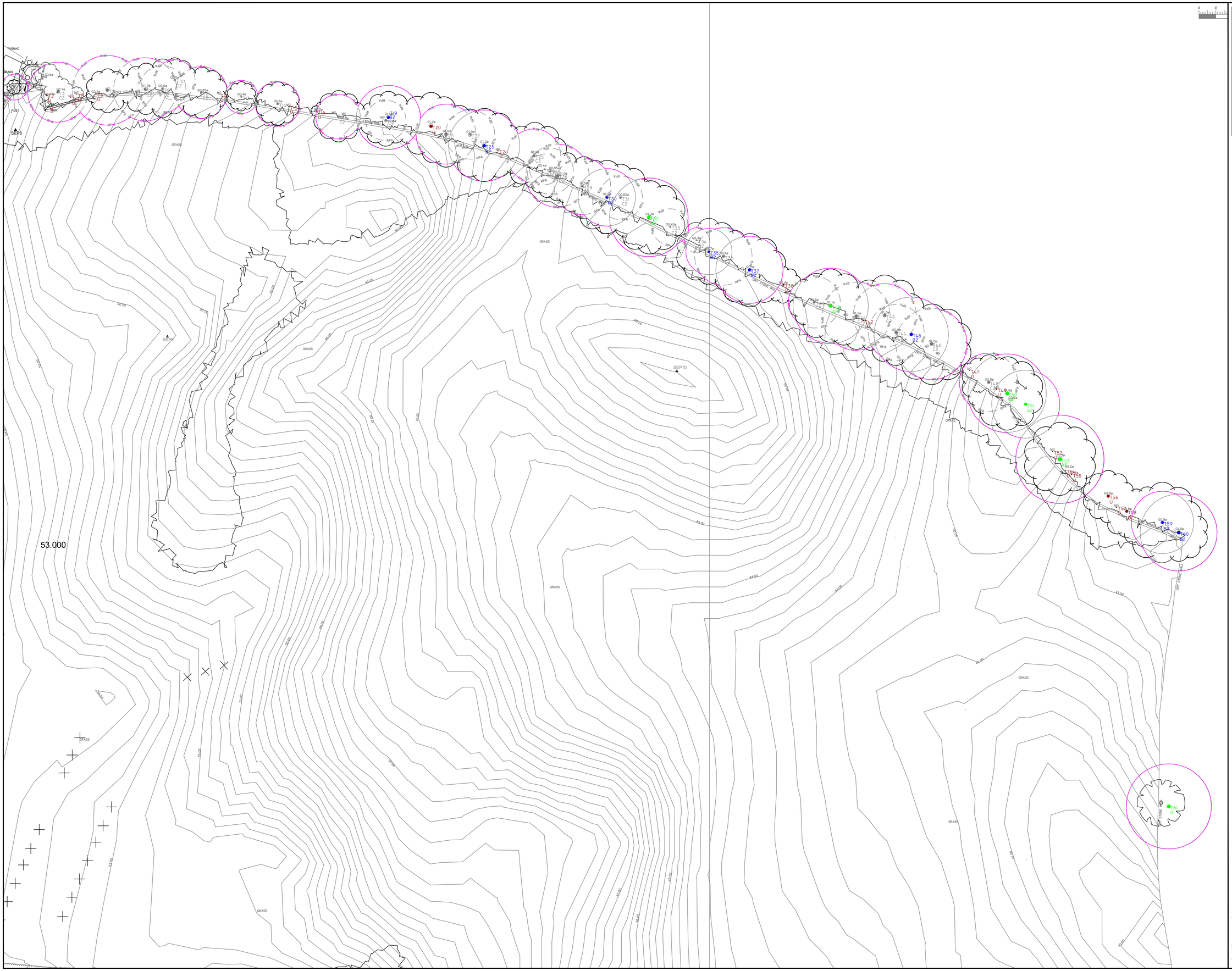
Root protection area (RPA) calculated in accordance with Section 4.6.1 of BS 5837 (2012)

Scale - 1:1000 @ A1

NOTE: This is a colour drawing - monochrome reproductions might be difficult to interpret

Tree locations are taken from the topographic survey - crown spreads are indicative only and should not be scaled

Plan 1 – Overview tree constraints plan showing the existing site layout



NOTE: This is a colour drawing - monochrome reproductions might be difficult to interpret

Tree locations are taken from the topographic survey - crown spreads are indicative only and should not be scaled

Plan 2 – Tree constraints plan showing the north-east section of the existing site layout

Approximate tree location and ID number

Red = Category U
Green = Category A
Blue = Category B
Grey = Category C

Root protection area (RPA) calculated in accordance with Section 4.6.1 of BS 5837 (2012)

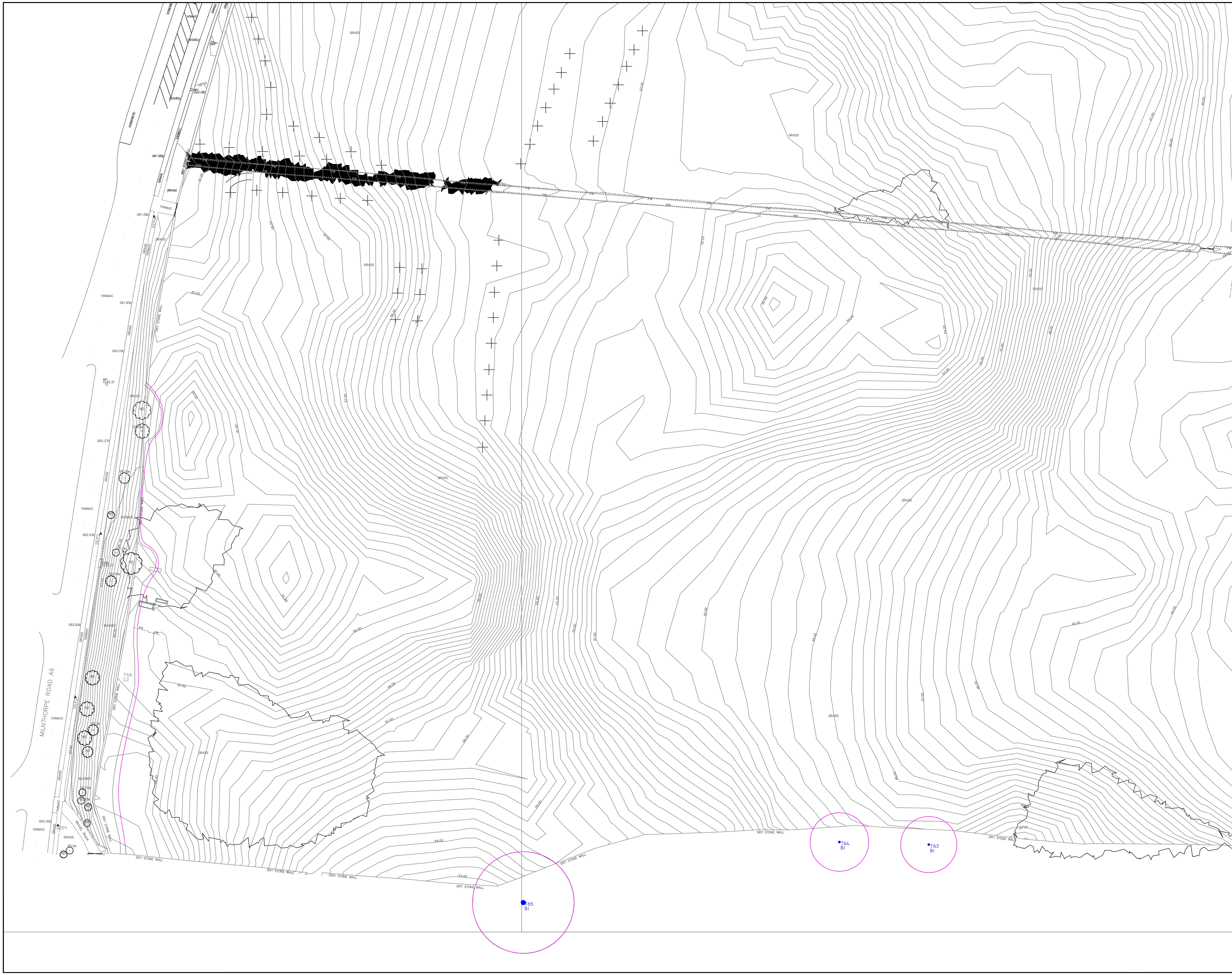
Scale - 1:500 @ A3

Metres
1 5 10 15 20

NOTE: This is a colour drawing - monochrome reproductions might be difficult to interpret

Tree locations are taken from the topographic survey - crown spreads are indicative only and should not be scaled

Plan 3 – Tree constraints plan showing the south-east section of the existing site layout



Approximate tree location and ID number

Red = Category U
Green = Category A
Blue = Category B
Grey = Category C

Root protection area (RPA) calculated in accordance with Section 4.6.1 of BS 5837 (2012)

Scale - 1:500 @ A3

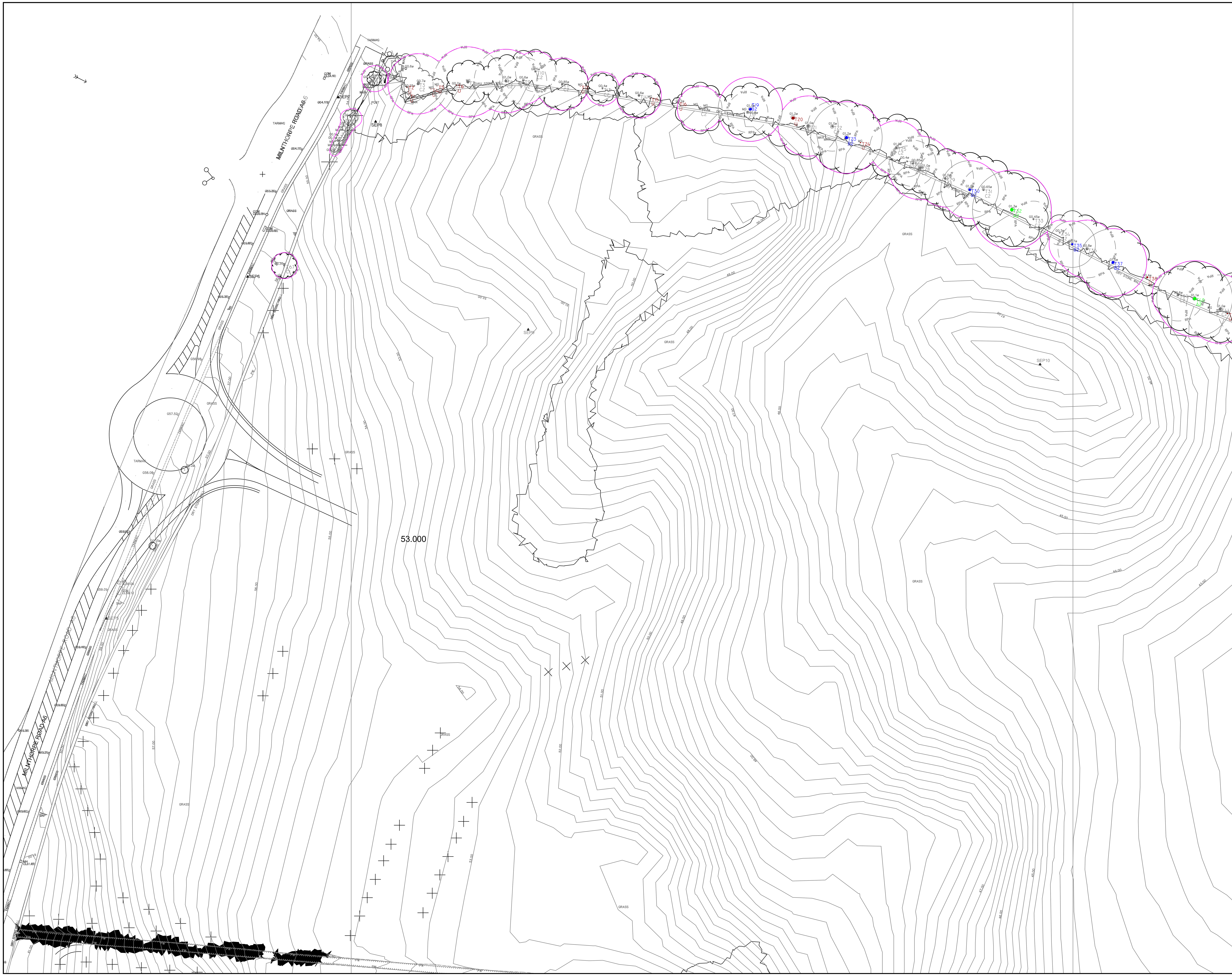
Metres

1 5 10 15 20

NOTE: This is a colour drawing - monochrome reproductions might be difficult to interpret

Tree locations are taken from the topographic survey - crown spreads are indicative only and should not be scaled

Plan 4 – Tree constraints plan showing the south-west section of the existing site layout



Approximate tree location and ID number

Red = Category U
Green = Category A
Blue = Category B
Grey = Category C

Root protection area (RPA) calculated in accordance with Section 4.6.1 of BS 5837 (2012)

Scale - 1:500 @ A3

Metres
1 5 10 15 20

NOTE: This is a colour drawing - monochrome reproductions might be difficult to interpret

Tree locations are taken from the topographic survey - crown spreads are indicative only and should not be scaled

Plan 5 – Tree constraints plan showing the north-west section of the existing site layout

Appendix 1

Alistair Hearn – Experience and Qualifications

QUALIFICATIONS

- In 2001, the Royal Forestry Society awarded Alistair the Certificate in Arboriculture, from the National School of Forestry at Newton Rigg, Penrith.
- In 2004, Alistair passed a Higher National Diploma in Urban Forestry, from the National School of Forestry at Newton Rigg, Penrith.
- In 2005, Alistair became a Professional Member of the Arboricultural Association.

PRACTICAL EXPERIENCE

Alistair has been working and studying within the field of arboriculture for nearly 20 years, first as a tree surgeon and latterly in an advisory capacity. Until July 2004, Alistair worked within the practical field of arboriculture, carrying out tree surgery for local and national clients. Since August 2004, Alistair has been working as an arboricultural consultant with Capita Symonds Ltd. This work involved various large-scale tree condition and safety surveys, along with carrying out detailed tree inspections. More recently, he concentrated on trees in relation to construction and the planning system. This involved providing the relevant tree surveys, implication assessments and protection plans for development applications. Alistair also provided Salford City Council with advice on tree preservation orders, trees in conservation areas and trees in development applications. While acting as an arboricultural consultant he has been involved with a number of commissions covering a variety of different aspects of arboriculture:

- surveying and making safety recommendations for trees on school sites in Cumbria;
- putting tree work out to tender and managing the resulting contracts;
- evaluating tree quality on development sites, assessing the impacts of development proposals on those trees to be retained, making recommendations, advising on protection methods, and outlining mitigation measures; and
- involved with carrying out a 'drive-by' scoping survey of 2500 miles of highway for Lancashire County Council

CONTINUING PROFESSIONAL DEVELOPMENT

Alistair Hearn attends conferences, seminars and workshops run by forestry and arboricultural organisations, colleges and universities.

RELEVANT EXPERIENCE

Alistair Hearn has spent many years working with trees, some of which he considers to pose a high level of risk. This has informed his decision making process for judging how much risk the trees pose and the remedial work required to make a tree safe.

MEMBERSHIP OF PROFESSIONAL ORGANISATIONS

In addition to being a Professional Member of the Arboricultural Association, Alistair Hearn is a member of the Royal Forestry Society of England, Wales, and Northern Ireland.

Appendix 2

Extracts from the British Standard: BS 5837, *Trees In Relation To Design, Demolition and Construction – Recommendations* (2012)

TREE CATEGORISATION

The trees have been categorised as recommended in Section 4.5, Tree categorization method and Table 1 of the standard (BS 5837, 2012). A copy of Table 1 is included as Appendix 3.

TREE CONSTRAINTS

Section 5 of BS 5837 recommends producing a tree constraints plan (TCP) showing the trees and an area around them referred to as the root protection area (RPA). The RPA is a calculated area of soil sufficient to provide enough water and nutrients for the tree to remain in a healthy condition. The RPA is equal to the area of a circle with a radius 12 times the diameter of the trunk measured 1.5m above the ground. Alternatively, for multi-stemmed trees with more than five stems, the RPA is equal to the area of a circle with a radius equal to 12 times their mean trunk diameter measured at 1.5m above the ground level.

In Section 5.2.3, the Standard states:

'The following factors should also be taken into account during the design process:

a) the presence of tree preservation orders, conservation areas or other regulatory protection;

b) potential incompatibilities between the layout and trees proposed for retention;

c) the working and access space needed for the construction of the proposed development;

NOTE This might involve access facilitation pruning, or the use of a height restriction bar to prohibit tall vehicles accessing a site containing trees with low canopies.

d) the effect that construction requirements might have on the amenity value of trees, both on and near the site, including the effects of pruning to facilitate access and working space;

e) the requirement to protect the overhanging canopies of trees where they could be damaged by machinery, vehicles, barriers or scaffolding, where it will be necessary to increase the extent of the tree protection barriers to contain the canopy;

f) infrastructure requirements in relation to trees, e.g. easements for underground or above-ground apparatus; highway safety and visibility splays; and other infrastructural provisions, such as substations, refuse stores, lighting, signage, solar collectors, satellite dishes and CCTV sightlines;

g) the proposed end use of the space adjacent to retained trees;

h) the potential for new planting to provide mitigation for any losses.'

TREE PROTECTION

The RPA forms the basis for a construction exclusion zone (CEZ) and requires protection during the development by means of barriers and/or ground protection fit for ensuring the successful long-term retention of the trees. Section 6.2.1.1 of the standard states:

'*All trees that are being retained on site should be protected by barriers and/or ground protection (see 5.5) before any materials or machinery are brought onto the site, and before any demolition, development or stripping of soil commences. Where all activity can be excluded from the RPA, vertical barriers should be erected to create a construction exclusion zone.*

Where, due to site constraints, construction activity cannot be fully or permanently excluded in this manner from all or part of a tree's RPA, appropriate ground protection should be installed.'

TREE PROTECTION FENCES

With regard to barriers erected to protect the retained trees, Section 6.2.2.1 of the standard states:

'Barriers should be fit for the purpose of excluding construction activity and appropriate to the degree and proximity of work taking place around the retained tree(s). Barriers should be maintained to ensure that they remain rigid and complete.'

In addition, Section 6.2.2.2 states:

'The default specification should consist of a vertical and horizontal scaffold framework, well braced to resist impacts, as illustrated in Figure 2. The vertical tubes should be spaced at a maximum interval of 3 m and driven securely into the ground. Onto this framework, welded mesh panels 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. If the presence of underground services precludes the use of driven poles, an alternative specification should be prepared in conjunction with the project arboriculturist that provides an equal level of protection. Such alternatives could include the attachment of the panels to a free-standing scaffold support framework.'

Appendix 7 of this report is a diagram of a tree protection barrier based default specification shown in BS 5837 (2012).

Appendix 3

Extracts from the British Standard: BS 5837, Trees In Relation To Design, Demolition and Construction – Recommendations (2012): Table 1 – Cascade Chart for Tree Quality Assessment

TREES UNSUITABLE FOR RETENTION (see Note)			
Category U 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) • Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline • 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 NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve; see 4.5.7 below.		
TREES TO BE CONSIDERED FOR RETENTION			
Category and Definition	*1. Mainly arboricultural qualities*	*2. Mainly landscape qualities*	*3. Mainly cultural values, including conservation*
Category A 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)
Category B 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
Category C 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

BS 5837 (2012) Section 4.5.7 states:

> *'Where trees would otherwise be categorized as U, but have identifiable conservation, heritage or landscape value, even though only for the short term, they may be upgraded, although they might be suitable for retention only where issues concerning their safety can be appropriately managed.'*

Appendix 4

Data Schedule and Remedial Action Explanatory Notes

- **Mathematical abbreviations:** < = Less than & > = Greater than
- **Compass Bearing:** N = north; NE = north-east; E = east; SE = south-east; S = south; SW = south-west W = west; NW = north-west.
- **ID No.:** This is the number used to identify the trees or groups on the plans and correlates to the ID No. in the Tree Data Schedule and Tree Works Schedule.
- **Species:** Common English name of what the tree appeared to be, based on observations at the time.
- **Trunk Ø:** The diameter of the trunk at 1.5m above ground level and recorded in centimetres measured with a diameter tape. If, for whatever reason, the height was measured at a different height above the ground, that height will be mentioned. If the diameter has been estimated an 'E' or 'Est' will appear in the column. For multiple stemmed trees, each significant stem diameter is recorded.
- **BS 5837 Retention category:** The retention category assessed using the guidance in the Tree Categorisation Table in BS 5837 (2005) in the Appendix.

  U) (Red on plan) 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

  A) (Green on plan) Trees of high quality with an estimated remaining life expectancy of at least 40 years

  B) (Blue on plan) Trees of moderate quality with an estimated remaining life expectancy of at least 20 years

  C) (Grey on plan) 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

Appendix 5

Tree Data Schedule

ID	Species	Diameter	Retention category	Comments	Easting	Northing
1	hazel	13	U		350851.21	490707.25
2	common ash	23	U		350850.7	490709.54
3	sycamore	74	C2		350853.93	490710.58
4	sycamore	18, 17, 14	U		350857.79	490709.03
5	sycamore	7, 11, 10, 12	U		350859.59	490709.93
6	sycamore	22	U		350865.32	490710.22
7	sycamore	86	C2		350868.69	490711.15
8	sycamore	78	C2		350879.9	490711.42
9	common ash	58	C2		350885.03	490711.51
10	sycamore	50	C2		350888.72	490714.21
11	common ash	64	C2		350896.55	490710.47
12	sycamore	15, 15	U		350901.86	490709.89
13	sycamore	41	C2		350908.44	490709.16
14	sycamore	55	C2		350919.24	490707.09
15	sycamore	17, 27	U		350922.56	490706.31
16	common ash	23	U		350930.79	490704.96
17	common ash	55	C2		350937.19	490703.3
18	sycamore	50	C2		350951.36	490702.2
19	sycamore	79	B2		350952.13	490703.08
20	sycamore	91	U	Major decaying cavity to N & W	350964.79	490700.48
21	sycamore	74	C2		350969.24	490698.12
22	sycamore	61	C2		350976.39	490698.01
23	sessile oak	88	B2		350980.57	490694.71
24	wych elm	33, 28	U		350984.69	490693.21
25	sycamore	66	C2		350995.36	490691.72
26	sycamore	38	C2		350998.62	490687.67
27	sycamore	57	C2	Decaying cavity at base to SE	351000.2	490687.1

ID	Species	Diameter	Retention category	Comments	Easting	Northing
28	sycamore	78	C2	Tag0586.Decaying cavity at base to SW	351002.35	490685.78
29	sycamore	70	C2	Suspect internal basal decay	351009.72	490682.64
30	common ash	71	B2		351016.98	490679.34
31	sycamore	54	C2		351021.08	490679.21
32	commonbeech	97	A2		351029.45	490673.41
33	sycamore	45	C2		351035.83	490670.55
34	sycamore	31	C2		351043.71	490666.59
35	common ash	57	B2		351047.3	490663.21
36	sycamore	71	C2	Suspect internal basal decay	351051.59	490661.78
37	sycamore	83	B2		351059.32	490657.83
38	sessile oak	52	U		351069.48	490653.43
39	sycamore	64	C2		351078.61	490648.22
40	sessile oak	93	A2		351083.45	490647.12
41	sessile oak	84	C2		351091.01	490644.07
42	wych elm	34	U	Cracked decaying stem!	351093.14	490642.73
43	sessile oak	78	C2	Spiral cracks in trunk base to NW & NE	351099.52	490644.32
44	sycamore	69	C2		351102.92	490639.23
45	sessile oak	92	B2		351107.38	490638.66
46	sessile oak	88	C2		351113.35	490635.82
47	wych elm	9, 12, 18	U		351124.67	490627.95
48	sessile oak	72	C2		351130.33	490624.42
49	wych elm	34	U		351132.69	490622.41
50	sessile oak	97	A2		351135.85	490621.17
51	sessile oak	84	A2		351141.36	490617.92
52	common ash	12, 14, 14, 16, 22	U		351149.31	490603.86
53	sessile oak	109	A2		351151.51	490601.56
54	sycamore	23	U		351153.19	490598.29

ID	Species	Diameter	Retention category	Comments	Easting	Northing
55	sessile oak	25	U		351155	490597.05
57	common ash	15, 25	U		351168.29	490587.32
56	sycamore	78	U	Basal damage to S	351165.87	490590.63
58	sycamore	73	U	Tag0551.Decaying cavity at base to NW	351171.33	490586.15
59	sycamore	77	B2		351181.99	490582.79
60	sycamore	95	B2	Tag 0550	351186.75	490579.79
61	english oak	105	A1		351182.34	490498.64
62	common ash	123	B1		351207.96	490249.32
63	sycamore	69	B1		350953.41	490260.72
64	sycamore	72	B1		350928.15	490258.46
65	english oak	146	B1		350831.48	490245.65
67	common ash	32	C2		350814.53	490656.89
69	common ash	32	C2		350841.16	490712.1

Treescapes Consultancy Ltd.
Melbourne
17 Millans Park
Ambleside
Cumbria
LA22 9AG

Office/Fax: 015394 34698
Website: www.treescapesconsultancy.co.uk

Luke Steer – Mobile: 07734 113964 – Email: luke.steer@treescapesconsultancy.co.uk
Alistair Hearn – Mobile: 07710 751970 – Email: alistair.hearn@treescapesconsultancy.co.uk

Appendix 6

SCROGGS WOOD, KENDAL, CUMBRIA

EXTENDED PHASE 1 HABITAT SURVEY REPORT

PREPARED FOR:	**Levens Hall Estates**
Prepared by:	**SK Environmental Solutions Ltd**
Date:	**May 2013**
Reference:	**SK/PR0096/D01**

SK Environmental Solutions Ltd
Eastview, 1 Norwood Farm Cottages, High Casterton, Cumbria LA6 2SD

Telephone: 01524 273 410 Email: mail@skenvironment.com Website: www.skenvironment.com

CONTENTS

APPENDICES

DRAWINGS

1 INTRODUCTION

Background

1.1 SK Environmental Solutions Limited was commissioned Levens Hall Estates to undertake an Extended Phase 1 Habitat Survey at the Scroggs Wood site in Kendal, Cumbria.

1.2 The purpose of the Extended Phase 1 Habitat Survey is to identify:

- the major habitats present within the site and immediate vicinity;
- the potential for legally protected and / or notable species to be present; and
- the need for additional specialist ecological surveys.

1.3 An Extended Phase 1 Habitat Survey does not constitute a full survey for protected species to standard survey methodologies, but is used as a tool to determine a sites potential to support protected/notable species and whether any additional specialist species surveys are likely to be required.

1.4 This report includes the results of consultation with relevant nature conservation organisations and websites, a desktop review and the Extended Phase 1 Habitat Survey. These results have been used to assess the nature conservation importance of the area surrounding the proposed site with regards to the habitats and species present.

Definition of Terms

1.5 For the purposes of this report, the term ‘site’ is used to describe the area of land located within the Red Line Boundary as shown on Drawing Number PR0096/01.

Site Description

1.6 The site is located within Kendal, Cumbria (Grid Ref: SD 5089 9046). The site comprises of approximately 18ha and consists primarily of land for grazing sheep. The site is made up of two fields with hedgerows, post and wire fences and dry stone walls marking the field boundaries. The site is bounded to the north by Scroggs Wood, which is managed by the Woodland Trust, to the west by the A6 and the south and east by agricultural land. The River Kent is located beyond the eastern boundary of the site, approximately 60m at its closest point.

Proposed Development

1.7 The proposed development site is 18Ha of grazed grassland located on the southern boundary of Kendal. It is proposed that the site should be allocated for development for Employment land with a scheme to create built development over approximately 2/3 of the site, with the remainder retained as green infrastructure.

2 SURVEY METHODOLOGY

Desk Study

2.1 The desktop study involved conducting database searches for statutory and non-statutory designated sites, records of legally protected and/or notable species and features of interest within and surrounding the proposed site up to 2km from the central grid reference. The central grid reference SD 5089 9046 was used as the central point of all searches. The baseline conditions are based on a review of existing available information including:

- MAGIC (Multi-Agency Geographical Information for the Countryside) website (to identify statutory designated sites);
- Nature on the Map website (to identify statutory designated sites and areas of UKBAP habitat);
- Ordnance Survey mapping (to identify potentially notable habitats);
- Aerial photography (to identify potentially notable habitats);
- UK Biodiversity Action Plan (UKBAP);
- Cumbria Biodiversity Action Plan (CBAP); and
- Cumbria Biodiversity Data Centre (CBDC).

2.2 Copies of all consultation data received from CBDC are provided in Appendix 1.

Extended Phase 1 Habitat Survey

2.3 SK Environmental Solutions Limited undertook an Extended Phase 1 Habitat Survey of the site and immediate surroundings on 10th April, 2013; the survey was conducted by a suitably qualified ecologist. Weather conditions were fine and sunny.

2.4 The field survey broadly followed the 'Extended Phase 1 Habitat Survey' methodology as set out in 'Guidelines for Baseline Ecological Assessment' (*Institute of Environmental Assessment, 1995*), which is a development of the method described in the 'Handbook for Extended Phase 1 Habitat Survey – a technique for environmental audit' (*Joint Nature Conservation Committee, 1990*).

2.5 The Extended Phase 1 Habitat Survey provides information on the habitats in the survey area and identifies actual or potential presence of legally protected or otherwise notable species in or immediately adjacent to the site. The main habitats

within the site were mapped and are shown at an appropriate scale on Drawing Number PR0096/01 – Extended Phase 1 Habitat Plan.

2.6 Target Notes were taken to provide a more detailed description of a particular habitat in terms of species composition or as a means of highlighting a particular feature of ecological interest; these are provided in Appendix 2.

2.7 Plant names follow 'New Flora of the British Isles' (*Stace 1997*). The common and scientific names of all botanical species identified are provided when first mentioned in the text, but only the common name is stated thereafter.

2.8 In addition to establishing the baseline ecological interest within the area, the survey intended to identify areas where further surveys may be required, during the appropriate season. Habitat potential for legally protected or national/local BAP species, including but not limited to bats, badger, breeding birds, flora, amphibians and reptiles was noted.

Caveat

2.9 Ecological surveys are limited by factors that affect presence of plants and animals such as time of year, weather, migration patterns and behaviour.

3 BASELINE CONDITIONS FROM DESK STUDY

Aerial Photography and OS Maps

3.1 From aerial photography two watercourses that feed into the River Kent have been identified within 2km of the site. One watercourse is located to the north of the site within Scroggs Wood, this watercourse was partially dry at the time of the survey and the second watercourse is located approximately 30-40m to the south of the site boundary.

3.2 A waterbody was identified from aerial photographs within the south west corner of the site. However, this was found not to be present during the field survey.

Statutory and Non-statutory Designated Sites for Nature Conservation

Statutory Designated Sites

3.3 There are two statutory sites within 2km of the site. The River Kent SAC / SSSI is located approximately 60m away from the site at its nearest point and Scout and Cunswick Scars SSSI is located approximately 1km to the west of the site boundary.

3.4 River Kent SAC / SSSI - The River Kent and its tributaries support nationally important populations of white-clawed crayfish *Austropotamobius pallipes*. One of the headwaters also supports one of the largest populations of fresh water pearl mussel *Margaritifera margaritifera* in England. The River Kent also supports population of European Bullhead *Cottus gobio*.

3.5 The River Kent's main tributaries have their catchments in the south eastern Lake District fells. On the higher ground these drain from rocks of Ordovician and Silurian age. Natural mineral enrichment provides the calcium necessary for growth of crayfish. Downstream from Kendal, the main channel of the Kent flows through a series of limestone defiles and gorges. This stretch is influenced by calcium-rich limestone springs.

3.6 White-clawed crayfish are found throughout the river system, from the headwaters of the Rivers Kent, Gowan, Mint and Sprint downstream to the lower reaches of the main Kent channel near Sedgwick. The Kent is the only major river system in England where populations of white-clawed crayfish can still be found throughout the catchment, wherever there are suitable habitats. Within the Kent catchment, crayfish are found in the lower reaches near sea level, up to at least 250m above sea level in

the headwaters of the Rivers Kent and Mint. Dubbs Beck, the headwater of the River Gowan, also has populations in two small reservoirs.

3.7 The Kent system presents a variety of habitats for crayfish. This includes extensive areas with a loosely structured but stable stream bed of cobbles and stones. Crayfish are also found in the more unstable, turbulent reaches of the upper Kent and Sprint wherever there are small areas of cobbles and stones at the edge of channels. In the lower reaches, and particularly through Kendal, there are extensive beds of water crowfoot *Ranunculus spp* and alternate-flowered water-milfoil *Myriophyllum alterniflorum* providing a further habitat and food source for crayfish. In the headwaters of the River Gowan, populations are found in streams less than a metre wide with only a few centimetres depth of water. This contrasts with the lower stretches of the main Kent channel where crayfish are found in much deeper water amongst boulders and shattered bedrock.

3.8 The site contains the largest area of saltmarsh in South Cumbria and the second largest in Lancashire after the Ribble Estuary. The majority of the intertidal flats consist of fine sand with small amounts of silt, whilst relatively muddy areas can be found near Walney Island and towards the Lune Estuary. Mussel *Mytilus edulis* beds are a major feature of the Bay with very large areas off Morecambe, Heysham and Foulney Island. The flats are divided by three main river channels namely the Keer, Kent and Leven, in addition to numerous creeks which dissect the marshes.

3.9 Apart from the quality and extent of habitats, the Kent is an excellent river for crayfish for a number of other reasons. The Kent and its tributaries have generally high water quality. With a short distance from the headwaters to the mouth of the river, and heavy rainfall on the catchment fells, the river has a high degree of flushing. This maintains the river bed relatively free of silt and algal growth. This means the spaces between and under river stones and cobbles provide excellent habitat for crayfish and their invertebrate food. Finally, the Kent catchment is free from introductions of non-native crayfish and there is no record of crayfish plague

3.10 Scout and Cunswick Scars SSSI – The Scout and Cunswick Scars are located approximately 1km west of the site boundary forms a carboniferous limestone ridge which runs approximately 5km north to south. The ridge has a steep, west facing scarp slope which reached 229m at its highest point, whilst the gentler dip slope extends east towards Kendal.

3.11 The scars are made up of a complex of limestone habitats which a rich in flora and fauna including a number of rare and notable local species. The main habitats present are areas of unimproved calcareous grassland and dry dwarf shrub heath, with scattered trees, shrub, pen water and fen habitats present.

3.12 The limestone grassland of Scout and Cunswick Scars form an important part of the hill pasture of surrounding farms and thus the continuation of traditional farming methods are essential to the integrity of the area. The vegetation community present is known as blue moor-grass – limestone bedstraw *Sesleria albican - Galium sterner* type is almost wholly confined to the North of England.

3.13 Many calcareous grassland species are present here including; carline thistle *Carlina vulgaris*, hairy violet *Viola hirta*, dropwort *Filipendula vulgari*, common rock-rose *Helianthemum nummularium*, salad burnet *Sanguisorba minor*, horseshoe vetch *Hippocrepis comosa*, wild thyme *Thymus praecox*, squinancy wort A*sperula cynanchica*, fairy flax *Linum catharticum*, mouse-ear hawkweed *Hieracium pilosella* and the local lesser meadow rue *Thalictrum minus.*

3.14 The complex range of habitat types contributes to the site's regional importance for invertebrate conservation which includes several scarce species. There are strong populations of the vulnerable High Brown Fritillary butterfly *Argynnis adippe* and the nationally rare Least Minor moth *Photedes captiuncula*. Other nationally scarce species of Lepidoptera include the Northern Brown Argus butterfly *Aricia artaxerxes* , the Pearl Bordered Fritillary butterfly Boloria euphrosyne , the Barred Tooth-striped moth *Trichopteryx polycommata* , the Thyme Pug moth *Eupithecia distinctaria*, the Argent and Sable moth *Rheumaptera hastate*, and the chestnut-coloured carpet *Thera cognate.*

Non-statutory Designated Sites

3.15 There are seven non statutory designated sites within 2km of the proposed development site. They are as follows:

- Warriner's Wood County Wildlife Site - this wildlife site is owned by the Woodland Trust and comprises a 3.61ha of ancient semi-natural Woodland. This site is located approximately 1.0km west of the site.
- Scout and Cunswick Scars Site of Invertebrate Significance - is located approximately 1.2km to the west of the site and is also designated as a SSSI (as described above).
- River Kent, Natland, Site of Invertebrate Significance - is located approximately 1.5km south of the site. The River Kent is also designated as an SAC and SSSI (as described above).
- Hawes Wood (Natland) County Wildlife Site - this wildlife site comprises an area of ancient woodland and is located approximately 1.6km south of the proposed development site.
- Lancaster Canal County Wildlife Site - this wildlife site is located approximately 1.6km south of the site.
- Low Park Wood County Wildlife Site - this wildlife site comprises an area of ancient woodland and is located approximately 2km south of the proposed development site.
- Serpentine Wood and Kendal Fell County Wildlife Site - this wildlife site is also designated as Site of Invertebrate Significance and is located approximately 2km north of the proposed development site.

3.16 In addition to the sites described above there is also an important roadside verge located within approximately 1.5km to the west of the proposed development site.

UK and Local Biodiversity Action Plans

3.17 The National Biodiversity Action Plan (UKBAP) and the Cumbria Biodiversity Action Plan (CBAP), published in 2001, are relevant to the proposed development site. Table 1, below, identifies the Habitats listed on the CBAP and their associated UKBAP habitats.

Table 1 – Local BAP habitats for Cumbria and associated UK BAP Habitats

CBAP Habitats	UK BAP Habitats
Upland mixed ash woodland	Broadleaved, mixed and yew woodland (Broad Habitat)
Calcareous grassland	Calcareous grassland (Broad Habitat)
Standing water	Eutrophic standing waters (Priority Habitat) Ponds (Priority Habitat)

Table 1 – Local BAP habitats for Cumbria and associated UK BAP Habitats	
CBAP Habitats	**UK BAP Habitats**
Rivers and streams	Rivers and streams (Broad Habitat)
Upland oak woodland	Broadleaved, mixed and yew woodland (Broad Habitat)
Lowland pastures	N/A
Heath-grassland	Lowland heathland (Priority Habitat)
Ancient Hedgerows	Boundary and linear features (Broad Habitat) Hedgerows (Priority Habitat)
Reedbeds	Reedbeds (Priority Habitat)
Cities, towns and villages	Urban (Broad Habitat)
Wet woodland	Wet woodland (Priority Habitat)
Coastal	Coastal and floodplain grazing marsh (Priority Habitat)
Limestone pavement	Limestone pavements (Priority Habitat)

3.18 In addition to the County Wildlife Sites which comprise Ancient Woodland (described above), there is an additional two areas of Ancient Woodland located approximately 100m south of the site.

3.19 The CBAP has also prepared Local Action Plans for the following species:

- Barn owl *Tyto alba*
- Bats
- Caddisfly *Glossosoma intermedium*
- Geyers whorl snail *Vertigo geyeri*
- Great crested newt *Triturus cristatus*
- High brown fritillary *Argynnis adippe*
- Juniper *Juniperus communis*
- Lichen *Lobaria amplissima*
- Marsh fritillary *Eurodryas aurinia*
- Natterjack toad *Bufo calamita*
- Netted carpet moth *Eustroma reticulate*
- Pearl-bordered fritillary *Boloria euphrosyne*
- Red squirrel *Sciurus vulgaris*
- Sandbowl snail *Catinella arenaria*

- Slender green feather-moss *Hamatocaulis vernicosus*
- Song thrush *Turdus philomelos*
- Variable damselfly *Coenagrion pulchellum*
- Vendace *Coregonus albula*
- Water beetle *Hydroporus rufifrons*
- Water vole *Arvicola amphibious* (previously known as *A. terrestris*)
- White-faced darter *Leucorrhinia dubia*

3.20 Information regarding the CBAP has been taken from the Cumbria Wildlife Trust website - http://www.wildlifeincumbria.org.uk

3.21 All of the above species are known to occur within the Cumbrian region and are in a state of decline. All are therefore, locally important with some being afforded national and / or European protection.

Protected Species Records

3.22 Consultation with Cumbria Biodiversity Data Centre (CBDC) identified a number of records of protected and / or notable species located within 2km of the central grid reference for the site. A summary of the records is provided below.

3.23 N.B. For the purpose of this desk study only records from 2000 onwards will be used.

Badger

3.24 CBDC holds eight records of badger *Meles meles* located within 2km of the site. Five of these records are for badgers found dead on the road. Two records are of badgers located approximately 1.3km south east of the central grid reference, dated 2001 and 2004 and the third record is located approximately 1.3km south of the central grid reference and is dated 2009.

Bats

3.25 CBDC holds a number of records of bats located within 2km of the site. There are seven records where the bat species has not been identified. These records include two records of maternity roosts. The records are located between 400m north and 1.7km north east of the central grid reference and dated between 2003 and 2010.

3.26 A further twenty six records are for pipistrelle species *Pippistrellus spp.* The records are located between 450m north and 2km north of the central grid reference and are dated between 2000 and 2010.

3.27 There are thirty records of common pipistrelle *Pipistrellus pipistrellus* and twenty two records of soprano pipistrelle *Pipistrellus pygmaeus* located within 2km of the site. The closest records are located within Scroggs Wood which borders the site to the north. None of the records located within Scroggs Wood were for bat roosts and they are all dated between 2000 and 2003.

3.28 There are two records of Brandt's bat *Myotis brandtii*; one located approximately 1.5km east of the central grid reference and one located approximately 1.8km north east of the central grid reference. The records are dated 2003 and 2004 respectively.

3.29 There are a further thirteen records of noctule bat *Nyctalus noctula*. One of the records is for a roost site located approximately 1km east of the central grid reference and the remaining records are field records or aural bat detector recordings. Four of these records are for Scroggs Wood and are all dated 2000.

3.30 The remaining record is for a Daubenton's *Myotis daubentonii* roost site located approximately 1km east of the central grid reference, dated 2003.

Otter and Water Vole

3.31 CBDC holds eight records of otter *Lutra lutra* located on the River Kent. The records are all located over 1 km from the central grid reference and are dated between 2000 and 2012.

3.32 CBDC does not hold any records of water vole *Arvicola terrestris* located within 2km of the central grid reference.

Other Mammals

CBDC holds thirty four records of hedgehog *Erinaceus europaeus* located within 2km of the central grid reference. Twenty three of these records are for road fatalities. The closest of the remaining field records are located approximately 400m north of the central grid reference, which places the in the Scroggs Wood area.

3.33 CBDC holds four records of brown hare *Lepus europaeus*. One record is of a road fatality and the remaining three records are all located over 1km from the central grid reference.

3.34 CBDC holds five records of polecat *Mustela putorius*. All five records represent road fatalities dated between 2000 and 2005.

3.35 CBDC also holds eight records of red squirrel; all of the records are located over 1.5km from the central grid reference.

Birds

3.36 CBDC holds a large number of bird records located within 2km of the proposed development site. A full list of the records is provided as Appendix 1. A summary of the records is provided in the Table 2. Please note that the distances for the records are given as the minimum possible distance as a number of records are only recorded to an accuracy of a 1km grid square.

Table 2 – Bird Records Located within 2km of the Proposed Development Site				
Common Name	**Scientific Name**	**Status**	**Number of Records**	**Closest Record to Central Grid Reference**
Pink Footed Goose	*Anser brachyrynchus*	Amber	1	0.0m
Shelduck	*Tadorna tadorna*	Amber	1	1.0km
Mallard	*Anas platyrhynchos*	Amber	1	0.0km
Goosander	*Mergus merganser*	Green	1	1.5km
Pheasant	*Phasianus colchicus*	n/a	1	0.0km
Great Cormorant	*Phalacrocorax carbo*	Green	1	1.6km
Sparrowhawk	*Accipiter nisus*	Green	2	450m
Buzzard	*Buteo buteo*	Green	1	1.8km
Kestrel	*Falco tinnunculus*	Amber	1	1.8km
Moorhen	*Gallinula chloropus*	Green	1	450m
Coot	*Fulica atra*	Green	1	1.8km
Oystercatcher	*Haematopus ostralegus*	Amber	2	1.0km
Lapwing	*Vanellus vanellus*	Red	2	1.1km
Woodcock	*Scolopax rusticola*	Amber	3	900m
Curlew	*Numenius arquata*	Amber	1	900m
Redshank	*Tringa totanus*	Amber	1	1.0km
Lesser Black-backed Gull	*Larus fuscus*	Amber	2	0.0km
Herring Gull	*Larus argentatus*	Red	3	0.0km
Feral Pigeon	*Columba livia*	n/a	3	1.1km
Collared Dove	*Streptopelia decaocto*	Green	2	1.75km
Cuckoo	*Cuculus canorus*	Red	1	1.9km
Sens T			5	1.0km
Little Owl	*Athene noctua*	n/a	2	900m
Tawny Owl	*Strix aluco*	Green	3	0.0km
Swift	*Apus apus*	Amber	11	0.0km

Table 2 – Bird Records Located within 2km of the Proposed Development Site				
Common Name	**Scientific Name**	**Status**	**Number of Records**	**Closest Record to Central Grid Reference**
Kingfisher	*Alcedo atthis*	Amber / Schedule 1	2	500m
Green Woodpecker	*Picus viridis*	Amber	2	1.4km
Great Spotted Woodpecker	*Dendrocopos major*	Green	2	1.4km
Skylark	*Alauda arvensis*	Red	2	900m
Swallow	*Hirundo rustica*	Amber	1	900m
Meadow Pipit	*Anthus pratensis*	Amber	1	0.0km
Pied Wagtail	*Motacilla alba*	Green	3	0.0km
Bohemian Waxwing	*Bombycilla garrulus*	Green	11	1.1km
White-throated Dipper	*Cinclus cinclus*	Green	3	0.0km
Wren	*Troglodytes troglodytes*	Green	1	1.8km
Dunnock	*Prunella modularis*	Amber	1	900m
Whinchat	*Saxicola rubetra*	Amber	1	900m
Stonechat	*Saxicola torquata*	Green	1	1.4km
Sens W			1	1.1km
Song Thrush	*Turdus philomelos*	Red	1	900m
Redwing	*Turdus iliacus*		1	1.1km
Grasshopper Warbler	*Locustella naevia*	Red	1	1.1km
Whitethroat	*Sylvia communis*	Amber	1	0.0km
Wood Warbler	*Phylloscopus sibilatrix*	Red	1	1.5km
Willow Warbler	*Phylloscopus trochilus*	Amber	1	1.1km
Goldcrest	*Regulus regulus*	Green	2	450m
Spotted Flycatcher	*Muscicapa striata*	Red	1	900m
Nuthatch	*Sitta europaea*	Green	2	450m
Treecreeper	*Certhia familiaris*	Green	1	450m

Table 2 – Bird Records Located within 2km of the Proposed Development Site				
Common Name	**Scientific Name**	**Status**	**Number of Records**	**Closest Record to Central Grid Reference**
Sens Y			1	1.7km
Lesser Redpoll	*Carduelis cabaret*	Red	1	1.1km
Redpoll	*Carduelis flammea*		3	0.0km
Crossbill	*Loxia curvirostra*	Green / Schedule 1	1	900m
Bullfinch	*Pyrrhula pyrrhula*	Amber	2	1.1km
Hawfinch	*Coccothraustes coccothraustes*	Red	2	900m

Reptiles

3.37 CBDC holds three records of adder *Vipera berus.* All three records are located over 1.5km from the central grid reference with two of them being associated with Scouts Scar. The records are dated between 2005 and 2010.

Amphibians

3.38 CBDC holds one record of common frog *Rana temporaria* within 2km of the central grid reference dated 2009.

Crustaceans

3.39 CBDC holds six records of white-clawed crayfish *Austropotamobius pallipes* within 2km of the central grid reference. The records area associated with the River Kent and Natland Mill Beck. All the records are located over 1km from the central grid reference and are dated between 2000 and 2002.

Invertebrates

3.40 CBDC holds over 800 records of invertebrate species recorded within 2km of the central grid reference. Full details are provided in Appendix 1, with a summary provided in the bullet points below:

- 62 records of Dingy Skipper *Erynnis tagesi* – the majority of the records originating from with the Scout and Cunswick Scars SSSI. No records of Dingy Skipper are identified closer than 1km to the site boundary.

- 1 record of the Northern Brown Argus *Aricia artaxerxes* identified approximately 1-2 km west of the site boundary within the Scout and Cunswick Scars SSSI.
- 5 records of Comma butterfly *Polygonia c-album* the closest being identified approximately 100m northeast of the site boundary site near to the River Kent SSSI and the remainder originating from approximately 1km west of the site boundary within the Scout and Cunswick Scars SSSI
- 156 records of Small Pearl Bordered Frittilary *Boloria selene* with all records originating from approximately 1-2 km west within the Scout and Cunswick Scars SSSI. No records of Small Pearl Bordered Frittilary are identified closer than 1km to the site boundary.
- 40 records of Pearl Bordered Frittilary *Boloria euphrosyne* all of which originate from approximately 1-2 km west of the site boundary within the Scout and Cunswick Scars SSSI. No records of Pearl Bordered Frittilary are identified closer than 1km to the site boundary.
- 161 records of High Brown Frittilary *Argynnis adippe* were idenfied all of which originate from approximately 1-2 km west of the site boundary within the Scout and Cunswick Scars SSSI. No records of High Brown Frittilary are identified closer than 1km to the site boundary.
- 11 records of Wall *Lasiommata megera* all of which originate from approximately 1-2km west of the site boundary within the Scout and Cunswick Scars SSSI. No records of Wall are identified closer than 1km to the site boundary.
- 20 records of Grayling *Hipparchia semele* all of which originate from approximately 1-2 km west of the site boundary within the Scout and Cunswick Scars SSSI. No records of Grayling are identified closer than 1km to the site boundary.
- 280 records of Small Heath *Coenonympha pamphilus* all of which originate from approximately 1-2 km west of the site boundary within the Scout and Cunswick Scars SSSI. No records of Small Heath are identified closer than 1km to the site boundary.
- 1 record of Dark Brown Twin Spot moth *Xanthorhoe ferrugata* identified approximately 300m northwest of the site boundary
- 2 records of the Small Phoenix moth *Ecliptopera silaceata* from approximately 1-2 km west of the site boundary within the Scout and Cunswick Scars SSSI. No records of Small Phoenix are identified closer than 1km to the site boundary.
- 2 records of Juniper Carpet moth *Thera juniperata* from approximately 1-2 km west of the site boundary within the Scout and Cunswick Scars SSSI. No records of Juniper Carpet are identified closer than 1km to the site boundary.

- 3 records of White Ermine moth *Spilosoma lubricipeda* from approximately 1-2 km west of the site boundary within the Scout and Cunswick Scars SSSI. No records of White Ermine are identified closer than 1km to the site boundary.
- 2 records of Buff Ermine moth *Spilosoma luteum* from approximately 1-2 km west of the site boundary within the Scout and Cunswick Scars SSSI. No records of Buff Ermine are identified closer than 1km to the site boundary.
- 5 records of Cinnabar moth *Tyria jacobaeae* from approximately 1-2 km west of the site boundary within the Scout and Cunswick Scars SSSI. No records of Cinnabar are identified closer than 1km to the site boundary.
- 1 record of Small Square Spot moth *Diarsia rubi* from approximately 1-2 km west of the site boundary within the Scout and Cunswick Scars SSSI. No records of Small Square Spot are identified closer than 1km to the site boundary.
- 5 records of Broom moth *Melanchra pisi* from approximately 1-2 km west of the site boundary within the Scout and Cunswick Scars SSSI. No records of Broom are identified closer than 1km to the site boundary.
- 1 record of Flounced Chestnut moth *Agrochola helvola* from approximately 1-2 km west of the site boundary within the Scout and Cunswick Scars SSSI. No records of Flounced Chestnut are identified closer than 1km to the site boundary.
- 4 records of Knot Grass moth *Acronicta rumicis* from approximately 1-2 km west of the site boundary within the Scout and Cunswick Scars SSSI. No records of Knot Grass are identified closer than 1km to the site boundary.
- 2 records of Rosy Rustic moth *Hydraecia micaceaI* from between 0.75 and 1.5km northwest of the site boundary

Flora

3.41 CBDC holds a number of notable flora records, the majority being associated with Scouts Scar. Records are provided to the nearest 1km grid square and therefore it is difficult to provide accurate locations.

4 SURVEY RESULTS

Habitats

4.1 The main habitats within the survey area are described below. Habitats are shown on the Extended Phase 1 Habitat Plan (Drawing Number – PR0096/01) and Target Notes are provided as Appendix 2.

Semi Improved Grassland

4.2 The site is made up of two fields separated by a hedgerow and associated fencing (see Target Note 1). The fields comprise species poor semi improved grassland which was being used to graze sheep at the time of the survey. Species present include perennial ryegrass *Lolium perenne*, rough meadow grass *Poa trivialis*, timothy grass *Phleum pratense*, sheep's fescue *Festuca* ovina, creeping bent *Agrostis stolonifera*, Yorkshire fog *Holcus lanatus*, cock's-foot *Dactylis glomerata*, white clover *Trifolium repens*, dock *Rumex obtusifolius*, creeping thistle *Cirsium arvense,* dandelion *Taraxacum officinale*, creeping buttercup *Ranunculus repens*, nettle *Urtica diocia*, chickweed *Stellaria media*, and lesser celandine *Ranunculus ficaria.*

Scroggs Wood

4.3 A small parcel of woodland is located along the northern site boundary (see Target Note 2). The woodland is known as Scroggs Wood and is owned and managed by the Woodland Trust. The woodland comprises of semi-mature and mature trees (a number of which are heavily clad with ivy *Hedera helix* and is bisected west to south by a partially dry watercourse which forms a tributary of the River Kent. Canopy species comprise of hawthorn *Crataegus* monogyna, blackthorm *Prunus spinosa*, sycamore *Acer pseudoplatanus*, oak *Quercus robur*, ash *Fraxinus excelsior*, holly *Ilex aquifolium*, wych elm *Ulumus glabra* and silver birch *Betula pendula*.

4.4 Ground flora species include bluebell *Hyacinthoides non-scripta*, dog's mercury *Mercurialis perennis*, ground elder *Aegopodium podagraria*, ivy, lesser celandine, wild garlic *Allium ursinum*, herb Robert *Geranium robertianum*, cow parsley *Anthriscus sylvestris*, dandelion, male-fern *Dryopteris filix-mas*, daffodil *Narcissus sp.*, snow drop *Galanthus sp.*, bramble *Rubus fruticosus agg.*, hogweed *Heracleum sphondylium*, nettle, wood avens *Geum urbanum*, yellow star of Bethlehem *Gagea lutea* and wood anemone *Anemone nemorosa*.

4.5 Badger activity was identified within the eastern section of Scroggs Wood, with two active sett entrances identified.

Trees

4.6 There are a number of mature trees located along the boundaries of the site (excluding those located within Scroggs Wood). See Target Notes 3, 4 and 5.

Hedgerows

4.7 The site is bounded to the east by a gappy (approximately 40%), hawthorn dominated hedgerow (see Target Note 6). The hedgerow is laid and managed and has associated stock fencing on one side.

4.8 A second hedgerow is present within the site, separating the two semi-improved grassland fields (see Target Note 7). The hedgerow has been laid and is managed. Stock proof fencing is present along both sides of the hedgerow. The hedgerow has approximately 10% gaps. Species present within the hedgerow include hawthorn (dominant species), elder *Sambucus nigra*, and rose *Rosa canina*. Nettle and sheep's sorrel *Rumex acetosella* were identified at the base of the hedgerow as were species which had encroached from the adjacent semi improved grassland. Two potential badger setts were identified at the eastern end of the hedgerow.

Scrub

4.9 A small area of semi-mature trees and scrub associated with the A6 road embankment is located along the south west site boundary (see Target Note 8). Species present include sycamore, ash, wych elm, hawthorn, bramble and rose.

Watercourses

4.10 There is a small watercourse (a tributary of the River Kent) located approximately 30-40m south of the site (see Target Note 9). The watercourse has very clear water and shallow banks which have been closely grazed. There is little in the way of aquatic or emergent vegetation present. The substrate comprises cobbles and pebbles. A small drainpipe enters the watercourse within the section which flows parallel to the south eastern site boundary.

4.11 A partially dry watercourse bisects the section of Scroggs Wood located adjacent to the northern site boundary (see Target Note 11). A drainpipe flows into the watercourse at the eastern section; downstream of this drain the watercourse was holding some flowing water.

4.12 The watercourse has been culverted at the western end, under the A6, (see Target Note 10) and at the eastern end, under Scroggs Lane (sees Target Note 12). The

rendering at both culverts was intact and offered little potential for roosting bats. Both of the culverts look to have been recently restored.

Protected Species

4.13 Legislation relating to protected species is provided as Appendix 3.

Badger

4.14 Two potential sett entrances were identified within the hedgerow which bisects the site (Target Note 7) and two active sett entrances were identified within Scroggs Wood, which abuts the northern site boundary (Target Note 2). No latrines or snuffle holes were identified within the site during the Extended Phase 1 Habitat Survey. Exact locations of the active and potential setts have not been provided on the Extended Phase 1 Habitat Plan as this document could end up in the public domain. This information can be provided to the appropriate parties on request.

Bats

4.15 The hedgerows, Scroggs Wood and the watercourses in and around the site, have the potential to provide flight lines for foraging bat species. In addition a number of mature, ivy clad trees with the potential to support bat roosts are located within Scroggs Wood (Target Note 2) and along the site boundaries (Target Notes 3, 4 and 5).

4.16 There are also two culverts (Target Notes 10 and 12) located within close proximity to the site however, the render within both culverts was in good condition and no cracks or crevices suitable for roosting bats were observed.

Water Vole and Otter

4.17 The stream located to the south of the site (Target Note 9) has some potential to support foraging otter as the species is known to occur in the River Kent. However, there is little marginal and bank side vegetation which means that there are limited opportunities for holts along this watercourse. Foraging otters would therefore be unlikely to move into the site from the watercourse.

4.18 It is considered unlikely that otter would utilise the watercourse which flows through Scroggs Wood (Target Note 11) due to the very low water levels present within the channel.

Water Vole

4.19 It is not considered that either watercourse has the potential to support water vole due to unsuitable bank structure, limited bank side vegetation and in the case of the northern watercourse very low water levels.

Other Mammals

4.20 Other mammal species such as hedgehog, fox and brown hare may utilise the site and surrounding area for foraging habitat, particularly Scroggs Wood. It is considered unlikely that red squirrel would be present within the section of Scroggs Wood located adjacent to the site. No evidence of the presence of any other mammal species was identified within the site during the Extended Phase 1 Habitat Survey.

Birds

4.21 The site consists primarily of semi improved grassland with associated trees, scrub and hedgerows. The hedgerows, trees and scrub (as well as Scroggs Wood) will all provide suitable breeding and foraging habitat for nesting birds. A number of passerine species were identified during the field survey. Although five oystercatchers were identified within the northern field during the Extended Phase 1 Habitat Survey, it is considered unlikely that any ground nesting birds would be utilising the site due to heavy grazing having resulted in a very short sward.

Reptiles

4.22 The site is not considered to have the potential to support reptile species due to a lack of cover/shelter and foraging habitat and grazed grassland.

Amphibians

4.23 It is not considered that there is any suitable aquatic habitat for amphibian species located within 500m of the site that also has habitat connectivity to the site. A feature which appeared to be a waterbody was identified within the south west corner of the site from aerial photography; however during the Extended Phase 1 Habitat Survey it was found that this waterbody did not exist.

Crustaceans

4.24 White-clawed crayfish are known to be present within the River Kent. Therefore, it is possible that the species could be present in the watercourse located 30 - 40m south of the site (Target Note 9). No evidence of the species was identified during the Extended Phase 1 Habitat Survey, however, the habitat is considered to be suitable

and the species was identified in the watercourse during a survey undertaken by Bowland Ecology in 2010.

Invertebrates

4.25 A large number of invertebrate records were identified within 2km of the proposed development site; the majority were associated with Scouts and Cunswick Scars SSSI. The site has the potential to support a range of common invertebrate species. However, no species of note were identified during the Extended Phase 1 Habitat Survey and nor were any habitats considered to be significant for invertebrates identified within the site.

Invasive Species

4.26 No invasive species were identified within site during the Extended Phase 1 Habitat Survey.

5 CONCLUSIONS AND RECCOMENDATIONS

Statutory and Non-statutory Designated Sites

5.1 There are two statutory designated sites and there are seven non-statutory designated sites and an important roadside verge located within 2km of the site.

5.2 The River Kent SAC / SSSI is located approximately 60m north east of the site at its closest point. However, two tributaries of the River Kent are located in close proximity to the site, flowing in parallel to both the northern and southern site boundaries. Therefore, without mitigation, there is the potential for the proposed works to impact the tributaries and subsequently the SAC/SSSI through run-off and / or pollution incidents. In order to prevent this happening it is recommended that best practice guidelines be followed to prevent sediments and or pollutants entering the watercourses. These should include:

- The erection of sediment fencing along the northern and southern site boundaries to prevent any sediment from entering the watercourses as a result of any works undertaken at the site;
- Secure storage of materials such as topsoil, building materials and chemicals away from the watercourses (these storage facilities should be bunded if appropriate);
- Appropriate spillage procedures should be put in place and enforced as necessary; and
- Appropriate surface water drainage facilities utilised.

5.3 It is not anticipated that the any of the other statutory or non-statutory sites or habitat features will be affected by the proposed development.

Habitats

5.4 The proposed Masterplan for the site will not result in the loss of any important habitats. The only habitat to be lost will be the species poor semi improved grassland fields, which are considered to be of low importance for nature conservation.

5.5 The only other habitats which could be subject to negative impacts as a result of the proposed development scheme are the two watercourses located to the north and south of the site. Mitigation measures to ensure they are not adversely affected are outlined in the section above.

5.6 The Masterplan would result in net gains in biodiversity for the site, through the planting up of the existing hedgerows and additional woodland planting along the northern site boundary, which will act as a buffer for Scroggs Wood. All the mature trees identified during the Extended Phase 1 Habitat Survey will be retained as part of the development scheme. Areas of additional tree planting are also proposed to the south and south east of the site. This will result in a net gain in tree cover as a result of the development scheme. It is recommended that the tree planting should include native species of local provenance in order to maximise benefits to biodiversity.

5.7 As part of the Masterplan for the site there are also a number of areas of proposed meadow grassland to be sown. This species rich habitat would be of benefit to invertebrates, birds and bats. The meadow grassland should comprise native species of local provenance. An example of a suitable species mix is provided in the table below:

Table 3 – Example Wildflower Meadow Mix		
Percentage (%)	**Common Name**	**Scientific Name**
20%	Crested dogstail	*Cynosurus cristatus*
20%	Red fescue	*Festuca rubra ssp. Pruinosa*
10%	Red fescue	*Festuca rubra ssp. Commutata*
5%	Highland bent	*Agrostis castellana*
10%	Meadow buttercup	*Ranunculus acris*
5%	Lady's bedstraw	*Galium verum*
5%	Yellow rattle	*Rhinanthus minor*
5%	Cowslip	*Primula veris*
4%	Ox-eye daisy	*Leucanthemum vulgare*
4%	Red campion	*Silene dioica*
3%	Common sorrel	*Rumex acetosa*
3%	Musk marrow	*Malva moschata*
2%	Yarrow	*Achilla millefolium*
2%	Great burnet	*Sanguisorba officinalis*
1%	Black knapweed	*Centaurea nigra*
1%	Common St John's wort	*Hypericum perforatum*
Plus nurse crop of wildflower annuals to flower in the first year:		
Percentage (%)	**Common Name**	**Scientific Name**
50%	Corn cockle	Agrostemma githago
20%	Corn marigold	Chrysanthemum segetum

Table 3 – Example Wildflower Meadow Mix		
Percentage (%)	**Common Name**	**Scientific Name**
10%	Corn flower	Centaurea cyanus
10%	Corn camomile	Anthenmis arvensis
10%	Corn poppy	Papaver rhoeas

5.8 There are two new waterbodies on the Masterplan which are proposed as part of the SUDS scheme. However, these waterbodies could also be enhanced for biodiversity through the planting of native species of local provenance. This would attract additional invertebrate species which would provide 'knock on' benefits further up the food chain. An example of species which could be used aquatic and marginal planting is provided in the table below:

Table 4 – Example Aquatic and Marginal Planting Mix		
Percentage (%)	**Common Name**	**Scientific Name**
15%	Lesser pond sedge	*Carex acutiformis*
10%	Flag iris	*Iris psuedacorus*
10%	Branched bur-reed	*Sparganium erectum*
10%	Greater tussock sedge	*Carex paniculata*
10%	Marsh Marigold	*Caltha palustris*
7%	Water plantain	*Alisma plantago-aquatica*
7%	Yellow water-lily	*Nuphar lutea*
5%	White water-lily	*Nymphaea alba*
5%	Bulbous rush	*Juncus bulbosus*
5%	Soft rush	*Juncus effusus*
5%	Purple loosestrife	*Lythrum salicaria*
3%	Yellow loosestrife	*Lysimachia vulgaris*
3%	Water forget-me-not	*Myosotis scorpioides*
3%	Water mint	*Mentha aquatica*
2%	Gipsywort	*Lycopus europaeus*

Protected Species

5.9 A number of active and / or potential badger setts were identified within the site and the adjacent Scroggs Wood. In order to avoid any negative impacts to badgers resulting from the proposed development scheme it would be recommended that a full badger survey be undertaken ahead of the works commencing. The results of this survey could then be used to inform an appropriate mitigation scheme which would need to be approved by Natural England. The habitat enhancement works such as

planting up of the hedgerow and 10m buffer for Scroggs Wood would benefit badgers utilising the site as they would have additional cover.

5.10 The important consideration for the badgers will be maintaining habitat connectivity between setts and important feeding areas. If the setts identified within the hedgerow in the middle of the site are found to be active at the time of the badger survey it may be necessary to apply for a Natural England development licence to close these setts and create artificial setts within the new woodland buffer. This would prevent any badgers that are using the centre of the site from becoming isolated from adjacent habitats and would also avoid the need for them to cross additional roads.

5.11 It is not anticipated that the proposed development scheme would result in any adverse impacts to local bat populations. All mature trees with the potential to support bat roosts are to be retained within the development and the additional habitats such as hedgerows, woodland, waterbodies and wildflower meadow will increase the foraging habitat available to the species. In addition the proposals will not result in the loss of any important bat flight lines. As a precaution a stand-off of 5m should be maintained between works and the retained mature trees and Scroggs Wood. If this is not possible then the affected habitats would need to be subject to a bat survey to determine whether bat roosts are present. Works within 5m of a bat roost are considered to constitute a disturbance and therefore could result in an offence being committed.

5.12 As with the bats, it is not anticipated that there would be any negative impacts to local bird populations associated with the development proposals. The habitats to be created would offer additional nesting and foraging opportunities to wild birds when compared to the species poor semi-improved grassland which is to be lost.

5.13 Works located within 5m of any suitable nesting habitat (e.g. trees, hedgerows, scrub etc) should be undertaken outside of the birds breeding season (March - August inclusively). If this is not possible then the affected habitats should be checked for active nests, by a suitably qualified ecologist immediately prior to works commencing. If no active nests (or nests in construction) are identified then work can continue. If a nest is identified then work cannot begin until the young have fledged and left the nest. An experienced ecologist would then need to undertake a weekly check on the nest until the nest can be declared empty.

5.14 The watercourse located 30-40m south of the site is considered to have the potential to support white-clawed crayfish and foraging otter. It is recommended that Natural England is informed of the proposals and of the mitigation measures which will be put in place to protect the watercourse from sedimentation, surface water run-off and pollution incidents (see previous section relating to the River Kent SAC/SSSI). Natural England may require additional survey effort to confirm presence or absence of these species prior to works commencing. If the species are found to be present the survey results would not only help to inform the mitigation measures but could also be used as a baseline for future monitoring.

6 REFERENCES

Anon (2003) *Handbook for Extended Phase 1 Habitat Survey – A Technique for Environmental Audit* (Revised reprint). Joint Nature Conservancy Council, Peterborough.

Anon (1995) Institute of Environmental Assessment, Guidelines for Baseline Ecological Assessment.

Stace, C. (1997) *New Flora of the British Isles* (2nd edition). Cambridge University Press, Cambridge.

http://www.wildlifeincumbria.org.uk

http://magic.defra.gov.uk/

http://www.natureonthemap.naturalengland.org.uk/

DO NOT SCALE FROM DRAWING

Key

- Watercourse
- Semi Improved Grassland
- Woodland
- Scrub
- Hedgerow
- Scattered Mature Trees
- Target Notes (1)

Scroggs Wood

Extended Phase 1 Habitat Plan

Job No: PR0096 Drawing No: PR0096/01 Approved: MJK

Date: May 2013 Scale: N/A Drawn: RHS

SK environmental solutions ltd

Appendix 2 – Target Notes

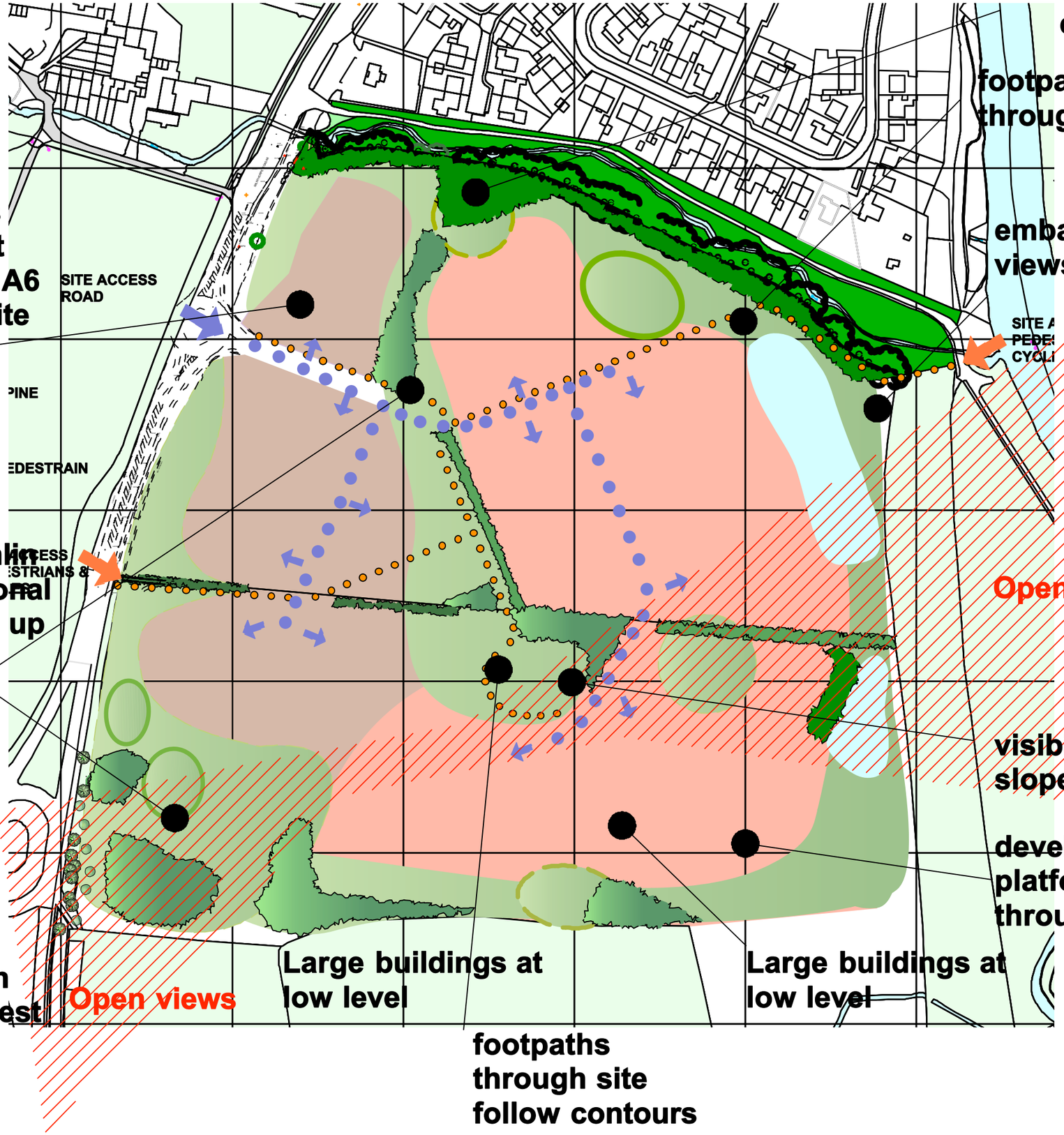
TARGET NOTE	HABITAT DESCRIPTION	PHOTOGRAPH(S)
1 Semi-improved Grassland	Two fields comprising of species poor semi-improved grassland used for sheep grazing. Species present include perennial ryegrass *Lolium perenne*, rough meadow grass *Poa trivialis*, timothy grass *Phleum pratense*, sheep's fescue *Festuca ovina*, creeping bent *Agrostis stolonifera*, Yorkshire fog *Holcus lanatus*, cock's-foot *Dactylis glomerata*, white clover *Trifolium repens*, dock *Rumex obtusifolius*, creeping thistle *Cirsium arvense*, dandelion *Taraxacum officinale*, creeping buttercup *Ranunculus repens*, nettle *Urtica diocia*, chickweed *Stellaria media*, and lesser celandine *Ranunculus ficaria*.	
2 Scroggs Wood	A small strip of woodland owned and managed by the Woodland Trust. The woodland comprises of semi-mature and mature trees (a number of which are heavily clad with ivy *Hedera helix* and is bisected by a partially dry watercourse which forms a tributary of the River Kent. Canopy species comprise of hawthorn *Crataegus monogyna*, blackthorm *Prunus spinosa*, sycamore *Acer pseudoplatanus*, oak *Quercus robur*, ash *Fraxinus excelsior*, holly *Ilex aquifolium*, wych elm *Ulumus glabra* and silver birch *Betula pendula.* Ground flora species include bluebell *Hyacinthoides non-scripta*, dog's mercury *Mercurialis perennis*, ground elder *Aegopodium podagraria*, ivy, lesser celandine *Ranunculus ficaria*, wild garlic *Allium ursinum*, herb Robert *Geranium robertianum*, cow parsley *Anthriscus sylvestris*, dandelion *Taraxacum officinale*, male-fern Dryopteris filix-mas, daffodil *Narcissus sp*., snow drop *Galanthus sp.*, bramble *Rubus fruticosus agg*., hogweed *Heracleum sphondylium*, nettle *Urtica diocia*, wood avens *Geum urbanum*, yellow star of Bethlehem *Gagea lutea* and wood anemone *Anemone nemorosa*.	 

	Badger activity as identified within the eastern section of Scroggs Wood, with two active sett entrances identified.	
3 Mature Tree	A mature ash *Fraxinus excelsior* tree with good potential to support bat roosts.	
4 Mature Tree	A mature ash *Fraxinus excelsior* tree with good potential to support bat roosts.	
5 Scattered Mature Trees	An area of semi improved grassland with scattered mature trees with the potential to support bat roosts.	

6 Hedgerow	A gappy (approximately 40%), hawthorn *Crataegus monogyna* dominated hedgerow. The hedgerow is laid and managed and has associated stock fencing on one side.	
7 Hedgerow	A hedgerow separating the two semi improved grassland fields. The hedgerow has been laid and is managed. Stock proof fencing is present along both sides of the hedgerow. The hedgerow has approximately 10% gaps. Species present within the hedgerow include hawthorn *Crataegus monogyna* (dominant species), elder *Sambucus nigra* and rose *Rosa canina*. Nettle *Urtica diocia* and sheep's sorrel *Rumex acetosella* were identified at the base of the hedgerow. Two potential badger setts were identified at the eastern end of the hedgerow.	
8 Scrub	A small area of semi-mature trees and scrub associated with the A6 road embankment is located along the south west site boundary. Species present include sycamore *Acer pesudoplatanus*, ash *Fraxinus excelsior*, wych elm *Ulmus glabra*, hawthorn *Crataegus monogyna*, bramble *Rubus fruticosus* and rose *Rosa canina*.	
9 Watercourse	A small watercourse (a tributary of the River Kent) with very clear water and shallow banks which have been closely grazed. There is little in the way of aquatic or emergent vegetation present. The substrate comprises cobbles and pebbles. A small drain pipe enter the watercourse within the section which flows parallel to the south eastern site boundary. The watercourse has the potential to support white-clawed crayfish and foraging otter.	

10 Culvert	A culvert under the A6. Mortar in good condition with no cracks and crevices. Low bat potential.	
11 Watercourse	A partially dry watercourse bisects the section of Scroggs Wood located adjacent to the northern site boundary. A drainpipe flows into the watercourse at the eastern section; downstream of this drain the watercourse was holding some flowing water.	 
12 Culvert	A culvert under Scroggs Lane. Mortar in good condition with no cracks and crevices. Low bat potential.	
13 River Kent	The River Kent SSSI and SAC designated for white-clawed crayfish and freshwater pearl mussel.	

Appendix 7



Scroggs Wood extended into site

footpaths through site

smaller buildings and carparking at higher level near A6 can respond to site topography

embankment shields views into site

retention of drumlin features & additional woodland breaks up views into site

Open views

visibility to steep slopes retained

development platforms step down through site

retention of green space to south west part of site

Open views

Large buildings at low level

Large buildings at low level

footpaths through site follow contours

Scroggs Wood Opportunities Key Plan

Appendix 8

Scroggs Wood

landscape screening

extended woodland

A6

Development platform

drumlin retention

Development platform

SITE ACCESS ROAD

SITE ACCESS PEDESTRIANS & CYCLES

N

0 10 20 30 40 50 60 70 80 90 100m

LANDSCAPED SPINE ROADS

LANDSCAPED PEDESTRAIN CYCLE ROUTES

landscape screening

Development platform

Development platform

Pond

SITE ACCESS PEDESTRIANS & CYCLES

Development platform

drumlin retention

drumlin retention

drumlin retention

Development platform

landscape screening

landscape screening

SCROGGS WOOD SITE, KENDAL

Appendix 9

Existing woodland extended into site where landforms undulate

Existing tree group strengthened with additional tree planting

Existing drumlin feature

pedestrian and cycle routes through the site

N

0 10 20 30 40 50 60 70 80 90 100m

Retention of existing hedgerow and planting additional trees

development platforms created between natural landforms

development platforms created between natural landforms

ponds and swales to lower parts of the site

pedestrian and cycle routes through the site

Existing drumlin feature

Existing drumlin feature

development platforms created between natural landforms

Existing drumlin feature

Indigenous tree structure planting to filter views of new development and enhance undulating land forms

SCROGGS WOOD SITE, KENDAL
GREEN INFRASTRUCTURE

Appendix 10

Scroggs Wood Employment Site Preliminary Area Schedule (Indicative Only)

Site	Area sq m	Area Acres	Gross Indicative Building size	Level	Use	B2 carparking	percentage
1	9,500	2.35	4,300		B1 Office	119	
2	5,150	1.27	1,844		B2/ SME	37	
3	6,178	1.53	2,054		B2/ SME	41	
4	13,800	3.41	5,870		B2/ B8	117	
5	21,366	5.28	8,071		B2/ B8	161	
6	9,335	2.31	4,130		B2/ B8	83	
7	8,611	2.13	3,280		B2/ B8	66	
8	6,900	1.71	1,844		B2/ SME	37	
9	7,100	2.13	3,000		B2/B8	60	
10	11,000	2.72	4,920		B1 Office	137	
11	12,500	3.09	5,980		B1 Office	166	
Total	111,440	28	45,293	0		1,024	
Developable site area Ha		11.14	Ha				
Total Site Area		18.00	Ha				
Total B1		**15200.00**	422				
Total B2/SME		**5742.00**					
Total B2/B8		**24351.00**					
Total		**45293.00**					

Average

Appendix 11

GVA

Development Appraisal

Scroggs Wood

Viability Appraisal

Report Date: 06 May 2013

APPRAISAL SUMMARY GVA

Scroggs Wood
Viability Appraisal

Summary Appraisal for Phase 1 Phase 1

REVENUE

Sales Valuation	**Units**	**ft²**	**Rate ft²**	**Unit Price**	**Gross Sales**
B1 Office Space	1	147,250	£140.00	£20,614,986	20,614,986
B2/B8/SME Space	1	323,918	£70.00	£22,674,260	22,674,260
Totals	**2**	**471,168**			**43,289,246**

NET REALISATION	**43,289,246**

OUTLAY

ACQUISITION COSTS			
Fixed Price		3,119,200	
Stamp Duty	4.00%	124,768	
Agent Fee	1.00%	31,192	
Legal Fee	0.50%	15,596	
Strategic Promotion		50,000	
Outline Planning Consultant Costs		25,000	
Outline Application Fee		12,785	
Full Planning Application Fees		206,250	
Survey		150,000	
			3,734,791

CONSTRUCTION COSTS

Construction	**ft²**	**Rate ft²**	**Cost**	
B1 Office Space	163,611	£94.00	15,379,434	
B2/B8/SME Space	323,918	£40.00	12,956,720	
Totals	487,529		28,336,154	**28,336,154**

Contingency	3.50%	991,765	
New Site Access		225,000	
Initial Cut & Fill		500,000	
Utilities Connections & Upgrades		109,050	
Initial Road Infrastructure 350m		420,000	
Phase 9+ Road Infrastructure 330m		396,000	
Cut & Fill		500,000	
Landscaping		500,000	
			3,641,815
PROFESSIONAL FEES			
Professional Fees	8.00%	2,364,234	
			2,364,234
DISPOSAL FEES			
Sales Agent Fee	1.00%	432,892	
Marketing Costs		100,000	
Sales Legal Fee	0.50%	216,446	
			749,339
Additional Costs			
Developers Profit		7,895,259	
			7,895,259
FINANCE			
Debit Rate 7.000% Credit Rate 0.000% (Nominal)			
Land		542,645	
Construction		107,317	
Total Finance Cost			649,962
TOTAL COSTS			**47,371,554**

Scroggs Wood
Viability Appraisal

PROFIT

(4,082,308)

Performance Measures

Profit on Cost%	(8.62)%
Profit on GDV%	(9.43)%
Profit on NDV%	(9.43)%
IRR	(8.11)%
Profit Erosion (finance rate 7.000%)	N/A