The Parish of Sandon and Burston in the Borough of Stafford

Neighbourhood Plan 2031

Evidence Base Document

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METHODOLOGY FOR THE REFINED HLC FOR STAFFORDSHIRE

Staffordshire County Council

February 2008
Revised April 2011

Staffordshire County Council

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Cultural Environment Team
Environment and Countryside
Development Services Directorate
Staffordshire County Council
Riverway
Stafford
ST16 3TJ

Tel: 01785 277285
Email: her@staffordshire.gov.uk

April 2011

1. Introduction

This brief methodology has been produced as a guide for external consultants regarding the Historic Landscape Characterisation (HLC) data held by Staffordshire County Council.

Since the original methodology was produced in February 2008 a number of new Revised HLC types have been added to the Broad Type 'Fieldscapes'. This was done to take into account the greater potential for historic components to survive within certain landscapes of later origin.

2. Methodology

2.1 Historic Landscape Character (HLC)

This is a brief summary of the methodology of the Staffordshire HLC project; please refer to the final report for further information.

The Staffordshire HLC was completed between April 2003 and March 2006 and was carried out in partnership with English Heritage as part of a national programme.

The primary object of the Staffordshire HLC was to characterise, or describe, the county's historic landscape utilising the County Council's Geographic Information System (GIS) to produce a character map for the entire county. The project used digital sources such as the First Edition 6" OS maps (1880s), the OS 1:10,000 maps (circa 2003), Yates' map (1775) and aerial photography (2000).

All of the HLC projects carried out across the country are value-free. Ascribing value to the HLC is considered to form a second stage to the initial project.

The HLC is being updated on an ad hoc basis where it is obvious that the landscape has changed since the project was originally carried out.

See Appendix A for the definition of the current HLC types used within the Staffordshire project.

2.2 Refined HLC

The Refined HLC has been created by combining the original HLC types by those with a similar character and period of origin. The tables in Section 3 exemplify this process; the first two columns ('HLC Type' and 'Period of Origin' determine the third column 'Refined HLC'. This process intends to embed a degree of meaning into the Refined HLC types thus making the data more easily readable in GIS.

There were 65 HLC types identified within the original dataset and the combining process resulted in 35 Refined HLC types.

At a broad level the Refined HLC allows at a glance the overall changes which have occurred particularly in the mid to late 20th century. For example the HLC type 'Very Large Post War Fields' in the original HLC have been re-categorised as 'Post War

Amalgamated Fields' in the Refined HLC (along with other relevant HLC types). The Refined HLC type, therefore, pre-supposes that all the landscapes designated as 'Post War Amalgamated Fields' are field systems whose earlier historic character has been degraded through the removal of field boundaries, although individual historic boundaries may survive. These landscapes, however, are likely to have a lower heritage value than those where the integrity of the field system survives. Any assessment of the heritage value, however, should also take into account data held by the Historic Environment Record (HER) relating to individual sites.

3. Refined HLC Types definitions

3.1 Broad Type: Communications

3.1.1 Refined HLC Type: Communications

HLC Type	Period of Origin	Refined HLC Type
Airfield	Modern	Communications
Major Road Junction	Modern	Communications
Service Station	Modern	Communications
Canal Locks/Basin	Industrial and Modern	Communications
Train Station/Sidings	Industrial and Modern	Communications

An analysis of the Broad Type in the original dataset found that all Communications recorded had their origins in either the Industrial or Modern period. The earliest features recorded are the specific features along the canal and railway infrastructure. Many of the surviving canals have been designated as Conservation Areas and some surviving features are protected as Listed Buildings.

However, the majority of the HLC types under Communications were found to relate to the modern road system in particular road roundabouts.

3.2 Broad Type: Field Systems

HLC Type	Period of Origin	Refined HLC Type
Drained Wetlands	All Periods	Drained Wetlands
Irregular Squatter Enclosure	Mainly Industrial	Squatter Enclosure
Large Assarts with Sinuous Boundaries	Medieval and Post Medieval	Early Assarts
Large Assarts with Sinuous Boundaries	Industrial, Post-1914 and Post-War	Recent Woodland Clearance
Large Irregular Fields	Medieval and Post Medieval	Early Irregular Enclosure
Large Irregular Fields	Industrial and Post-1914	Post 1880s Reorganised Fields
Large Irregular Fields	Post-War	Post War Amalgamated Fields
Other Large Rectilinear Fields	Post Medieval and Industrial	18th/19th Century Semi Planned Enclosure
Other Large Rectilinear Fields	Post-1914	Post 1880s Reorganised Fields

Other Large Rectilinear Fields	Post-War	Post War Amalgamated Fields
Other Small Rectilinear Fields	Medieval and Post Medieval	Early Small Rectilinear Fields
Other Small Rectilinear Fields	Industrial, Post-1914 and Post-War	Post 1880s Small Replanned Enclosure
Paddocks/Closes	All are Post Medieval or Industrial	Pre 1880s Paddocks & Closes
Piecemeal Enclosure	Post Medieval and Industrial	Piecemeal Enclosure
Planned Clearance/Assartment	Medieval and Post Medieval	Early Assarts
Planned Clearance/Assartment	Industrial, Post-1914 and Post-War	Recent Woodland Clearance
Planned Enclosure	Post Medieval and Industrial	18th/19th Century Planned Enclosure
Planned Enclosure	Post-1914	Post 1880s Reorganised Fields
Planned Enclosure	Post War	Post War Amalgamated Fields?
Rectilinear Squatter Enclosure	Medieval, Post Medieval and Industrial	Squatter Enclosure
Reorganised Piecemeal Enclosure	Post Medieval	Early Reorganised Piecemeal Enclosure
Reorganised Piecemeal Enclosure	Industrial?. Post-1914 and Post War	Post 1880s Reorganised Piecemeal Enclosure
Small Assarts	Medieval and Post Medieval	Early Assarts
Small Assarts	Industrial, Post-1914 and Post-War	Recent Woodland Clearance
Small Irregular Fields	Medieval, Post Medieval and Industrial	Early Irregular Enclosure
Small Irregular Fields	Post-1914 and Post War	Post 1880s Small Replanned Enclosure
Very Large Post War Fields	Post-War	Post War Amalgamated Fields

3.2.1 Refined HLC Type: 18th/19th Century Planned Enclosure

These fields were created, or have the appearance of having been created, by surveyors during the 18th and 19th centuries to create a landscape of fields with very straight boundaries, giving them a geometric, planned appearance. Some of these fields were enclosed as a result of Acts of Parliament. In Staffordshire the majority of these fields were created out of former commons, heathland or moorland, but in some areas they may formerly have been arable open fields dating from the medieval period.

These field systems are fairly common across Staffordshire, but much of the county had already been enclosed prior to this date and they therefore relate to a relatively small area.

The origins of these planned field systems are generally well understood and they often have landscape relations with other important historic landscape elements such as model farms and designed parklands (Refined HLC type 'Historic Parks and Gardens').

3.2.2 Refined HLC Type: 18th/19th Century Semi Planned Enclosure

Fields described within the HLC as 'rectilinear' dating to the Industrial, and in some specific cases Post Medieval, period still have a planned appearance. The overall form, however, does not suggest that the whole area was planned by a surveyor as is the case for the planned enclosure described above.

3.2.3 Refined HLC Type: Drained Wetlands

This HLC type has not been classified by period of origin. However, the draining of the Staffordshire wetlands has occurred since at least the late 18th century, but grew apace with technological advances from the mid 19th century onwards. It is not a common Refined HLC type across the country because of the difficulty of identifying them within the original HLC project.

There may be some relation between this type and the Watermeadows project carried out in 2008/2009.

3.2.4 Refined HLC Type: Early Assarts

Assarting is recorded in historical documents for Staffordshire from the 11th century onwards. They are identified as areas of land which have been enclosed out of ancient woodland. Very few assarts have been positively identified within the HLC and other currently unrecognised assarting may be incorporated under the Refined HLC types 'Early Irregular Enclosure' or possibly 'Early Small Rectilinear Fields'.

3.2.5 Refined HLC Type: Early Irregular Enclosure

These fields are assumed to mostly date from the Post Medieval period. Their history is not always well understood except where this can be seen within the context of a particular landscape. For instance in upland areas of the county it is likely that this Refined HLC type represents the earlier stages of the enclosure of moorland which probably occurred from the later medieval period onwards. In other areas they may represent unrecognised 'Piecemeal Enclosure' (see below), early encroachment onto 'Unenclosed Land' (see below) or as unrecognised 'Early Assarts' (see above).

The 'Industrial' period has been included within this type because of the predominant morphology of the field pattern rather than a strict adherence to period of origin. This is because the period of origin may not be well understood given the restrictions of the sources used within the original HLC project.

3.2.6 Refined HLC Type: Early Reorganised Piecemeal Enclosure

This Refined HLC Type has only recently been recognised and its period of origin dates specifically to the 18th and 19th centuries. It is related to 'Planned Enclosure' in that it appears to be associated with the replanning of earlier field systems, specifically 'Piecemeal Enclosure' (see below). It is typified by a mix of typical 'Piecemeal Enclosure' type field boundaries (see below) and straight boundaries more commonly seen within '18th/19th Century Planned Enclosure' (see above).

3.2.7 Refined HLC Type: Early Small Rectilinear Fields

This HLC type relates to those fields which have been recognised within the dataset as having (or likely to have) Post Medieval origins. In some areas more detailed research may shown they have earlier or later origins. In the upland areas they are frequently associated with stone walls which are particularly characteristic of those landscapes.

In the uplands they may be associated with the enclosure of moorland (Refined HLC 'Unenclosed Land' see below).

3.2.8 Refined HLC Type: Piecemeal Enclosure

This type refers solely to those areas which had previously been open arable fields from the medieval period onwards. These are identified through map evidence by the reverse 'S', curvilinear and sometimes dog-leg field boundaries; these indicate that the enclosure has followed the earthworks of the former medieval strip fields (or open fields). Piecemeal enclosure is a process which documentary sources suggest had begun in Staffordshire by the early 16th century, with the last fields appearing to have been enclosed during the 18th century. The enclosure was carried out incrementally by means of informal, verbal agreements between farmers who wished to consolidate their holdings (the individual strips spread across the open field system).

3.2.9 Refined HLC Type: Post 1880s Reorganised Fields

This Refined HLC Type reflects changes to the field patterns in the period since the publication of the First Edition 6" OS map which have not resulted in either the enlargement or subdivision of fields (for which see Post War Amalgamated Fields and Post 1880s Small Replanned Enclosure respectively).

3.2.10 Refined HLC Type: Post 1880s Reorganised Piecemeal Enclosure

This Refined HLC type represents those fields that were identified by this HLC type in the original project. It represents changes to the field pattern which have occurred in the period since the publication of the First Edition 6" OS map (e.g. Post-1914 and Post-War date). Its previous types will always be 'Piecemeal Enclosure' and 'Strip Fields' which reflect the former medieval open fields. Despite 20th century changes these fields potentially retain some legibility of the earlier pattern and distinctive field boundaries.

3.2.11 Refined HLC Type: Post 1880s Small Replanned Enclosure

These are fields which have been recognised as having been created over the last century or so. They may represent the reorganisation of earlier field systems or the establishment of fields in areas which had been Industrial and Extractive during the 19th century for example. They also apply to the subdivision of larger fields for horse paddocks, usually enclosed with fencing.

3.2.12 Refined HLC Type: Post War Amalgamated Fields

The period of origin for this Refined HLC Type is always 'Post-1945' and reflects the intensification of agriculture from the end of the Second World War, which resulted in the loss of many field boundaries.

3.2.13 Refined HLC Type: Pre 1880s Paddocks & Closes

These are small fields recognised in the original HLC dataset that are located on the edge of settlements and which have been given a period of origin in the Medieval and Post Medieval periods. In many cases these probably represent small meadows and paddocks.

3.2.14 Refined HLC Type: Recent Woodland Clearance

This type represents the advance of farmland at the expense of woodland in the period between the 19th and early 21st centuries.

3.2.15 Refined HLC Type: Squatter Enclosure

Mainly of Industrial date within the Staffordshire dataset and frequently associated with areas of early industry. They can generally be seen to represent encroachment onto Unenclosed Land and are often associated with small farmsteads or small holdings (see Farmsteads data). It is a rare landscape type and its integrity is sensitive to change through boundary loss and reorganisation.

3.3 Broad Type: Industrial and Extractive

3.3.1 Refined HLC Type: Industrial and Extractive

HLC Type	Period of Origin	Refined HLC Type
Colliery	Industrial and Modern	Industrial and Extractive
Derelict Industrial Land	Industrial and Modern	Industrial and Extractive
Disused Colliery/Spoil Tips	Industrial and Modern	Industrial and Extractive
Industrial Complex	Industrial and Modern	Industrial and Extractive
Quarry	Industrial and Modern	Industrial and Extractive
Quarry Inactive	Industrial and Modern	Industrial and Extractive
Stone Quarry	Industrial and Modern	Industrial and Extractive

The majority of the land identified within the original HLC data has been found to have originated in the Modern period (1914 to present) although a few have been identified as originating in the Industrial period (1800-1913). Consequently only one 'Refined HLC type' was assigned for these sites.

The lack of earlier industrial and extractive sites within the HLC may partly be explained by the fact that in general industry prior to the mid 19th century was carried out on a smaller, even domestic scale and was therefore did not cover a sufficient area (of at least 1ha) to be represented in the HLC. However, such sites are considered an important part of the historic environment and are recorded on the Staffordshire Historic Environment Record (HER) where they are known.

3.4 Broad Type: Military

3.4.1 Refined HLC Type: Military

HLC Type	Period of Origin	Refined HLC Type
Abandoned Barracks	Modern	Military
Airfield	Modern	Military
Barracks	Modern	Military
Former Ordnance Depot Now Used For Other Purposes	Modern	Military
Other Military	Modern	Military

These landscapes relate to Airfields, and any surviving features, but also to any current and former military buildings such as barracks and depots. Some of the surviving buildings or elements of military sites associated with the two World Wars are of at least local if not national importance.

3.5 Broad Type: Ornamental, Parkland and Recreational

HLC Type	Period of Origin	Refined HLC Type
Golf Course	Any Period	Other Parkland
Other Parkland	Any Period	Other Parkland
Parks and Gardens	Post Medieval and Industrial	Historic Parks and Gardens
Sports Fields	Any Period	Other Parkland

3.5.1 Refined HLC Type: Historic Parks and Gardens

This type relates to all the parks and gardens in the county mostly created from the 18th century onwards. It includes, but is not limited to, those which are included in the English Heritage Register of Parks and Gardens.

3.5.2 Refined HLC Type: Other Parkland

This category includes golf courses and sports grounds which are predominantly of 20th century date (Post-1914 and Post War).

3.6 Broad Type: Settlement

HLC Type	Period of Origin	Refined HLC Type
Historic Settlement Core	Medieval and Post Medieval	Pre 1880s Settlement
Post 1880s Settlement	Post-1914, Post War	Post 1880s Settlement
Pre 1880s Settlement	Medieval, Post Medieval and Industrial	Pre 1880s Settlement

Redeveloped Pre 1880s Settlement	Industrial, Post-1914 and Post War	Post 1880s Settlement

3.6.1 Refined HLC Type: Post 1880s Settlement

This category includes settlement which has been largely redeveloped since the late 19th century as well as developments on 'green field' sites over the last century or so. In the latter case especially the overall character of this category will incorporate associated road systems.

3.6.2 Refined HLC Type: Pre 1880s Settlement

This type relates to the earliest areas of settlement and is more likely to retain historic buildings (including Listed Buildings) as well as a historic street pattern.

3.7 Broad Type: Unenclosed Land

HLC Type	Period of Origin	Refined HLC Type
Heathland	Medieval	Early Unenclosed Land
Heathland	Post-1914 and Post War	Recent Regenerated Unenclosed Land
Moorland	Medieval and Post Medieval	Early Unenclosed Land
Moorland	Post-1914 and Post War	Recent Regenerated Unenclosed Land
Other Commons	Medieval and Post Medieval	Early Unenclosed Land
Other Commons	Industrial, Post-1914 and Post War	Recent Regenerated Unenclosed Land
Other Unenclosed Ground	Post-1914 and Post War	Recent Regenerated Unenclosed Land
Unimproved Enclosed Hill Pasture	Medieval and Post Medieval	Enclosed Hill Pasture
Unimproved Open Hill Pasture	Medieval	Early Unenclosed Land

3.7.1 Refined HLC Type: Early Unenclosed Land

This category includes the original HLC types Moorland, Heathland, Other Commons and Unimproved Open Hill Pasture. These are landscapes which are little changed from their depiction on the First Edition 6" OS map; many may represent fragments of larger areas of Unenclosed Land depicted upon Yates' map of Staffordshire (1775). Consequently these landscapes represent some of the earliest in the county and are less likely to have been subjected to intensive farming practices over the last century so there is a greater potential for the survival of upstanding archaeological sites to survive. Along with these considerations is the acknowledgment that they are fragile and increasingly rare landscapes.

3.7.2 Refined HLC Type: Enclosed Hill Pasture

All of the 'Enclosed Hill Pasture' identified in Staffordshire have been assumed to have medieval origins. It is very rare within the county as a whole, being confined to the Staffordshire Moorlands.

3.7.3 Refined HLC Type: Recent Regenerated Unenclosed Land

These unenclosed landscapes comprise the original HLC types Moorland, Heathland, Other Commons and Other Unenclosed Ground where it has been identified that they had a different land use prior to the current HLC type. For instance they may have been farmland, or more frequently, the site of an industrial or extractive works at the time of the First Edition 6" OS map. In the intervening period the land has either been allowed to revert naturally or has been deliberately re-established as part of a Nature Reserve or other scheme to enhance bio-diversity.

3.8 Broad Type: Water and Valley Floor Fields

HLC Type	Period of Origin	Refined HLC Type
Artificial Lake/Pond	Any Period	Artificial Water Bodies
Floodplain Marshes	None recognised in the modern landscape	N/A
Miscellaneous Floodplain Fields	Any Period	Miscellaneous Floodplain Fields
Moss/Raised Bog	None recognised in the modern landscape	N/A
Natural Open Water	Any Period	Natural Open Water
Reservoir	Any Period	Artificial Water Bodies

3.8.1 Refined HLC Type: Artificial Water Bodies

These bodies of water have not been identified by period of origin within the Refined HLC, but may include mill ponds, ornamental lakes in parkland. Many of these sites will also be recorded within the HER.

3.8.2 Refined HLC Type: Miscellaneous Floodplain Fields

These are the fields which line the sides of river valleys and whose origins may be of a variety of dates, although the majority have been classified as being of Post Medieval date. Some of these landscapes will have been extensively drained from the 17th century onwards, or have been utilised as water meadows from a similar period (see the Water Meadows Survey data for further information on the latter).

3.8.3 Refined HLC Type: Natural Open Water

There are very few sites identified within Staffordshire within the modern landscape, although this may be in part due to drainage from the 17th century onwards. These sites are consequently particularly rare within Staffordshire and often form the basis of designated sites of biodiversity interest.

3.9 Broad Type: Woodland

HLC Type	Period of Origin	Refined HLC Type
Broadleaved Ancient Woodlands	Any Period	Ancient Woodland
Mixed Ancient Woodlands	Any Period	Ancient Woodland
Broadleaved Woods With Sinuous Boundaries	Medieval, Post Medieval and Industrial	Other Early Woodland
Coniferous Woodland With Sinuous Boundaries	Medieval, Post Medieval and Industrial	Other Early Woodland
Mixed Woods With Sinuous Boundaries	Medieval, Post Medieval and Industrial	Other Early Woodland
Other Woods With Sinuous Boundaries	Medieval, Post Medieval and Industrial	Other Early Woodland
Broadleaved Woods With Sinuous Boundaries	Post-1914 and Post War	Other Recent Woodland
Mixed Woods With Sinuous Boundaries	Post-1914 and Post War	Other Recent Woodland
Coniferous Woodland With Sinuous Boundaries	Post-1914 and Post War	Other Recent Woodland
Other Woods With Sinuous Boundaries	Post-1914 and Post War	Other Recent Woodland
Broadleaved Plantation	Any Period	Plantations
Coniferous Plantation	Any Period	Plantations
Mixed Plantation	Any Period	Plantations
Other Plantation	Any Period	Plantations
Replanted Ancient Woodlands	Post-1914 and Post War	Recent or replanted ancient woodland

3.9.1 Refined HLC Type: Ancient Woodland

These woodlands have been identified from the Ancient Woodland dataset now administered by Natural England (formerly English Nature). It is likely that many of these woodlands had their origins in at least the medieval period and earthworks associated with earlier woodland management may survive within them.

3.9.2 Refined HLC Type: Other Early Woodland

These are areas of woodlands which have been identified on historic maps, such as the first edition OS maps (c.1880s) and, in particular, Yates' map of Staffordshire (1775), but have not been identified as ancient woodlands by Natural England. This may be because the woodlands have been replanted since the 18th/19th century,

however, these may be on the sites of ancient woodlands which date to at least the medieval period and may retain earthwork features associated with early woodland management.

3.9.3. Refined HLC Type: Recent or Replanted Ancient Woodland

These are woodlands that have been identified by Natural England as having recently been replanted. These areas may also retain earthworks associated with earlier woodland management.

3.9.4 Refined HLC Type: Other Recent Woodland

These are woodlands that have been established since the 1880s, and most particularly in the second half of the 20th century, upon areas that had not previously been woodland.

3.9.5 Refined HLC Type: Plantations

On the whole this category dates from the 20th century. However, there are a few plantations which have been included within this category that have been identified as being of 18th/19th century and are often associated with historic parks. Consequently they should be read as being part of that Historic parks and gardens landscape.

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5. Contacts

For information regarding the above please contact

Debbie Langley
Landscape Archaeologist

Telephone: 01785 277285
Email: debbie.langley@staffordshire.gov.uk

Please see our website for further information on our services and contacts:

http://www.staffordshire.gov.uk/environment/e-land/HistoricEnvironment/

APPENDIX A – HLC TYPES (reproduced from draft final report)

Unimproved land.

Historic Landscape Character Type	**Description and interpretation**
Moorland	Unenclosed land above 244m that supports moorland vegetation (e.g. heather, bilberry etc). Will usually have had the same historic character since at least the late medieval period. May contain well preserved monuments and landscapes dating to the medieval, Roman and prehistoric periods as extant features.
Unimproved open hill pasture	Unenclosed, unimproved grassland above 244m. Often represent areas of former common land. May preserve monuments and landscapes dating to the medieval, Roman and prehistoric periods as extant features..
Unimproved enclosed hill pasture	Enclosed, unimproved grassland above 244m. The field boundaries within these areas were probably set out in the post-medieval or industrial periods (or during the post-War period in association with wire fences). This character type also includes areas of land enclosed during these periods that have since begun to revert back to scrub and moorland.
Heathlands	Generally situated below the 244m contour line, this category distinguishes areas of heathland. In most cases this land was probably held in common during the medieval and early post-medieval period.
Other unimproved ground	Unimproved land that does not fall into any of the above categories.
Other common	This category includes areas of common land that do not fall into any of the above categories. For instance, it covers areas of lower lying ground that were used for communal grazing but which, on the basis of place name evidence, do not appear to have been heathlands.

Fieldscapes.

Historic Landscape Character Type	**Description and interpretation**
Irregular squatter enclosure	Field systems principally comprising small irregular fields with sinuous or curvilinear boundaries. The overall field pattern has an unordered, 'organic', often amorphous, appearance. These areas are often associated with networks of lanes and access tracks and small cottages. In addition, they may be associated with mining, quarrying or other industrial activity. They are usually indicative of encroachment onto common land in the post-medieval or industrial periods.
Rectilinear squatter enclosure	Field systems principally comprising small rectilinear fields with straight boundaries. The overall field pattern has a more planned appearance than in areas of 'irregular squatter enclosure'. These areas are often associated with networks of lanes and access tracks and small cottages. In addition, they may be associated with mining, quarrying or other industrial activity. They are usually indicative of encroachment onto common land in the post-medieval or industrial periods.
Paddocks/closes	Small irregular fields distinguished from 'other small fields' character type by their location on the edge of settlements. In many cases these probably represent small meadows and paddocks.
Small assarts	Field patterns consisting of small rectilinear or irregular fields that appear to have been created through woodland clearance. They will either border, or occur in close proximity to, areas of ancient woodland.
Large assarts with sinuous boundaries	Field patterns comprised of large irregular or rectilinear fields with predominately sinuous boundaries that appear to have been created through woodland clearance. Includes fields created through recent (e.g. post-1880s) amalgamation of areas of small assarts. Either border or occur in close proximity to areas of ancient woodland.
Planned clearance/ assartment	Field patterns comprising of small and large rectilinear or irregular fields that most cases have straight boundaries, and which appear to have been created through the woodland clearance. Either border or occur in close proximity to areas of ancient woodland
Small irregular fields	Areas of small irregular fields that cannot be assigned to one of the other historic landscape character types. Includes small meadows and closes that do not occur next to settlement boundaries.

Piecemeal enclosure	Piecemeal enclosure can be defined as those fields created out of the medieval open fields by means of informal, verbal agreements between farmers who wished to consolidate their holdings. Within Staffordshire this process appears to have been well under way by the late medieval period, and was probably largely enclosed by the 16th century. These areas have field patterns comprised of small irregular or rectilinear fields. At least two boundaries will have 's-curve' or 'dog-leg' morphology, suggesting that that they follow the boundaries of former medieval field strips.
Re-organised piecemeal enclosure	Areas of either small irregular or rectilinear fields that have lost 10 or more field boundaries since the 1st ed. 6" map, OR areas of large irregular or rectilinear fields. In both cases there will be at least two field boundaries that exhibit 's-curve' or 'dog-leg' morphology. The field patterns in these areas result from the amalgamation of fields created through piecemeal enclosure. In most cases it can be demonstrated that this has occurred since the publication of the 1st ed. 6" OS map.
Drained wetlands	The field patterns in these areas can be small or large, irregular or rectilinear. However, most of their boundaries will be defined by the course of drainage ditches, and some field boundaries may also follow water courses. The drainage of wetlands was underway in Staffordshire by the 16th century, after which some of these more extensive areas began to specialise in livestock fattening. Some drained wetlands were brought into cultivation during the later 18th century and drainage operations and improvements continued into the 19th and 20th century.
Planned enclosure	These areas are characterised by either small or large fields that share very straight boundaries, giving them a geometric, planned appearance. Laid out by surveyors, these field patterns result from late enclosure during the 18th and 19th centuries. This historic landscape character type, therefore, includes commons that were enclosed by Act of Parliament.
Other small rectilinear fields	Areas of small rectilinear fields that cannot be assigned to one of the other historic landscape character types. Includes small meadows and closes that do not occur next to settlement boundaries.
Other large rectilinear fields	Areas of large rectilinear fields that have a significant number (i.e. as either predominant or secondary boundary morphology) of sinuous boundaries, and which can not be assigned to one of the other historic landscape character types. Includes some field patterns that have been created through the amalgamation of fields in the period since the publication of the 1st ed. 6" OS map.
Large irregular fields	Areas of large irregular fields that have a significant number (i.e. either predominant or secondary boundary morphology) of sinuous boundaries, and which cannot be assigned to one of the other historic landscape character types. Includes some field patterns that have been created through the amalgamation of fields in the period since the publication of the 1st ed. 6" OS map.
Very large Post-War fields	Very large fields (e.g. > 8.1ha and often significantly larger) created through the amalgamation of fields since the publication of the 1st ed. 6" OS map. Almost certainly the result of Post-War agricultural 'improvements' designed to meet the requirements of intensive arable cultivation.

Woodlands.

Historic Landscape Character Type	**Description and interpretation**
Broadleaved ancient woodlands	Woods that the Forestry Commission have identified as being broadleaved, and which English Nature has designated as being 'Ancient Semi-Natural'. This category will include the oldest woods in the county, some of which date to at least the medieval period. They may also contain well preserved archaeological monuments and relict landscapes dating to the Roman and prehistoric periods.
Mixed ancient woodlands	Woods that the Forestry Commission have identified as being mixed, and which English Nature has designated as being 'Ancient Semi-Natural'. This category will include the oldest areas of woods in the county, although some parts may have been planted with coniferous species. They may also contain well preserved archaeological monuments and relict landscapes dating to the Roman and prehistoric periods. Woods that the Forestry Commission have identified as being mixed, and which English Nature has designated as being 'Ancient Semi-Natural'. This category will include the oldest areas of woods in the county, although some parts may have been planted with coniferous species. They may also contain well preserved archaeological monuments and relict landscapes dating to the Roman and prehistoric periods.
Replanted ancient woodlands	Woods that have been designated as Ancient Semi-Natural by English Nature but which the Forestry Commission has identified as comprising of conifers or 'young trees'. Consequently, these woods are likely to have been clear-felled and replanted during the 19th or 20th century.

Broadleaved woods with sinuous boundaries	Woods that the Forestry Commission has identified as being broadleaved which also have sinuous boundaries. Although not designated as 'Ancient Semi-Natural', some are likely to represent fragments of older managed woodland.
Mixed woods with sinuous boundaries	Woods that the Forestry Commission has identified as being mixed which also have sinuous boundaries. Some may represent stands of much older woodland that have been colonised by or partially planted with conifers.
Coniferous Woodland with sinuous boundaries	Woods that the Forestry Commission has identified as being coniferous which also have sinuous boundaries. In many cases these are likely to represent plantations.
Other woods with sinuous boundaries	Woods that either have no Forestry Commission designation (e.g. because they are < 2ha in size) OR have been identified as either having been felled or as consisting of young trees. However, the boundaries of the woods are predominantly sinuous.
Broadleaved plantation	Woods that the Forestry Commission has identified as being broadleaved, where the wood's name and/or straight boundary morphology suggests that it has been planted in the 19th or 20th century (the latter can be identified by absence from the 1st ed. 6" map).
Mixed plantation	Woods that the Forestry Commission has identified as being mixed, where the woods name and/or straight boundary morphology suggests that it has been planted in the 19th or 20th century (the latter can be identified by absence from the 1st ed. 6" map).
Coniferous plantation	Woods that the Forestry Commission have identified as being coniferous, where the woods name and/or straight boundary morphology suggests that it has been planted in the 19th or 20th century (the later can be identified by their absence from the 1st ed. 6" map).
Other plantation	Woods that either having no Forestry Commission designation (e.g. because they are < 2ha in size) OR have identified as either having been felled or as consisting of young trees. However, the woods name and/or straight boundary morphology suggests that it has been planted in the 19th or 20th century (the later can be identified by their absence from the 1st ed. 6" map).

Water and valley floor.

Historic Landscape Character Type	**Description and interpretation**
Miscellaneous floodplain fields	Fields on river floodplains that do not fall into any of the more diagnostic Fieldscapes categories. The fields in these locations will traditionally have been used as meadows. By the mid 17th century the lush pastures in these areas were being used to fatten cattle. They may possibly preserve earthwork remains of water meadows
Moss/ raised bog	Areas of unimproved peats. In most cases peat formation will have began in the prehistoric period. The acidic conditions in these environments favour the preservation of organic remains and, as a result, these areas often preserve high-quality palaeoenvironmental and archaeological evidence. Truncation of the uppermost layers may have occurred due to peat cutting in the historic period. These also sustain ecologically rich wetland habitats.
Artificial lake/pond	Lakes or ponds that can be recognised as being artificial by the presence of retaining earthworks and/or dams. This category includes ornamental lakes, recreational facilities (e.g. modern fish ponds), flooded quarries and ponds associated with former industrial activity.
Reservoir	Artificial bodies of water created specifically for the purposes of water supply and which are marked as such on current maps. In Staffordshire these will generally date to the latter half of the 20th century
Natural open water	Expanses of open water over 1ha which have a natural origin. In most cases they will occupy basins that were formed during the last glaciation, although water levels may well have fluctuated over the course of the Holocene.

Industrial.

Historic Landscape Character Type	**Description and interpretation**
Industrial complex	Modern industrial complexes. Includes industrial estates, large factories and sewage farms. Most will date to the latter half of the 20th century.
Active stone quarries	Stone quarries that are in active used. Will usually comprise of very large modern quarries run by aggregates/ construction companies.
Abandoned stone quarries	Disused stone quarries. This category will usually consist of larger quarries created during the 19th and early 20th centuries.
Colliery Active	Areas marked on the 1:10,000 OS as working collieries.
Colliery Inactive	Areas marked on the 1:10,000 OS map as abandoned colliery sites.

Gravel Quarries Active	Gravel quarries that are in active used. Will usually comprise of very large modern quarries run by aggregates/ construction companies.
Gravel Quarries Inactive	Disused gravel quarries. This category will usually consist of larger quarries created during the 19th and early 20th centuries.
Derelict Industrial Land	Land upon which industrial activity has taken place during the 19th and 20th centuries but has since been cleared and not put to any obvious subsequent use.

Military.

Historic Landscape Character Type	**Description and interpretation**
Former ordnance depot now used for other purposes	Areas given over to the storage of ammunition during the Second World War but are now used for other purposes (e.g. storage, industrial units etc.), although the military architecture continues to form the dominant historic landscape type.
Abandoned ordnance depot	Areas given over to the storage of ammunition during the Second World War which have been abandoned but continue to form the dominant historic landscape type.
Barracks	Current military bases. In most cases these will have been built during the 20th century.
Airfield	Areas marked on the 1:10,000 OS map as Airfields used for military purposes. Some of these may have been abandoned, although military architecture and ground layout survives, and so continues to form the dominant historic landscape type.
Other Military	Current military bases either in current use or abandoned which do not fall into any of the above criteria. In most cases these will have been built during the 20th century.

Ornamental, parkland and recreational.

Historic Landscape Character Type	**Description and interpretation**
Parks and gardens	This category includes all parks and gardens that can still be identified in the present day landscape. In most cases these result from emparkment during the post-medieval or 19th century, although they may incorporate elements of medieval parks (e.g. deer parks).
Golf course	Modern golf courses identified as such on current maps.
Sports fields	Modern sports fields identified as such on current maps.
Other parkland	Others forms of parkland, recreational or ornamental landscapes that do not fall into any of the above categories. This category includes playing fields, caravan parks and cemeteries.

Settlements.

Historic Landscape Character Type	**Description and interpretation**
Historic settlement core	Historic settlement cores suggested by morphology or data held in the HER. In most cases these represent the extent of the settlement either by the end of the medieval period OR by the beginning of the 19th century. The distinction between the two is made via the period category in the current historic landscape character component of the database.
Pre-1880s settlement	This category defines the extent of a settlement as marked on the 1st ed. 6" OS map. In most cases this will effectively define the historic settlement core. However, for those settlements with an identified Historic Settlement Core this category will provide a measure of settlement growth since the period defined by the historic core (e.g. either over the course of the post-medieval and 19th century).
Redeveloped pre-1880s settlement	This relates to those parts of a settlement that are visible on the 1st ed. 6" OS map that have been changed significantly over the past 120 years, either through substantial infilling or wholesale redevelopment
Post-1880s settlement	This category defines the limit of a settlement shown on the current 1:10,000 HLCA base maps. Where other settlement categories exist, it provides a measure of settlement growth over the past 120 years (i.e. since the 1st ed. 6" map).

Orchards.

Historic Landscape Character Type	Description and interpretation
Pre-1880s orchards	This category defines orchards that are marked on both the 1st ed. 6" map and the modern HLCA base map. Consequently, the orchards will date to either the post-medieval OR early-mid 19th century
Post-1880s orchards	This category defines orchards that are marked on the modern HLCA base map but not on the 1st ed. 6" OS map. Therefore, it can be demonstrated that these orchards must have been planted over the past 120 years.

Communications

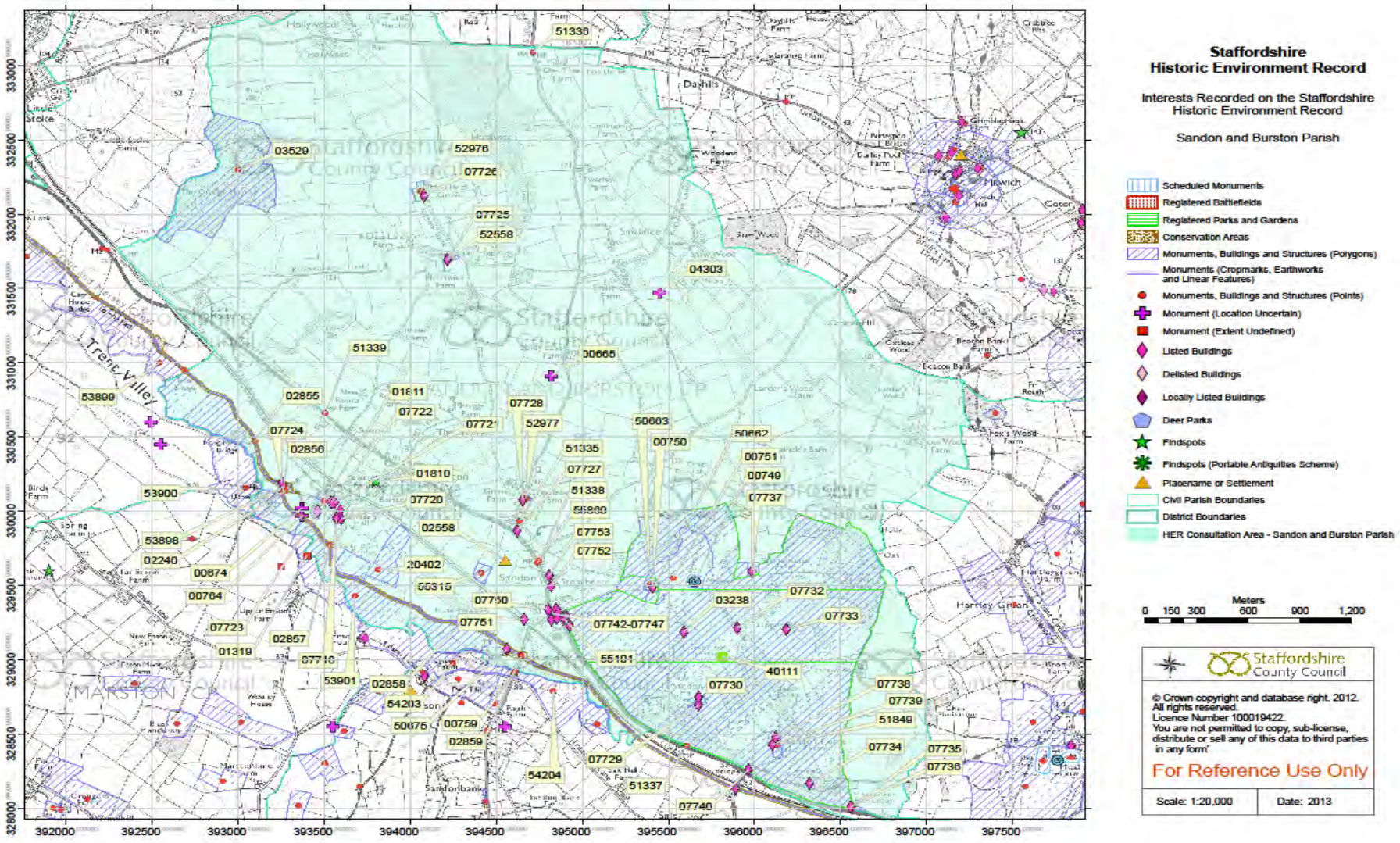
Historic Landscape Character Type	Description and interpretation
Airfield	This category defines civil airfields; both abandoned and in current use, marked on the current 1:10,000 OS map.
Major Road Junction	This category defines major road junctions marked on the current 1:10,000 OS map.
Service Station	This category defines motorway service stations marked on the current 1:10,000 OS map.
Canal Locks/Basin	This category defines canal lock and sidings marked on the current 1:10,000 OS map.
Train Station/Sidings	This category defines train stations and large sidings as marked on the current 1:10,00 OS map.

APPENDIX B – Periods

The periods used throughout the projects is consistent and follows the period system used by the Historic Environment Record (HER) and is as follows:

Prehistoric – 500,000 BC to 42 AD
Roman – 43 AD to 409 AD
Early Medieval – 410 AD to 1065 AD
Medieval – 1066 AD to 1485 AD
Post Medieval – 1486 AD to 1799 AD
Industrial – 1800 AD to 1913 AD
Modern - 1914 AD to 1999 AD

2.0 – Sandon and Burston Parish Historic Environment Record Map



2.1 – Sandon and Busrton Parish Historic Environment Record Monument Report

Staffordshire County Council Historic Environment Record Monument Full Report

21/10/2013 **Number of records: 76**

PRN Number	Site Name	Record Type
00665 - MST665	Windmill, Burston	Monument

Documentary and field name evidence for the possible site of a windmill on prominent high ground to the north-east of Burston.

Monument Types and Dates

WINDMILL (POST MEDIEVAL - 1486 AD? to 1799 AD?)

Evidence DOCUMENTARY EVIDENCE

Description and Sources

Description

Windmill: The field names 'Great Windmill Hill' and 'Little Windmill Hill' are given on the 1845 Tithe map of Sandon. The area is prominent high ground and a map of 1682 showed a windmill here, although the exact location is now uncertain. <1> <2> <3>

Sources

(1) Index: Ordnance Survey. See cards. Ordnance Survey Card Index. SJ 93 SW - 12 (Tithe Map - Sandon - 1845)

(2) Published Book: Robert Plot. 1686. The Natural History of Staffordshire. Map at (approximate) Scale of 1 inch to 1 1/2 miles

(3) Index: Ordnance Survey. See cards. Ordnance Survey Card Index. SK 93 SW - 12 (W. Woodhouse - Ordnance Survey Field Inspector - 08-Jan-1958)

Location

National Grid Reference

SJ 94820 30910 (point) SJ93SW Point

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Ordnance Survey Card number - SJ 93 SW - 12 Active

Primary Record Number - 00665 Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
00674 - MST674	Burston Chapel	Monument

The reputed site of a 7th century chapel at Burston. The field name 'Chapel Meadow' indicates the possible location of the chapel.

Monument Types and Dates

CHAPEL OF EASE (SAXON - 650 AD to 1065 AD)
Evidence DOCUMENTARY EVIDENCE

Description and Sources

Description

CHAPEL OF EASE: REPUTED SITE OF LATE C7 CHAPEL. CHAPEL MEADOW. <4>

Sources

(1) Index: Ordnance Survey. See cards. Ordnance Survey Card Index. SJ 93 SW - 26 ('Erdeswick's A Survey of Staffordshire (1593-1603)' by T. Harwood, 1844, page 45)

(2) Index: Ordnance Survey. See cards. Ordnance Survey Card Index. SJ 93 SW - 26 ('The Archdeaconry of Stoke on Trent' by Rev. S.W. Hutchinson, 1893, page 135)

(3) Index: Ordnance Survey. See cards. Ordnance Survey Card Index. SJ 93 SW - 26 ('Researches into the History of Stone' W.H. Bowers & J.W. Clough, 1929, pages 79-80)

(4) Index: Ordnance Survey. See cards. Ordnance Survey Card Index. SJ 93 SW - 26 (Tithe Map - Stone - 1840)

(5) Index: Ordnance Survey. See cards. Ordnance Survey Card Index. SJ 93 SW - 26 ('Transactions of the Old Stafford Society' by S. A. H. Burne, 1949-1950, page 13)

Location

National Grid Reference

SJ 933 300 (point) SJ93SW Point

Administrative Areas

Parish Stone Rural, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Ordnance Survey Card number - SJ 93 SW - 26 Active
Primary Record Number - 00674 Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
00749 - MST749	Sandon Old Hall Moated Site, Sandon	Monument

A scheduled medieval moated site with a wet moat, located to the east of Great Sandon Deserted Settlement (Primary Record Number 00751).

Monument Types and Dates

FISHPOND (Norman to POST MEDIEVAL - 1066 AD to 1539 AD)
Evidence EARTHWORK
MOAT (Norman to POST MEDIEVAL - 1066 AD to 1539 AD)
Evidence EARTHWORK
MANSION HOUSE (POST MEDIEVAL to Victorian - 1547 AD to 1899 AD)
Evidence EXTANT BUILDING

Description and Sources

Description

Moated Site/Fishpond/Mansion: A rectangular moated site with adjacent moat. The moat is wet, 12-15 metres wide and 4 metres deep. The moat formerly enclosed a large, medieval, timber-framed house and originally had a drawbridge on its eastern side. <1>

The site is now occupied by a post-medieval country house. Home of the Sampson Erdeswick from 1338. <2>

A rectangular, wet homestead moat with outside dimensions of 330 feet by 312 feet. A spread bank is visible on the outside of the moat to the south, south-west and south-east. In 1854 a small section of the inner wall of the hall was all that survived of the old building. A 19th century engraving shows a large, timbered Elizabethan building within the moat. This appears to have become derelict in the mid 18th century. Fragments of brick and tile can be seen in the disturbed ground, and along part of the south side of the interior a scatter of stone, bricks and tile may be the remains of a length of wall. The western edges of the moat are lined with stone and the western arm is divided by a projecting piece of land, suggesting that the moat was remodelled in the 18th and 19th centuries. An external banks to the north of the western side may be associated with these alterations. Fishpond associated with the moated site. (SB, 17-Mar-2004) <3>

Sources

(1) Published Book: The Victoria History of the Counties of England. 1908. (VCH volume 1) A History of the County of Stafford, Volume I. Volume 1 - page 366

(2) Descriptive text: T. Harwood (Editor). 1844. S. Erdeswick: A Survey of Staffordshire (1844). Pages 47-48

(3) Index: Ordnance Survey. See cards. Ordnance Survey Card Index. SJ 92 NE - 1 a to d

Location

National Grid Reference

Centred SJ 9565 2952 (113m by 95m) SJ92NE Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Scheduled Monument - 1011049 Sandon Old Hall moated site Active DST5250

Other Statuses and Cross-References

Ordnance Survey Card number - SJ 92 NE - 1 Active
Primary Record Number - 00749 Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
00750 - MST750	Church of All Saints, Sandon Park	Monument

A listed parish church, the earliest remains of which are 12th-or early 13th century in date. The church was largely rebuilt in circa 1300 and is of stone construction with tiled roof. It comprises a nave with aisles, chancel and a Perpendicular south-west tower (of 15th century date). The north aisle of the church was elaborately remodelled in 1851 as a family chapel of the Earls of Harrowby. Possibly on the site of an earlier church founded in the 11th century?

Monument Types and Dates

CHURCH? (Founded, (between) SAXON to Norman - 1000 AD? to 1099 AD?)
- Evidence: CONJECTURAL EVIDENCE

CHURCH (Built, (between) Norman - 1100 AD? to 1234 AD?)
- Evidence: EXTANT BUILDING
- Main Building Material: STONE
- Main Building Material: TILE

TOWER (Built, (between) MEDIEVAL to POST MEDIEVAL - 1400 AD to 1499 AD)

GRAVE SLAB (POST MEDIEVAL - 1600 AD to 1603 AD)
- Evidence: EXTANT STRUCTURE
- Main Building Material: STONE

FONT (Built, (between) POST MEDIEVAL - 1669 AD)

WALL PAINTING? (POST MEDIEVAL - 1675 AD)
- Evidence: ARCHITECTURAL COMPONENT

Description and Sources

Description

Church, supposedly of 11th century foundation. The core fabric is early 12th century. Much enlarged in the 13th century and altered in the 14th, 17th, 19th and 20th centuries. The tower is of 15th century date. Also an associated cemetery (churchyard) of possible medieval origin (see PRN 50663), which has the base and part of churchyard cross (PRN 50662) within it. <1>

An oblique aerial photograph shows the isolated church with the area of the deserted settlement (Primary Record Number 00751) to the north. (SB, 17-Mar-2004) <2>

The church was founded in the early part of the 12th century, but there may have been an earlier church. The church was given to Combermere Abbey in the late 12th century. The foundations stones are of 12th century date, with the 13th century outer walls built on them. This 13th century building was practically rebuilt on the 14th century. The church was greatly enlarged at a later date and a tower was added, probably in the late 15th century. The church was repaired in the 17th century and restored in 1835 and again in 1929. (SB, 17-Mar-2004) <3>

The remains of an ancient churchyard cross (Primary Record Number 50662) survives in the churchyard. (SB, 17-Mar-2004)<4>

Sources

(1) Index: Ordnance Survey. See cards. Ordnance Survey Card Index. SJ 92 NE - 2 (T.N.S.F.C. Volume 45 (1910-1911) page 136 (by A. Scrivaner))

(2) Aerial Photograph: Cambridge University. Ongoing. Cambridge University Collection of Aerial Photographs (CUCAP). SC 47 (Stafford Borough Boxfile 1 - Sandon and Burston)

(3) Index: Ordnance Survey. See cards. Ordnance Survey Card Index. SJ 92 NE - 2 a & b

(4) Index: Ordnance Survey. See cards. Ordnance Survey Card Index. SJ 92 NE - 2 a & b

Location

National Grid Reference

Centred SJ 9541 2948 (33m by 21m) SJ92NE Dispersed

Administrative Areas

PRN Number 00750 - MST750 **Site Name** Church of All Saints, Sandon Park

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (I) - 1294163	Church of All Saints	Active	DST3027

Other Statuses and Cross-References

Ordnance Survey Card number - SJ 92 NE - 2	Active
Listed Building Volume Number - 0953	Active
Former Primary Record Number - 07717	Active
Primary Record Number - 00750	Active
Ecclesiatical Use	Active

Ratings and Scorings - None recorded

Related Monuments

50663 Churchyard, Church of All Saints, Sandon Park Geographical

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
00751 - MST751	Great Sandon Deserted Settlement	Monument

The earthwork remains of a deserted settlement. The settlement was established by the time of the Domesday (in 1086), but deserted during the 17th or 18th century. Excavation on the site revealed evidence of medieval buildings and a cobbled road.

Monument Types and Dates

DESERTED SETTLEMENT (Norman to POST MEDIEVAL - 1066 AD to 1539 AD)
Evidence EARTHWORK
FISHPOND (Norman to POST MEDIEVAL - 1066 AD to 1539 AD)
Evidence EARTHWORK

Description and Sources

Description

Deserted Settlement in the area to east of the Church at Sandon Park. <1>

The earthworks include a roadway, pond and house platforms. <2>

The site was excavated between 1717 and 1777, probably when the post-medieval Sandon Park was established. <3>

Several excavations have revealed pottery and the remains of medieval structures. <4> <5>

Several fishponds survive in the area of the deserted settlement. <not sourced>

The Domesday survey records land for 15 ploughs, with 8 acres of meadow and one league by half a league of woodland. There were eighteen villagers, eight of whom were smallholders, and it was valued at £6. (SB, 16-Mar-2004) <6>

The settlement is recorded as being deserted between 1539 and 1666. (SB, 16-Mar-2004) <7>

Aerial photographs show the area of the church (Primary Record Number 00750) and the land to the north where the settlement existed, another shows the associated moated site. (SB, 16-Mar-2004) <8>

The village was situated between the moat and All Saints' Church. It was called Great Sandon and there is a strong local tradition of it. The valley is though to have been an access route to Stone in medieval times and the village possibly became established here in consequence. Its disappearance may be attributed to the decline of the moated park and the establishment of the modern Sandon Park in the 18th century. An excavation in 1968/1969 recovered fragments of medieval pottery, the foundations of one or two houses and a cobbled road. Parish records show that the village was still located near the church 1633. Recent excavation confirmed the site to be near the church, but no evidence was found to indicate the date of its demise. The site of the village is visible in scarp slopes, averaging 0.5 metres high, under pasture. The main street, running north-east to south-west, at the foot of Black Hill, is lined with house platforms and garden plots, mainly on the south-east side. South-east of the church and individual scarp, measuring 1.6 metres high, may also have been part of the village, but no individual house platforms could be recognised. A survey of the site, carried out in 1974, shows the location of the road, house platforms and the site of a building as well as the site of a spring or well and the possible site of a pond. (SB, 16-Mar-2004) <9>

Sources

(1) Index: Ordnance Survey. See cards. Ordnance Survey Card Index. SJ 92 NE - 4 (T.N.S.F.C. Volume 73 (1938-1939) page 120 (Excursion Report))

(2) Index: Ordnance Survey. See cards. Ordnance Survey Card Index. SJ 92 NE - 4 (Illustration - Durveyed by D.J. Chapman - 19-Sept-1974)

(3) Index: Ordnance Survey. See cards. Ordnance Survey Card Index. SJ 92 NE - 4 (' "Jesus Be Our Spede" The Parish Church of All Saints' by G.F. Greenup, 1973, p7)

(4) Index: Ordnance Survey. See cards. Ordnance Survey Card Index. SJ 92 NE - 4 ('Deserted Medieval Villages' by M. Beresford and J.G. Hurst, 1971, pages 163 and 203)

(5) Index: Ordnance Survey. See cards. Ordnance Survey Card Index. SJ 92 NE - 4 (Oral Communication - Reverend G.F. Greenup (Vicar of Sandon) 18-Sept-1974)

(6) Published Book: William I - Translated Alison Hawkins & Alex Rumble. 1086/1976. Domesday Book 24: Staffordshire (Phillimore Translation). 1:13

(7) Serial: South Staffordshire Archaeological & Historical Society. 1971. South Staffordshire Archaeological and Historical Society Transactions 1970-1971 (Volume XII). 'Suspected Lost Village Sites in Staffordshire' by P.V. Bate and D.M. Palliser, p36 (79)

(8) Aerial Photograph: Cambridge University. Ongoing. Cambridge University Collection of Aerial Photographs (CUCAP). SC 46 and SC 47 (Stafford Borough Boxfile 1 - Sandon)

(9) Index: Ordnance Survey. See cards. Ordnance Survey Card Index. SJ 92 NE - 4 (a-d)

Location

National Grid Reference

Centred SJ 95557 29630 (404m by 521m) SJ92NE Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Other Statuses and Cross-References

Ordnance Survey Card number - SJ 92 NE - 4 Active

Primary Record Number - 00751 Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities

EST171 A archaeological excavation on the site of Great Sandon deserted settlement. (Event - Intervention)

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
00759 - MST759	Sandon Bridge	Monument

A mid 20th century road bridge, thought to be built on the site of an earlier (15th-16th century?) two-arched road bridge.

Monument Types and Dates

ROAD BRIDGE (MEDIEVAL to POST MEDIEVAL - 1400 AD to 1599 AD)

Evidence	DESTROYED MONUMENT
Evidence	DOCUMENTARY EVIDENCE
Main Building Material	STONE

ROAD BRIDGE (Post-War - 1947 AD)

Evidence	STRUCTURE

Description and Sources

Description

ROAD BRIDGE: SITE OF A TWO ARCHED BRIDGE, ONE HAVING FOUR RIBS AND ONE FIVE. TOTAL SPAN IS CIRCA 22M WITH THE WIDTH BETWEEN PARAPETS CIRCA 4M. OVER EACH OF THE CUT WATERS WAS A RECESS FOR FOOT PASSENGERS. <1>

INCLUDED IN A LIST OF BRIDGES IN 1608. <2>

MODERN BRIDGE NOW STANDS ON SITE, BUILT IN 1947. <3>

Sources

(1) Index: Ordnance Survey. See cards. Ordnance Survey Card Index. SJ 92 NW - 1 ('The Ancient Bridges of Mid & Eastern England' by E. Jervoise, 1932, p2 & photo)

(2) Index: Ordnance Survey. See cards. Ordnance Survey Card Index. SJ 92 NW - 1 (Collections for a History of Staffordshire 1934 by A.L. Thomas p23, p144 & map)

(3) Index: Ordnance Survey. See cards. Ordnance Survey Card Index. SJ 92 NW - 1 (W. Woodhouse - Ordnance Survey Field Insepctor - 31-Dec-1957)

Location

National Grid Reference

Centred SJ 94617 28925 (20m by 28m) SJ92NW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Ordnance Survey Card number - SJ 92 NW - 1	Active
Primary Record Number - 00759	Active

Ratings and Scorings

Condition	Destroyed
Survival	0%

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
00764 - MST764	Druid's Well / St Rufin's Well, Burston	Monument

The suggested site of a holy well in a field called 'chapel meadow', which is recorded to have once been the only source of drinking water for the village of Burston.

Monument Types and Dates

HOLY WELL (Norman to POST MEDIEVAL - 1066 AD? to 1539 AD?)

Evidence DOCUMENTARY EVIDENCE

Description and Sources

Description

HOLY WELL: SITE OF WELL WHICH CONSISTED OF A STONE LINED NATURAL SPRING, IN A FIELD CALLED CHAPEL MEADOW. SAID CIRCA 80 YEARS AGO TO BE THE ONLY SOURCE OF DRINKING WATER FOR BURSTON VILLAGE. <1>

Sources

(1) Verbal communication: CHAWNER J. 1957.

Location

National Grid Reference

SJ 93370 29970 (point) SJ92NW Point

Administrative Areas

Parish Stone Rural, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Ordnance Survey Card number - 26 Active

Primary Record Number - 00764 Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
01319 - MST1311	Sluice, South of Burston	Monument

The remains of a sluice structure on the River Trent to the south of Burston. Possibly indicating the former site of a watermill (may be associated with the mill recorded as PRN 00752).

Monument Types and Dates

SLUICE? (Unknown date)

Evidence	STRUCTURE
Main Building Material	BRICK

Description and Sources

Description

At a weir on the River Trent is a stone and brick sluice which may belong to a former watermill. <1>

(This may be related to the mill recorded as PRN 00752).

Sources

(1) Verbal communication: N. Lock. 1986.

Location

National Grid Reference

SJ 9340 2970 (point) SJ92NW Point

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Primary Record Number - 01319 Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
01810 - MST1802	Coin Hoard, Burston	Find Spot

A hoard of eight Roman coins spanning a long date range, found in the Burston area.

Monument Types and Dates

FINDSPOT (ROMAN - 250 AD to 409 AD)
Evidence FIND

Description and Sources

Description

Coin hoard: Eight Roman coins found in the Bank of a stream at Burston. The coins cover a long date range and included ones Constantine II, Gallienus, Constantine I, and possibly Maximianus, while the remainder were worn. The ground in the area near where the coins were found rises to a small hill (which now has a farm on it). <1>

Sources

(1) Index: Stoke-on-Trent City Museum Field Archaeology Unit. Card Index (Stoke-on-Trent City Museum Field Archaeology Unit).

Location

National Grid Reference

SJ 938 302 (point) SJ93SW Point

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Primary Record Number - 01810 Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Associated Finds

FST808 COIN HOARD (1) (ROMAN - 250 AD to 400 AD) METAL

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
01811 - MST1803	Millpond, Sandon and Burston	Monument

A millpond of unknown date.

Monument Types and Dates

MILL POND (Unknown date)
Evidence EARTHWORK

Description and Sources

Description

MILLPOND
MILLPOND, LEAT AND MILLRACE. CORNMILL TO WEST <1>.

Sources

(1) Cartographic: Ordnance Survey. Pre 1972. Ordnance Survey 1:10560 National Grid Series.

Location

National Grid Reference

Centred SJ 9349 3007 (86m by 47m) SJ93SW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Primary Record Number - 01811 Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
02212 - MST2203	Trent and Mersey Canal	Monument

The course of the Trent and Mersey Canal, constructed by engineers James Brindley and Hugh Henshall. The canal opened in November 1771.

Monument Types and Dates

CANAL (Built, (between) Georgian - 1766 AD to 1771 AD)

Evidence	COURSE OF
Evidence	EXTANT STRUCTURE

Description and Sources

Description

Canal: Trent and Mersey Canal authorised in 1766. Engineers James Brindley and Hugh Henshall. Opened November 1771. <1>

A large set of Ordnance Survey maps at a scale of 1:2500 show the extent of the Conservation Area which covers the whole of the route of the Trent and Mersey Canal through Staffordshire. See also the Conservation Area Booklet. (SB, 25-Feb-2004) <2>

A canal spur was identified running south-west to north-east, parallel to the old salt works buildings at Weston during an archaeological evaluation in 2007. No terminus for the canal spur was identified within the area covered by the excavation. (HC, 28/07/2008) <3>

Sources

(1) Designation Record: Staffordshire County Council. 1988. (083) Trent and Mersey Canal Conservation Area.

(2) Designation Record: Staffordshire County Council. Unknown. (083) Trent and Mersey Canal Conservation Area - Index Maps. Transferred to Stafford Record Office

(3) Evaluation Report: Richard Lee (Oxford Archaeology North). 2007. Saltworks Lane Weston, Staffordshire: Archaeological Evaluation. Page 18

(4) Aerial Photograph: English Heritage (National Monuments Record). c.2000. English Heritage - National Monuments Record Air Photos Library. SJ 9033/ 10-12 (NMR-AP Accession Number: 17498 Frame Numrs 41-43 (17-Jul-2000)

Location

National Grid Reference

Centred SK 0766 2648 (38484m by 26497m) SK02NE Dispersed

Administrative Areas

Parish	Alrewas and Fradley, Lichfield District
Parish	Armitage with Handsacre, Lichfield District
Parish	Barton under Needwood, East Staffordshire Borough
Parish	Branston, East Staffordshire Borough
Parish	Brereton and Ravenhill, Cannock Chase District
Parish	Burton, East Staffordshire Borough
Parish	Colwich, Stafford Borough
Parish	Dunstall, East Staffordshire Borough
Parish	Horninglow and Eton, East Staffordshire Borough
Parish	Kidsgrove, Newcastle Borough
Parish	Kings Bromley, Lichfield District
Parish	Salt and Enson, Stafford Borough
Parish	Sandon and Burston, Stafford Borough
Parish	Shobnall, East Staffordshire Borough
Parish	Stone Rural, Stafford Borough

Parish	Stone, Stafford Borough
Parish	Stowe, Stafford Borough
Parish	Stretton, East Staffordshire Borough
Parish	Tatenhill, East Staffordshire Borough
Parish	Weston, Stafford Borough
Parish	Wychnor, East Staffordshire Borough
Unitary Authority	Stoke on Trent

Designations, Statuses and Scoring

Associated Legal Designations

Conservation Area - 007	Great Haywood and Shugborough	Active	DST5687
Conservation Area - 083	Trent and Mersey Canal	Active	DST5720

Other Statuses and Cross-References

Primary Record Number - 02212	Active
Public Access	Active
Former Primary Record Number - 05233 / MST4767	Revoked
Former Primary Record Number - 05234 / MST4768	Revoked
Former Primary Record Number - 05232 / MST4766	Revoked
Former Primary Record Number - 05231 / MST4765	Revoked
Former Primary Record Number - 05230 / MST4764	Revoked
Former Primary Record Number - 05229 / MST4763	Revoked
Former Primary Record Number - 05228 / MST4762	Revoked

Ratings and Scorings - None recorded

Related Monuments

00164	Great Haywood Canal Bridge (Number 109), Haywood Junction, Colwich	Geographical
02213	Burton Branch of the Trent and Mersey Canal / Bond End Canal	Geographical
02836	Old Road Bridge, Trent and Mersey Canal, Barlaston	Geographical
02837	Canal Bridge, Trent and Mersey Canal, Barlaston	Geographical
02838	Meaford Farm Bridge, Trent and Mersey Canal, Barlaston	Geographical
02839	Turnover Bridge / Malkins Bridge (Bridge Number 100), Trent and Mersey Canal, Stone	Geographical
02840	Siddall's Bridge, Trent and Mersey Canal, Stone	Geographical
02841	Top Lock Bridge, Trent and Mersey Canal, Meaford, Stone	Geographical
02842	Canal Lock, Trent and Mersey Canal, Meaford, Stone	Geographical
02843	Turnover Bridge, Trent and Mersey Canal, Meaford	Geographical
02844	Canal Bridge, Trent and Mersey Canal, Stonefield, Stone	Geographical
02846	Workhouse Bridge (Number 94), Trent and Mersey Canal	Geographical
02849	Andre Mills Bridge (Number 92),Trent and Mersey Canal, Stone	Geographical
02850	Brassworks Bridge, Trent and Mersey Canal,	Geographical

	Little Stoke	
02851	Aston Bridge, Trent and Mersey Canal, Aston-by-Stone	Geographical
02852	Aston Lock, Trent and Mersey Canal, Aston-by-Stone	Geographical
02853	Carr House Bridge, Trent and Mersey Canal, Aston-by-Stone	Geographical
02854	Iron Bridge, Trent and Mersey Canal, Burston	Geographical
02855	Long Meadow Bridge, Trent and Mersey Canal, Burston	Geographical
02864	Ingestre Bridge	Geographical
02870	Pasturefields Bridge, Stowe by Chorley	Geographical
02872	Middle Bridge, Trent and Mersey Canal, Shugborough	Geographical
02873	Wharf Bridge, Trent and Mersey Canal, Colwich	Geographical
02875	Iron Bridge, Shugborough Park	Geographical
02877	Colwich Lock and Bridge, Colwich	Geographical
02879	Taft Bridge, Trent and Mersey Canal, Colwich	Geographical
02880	Wharf Cottage, Trent and Mersey Canal, Colwich	Geographical
02881	Accommodation Bridge, Trent and Mersey Canal, Colwich	Geographical
02882	Canal Aqueduct, Trent and Mersey Canal, Colton	Geographical
02885	Mossley Bridge, Trent and Mersey Canal, Brereton and Ravenhill	Geographical
02889	Canal Bridge, Armitage	Geographical
02890	Canal Bridge, Armitage	Geographical
02891	Canal Bridge Number 56, Trent and Mersey Canal	Geographical
02894	Canal Bridge Number 53 and Woodend Lock, Trent and Mersey Canal	Geographical
02898	Possible Lock Keeper's Cottage, Trent and Mersey Canal, East of Fradley Junction, Fradley	Geographical
02900	Common Lock, Trent and Mersey Canal, North of Fradley	Geographical
02901	Navigation Inn, Alrewas	Geographical
02902	Bagnall Lock, Trent and Mersey Canal, Alrewas	Geographical
02903	Kent's Bridge, Trent and Mersey Canal, Alrewas	Geographical
02904	Gallow's Bridge, Trent and Mersey Canal, Alrewas	Geographical
02906	Cow Bridge, Trent and Mersey Canal, Wychnor	Geographical
02907	Bridge 43, Canal Junction and Lock, Trent and Mersey Canal, Wychnor	Geographical
02908	Canal Arm and Basin, Trent and Mersey Canal, Wychnor	Geographical
02910	Catholme Bridge, Trent and Mersey Canal, Barton under Needwood	Geographical
02911	Mill Bridge / Bridge 39, Trent and Mersey Canal, Barton under Needwood	Geographical
02916	Branston Bridge, Trent and Mersey Canal, Branston	Geographical

02917	Branston Lock, Trent and Mersey Canal	Geographical
02918	Canal Basin, Trent and Mersey Canal / Bond End Canal, Shobnall	Geographical
02919	Dallow Lock and Bridge, Trent and Mersey Canal, Outwoods	Geographical
02920	Horninglow Basin and Canal Bridge, Trent and Mersey Canal	Geographical
02921	Canal Bridge, Trent and Mersey Canal, Stretton	Geographical
02922	Canal Bridge, Trent and Mersey Canal, Stretton	Geographical
02923	Canal Bridge, Trent and Mersey Canal, Stretton	Geographical
02924	Canal Aqueduct, Trent and Mersey Canal, Stretton	Geographical
03246	Canal Tunnel, Trent and Mersey Canal	Geographical
12770	The Boatyard Docks	Geographical
13033	Milepost, Trent and Mersey Canal, Great Haywood	Geographical
07798	Canal Milepost, Top Lock Bridge, Trent and Mersey Canal, Meaford	Geographical
13090	Milepost, Trent and Mersey Canal, Stretton	Geographical
13125	Bridge 42, Trent and Mersey Canal, Wychnor	Geographical
12473	Bridge Number 50 and Keeper's Lock, Fradley Junction	Geographical
13916	Limekiln Lock, Trent and Mersey Canal, Stone	Geographical
13921	Yard Lock, Trent and Mersey Canal	Geographical
14180	Milepost, Trent and Mersey Canal, Barton under Needwood	Geographical
14187	Milepost, Trent and Mersey Canal, Wychnor	Geographical
14194	Canal Milepost, Trent and Mersey Canal	Geographical
14217	Bridge Number 64, Trent and Mersey Canal, Brereton	Geographical
53478	Canal Worker's Cottage, Colwich	Geographical
02897	Fradley Junction, Trent and Mersey Canal / Coventry Canal, Fradley	All Groups

Finds - None recorded

Associated Events/Activities

EST1099	An archaeological desk-based assessment of Stone Town Centre, Staffordshire. (Event - Interpretation)
EST1020	An archaeological assessment at Foston, Hatton, Hilton and Rolleston, Staffordshire and Derbyshire. (Event - Interpretation)
EST794	An archaeological evaluation at Barton Turn Marina. (Event - Intervention)
EST825	An archaeological evaluation at the Parkway Spine Road, Burton on Trent (Event - Intervention)
EST821	An archaeological desk-based assessment of land at Shobnall, Burton on Trent. (Event - Interpretation)
EST810	Fieldwalking for the surface collection of finds at Shobnall, Burton onTrent, Staffordshire (Event - Survey)
EST671	An archaeological desk-based assessment of land adjacent to 'The Beech', Stretton, Staffordshire (Event - Interpretation)
EST708	An archaeological watching brief at Lea Hall Colliery Employment Park, Rugeley, Staffordshire (Event - Intervention)

Associated Individuals/Organisations

Brindley, James - Unassigned	Engineer (Historic)

PRN Number	Site Name	Record Type
02240 - MST2230	Corn Mill, Burston	Monument

The site of a corn mill, which was extant by the late 19th century.

Monument Types and Dates

CORN MILL (Built, (between) INDUSTRIAL to Victorian - 1836 AD to 1885 AD)
Evidence DOCUMENTARY EVIDENCE
WATERMILL (Built, (between) INDUSTRIAL to Victorian - 1836 AD to 1885 AD)
Evidence DOCUMENTARY EVIDENCE

Description and Sources

Description

Watermill: A cornmill shown on the 6-inch Ordnance Survey mapping. <1>

The mill does not appear on the 1" Ordnance Survey map of 1836, indicating that the mill was established in the mid 19th century. (SB, 12-Apr-2010) <2>

Sources

(1) Cartographic: Ordnance Survey. 1875 - 1890. Ordnance Survey 1st Edition 6" maps.
(2) Cartographic: David & Charles (publisher). 1970. Ordnance Survey 1834-1836 1" maps. Sheet 34 - Stafford
(3) Written: Robert Sherlock (and others). c1985. Staffordshire Mills Survey.

Location

National Grid Reference

Centred SJ 9327 3013 (27m by 16m) SJ93SW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Primary Record Number - 02240 Active

Ratings and Scorings - None recorded

Related Monuments

53898	Burston Villa Farm, Burston	Geographical

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
02558 - MST2548	Little Sandon / Sandon / Sandone (Settlement)	Place

A settlement recorded in the Domesday survey of 1086.

Monument Types and Dates

SETTLEMENT (SAXON - 410 AD to 1065 AD)
- Evidence DOCUMENTARY EVIDENCE
- Evidence PLACENAME EVIDENCE

Description and Sources

Description

Settlement: Four villagers and two smallholders with two ploughs in 1086. <1>

Significant placename. <2>

Sources

(1) Published Book: William I - Translated Alison Hawkins & Alex Rumble. 1086/1976. Domesday Book 24: Staffordshire (Phillimore Translation). 11-10

(2) Article in serial: Dr. Margaret Gelling. 1981. Some Thoughts on Staffordshire Place-Names in North Staffordshire Journal of Field Studies Volume 21 (1981). Page 3

(3) Index: Royal Commission on the Historical Monuments of England. 1994. Medieval Village Research Group Index (Royal Commission on the Historical Monuments of England).

Location

National Grid Reference

SJ 945 296 (point) SJ92NW Point

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Primary Record Number - 02558 Active

Former Primary Record Number - 03882 Revoked

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
02855 - MST2842	Long Meadow Bridge, Trent and Mersey Canal, Burston	Monument

A bridge spanning the Trent and Mersey Canal to the north of Burston.

Monument Types and Dates

ACCOMMODATION BRIDGE (Georgian to Victorian - 1771 AD to 1899 AD)
Evidence STRUCTURE

Description and Sources

Description

CANAL BRIDGE: BRIDGE ACROSS TRENT AND MERSEY CANAL. <1>

Sources

(1) Cartographic: Ordnance Survey. Pre 1972. Ordnance Survey 1:10560 National Grid Series.

Location

National Grid Reference

Centred SJ 9309 3047 (12m by 8m) SJ93SW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Conservation Area - 083 Trent and Mersey Canal Active DST5720

Other Statuses and Cross-References

Primary Record Number - 02855 Active

Ratings and Scorings - None recorded

Related Monuments

02212 Trent and Mersey Canal Geographical

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations

Brindley, James - Unassigned Engineer (Historic)

PRN Number	Site Name	Record Type
02856 - MST2843	Upper Burston Bridge, Trent and Mersey Canal, Burston	Monument

A bridge spanning the Trent and Mersey Canal at Burston. Of possible late 18th century date.

Monument Types and Dates

ACCOMMODATION BRIDGE (Georgian - 1750 AD to 1799 AD)
Evidence STRUCTURE

Description and Sources

Description

Canal bridge: Bridge across the Trent and Mersey Canal. <1>

Sources

(1) Cartographic: Ordnance Survey. Pre 1972. Ordnance Survey 1:10560 National Grid Series.

Location

National Grid Reference

Centred SJ 9325 3012 (13m by 7m) SJ93SW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Primary Record Number - 02856 Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
02857 - MST2844	Lower Burston Bridge, Trent and Mersey Canal, Burston	Monument

A bridge spanning the Trent and Mersey Canal at Burston. Of possible late 18th century date.

Monument Types and Dates

ACCOMMODATION BRIDGE (Georgian - 1750 AD to 1799 AD)
Evidence STRUCTURE

Description and Sources

Description

Canal Bridge: Bridge across the Trent and Mersey Canal. <1>

Sources

(1) Cartographic: Ordnance Survey. Pre 1972. Ordnance Survey 1:10560 National Grid Series.

Location

National Grid Reference

Centred SJ 9352 2977 (17m by 18m) SJ92NW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Primary Record Number - 02857 Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
02858 - MST2845	Flute Meadow Bridge, Trent and Mersey Canal	Monument

A canal bridge spanning the Trent and Mersey Canal. Of probable late 18th century date.

Monument Types and Dates

ACCOMMODATION BRIDGE (Georgian - 1750 AD to 1799 AD)
Evidence STRUCTURE

Description and Sources

Description

CANAL BRIDGE: BRIDGE ACROSS TRENT AND MERSEY CANAL.<1>

Sources

(1) Cartographic: Ordnance Survey. Pre 1972. Ordnance Survey 1:10560 National Grid Series.

Location

National Grid Reference

Centred SJ 94296 29246 (8m by 16m) SJ92NW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Conservation Area Trent and Mersey Canal Active DST5720

Other Statuses and Cross-References

Primary Record Number - 02858 Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
02859 - MST2846	Sandon Bridge, Trent and Mersey Canal	Monument

A canal bridge spanning the Trent and Mersey Canal. Of probable late 18th century date.

Monument Types and Dates

ACCOMMODATION BRIDGE (POST MEDIEVAL to Victorian - 1547 AD to 1899 AD)
Evidence EXTANT STRUCTURE

Description and Sources

Description

CANAL BRIDGE: BRIDGE ACROSS TRENT AND MERSEY CANAL.<1>

Sources

(1) Cartographic: Ordnance Survey. Pre 1972. Ordnance Survey 1:10560 National Grid Series.

Location

National Grid Reference

Centred SJ 94646 29029 (10m by 13m) SJ92NW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Conservation Area	Trent and Mersey Canal	Active	DST5720

Other Statuses and Cross-References

Primary Record Number - 02859	Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
03238 - MST3225	Ice House, Sandon Park	Building

The listed remains of an icehouse at Sandon Park, dating from circa 1780.

Monument Types and Dates

ICEHOUSE (Constructed, (Circa) Georgian - 1780 AD)

Evidence	EXTANT BUILDING
Main Building Material	ASHLAR

Description and Sources

Description

Ice House: an ice house is marked on the 1st Edition 6" Ordnance Survey map. <1>

Sources

(1) Cartographic: Ordnance Survey. 1875 - 1890. Ordnance Survey 1st Edition 6" maps.

Location

National Grid Reference

Centred SJ 9559 2918 (4m by 5m) SJ92NE Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II) - 1294124	Ice House located 600 yards to the north of Sandon Hall	Active	DST3030

Other Statuses and Cross-References

Former Primary Record Number - 07731	Active
Primary Record Number - 03238	Active

Ratings and Scorings - None recorded

Related Monuments

40111	Sandon Park	Geographical

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
03529 - MST3304	Orange Hayes Wood	Monument

An area of ancient woodland which is now largely commercial. Seventeenth and eighteenth century fields encroach on the woodland.

Monument Types and Dates

WOOD (Unknown date)

Description and Sources

Description

ANCIENT WOODLAND: NOW LARGELY COMMERCIAL WOODLAND. WOODROFFE PRESENT (ANCIENT WOODLAND INDICATOR). C17TH-18TH FIELDS ENCROACH WOODLAND. <1>

Sources

(1) Verbal communication: Steve Potter (Staffordshire County Council). 1984. Comment on The Orange Hayes Wood, Sandon. 26 April 1984

Location

National Grid Reference

Centred SJ 9287 3224 (699m by 876m) SJ93SW Dispersed

Administrative Areas

Parish	Sandon and Burston, Stafford Borough
Parish	Stone Rural, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Primary Record Number - 03529 Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
04303 - MST4026	Possible Barrow, Shortwood Farm, Sandon and Burston	Monument

The suggested site of a barrow at Shortwood Farm, Sandon and Burtson. It is considered likley that this is actually a duplicate of PRN 00475, plotted in the wrong place due to an innaccurate grid reference.

Monument Types and Dates

ROUND BARROW (BRONZE AGE - 2350 BC? to 701 BC?)
- Evidence CONJECTURAL EVIDENCE
- Evidence DOCUMENTARY EVIDENCE

(Alternate Type) NON ANTIQUITY (Unknown date)
- Evidence CONJECTURAL EVIDENCE
- Evidence DOCUMENTARY EVIDENCE

Description and Sources

Description

Possible Round Barrow: Reference to a mound surrounded by a ditch at Shortwood Farm. <1>

The description could be that of a barrow, but the location details are vague with a 7 figure national grid reference. Assumed to be near Shaw's Wood Farm. Furthermore the record makes reference to an excavation by Pape that he did not undertake. <1>

(Please see PRN 00475, a mound feature between 'Short Wood Barn' and Standon Hall at NGR SJ 795 355 (it is possible that the 7 figure NGR for this PRN had the '7' missing, and is therefore simply a duplicate of PRN 00475).

Sources

(1) Index: Ordnance Survey. See cards. Ordnance Survey Card Index. SJ 73 NE - 1 (T.N.S.F.C. Volume 70 (1935-1936) pages 65-66 (by T. Pape))

Location

National Grid Reference

SJ 95450 31470 (point) SJ93SE Point

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Primary Record Number - 04303 Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
20402 - MST5672	Ridge and Furrow, South of Burston	Monument

The earthwork remains of medieval ridge and furrow, identified on aerial photography to the south of Burston.

Monument Types and Dates

RIDGE AND FURROW (MEDIEVAL - 1066 AD to 1485 AD)
Evidence EARTHWORK

Description and Sources

Description

Ridge and furrow identified on aerial photography. <1> <2>

Sources

(1) Aerial Photograph: Hunting Surveys Ltd. 1963. 1963 Aerial Photography. Run 27 - 0730

(2) Drawn: Trent Valley Archaeological Research Committee (?). Unknown. 1:10 000 Overlays.

Location

National Grid Reference

Centred SJ 9378 2969 (443m by 421m) SJ92NW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Primary Record Number - 20402 Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
40111 - MST6218	Sandon Park	Monument

Extensive gardens and pleasure grounds set in a landscape park around Sandon Hall, work on which began in the mid to late 18th century. Sandon Hall Park is a Registered Park and Garden and includes among its documented designers William Ermes, John Webb and W. A. Nesfield

Monument Types and Dates

LANDSCAPE PARK (Established, (Circa) Georgian - 1770 AD)
Evidence BOTANICAL FEATURE

Description and Sources

Description

Landscape Park: A landscaped area around Sandon Hall. <1>

Extensive gardens and pleasure grounds set in a landscape park around Sandon Hall. Among the designers documented are William Ermes, John Webb and W. A. Nesfield. The park is roughly triangular and is divided into two halves by its main topographic and scenic feature, The Valley, which runs north-west to south-east. To the west of the Valley is Lower Park, Sandon Hall and the pleasure grounds, to the east is the High or Upper Park. Both Upper Park and Lower Park are largely permenant pasture with mature parkland trees. It is uncertain if the creation of the park began prior to 1776 when the Sandon Estate was sold to the Harrowby family. By 1778 William Emes had been brought in and had begun planting, which went along with the removal of hedges and fences, the digging of ha-has and the creation of the parkland sward. Work proceeded outwards along The Valley from the Hall, and by 1787 TheValley, the North Lawn and Icehouse Plantation, the perimeter pkantations and Black Hill Plantation were in existence. However, parts of Upper Park may have remained divided into fields as late as 1802. (SB, 17-Mar-2004) <2>

Sources

(1) Cartographic: Ordnance Survey 2nd Edition 6" maps. Staffordshire Sheets XXX. S.E. and XXXI. S.W.

(2) Index: English Heritage. 2000. Register of Parks and Gardens of Special Historic Interest in England: Part 38 - Staffordshire. GD2170 - Sandon Park

(3) Published Book: Timothy Mowl and Dianne Barr. 2009. The Historic Gardens of England: Staffordshire. Page 18

Location

National Grid Reference

Centred SJ 9581 2901 (1890m by 2077m) SJ92NE Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Registered Park or Garden (II) - 1001166 Sandon Park Active DST5407

Other Statuses and Cross-References

Primary Record Number - 40111 Active

Ratings and Scorings - None recorded

Related Monuments

07729	Sandon Hall, Sandon Park	Geographical
03238	Ice House, Sandon Park	Geographical
07341	Boat House, Cop Mere, Sugnall Park, Eccleshall	Geographical
07735	Lichfield Lodge, Sandon Park	Geographical
07736	Gates and Gate Piers, Lichfield Lodge, Sandon Park	Geographical

07741	The Old Lodge, Sandon Park	Geographical
07742	Stafford Lodges (North-East Lodge), Sandon Park	Geographical
07743	Stafford Lodge Entrance, Sandon Park	Geographical
07740	Home Farm Lodge, Sandon Park	Geographical
07730	Gates and Gate Piers, North of Sandon Hall	Geographical
07732	The Perceval Shrine, Sandon Park	Geographical
07733	Trentham Tower, Sandon Park	Geographical
07734	Pitt's Column, Sandon Park	Geographical
51849	Home Farm / Sandon Hall Farm, Sandon Park	Geographical
55101	Stafford Lodges (South-West Lodge), Sandon Park	Geographical

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
07718 - MST7782	Burston Hall	Building

A listed early 19th century of two storeys with plastered brickwork and a slate roof.

Monument Types and Dates

HOUSE (Built, (between) INDUSTRIAL - 1800 AD to 1834 AD)

Evidence	EXTANT BUILDING
Main Building Material	BRICK
Main Building Material	SLATE

Description and Sources

Description - None recorded

Sources - None recorded

Location

National Grid Reference

Centred SJ 9357 2995 (20m by 32m) SJ92NW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II) - 0953/15/027	Burston Hall	Active	DST3025

Other Statuses and Cross-References

Listed Building Volume Number - 0953	Active
Primary Record Number - 07718	Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
07720 - MST7783	Gate Piers, Burston Hall	Monument

A pair of listed 18th century stone gate piers associated with the earlier house on the site (which was demolished in the early 19th century).

Monument Types and Dates

GATE PIER (POST MEDIEVAL to Georgian - 1700 AD to 1750 AD)

Evidence	STRUCTURE
Main Building Material	STONE

Description and Sources

Description - None recorded

Sources - None recorded

Location

National Grid Reference

SJ 9359 2995 (point) SJ92NW Point

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II) - 0953/15/028	Gate piers of Burston Hall	Active	DST3026

Other Statuses and Cross-References

Primary Record Number - 07720 Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
07721 - MST7784	Burston House, Burston	Building

A listed three storey house of red brick construction with a tiled roof, dated to circa 1800.

Monument Types and Dates

HOUSE (Built, (Circa) INDUSTRIAL - 1800 AD)

Evidence	EXTANT BUILDING
Main Building Material	BRICK
Main Building Material	TILE

Description and Sources

Description - None recorded

Sources - None recorded

Location

National Grid Reference

Centred SJ 9356 3006 (19m by 13m) SJ93SW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II) - 0953/11/029	Burston House	Active	DST2956

Other Statuses and Cross-References

Listed Building Volume Number - 0953	Active
Primary Record Number - 07721	Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
07722 - MST7785	Railings and Gate, Burston House, Burston	Building

The listed wrought iron railings and gate enclosing the front garden to Burston House. The railings and gate are dated to circa 1800.

Monument Types and Dates

GATE (Erected, (Circa) INDUSTRIAL - 1800 AD)

Evidence	EXTANT STRUCTURE
Main Building Material	WROUGHT IRON

RAILINGS (Erected, (Circa) INDUSTRIAL - 1800 AD)

Evidence	EXTANT STRUCTURE
Main Building Material	WROUGHT IRON

Description and Sources

Description - None recorded

Sources - None recorded

Location

National Grid Reference

Centred SJ 9354 3005 (17m by 43m) SJ93SW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II) - 0953/11/030	Railings and gate of Burston House	Active	DST2957

Other Statuses and Cross-References

Listed Building Volume Number - 0953	Active
Primary Record Number - 07722	Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
07723 - MST7786	Burston Lodge, Burston	Building

A listed house which has a roughcast exterior to an earlier timber frame of probable 17th century origin. The house has red brick with exposed imber-framing to the north. The iron studded plank door was re-used from the Old Mission Church (now demolished).

Monument Types and Dates

TIMBER FRAMED HOUSE (Built, (between) POST MEDIEVAL - 1600 AD to 1699 AD)

Evidence	EXTANT BUILDING
Main Building Material	BRICK
Main Building Material	TILE?
Main Building Material	TIMBER

Description and Sources

Description - None recorded

Sources - None recorded

Location

National Grid Reference

Centred SJ 9353 3000 (143m by 18m) SJ93SW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II) - 0953/11/031	Burston Lodge	Active	DST2958

Other Statuses and Cross-References

Listed Building Volume Number - 0953	Active
Primary Record Number - 07723	Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
07724 - MST7787	Burston Villa, Burston	Building

A listed early 19th century red brick house of three storeys.

Monument Types and Dates

HOUSE (INDUSTRIAL - 1800 AD to 1834 AD)

Evidence	EXTANT BUILDING
Main Building Material	BRICK

Description and Sources

Description - None recorded

Sources - None recorded

Location

National Grid Reference

Centred SJ 9325 3019 (20m by 21m) SJ93SW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Conservation Area	Trent and Mersey Canal	Active	DST5720
Listed Building (II) - 0953/11/032	Burston Villa	Active	DST2959

Other Statuses and Cross-References

Listed Building Volume Number - 0953	Active
Primary Record Number - 07724	Active

Ratings and Scorings - None recorded

Related Monuments

53898	Burston Villa Farm, Burston	Geographical

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
07727 - MST7788	The Old Smithy, Hilderstone Road, Burston	Building

A listed early 19th century house and former smithy, which is of red brick with an ornamental tile roof.

Monument Types and Dates

BLACKSMITHS WORKSHOP? (Built, (between) INDUSTRIAL - 1800 AD to 1834 AD)

Evidence	EXTANT BUILDING
Main Building Material	BRICK
Main Building Material	TILE

HOUSE (Built, (between) INDUSTRIAL - 1800 AD to 1834 AD)

Evidence	EXTANT BUILDING
Main Building Material	BRICK
Main Building Material	TILE

Description and Sources

Description - None recorded

Sources - None recorded

Location

National Grid Reference

Centred SJ 9461 2986 (14m by 16m) SJ92NW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II) - 0953/15/025	The Old Smithy	Active	DST3024

Other Statuses and Cross-References

Listed Building Volume Number - 0953	Active
Primary Record Number - 07727	Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number 07728 - MST7789 **Site Name** Farmhouse, Yewtree Farm, Hilderstone Road, Sandon and Burston

PRN Number	Site Name	Record Type
07728 - MST7789	Farmhouse, Yewtree Farm, Hilderstone Road, Sandon and Burston	Building

A late 18th century red brick farmhouse of stwo storeys.

Monument Types and Dates

FARMHOUSE (Built, (between) Georgian - 1765 AD to 1799 AD)

Evidence	EXTANT BUILDING
Main Building Material	BRICK
Main Building Material	TILE

Description and Sources

Description - None recorded

Sources - None recorded

Location

National Grid Reference

Centred SJ 9465 3007 (12m by 16m) SJ93SW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II) - 1189681 Yewtree Farm Active DST2955

Other Statuses and Cross-References

Listed Building Volume Number - 0953 Active

Primary Record Number - 07728 Active

Ratings and Scorings - None recorded

Related Monuments

52977 Yewtree Farm, Sandon Geographical

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
07726 - MST7790	Hardwick Grove, Jolpool Lane	Building

A listed red brick house of two streys, dated to 1711.

Monument Types and Dates

HOUSE (Built, POST MEDIEVAL - 1711 AD)

Evidence	EXTANT BUILDING
Main Building Material	BRICK

Description and Sources

Description - None recorded

Sources - None recorded

Location

National Grid Reference

Centred SJ 9407 3212 (19m by 18m) SJ93SW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II) - 0953/11/034	Hardwick Grove	Active	DST2961

Other Statuses and Cross-References

Listed Building Volume Number - 0953	Active
Primary Record Number - 07726	Active

Ratings and Scorings - None recorded

Related Monuments

52976	Hardiwick Grove Farm, Jolpool Lane, Sandon and Burtson	Geographical

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
07725 - MST7791	Hardwick Farmhouse, Kilplass Lane, Sandon and Burston	Building

A listed 17th century timber-framed house, the core of which is probably 16th century.

Monument Types and Dates

FARMHOUSE (Built, (between) POST MEDIEVAL - 1500 AD to 1599 AD)

Evidence	ARCHITECTURAL COMPONENT
Evidence	EXTANT BUILDING
Main Building Material	BRICK
Main Building Material	STONE
Main Building Material	TIMBER

Description and Sources

Description - None recorded

Sources - None recorded

Location

National Grid Reference

Centred SJ 9421 3169 (12m by 18m) SJ93SW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II) - 1038993	Hardwick Farmhouse	Active	DST2960

Other Statuses and Cross-References

Listed Building Volume Number - 0953	Active
Primary Record Number - 07725	Active

Ratings and Scorings - None recorded

Related Monuments

52558	Hardiwick Farm, Kiplass Lane, Sandon and Burston	Geographical

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
07735 - MST7792	Lichfield Lodge, Sandon Park	Building

A listed mid 19th century lodge in the south-east corner of Sandon Park.

Monument Types and Dates

LODGE (Built, (between) INDUSTRIAL to Victorian - 1835 AD to 1864 AD)

Evidence	EXTANT BUILDING
Main Building Material	ASHLAR
Main Building Material	SLATE

Description and Sources

Description - None recorded

Sources - None recorded

Location

National Grid Reference

Centred SJ 9656 2801 (9m by 12m) SJ92NE Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II) - 1038994	Lichfield Lodge	Active	DST3033

Other Statuses and Cross-References

Primary Record Number - 07735	Active

Ratings and Scorings - None recorded

Related Monuments

40111	Sandon Park	Geographical
07736	Gates and Gate Piers, Lichfield Lodge, Sandon Park	Geographical

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
07736 - MST7793	Gates and Gate Piers, Lichfield Lodge, Sandon Park	Monument

A pair of listed stone rusticated gate piers, with wrought iron gates, which are of mid 19th century date. Located at the south-east entrance to Sandon Hall Park.

Monument Types and Dates

GATE PIER (Constructed, (between) INDUSTRIAL to Victorian - 1835 AD to 1864 AD)

Evidence	EXTANT STRUCTURE
Main Building Material	ASHLAR

Description and Sources

Description - None recorded

Sources - None recorded

Location

National Grid Reference

SJ 9655 2800 (point) SJ92NE Point

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II) - 1374208	Gate piers and gates at Lichfield Lodge	Active	DST3034

Other Statuses and Cross-References

Listed Building Volume Number - 0953	Active
Primary Record Number - 07736	Active

Ratings and Scorings - None recorded

Related Monuments

40111	Sandon Park	Geographical
07735	Lichfield Lodge, Sandon Park	Geographical

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
07741 - MST7794	The Old Lodge, Sandon Park	Building

A listed former lodge to Sandon Park. The single storey, early 19th century lodge is of ashlar construction with a slate roof.

Monument Types and Dates

LODGE (Built, (between) INDUSTRIAL - 1800 AD to 1834 AD)

Evidence	EXTANT BUILDING
Main Building Material	ASHLAR
Main Building Material	SLATE

Description and Sources

Description - None recorded

Sources - None recorded

Location

National Grid Reference

Centred SJ 9492 2923 (10m by 11m) SJ92NW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II) - 1038995	The Old Lodge	Active	DST3014

Other Statuses and Cross-References

Primary Record Number - 07741	Active

Ratings and Scorings - None recorded

Related Monuments

40111	Sandon Park	Geographical

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
07742 - MST7795	Stafford Lodges (North-East Lodge), Sandon Park	Building

One of a pair of listed early 20th century lodges to Sandon Hall. The lodges are in a restrained Jacobean style and are of ashlar construction with slate roofs and stone stacks.

Monument Types and Dates

LODGE (Built, Edwardian - 1902 AD)

Evidence	EXTANT BUILDING
Main Building Material	ASHLAR
Main Building Material	SLATE
Main Building Material	STONE

Description and Sources

Description - None recorded

Sources - None recorded

Location

National Grid Reference

Centred SJ 9490 2929 (12m by 12m) SJ92NW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II) - 1374209 Stafford Lodges (2 tenements) Active DST3015

Other Statuses and Cross-References

Primary Record Number - 07742 Active

Ratings and Scorings - None recorded

Related Monuments

40111 Sandon Park Geographical

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
07743 - MST7796	Stafford Lodge Entrance, Sandon Park	Building

The listed Stafford Lodge entrance to Sandon Park comprising of a pair of stone gate piers surmounted by dragon heads with a pair of wrought iron entrance gates bearing the Harrowby crest and screen walls to each side. The entrance is dated circa 1902.

Monument Types and Dates

GATE (Built, (Circa) Edwardian - 1902 AD)

Evidence	EXTANT STRUCTURE
Main Building Material	WROUGHT IRON

GATE PIER (Built, (Circa) Edwardian - 1902 AD)

Evidence	EXTANT STRUCTURE
Main Building Material	STONE

WALL (Built, (Circa) Edwardian - 1902 AD)

Evidence	EXTANT STRUCTURE
Main Building Material	STONE

Description and Sources

Description - None recorded

Sources - None recorded

Location

National Grid Reference

SJ 9489 2928 (point) SJ92NW Point

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II) - 1038996	Gate piers, gates and side screens at Stafford Lodge	Active	DST3016

Other Statuses and Cross-References

Primary Record Number - 07743 Active

Ratings and Scorings - None recorded

Related Monuments

40111	Sandon Park	Geographical

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
07744 - MST7797	Coots House, Lichfield Road, Sandon	Building

A listed late 18th century farmhouse of red brick construction with tiled roof. Formerly referred to as Dog Farmhouse.

Monument Types and Dates

FARMHOUSE (Georgian - 1750 AD to 1799 AD)

Evidence	EXTANT BUILDING
Main Building Material	BRICK
Main Building Material	TILE

Description and Sources

Description - None recorded

Sources

Photographic: Andrew kirkham (Staffordshire County Council). 1988 - 1995. Photographic Negative Collection 1988 - 1995 (Buildings).

Location

National Grid Reference

Centred SJ 9484 2934 (19m by 18m) SJ92NW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II) - 1038997 Coots House Active DST3040

Other Statuses and Cross-References

Primary Record Number - 07744 Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
07745 - MST7798	Seven Stars Cottage, Lichfield Road, Sandon	Building

A listed estate cottage of probable 17th century origin, remodelled in circa 1905 (probably by Sir Guy Dawber). The cottage has a sham timber frame with roughcast to an earlier timber-framed core.

Monument Types and Dates

ESTATE COTTAGE (Built, (between) POST MEDIEVAL - 1600 AD to 1699 AD)

Evidence	EXTANT BUILDING
Main Building Material	ROUGHCAST
Main Building Material	TILE
Main Building Material	TIMBER

Description and Sources

Description - None recorded

Sources - None recorded

Location

National Grid Reference

Centred SJ 9485 2931 (11m by 11m) SJ92NW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II) - 0953/15/018	Seven Stars Cottage	Active	DST3017

Other Statuses and Cross-References

Listed Building Volume Number - 0953	Active
Primary Record Number - 07745	Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
07747 - MST7799	Dawber Cottages, Lichfield Road, Sandon	Building

A listed row of early 20th century cottages by architect Sir Guy Dawber. The cottages are of shame timber frame, brick and roughcast construction with tall brick chimney stacks and tiled roofs.

Monument Types and Dates

ESTATE COTTAGE? (Built, (Circa) Edwardian - 1904 AD to 1905 AD)

Evidence	EXTANT BUILDING
Main Building Material	BRICK
Main Building Material	ROUGHCAST
Main Building Material	TILE
Main Building Material	TIMBER

Description and Sources

Description - None recorded

Sources - None recorded

Location

National Grid Reference

Centred SJ 9484 2927 (22m by 17m) SJ92NW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II) - 0953/15/020	Dawber Cottages (Nos 1 to 3 consec.)	Active	DST3019

Other Statuses and Cross-References

Listed Building Volume Number - 0953	Active
Primary Record Number - 07747	Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
07752 - MST7800	Sandon Lodge, Lichfield Road, Sandon	Building

A listed house with a timber-framed core of probable 17th century, refronted in roughcast in the 18th century.

Monument Types and Dates

HOUSE (Built, (between) POST MEDIEVAL - 1600 AD to 1699 AD)

Evidence	EXTANT BUILDING
Main Building Material	ROUGHCAST
Main Building Material	TILE
Main Building Material	TIMBER

Description and Sources

Description - None recorded

Sources - None recorded

Location

National Grid Reference

Centred SJ 9481 2949 (18m by 32m) SJ92NW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II) - 0953/15/023	Sandon Lodge	Active	DST3022

Other Statuses and Cross-References

Listed Building Volume Number - 0953	Active
Primary Record Number - 07752	Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number 07753 - MST7801 **Site Name** Knowles Cottages and Stonebench Cottage, Lichfield Road, Sandon

PRN Number	Site Name	Record Type
07753 - MST7801	Knowles Cottages and Stonebench Cottage, Lichfield Road, Sandon	Building

A modest range of late 18th to early 19th century listed estate cottages.

Monument Types and Dates

ESTATE COTTAGE (Georgian to Victorian - 1750 AD to 1850 AD)

Evidence	EXTANT BUILDING
Main Building Material	BRICK

Description and Sources

Description - None recorded

Sources - None recorded

Location

National Grid Reference

Centred SJ 9480 2955 (34m by 33m) SJ92NW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II) - 0953/15/024	Knowles Cottages (Nos 1 and 2) and Stonebench Cottage	Active	DST3023

Other Statuses and Cross-References

Primary Record Number - 07753 Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
07750 - MST7802	Village Club, Lichfield Road, Sandon	Building

A listed early 20th century village hall built by architect Sir Guy Dawber. The club is of roughcast red brick with sham timber-framing and a tiled roof. The building also bears the Harrowby crest and the date '1904'.

Monument Types and Dates

VILLAGE HALL (Built, Edwardian - 1904 AD)

Evidence	EXTANT BUILDING
Main Building Material	BRICK
Main Building Material	TILE
Main Building Material	TIMBER

Description and Sources

Description - None recorded

Sources - None recorded

Location

National Grid Reference

Centred SJ 9480 2933 (19m by 24m) SJ92NW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II) - 0953/15/021	Village Club	Active	DST3020

Other Statuses and Cross-References

Listed Building Volume Number - 0953	Active
Primary Record Number - 07750	Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
07740 - MST7803	Home Farm Lodge, Sandon Park	Building

A listed lodge, with a sham timber frame, dated 1869, which is located on the south side of Sandon Hall Park.

Monument Types and Dates

LODGE (Victorian - 1869 AD)

Evidence	EXTANT BUILDING
Main Building Material	ROUGHCAST
Main Building Material	TIMBER

Description and Sources

Description - None recorded

Sources - None recorded

Location

National Grid Reference

Centred SJ 9596 2825 (11m by 10m) SJ92NE Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II) - 1374212 Home Farm Lodge Active DST3039

Other Statuses and Cross-References

Primary Record Number - 07740 Active

Ratings and Scorings - None recorded

Related Monuments

40111 Sandon Park Geographical

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
07729 - MST7804	Sandon Hall, Sandon Park	Building

A Listed country house built in 1852 by the architect William Burn in a Jacobean style.

Monument Types and Dates

COUNTRY HOUSE (Built, Victorian - 1852 AD)

Covering Building Material	SLATE
Evidence	EXTANT BUILDING
Main Building Material	ASHLAR

Description and Sources

Description - None recorded

Sources

Published Book: Timothy Mowl and Dianne Barr. 2009. The Historic Gardens of England: Staffordshire. plate 3, page 19, page 21

Location

National Grid Reference

Centred SJ 9566 2869 (105m by 43m) SJ92NE Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II*) - 1189732 Sandon Hall Active DST3028

Other Statuses and Cross-References

Primary Record Number - 07729 Active

Ratings and Scorings - None recorded

Related Monuments

40111 Sandon Park Geographical

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
07730 - MST7805	Gates and Gate Piers, North of Sandon Hall	Monument

A pair of listed early 18th century wrought iron gates hung on openwork standards with flanking screen walls fronting the northern façade to Sandon Hall. The gates were probably made in Gloucestershire by William Edney and were moved here from Burnt Norton, Gloucestershire in circa 1900 by the Fifth Earl of Harrowby.

Monument Types and Dates

GATE (Constructed, (between) POST MEDIEVAL to Georgian - 1700 AD to 1734 AD)

Evidence	EXTANT STRUCTURE
Evidence	MOVED STRUCTURE?
Main Building Material	WROUGHT IRON

GATE PIER (Constructed, (between) POST MEDIEVAL to Georgian - 1700 AD to 1734 AD)

Evidence	EXTANT STRUCTURE
Evidence	MOVED STRUCTURE?
Main Building Material	STONE

WALL (Constructed, (between) POST MEDIEVAL to Georgian - 1700 AD to 1734 AD)

Evidence	EXTANT STRUCTURE
Main Building Material	STONE?

Description and Sources

Description - None recorded

Sources - None recorded

Location

National Grid Reference

Centred SJ 9568 2873 (60m by 27m) SJ92NE Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II*) - 1039000	Gates, gate standards and side screens fronting north façade of Sandon Hall	Active	DST3029

Other Statuses and Cross-References

Primary Record Number - 07730 Active

Ratings and Scorings - None recorded

Related Monuments

40111	Sandon Park	Geographical

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
07732 - MST7806	The Perceval Shrine, Sandon Park	Building

A small, Listed structure dating from circa 1815, which set into the hillside of Sandon Park. The shrine commemorates (Prime Minister) Spencer Perceval, who was shot by a madman in the lobby of the House of Commons in 1812.

Monument Types and Dates

COMMEMORATIVE MONUMENT (INDUSTRIAL - 1815 AD)

Evidence	EXTANT STRUCTURE
Main Building Material	ASHLAR
Main Building Material	STONE

Description and Sources

Description - None recorded

Sources - None recorded

Location

National Grid Reference

Centred SJ 9589 2921 (5m by 4m) SJ92NE Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II) - 1039001 The Perceval Shrine Active DST3031

Other Statuses and Cross-References

Primary Record Number - 07732 Active

Ratings and Scorings - None recorded

Related Monuments

40111 Sandon Park Geographical

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
07733 - MST7807	Trentham Tower, Sandon Park	Building

A listed square tower designed by Sir Charles Barry and dating from circa 1840. The tower was formerly part of Trentham Hall, but was moved here after the hall was demolished in 1910-12.

Monument Types and Dates

TOWER (Victorian - 1840 AD)

Evidence	EXTANT BUILDING
Main Building Material	ASHLAR
Main Building Material	BRICK

Description and Sources

Description - None recorded

Sources

(1) Published Book: English Heritage. 2011. Heritage at Risk Register 2011 (West Midlands). Page 45

Location

National Grid Reference

Centred SJ 9618 2920 (13m by 10m) SJ92NE Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II*) - 1189768 Trentham Tower Active DST3032

Other Statuses and Cross-References

Primary Record Number - 07733 Active

Ratings and Scorings

Heritage at Risk Condition	Fair	01/06/2008	Heritage at Risk Survey 2008
Heritage at Risk Condition	Fair	01/06/2009	Heritage at Risk Survey 2009 (West Midlands Region)
Heritage at Risk Condition	Fair	01/06/2010	Heritage at Risk Survey 2010 (West Midlands Region)
Heritage at Risk Condition	Fair	01/06/2011	Heritage at Risk Survey 2011 (West Midlands Region)
Heritage at Risk Occupancy	Not Applicable	01/06/2008	Heritage at Risk Survey 2008
Heritage at Risk Occupancy	Not Applicable	01/06/2009	Heritage at Risk Survey 2009 (West Midlands Region)
Heritage at Risk Occupancy	Not Applicable	01/06/2010	Heritage at Risk Survey 2010 (West Midlands Region)
Heritage at Risk Occupancy	Not Applicable	01/06/2011	Heritage at Risk Survey 2011 (West Midlands Region)
Heritage at Risk Priority	Priority C	01/06/2008	Heritage at Risk Survey 2008
Heritage at Risk Priority	Priority C	01/06/2009	Heritage at Risk Survey 2009 (West Midlands Region)
Heritage at Risk Priority	Priority C	01/06/2010	Heritage at Risk Survey 2010 (West Midlands Region)
Heritage at Risk Priority	Priority C	01/06/2011	Heritage at Risk Survey 2011 (West Midlands Region)

Related Monuments

40111 Sandon Park Geographical

Finds - None recorded

Associated Events/Activities

EST1871 Heritage at Risk Survey 2008 (Management)
EST1944 Heritage at Risk Survey 2009 (West Midlands Region) (Management)
EST2052 Heritage at Risk Survey 2010 (West Midlands Region) (Management)
EST2248 Heritage at Risk Survey 2011 (West Midlands Region) (Management)

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
07737 - MST7808	Stonehouse Farmhouse, Sandon Park	Building

A listed early 19th century farmhouse on the edge of Sandon Park.

Monument Types and Dates

FARMHOUSE (INDUSTRIAL to Victorian - 1800 AD to 1850 AD)
Evidence EXTANT BUILDING

Description and Sources

Description - None recorded

Sources - None recorded

Location

National Grid Reference

Centred SJ 9598 2959 (15m by 11m) SJ92NE Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II) - 0953/16/009	Stonehouse Farmhouse	Active	DST3035

Other Statuses and Cross-References

Listed Building Volume Number - 0953	Active
Primary Record Number - 07737	Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
07734 - MST7809	Pitt's Column, Sandon Park	Monument

A listed monumental column erected in 1806 by the first Earl of Harrowby in memory of Prime Minister William Pitt the Younger. The stone Doric column is 75 feet high and was modelled on Trajan's column.

Monument Types and Dates

COLUMN (Erected, INDUSTRIAL - 1806 AD)
- Evidence: EXTANT STRUCTURE
- Main Building Material: STONE

COMMEMORATIVE MONUMENT (INDUSTRIAL - 1806 AD)
- Evidence: EXTANT STRUCTURE

RAILINGS (Erected, INDUSTRIAL - 1806 AD)
- Evidence: EXTANT STRUCTURE
- Main Building Material: WROUGHT IRON

URN (Erected, INDUSTRIAL - 1806 AD)
- Evidence: EXTANT STRUCTURE
- Main Building Material: STONE

Description and Sources

Description - None recorded

Sources - None recorded

Location

National Grid Reference

Centred SJ 9632 2816 (8m by 8m) SJ92NE Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II*) - 1189785 Pitt's Column Active DST3036

Other Statuses and Cross-References

Primary Record Number - 07734 Active

Ratings and Scorings - None recorded

Related Monuments

40111 Sandon Park Geographical

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number 07738 - MST7810 **Site Name** Home Farmhouse, Home Farm / Sandon Hall Farm, Sandon Park

PRN Number	Site Name	Record Type
07738 - MST7810	Home Farmhouse, Home Farm / Sandon Hall Farm, Sandon Park	Building

A listed neo-classical farmhouse located in Sandon Park, which dates from 1782. The farmhouse is of ashlar construction with hipped slate roof, stone chimney stacks and sash windows.

Monument Types and Dates

FARMHOUSE (Built, Georgian - 1782 AD)

Evidence	EXTANT BUILDING
Main Building Material	ASHLAR
Main Building Material	SLATE
Main Building Material	STONE

Description and Sources

Description - None recorded

Sources - None recorded

Location

National Grid Reference

Centred SJ 9612 2847 (26m by 11m) SJ92NE Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II) - 1039002 Home Farmhouse Active DST3037

Other Statuses and Cross-References

Primary Record Number - 07738 Active

Ratings and Scorings - None recorded

Related Monuments

51849	Home Farm / Sandon Hall Farm, Sandon Park	Geographical
07739	Range of Outbuildings, Home Farm / Sandon Hall Farm, Sandon Park	All Groups

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number 07739 - MST7811 **Site Name** Range of Outbuildings, Home Farm / Sandon Hall Farm, Sandon Park

PRN Number	Site Name	Record Type
07739 - MST7811	Range of Outbuildings, Home Farm / Sandon Hall Farm, Sandon Park	Building

A group of three listed outbuildings dating from 1782, which are ranged round 3 sides of courtyard. With Home Farmhouse (PRN 07738) this is an excellent example of a model farm of the period.

Monument Types and Dates

OUTBUILDING (Built, Georgian - 1782 AD)

Evidence	EXTANT BUILDING
Main Building Material	ASHLAR
Main Building Material	SLATE

Description and Sources

Description - None recorded

Sources - None recorded

Location

National Grid Reference

Centred SJ 9611 2842 (36m by 43m) SJ92NE Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II) - 1374214	Triple range of outbuildings located to the south of Home Farmhouse	Active	DST3038

Other Statuses and Cross-References

Primary Record Number - 07739 Active

Ratings and Scorings - None recorded

Related Monuments

51849	Home Farm / Sandon Hall Farm, Sandon Park	Geographical
07738	Home Farmhouse, Home Farm / Sandon Hall Farm, Sandon Park	All Groups

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
07746 - MST7812	Dog and Doublet Inn, Sandon Road, Sandon	Building

A listed early 20th century public house by architect Sir Guy Dawber. The public house is of roughcast and red brick with a sham timber-frame and is L-shaped on plan.

Monument Types and Dates

PUBLIC HOUSE (Built, Edwardian - 1906 AD)

Evidence	EXTANT BUILDING
Main Building Material	BRICK
Main Building Material	ROUGHCAST
Main Building Material	TILE?

Description and Sources

Description - None recorded

Sources - None recorded

Location

National Grid Reference

Centred SJ 9482 2926 (35m by 35m) SJ92NW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II) - 0953/15/019	Dog and Doublet Inn	Active	DST3018

Other Statuses and Cross-References

Listed Building Volume Number - 0953	Active
Primary Record Number - 07746	Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
07751 - MST7813	Sandon Railway Station, Sandon	Building

A listed, disused Jacobean railway station, built circa 1848-1850 by the North Staffordshire Railway to the designs of H. A. Hunt. The station is of red brick construction with diapering of blue brick and stone dressings. The building has now been converted to a dwelling.

Monument Types and Dates

RAILWAY STATION (Victorian - 1848 AD to 1850 AD)
Evidence EXTANT BUILDING

Description and Sources

Description

(SB, 15-Nov-2004) The station was built in 1848 by the North Staffordshire Railway to the designs of H. A. Hunt. The building was sold by British Rail in the mid 1970's, and it suffered badly from neglect and vandalism. In the mid 1980's the building was converted into a private dwelling. <1>

Sources

(1) Survey Report: Staffordshire County Council. 1985. Historic Railway Buildings in Staffordshire (Visit of the Chairman of the Railway Heritage Trust to Stafford, 15th August 1985). Pages 13 and 14 (including copies of two black and white photographs)

Location

National Grid Reference

Centred SJ 9466 2927 (19m by 17m) SJ92NW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II) - 0953/15/022	Sandon Railway Station	Active	DST3021

Other Statuses and Cross-References

Listed Building Volume Number - 0953	Active
Primary Record Number - 07751	Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities

EST1186 A photographic survey of some historic railway buildings in Staffordshire (Event - Survey)

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
50662 - MST12233	Churchyard Cross, Church of All Saints, Sandon	Monument

The remains of a churchyard cross of possible medieval date, which consists of the base and part of shaft. It is now used as part of a sundial.

Monument Types and Dates

CROSS (MEDIEVAL - 1066 AD? to 1485 AD?)

Evidence STRUCTURE

Description and Sources

Description

The base and part of the shaft of an ancient churchyard cross survive to the south of the church. The remains comprise of a crude, circular pedestal base of two steps which is partly buried. A circularsocket-stone with moulding around the upper edge, and the lower half of an octagonal shaft, 1 metre in height. It now serves as a sundail, with a sundail plate mounted upon it. (SB, 17-Mar-2004) <1>

Sources

(1) Index: Ordnance Survey. See cards. Ordnance Survey Card Index. SJ 92 NE - 3 a & b

Location

National Grid Reference

SJ 9541 2947 (point) SJ92NE Point

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Primary Record Number - 50662 Active

Ratings and Scorings - None recorded

Related Monuments

50663 Churchyard, Church of All Saints, Sandon Park Geographical

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
50663 - MST12234	Churchyard, Church of All Saints, Sandon Park	Monument

A churchyard around the Church of All Saints, which was used for burials and may be of medieval origin.

Monument Types and Dates

CHURCHYARD (Norman to POST MEDIEVAL - 1066 AD to 1799 AD)
Evidence STRUCTURE

Description and Sources

Description

The churchyard has been used for burials and a considerable number of headstones and monuments survive. It also appears that the churchyard has been extended to the east at some point. (SB, 17-Mar-2004) <1>

The churchyard may have medieval origins as it surrounds a church of 12th century or possibly earlier origin. (SB, 17-Mar-2004) <2>

The remains of an 'ancient cross' (PRN 50662) survive in the churchyard, to the south of the church itself. (SB, 17-Mar-2004) <3>

Sources

(1) Aerial Photograph: Cambridge University. Ongoing. Cambridge University Collection of Aerial Photographs (CUCAP). SC 47

(2) Index: Ordnance Survey. See cards. Ordnance Survey Card Index. SJ 92 NE - 2 a & b

(3) Index: Ordnance Survey. See cards. Ordnance Survey Card Index. SJ 92 NE - 3 a & b

Location

National Grid Reference

Centred SJ 9539 2950 (84m by 96m) SJ92NE Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Primary Record Number - 50663 Active

Ratings and Scorings - None recorded

Related Monuments

00750	Church of All Saints, Sandon Park	Geographical
50662	Churchyard Cross, Church of All Saints, Sandon	Geographical

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
50675 - MST12246	Sandon Lime and Flint Kiln	Monument

A listed, extant 'draw' type lime kiln, probably also used for calcining flint, which formed part of Sampson Handley's flint mill complex dating from the 1790's. The kiln appears to have gone out of use by the 1880's.

Monument Types and Dates

LIME KILN (Georgian to Victorian - 1791 AD to 1881 AD)
Evidence STRUCTURE

Description and Sources

Description

The Sandon kiln is thought to be a 'draw limekiln' with a single pot accessed from a steep slope on the same side of the kiln as the canal. The kiln stands 6 metres high and is constructed of brick. It was built on a level site, rather than up against a steep natural bank as is typical for this type of kiln. This meant that access to feed the kiln with raw materials would have required some sort of ramp or path. Archaeological excavation in 2003 revealed possible evidence of a track on the west side of the kiln which could have provided an alternative route from the canal to the drawhole, although it is thought that the main route would have been through the gate in the wall alongside the canal and across the yard in front of the smithy. The coal and other raw materials would have been transported to the site on the adjacent canal. The kiln was probably used for calcining flint as well as for producing lime and was included in Sampson Hadley's original flint mill complex, which dates from the early 1790's. There is documentary evidence relating to use of the kiln at Sandon throughout most of the 19th century, however, it does appear to have gone out of use by the 1880's. (SB, 24-May-2004) <1>

The limekiln was over-grown and partly filled with rubbish in 2002. (SB, 20-Aug-2004) <2>

The earliest record of Sandon Mill is a reference from 1292 to an existing watermill on the site adjacent to the current river channel. The mill was in use up until the 18th century. In the late 18th century it was superseded by a flint mill complex built by Sampson Handley on a new site adjacent to the Trent and Mersey Canal. This new complex also included a Limekiln and a Mill House (later called Sandon Villa). The flint mill supplied ground flint to the pottery industry, and was in use up until the 1860's. Sampson Handley sold the complex in 1830 due to bankruptcy probably due to the financial problems of his brothers. The mill was then taken over by Samuel Ginders, who moved to the mill house in the early 1830's. There are very few records of the activity of the limekiln. It was definitely a working kiln in 1832-1833, and probably supplied lime to the local estate for building and agricultural use, from the time when it was built in the 1790's. From the opening of the Railway in 1849 it probably became cheaper to buy the lime from larger kilns such as those at Froghall and it is therefore likely that this is when lime burning at Sandon ceased. The grinding of flint at the mill continued until 1865, as by this time competition from the steam driven mills from the Potteries meant that the flint milling business at Sandon had become less profitable. The mill was used as a flourmill for a short time, but by 1871 all milling at Sandon appears to have ceased. The buildings were then converted to residential use to provide a different source of income to the Sandon Estate. (SB, 05-Oct-2004) <3>

Sources

(1) Excavation Report: Anne and Jim Andrews. 2003. Archaeological Report on the Lime and Flint Kiln at Sandon, Staffordshire.

(2) Photographic: Staffordshire County Council (? Penny Mcknight). 2002. Sandon Lime Kiln - Colour Photographs.

(3) Serial: Staffordshire Industrial Archaeology Society. 2004. Journal of the Staffordshire Industrial Archaeology Society Number 18 (2004) - Sandon Limekiln. 'Sandon Limekiln and Mills' by Anne Andrews (page 33)

Location

National Grid Reference

Centred SJ 9456 2907 (24m by 16m) SJ92NW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Conservation Area - 083	Trent and Mersey Canal	Active	DST5720
Listed Building (II) - 508967	Sandon Limekiln	Active	DST2221

Other Statuses and Cross-References

Primary Record Number - 50675 Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities

EST1359 A photographic record of Sandon lime kiln, Sandon in 2002. (Event - Survey)

EST1344 An archaeological excavation and survey of the Sandon Lime and Flint Kiln, Sandon, Staffordshire. (Event - Intervention)

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
51335 - MST12558	Milepost, Sandon Village	Monument

A late 19th century triangular cast iron milepost located in Sandon Village on the B5066 close to the A51 junction.

Monument Types and Dates

MILEPOST (Erected, Victorian - 1893 AD)

Evidence	EXTANT STRUCTURE
Main Building Material	CAST IRON

Description and Sources

Description

(LF 8-Mar-2007) A cast iron milepost of hollow triangular section with chamfered front edges. The angled triangular front panel features the parish name of Sandon. The signage of the left hand side reads Stafford (5 miles). The signage of the right hand side reads Hilderstone (3 miles), Cheadle (11 1/2 miles), Leek (18 1/2 miles). <1>

The milepost is dated to 1893. (SB, 27-Sept-2011) <2>

Sources

(1) Written: John Higgins (The Milestone Society). 2000. Staffordshire Milestones (and Canal Milestones, Boundary Markers and Guide Posts). Milestone No. ST/SAD/01

(2) Verbal communication: John Higgins (The Milestone Society). 2011. Comments and observations on various sites in the Churnet Valley.

Location

National Grid Reference

SJ 946 299 (point) SJ92NW Point

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Primary Record Number - 51335 Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities

EST1287 A survey by John Higgins of The Milestone Society of Staffordshire Milestones. (Event - Survey)

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
51336 - MST12559	Milepost, Hilderstone Cross Roads	Monument

A late 19th century triangular cast iron milepost located at Hilderstone crossroads on the B5066.

Monument Types and Dates

MILEPOST (Erected, Victorian - 1893 AD)

Evidence	EXTANT STRUCTURE
Main Building Material	CAST IRON

Description and Sources

Description

(LF 8-Mar-2007) A cast iron milepost of hollow triangular section with chamfered front edges. The angled traingular front panel features the parish name of Sandon. The signage of the left hand side reads Sandon (2 1/2 miles), Stafford (7 miles). The signage of the right hand side reads Hilderstone (1 mile), Cheadle (9 1/2 miles), Leek (16 1/2 miles). The milepost was manufactured by Chas-Lathe, Tipton. <1>

The milepost is dated to 1893. (SB, 27-Sept-2011) <2>

Sources

(1) Written: John Higgins (The Milestone Society). 2000. Staffordshire Milestones (and Canal Milestones, Boundary Markers and Guide Posts). Milestone No. ST/SAD/02

(2) Verbal communication: John Higgins (The Milestone Society). 2011. Comments and observations on various sites in the Churnet Valley.

Location

National Grid Reference

SJ 947 330 (point) SJ93SW Point

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Primary Record Number - 51336 Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities

EST1287 A survey by John Higgins of The Milestone Society of Staffordshire Milestones. (Event - Survey)

Associated Individuals/Organisations

Charles Lathe, Tipton Manufacturer

PRN Number	Site Name	Record Type
51337 - MST12560	Milepost, Sandon	Monument

An early 20th century triangular cast iron milepost located on the north east side of the A51 between Sandon and Weston.

Monument Types and Dates

MILEPOST (Erected, Edwardian - 1909 AD to 1910 AD)

Evidence	EXTANT STRUCTURE
Main Building Material	CAST IRON

Description and Sources

Description

(LF 8-Mar-2007) A cast iron milepost of hollow triangular section 19 1/2 inches wide and 12 inches deep to the front of the triangle. The angled front panel reads Sandon Parish. The signage of the left hand side reads Weston (1 3/4 miles). Rugeley (9 1/2 miles), Lichfield (17 miles), London (136 miles). The signage of the right hand side reads Sandon (3/4 mile), Stone (5 miles), Newcastle (13 1/2 miles). The milepost was manufactured by Cochrane and Co., Dudley. <1>

The milepost is dated to 1909-1910. (SB, 27-Sept-2011) <2>

Sources

(1) Written: John Higgins (The Milestone Society). 2000. Staffordshire Milestones (and Canal Milestones, Boundary Markers and Guide Posts). Milestone No. ST/SAD/03
Milestone No. ST/SAD/03

(2) Verbal communication: John Higgins (The Milestone Society). 2011. Comments and observations on various sites in the Churnet Valley.

Location

National Grid Reference

SJ 956 284 (point) SJ92NE Point

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Primary Record Number - 51337 Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities

EST1287 A survey by John Higgins of The Milestone Society of Staffordshire Milestones. (Event - Survey)

Associated Individuals/Organisations

Cochrane & Co, Dudley Manufacturer

PRN Number	Site Name	Record Type
51338 - MST12561	Milepost, Sandon Village	Monument

An early 20th century triangular cast iron milepost located on the east side of the A51 in Sandon Village.

Monument Types and Dates

MILEPOST (Erected, Edwardian - 1909 AD to 1910 AD)

Evidence	EXTANT STRUCTURE
Main Building Material	CAST IRON

Description and Sources

Description

(LF 8-Mar-2007) A cast iron milepost of hollow triangular section 19 1/2 inches wide and 12 inches deep to the front of the triangle. The angled front panel reads Sandon Parish. The signage of the left hand side reads Sandon (1/4 mile), Weston (2 3/4 miles). Rugeley (10 1/2 miles), Lichfield (18 miles), London (137 miles). The signage of the right hand side reads, Stone (4 miles), Newcastle (12 1/2 miles). The milepost was manufactured by Cochrane and Co., Dudley. <1>

The milepost is dated to 1909-1910. (SB, 27-Sept-2011) <2>

Sources

(1) Written: John Higgins (The Milestone Society). 2000. Staffordshire Milestones (and Canal Milestones, Boundary Markers and Guide Posts). Milestone No. ST/SAD/04

(2) Verbal communication: John Higgins (The Milestone Society). 2011. Comments and observations on various sites in the Churnet Valley.

Location

National Grid Reference

SJ 947 296 (point) SJ92NW Point

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Primary Record Number - 51338 Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities

EST1287 A survey by John Higgins of The Milestone Society of Staffordshire Milestones. (Event - Survey)

Associated Individuals/Organisations

Cochrane & Co, Dudley Manufacturer

PRN Number	Site Name	Record Type
51339 - MST12562	Milepost, Sunnyside, Burston	Monument

A cast iron milepost on the A51 to the north of Burston. The milepost bears the original parish name of 'Stone' and gives distances to Sandon, Weston, Rugeley, Lichfield, London as well as to Stone and Newcastle. Of early 20th century date.

Monument Types and Dates

MILEPOST (Erected, Edwardian - 1909 AD to 1910 AD)

Evidence	EXTANT STRUCTURE
Main Building Material	CAST IRON

Description and Sources

Description

A cast iron milepost of hollow triangular section 19 1/2 inches wide and 12 inches deep to the front. The angled triangular front panel bears the original parish name of Stone Parish. The signage of the left hand side reads Sandon (1 1/4 miles), Weston (3 3/4 miles), Rugeley (11 1/2 miles), Lichfield (20 miles), London (138 miles). The signage of the right hand side reads Stone (3 miles), Newcastle (11 1/2 miles). The milepost was manufactured by Cochrane and Co, Dudley. (LF, 09-Mar-2007) <1>

Sources

(1) Written: John Higgins (The Milestone Society). 2000. Staffordshire Milestones (and Canal Milestones, Boundary Markers and Guide Posts). Milestone No. ST/SAD/05

Location

National Grid Reference

SJ 935 306 (point) SJ93SW Point

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Primary Record Number - 51339 Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities

EST1287 A survey by John Higgins of The Milestone Society of Staffordshire Milestones. (Event - Survey)

Associated Individuals/Organisations

Cochrane & Co, Dudley Manufacturer

PRN Number	Site Name	Record Type
51849 - MST13267	Home Farm / Sandon Hall Farm, Sandon Park	Monument

A late eighteenth century model farm complex that was part of the estate of Lord Harrowby.

Monument Types and Dates

MODEL FARM (Established, Georgian - 1782 AD)
Multi Yard Plan (Established, Georgian - 1782 AD)
Regular Courtyard Plan (Established, Georgian - 1782 AD)

Description and Sources

Description

A late eighteenth century model farm complex that was part of the estate of Lord Harrowby. The complex was designed by S. Wyatt and is an excellent example of a model farm on an axial layout. The farmhouse and farm buildings are both listed at Grade II. (LH, 13-Dec-2007) <1>

Laid out around several, regular courtyards. (SB, 22-Nov-2012) <2>

Sources

(1) Other Report: English Heritage. c.2007. Thematic Survey of Planned and Model Farms - Staffordshire. Page 16

(2) Digital Archive: Bob Edwards (Forum Heritage Services). 2008. Historic Farmsteads and Landscape Character in Staffordshire - GIS Data. 262533

Location

National Grid Reference

Centred SJ 9612 2841 (59m by 152m) SJ92NE Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Primary Record Number - 51849 Active

Ratings and Scorings - None recorded

Related Monuments

40111	Sandon Park	Geographical
07738	Home Farmhouse, Home Farm / Sandon Hall Farm, Sandon Park	Geographical
07739	Range of Outbuildings, Home Farm / Sandon Hall Farm, Sandon Park	Geographical

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
52558 - MST13991	Hardiwick Farm, Kiplass Lane, Sandon and Burston	Building

A farmstead of possible 16th century origin, located within a small hamlet and laid out around a regular, 'F' plan courtyard with additional detached outbuildings.

Monument Types and Dates

F Shape Plan (Established, (between) POST MEDIEVAL - 1500 AD to 1599 AD)

FARMSTEAD (Established, (between) POST MEDIEVAL - 1500 AD to 1599 AD)

Evidence DOCUMENTARY EVIDENCE

Evidence EXTANT BUILDING

Regular Courtyard Plan (Established, (between) POST MEDIEVAL - 1500 AD to 1599 AD)

Description and Sources

Description

A farmstead located within a small hamlet, laid out around a regular 'F' plan courtyard with additional detaching outbuildings and the farmhouse long side on to the yard. (SW, 17-02-2009) <1>

The listed farmhouse is of 17th century, timber-framed construction, although probably has an earlier core of 16th century date. (SW, 17-02-2009) <2>

The farmstead is still extant, with minor alterations and additions to its layout since the late 19th century. (17-02-2009) <3> <4>

Sources

(1) Digital Archive: Bob Edwards (Forum Heritage Services). 2008. Historic Farmsteads and Landscape Character in Staffordshire - GIS Data. 262493

(2) Designation Record: Department of the Environment. Ongoing. Listed Buildings of Special Architectural or Historical Importance (Green and Blue Backs).

(3) Cartographic: Ordnance Survey. 1875 - 1890. Ordnance Survey 1st Edition 6" maps.

(4) Aerial Photograph: 2006-2010. Aerial photosurvey of Staffordshire - 2006-2010.

Location

National Grid Reference

Centred SJ 94240 31700 (88m by 55m) SJ93SW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Primary Record Number - 52558 Active

Ratings and Scorings - None recorded

Related Monuments

07725	Hardwick Farmhouse, Kilplass Lane, Sandon and Burston	Geographical

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
52976 - MST14410	Hardiwick Grove Farm, Jolpool Lane, Sandon and Burtson	Monument

An isolated early 18th century farmstead laid out around a series of regular courtyards.

Monument Types and Dates

FARMSTEAD (Established, (Circa) POST MEDIEVAL - 1711 AD)
- Evidence DOCUMENTARY EVIDENCE
- Evidence EXTANT BUILDING

ORCHARD (Established, (Circa) POST MEDIEVAL - 1711 AD?)
- Evidence DOCUMENTARY EVIDENCE

Regular Courtyard Plan (Established, (Circa) POST MEDIEVAL - 1711 AD)

Description and Sources

Description

An isolated farmstead laid out around a series of regular courtyards. (SW, 05-05-2009) <1>

The farmhouse listed is fated to 1711, providing a possible relative date for the origin of the farmstead. (SW, 05-05-2009) <2>

The farmstead is still extant, although additional modern agricultural buildings have been added to the site. A possible orchard is shown immediately to the west of the farmhouse on 1st Edition Ordnance Survey mapping. (SW, 05-05-2009) <3> <4>

Sources

(1) Digital Archive: Bob Edwards (Forum Heritage Services). 2008. Historic Farmsteads and Landscape Character in Staffordshire - GIS Data. 262490

(2) Designation Record: Department of the Environment. Ongoing. Listed Buildings of Special Architectural or Historical Importance (Green and Blue Backs).

(3) Cartographic: Ordnance Survey. 1875 - 1890. Ordnance Survey 1st Edition 6" maps.

(4) Aerial Photograph: 2006-2010. Aerial photosurvey of Staffordshire - 2006-2010.

Location

National Grid Reference

Centred SJ 9405 3215 (87m by 136m) SJ93SW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Primary Record Number - 52976 Active

Ratings and Scorings - None recorded

Related Monuments

07726	Hardwick Grove, Jolpool Lane	Geographical

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
52977 - MST14411	Yewtree Farm, Sandon	Monument

A farmstead located within the hamlet of Sandon, laid out around a regular U-plan courtyard with farmhouse long side on to the yard. The farmstead is of probable late 18th century and is still extant, although with with new, larger scale agricultural buildings now added to the site.

Monument Types and Dates

FARMSTEAD (Built, (between) Georgian - 1765 AD to 1799 AD)

Evidence DOCUMENTARY EVIDENCE

Evidence EXTANT BUILDING

Regular Courtyard Plan (Built, (between) Georgian - 1765 AD to 1799 AD)

U SHAPE PLAN (Built, (between) Georgian - 1765 AD to 1799 AD)

Description and Sources

Description

A farmstead located within the hamlet of Sandon, laid out around a regular U-plan courtyard with farmhouse long side on to the yard. The farmstead is of probable late 18th century and is still extant, although with with new, larger scale agricultural buildings now added to the site. (SW, 07-05-2009) <1>

Sources

(1) Digital Archive: Bob Edwards (Forum Heritage Services). 2008. Historic Farmsteads and Landscape Character in Staffordshire - GIS Data. 262499

Location

National Grid Reference

Centred SJ 9467 3008 (71m by 53m) SJ93SW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Primary Record Number - 52977 Active

Ratings and Scorings - None recorded

Related Monuments

07728 Farmhouse, Yewtree Farm, Hilderstone Road, Sandon and Burston Geographical

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
53898 - MST17665	Burston Villa Farm, Burston	Monument

A farmstead probably associated with a mid 19th century corn mill (PRN 02240). The outbuilding ranges are laid out around a regular U-plan courtyard, and Burston Villa (PRN 07724) to the north may have functioned as the associated farmhouse. The outbuilding ranges are still extant, although may have been converted to residential accommodation.

Monument Types and Dates

FARMSTEAD (Established, (between) INDUSTRIAL to Victorian - 1836 AD? to 1885 AD?)

Evidence DOCUMENTARY EVIDENCE

Evidence EXTANT BUILDING

Regular Courtyard Plan (Established, (between) INDUSTRIAL to Victorian - 1836 AD? to 1885 AD?)

U SHAPE PLAN (Established, (between) INDUSTRIAL to Victorian - 1836 AD? to 1885 AD?)

Description and Sources

Description

A range of outbuildings laid out around a regular U-plan courtyard. Burton Villa, to the north, may have functioned as the 'farmhouse' to the mill and outbuildings. (SB, 12-Apr-2010) <1>

The outbuilding range is not shown on the 1" Ordnance Survey mapping of 1836, but is depicted on the late 19th century 1st Edition Ordnance Survey mapping in association with a corn mill. (SB, 12-Apr-2010) <2> <3>

The U-plan range of outbuildings is still extant, although may have been converted to residential accommodation. <4> <5>

Sources

(1) Digital Archive: Bob Edwards (Forum Heritage Services). 2008. Historic Farmsteads and Landscape Character in Staffordshire - GIS Data. 264376

(2) Cartographic: David & Charles (publisher). 1970. Ordnance Survey 1834-1836 1" maps. Sheet 34 - Stafford

(3) Cartographic: Ordnance Survey. 1875 - 1890. Ordnance Survey 1st Edition 6" maps.

(4) Aerial Photograph: 2000. Aerial photosurvey of Staffordshire - 1999 - 2001.

(5) Cartographic: Ordnance Survey. 2003 Onwards. OS Mastermap.

Location

National Grid Reference

Centred SJ 9327 3016 (97m by 83m) SJ93SW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Primary Record Number - 53898 Active

Ratings and Scorings - None recorded

Related Monuments

02240	Corn Mill, Burston	Geographical
07724	Burston Villa, Burston	Geographical

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
53899 - MST17666	Water Meadow, Aston by Stone	Monument

The earthwork remains of a part of a former post-medieval water meadow system on the River Trent at Aston by Stone. (See also PRNs 53168, 53900 and 53901).

Monument Types and Dates

WATER MEADOW (POST MEDIEVAL to Georgian - 1600 AD to 1799 AD)

Evidence	DOCUMENTARY EVIDENCE
Evidence	EARTHWORK

Description and Sources

Description

The earthwork remains of part of a former water-meadow field system on the River Trent. Aerial photography from the 1960s shows that upstanding earthworks with carriers survive across 10-50% of the total area of this part of the meadow. Further, very well preserved areas of water meadow survive to the north and south. (SB, 12-Apr-2010) <1> <2>

Sources

(1) Digital Archive: Paul Breeze (Birmingham Archaeology). 2008. Staffordshire Water Meadows Survey (GIS Data). GIS Feature Number 9

(2) Survey Report: Paul Breeze, Keith Challis and Mark Kincey (Birmingham Archaeology). 2008. Staffordshire Water Meadows Survey (Report). Page 14 and Pages 32-34

Location

National Grid Reference

Centred SJ 9251 3099 (1183m by 1230m) SJ93SW Dispersed

Administrative Areas

Parish	Sandon and Burston, Stafford Borough
Parish	Stone Rural, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Primary Record Number - 53899 Active

Ratings and Scorings - None recorded

Related Monuments

53168	Water Meadow, Aston Hall Farm, Stone	All Groups
53900	Water Meadow, Burston	All Groups
53901	Water Meadow, South of Burston	All Groups
54203	Water Meadow, Enson	All Groups
54204	Water Meadow, Sandon Bridge	All Groups

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
53900 - MST17667	Water Meadow, Burston	Monument

The well preserved earthwork remains of part of a former post-medieval water meadow system, located to the west of Burston. See also PRNs 53168, 53899 and 53901).

Monument Types and Dates

WATER MEADOW (POST MEDIEVAL to Georgian - 1600 AD to 1799 AD)

Evidence	DOCUMENTARY EVIDENCE
Evidence	EARTHWORK

Description and Sources

Description

The well preserved earthwork remains of part of a former water-meadow field system on the River Trent. Aerial photography from 2000 show that upstanding earthworks with carriers survive across over 50% of the total area of this part of the meadow. (SB, 12-Apr-2010) <1> <2>

Sources

(1) Digital Archive: Paul Breeze (Birmingham Archaeology). 2008. Staffordshire Water Meadows Survey (GIS Data). GIS Feature Number 77

(2) Survey Report: Paul Breeze, Keith Challis and Mark Kincey (Birmingham Archaeology). 2008. Staffordshire Water Meadows Survey (Report). Page 14

Location

National Grid Reference

Centred SJ 9308 3018 (558m by 666m) SJ93SW Dispersed

Administrative Areas

Parish	Sandon and Burston, Stafford Borough
Parish	Stone Rural, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Primary Record Number - 53900 Active

Ratings and Scorings - None recorded

Related Monuments

53168	Water Meadow, Aston Hall Farm, Stone	All Groups
53899	Water Meadow, Aston by Stone	All Groups
53901	Water Meadow, South of Burston	All Groups
54203	Water Meadow, Enson	All Groups
54204	Water Meadow, Sandon Bridge	All Groups

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
53901 - MST17668	Water Meadow, South of Burston	Monument

The earthwork remains of a part of a former post-medieval water meadow system on the River Trent at Aston by Stone. (See also PRNs 53168, 53899, 53900 and 54203).

Monument Types and Dates

WATER MEADOW (POST MEDIEVAL to Georgian - 1600 AD to 1799 AD)

Evidence	DOCUMENTARY EVIDENCE
Evidence	EARTHWORK

Description and Sources

Description

The earthwork remains of part of a former water-meadow field system on the River Trent. Aerial photography from the 1960s shows that upstanding earthworks with carriers survive across 10-50% of the total area of this part of the meadow. Further, very well preserved areas of water meadow survive to the north. (SB, 12-Apr-2010) <1> <2>

Some of the earthworks within this area were initially identified as part of a survey identifying ridge and furrow. (DAT, 11/01/2013) <3>

Sources

(1) Digital Archive: Paul Breeze (Birmingham Archaeology). 2008. Staffordshire Water Meadows Survey (GIS Data). GIS Feature Number 129

(2) Survey Report: Paul Breeze, Keith Challis and Mark Kincey (Birmingham Archaeology). 2008. Staffordshire Water Meadows Survey (Report). Page 14

(3) Drawn: Trent Valley Archaeological Research Committee (?). Unknown. 1:10 000 Overlays.

Location

National Grid Reference

Centred SJ 9389 2944 (1182m by 1015m) SJ92NW Dispersed

Administrative Areas

Parish Salt and Enson, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Primary Record Number - 53901 Active

Ratings and Scorings - None recorded

Related Monuments

53168	Water Meadow, Aston Hall Farm, Stone	All Groups
53899	Water Meadow, Aston by Stone	All Groups
53900	Water Meadow, Burston	All Groups
54203	Water Meadow, Enson	All Groups
54204	Water Meadow, Sandon Bridge	All Groups

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
54203 - MST17972	Water Meadow, Enson	Monument

The earthwork remains of a part of a former post-medieval water meadow system on the River Trent at Enson. The north-western area of earthworks were previously identified as lynchets (see PRN 04271).

Monument Types and Dates

WATER MEADOW (POST MEDIEVAL to Georgian - 1600 AD to 1799 AD)

(Alternate Type) RIDGE AND FURROW (MEDIEVAL - 1066 AD to 1485 AD)

Evidence EARTHWORK

(Former Type) LYNCHET (MEDIEVAL - 1066 AD? to 1485 AD?)

Evidence EARTHWORK

Description and Sources

Description

The earthwork remains of part of a former water-meadow field system on the River Trent. Aerial photography from the 1960s shows that upstanding earthworks with carriers survive across 10-50% of the total area of this part of the meadow. (SB, 04-11-2010) <1> <2>

Recent aerial photography indicates that some earthworks may still be extant. (SB, 04-11-2010) <3>

The earthworks in this area had also been identified in a survey to identify ridge and furrow from aerial photography (DAT 11/01/2013) <4>

Sources

(1) Digital Archive: Paul Breeze (Birmingham Archaeology). 2008. Staffordshire Water Meadows Survey (GIS Data). GIS Feature Number 104

(2) Survey Report: Paul Breeze, Keith Challis and Mark Kincey (Birmingham Archaeology). 2008. Staffordshire Water Meadows Survey (Report). Page 14

(3) Aerial Photograph: 2000. Aerial photosurvey of Staffordshire - 1999 - 2001.

(4) Drawn: Trent Valley Archaeological Research Committee (?). Unknown. 1:10 000 Overlays.

Location

National Grid Reference

Centred SJ 9431 2897 (451m by 189m) SJ92NW Dispersed

Administrative Areas

Parish Salt and Enson, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Primary Record Number - 54203 Active

Ratings and Scorings - None recorded

Related Monuments

53618	Former Forge Pool, Rugeley	All Groups
53899	Water Meadow, Aston by Stone	All Groups
53900	Water Meadow, Burston	All Groups
53901	Water Meadow, South of Burston	All Groups
54204	Water Meadow, Sandon Bridge	All Groups

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
54204 - MST17973	Water Meadow, Sandon Bridge	Monument

The earthwork remains of a part of a former post-medieval water meadow system on the River Trent at Sandon Bridge.

Monument Types and Dates

WATER MEADOW (POST MEDIEVAL to Georgian - 1600 AD to 1799 AD)

Description and Sources

Description

The earthwork remains of part of a former water-meadow field system on the River Trent. Aerial photography from the 1960s shows only partial survival of the water meadow, with only basic elements (such as the main heads and drains) surviving as earthworks. (SB, 04-11-2010) <1> <2>

More recent aerial photography indicates that survival of the earthworks may have deteriorated, with some features now only visible as cropmarks. (SB, 04-11-2010) <3>

Sources

(1) Digital Archive: Paul Breeze (Birmingham Archaeology). 2008. Staffordshire Water Meadows Survey (GIS Data). GIS Feature Number 179 / GIS Feature Number 103

(2) Survey Report: Paul Breeze, Keith Challis and Mark Kincey (Birmingham Archaeology). 2008. Staffordshire Water Meadows Survey (Report). Page 14

(3) Aerial Photograph: 2000. Aerial photosurvey of Staffordshire - 1999 - 2001.

Location

National Grid Reference

Centred SJ 9484 2873 (630m by 437m) SJ92NW Dispersed

Administrative Areas

Parish Salt and Enson, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Primary Record Number - 54204 Active

Ratings and Scorings - None recorded

Related Monuments

53168	Water Meadow, Aston Hall Farm, Stone	All Groups
53899	Water Meadow, Aston by Stone	All Groups
53900	Water Meadow, Burston	All Groups
53901	Water Meadow, South of Burston	All Groups
54203	Water Meadow, Enson	All Groups

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
55101 - MST18870	Stafford Lodges (South-West Lodge), Sandon Park	Building

One of a pair of listed early 20th century lodges to Sandon Hall. The lodges are in a restrained Jacobean style and are of ashlar construction with slate roofs and stone stacks.

Monument Types and Dates

LODGE (Built, Edwardian - 1902 AD)

Evidence	EXTANT BUILDING
Main Building Material	ASHLAR
Main Building Material	SLATE
Main Building Material	STONE

Description and Sources

Description - None recorded

Sources - None recorded

Location

National Grid Reference

Centred SJ 9489 2927 (10m by 11m) SJ92NW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations

Listed Building (II) - 1374209	Stafford Lodges (2 tenements)	Active	DST3015

Other Statuses and Cross-References

Primary Record Number - 55101	Active
Former Primary Record Number - 07742	Revoked

Ratings and Scorings - None recorded

Related Monuments

40111	Sandon Park	Geographical

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
55315 - MST19084	Ridge and Furrow, South of Burston	Monument

The earthwork remains of medieval ridge and furrow, identified on aerial photography to the south of Burston.

Monument Types and Dates

RIDGE AND FURROW (MEDIEVAL - 1066 AD to 1485 AD)
Evidence EARTHWORK

Description and Sources

Description

Ridge and furrow identified on aerial photography. <1> <2>

Sources

(1) Aerial Photograph: Hunting Surveys Ltd. 1963. 1963 Aerial Photography. Run 27 - 0730

(2) Drawn: Trent Valley Archaeological Research Committee (?). Unknown. 1:10 000 Overlays.

Location

National Grid Reference

Centred SJ 9441 2957 (117m by 153m) SJ92NW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Primary Record Number - 55315 Active
Former Primary Record Number - 20402 Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

PRN Number	Site Name	Record Type
55869 - MST19986	Toll House, Sandon Gate, Sandon and Burston	Building

A surviving 19th Century Toll House, by the A51 in the Parish of Sandon and Burston.

Monument Types and Dates

TOLL HOUSE (Built, (between) INDUSTRIAL to Victorian - 1800 AD to 1899 AD)
Evidence EXTANT BUILDING

Description and Sources

Description

A surviving 19th Century former Toll House, situated on the A51, in the Parish of Sandon and Burston. (HP, 10-Oct-2013) <1>

Sources

(1) Index: The Milestones Society. 2013. Staffordshire Milestones, Boundstones, Fingerposts and Tollhouses Database. ST.SAN

Location

National Grid Reference

Centred SJ 9473 2965 (9m by 8m) SJ92NW Dispersed

Administrative Areas

Parish Sandon and Burston, Stafford Borough

Designations, Statuses and Scoring

Associated Legal Designations - None recorded

Other Statuses and Cross-References

Primary Record Number - 55869 Active

Ratings and Scorings - None recorded

Related Monuments - None Recorded

Finds - None recorded

Associated Events/Activities - None recorded

Associated Individuals/Organisations - None recorded

3.0 – Sandon and Burston Parish Socio-Economic Data

3.1 – Travel to Work Data

Method of Travel to Work

All categories: Method of travel to work	273
Work mainly at or from home	29
Underground, metro, light rail, tram	1
Train	2
Bus, minibus or coach	0
Taxi	0
Motorcycle, scooter or moped	0
Driving a car or van	125
Passenger in a car or van	8
Bicycle	5
On foot	28
Other method of travel to work	2
Not in employment	73

3.2 – Dwellings and Household Space

Dwelling Type

All categories: Dwelling type	177
Unshared dwelling	177
Shared dwelling: Two household spaces	0
Shared dwelling: Three or more household spaces	0
Household spaces with at least one usual resident	158
Household spaces with no usual residents	19
Whole house or bungalow: Detached	106
Whole house or bungalow: Semi-detached	39
Whole house or bungalow: Terraced (including end-terrace)	23
Flat, maisonette or apartment: Purpose-built block of flats or tenement	0
Flat, maisonette or apartment: Part of a converted or shared house (including bed-sits)	7
Flat, maisonette or apartment: In a commercial building	2
Caravan or other mobile or temporary structure	0

3.3 – Resident Population

Variable	
All usual residents	361
Males	177
Females	184

3.4 – Household Spaces

Household Size	
All categories: Household size	158
1 person in household	45
2 people in household	60
3 people in household	26
4 people in household	18
5 people in household	8
6 people in household	1
7 people in household	0
8 or more people in household	0

3.5 – Tenure Households

Tenure	
All categories: Tenure	158
Owned: Total	72
Shared ownership (part owned and part rented)	0
Social rented: Total	2
Private rented: Total	69
Living rent free	15

3.6 – Household Composition

Household Composition

All categories: Household composition	158
One person household: Total	45
One person household: Aged 65 and over	19
One person household: Other	26
One family only: Total	109
One family only: All aged 65 and over	15
One family only: Married couple: Total	79
One family only: Same-sex civil partnership couple: Total	0
One family only: Cohabiting couple: Total	6
One family only: Lone parent: Total	9
Other household types: Total	4
Other household types: With one dependent child	1
Other household types: With two or more dependent children	1
Other household types: All full-time students	0
Other household types: All aged 65 and over	1
Other household types: Other	1

3.7 – Residence Type

Residence Type

residence type	All categories: Residence type	361
residence type	Lives in a household	361
residence type	Lives in a communal establishment	0

3.8 – Accommodation Type

Dwelling Type

All categories: Accommodation type	158
Unshared dwelling: Total	158
Unshared dwelling: Whole house or bungalow: Total	153
Unshared dwelling: Flat, maisonette or apartment: Total	5
Unshared dwelling: Caravan or other mobile or temporary structure	0
Shared dwelling	0

3.9 – Population Density and Area

Area/Population Density

All usual residents	361
Area Hectares	1621.06
Density (number of persons per hectare)	0.2

QS701EW - Method of travel to work

population	All usual residents aged 16 to 74
units	Persons
date	2011
rural urban	Total

Method of Travel to Work	E04008984 : Barlaston	E04008991 : Colwich	E04008993 : Eccleshall	E04008999 : Gnosall
All categories: Method of travel t	2,003	3,455	3,551	3,539
Work mainly at or from home	102	207	286	198
Underground, metro, light rail, tr	0	2	1	1
Train	13	44	23	50
Bus, minibus or coach	23	49	36	77
Taxi	6	1	0	2
Motorcycle, scooter or moped	12	10	15	12
Driving a car or van	949	1,741	1,598	1,764
Passenger in a car or van	90	102	68	113
Bicycle	21	24	17	18
On foot	56	108	232	131
Other method of travel to work	4	7	11	14
Not in employment	727	1,160	1,264	1,159

In order to protect against disclosure of personal information, records have been swapped between different

E04009015 : Hixon	E04009010 : Sandon and Burston
1,404	273
58	29
0	1
8	2
16	0
0	0
6	0
772	125
41	8
6	5
84	28
5	2
408	73

t geographic areas. Some counts will be affected, particularly small counts at the lowest geographies.

KS401EW - Dwellings, household spaces and accommodation type

population	All dwellings; all household spaces
units	Household spaces and Dwellings
date	2011
rural urban	Total

Dwelling Type	E04008984 : Barlaston	E04008991 : Colwich	E04008993 : Eccleshall	E04008999 : Gnosall
All categories: Dwelling type	1,254	1,987	2,116	2,114
Unshared dwelling	1,254	1,987	2,115	2,114
Shared dwelling: Two household	0	0	1	0
Shared dwelling: Three or more	0	0	0	0
Household spaces with at least	1,208	1,946	2,011	2,048
Household spaces with no usual	46	41	106	66
Whole house or bungalow: Deta	448	1,051	1,158	1,213
Whole house or bungalow: Sem	496	569	567	631
Whole house or bungalow: Terra	184	238	191	142
Flat, maisonette or apartment: P	107	100	134	92
Flat, maisonette or apartment: P	10	15	33	13
Flat, maisonette or apartment: In	9	12	32	20
Caravan or other mobile or temp	0	2	2	3

In order to protect against disclosure of personal information, records have been swapped between different

E04009015 : Hixon	E04009010 : Sandon and Burston
799	177
799	177
0	0
0	0
774	158
25	19
462	106
239	39
70	23
15	0
6	7
5	2
2	0

t geographic areas. Some counts will be affected, particularly small counts at the lowest geographies.

KS101EW - Usual resident population

population	All usual residents
units	Persons
date	2011
rural urban	Total

Variable	E04008984 : Barlaston	E04008991 : Colwich	E04008993 : Eccleshall	E04008999 : Gnosall
All usual residents	2,858	4,528	4,651	4,736
Males	1,379	2,219	2,181	2,354
Females	1,479	2,309	2,470	2,382

In order to protect against disclosure of personal information, records have been swapped between different

E04009015 : Hixon	E04009010 : Sandon and Burston
1,917	361
926	177
991	184

t geographic areas. Some counts will be affected, particularly small counts at the lowest geographies.

QS406EW - Household size

population	All household spaces with at least one usual resident
units	Household spaces
date	2011
rural urban	Total

Household Size	E04008984 : Barlaston	E04008991 : Colwich	E04008993 : Eccleshall	E04008999 : Gnosall
All categories: Household size	1,208	1,946	2,011	2,048
1 person in household	336	462	594	549
2 people in household	482	845	826	818
3 people in household	187	316	291	318
4 people in household	134	250	208	256
5 people in household	50	56	67	83
6 people in household	15	14	23	20
7 people in household	3	3	2	4
8 or more people in household	1	0	0	0

In order to protect against disclosure of personal information, records have been swapped between different

E04009015 : Hixon	E04009010 : Sandon and Burston
774	158
193	45
288	60
130	26
122	18
29	8
7	1
4	0
1	0

t geographic areas. Some counts will be affected, particularly small counts at the lowest geographies.

QS405EW - Tenure - Households

population	All households
units	Households
date	2011
rural urban	Total

Tenure	E04008984 : Barlaston	E04008991 : Colwich	E04008993 : Eccleshall	E04008999 : Gnosall
All categories: Tenure	1,208	1,946	2,011	2,048
Owned: Total	847	1,615	1,537	1,653
Shared ownership (part owned a	0	14	9	0
Social rented: Total	237	147	163	180
Private rented: Total	102	148	272	178
Living rent free	22	22	30	37

In order to protect against disclosure of personal information, records have been swapped between different

E04009015 : Hixon	E04009010 : Sandon and Burston
774	158
650	72
5	0
74	2
36	69
9	15

t geographic areas. Some counts will be affected, particularly small counts at the lowest geographies.

QS405EW - Tenure - Households

population	All households
units	Households
date	2011
rural urban	Total

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E04009015 : Hixon	E04009010 : Sandon and Burston
774	158
650	72
5	0
74	2
36	69
9	15

t geographic areas. Some counts will be affected, particularly small counts at the lowest geographies.

QS113EW - Household composition - Households

population	All households
units	Households
date	2011
rural urban	Total

Household Composition	E04008984 : Barlaston	E04008991 : Colwich	E04008993 : Eccleshall	E04008999 : Gnosall
All categories: Household compo	1,208	1,946	2,011	2,048
One person household: Total	336	462	594	549
One person household: Aged 65	190	243	297	286
One person household: Other	146	219	297	263
One family only: Total	840	1,422	1,346	1,424
One family only: All aged 65 and	163	246	270	239
One family only: Married couple:	477	867	807	861
One family only: Same-sex civil	0	2	2	0
One family only: Cohabiting cou	120	175	136	185
One family only: Lone parent: To	80	132	131	139
Other household types: Total	32	62	71	75
Other household types: With one	14	20	9	12
Other household types: With two	2	11	14	8
Other household types: All full-ti	1	0	0	1
Other household types: All aged	0	3	6	10
Other household types: Other	15	28	42	44

In order to protect against disclosure of personal information, records have been swapped between different

E04009015 : Hixon	E04009010 : Sandon and Burston
774	158
193	45
96	19
97	26
559	109
72	15
357	79
2	0
79	6
49	9
22	4
8	1
5	1
0	0
0	1
9	1

t geographic areas. Some counts will be affected, particularly small counts at the lowest geographies.

QS101EW - Residence type

population	All usual residents; communal establishments with persons sleeping rough
units	Communal establishments and Persons
date	2011
residence type	All categories: Residence type

Rural Urban	E04008984 : Barlaston	E04008991 : Colwich	E04008993 : Eccleshall	E04008999 : Gnosall
Total	2,858	4,528	4,651	4,736

In order to protect against disclosure of personal information, records have been swapped between different

QS101EW - Residence type

population	All usual residents; communal establishments with persons sleeping rough
units	Communal establishments and Persons
date	2011
residence type	Lives in a household

Rural Urban	E04008984 : Barlaston	E04008991 : Colwich	E04008993 : Eccleshall	E04008999 : Gnosall
Total	2,766	4,485	4,438	4,726

In order to protect against disclosure of personal information, records have been swapped between different

QS101EW - Residence type

population	All usual residents; communal establishments with persons sleeping rough
units	Communal establishments and Persons
date	2011
residence type	Lives in a communal establishment

Rural Urban	E04008984 : Barlaston	E04008991 : Colwich	E04008993 : Eccleshall	E04008999 : Gnosall
Total	92	43	213	10

In order to protect against disclosure of personal information, records have been swapped between different

identified

E04009015 : Hixon	E04009010 : Sandon and Burston
1,917	361

t geographic areas. Some counts will be affected, particularly small counts at the lowest geographies.

identified

E04009015 : Hixon	E04009010 : Sandon and Burston
1,870	361

t geographic areas. Some counts will be affected, particularly small counts at the lowest geographies.

identified

E04009015 : Hixon	E04009010 : Sandon and Burston
47	0

t geographic areas. Some counts will be affected, particularly small counts at the lowest geographies.

QS402EW - Accommodation type - Households

population	All households
units	Households
date	2011
rural urban	Total

Dwelling Type	E04008984 : Barlaston	E04008991 : Colwich	E04008993 : Eccleshall	E04008999 : Gnosall
All categories: Accommodation t	1,208	1,946	2,011	2,048
Unshared dwelling: Total	1,208	1,946	2,009	2,048
Unshared dwelling: Whole hous	1,088	1,826	1,842	1,936
Unshared dwelling: Flat, maison	120	119	165	110
Unshared dwelling: Caravan or	0	1	2	2
Shared dwelling	0	0	2	0

In order to protect against disclosure of personal information, records have been swapped between different

E04009015 : Hixon	E04009010 : Sandon and Burston
774	158
774	158
752	153
21	5
1	0
0	0

t geographic areas. Some counts will be affected, particularly small counts at the lowest geographies.

QS102EW - Population density

population	All usual residents
units	Persons
date	2011
rural urban	Total

Area/Population Density	E04008984 : Barlaston	E04008991 : Colwich	E04008993 : Eccleshall
All usual residents	2,858	4,528	4,651
Area Hectares	1,219.31	2,862.18	7,403.95
Density (number of persons per hectare)	2.3	1.6	0.6

In order to protect against disclosure of personal information, records have been swapped between

E04008999 : Gnosall	E04009015 : Hixon	E04009010 : Sandon and Burston
4,736	1,917	361
3,776.94	733.12	1,621.06
1.3	2.6	0.2

different geographic areas. Some counts will be affected, particularly small counts at the lowest geograp

hies.

SANDON AND BURSTON PARISH COUNCIL

HOUSING NEEDS SURVEY REPORT

JULY 2010

RAHP *consultancy*

SANDON AND BURSTON PARISH COUNCIL

HOUSING NEEDS SURVEY REPORT

JULY 2010

RAHP *consultancy*

SANDON AND BURSTON PARISH COUNCIL

Table of Contents of Housing Needs Survey Report

EXECUTIVE SUMMARY: SANDON AND BURSTON HOUSING NEEDS SURVEY

Key Features and Main Outcomes

1. The parish has an unusual property tenure profile due to the large number of estate-owned private rented properties. But also there are few smaller, cheaper homes either to buy: there is a low turnover of open market and other stock partly due to their being a higher than average ageing population under-occupying larger houses. There is no housing association or local authority housing.

2. House prices are high in relation to the incomes of those in need: the cheapest or entry-level house sold in parts of the Parish in the past two years was a cottage for £114,000 but even this was unaffordable to local residents in need based on their incomes.

3. The survey has identified and recommended the need for a small scheme of 4 housing association homes for local people who need a home now or in the next few years, the need being for 2 and 3 bed units.

.

4. The proposed scheme should be a mix of 2 rented and 2 shared ownership homes.

5. Respondents cited 5 family members having recently moved away from the parish because they could not find a suitable home.

6 . Wanting to set up an independent first home, family break-up, needing a smaller home and property condition were all cited as reasons for needing housing.

7 .None of those households in need is on the Housing Register.

8. The majority (80%) of those in need have a household income of less than £16,000 per year.

9. All of the households recommended as eligible for the proposal have a strong local connection, ie live in the parish.

10. A strong majority, 73%, of all respondents would support the idea of building a small affordable housing scheme for local people in the parish.

11. The location and design of any proposal were seen as critical issues.

12. All households in the parish were surveyed to assess local housing need: a very good response rate of 26% was achieved.

SANDON AND BURSTON PARISH COUNCIL; Housing Needs Survey

July 2010

SURVEY REPORT

SECTION ONE: BACKGROUND AND GENERAL INFORMATION

Introduction

1.1 Following a presentation to the Parish Council February 2010, the Parish Council commissioned Housing Plus to carry out a Housing Needs Survey to determine whether or not there is a need for affordable housing for local people in the Parish.

1.2 The motivation and reason for the survey is best expressed perhaps by the following extract from the Parish Council's covering letter which was sent along with the survey questionnaire:

> *Provision of Affordable Housing could help local people of all ages to remain in the community when the necessity arises…It is an important issue for all communities with the limited opportunities for housing development in rural areas…*

1.3 The survey and this report has been conducted and produced by RAHP consultancy without the Borough Council officers, Housing Association officers or Parish Council members having had sight of any data or had any input into the content of the report. Thus the report and the findings are an independent and impartial commentary based on the evidence collected.

1.4 The survey has been carried out at no financial cost to the Parish Council. The survey was funded by Housing Plus as part of its remit to explore the need for affordable housing in certain parts of rural Staffordshire.

1.5 This survey is the most comprehensive study of housing need undertaken in the Parish. Whilst some households will already be on the Council Housing Register, many may not be included on existing records of need. This survey also raises awareness of housing issues facing local people and gave respondents space to express their views on local housing issues.

1.6 The findings in this report are based on the survey only. They should be read in conjunction with other Borough-wide housing needs surveys, the housing market assessment, affordable housing and planning policies (www.staffordbc.gov.uk) to place the conclusions in a district-wide, sub-regional and regional context.

1.7 For a wider overview of the national rural housing problem, reference should be made to the findings and recommendations of the Government's Affordable Rural Housing Commission Final Report, May 2006 (www.defra.gov.uk) and the Matthew Taylor Report (www.clg.gov.uk).

2. Survey Purpose and Methodology

2.1 The purpose of the survey was to acquire detailed information about the current housing situation and the numbers and types of households in housing need and to find out what kind of alternative housing they were seeking. Also, it gave people an opportunity to express their views on what was or was not needed.

2.2 Although based on a core questionnaire, the survey form (a copy is appended to the report) was agreed by the Parish Council in its final form before distribution. The survey form was divided into two parts: Part 1 collected general information about the respondent's household and Part 2 was for completion by those in housing need. Also the questionnaire included an explanatory section on what is meant by affordable housing as it can be provided by housing associations together with a case study of a previous beneficiary now living in a home on a small rural exception site.

2.3 An important element in the design of the form was to reveal what is called hidden or concealed households, people who cannot afford to be in the housing market and are living within another household.

2.4 The forms were posted to all households in the Parish using address data from the Council Tax Register. They were returned in prepaid freepost envelopes to Housing Plus and forwarded unopened to RAHP for analysis.

2.5 The data processing was carried out by RAHP research assistants.

2.6 As the questionnaires went to 100% of households, this is a total or census survey rather than a sample survey. This methodology is that recommended* as being appropriate for rural areas in that from the usual borough-wide sample surveys, rural wards are grouped together and as such it is not possible to disaggregate information for individual villages or parishes. There is a presumption (*Source: A Guide to Housing Needs Assessment, IOH 1993*) that there will be a greater response from those in need using this methodology. The results are presented as found (no figures have been 'grossed up').

*Assessing Housing Need in the South East – A Good Practice Guide (SEERA 2004)

2.7 It should be noted that a few respondents did not answer all the questions asked. Percentages quoted are based on responses received for that particular question.

2.8 It is possible; indeed likely, that a degree of housing need occurs within the households that did not respond to the questionnaire and therefore the need identified in this report could be an under-representation of the real situation. The actual figures from the survey can be classed as demonstrable need.

2.9 Some information has also been cross-referenced to the Census, the HM Land Registry parish-based data from web-based sites and the Office of National Statistics.

2.10 It is hoped that this report is clear and readable. But some terms have differing definitions, not least '*What is affordable housing?'*

We have used

Housing provided with subsidy so the asking price or rent can be substantially lower than prevailing local market prices or rents, ensuring it stays affordable for those who cannot afford market housing.

The terms house and housing used in this report refers to all types of residential property including flats, bungalows, sheltered accommodation etc unless otherwise stated.

3. Response to Survey

3.1 Of the 170 questionnaires distributed, 45 were processed, a 26% response. The response rate is very good for such a survey and is large enough to have good statistical validity.

Population figures from the Census update of 2004 show that about 363 people live in the Parish with an average household size of 2.39. The 170 forms distributed equate to the Council Tax Register records for the number of households, validating this as a 100% survey. The 45 survey forms returned represent a survey population of 103 people giving an average household size of 2.29 people which equates well with the total Parish average from the Census update, again validating this as a representative survey.

3.2 The following sections of the report analyse the key features and present the key findings from the data analysis. Appendix I is a copy of the survey form and the Parish Council's covering letter.

3.3 The survey was carried out for three weeks in June before the questionnaire return date of June 28th, 2010. The date was extended for a further two weeks to allow for late returns before data processing and analysis commenced.

SECTION TWO: THE SURVEY FINDINGS

4. Current Housing Situation – Key Features

4.1 Part 1 of the questionnaire was completed by all households whether or not there was any housing need so as to build up a picture of the current housing situation.

The Population

4.2 The 45 households replying to the survey contain a total population of 103 of which 14% are children aged less than 15, 9% are aged 16-24, 14% aged 25-44, 36% aged 44-65, with the remaining 27% over 65. Making a broad comparison with some national figures – 20% under 15 and 16% over 65 for 2003 (source: Office of National Statistics www.statistics.gov.uk), the conclusion is that the Parish has less young people and significantly more elderly people than the national average.

Based on the survey information, the key changes since the last census are that the numbers of children and young adults have fallen by 2% while the percentage of over 65's have risen by 12%.

The overall profile depicted for the parish is similar to that profiled for rural villages in The State of the Countryside Report 2009 (Commission for Rural Communities), where the out-migration of younger people partly due to lack of affordable housing and un-affordability of market housing, and the in-migration of affluent families and retiring older people and an ageing resident population is apparent.

The Housing Stock and Tenure

4.3 All of the housing stock is houses (87%) or bungalows (7%) with a further 6% describing their homes as cottages or barn conversions. Of this stock 93% is 3 or 4 bedroom accommodation with only 7% as 2 bedroom homes. With the demographic trend towards smaller households, the lack of 1 and 2 bed units will make it difficult for younger people in particular, whether single, couples, small families as first-time buyers or those on lower incomes to enter the housing market either by affordability or lack of supply: none of the homes in the survey are 1 bed units. Despite the number of larger houses, a significant number are occupied by one or two people: these tend to be 'empty-nesters' – people whose children have grown-up and left leaving under-occupying parents.

4.4 The tenure profile for the parish is very unusual. A total 62% of respondents are owner-occupiers, with a highly significant percentage (67% of that figure) owned outright without a mortgage, typical of an older population, reinforcing the issues as highlighted above. But the private rented sector and tied accommodation, mostly through private estate ownership, represents the rest of the tenures (38%) and probably presents limited opportunities for those on lower incomes unable to access the open

market or to rent within the parish, private sector rents being significantly higher than for local authority or housing association homes of which there are none in the parish.

Property Turnover

4.5 The question on length of residency shows that 64% of respondents have lived in the parish for over 10 years with a further 11% of households being resident for 5-10 years. This represents a stable community, a low level of development and a low turnover of property. If this low availability of property is added to the poor potential supply of smaller units as indicated above, the possibilities for local people on lower incomes who wish to remain in the parish, or indeed those who may wish to return, appear very limited. The analysis of local affordability in a following section will amplify this problem.

Housing Need and Out-Migration

4.6 The survey data shows that there are 5 respondents (representing 12 people) with someone needing a different type of accommodation now or within the next 3 years. All of these households completed Part 2 of the form as wanting to remain in the parish.

4.7 Directly connected to the above, respondent households report 5 family members having had to move from the Parish due to difficulties in finding a suitable home locally in the last two years. This represents some out-migration and is indicative of a lack of affordable housing to rent or buy. Given the very low percentage of the survey population aged 16-24, only 9%, and this being the age group most likely to be looking for their first home, and an affordable home, there is an indication here that this is a trend which the Parish Council may wish to address: the housing needs analysis in detail below will further justify this.

5. Level of Support for a Small Development of Affordable Housing

5.1 One of the purposes of the report was to establish the level of local support for a possible new scheme. Question 6 on the questionnaire asked: "*Would you support a small development of affordable housing in the Parish if there was a proven need from households in the Parish or with a genuine local connection?"*

All 45 respondents answered the question.

73% said 'Yes': 27% said 'No'.

5.2 Numerically, this represents a very strong majority who would support the Parish Council if a small development were needed. But many respondents backed up their decision by adding comments and I have included these as verbatim transcripts in Appendix II.

I have made no judgement nor attempted to attach any weight to these findings either way, preferring to leave such local opinion to be considered by the Parish Council.

6. Housing Need

6.1 Part 1 asked households if they or anyone living within the household needed separate accommodation now or in the near future. Some 5 respondents completed the question with all of those respondents completing most of Part 2 as needing a new home in the next three years and wishing to live in the parish. What follows analyses the needs and situations of those households;

Local Connection

6.2 Of those respondents completing Part 2, 4 were completed by themselves as being in need and one was completed on behalf of family members needing separate accommodation.

It is worth emphasising here that strong local connection criteria would be rigidly enforced should a scheme be proposed and advanced.

6.3 In addition, as indicated in 4.7 above, survey responses identified 5 people that have moved away in the past two years because of difficulties finding a suitable home. It is not known whether these people are still in housing need or they may have settled into alternative accommodation elsewhere.

Current Tenure

6.4 In terms of the current tenure of those households in need, 1 is living within a home owned or rented by their parents, a concealed household, 1 owns their own home and a further 3 households rent from a private landlord.

Preferred Tenure

6.5 Of preferred tenure of first choice, 2 would prefer to rent from a housing association, 2 require shared ownership but also expressed an equal preference to buy on the open market. Private rented accommodation is a first choice for 1 household.

It would seem that a preference for buying on the open market does not reflect an air of reality in terms of financial capacity. The following section on affordability will echo and demonstrate that most who aspire to open market purchase can often, at best only afford shared ownership.

Households on the Housing Register

6.6 None of the Part 2 respondents is already on the Housing Register. Should any other households wish to qualify for any possible future scheme, they would need to go on the Housing Register.

The Housing Register process in the Borough currently does not identify need by local connection. Close examination of their data may reveal other households who may qualify.

Household Composition

6.7 In terms of household composition, for the 5 households completing part 2 of this question, there is 1 single person over 60; 1 couple under 60; 1 family with children and 2 single parent families.

Reasons Accommodation Needed

6.8 The main reasons for needing to move fall into several categories with wanting to start a first home, needing a smaller home, to be nearer family and family break up all given in equal measure as significant reasons for needing a new home. Several comments regarding the state of repair of private rented property and high rents on such were also cited.

Size of Accommodation Required

6.9 In terms of the size of accommodation required, one 1-bed, one 2-bed and three 3-bed homes are required with seven children in the latter family homes.

6.10 One household would require special care or support because of a mental health or learning disability.

7. Affordability

7.1 It is best perhaps to approach this issue by revisiting the preferred tenure of those in housing need, and comparing this to financial information provided.

Rent

7.2 For the households which would prefer to rent from a housing association, the spectrum of rents for a 1-bed to a 3-bed unit would lie from £50 - £150 per week: from the financial information provided the households wanting this form of tenure could afford this

Shared Ownership

7.3 Some 3 households indicated an interest in shared ownership and it maybe that 2 households could be eligible for shared ownership housing as they may have a sufficient deposit. But most households in need (80%) have a gross income of less than £16,000 per year. This figure is well below the generally accepted threshold, £26,000, above which a household might be considered to be financially eligible for a shared ownership property, usually taking out a mortgage on 40% of the equity as an entry level and paying rent on the balance (based on 40% of a home valued at £200,000).

Open Market

7.4 For those households expressing an interest to buy on the open market as a preferred first option, the issues in Sandon and Burston are as follows.

Using HM Land Registry data on parish house sales (www.nethouseprices.com), using the relevant postcode areas, for the two years to February 2010 there were no sales, reflecting the national economic downturn. In 2008, based on three sales, the average house price was £364,000. In March 2010, a cottage was sold for £114,000.

So taking the cheapest house sold, i.e. what would be the open market entry level price, assuming a 95% mortgage at 3.5 joint income (although it is recognised that in the current mortgage lending climate such a deal may not be available with higher deposits being required), a household would need a gross income of around £31,000 and a deposit of £6,000 to afford the latter property.

Of the survey respondents, 2 households may have such savings or equity for a deposit but only 1 the required income – to repeat the above figure, 80% of those in need have a household income of less than £16,000 per year. So for most households preferring to buy on the open market, the prospect is that most will be unable to do so and the options are that they will need to consider moving to a cheaper area, staying in their existing home or investigating a different tenure such as renting or shared ownership. Local house prices and the supply of houses on the open market clearly present a gap

between aspiration and attainment for those in need who wish to buy on the open market.

Economic Status and Travel

7.5 All households have someone in work and all travel to work by car.

SECTION THREE: THE WAY FORWARD

8. Conclusions

8.1 Though most households are satisfied with their housing situation, there is a demonstrable unmet housing need from local people for 4 units of affordable housing as quantified below.

8.2 The unmet need is a product of a low turnover of relatively large expensive open market housing in the parish which excludes those local people on lower incomes from gaining access to this market should they wish to stay in the parish. Some 80% of households in need have average incomes of less than £16,000 which represents a problem in an area of high property values. There is no affordable social rented housing or for shared ownership to meet the need. The only other choice in the parish is private renting of estate-owned property.

8.3 There is a very strong overall majority (73%) level of support for a small scheme from the local community to satisfy this need for affordable housing for local people in the parish.

8.4 Of the 5 households expressing a housing need, one only indicated a preference for open market housing and as this is cannot be provided by a housing association, I have concluded that a scheme of 4 homes should be considered.

8.5 Based on the financial information provided, 2 shared ownership homes are recommended and such provision would provide the opportunity for these households to get on the so-called housing ladder. The reservation to this recommendation is that further financial scrutiny would be needed should any proposal be advanced.

8.6 There are several reasons for needing accommodation and equal regard should be given to the reasons as detailed in paragraph 6.8 above.

8.7 The size of the proposed affordable housing scheme is given below. But explanation is needed in that although one unit as a 1 bed unit was required, Housing Plus are reluctant to develop such units because providing 2 bed units allows for more flexibility. For example, a young couple in a one bed unit may subsequently have a family thus requiring a two bed home; hence the preference for developing two bed homes removes the need for subsequent transfers due to overcrowding.

8.8 Given all the factors in this report, an affordable housing scheme for local people as detailed below would be appropriate for families with children, couples and single people, subject to planning and funding implications:

Proposal: 4 affordable homes for local people

Sizes: 2 x 2-bed (one rented and one shared ownership)
2 x 3-bed (one rented and one shared ownership)

8.9 It could be considered that a scheme of the above size would not have too significant an impact on either Sandon or Burston were it well-sited and well-designed, and would not have too large an impact on the physical landscape (currently 3 of those in need live in Sandon and one in Burston).

8.10 It should also be remembered that a housing needs survey is only a snapshot of the given need at any one time and while the scale of need is not likely to change, by the time any possible future scheme is likely to be achieved, the mix and size of units would need to be cross-referenced with the Council Housing Register to show emerging need with a local connection at that time.

9. Recommendations

9.1 It is recommended that the Parish Council consider advancing the process to achieve an additional small scheme of affordable housing as proposed above by:

1. Accepting the findings of this report

2. Engaging with the Council and Housing Plus to explore the potential for programming such a scheme and funding by the Homes and Communities Agency.

3. With Housing Plus, exploring potential locations and availability of any sites which the Parish Council may think appropriate.

John Lancaster
Director
RAHP consultancy

July 2010

www.rahpconsultancy.com
thelancasters54@btinternet.com
02392 864122

Appendix II

Residents' Views on Affordable Housing

Yes

- Small flats for elderly to free other accommodation
- It should be every British person's right to have an affordable home and not be forced into buying a roof over their heads with prices set by greedy developers, estate agents and house sellers. People should be able to rent properties from the local council or housing association which the average wage can cover and not be forced into negative equity and despair at the whim of the interest rate. A rented property also gives young couples a chance to save and make proper decisions on buying a house if that is their wish, not forced into it because that's the only way they can get a house. This must be the only country in Europe that houses the population by private development - a realignment of properties is long overdue, something successive governments have not had the guts to do since the demise of Margaret Thatcher.
- Definitely. In a grace and favour village like Sandon it is important that homes are available for the children of tenant farmers otherwise the village will die.
- Infilling empty spaces
- I would like to rent a more affordable home as a single mother of two. I currently rent from the Harrowby Estate but the properties are very run down and the rent is quite high. The maintenance of the properties is of a very low level.
- Our daughter and her partner would like to live nearby but at present cannot afford a property.
- Yes, for older residents.

No

- I don't feel that the parish has suitable amenities to support further residents
- No development in Burston
- Any building development in the village spoils the unique qualities that we moved here for in the first place, ie small, quiet hamlet.
- The A51 is busy enough as it is without more cars using it as a result of more housing being built in the area.
- Burston and Sandon are both small villages with few young people. I do not believe that there are many if any who need affordable housing. Burston has two properties in the village on sale for 2 years and are both affordable by today's standards.

5.0 - Project 12 – RAB Consultants Burston Hall FRA of May 2009, including Hydraulic Modelling and Watercourse Section Surveys of Jolpool Brook.

Burston Hall
Flood Risk Assessment

May 29, 2009
Version 1.0
Ref: RAB 139

Mr J Donnelly
Burston Hall
Burston
Staffordshire
ST18 0DR

RAB CONSULTANTS
FLOOD RISK AND INCIDENT MANAGEMENT
LICHFIELD BUSINESS VILLAGE, THE FRIARY, LICHFIELD, STAFFORDSHIRE WS13 6QG
PHONE: 01543 308631 FAX: 01543 308633
EMAIL: enquiries@rabconsultants.co.uk
WEBSITE: www.rabconsultants.co.uk

Revision History

Version	Date	Amendments	Issued to
1.0	29.05.09		Mr G Bennett

Quality Control

Action	Signature	Date
Prepared	C. Wilenchik	29.05.09
Checked	G. Wilson	29.05.09
Approved	J. Williams	29.05.09

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Table of Contents

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1.0 Introduction

This flood risk assessment has been prepared by RAB Consultants, in support of a proposed change of use of an existing building at Burston Hall, Burston, Staffordshire.

Planning Policy Statement 25: Development and Flood Risk (PPS25) requires a flood risk assessment to be carried out to ensure that new development is safe from flooding and will not increase the risk of flooding.

2.0 Site Location

The proposed site is at Burston Hall, Burston, Staffordshire, ST18 0DR (see location plan in Appendix A).

Access to the site is via Burston Lane and the entrance to the site is large enough for vehicular access.

3.0 Site History and Development Proposals

The site at present consists of a two storey outbuilding and piggery. It is proposed to convert the outbuilding to one residential unit and associated works. The external appearance of the building will not be changed. A new access route is to be laid to the west of the outbuilding (Appendix B).

The site lies on the edge of flood zone 3a and within flood zone 2 (Flood Map in Appendix A) and is classed as a 'more vulnerable' development in accordance with Table D.2 Flood Risk Vulnerability Classification of PPS25. The site is an 'appropriate development' in accordance with Table D.3 Flood Risk Vulnerability and Flood Zone 'Compatibility' of PPS25. The application is for a change of use and therefore is not subject to a sequential or exception test in accordance with paragraph D15 of PPS25.

4.0 Flood Risk

4.1 River Trent

The site is approximately 180m north east of the River Trent and lies on the edge of flood zone 3a (annual probability of flooding greater than 1%) and within flood zone 2 (annual probability of flooding between 1% - 0.1%). According to Environment Agency records, the 1% annual probability and the 0.5% annual probability flood levels for the site are 81.06m AOD and 81.25m AOD respectively (Table 1).

Table 1: Environment Agency's March 2009 River Trent Flood Mapping Study								
	Peak Water Level (m AOD)							
Annual Probability (%)	**20**	**10**	**4**	**2**	**1.33**	**1**	**0.66**	**0.5**
Cross section 3161413129	80.42	80.56	80.75	80.9	80.99	81.06	81.17	81.25

A topographic survey (Appendix C) of the site has been undertaken and ground levels at the site vary between 84.16m AOD and 85.40m AOD. The site is 2.91m – 4.15m higher than the 0.5% annual probability flood level of the River Trent. The development is therefore appropriate for this flood risk.

4.2 Climate Change

In making an assessment of the impacts of climate change on flooding from rivers, Table B.2 of PPS25 recommends a 20% increase on peak river flows. In the absence of specific modelled data from the Environment Agency, the 0.5% annual probability flood level shall be used for this assessment, i.e. 81.25m AOD.

4.3 Trent and Mersey Canal

The Trent and Mersey Canal (Figure 1) lies approximately 125m south west of the site at Burston Hall. The canal is situated between the River Trent and the site. British Waterways do not have any records of breaches or overtopping of this section of the canal (Appendix H).

Figure 1: Trent and Mersey Canal

Spot levels have been measured along the tow path of the Trent and Mersey Canal (Appendix C). These levels vary between 81.45m and 81.67m AOD, which is 0.2m – 0.41m higher than the 0.5% annual probability flood level of the River Trent. The canal therefore acts as a barrier preventing flood water

from the River Trent flowing north past the canal and up toward the site. The canal does not represent a flood risk to the site as it is also several metres lower than the site.

4.4 Previous Flood History

The current owners of the site have no knowledge of the site flooding in the recent past. The Environment Agency and British Waterways do not have any records of the site flooding (Appendix G and H).

4.5 Jolpool Brook

The Jolpool Brook is located approximately 90m to the north of the site (Appendix A). The Jolpool Brook is a tributary of the River Trent and is free flowing along much of its course. The Environment Agency was unable to provide any flood levels for the Jolpool Brook (Appendix G).

4.6 Catchment Description

The catchment area of the Jolpool Brook is 4.58km^2. It is a small, rural ungauged catchment, which is a tributary to the River Trent. Upstream of the site the brook flows through open fields (Figure 2), into a culvert under the railway line (Figure 4) and behind residential properties (Figure 3).

The Jolpool Brook flows underneath a bridge (Figure 5) adjacent to the site and then around the village pond. The brook flows into the River Trent a further 300m downstream of the site.

Figure 2: Jolpool Brook upstream of the site flowing through fields

Figure 3: Jolpool Brook flowing past residential houses

Figure 4: The culvert in which the Jolpool Brook flows under the railway

Figure 5: The bridge adjacent to the site

4.7 Methodology

The Flood Estimation Handbook (FEH) has been used to estimate the flood flows in the Jolpool Brook at Burston Hall using the revised 2007 CEH Wallingford statistical method. Details are included in Appendix E.

As there is no gauge at the site, catchment descriptors have been obtained from the FEH CD-ROM and used to determine QMED at the site. QMED has then been adjusted using the revised CEH Wallingford method and a local donor site, the River Dove at Rocester Weir.

A pooling group for the site was obtained using the UK Hiflows sites suitable for pooling, version 2.2.1. The pooling group was reviewed and adjusted and it was determined that the revised group was an acceptable, possibly heterogeneous group. A generalised logistic distribution was applied to the pooling group to determine flow estimated up to the 1% annual probability using 526 years of data.

The revised statistical method was then compared to the Revitalised FSR/FEH Rainfall Runoff (ReFH) method and the IH124 method. The ReFH method has been chosen as the preferred method of calculating flows for the Jolpool Brook because it gives a more conservative estimate than the other statistical methods used.

Using the ReFH results, the 0.1% annual probability flow has been extrapolated using a logarithmic trend (Appendix D). The flow has been estimated to be approximately 5.4m^3/s. This flow will be used to estimate the extent of flood zone 2 of the Jolpool Brook.

4.8 Flood Flows

Catchment descriptors from the FEH CD-ROM are listed in Table 2 below.

Table 2: Catchment Descriptors	
Descriptor	**Value**
AREA	4.58km^2
URBEXT$_{2000}$	0.0068
SAAR	775mm
FARL	1.000
SPRHOST	32.9

Details of the flow estimation methods used are provided in Appendix E. The estimated flood flows using catchment descriptors and the ReFH method up to the 150 year return period are summarised in Table 3. The 100 year return period has been increased by 20% to allow for climate change in accordance with Table B.2 of PPS25.

Table 3: Estimated Flood Flows	
Annual Probability (%)	**Estimated Flow (m^3/s)**
50	**1.5**
20	**2.0**
10	**2.4**
4	**2.9**
2	**3.4**
1	**4.0**
1 + 20% cc	**4.8**
0.66	**4.4**
Extrapolated 0.1%	**5.4**

5.0 Predicted Extent and Depth of Flooding

5.1 Methodology

A simple Hec-Ras model of the Jolpool Brook has been constructed (see CD with 'Burston Hall FRA' file) using topographic survey sections included in Appendix C. The model includes a culvert and a bridge (modelled as a culvert) and begins approximately 79m upstream of the culvert. The model extends a further 293m downstream of the culvert. The dimensions of the culvert have been provided by Network Rail (Appendix I).

Cross sections 7.9 to 7.1 have been interpolated using cross sections 7 and 8. Two weirs are located between cross section 7 and 8, the cross sections from the survey have not picked up the detail of the weirs, therefore cross sections 7.3, 7.5, 7.7 and 7.9 have been interpolated to mimic the fall in water levels at each weir. The results from section 4.8 have been used to estimate flows down the Jolpool Brook within the Hec-Ras model (Appendix F).

It is possible that the River Trent could back up the Jolpool Brook during an extreme flood event. However, it is likely that the Jolpool Brook catchment will peak before the River Trent and therefore the model only considers flooding directly from the Jolpool Brook.

5.2 Sensitivity Analysis

A sensitivity analysis has been undertaken by increasing/decreasing the manning's 'n' value by 10% on the Jolpool Brook model. The analysis shows that the model is not very sensitive to the roughness (+/- 50mm maximum) coefficient throughout the model (see Table 4).

Table 4: Sensitivity Analysis for the Jolpool Brook

Model Section	'n' -10%	1% + 20% normal 'n'	'n' +10%
11	88.26	88.26	88.26
10	86.74	86.74	86.74
9	86.25	86.29	86.33
8	86.07	86.10	86.12
7.9	85.83	85.83	85.83
7.7	85.66	85.69	85.72
7.5	85.37	85.42	85.37
7.3	85.45	85.48	85.45
7.1	85.36	85.37	85.36
7	85.32	85.32	85.32
6	84.75	84.75	84.75
5	84.51	84.51	84.52
4	84.28	84.28	84.28
3	83.87	83.87	83.89
2	83.62	83.62	83.62

5.3 Results

Estimated flow levels have been used to calculate water surface elevations at each of the cross sections on the Jolpool Brook. Table 5 provides a summary of these water surface elevations.

Table 5: Flood levels for the Jolpool Brook

Model Section	Annual Probability (%)						
	10	4	2	1	1 + 20%	0.66	Extrapolated 0.1
11	88.08	88.13	88.19	88.25	88.26	88.28	88.37
10	86.24	86.34	86.44	86.56	86.74	86.65	86.94
9	86.07	86.13	86.18	86.23	86.29	86.26	86.33
8	85.88	85.93	85.98	86.04	86.10	86.07	86.14
7.9	85.58	85.66	85.72	85.77	85.83	85.80	85.87
7.7	85.12	85.48	85.51	85.60	85.69	85.64	85.75
7.5	85.11	85.16	85.32	85.42	85.42	85.42	85.43
7.3	85.11	85.20	85.35	85.45	85.48	85.46	85.50
7.1	85.01	85.11	85.28	85.38	85.37	85.38	85.37
7	84.95	85.06	85.25	85.35	85.32	85.34	85.29
6.5 Cul u/s	84.72	84.78	85.25	85.40	85.40	85.40	85.40

6.5 Cul d/s	84.44	84.49	84.62	85.39	85.39	85.39	85.39
6	84.52	84.57	84.62	84.67	84.75	84.71	84.80
5	84.44	84.44	84.44	84.45	84.51	84.48	84.56
4	84.11	84.16	84.20	84.24	84.28	84.26	84.31
3	83.74	83.80	83.84	83.82	83.87	83.85	83.89
2	83.38	83.43	83.48	83.60	83.62	83.61	83.64

The Jolpool Brook is approximately 90m north east of the site at Burston Hall. The cross sections between 8 and 6 are therefore the most relevant cross sections to the site. The model illustrates that the flood flows at cross sections 8, 7 and 6 do not reach the top of the left bank and therefore would not affect the site purely on their own. However, the model suggests that the bridge at cross section 6.5 Cul u/s and 6.5 Cul d/s could cause flood water to travel out of bank (Table 5).

A spot level has been taken on the upstream side of the bridge where water could come out of bank (85.44m AOD), however it is unlikely that flood water will be able to travel out of bank towards the site. In the unlikely event that the flood water did reach this height (85.44m AOD) the water would travel along Burston Lane and pool at a low point (84.69m AOD) in the road located to the west of the bridge, adjacent to the pond. This water would not reach the site as there is an overland flow route across the fields to the River Trent between the site and the Jolpool Brook.

5.4 Recommended Finished Floor Levels

There is limited scope to change the floor level within the building as this development is a change of use. Raising the floor level to 600mm above the 1% plus climate change level would be impractical due to limited floor to ceiling heights of the building, create access problems and would not be in keeping with the street scene. Therefore it is recommended that the finished floor level be kept at 85.25m AOD.

A flood resilient design will be undertaken, for example, raising electrical circuitry 0.6m above the 1% plus climate change flood level and using flood resilient materials throughout the building. It is understood that the building already has concrete floors.

More detailed information can be found at the Environment Agency's website (www.environment-agency.gov.uk) and in 'Improving the flood performance of new buildings' (www.planningportal.gov.uk/uploads/br/flood_performance.pdf).

5.5 Safe Access and Exit

Safe access and exit will be maintained during an extreme flood event. Residents of the property would be able to travel north along Burston Lane towards Butterhill Bank and Lichfield Road. In the unlikely event that floodwater travels out of bank at the bridge, it is likely that the water will flow

down Burston Lane and pool at a low point (84.69m AOD) in the road near the pond, highlighted on the map in Appendix C. It is unlikely that the floodwater would reach the site during an extreme event, as it is likely that the water will flow into the fields adjacent to the site and travel south towards the River Trent.

6.0 Surface Water Runoff

The site is currently impermeable hard surface, the development may provide an opportunity to introduce sustainable drainage techniques to minimise runoff from the site.

6.1 SUDS – Sustainable Drainage Systems

Paragraph 1.3.2 from the SUDS manual (C697) discusses the SUDS 'management train', which is intended to mimic the natural catchment process as closely as possible. Table 6 gives examples of the hierarchy of techniques that can be used to achieve the management train.

Table 6: Hierarchy of techniques and their descriptions

Technique	Description
Prevention	The use of good house design and housekeeping measures to prevent runoff and pollution; rainwater reuse/harvesting
Source control	Soakaways, porous and pervious surfaces, water butts, green roofs
Site control	Routing water to large soakaways, infiltration or detention basins
Regional control	Balancing pond, wetlands, swales, retention ponds

Due to the size of the site and that the proposal is to change the use of the building on the site, there are a limited number of techniques which would be feasible to use for this type of development. Site and regional control techniques are not considered feasible due to the small size of the proposed development and as the proposal is for a change of use. Table 7 illustrates the feasibility of the SUDS techniques that could be available at the site.

Table 7: Feasibility of techniques at the proposed site

Technique	Issues	Feasible? Y / N
Prevention		
Good building design and rainwater harvesting	To ensure that drains and guttering are properly located and laid. Water butts could be incorporated into the design of the building to enable the reuse of rainwater for watering the surrounding garden and border area.	Y

Source Control		
Porous and pervious materials	Using porous and pervious materials on the proposed driveway is considered to be beneficial for surface water runoff.	Y
Soakaways	The developer has the opportunity to dispose of surface water via soakaways. According to www.landis.org.uk/soilscapes the subsoil type for this area of the UK is classified as "slightly acid loamy and clayey soils with impeded drainage" which means there may be limited opportunity for infiltration. This soil may be satisfactory for soakaways but should be confirmed by a site investigation.	Limited
Green Roof	Although a green roof could offer a certain level of runoff betterment, it is not in keeping with the street scene of the surrounding area and is therefore not a viable option.	N
Site and Regional Control		
Infiltration / detention basins / balancing ponds / wetlands / swales / retention ponds	These techniques will be too large, costly and would not hold a great benefit to the surrounding area. There is limited scope to use these techniques outside the floodplain at the site.	Limited

In summary, the use of SUDS techniques are recommended for this development. There are a number of techniques that could be incorporated into the design of the development e.g. the use of water butts and pervious pavements. There will be no increase in surface water runoff at the site. The use of these techniques should be designed to provide some surface water betterment at the site.

7.0 Conclusion

The proposed site at Burston Hall lies on the edge of flood zone 3 and within flood zone 2. The proposal is to convert the outbuilding to one residential unit and associated works. The external appearance of the building will not be changed and a new access route is to be laid to the west of the outbuilding.

The source of fluvial flood risk at the site is from the River Trent and the Jolpool Brook. The site is between 2.91m – 4.15m higher than the 0.5% annual probability flood level for the River Trent, therefore the development is appropriate for the flood risk. The Trent and Mersey Canal lies between the River Trent and the site and acts as an additional barrier to protect the site from flooding from the River Trent.

The Jolpool Brook is a natural channel along much of its course. Flow estimations have been calculated using the ReFH method. There are no flood defences located along the Jolpool Brook. The model suggests that the site will not flood during a 1% plus 20% climate flood event.

The majority of the site currently consists of impermeable hard surface. The impermeable area of the site will remain the same with the proposed development and the new driveway will consist of permeable gravel material.

8.0 Recommendations

The following actions have been recommended;

- It is recommended that the finished floor levels are kept at the existing height of 85.25m AOD and that a flood resilient design is incorporated into the design of the building.

- The drainage design for the site should make best use of SUDS techniques e.g. porous pavements and water butts, where appropriate, to provide some betterment of surface water runoff at the site.

Appendix A – Location Plan and Flood Map

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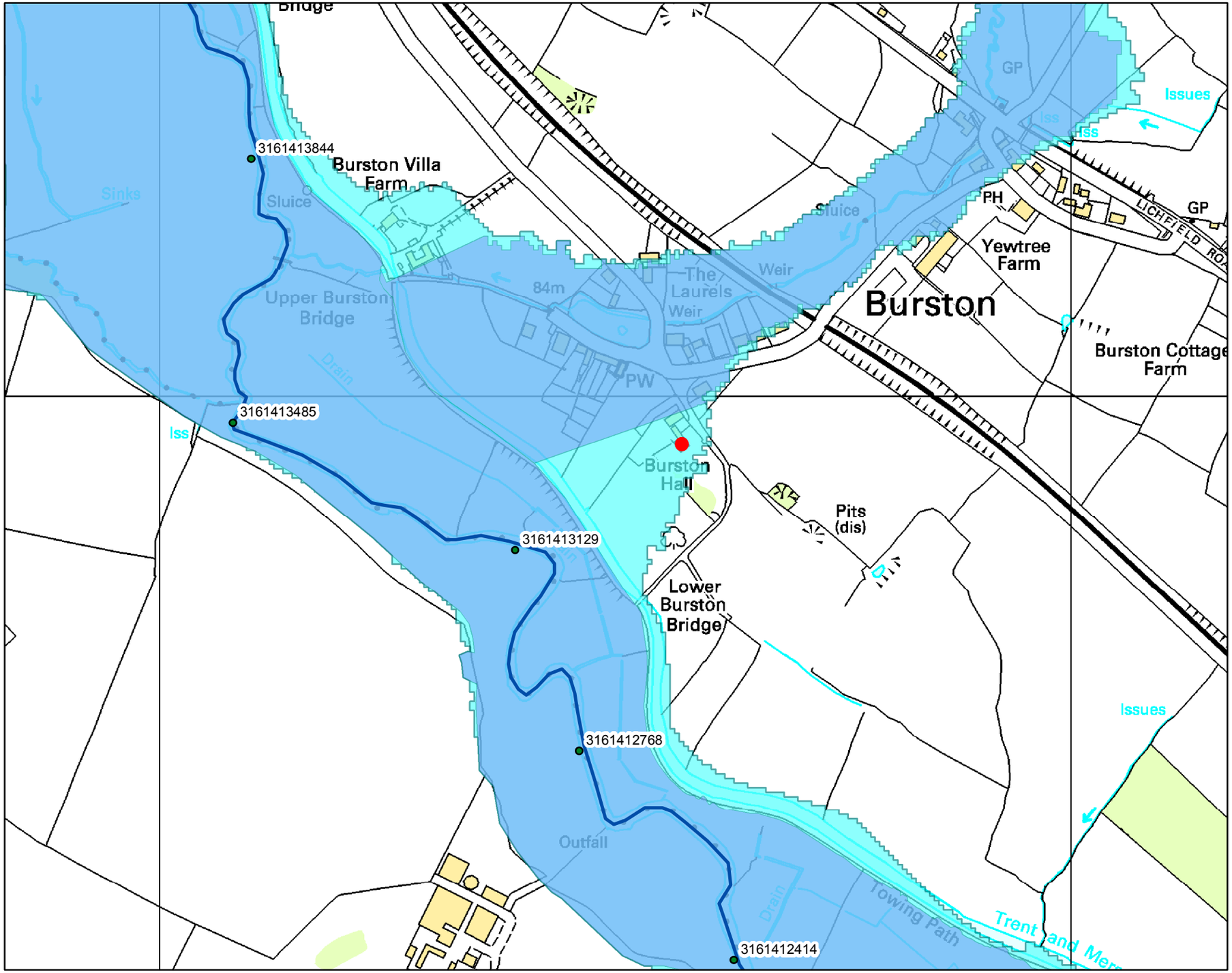


Environment Agency

MC16915
Burston Hall
Burston
Staffordshire
ST18 0DR

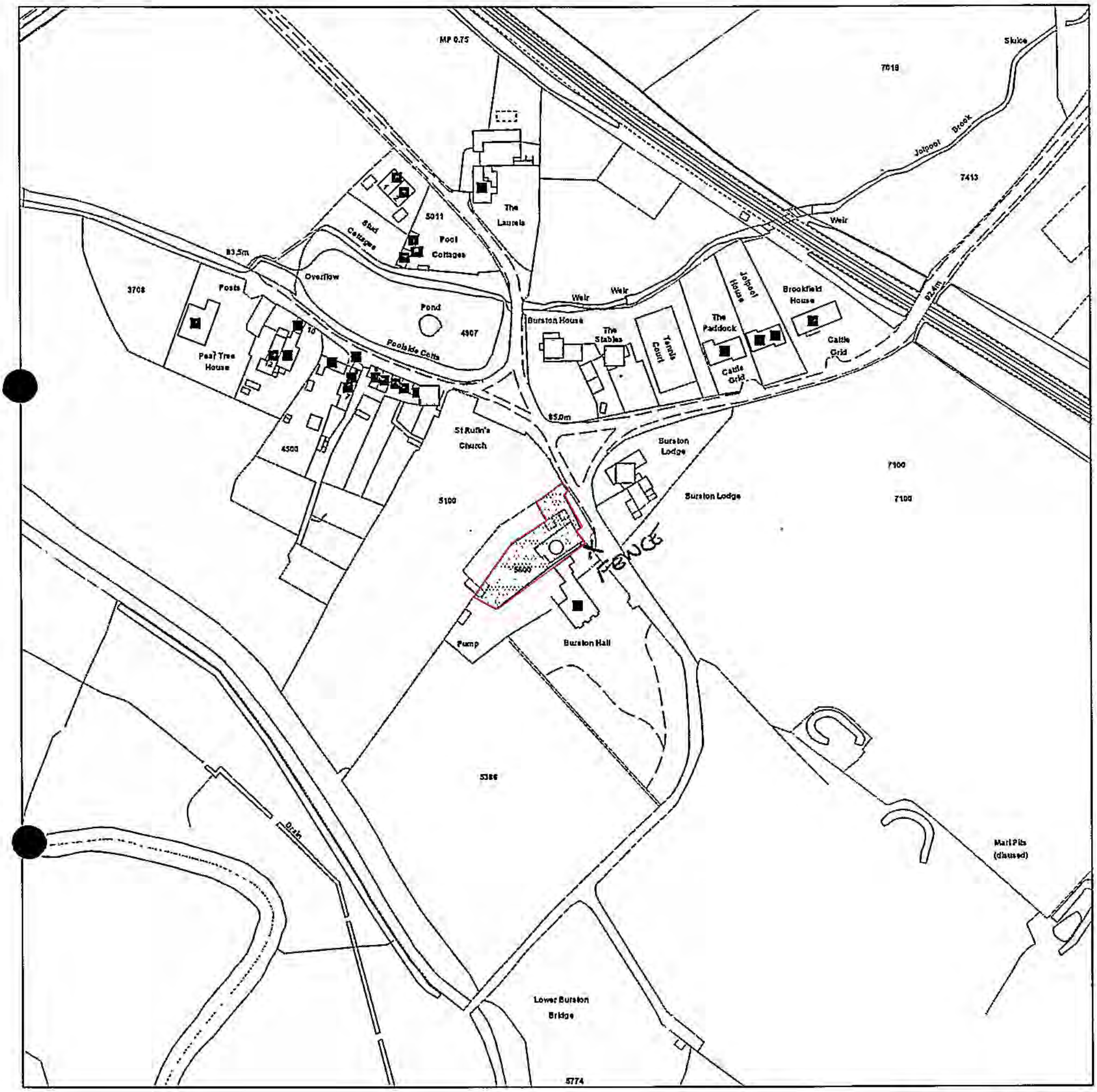
Legend

- Modelled_Levels_Mar_09
- rivers_main_010k
- flood_zone_3_(1in100yr)
- flood_zone_2_(1in1000yr)

04/02699/FUL

SE

GIS by ESRI (UK)



Scale : 1:2500

Produced using ESRI (UK)'s MapExplorer 2.0 - http://www.esriuk.com

Organisation	Stafford Borough Council
Department	Planning Services
Comments	Location Plan
Date	25 June 2004
SLA Number	100018205

Appendix B – Development Proposals

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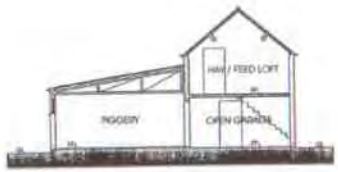
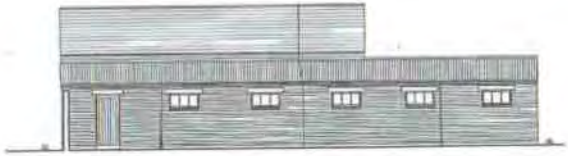


SECTION A-A

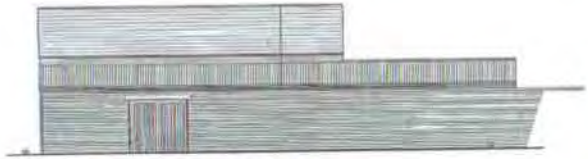
SECTION B-B

REAR ELEVATION

LANE ELEVATION



INTERNAL SIDE ELEVATION



SIDE ELEVATION FROM FIELD

COURTYARD ELEVATION

SURVEY OF EXISTING

GROUND FLOOR PLAN

FIRST FLOOR PLAN

NOTE!

STAFFORD BOROUGH COUNCIL
This is the plan/one of the plans referred to in Decision Notice
Reference
Dated

MR J DONNELLY

MR J DONNELLY

PROPOSED PIG STY AND OUTBUILDING CONVERSION
BURSTON HALL BURSTON STAFFORDSHIRE ST18 0EW

SURVEY OF EXISTING

1:100	NBC	0403-002	-

82 Simmonds Road
Little Bloxwich
Walsall
West Midlands
WS3 3PU
t: 01922 475414
f: 01922 475414
m: 07971 447031
w: cube@bloxwich.freeserve.co.uk

CUBE
design + visualisation

AMENDED PLAN
Received
Application No


NOTE!
STAFFORD BOROUGH COUNCIL
This is the plan/one of the plans referred to in Decision Notice
Reference
Dated
BEDROOM 2
SAUNA
BATHROOM
KITCHEN
BEDROOM 3
UTILITY
BREAKFAST
DINING
DRAWING ROOM
EXISTING COURTYARD
NEW COURTYARD
BURSTON HALL
GROUND FLOOR PLAN
BEDROOM 4
BEDROOM 5
FIRST FLOOR PLAN
PLANNING PROPOSAL
MR J DONNELLY
MR J DONNELLY
PROPOSED PIG STY AND OUTBUILDING CONVERSION
PLANNING PROPOSAL - SHEET 1 - PLANS
1:100
NBC
0314-011
A
CUBE
AMENDED PLAN
Received
Application No.

Appendix C – Topographic Survey and cross sections of Jolpool Brook

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Appendix D – Logarithmic Graph

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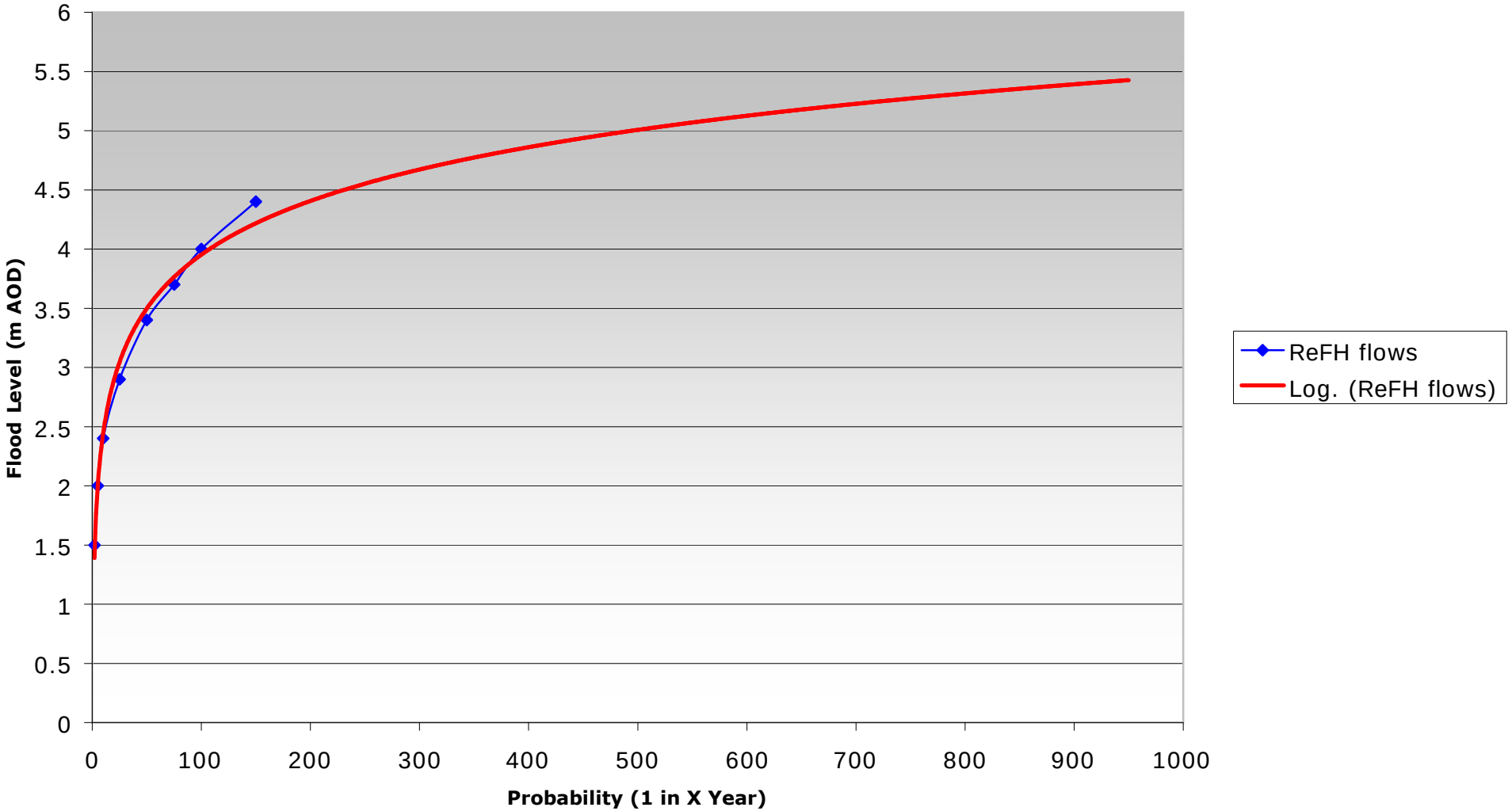
A Logarithmic Graph to Show the Predicted 0.1% Flood Level



Appendix E – Calculations

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RAB Consultants

Flow Calculations for the Jolpool Brook at Burston Hall

Location

Burston Hall, Burston, Staffordshire, ST18 0DR

Grid Reference SJ 936 300

Method

To obtain flood flow estimations for the Jolpool Brook at Burston Hall, it is proposed to use the revised FEH statistical method, developed by CEH Wallingford in 2007. QMED shall be obtained from catchment characteristics, as there is no gauge at the site, and improved using the QMED from a local donor site using the new CEH Wallingford 2007 revised data transfer calculation. A suitable pooling group shall be used and a GL distribution applied to produce flood frequency estimates.

These estimates will then be compared against the Revitalised FSR/FEH Rainfall Runoff method and the IH124 method.

Catchment Descriptors

From FEH CD-ROM, catchment descriptors for the site are:

AREA	4.58km^2	PROPWET	0.44
FARL	1.000	BFIHOST	0.545
URBEXT$_{2000}$	0.0068	DPLBAR	3.14km
SAAR	775mm	DPSBAR	62.0m/km
SPRHOST	32.9		

QMED for the site from Catchment Descriptors

$$QMED = 8.3062 \times AREA^{0.8510} \times 0.1536^{\frac{1000}{SAAR}} \times FARL^{3.4451} \times 0.0460^{BFIHOST^2}$$

$$QMED = 8.3062 \times 4.58^{0.8510} \times 0.1536^{\frac{1000}{775}} \times 1.000^{3.4451} \times 0.0460^{0.545^2}$$

$$QMED = 8.3062 \times 3.6509 \times 0.0892 \times 1.000 \times 0.4007$$

$$QMED = 1.08 m^3/s$$

No urban adjustment needed as URBEXT$_{2000}$ = 0.0068

Data Transfer

Gauging station for data transfer to adjust the QMED at the site.

			28008
AREA	397.97km^2	SAAR	1022mm
FARL	0.991	SPRHOST	24.77
URBEXT$_{2000}$	0.659	BFIHOST	0.555
QMED from AMAX 1954-2005	86.965		

Using the new revised data transfer method produced by CEH Wallingford in 2007, gauge 28008 has been chosen as the single donor to improve QMED at the site. The gauge is approximately 29.04km from the site.

Dove at Rocester Weir, 28008

QMED from catchment descriptors

$$QMED = 8.3062 \times AREA^{0.8510} \times 0.1536^{\frac{1000}{SAAR}} \times FARL^{3.4451} \times 0.0460^{BFIHOST^2}$$

$$QMED = 8.3062 \times 397.97^{0.8510} \times 0.1536^{\frac{1000}{1022}} \times 0.991^{3.4451} \times 0.0460^{0.555^2}$$

$$QMED = 8.3062 \times 163.1070 \times 0.1599 \times 0.9693 \times 0.38734$$

$$QMED = 81.34 m^3 / s$$

A weighted average of the estimates of QMED is applied based on the FEH comments on gauge suitability.

Revised adjustment QMED for Burston Hall

$$QMED_{s,adj} = QMED_{s,cds} \left(\frac{QMED_{g,obs}}{QMED_{g,cds}} \right)^a$$

$$QMED_{s,adj} = 1.08 \times \left(\frac{86.965}{81.34} \right)^a$$

$$a = 0.4598 \times \exp(-0.020 \times dij) + (1 - 0.4598) \times \exp(-0.4785 \times dij)$$

$$a = 0.4598 \times \exp(-0.020 \times 29.04) + (1 - 0.4598) \times \exp(-0.4785 \times 29.04)$$

$$a = 0.4598 \times 0.5595 + 0.5402 \times 0.000000922$$

$$a = 0.26$$

$$QMED_{s,adj} = 1.08 \times \left(\frac{86.965}{81.34} \right)^{0.26}$$

$$QMED_{s,adj} = 1.1 m^3 / s$$

FEH Pooled Analysis

FEH pooling group for Burston Hall SJ 936 300 using stations ok for pooling from updated WINFAP data supplied from UK HiFlows website.

Pooling Group	
25019	45817
44801	20006
(32029)	206004
33045	203046
20002	41022
45816	30004
29009	20007
53017	49004
54034	36009
	50009

Giving a total of 520 years of records, however station 32029 only has five years of records and has therefore been removed from the pooling group and replaced with 50009.

This new pooling group is considered strongly heterogeneous and a review of the pooling group is desirable.

After analysing the pooling group, it appears that gauges 206004, 50009 and 36009 are discordant. They all appear to have very low values for L-skewness and L-kurtosis. Therefore, these stations have been removed from the data and replaced with stations 51003 and 36003.

Pooling Group	
44801	20006
33045	203046
20002	41022
45816	30004
25019	20007
29009	49004
53017	51003
54034	36003
45817	

Giving a total of 526 years of records and the pooling group is now considered as possibly heterogeneous.

The pooling group has been used to calculate the final flow estimates.

Return Period	Peak Flow (m^3/s)
2	1.1
5	1.6
10	2.0
25	2.5
50	3.0
100	3.5
200	4.1
500	4.9

Revitalised FSR/FEH Rainfall Runoff Method (ReFH)

The ReFH spreadsheet has been used to calculate flows on the Jolpool Brook.

Return Period	Peak Flow (m^3/s)
2	1.5
5	2.0
10	2.4
25	2.9
50	3.4
100	4.0
150	4.4

IH124 Method

$$QBAR = 0.00108 \times AREA^{0.89} \times SAAR^{1.17} \times SOIL^{2.17}$$

AREA = 4.58*

SAAR4170 = 784*

* Values taken from the FEH CD-ROM

SOIL= Soil type from FSR WRAP maps

SOIL = 0.45

$$QBAR = 0.00108 \times 4.58^{0.89} \times 784^{1.17} \times 0.45^{2.17}$$

$$QBAR = 0.00108 \times 43.87409 \times 2434.163766 \times 0.17679$$

$$QBAR = 1.8$$

To calculate the final flows the IH124/FSR growth factors for the Midlands was applied to QBAR.

Return Period		Peak Flow (m^3/s)
2	0.89 x 1.8	1.6
5	1.23 x 1.8	2.2
10	1.49 x 1.8	2.7
25	1.87 x 1.8	3.4
50	2.20 x 1.8	4.0
100	2.57 x 1.8	4.6
200	2.98 x 1.8	5.4

Conclusion

After calculating the flows using the three different methods, the ReFH flows will be used to estimate flood flows on the Jolpool Brook. The Revised FEH Statistical method is the most appropriate for the size of the catchment. The ReFH method will be used as it is more conservative than the revised statistical method. The IH124 method is a simple three parameter equation used to indicate that the flows are of an appropriate magnitude.

Final flow estimates – ReFH Method

Return Period	Peak Flow (m^3/s)
2	1.5
5	2.0
10	2.4
25	2.9
50	3.4
100	4.0
150	4.4

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	Claire Wilenchik	**Catchment name**	Jolpool Brook	**Date/time modelled**	07-May-2009 11:07
Company name	RAB Consultants	**Catchment easting**	393200	**Version**	1.4
Project name	Burston Hall FRA	**Catchment northing**	330150		
		Catchment area	4.58		

Summary of model setup

Design rainfall parameters

Return period (yr)	2
Duration (hr)	5
Timestep (hr)	1
Season	Winter

Loss model parameters

C_{max} (mm)	408
C_{ini} (mm)	130
α factor	1

Routing model parameters

T_p (hr)	2.37
U_p	0.65
U_k	0.8

Baseflow model parameters

BL (hr)	37.3
BR	1.45
BF_0 (m^3/s)	0.2

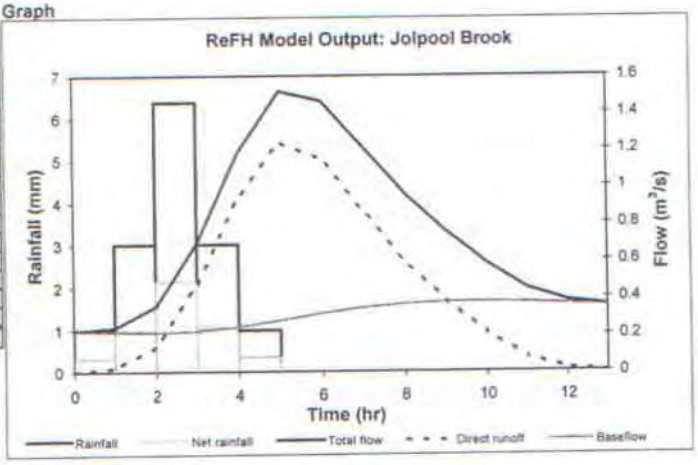
Summary of results

FEH DDF rainfall (mm)	21.1	**Peak rainfall (mm)**	6.4
Design rainfall (mm)	14.4	**Peak flow (m^3/s)**	1.5

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0	1.0	0.3	0.0	0.2	0.2
1	3.0	1.0	0.0	0.2	0.2
2	6.4	2.1	0.1	0.2	0.4
3	3.0	1.0	0.5	0.2	0.7
4	1.0	0.3	0.9	0.2	1.2
5	0.0	0.0	1.2	0.3	1.5
6	0.0	0.0	1.1	0.3	1.5
7	0.0	0.0	0.9	0.3	1.2
8	0.0	0.0	0.6	0.4	1.0
9	0.0	0.0	0.4	0.4	0.8
10	0.0	0.0	0.2	0.4	0.6
11	0.0	0.0	0.1	0.4	0.4
12	0.0	0.0	0.0	0.4	0.4
13	0.0	0.0	0.0	0.4	0.4
Total (mm)	14.4	4.8	4.8	3.3	8.2

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = '139 FEH Catchment Descriptors.csv'
Catchment decriptor file exported from CD ROM version 2
Catchment descriptor file exported on 24-Apr-2009 14:46
BFIHOST value of 0.545 used
PROPWET value of 0.44 used
SAAR value of 775 used
DPLBAR value of 3.14 used
DPSBAR value of 62 used
URBEXT value of 0.003 used
C value of -0.02986 used
D1 value of 0.37198 used
D2 value of 0.30324 used
D3 value of 0.33511 used
E value of 0.31037 used
F value of 2.35414 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.71 applied
ReFH design standard Areal Reduction Factor of 0.96 applied

Loss Model
C_{Max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	Claire Wilenchik	**Catchment name**	Jolpool Brook	**Date/time modelled**	07-May-2009 11:08
Company name	RAB Consultants	**Catchment easting**	393200	**Version**	1.4
Project name	Burston Hall FRA	**Catchment northing**	330150		
		Catchment area	4.58		

Summary of model setup

Design rainfall parameters

Return period (yr)	5
Duration (hr)	5
Timestep (hr)	1
Season	Winter

Loss model parameters

C_{max} (mm)	408
C_{ini} (mm)	130
α factor	1

Routing model parameters

T_p (hr)	2.37
U_p	0.65
U_k	0.8

Baseflow model parameters

BL (hr)	37.3
BR	1.45
BF_0 (m^3/s)	0.2

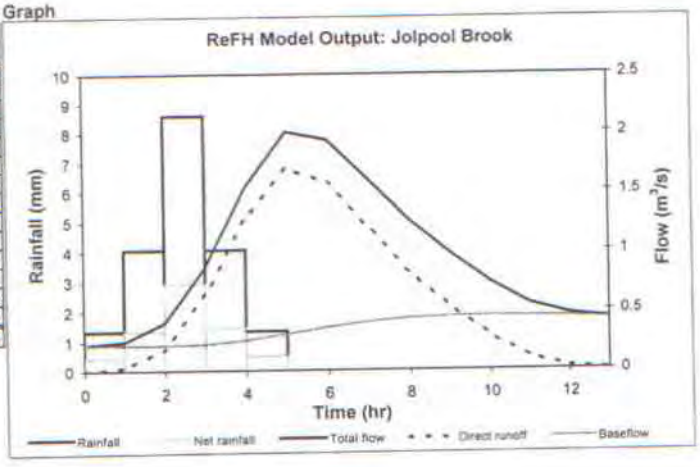
Summary of results

FEH DDF rainfall (mm)	28.4	**Peak rainfall (mm)**	8.6
Design rainfall (mm)	19.3	**Peak flow (m^3/s)**	2

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0	1.3	0.4	0.0	0.2	0.2
1	4.1	1.3	0.0	0.2	0.2
2	8.6	2.9	0.2	0.2	0.4
3	4.1	1.4	0.6	0.2	0.9
4	1.3	0.5	1.3	0.3	1.5
5	0.0	0.0	1.7	0.3	2.0
6	0.0	0.0	1.5	0.4	1.9
7	0.0	0.0	1.2	0.4	1.6
8	0.0	0.0	0.8	0.4	1.3
9	0.0	0.0	0.5	0.4	1.0
10	0.0	0.0	0.3	0.5	0.7
11	0.0	0.0	0.1	0.4	0.6
12	0.0	0.0	0.0	0.4	0.5
13	0.0	0.0	0.0	0.4	0.4
Total (mm)	19.3	6.6	6.6	3.8	10.4

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Catchment

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DPSBAR value of 62 used
URBEXT value of 0.003 used
C value of -0.02986 used
D1 value of 0.37198 used
D2 value of 0.30324 used
D3 value of 0.33511 used
E value of 0.31037 used
F value of 2.35414 used

Rainfall

Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.71 applied
ReFH design standard Areal Reduction Factor of 0.96 applied

Loss Model

C_{max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model

T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model

BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	Claire Wilenchik	**Catchment name**	Jolpool Brook	**Date/time modelled**	27-Apr-2009 14:43
Company name	RAB Consultants	**Catchment easting**	393200	**Version**	1.4
Project name	Burston Hall FRA	**Catchment northing**	330150		
		Catchment area	4.58		

Summary of model setup

Design rainfall parameters

Return period (yr)	10
Duration (hr)	5
Timestep (hr)	1
Season	Winter

Loss model parameters

C_{max} (mm)	408
C_{ini} (mm)	130
α factor	0.98

Routing model parameters

T_p (hr)	2.37
U_p	0.65
U_k	0.8

Baseflow model parameters

BL (hr)	37.3
BR	1.45
BF_0 (m^3/s)	0.2

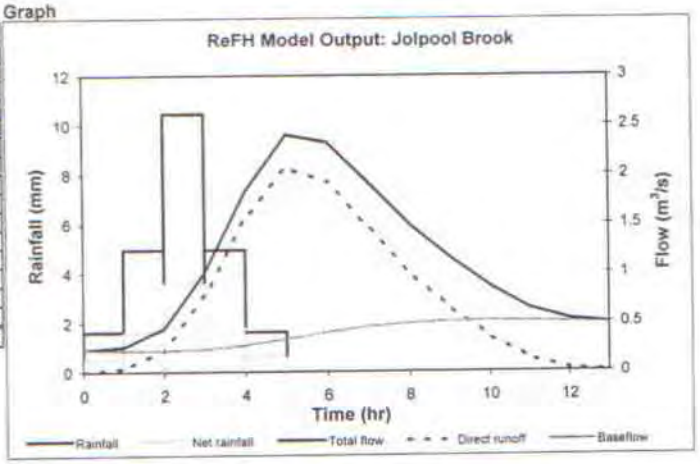
Summary of results

FEH DDF rainfall (mm)	34.6	**Peak rainfall (mm)**	10.4
Design rainfall (mm)	23.6	**Peak flow (m^3/s)**	2.4

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0	1.6	0.5	0.0	0.2	0.2
1	4.9	1.6	0.0	0.2	0.3
2	10.4	3.6	0.2	0.2	0.4
3	4.9	1.8	0.8	0.2	1.0
4	1.6	0.6	1.6	0.3	1.8
5	0.0	0.0	2.1	0.3	2.4
6	0.0	0.0	1.9	0.4	2.3
7	0.0	0.0	1.5	0.5	1.9
8	0.0	0.0	1.0	0.5	1.5
9	0.0	0.0	0.6	0.5	1.2
10	0.0	0.0	0.4	0.5	0.9
11	0.0	0.0	0.1	0.5	0.6
12	0.0	0.0	0.0	0.5	0.5
13	0.0	0.0	0.0	0.5	0.5
Total (mm)	23.6	8.0	8.0	4.2	12.2

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

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DPSBAR value of 62 used
URBEXT value of 0.003 used
C value of -0.02986 used
D1 value of 0.37198 used
D2 value of 0.30324 used
D3 value of 0.33511 used
E value of 0.31037 used
F value of 2.35414 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.71 applied
ReFH design standard Areal Reduction Factor of 0.96 applied

Loss Model
C_{max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	Claire Wilenchik	**Catchment name**	Jolpool Brook	**Date/time modelled**	27-Apr-2009 14:45
Company name	RAB Consultants	**Catchment easting**	393200	**Version**	1.4
Project name	Burston Hall FRA	**Catchment northing**	330150		
		Catchment area	4.58		

Summary of model setup

Design rainfall parameters

Return period (yr)	25
Duration (hr)	5
Timestep (hr)	1
Season	Winter

Loss model parameters

C_{max} (mm)	408
C_{ini} (mm)	130
α factor	0.92

Routing model parameters

T_p (hr)	2.37
U_p	0.65
U_k	0.8

Baseflow model parameters

BL (hr)	37.3
BR	1.45
BF_0 (m^3/s)	0.2

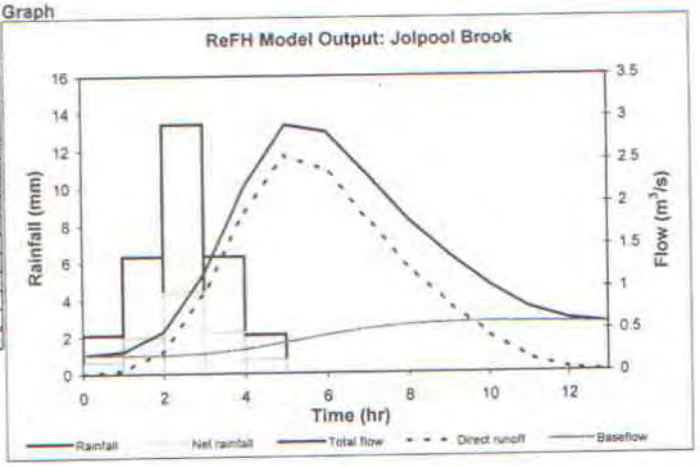
Summary of results

FEH DDF rainfall (mm)	44.3	**Peak rainfall (mm)**	13.4
Design rainfall (mm)	30.2	**Peak flow (m^3/s)**	2.9

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0	2.1	0.6	0.0	0.2	0.2
1	6.3	1.9	0.0	0.2	0.3
2	13.4	4.4	0.3	0.2	0.5
3	6.3	2.2	0.9	0.2	1.2
4	2.1	0.8	1.9	0.3	2.2
5	0.0	0.0	2.6	0.4	2.9
6	0.0	0.0	2.4	0.4	2.8
7	0.0	0.0	1.8	0.5	2.3
8	0.0	0.0	1.2	0.6	1.8
9	0.0	0.0	0.8	0.6	1.4
10	0.0	0.0	0.4	0.6	1.0
11	0.0	0.0	0.2	0.6	0.8
12	0.0	0.0	0.0	0.6	0.6
13	0.0	0.0	0.0	0.6	0.6
Total (mm)	30.2	9.9	9.9	4.7	14.6

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
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SAAR value of 775 used
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DPSBAR value of 62 used
URBEXT value of 0.003 used
C value of -0.02986 used
D1 value of 0.37198 used
D2 value of 0.30324 used
D3 value of 0.33511 used
E value of 0.31037 used
F value of 2.35414 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.71 applied
ReFH design standard Areal Reduction Factor of 0.96 applied

Loss Model
C_{max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	Claire Wilenchik	**Catchment name**	Jolpool Brook	**Date/time modelled**	27-Apr-2009 14:45
Company name	RAB Consultants	**Catchment easting**	393200	**Version**	1.4
Project name	Burston Hall FRA	**Catchment northing**	330150		
		Catchment area	4.58		

Summary of model setup

Design rainfall parameters

Return period (yr)	50
Duration (hr)	5
Timestep (hr)	1
Season	Winter

Loss model parameters

C_{max} (mm)	408
C_{ini} (mm)	130
α factor	0.88

Routing model parameters

T_p (hr)	2.37
U_p	0.65
U_k	0.8

Baseflow model parameters

BL (hr)	37.3
BR	1.45
BF_0 (m^3/s)	0.2

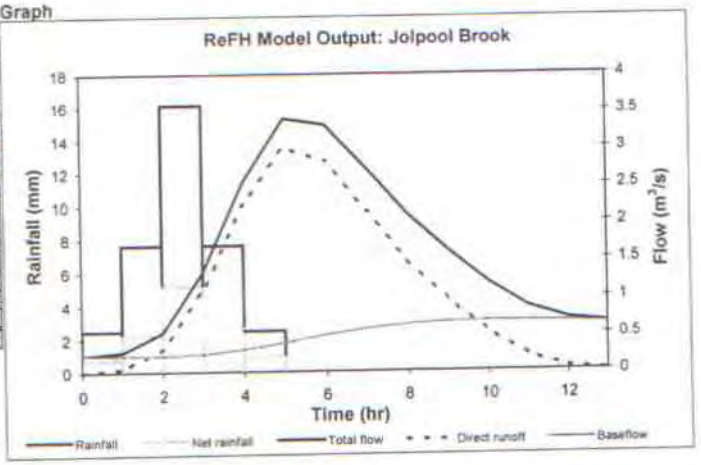
Summary of results

FEH DDF rainfall (mm)	53.3	**Peak rainfall (mm)**	16.1
Design rainfall (mm)	36.3	**Peak flow (m^3/s)**	3.4

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0	2.5	0.7	0.0	0.2	0.2
1	7.6	2.2	0.1	0.2	0.3
2	16.1	5.2	0.3	0.2	0.5
3	7.6	2.7	1.1	0.2	1.3
4	2.5	0.9	2.2	0.3	2.5
5	0.0	0.0	3.0	0.4	3.4
6	0.0	0.0	2.8	0.5	3.3
7	0.0	0.0	2.1	0.6	2.7
8	0.0	0.0	1.5	0.6	2.1
9	0.0	0.0	1.0	0.7	1.6
10	0.0	0.0	0.5	0.7	1.2
11	0.0	0.0	0.2	0.7	0.9
12	0.0	0.0	0.0	0.7	0.7
13	0.0	0.0	0.0	0.6	0.6
Total (mm)	36.3	11.7	11.7	5.2	16.9

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = '139 FEH Catchment Descriptors.csv'
Catchment decriptor file exported from CD ROM version 2
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DPLBAR value of 3.14 used
DPSBAR value of 62 used
URBEXT value of 0.003 used
C value of -0.02986 used
D1 value of 0.37198 used
D2 value of 0.30324 used
D3 value of 0.33511 used
E value of 0.31037 used
F value of 2.35414 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.71 applied
ReFH design standard Areal Reduction Factor of 0.96 applied

Loss Model
C_{max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	Claire Wilenchik	**Catchment name**	Jolpool Brook	**Date/time modelled**	27-Apr-2009 14:49
Company name	RAB Consultants	**Catchment easting**	393200	**Version**	1.4
Project name	Burston Hall FRA	**Catchment northing**	330150		
		Catchment area	4.58		

Summary of model setup

Design rainfall parameters

Return period (yr)	100
Duration (hr)	5
Timestep (hr)	1
Season	Winter

Loss model parameters

C_{max} (mm)	408
C_{ini} (mm)	130
α factor	0.83

Routing model parameters

T_p (hr)	2.37
U_p	0.65
U_k	0.8

Baseflow model parameters

BL (hr)	37.3
BR	1.45
BF_0 (m^3/s)	0.2

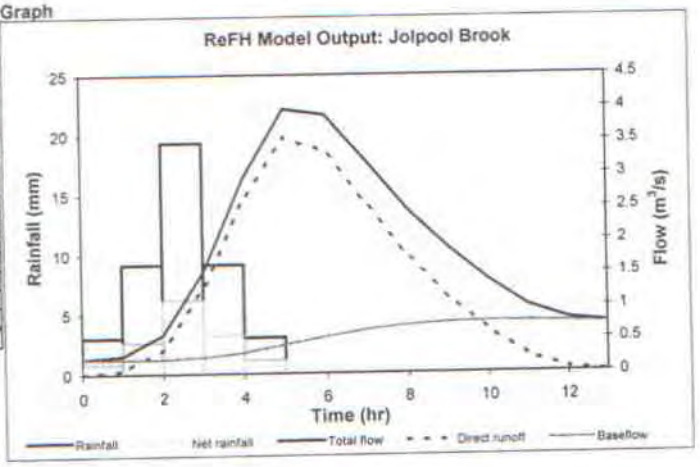
Summary of results

FEH DDF rainfall (mm)	64	**Peak rainfall (mm)**	19.4
Design rainfall (mm)	43.6	**Peak flow (m^3/s)**	4

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0	3.0	0.8	0.0	0.2	0.2
1	9.1	2.6	0.1	0.2	0.3
2	19.4	6.1	0.4	0.2	0.6
3	9.1	3.2	1.3	0.2	1.5
4	3.0	1.1	2.6	0.3	2.9
5	0.0	0.0	3.6	0.4	4.0
6	0.0	0.0	3.3	0.5	3.9
7	0.0	0.0	2.5	0.6	3.2
8	0.0	0.0	1.8	0.7	2.5
9	0.0	0.0	1.1	0.7	1.9
10	0.0	0.0	0.6	0.8	1.4
11	0.0	0.0	0.2	0.8	1.0
12	0.0	0.0	0.1	0.7	0.8
13	0.0	0.0	0.0	0.7	0.7
Total (mm)	**43.6**	**13.8**	**13.8**	**5.7**	**19.6**

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Catchment

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DPSBAR value of 62 used
URBEXT value of 0.003 used
C value of -0.02986 used
D1 value of 0.37198 used
D2 value of 0.30324 used
D3 value of 0.33511 used
E value of 0.31037 used
F value of 2.35414 used

Rainfall

Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.71 applied
ReFH design standard Areal Reduction Factor of 0.96 applied

Loss Model

C_{max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model

T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model

BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Revitalised FSR/FEH rainfall runoff method

Spreadsheet application report

User name	Claire Wilenchik	**Catchment name**	Jolpool Brook	**Date/time modelled**	27-Apr-2009 14:49
Company name	RAB Consultants	**Catchment easting**	393200	**Version**	1.4
Project name	Burston Hall FRA	**Catchment northing**	330150		
		Catchment area	4.58		

Summary of model setup

Design rainfall parameters

Return period (yr)	150
Duration (hr)	5
Timestep (hr)	1
Season	Winter

Loss model parameters

C_{max} (mm)	408
C_{ini} (mm)	130
α factor	0.81

Routing model parameters

T_p (hr)	2.37
U_p	0.65
U_k	0.8

Baseflow model parameters

BL (hr)	37.3
BR	1.45
BF_0 (m^3/s)	0.2

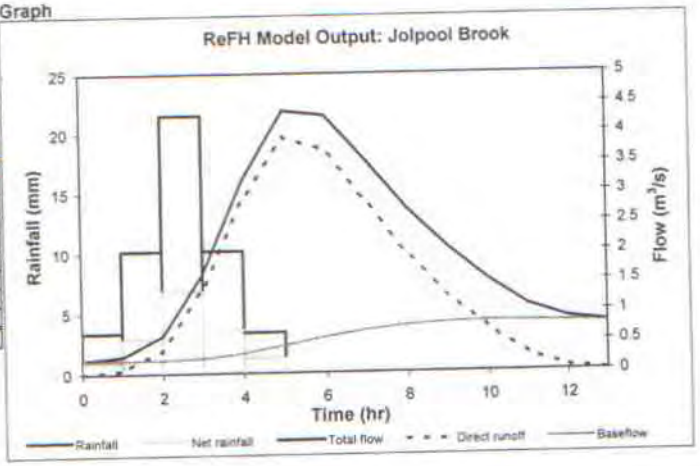
Summary of results

FEH DDF rainfall (mm)	71.3	**Peak rainfall (mm)**	21.5
Design rainfall (mm)	48.5	**Peak flow (m^3/s)**	4.4

Results

Series	Design Rainfall	Net rainfall	Direct runoff	Baseflow	Total flow
Unit	mm	mm	m^3/s	m^3/s	m^3/s
0	3.3	0.9	0.0	0.2	0.2
1	10.2	2.8	0.1	0.2	0.3
2	21.5	6.8	0.4	0.2	0.6
3	10.2	3.6	1.4	0.2	1.7
4	3.3	1.2	2.9	0.3	3.2
5	0.0	0.0	3.9	0.4	4.4
6	0.0	0.0	3.7	0.6	4.3
7	0.0	0.0	2.8	0.7	3.5
8	0.0	0.0	2.0	0.8	2.7
9	0.0	0.0	1.3	0.8	2.1
10	0.0	0.0	0.7	0.8	1.5
11	0.0	0.0	0.3	0.8	1.1
12	0.0	0.0	0.1	0.8	0.9
13	0.0	0.0	0.0	0.8	0.8
Total (mm)	48.5	15.3	15.3	6.1	21.4

Graph



Audit comments

Model run with ReFH dll version 1.4.0005

Catchment
Catchment descriptors imported from file
Catchment descriptor file = '139 FEH Catchment Descriptors.csv'
Catchment decriptor file exported from CD ROM version 2
Catchment descriptor file exported on 24-Apr-2009 14:46
BFIHOST value of 0.545 used
PROPWET value of 0.44 used
SAAR value of 775 used
DPLBAR value of 3.14 used
DPSBAR value of 62 used
URBEXT value of 0.003 used
C value of -0.02986 used
D1 value of 0.37198 used
D2 value of 0.30324 used
D3 value of 0.33511 used
E value of 0.31037 used
F value of 2.35414 used

Rainfall
Recommended season is Winter, as URBEXT < 0.125
ReFH design standard Seasonal Correction Factor of 0.71 applied
ReFH design standard Areal Reduction Factor of 0.96 applied

Loss Model
C_{max} derived from catchment descriptors
ReFH design standard C_{ini} used
ReFH design standard α factor used

Routing Model
T_p derived from catchment descriptors
ReFH design standard used for U_p
ReFH design standard used for U_k

Baseflow Model
BL derived from catchment descriptors
BR derived from catchment descriptors
ReFH design standard BF_0 used

Appendix F – Hec-Ras model profile and cross sections

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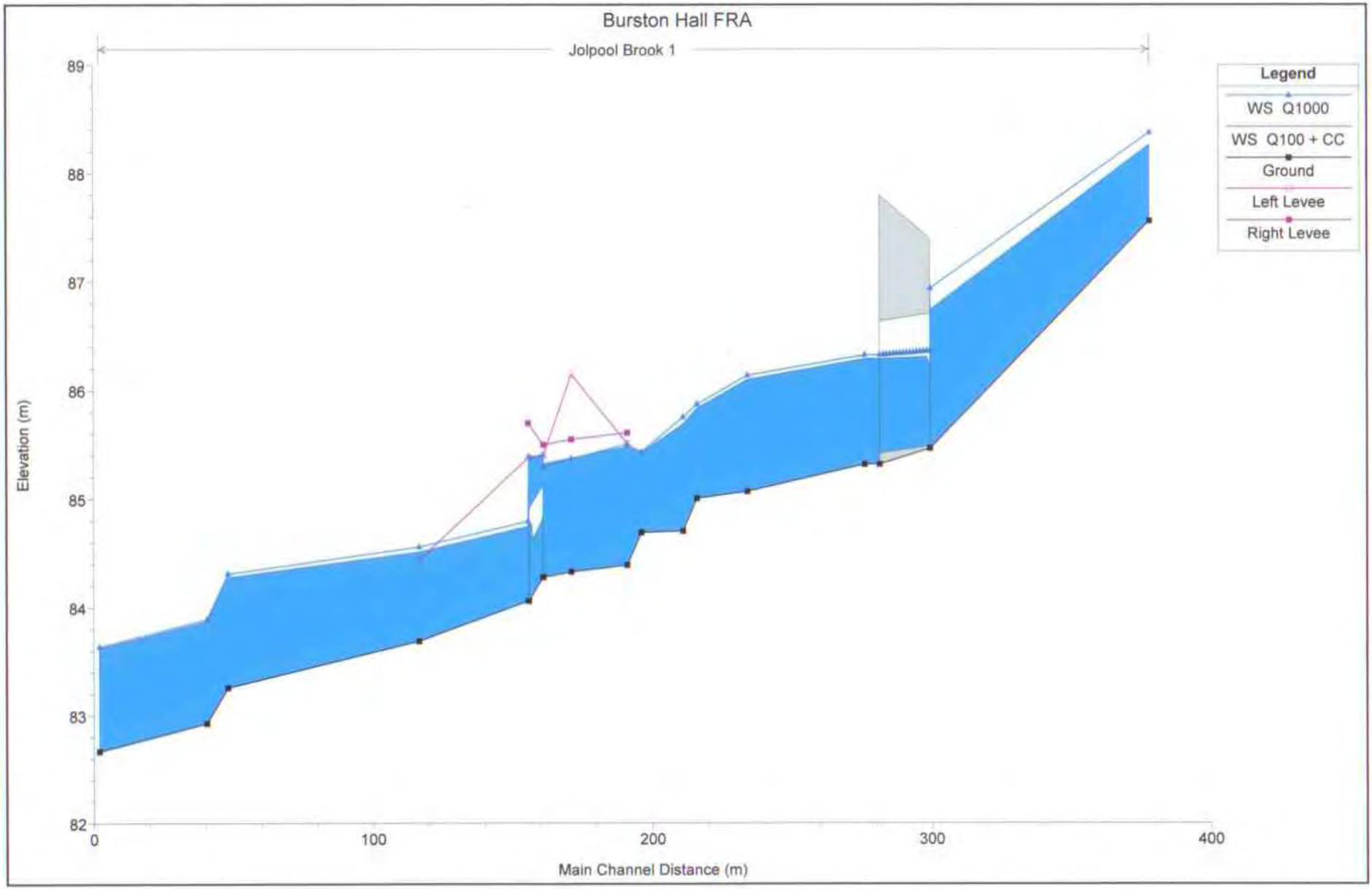
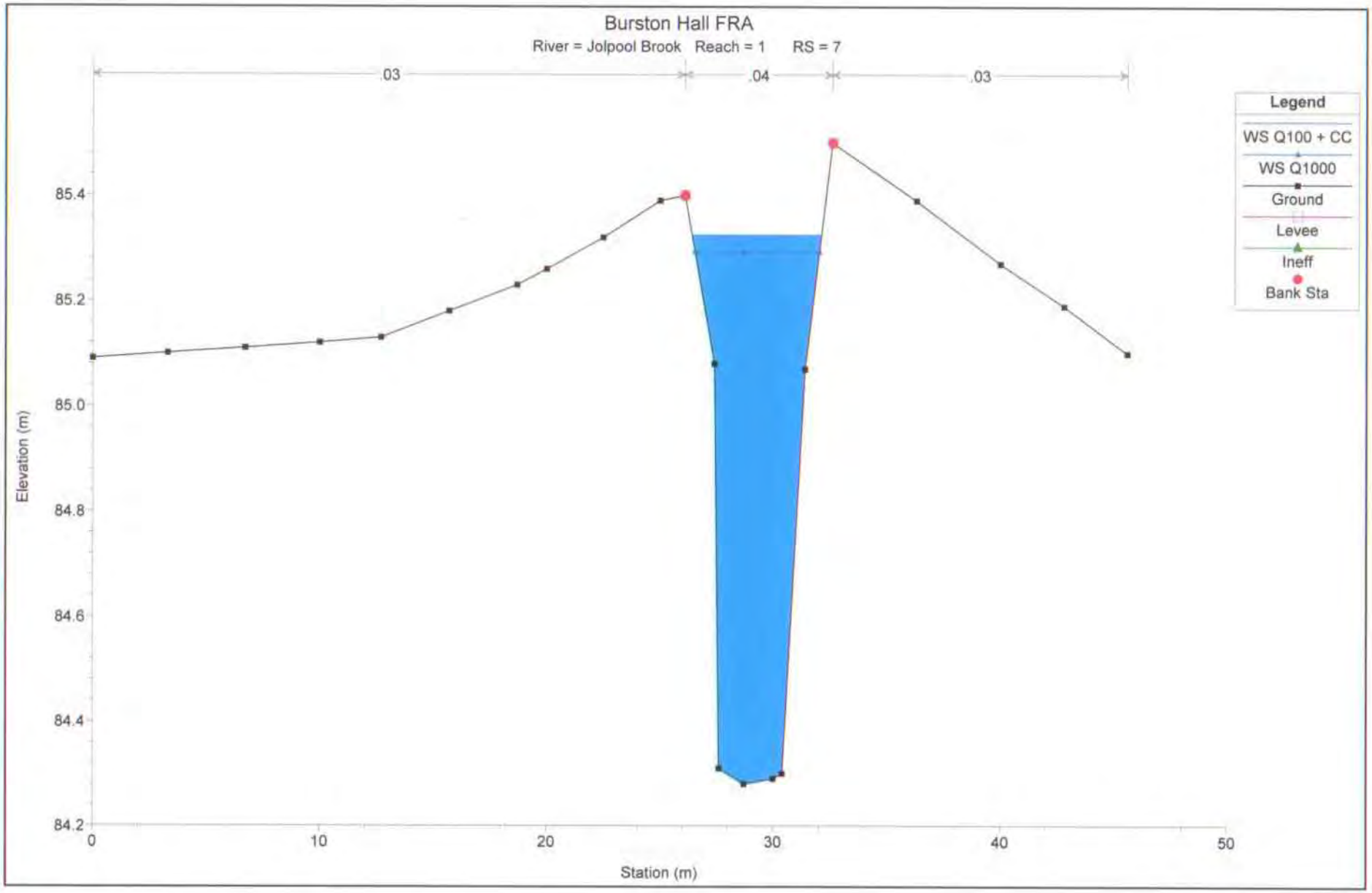
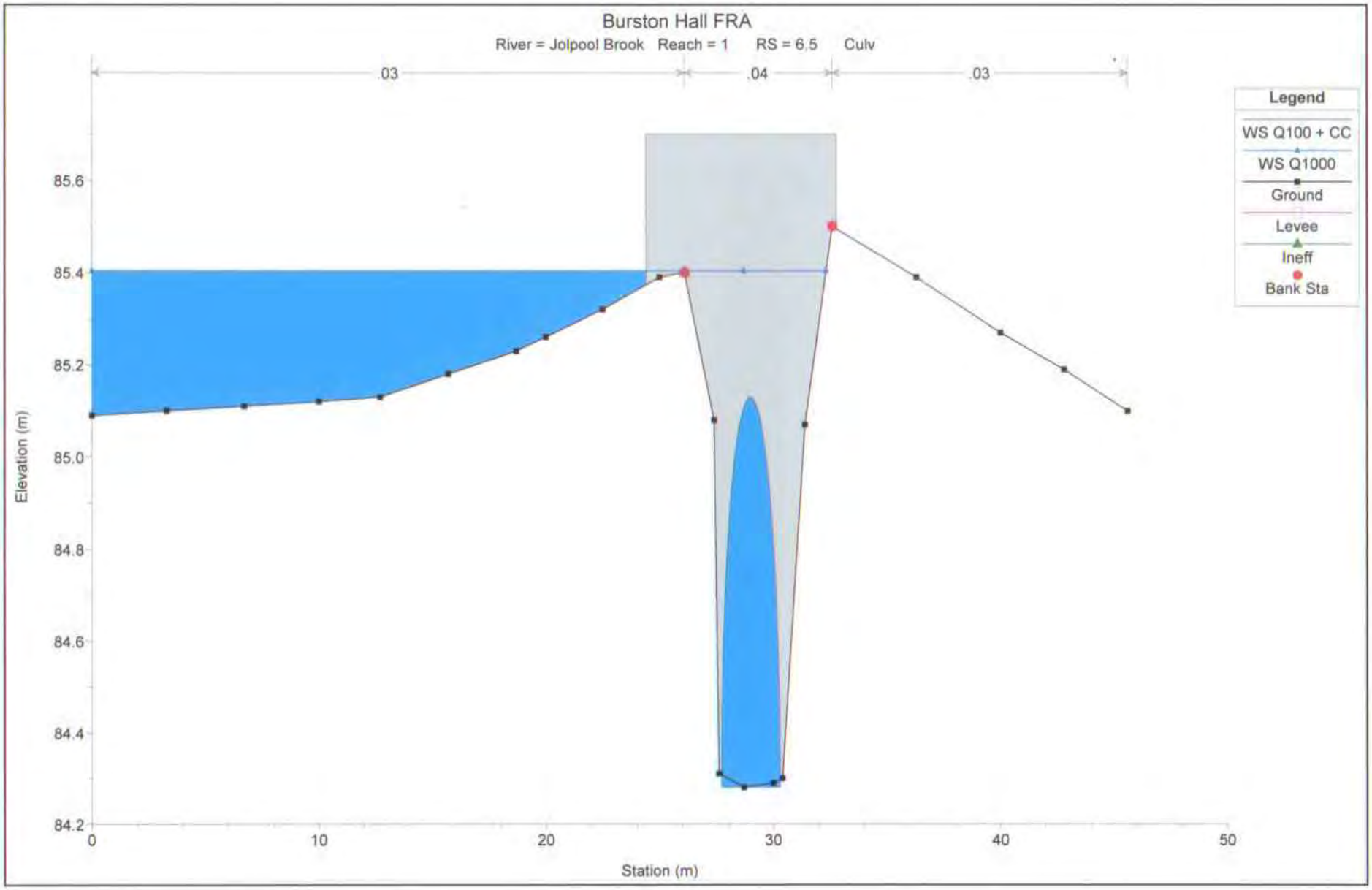
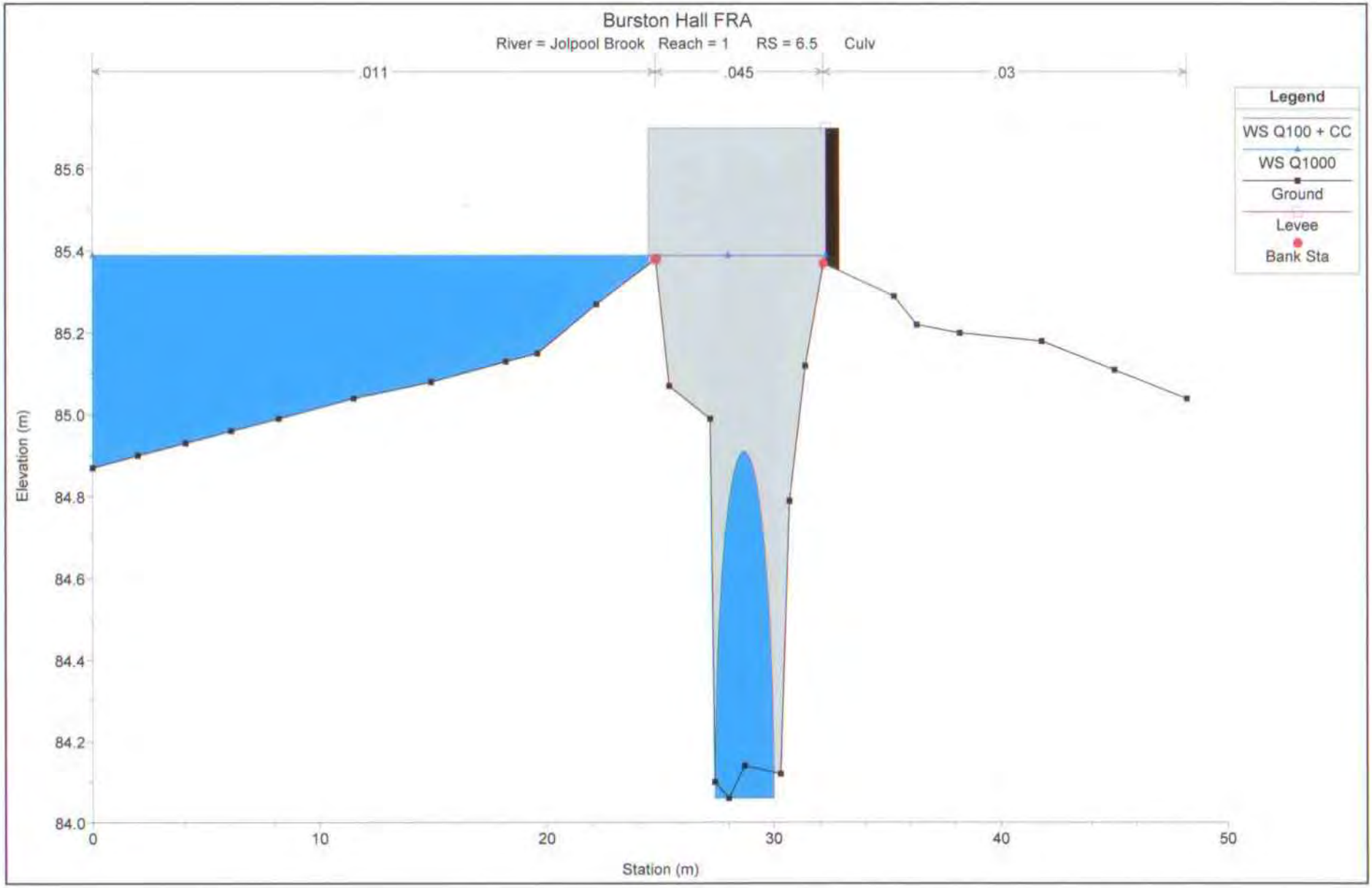
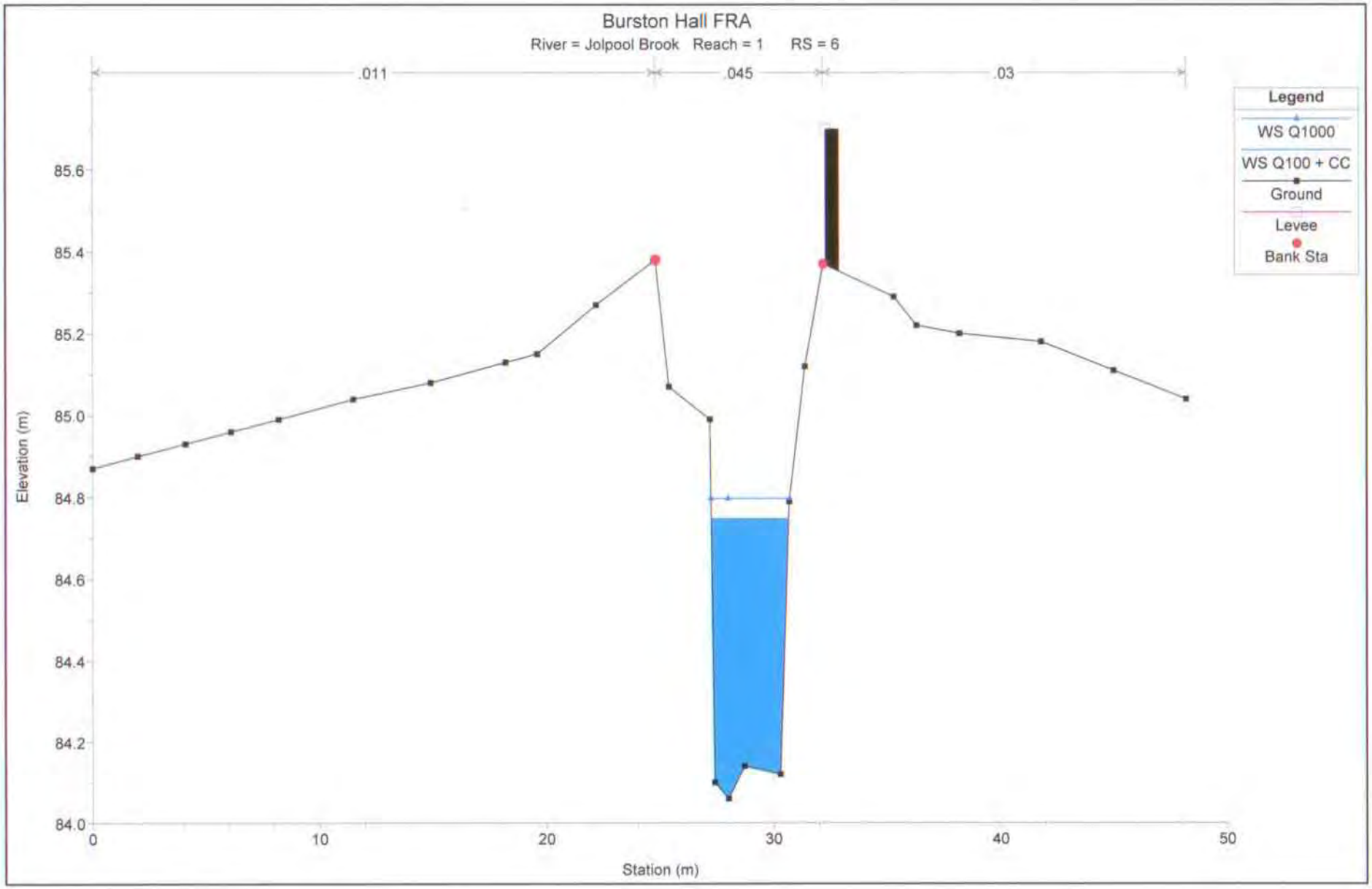

Burston Hall FRA
Jolpool Brook 1
Legend
WS Q1000
WS Q100 + CC
Ground
Left Levee
Right Levee
Elevation (m)
89
88
87
86
85
84
83
82
0
100
200
300
400
Main Channel Distance (m)


Burston Hall FRA
River = Jolpool Brook Reach = 1 RS = 7
.03
.04
.03
Legend
WS Q100 + CC
WS Q1000
Ground
Levee
Ineff
Bank Sta
85.4
85.2
85.0
84.8
84.6
84.4
84.2
Elevation (m)
0
10
20
30
40
50
Station (m)


Burston Hall FRA
River = Jolpool Brook Reach = 1 RS = 6.5 Culv
.03
.04
.03
Legend
WS Q100 + CC
WS Q1000
Ground
Levee
Ineff
Bank Sta
Elevation (m)
85.6
85.4
85.2
85.0
84.8
84.6
84.4
84.2
0
10
20
30
40
50
Station (m)


Burston Hall FRA
River = Jolpool Brook Reach = 1 RS = 6.5 Culv
.011
.045
.03
Legend
WS Q100 + CC
WS Q1000
Ground
Levee
Bank Sta
Elevation (m)
85.6
85.4
85.2
85.0
84.8
84.6
84.4
84.2
84.0
0
10
20
30
40
50
Station (m)


Burston Hall FRA
River = Jolpool Brook Reach = 1 RS = 6
.011
.045
.03
Legend
WS Q1000
WS Q100 + CC
Ground
Levee
Bank Sta
Elevation (m)
85.6
85.4
85.2
85.0
84.8
84.6
84.4
84.2
84.0
0
10
20
30
40
50
Station (m)

Appendix G – Correspondence from Environment Agency

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RAB Consultants Ltd
Lichfield Business Village
The Friary
Lichfield
Staffordshire
WS13 6QG

Our Ref: MC16915/DE

Your Ref:

Date: 07 April 2009

Dear Mr G Wilson

RE: BURSTON HALL, BURSTON, STAFFORDSHIRE ST18 ODR

Thank you for your enquiry requesting information relating to the above site.

Flood Risk
Our records indicate that the property lies on the **edge of Flood Zone 3** (1% annual probability or 1 in 100 year flood) **but within Flood Zone 2** (0.1% annual probability or 1 in 1000 year flood) of the River Trent. Please find enclosed a copy of the Flood Map for the area in the vicinity of the property.

Modelled levels taken from our March 2009 River Trent flood mapping study. Please see enclosed flood map for node locations:

	Return Period (Yrs)							
	mAOD	mAOD	mAOD	mAOD	mAOD	mAOD	mAOD	mAOD
NodePoint	5	10	25	50	75	100	150	200
3161413844	80.68	80.8	80.98	81.11	81.19	81.26	81.36	81.44
3161413485	80.54	80.67	80.85	81	81.09	81.16	81.26	81.34
3161413129	80.42	80.56	80.75	80.9	80.99	81.06	81.17	81.25
3161412768	80.26	80.41	80.61	80.76	80.86	80.93	81.04	81.12

Defences/Crest levels
There are currently no Environment Agency maintained flood defences at the site address/location.

Historic Flooding
Following an examination of our records of Historic Flooding (see explanation below) we have no record of flooding in the area. However this does not mean that the area of the property / site has never flooded. At the present time we do not have records of flooding in this area.

You are advised to contact your local authority or internal drainage board, to see if they have other relevant local flood information.

What are our records of Historic Flooding?
Our records of Historic Flooding show the extents of known flooding from rivers, the sea, and groundwater. The data does not show all the flooding that may ever have occurred – we can only show flooding where we have adequate records. If an area of land shown outside the extents of our recorded flooding area this does not mean it has never flooded. When more data on historic flooding becomes available, and as flood incidents occur, we will record this and update our historic data where appropriate.

Flood Warnings Direct
The nearest location for the Environment Agency's flood warnings direct service lies to the South East of the proposed location.

The River Trent at Enson, Sandon, Salt and Western
Quick Dial Code: 05211122

The information provided above is based on records and files from various sources and of varying reliability. We cannot accept any liability for any loss or damage arising from the interpretation or use of the information.

A site inspection has not been carried out in relation to your request for information. This information is provided under the conditions for use of data or information attached.

Yours sincerely

DIANE EDWARDS
External Relations Assistant
Direct dial 01543 404971

Environment Agency, Sentinel House, 9 Wellington Crescent, Fradley Park, Lichfield Staffordshire, WS13 8RR
Customer Service Line: 08708 506 506
Email: enquiries@environment-agency.gov.uk
www.environment-agency.gov.uk

Notice for the supply of Environment Agency information
(Standard Notice – Commercial)

1. Nothing in this notice will in any way restrict your statutory or any other rights of access to the Information. If you wish to do anything in excess of those rights you may do so in accordance with the following paragraphs only if you agree to all the terms.
2. All intellectual property rights in the documents, data or information supplied to you (referred to as "the Information") whether owned by the Environment Agency (referred to as "Agency information") or third parties (referred to as "Third Party information") will continue to be owned by them.
3. The information has not been prepared to meet your or anyone else's individual requirements. It is your responsibility to ensure that the Information meets your needs.
4. The Environment Agency cannot ensure and therefore gives no promise that the Information in its possession will always be accurate, complete, up to date or valid.
5. The Environment Agency will take reasonable precautions to ensure that we provide you with an accurate copy of the Information from our records.
6. If we have specified that you must pay us for supply of the Information you must pay us before we respond to your request. You will only be able to cancel and request your fee back up to the point when we start work on providing the requested information.
7. If you have asked for the Information to be supplied in an electronic format we cannot guarantee that either the disk or the data file is free of any defects and you should check it for viruses and other items that may affect your computer.
8. Use of Third Party information, including copying, must be limited to statutory rights. This generally means that you will need to seek permission to copy. Third Party information may include information from our public registers, which has been supplied to us by a third party, for example the Information provided in an application form.

Permitted use of Agency information

9. As you have paid us our internal commercial usage charge (currently £10) you may take unlimited copies of Agency information (exactly as it is) for the internal purposes of your business (commercial internal limited use), provided that:
   a) you ensure that all copies are attributed to the Environment Agency;
   b) you do not amend or alter the Information, or merge it with other information;
   c) you do not supply the Information (or any information derived from, or based on the use of it) to others.
10. If you are a professional advisor and you have paid us our internal commercial usage charge (currently £10) you may in addition to the rights in paragraph 9, give copies of Agency information (exactly as it is) to your client and any other person who reasonably requires a copy (limited professional use), provided that:
    a) any copies you send are in connection with the specific transaction or matter for which you obtained the Information from the Environment Agency;
    b) you make no charge for supplying the Information other than for your actual costs and time incurred;
    c) you attach a copy of this notice and require all recipients to comply with it.

    Recipients of information under this paragraph do not need to pay any additional fee as long as they use the Information exactly as it is, internally and only for the same specific transaction or matter.
11. Please contact us if you need permission for any other use.

It is important that you also read any additional information or warning we give you about specific information.

Appendix H – Correspondence from British Waterways

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From: Tony Leonard [Tony.Leonard@britishwaterways.co.uk]
Sent: 01 April 2009 10:59
To: claire.wilenchik@rabconsultants.co.uk
Cc: Mark T. Gorman; Sarina Young; Darren Green; Judith Bratby
Subject: Flood risk assessment Burston Hall ST18 0DR NGR 393656 330065

Dear Claire,

Your request for information was passed on to me for comment.

I am pleased to confirm the following:-

- I have examined British Waterways archives which contain records of breaches and overtopping incidents.
- There are no records of any incidences of breaching or overtopping along this section of the canal.

For further advice on flood risk assessments I have included some generic guidance (see appendix A).

If you require any further specific information or wish to view any relevant inspection reports you will be charged for our reasonable costs incurred in providing this information. Details of our hourly rates can be found in appendix 4 of British Waterways published Code of Practice for Works Affecting British Waterways available on the internet at:

http://www.britishwaterways.co.uk/images/Code_of_Practice_for_Works_Affecting_BW.pdf

The minimum charge for these additional works will be £60 plus VAT.

Please note that we are unable to comment on the flood risk to individual properties or developments and interpretation of the information provided in this communication is your responsibility.

Appendix A - Guidance Note for Flood Risk Assessments

The main incidents of uncontrolled loss of water from our waterways are overtopping and breaching as a result of inundation from adjacent water courses, vandalism or structural failure.

British Waterways maintains water levels using reservoirs, feeders and boreholes, and thereafter manages the water by transferring it within the canal system. The level of the water in canals is normally determined predominantly by the level and size of weirs. Water levels in river navigations are affected by the flow in the river and will fluctuate more widely than canals.

When surface water enters our waterways, the level of the water rises. Eventually the water level will reach a point where it discharges from our waterways through control structures. Where the capacity of these control structures is exceeded, overtopping may result.

Breaches which may lead to flooding can occur on our waterways. There can be a number of causes for these including: culvert collapse, animal burrowing and overtopping. British Waterways operates a comprehensive asset management system which enables us to manage the risks of such events occurring.

Breaches occur on average at a rate of three per year over the whole of the British Waterways owned canal network (that s over 2,000 mile of canal).

I trust this is satisfactory, however if you do require any further information please do not hesitate to contact me.

Regards,

Tony.

TONY LEONARD
WATER RESOURCES ENGINEER
DIRECT DIAL 4143
MOBILE 07884238646

Appendix I - Correspondence from Network Rail

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From: Price Brian [Brian.Price@networkrail.co.uk]
Sent: 18 March 2009 14:50
To: Claire Wilenchik
Subject: RE: Jolpool Brook, Burston, Staffs

Follow Up Flag: Follow up
Flag Status: Completed

Claire,

Having spoken to our structures maintenance engineer and having trawled through our electronic records it seems we have no drawings for this culvert. In the liability records for the culvert it states that it is of a semi circular construction 8' wide by 4' deep but obviously we cannot guarantee the accuracy of this information.

Sorry I cannot be of more assistance.

Regards,

Brian Price BEng (Hons),
Outside Party Engineer,
LNW (West Coast South),
100 Wharfside Street,
The Mailbox,
Birmingham,
B1 1NT.
Tel: 0121 345 3343
Mob: 07515 626395
E-mail: Brian.Price@Networkrail.co.uk

From: Claire Wilenchik [mailto:claire.wilenchik@rabconsultants.co.uk]
Sent: 16 March 2009 12:41
To: Price Brian
Subject: RE: Jolpool Brook, Burston, Staffs

Brian

This is the correct culvert, if you have any further information you could send to me that would be much appreciated.

Kind Regards

Claire Wilenchik
RAB Consultants
☎ 01543 308631
✉ claire.wilenchik@rabconsultants.co.uk
www.rabconsultants.co.uk

From: Price Brian [mailto:Brian.Price@networkrail.co.uk]
Sent: 16 March 2009 12:34
To: claire.wilenchik@rabconsultants.co.uk
Subject: Jolpool Brook, Burston, Staffs

Claire,

Please find attached the examination report for a culvert I believe is the one you have requested further information for. If you can confirm that this is the correct structure I will endeavour to find the construction drawings for it.

However, there is no guarantee that we have the drawings for it but I will try my best.

Regards,

Brian Price BEng (Hons),
Outside Party Engineer,
LNW (West Coast South),
100 Wharfside Street,
The Mailbox,
Birmingham,
B1 1NT.
Tel: 0121 345 3343
Mob: 07515 626395
E-mail: Brian.Price@Networkrail.co.uk

****
****
****

Examination Report Summary Sheet for Network Rail

mouchel

Examination Type:	Visual			**Examination Date:**	25/05/2008		
ELR:	CMD2	**Structure/ Group Ref:**	124	**Mileage (mile.yds):**	**From** 30.1482	**To**	
Area:	West Coast S	**Span:**	SPAN 1 of ?	**OS Ref:**	SJ-937-301		
Structure/Group Description:	Underbridge (BU)			**Group:**	B	**Type:**	U
At or between Stations:	BARLASTON & TITTENSOR - End			**Complete Examination (Y/N):**			Y
CARRS Exam ID:	401201	**Contract Year:**	2008/09	**Report Filename:**	CMD2-030-1482-124-1-BU-V-WCS-0809.pdf		
SEC Name:	Mouchel Parkman Rail			**SEC Report Referenc**	335064		

HIDDEN PARTS NOT EXAMINED (EXCLUDING FOUNDATIONS)

Section A: To be Completed By The Examining Organisation

PART	REASON NOT EXAMINED

Work Recommendations

ITEM	DESCRIPTION	LOCATION	Quantity	Est. Cost £K +/- 20%	Extent	Severity	Probability	Risk Score	Priority Year	Works Category

Examining Engineer's Comments	No Actions.				
Examiner's General Comments	No significant deterioration since last examination. No defects require action before next examination but note: water level is permanently above crown due to stream invert level being 300mm higher than crown				
Examiner	Mike Desmond	**Examining Engineer**	John Murtha	**Sign off Date**	16/06/2008

Examination Report Summary Sheet for Network Rail

mouchel

Examination Type:	Visual			**Examination Date:**	25/05/2008		
ELR:	CMD2	**Structure/ Group Ref:**	124	**Mileage (mile.yds):**	**From** 30.1482	**To**	
Area:	West Coast S	**Span:**	SPAN 1 of ?	**OS Ref:**	SJ-937-301		
Structure/Group Description:	Underbridge (BU)			**Group:**	B	**Type:**	U
At or between Stations:	BARLASTON & TITTENSOR - End			**Complete Examination (Y/N):**			Y
CARRS Exam ID:	401201	**Contract Year:**	2008/09	**Report Filename:**	CMD2-030-1482-124-1-BU-V-WCS-0809.pdf		
SEC Name:	Mouchel Parkman Rail			**SEC Report Referenc**	335064		

Miscellaneous Infomation

Extended Area (as of 2003)	Yes
Last Detail Exam	21/01/2005
Last Visual Exam	10/01/2007

Examined By:	**Mike Desmond**	Reviewed By:	**John Murtha**
Date:	**30/05/2008**	Date:	**16/06/2008**
Signed:	Mike Desmond.	Signed:	J.R. Murtha

Examination Report Summary Sheet for Network Rail

mouchel

Examination Type:	Visual			**Examination Date:**	25/05/2008		
ELR:	CMD2	**Structure/ Group Ref:**	124	**Mileage (mile.yds):**	**From** 30.1482	**To**	
Area:	West Coast S	**Span:**	SPAN 1 of ?	**OS Ref:**	SJ-937-301		
Structure/Group Description:	Underbridge (BU)			**Group:**	B	**Type:**	U
At or between Stations:	BARLASTON & TITTENSOR - End			**Complete Examination (Y/N):**			Y
CARRS Exam ID:	401201	**Contract Year:**	2008/09	**Report Filename:**	CMD2-030-1482-124-1-BU-V-WCS-0809.pdf		
SEC Name:	Mouchel Parkman Rail			**SEC Report Referenc**	335064		

IMAGES and PHOTOGRAPHS

Upside face **Photo 1**

Arch ring upside **Photo 2**

Examination Report Summary Sheet for Network Rail

mouchel

Examination Type:	Visual			**Examination Date:**	25/05/2008		
ELR:	CMD2	**Structure/ Group Ref:**	124	**Mileage (mile.yds):**	**From** 30.1482	**To**	
Area:	West Coast S	**Span:**	SPAN 1 of ?	**OS Ref:**	SJ-937-301		
Structure/Group Description:	Underbridge (BU)			**Group:**	B	**Type:**	U
At or between Stations:	BARLASTON & TITTENSOR - End			**Complete Examination (Y/N):**			Y
CARRS Exam ID:	401201	**Contract Year:**	2008/09	**Report Filename:**	CMD2-030-1482-124-1-BU-V-WCS-0809.pdf		
SEC Name:	Mouchel Parkman Rail			**SEC Report Referenc**	335064		

Upstream upside

Photo 3

Bed of watercourse is higher than crown of arch rings

Downside face

Photo 4

Downside outlet end. Water permanently above crown due to stream invert level being 300mm higher than crown

Examination Report Summary Sheet for Network Rail

mouchel

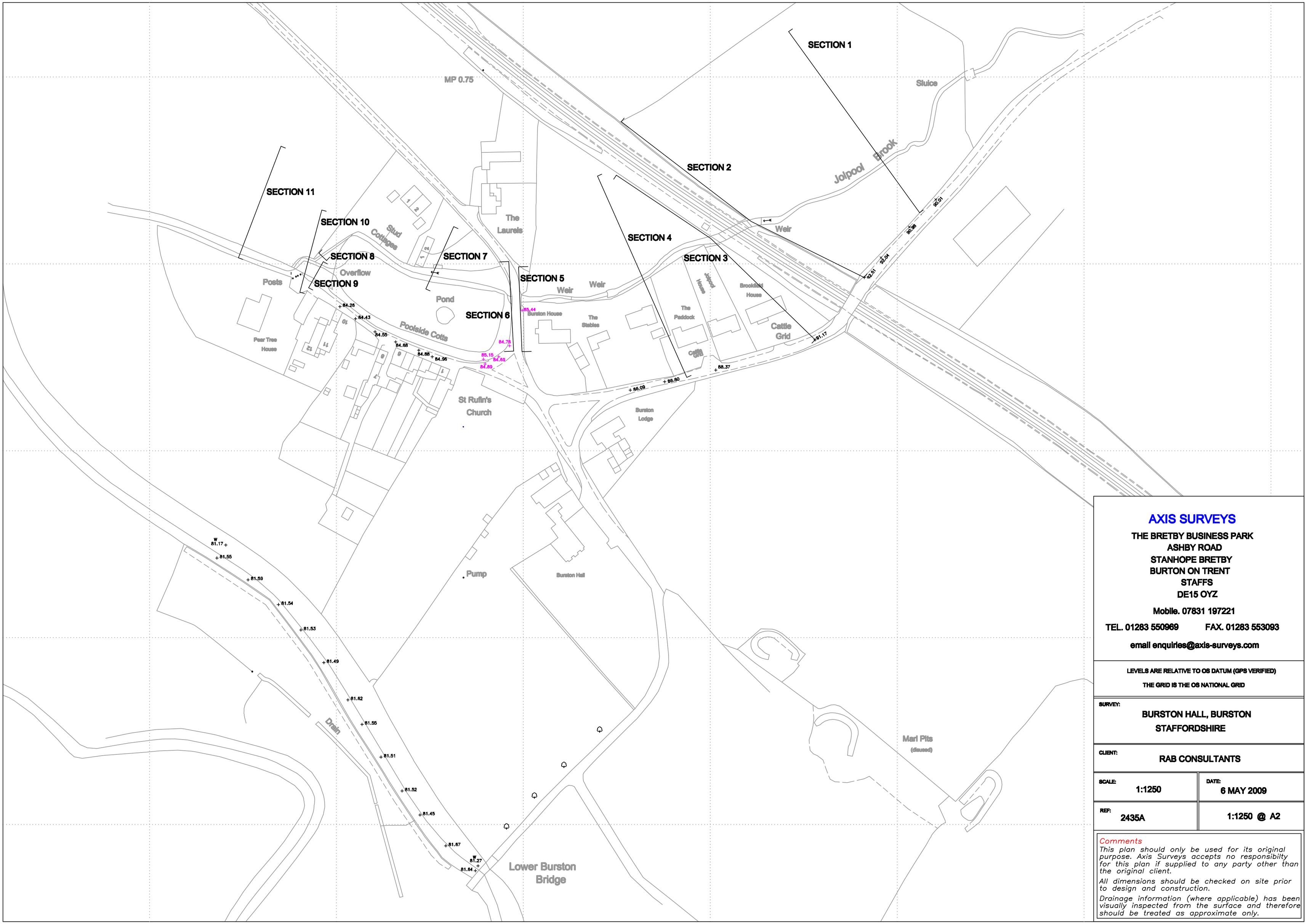
Examination Type:	Visual			**Examination Date:**	25/05/2008		
ELR:	CMD2	**Structure/ Group Ref:**	124	**Mileage (mile.yds):**	**From** 30.1482	**To**	
Area:	West Coast S	**Span:**	SPAN 1 of ?	**OS Ref:**	SJ-937-301		
Structure/Group Description:	Underbridge (BU)			**Group:**	B	**Type:**	U
At or between Stations:	BARLASTON & TITTENSOR - End			**Complete Examination (Y/N):**			Y
CARRS Exam ID:	401201	**Contract Year:**	2008/09	**Report Filename:**	CMD2-030-1482-124-1-BU-V-WCS-0809.pdf		
SEC Name:	Mouchel Parkman Rail			**SEC Report Referenc**	335064		

Downstream downside

Photo 5

Downstream downside

5.1 – Project 12 - Tower Surveys Topographical Survey of March 2015



AXIS SURVEYS

THE BRETBY BUSINESS PARK
ASHBY ROAD
STANHOPE BRETBY
BURTON ON TRENT
STAFFS
DE15 OYZ

Mobile. 07831 197221

TEL. 01283 550969 FAX. 01283 553093

email enquiries@axis-surveys.com

LEVELS ARE RELATIVE TO OS DATUM (GPS VERIFIED)

THE GRID IS THE OS NATIONAL GRID

SURVEY:
BURSTON HALL, BURSTON
STAFFORDSHIRE

CLIENT:
RAB CONSULTANTS

SCALE:	DATE:
1:1250	6 MAY 2009
REF: 2435A	1:1250 @ A2

Comments

This plan should only be used for its original purpose. Axis Surveys accepts no responsibilty for this plan if supplied to any party other than the original client.

All dimensions should be checked on site prior to design and construction.

Drainage information (where applicable) has been visually inspected from the surface and therefore should be treated as approximate only.

6.0 – Projects 13/14 - Tower Surveys Topographic and Watercourse Section Surveys of Jolpool Brook of January 2012.

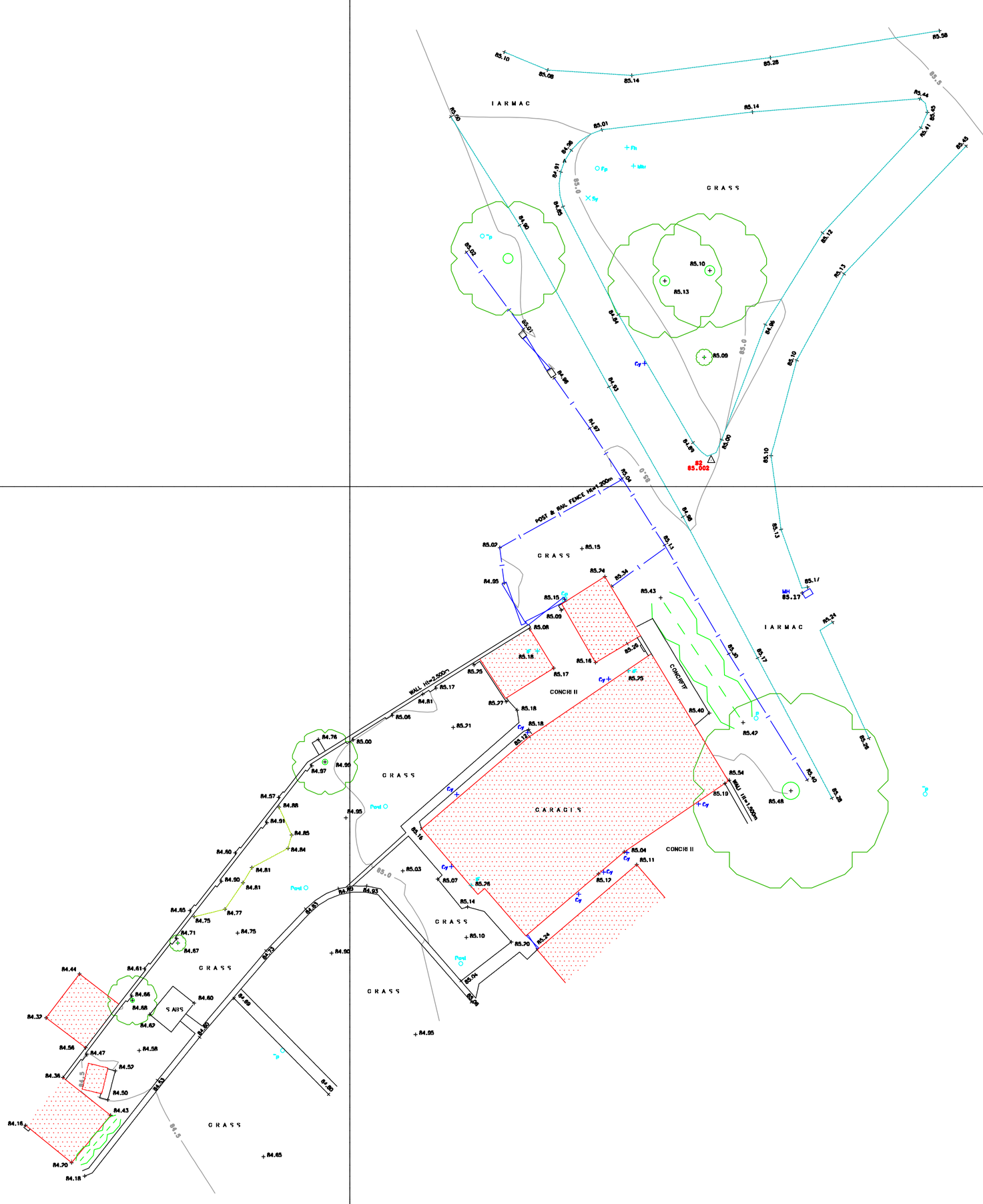
393550E

393600E

330050N

330000N

329950N



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STAFFS
DE15 OYZ

Mobile. 07831 197221

TEL. 01283 550969 FAX. 01283 553093

email enquiries@axis-surveys.com

LEVELS ARE RELATIVE TO O.S DATUM GPS VERIFIED

THE GRID IS O.S NATIONAL GRID

SURVEY:

Burston Hall - Burston

CLIENT:

R.A.B Consultants

SCALE:	DATE:
1:200	6 May 2009
REF: 2435	1:200 @ A1

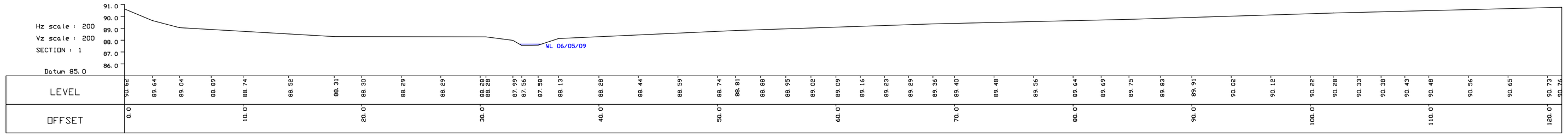
Comments

This plan should only be used for its original purpose. Axis Surveys accepts no responsibilty for this plan if supplied to any party other than the original client.

All dimensions should be checked on site prior to design and construction.

Drainage information (where applicable) has been visually inspected from the surface and therefore should be treated as approximate only.

6.1 – Projects 13/14 - RAB Consultants Hydraulic Assessment of July 2015



AXIS SURVEYS

THE BRETBY BUSINESS PARK
ASHBY ROAD
STANHOPE BRETBY
BURTON ON TRENT
STAFFS
DE15 OYZ
Mobile. 07831 197221
TEL. 01283 550969 FAX. 01283 553093
email enquiries@axis-surveys.com

LEVELS ARE RELATIVE TO OS DATUM (GPS VERIFIED)
THE GRID IS THE OS NATIONAL GRID

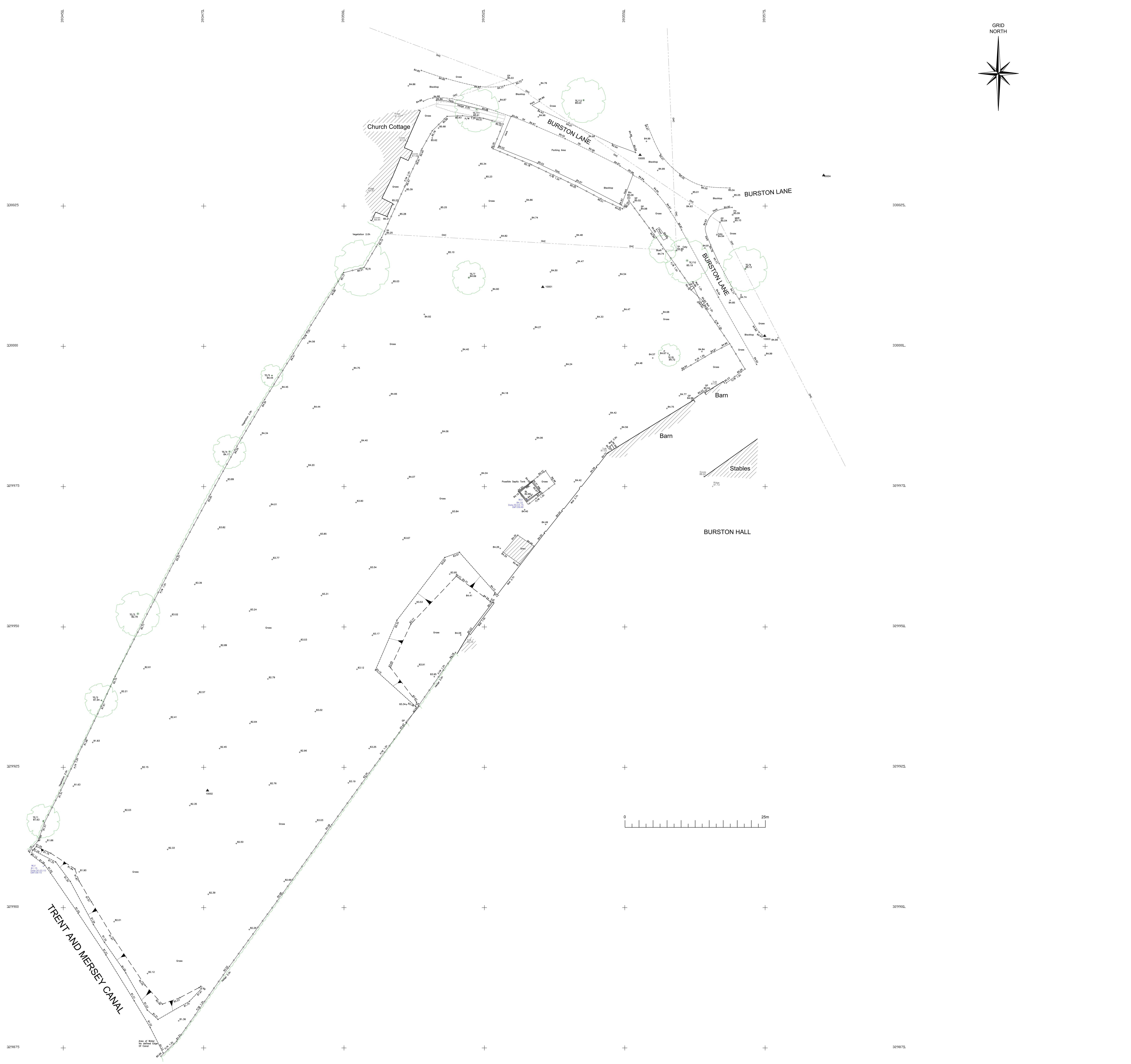
SURVEY: BURSTON HALL, BURSTON STAFFORDSHIRE

CLIENT: RAB CONSULTANTS

SCALE: 1:200	DATE: 6 MAY 2009
REF: 2435SECTIONS	1:200 @ A1

Comments
This plan should only be used for its original purpose. Axis Surveys accepts no responsibilty for this plan if supplied to any party other than the original client.
All dimensions should be checked on site prior to design and construction.
Drainage information (where applicable) has been visually inspected from the surface and therefore should be treated as approximate only.

7.0 – Project 15 - Tower Surveys additional Watercourse Section Surveys of June 2012



A0

NOTES

SURVEY CONTROL:

A) SURVEY GRID (HORIZONTAL):

THIS SURVEY IS ORIENTATED TO ORDNANCE SURVEY GRID NORTH. THE SURVEY IS REDUCED TO A PLANE GRID ABOUT BASE POINT STN/1. HORIZONTAL MEASUREMENTS TAKEN FROM THIS SURVEY WILL BE GROUND DISTANCES.

THE CONTROL HAS BEEN ESTABLISHED USING TRIMBLE VRS NOW NETWORK REAL TIME KINEMATIC (NRTK) FOR THE ON-SITE SURVEY CONTROL, USING TOPCON GPS SYSTEM, ANTENNA HIPER 2, MOUNTED ON A 2 METRE POLE STABILISED USING A BI-POD DURING OCCUPATIONS.

THE LOCAL SCALE FACTOR (LSF) APPLICABLE TO THIS SITE IS 0.99960178, CALCULATED USING STANDARD TABULATED DATA. THE SITE CENTRE CO-ORDINATES HAVE BEEN TAKEN AS BEING SURVEY STATION STN/1.

(FOR THIS RELATIVELY LOW LEVEL SITE, MEAN SEA LEVEL CORRECTIONS (MSL) ARE DEEMED TO BE INSIGNIFICANT AND HAVE THEREFORE NOT BEEN APPLIED.)

B) VERTICAL DATUM:

ALTITUDES FOR THE CONTROL ARE BASED GPS DERIVED HEIGHTS FOR SURVEY STATIONS STN/5 AND 6 AND CONVERTED TO ORTHOMETRIC HEIGHTS (ORDNANCE DATUM NEWLYN - ODN) USING OSGM02 TRANSFORMATION PARAMETERS AND ADJUSTED TO FIT ORTHOMETRIC LEVELLED HEIGHT DIFFERENCES TO OBTAIN FINAL ODN HEIGHT VALUES.

NO NEARBY OSBM WAS AVAILABLE TO CHECK.

C) GPS CONTROL:

THE CO-ORDINATE SYSTEM USED FOR THE PRIMARY CONTROL IS OSGB36; THIS HAS BEEN CALCULATED FROM ETRS89 USING OSTN02 TRANSFORMATION PARAMETERS.

OBSERVATIONS HAVE BEEN TAKEN ON THE FOLLOWING DATE: - 30/03/2015

2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS/DOCUMENTATION.
3. IF IN DOUBT ASK.
4. CRITICAL DIMENSIONS AND HEIGHTS MUST BE CHECKED ON SITE PRIOR TO CONSTRUCTION.

LEGEND

30.29	SPOT LEVEL
	SURVEY STATION
	SAPLING
	TREE (INDICATIVE ONLY)
	BUILDING
99.90	CONTOUR at 0.5 METRE INTERVALS
	BANKING
	GATE
	FENCE WITH DESCRIPTION
C/L	CHAIN LINK
I/R	IRON RAILING
P/R	POST AND RAIL
P/W	POST AND WIRE
W/P	WOODEN PANEL

ABBREVIATIONS

AC	AIR CONDITIONING UNIT	LW	LIGHTWELL
AXR	APEX ROOF LEVEL	MH	MANHOLE
B	BOLLARD	MHC	MANHOLE - CIRCULAR
BB	BELISHA BEACON	MH(F)	MANHOLE-FOUL
BL	BED LEVEL	MH(S)	MANHOLE-SURFACE
BOP	BACK OF PATH	MHT	MANHOLE-TRIANGULAR
BP	BOUNDARY POST	MP	MILE POST
BS	BUS STOP	OHC	OVERHEAD CABLE
BT	BRITISH TELECOM IC	PB	PILLAR BOX
CATV	CABLE TELEVISION IC	PI	PIPE
CC	CONTROL CABINET	PM	PARKING METER
CEL	SUBWAY CEILING LEVEL	P	POST
COL	COLUMN	PYL	ELECTRIC PYLON
CYR	CYCLE RACK	RE	RODDING EYE
CPY	CANOPY LINE	RF	ROOF LEVEL
CSTY	CABLESTAY	RG	RIDGE LEVEL
DK	DROP KERB	RS	ROAD SIGN
DR	DRAIN	RWL	RETAINING WALL
DP	DOWN WATER PIPE	SA	SOAK AWAY
EC	ELECTRIC CABLE	SAP	SAPLING
ECB	ELECTRIC CONTROL BOX	SC	STOP COCK
EL	ELECTRIC MANHOLE	SEC	SECURITY CAMERA
EP	ELECTRIC POLE	SuL	SUBWAY GROUND LEVEL
ER	EARTH ROD	SGY	STRIP GULLY
EV	EAVES LEVEL	SP	SIGN POST
FB	FLOWERBED	SV	STOP VALVE
FH	FIRE HYDRANT	SW	STORM WATER
FL	FLOOR LEVEL	TB	TELEPHONE BOX
FLT	FLOOD LIGHT	TCP	TACTILE PAVING
FW	FOUL WATER	TE	TREE
G	GULLY	THL	THRESHOLD LEVEL
GP	GATE POST	TL	TRAFFIC LIGHT
GV	GAS VALVE	TOF	TOP OF FENCE LEVEL
IC	INSPECTION COVER	TOW	TOP OF WALL LEVEL
IL	INVERT LEVEL	TP	TELEPHONE POLE
IC/M	MERCURY INSPECTION COVER	TRP	TRIAL PIT
KB	KERB	UTL	UNABLE TO LIFT
KO	KERB OUTLET GULLY	VP	VENT PIPE
LB	LITTER BIN	WLV	WATER LEVEL
LP	LAMP POST/LIGHT COLUMN	WM	WATER METER
		WO	WASH OUT

STATION CO-ORDINATES

STATION	EASTING	NORTHING	LEVEL	DESCRIPTION
STN/1	393535.40	330010.57	84.47	WOODEN PEG
STN/2	393475.69	329920.88	82.45	WOODEN PEG
STN/3	393574.92	330001.86	84.93	SURVEY NAIL
STN/4	393585.42	330030.47	85.37	SURVEY NAIL
STN/5	393552.73	330034.10	84.97	SURVEY NAIL

UNLESS OTHERWISE STATED THE SURVEY STATIONS LISTED ABOVE ARE ONLY INTENDED TO BE USED FOR TOPOGRAPHICAL SURVEY AT THE STATED SCALE DUE CONSIDERATION SHOULD BE GIVEN TO LONGTERM STABILITY OF SURVEY STATION MARKERS.

TREE SCHEDULE

No.	DIA.	SPREAD Ø	HEIGHT
TE/1	0.3	6	10
TE/2	0.15	6	8
TE/3	0.4	8	10
TE/4	0.4	6	6
TE/5	0.2	4	8
TE/6	0.3	10	10
TE/7	0.3	6	6
TE/8	0.15	4	5
TE/9	0.3	8	7
TE/10	0.4	8	7
TE/11	0.5	8	13
TE/12	0.3	8	7

TREE NOTES.

1) MB - MULTI BOLE.
2) TB - TWIN BOLE.
3) DIA. - APPROXIMATE DIAMETER MEASURED AT 1.5M ABOVE GROUND LEVEL.
   a. TRUNK SHOWN NOT TO SCALE - SEE SCHEDULE ABOVE FOR ACTUAL SIZE.
4) SPREAD - DIAMETER OF CANOPY.
   a. TREE SPREADS ARE SYMBOLIC ONLY AND ARE REPRESENTATIVE OF THE AVERAGE SPREAD. THIS MAY NOT REPRESENT THE TRUE OUTLINE.
   b. NOTE THAT THE TREE BOLE MAY NOT SIT CENTRALLY TO CANOPY.
5) HEIGHT - APPROXIMATE HEIGHT TO TOP OF CANOPY ESTIMATED FROM GROUND LEVEL.
6) THE TREE TYPES HAVE NOT BEEN IDENTIFIED BY AN ARBORIST AND HAVE THEREFORE BEEN ASSIGNED THE GENERAL FAMILY OR COLLOQUIAL TREE NAMES RATHER THAN THEIR FULL INDIVIDUAL SCIENTIFIC NAMES. SPECIALIST TREE SURVEYS CAN BE ARRANGED UPON REQUEST.
7) ATTENTION SHOULD BE PAID TO THE ORIGINAL TOPOGRAPHICAL SURVEY BRIEF AS TO WHAT TREES HAVE ACTUALLY BEEN SCHEDULED; I.E. ONLY THOSE "TREES LARGER THAN DIAMETER "X" OR "ONLY TREES WITHIN THE IMMEDIATE SURVEY LIMITS". (THIS IS NORMALLY THE CASE UNLESS OTHERWISE SPECIFIED AS INCLUDING "OFF SITE" TREES).

GENERAL

NO ALLOWANCE HAS BEEN MADE FOR SUB SURFACE ENTRY INTO MANHOLES OR OTHER CHAMBERS OR VOIDS BELOW GROUND LEVEL. THEREFORE ANY DETAILS RELATING TO DEPTHS, SIZES ETC. ARE TAKEN FROM ABOVE GROUND AND AS SUCH WILL BE APPROXIMATE ONLY.

THE CONTRACTOR IS TO CHECK AND VERIFY ALL CRITICAL DIMENSIONS AND LEVELS BEFORE WORK STARTS.

BURIED SERVICES SHOWN ON THIS DRAWING MAY BE ASSUMED ROUTES AND WILL NORMALLY BE OF UNKNOWN CONDITION, CONTRACTORS SHOULD UNDERTAKE SUITABLE VALIDATION WORK AND TAKE PARTICULAR CARE DURING EXCAVATION WORK; SAFE DIGGING PRACTICES SHOULD BE FOLLOWED.

SHOULD THERE BE ANY CONFLICT BETWEEN THE DETAILS INDICATED ON THIS DRAWING AND THOSE INDICATED ON OTHER DRAWINGS, THEN TOWER SURVEYS SHOULD BE INFORMED PRIOR TO CONSTRUCTION ON SITE.

IT IS IMPORTANT TO NOTE THAT THE SAME ACCURACIES IMPLIED BY THE PLOTTING SCALE ARE EQUALLY APPLICABLE TO DIGITAL DATA SUPPLIED FOR CAD.

EVERY EFFORT IS MADE TO IDENTIFY ALL VISIBLE ABOVE GROUND FEATURES. HOWEVER, IT SHOULD BE BORNE IN MIND THAT THERE MAY BE ITEMS OBSCURED AT THE TIME OF SURVEY.

VISIBLE FEATURES IN THE VICINITY OF THE BOUNDARIES, AS SHOWN ON THIS SURVEY, MAY NOT REPRESENT THE EXTENT OF LEGALLY CONVEYED OWNERSHIP.

DESCRIPTION	REV	DATE	DRWN	APPR

DRAWING STATUS

INFORMATION

Tower Surveys Ltd
Chartered Surveyors
Geomatics - Land, Utilities, Engineering & Building
RICS

1 LYME DRIVE
PARKLANDS
STOKE-ON-TRENT
ST4 6NW
TEL:+44 (0)1782 667550
FAX:+44 (0)1782 667501
info@towersurveys.co.uk
www.towersurveys.co.uk
Regulated by RICS

CLIENT

JOHN DONNELLY ASSOCIATES

PROJECT TITLE

LAND AT BURSTON HALL
BURSTON, STAFFORDSHIRE

DRAWING DETAIL

TOPOGRAPHICAL SURVEY AS OF 30/03/15

DRAWN	NW	DATE	MARCH 2015
PROJECT ENGINEER	PV		
CHECKED	PV	SCALE	1:250
APPROVED	PV	SHEET SIZE	A0

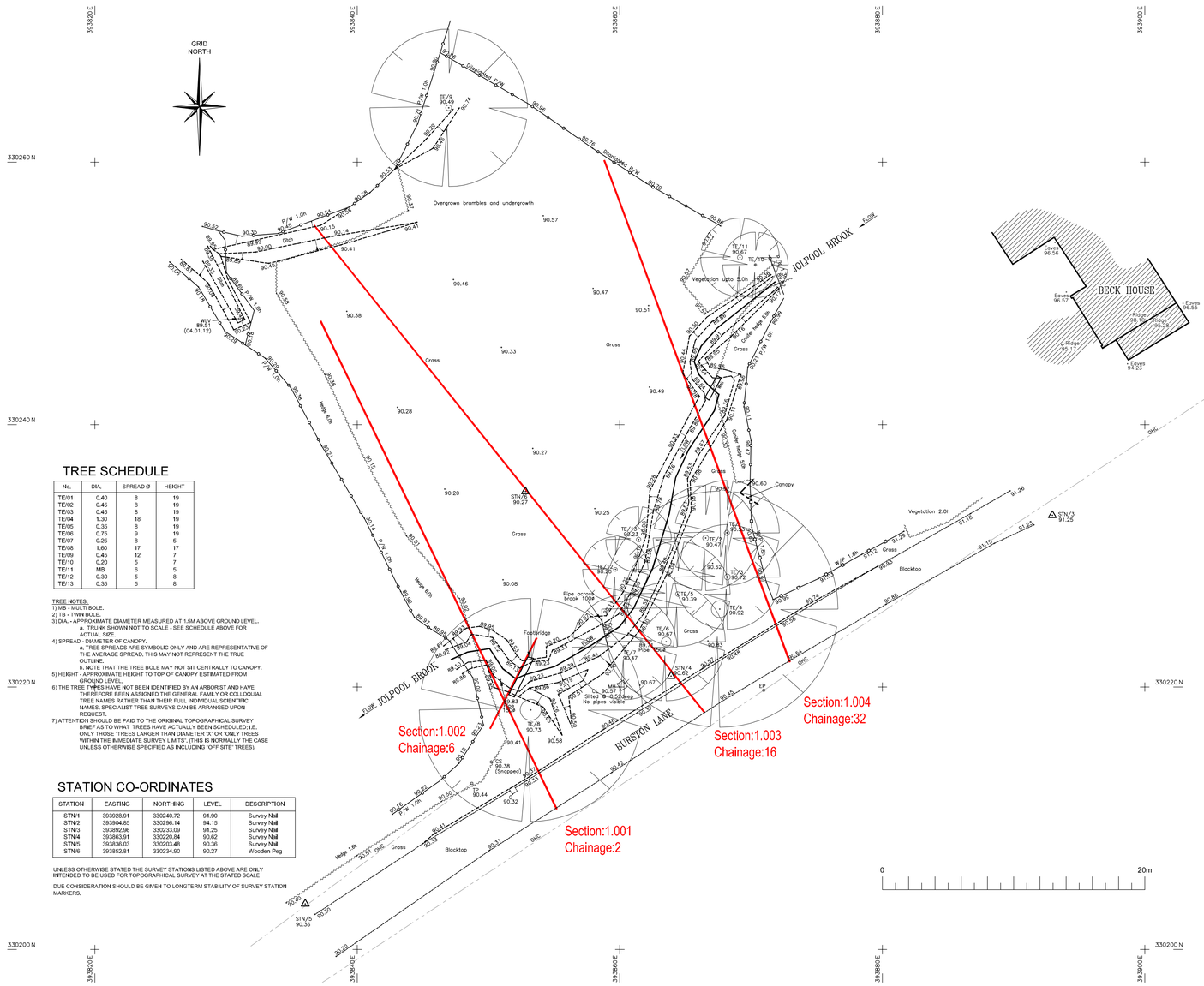
DRAWING NUMBER
R-S11122 / 201

REVISION

CAD REFERENCE
\\2015Projects\R-S11122\\R-S11122_201_ISSUE01

CTB REFERENCE
\\CTB-files\TS-Topo-v01

7.1 – Project 15 - Tower Surveys Topographical Survey of March 2015



TREE SCHEDULE

No.	DIA.	SPREAD Ø	HEIGHT
TE/01	0.40	8	19
TE/02	0.45	8	19
TE/03	0.45	8	19
TE/04	1.30	18	19
TE/05	0.35	8	19
TE/06	0.75	9	19
TE/07	0.25	8	5
TE/08	1.60	17	17
TE/09	0.45	12	7
TE/10	0.20	5	7
T1	MB	6	5
TE/12	0.30	5	8
TE/13	0.35	5	8

TREE NOTES.
1) MB - MULTIBOLE.
2) TB - TWIN BOLE.
3) DIA. - APPROXIMATE DIAMETER MEASURED AT 1.5M ABOVE GROUND LEVEL.
   a. TRUNK SHOWN NOT TO SCALE - SEE SCHEDULE ABOVE FOR ACTUAL SIZE.
4) SPREAD - DIAMETER OF CANOPY.
   a. TREE SPREADS ARE SYMBOLIC ONLY AND ARE REPRESENTATIVE OF THE AVERAGE SPREAD. THIS MAY NOT REPRESENT THE TRUE OUTLINE.
   b. NOTE THAT THE TREE BOLE MAY NOT SIT CENTRALLY TO CANOPY.
5) HEIGHT - APPROXIMATE HEIGHT TO TOP OF CANOPY ESTIMATED FROM GROUND LEVEL.
6) THE TREE TYPES HAVE NOT BEEN IDENTIFIED BY AN ARBORIST AND HAVE THEREFORE BEEN ASSIGNED THE GENERAL FAMILY OR COLLOQUIAL TREE NAMES RATHER THAN HIGHER FULL INDIVIDUAL SCIENTIFIC NAMES. SPECIALIST TREE SURVEYS CAN BE ARRANGED UPON REQUEST.
7) ATTENTION SHOULD BE PAID TO THE ORIGINAL TOPOGRAPHICAL SURVEY BRIEF AS TO WHAT TREES HAVE ACTUALLY BEEN SCHEDULED I.E. ONLY THOSE 'TREES LARGER THAN DIAMETER 'X' OR 'ONLY TREES WITHIN THE IMMEDIATE SURVEY LIMITS'. (THIS IS NORMALLY THE CASE UNLESS OTHERWISE SPECIFIED AS INCLUDING 'OFF SITE' TREES).

STATION CO-ORDINATES

STATION	EASTING	NORTHING	LEVEL	DESCRIPTION
STN/1	393928.91	330240.72	91.90	Survey Nail
STN/2	393904.85	330296.14	94.15	Survey Nail
STN/3	393892.96	330233.09	91.25	Survey Nail
STN/4	393863.91	330220.84	90.62	Survey Nail
STN/5	393836.03	330203.48	90.36	Survey Nail
STN/6	393852.81	330234.90	90.27	Wooden Peg

UNLESS OTHERWISE STATED THE SURVEY STATIONS LISTED ABOVE ARE ONLY INTENDED TO BE USED FOR TOPOGRAPHICAL SURVEY AT THE STATED SCALE

DUE CONSIDERATION SHOULD BE GIVEN TO LONGTERM STABILITY OF SURVEY STATION MARKERS.

A1

NOTES

1. DATUM DETAILS
   SURVEY CONTROL:

   A) SURVEY GRID (HORIZONTAL):
   THIS SURVEY IS ORIENTATED TO ORDNANCE SURVEY GRID NORTH. THE SURVEY IS TO A PLANE GRID, HORIZONTAL MEASUREMENTS TAKEN FROM THIS SURVEY WILL BE GROUND DISTANCES.
   ORDNANCE SURVEY NATIONAL GRID HAS BEEN ESTABLISHED USING TRIMBLE VRS NOW NETWORK REAL TIME KINEMATIC (RRTK), USING TRIMBLE GPS SYSTEM FIRMWARE V4.12, ANTENNA R8-2 SERIAL NUMBER 4732136934, MOUNTED ON A 2 METRE POLE STABILISED USING A BA-POD DURING OCCUPATIONS.
   THE LOCAL SCALE FACTOR (LSF) APPLICABLE TO THIS SITE IS 0.99960172, CALCULATED USING STANDARD TABULATED DATA. THE SITE CENTRE CO-ORDINATES HAVE BEEN TAKEN AS BEING STN/1.
   (FOR THIS RELATIVELY LOW LEVL SITE, MEAN SEA LEVEL CORRECTIONS (MSL) ARE DEEMED TO BE INSIGNIFICANT AND HAVE THEREFORE NOT BEEN SUPPLIED)

   B) VERTICAL DATUM:
   ALTITUDES FOR THE CONTROL ARE BASED ON GPS DERIVED HEIGHTS FOR STATIONS STN/1 AND STN/2 AND CONVERTED TO ORTHOMETRIC HEIGHTS (ORDNANCE DATUM NEWLYN - ODN) USING OSGM02 TRANSFORMATION PARAMETERS AND ADJUSTED TO FIT ORTHOMETRIC LEVELLED HEIGHTS TO OBTAIN FINAL ODN HEIGHT VALUES.
   A CHECK TO A LOCAL OSBM LOCATED ON ST VINCENT COTTAGE HAS BEEN MADE AND A DISCREPENCY OF 57mm NOTED.

   C) GPS CONTROL:
   THE CO-ORDINATE SYSTEM USED FOR THE PRIMARY CONTROL IS OSGB36; THIS HAS BEEN CALCULATED FROM ETRS89 USING OSTN02 TRANSFORMATION PARAMETERS.

   OBSERVATIONS HAVE BEEN TAKEN ON THE FOLLOWING DATE:- 04/01/2012

2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH
   ALL OTHER RELEVANT DRAWINGS/DOCUMENTATION. NAMELY: R-S2265/202 - SECTIONS

3. CHECK SCALE BEFORE TAKING NON-FIGURED DIMENSIONS FROM THIS DRAWING.

4. IF IN DOUBT ASK.

5. CRITICAL DIMENSIONS AND HEIGHTS MUST BE CHECKED ON SITE PRIOR TO CONSTRUCTION.

6. OS COPYRIGHT
   REPRODUCED FROM THE ORDNANCE SURVEY MAP WITH THE PERMISSION OF THE CONTROLLER OF HER MAJESTY'S STATIONERY OFFICE, CROWN COPYRIGHT, TOWER SURVEYS, VIVIAN HSE, VIVIAN AVENUE, NOTTINGHAM, NG5 1AF. LICENCE No WL1005152

LEGEND

30.29	SPOT LEVEL		FENCE WITH DESCRIPTION
STN/4	SURVEY STATION	C/P	CHESTNUT PALING
		C/B	CLOSE BOARDED
	SAPLING	C/I	CORRUGATED IRON
	BUSHES/SHRUB	C/L	CHAIN LINK
		C/B	CONCRETE BARRIER
	HEDGE/AREA OF VEGETATION	C/mP	CONCRETE PANEL
		Ele	ELECTRIC
	TREE (INDICATIVE ONLY)	Hrd	HOARDING
	BUILDING	H/M	HIT AND MISS
	CONTOUR	I/R	IRON RAILING
		Iwn	INTERWOVEN
	BOREHOLE/PIEZOMETER	O/L	OVERLAP
	TRIAL PIT	Pal	PALING
RWL	RETAINING WALL	P/W	POST AND WIRE
		P/R	POST AND RAIL
	BANKING	P/C	POST AND CHAIN
		P/Bw	POST AND BARBED WIRE
	GATE	S/W	STRAND WIRING
	STILE	W/M	WIRE MESH
	ROCKFACE	W/P	WOODEN PANEL
	KERB LINE	OSBM VALUE	ORDNANCE SURVEY BENCH MARK
		TBM VALUE	TEMPORARY BENCH MARK/SITE DATUM
		OHC	OVERHEAD CABLE

ABBREVIATIONS

AC	AIR CONDITIONING UNIT	MKR	MARKER POST
B	BOLLARD	MH	MANHOLE
BB	BELISHA BEACON	MHC	MANHOLE - CIRCULAR
BL	BED LEVEL	MH(F)	MANHOLE-FOUL
BOP	BACK OF PATH	MH(S)	MANHOLE-SURFACE
BS	BUS STOP	MHT	MANHOLE-TRIANGULAR
BT	BRITISH TELECOM IC	OHC	OVERHEAD CABLE
CATV	CABLE TELEVISION IC	PB	PILLAR BOX
CC	CONTROL CABINET	PM	PARKING METER
CL	COVER LEVEL	P	POST
C/L	CROWN LEVEL	PYL	ELECTRIC PYLON
CP	CATCH PIT	RE	ROCKING EYE
CPY	CANOPY LINE	RF	ROOF LEVEL
CTV	CABLE TELEVISION POINT	RG	RIDGE LEVEL
DK	DROP KERB	RS	ROAD SIGN
DP	DOWN WATER PIPE	RWL	RETAINING WALL
EC	ELECTRIC CABLE	SA	SOAK AWAY
ECB	ELECTRIC CONTROL BOX	SAP	SAPLING
EL	ELECTRIC MANHOLE	SC	STOP COCK
EP	ELECTRIC POLE	SEC	SECURITY CAMERA
ER	EARTH ROD	SGY	STRIP GULLY
EV	EAVES LEVEL	SP	SIGN POST
FFL	FINISHED FLOOR LEVEL	SV	STOP VALVE
FH	FIRE HYDRANT	TAP	WATER TAP
FL	FLOOR LEVEL	TCB	TELEPHONE CALL BOX
FLT	FLOOD LIGHT	TE	TREE
FW	FOUL WATER	THL	THRESHOLD LEVEL
G	GULLY	TL	TRAFFIC LIGHT
GP	GATE POST	TOF	TOP OF FENCE LEVEL
GV	GAS VALVE	TOW	TOP OF WALL LEVEL
IC	INSPECTION COVER	TP	TELEPHONE POLE
IL	INVERT LEVEL	TRP	TRIAL PIT
KB	KERB	UTL	UNABLE TO LIFT
KO	KERB OUTLET GULLY	VP	VENT PIPE
LB	LITTER BIN	WLV	WATER LEVEL
LP	LAMP POST/LIGHT COLUMN	WM	WATER METER
		WO	WASH OUT

GENERAL

NO ALLOWANCE HAS BEEN MADE FOR SUB SURFACE ENTRY INTO MANHOLES OR OTHER CHAMBERS OR VOIDS BELOW GROUND LEVEL. THEREFORE ANY DETAILS RELATING TO DEPTHS, SIZES ETC. ARE TAKEN FROM ABOVE GROUND AND AS SUCH WILL BE APPROXIMATE ONLY.

THE CONTRACTOR IS TO CHECK AND VERIFY ALL CRITICAL DIMENSIONS AND LEVELS BEFORE WORK STARTS.

BURIED SERVICES SHOWN ON THIS DRAWING MAY BE ASSUMED ROUTES AND WILL NORMALLY BE OF UNKNOWN CONDITION. CONTRACTORS SHOULD UNDERTAKE SUITABLE VALIDATION WORK AND TAKE PARTICULAR CARE DURING EXCAVATION WORK; SAFE DIGGING PRACTICES SHOULD BE FOLLOWED.

SHOULD THERE BE ANY CONFLICT BETWEEN THE DETAILS INDICATED ON THIS DRAWING AND THOSE INDICATED ON OTHER DRAWINGS, THEN TOWER SURVEYS SHOULD BE INFORMED PRIOR TO CONSTRUCTION ON SITE.

IT IS IMPORTANT TO NOTE THAT THE SAME ACCURACIES IMPLIED BY THE PLOTTING SCALE ARE EQUALLY APPLICABLE TO DIGITAL DATA SUPPLIED FOR CAD.

EVERY EFFORT IS MADE TO IDENTIFY ALL VISIBLE ABOVE GROUND FEATURES, HOWEVER, IT SHOULD BE BORNE IN MIND THAT THERE MAY BE ITEMS OBSCURED AT THE TIME OF SURVEY.

VISIBLE FEATURES IN THE VICINITY OF THE BOUNDARIES, AS SHOWN ON THIS SURVEY, MAY NOT REPRESENT THE EXTENT OF LEGALLY CONVEYED OWNERSHIP.

DESCRIPTION	REV	DATE	DRWN	APPR
SECTION LOCATIONS ADDED	A	11/01/12	PV	PV

DRAWING STATUS

INFORMATION

Tower Surveys
Chartered Surveyors
Geomatics and Engineering & Building
RICS
1 LYME DRIVE
PARKLANDS
STOKE-ON-TRENT
ST4 6NW
TEL: 01782 667 550
FAX: 01782 667 501
info@towersurveys.co.uk
www.towersurveys.co.uk

CLIENT
MILWOOD LIMITED

PROJECT TITLE
LAND OFF BURSTON LANE
BURSTON, NEAR STONE

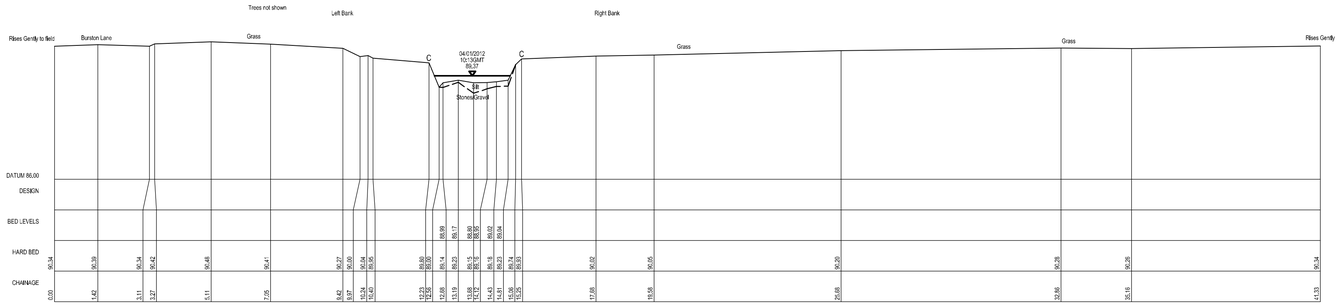
DRAWING DETAIL
TOPOGRAPHICAL SURVEY AS OF 04/01/2012

DRAWN	JW	DATE	JANUARY 2012
PROJECT ENGINEER	PV		
CHECKED	PV	SCALE	1:200
APPROVED	PV	SHEET SIZE	A1

DRAWING NUMBER: ML / R-S2265 / 201
REVISION: A

CAD REFERENCE: \\2009Projects\R-S2265\R-S2265_201-202_ISSUE01
CTB REFERENCE: \\CTB-files\surv2007

7.2 – Project 15 - RAB Consultants Hydraulic Assessment of July 2015



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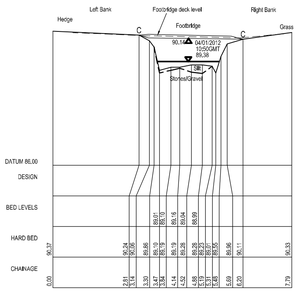
Chainage: 2.3
Open Channel



Section: 1.002
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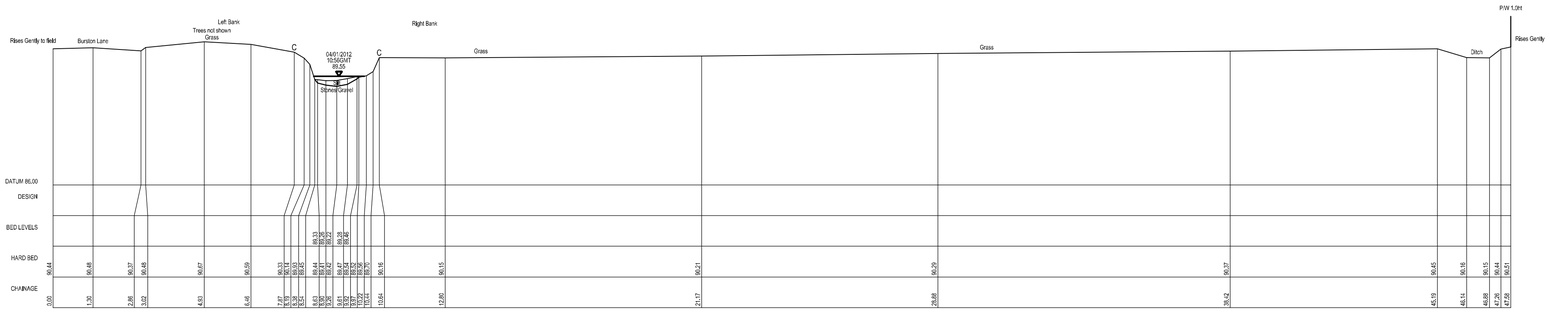
Chainage: 6.2
Downstream Footbridge



Section: 1.003
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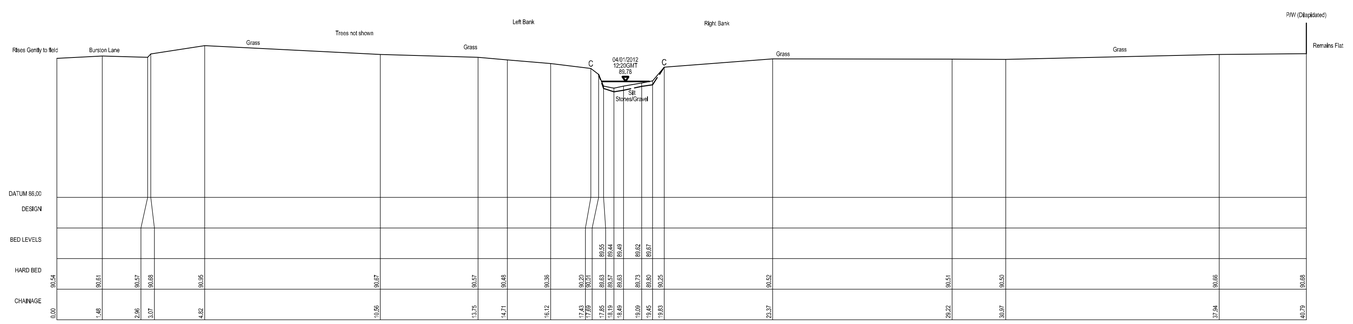
Chainage: 16.1
Open Channel



Section: 1.004
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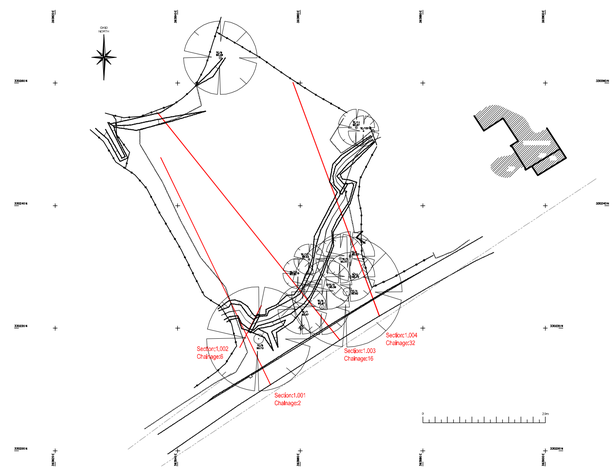
Chainage: 31.7
Open Channel

SECTION LOCATION PLAN SCALE 1:500



NOTES

A1

1. DATUM DETAILS
SURVEY CONTROL:

A) SURVEY GRID (HORIZONTAL):
THIS SURVEY IS ORIENTATED TO ORDNANCE SURVEY GRID NORTH. THE SURVEY IS TO A PLANE GRID, HORIZONTAL MEASUREMENTS TAKEN FROM THIS SURVEY WILL BE GROUND DISTANCES.
ORDNANCE SURVEY NATIONAL GRID HAS BEEN ESTABLISHED USING TRIMBLE VRS NOW NETWORK REAL TIME KINEMATIC (WRTK), USING TRIMBLE GPS SYSTEM FIRMWARE V4.12, ANTENNA R8-2 SERIAL NUMBER 4732136934, MOUNTED ON A 2 METRE POLE STABILISED USING A BIPOD DURING OCCUPATIONS.
THE LOCAL SCALE FACTOR (LSF) APPLICABLE TO THIS SITE IS 0.99960172, CALCULATED USING STANDARD TABULATED DATA. THE SITE CENTRE CO-ORDINATES HAVE BEEN TAKEN AS BEING STN/1.
(FOR THIS RELATIVELY LOW LEVL SITE, MEAN SEA LEVEL CORRECTIONS (MSL) ARE DEEMED TO BE INSIGNIFICANT AND HAVE THEREFORE NOT BEEN SUPPLIED)

B) VERTICAL DATUM:
ALTITUDES FOR THE CONTROL ARE BASED ON GPS DERIVED HEIGHTS FOR STATIONS STN/1 AND STN/2 AND CONVERTED TO ORTHOMETRIC HEIGHTS (ORDNANCE DATUM NEWYLN - ODN) USING OSGM02 TRANSFORMATION PARAMETERS AND ADJUSTED TO FIT ORTHOMETRIC LEVELLED HEIGHTS TO OBTAIN FINAL ODN HEIGHT VALUES.
A CHECK TO A LOCAL OSBM LOCATED ON ST VINCENT COTTAGE HAS BEEN MADE AND A DISCREPENCY OF 57mm NOTED.

C) GPS CONTROL:
THE CO-ORDINATE SYSTEM USED FOR THE PRIMARY CONTROL IS OSGB36; THIS HAS BEEN CALCULATED FROM ETRS89 USING OSTN02 TRANSFORMATION PARAMETERS.

OBSERVATIONS HAVE BEEN TAKEN ON THE FOLLOWING DATE:- 04/01/2012

2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH
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3. CHECK SCALE BEFORE TAKING NON-FIGURED DIMENSIONS FROM THIS DRAWING.

4. IF IN DOUBT ASK.

5. CRITICAL DIMENSIONS AND HEIGHTS MUST BE CHECKED ON SITE PRIOR TO CONSTRUCTION.

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LEGEND

30.29	SPOT LEVEL		FENCE WITH DESCRIPTION
STN/4	SURVEY STATION	C/P	CHESTNUT PALING
		C/B	CLOSE BOARDED
	SAPLING	C/I	CORRUGATED IRON
	BUSHES/SHRUB	C/L	CHAIN LINK
		Con	CONCRETE BARRIER
	HEDGE/AREA OF VEGETATION	Con/P	CONCRETE PANEL
		Elc	ELECTRIC
	TREE (INDICATIVE ONLY)	Hrd	HOARDING
		H/M	HIT AND MISS
	BUILDING	I/R	IRON RAILING
		Iwn	INTERWOVEN
	CONTOUR	O/L	OVERLAP
		Pal	PALING
	BOREHOLE/PIEZOMETER	P/W	POST AND WIRE
		P/R	POST AND RAIL
	TRIAL PIT	P/C	POST AND CHAIN
		P/Bw	POST AND BARBED WIRE
RWL	RETAINING WALL	W/M	WIRE MESH
		W/F	WIRE STRETCH
		W/P	WOODEN PANEL
	BANKING	OSBM VALUE	ORDNANCE SURVEY BENCH MARK
	GATE	TBM VALUE	TEMPORARY BENCH MARK/SITE DATUM
	STILE	OHC	OVERHEAD CABLE
	ROCKFACE		
	KERB LINE		

ABBREVIATIONS

AC	AIR CONDITIONING UNIT	MKR	MARKER POST
B	BOLLARD	MH	MANHOLE
BB	BELISHA BEACON	MH(C	MANHOLE - CIRCULAR
BL	BED LEVEL	MH(F)	MANHOLE-FOUL
BOP	BACK OF PATH	MH(S)	MANHOLE-SURFACE
BS	BUS STOP	MHT	MANHOLE-TRIANGULAR
BT	BRITISH TELECOM IC	OHC	OVERHEAD CABLE
CATV	CABLE TELEVISION IC	PB	PILLAR BOX
CC	CONTROL CABINET	PM	PARKING METER
CL	COVER LEVEL	P	POST
C/L	CROWN LEVEL	PYL	ELECTRIC PYLON
CP	CATCH PIT	RE	ROCDDING EYE
CPY	CANOPY LINE	RF	ROOF LEVEL
CTV	CABLE TELEVISION POINT	RG	RIDGE LEVEL
DK	DROP KERB	RS	ROAD SIGN
DP	DOWN WATER PIPE	RWL	RETAINING WALL
EC	ELECTRIC CABLE	SA	SOAK AWAY
ECB	ELECTRIC CONTROL BOX	SAP	SAPLING
El	ELECTRIC MANHOLE	SC	STOP COCK
EP	ELECTRIC POLE	SEC	SECURITY CAMERA
ER	EARTH ROD	SGY	STRIP GULLY
EV	EAVES LEVEL	SP	SIGN POST
FFL	FINISHED FLOOR LEVEL	SV	STOP VALVE
FH	FIRE HYDRANT	TAP	WATER TAP
FL	FLOOR LEVEL	TCB	TELEPHONE CALL BOX
FLT	FLOOD LIGHT	TE	TREE
FW	FOUL WATER	THL	THRESHOLD LEVEL
G	GULLY	TL	TRAFFIC LIGHT
GP	GATE POST	TOF	TOP OF FENCE LEVEL
GV	GAS VALVE	TOW	TOP OF WALL LEVEL
IC	INSPECTION COVER	TP	TELEPHONE POLE
IL	INVERT LEVEL	TRP	TRIAL PIT
KB	KERB	UTL	UNABLE TO LIFT
KO	KERB OUTLET GULLY	VP	VENT PIPE
LB	LITTER BIN	WLV	WATER LEVEL
LP	LAMP POST/LIGHT COLUMN	WM	WATER METER
		WO	WASH OUT

GENERAL

NO ALLOWANCE HAS BEEN MADE FOR SUB SURFACE ENTRY INTO MANHOLES OR OTHER CHAMBERS OR VOIDS BELOW GROUND LEVEL. THEREFORE ANY DETAILS RELATING TO DEPTHS, SIZES ETC. ARE TAKEN FROM ABOVE GROUND AND AS SUCH WILL BE APPROXIMATE ONLY.

THE CONTRACTOR IS TO CHECK AND VERIFY ALL CRITICAL DIMENSIONS AND LEVELS BEFORE WORK STARTS.

BURIED SERVICES SHOWN ON THIS DRAWING MAY BE ASSUMED ROUTES AND WILL NORMALLY BE OF UNKNOWN CONDITION. CONTRACTORS SHOULD UNDERTAKE SUITABLE VALIDATION WORK AND TAKE PARTICULAR CARE DURING EXCAVATION WORK; SAFE DIGGING PRACTICES SHOULD BE FOLLOWED.

SHOULD THERE BE ANY CONFLICT BETWEEN THE DETAILS INDICATED ON THIS DRAWING AND THOSE INDICATED ON OTHER DRAWINGS, THEN TOWER SURVEYS SHOULD BE INFORMED PRIOR TO CONSTRUCTION ON SITE.

IT IS IMPORTANT TO NOTE THAT THE SAME ACCURACIES IMPLIED BY THE PLOTTING SCALE ARE EQUALLY APPLICABLE TO DIGITAL DATA SUPPLIED FOR CAD.

EVERY EFFORT IS MADE TO IDENTIFY ALL VISIBLE ABOVE GROUND FEATURES. HOWEVER, IT SHOULD BE BORNE IN MIND THAT THERE MAY BE ITEMS OBSCURED AT THE TIME OF SURVEY.

VISIBLE FEATURES IN THE VICINITY OF THE BOUNDARIES, AS SHOWN ON THIS SURVEY, MAY NOT REPRESENT THE EXTENT OF LEGALLY CONVEYED OWNERSHIP.

DESCRIPTION	REV	DATE	DRWN	APPR

DRAWING STATUS

INFORMATION

Tower Surveys
Chartered Surveyors
Geomatics•Land, Engineering & Building
RICS
1 LYME DRIVE
PARKLANDS
STOKE-ON-TRENT
ST4 6NW
TEL: 01782 667 550
FAX: 01782 667 501
info@towersurveys.co.uk
www.towersurveys.co.uk

CLIENT
MILWOOD LIMITED

PROJECT TITLE
LAND OFF BURSTON LANE
BURSTON, NEAR STONE

DRAWING DETAIL
SECTIONS AS OF 04/01/2012

DRAWN	JW	DATE	JANUARY 2012
PROJECT ENGINEER	PV		
CHECKED	PV	SCALE	1:100
APPROVED	PV	SHEET SIZE	A1

DRAWING NUMBER: ML / R-S2265 / 202
REVISION:

CAD REFERENCE
\\2009Projects\R-S2265\\R-S2265_201-202_ISSUE02

CTB REFERENCE
\\CTB-files\surv2007

WWW.RABCONSULTANTS.CO.UK
enquiries@rabconsultants.co.uk

Burston and Sandon Neighbourhood Plan Sites – Hydraulic assessment

08 July 2015
Version 1.0
RAB: 1142_L

Mr N Ash
27 Thorneyfields Lane
Stafford
ST17 9YS

Lichfield Business Village, The Friary,
Lichfield, Staffordshire WS13 6QG
T. 01543 308 631

Unit 13, St Stephens Court, Willington,
Crook, County Durham DL15 0BF
T. 01388 748 366

Kingsbrook House, 7 Kingsway,
Bedford, Bedfordshire MK42 9BA
T. 01234 363 582

Revision History

Version	Date	Amendments	Issued to
1.0	08.07.15	First Issue	Mr N Ash and Kev Ryder

Quality Control

Action	Signature	Date
Prepared	C. Raw	30.06.15
Checked	G. Wilson	03.07.15
Approved	R. Burton	07.07.15

Disclaimer

RAB Office

Lichfield office

Lichfield Business Village
The Friary
Lichfield
Staffordshire
WS13 6QG

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Contents

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1.0 Introduction

1.1 Background

RAB Consultants has prepared this preliminary hydraulic assessment to make a high level assessment of flood risk at two sites which have been put forward to be included within the Burston and Sandon Neighbourhood Plan.

1.2 Site location

The proposed sites are located to the south of the A51, in the village of Burston, Staffordshire (Figure 1). They are situated close to the Jolpool Brook and are located within Flood Zone 3 on the Environment Agency's indicative flood map.

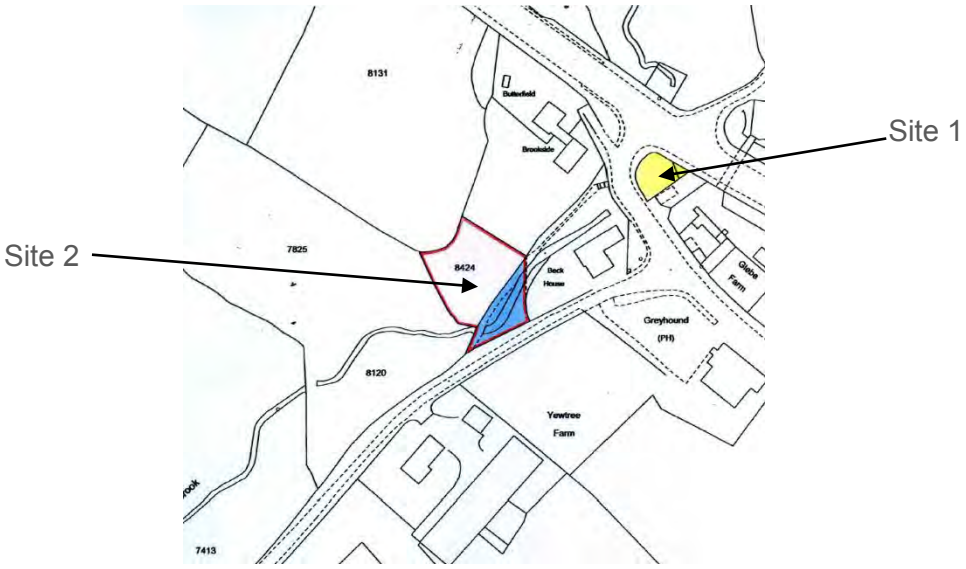

FIGURE 1: SITE LOCATIONS, HIGHLIGHTED IN YELLOW AND RED

The Environment Agency does not hold modelled flood risk information for the Jolpool Brook, therefore simple hydrological and hydraulic calculations will be undertaken for this preliminary assessment of flood risk at the two sites.

2.0 Jolpool Brook Flow Calculations

2.1 Method

To obtain flood flow estimations for the Jolpool Brook at Burston, it is proposed to limit hydrology estimations to the Revitalised FSR/FEH rainfall runoff method, given the preliminary nature of this work. This was done using the WHS ReFH2 software package.

2.2 Catchment descriptors

Catchment descriptors were obtained from the FEH CD-ROM 3. The map of the catchment is provided below (Figure 2).

FIGURE 2: CATCHMENT OF THE JOLPOOL BROOK

The catchment descriptors for the site are:

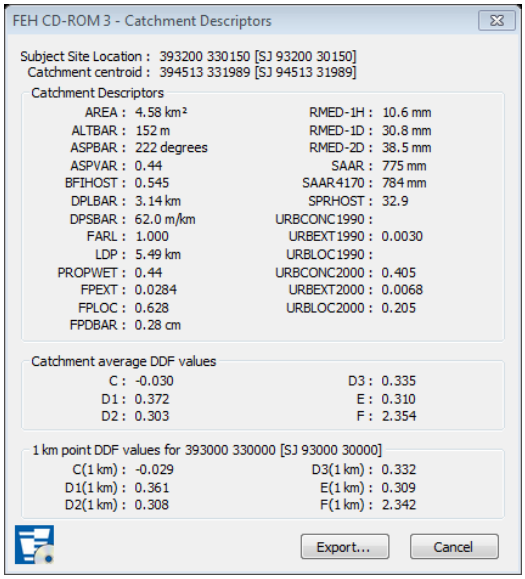

FIGURE 3: CATCHMENT CHARACTERISTICS OF THE JOLPOOL BROOK CATCHMENT

2.3 ReFH flow results

The ReFH 2 spreadsheet has been used to calculate flows on the Jolpool Brook (Appendix A).

Return period	Peak flow (m^3/s)
20 year	2.24
100 year	3.30
100 year plus climate change	3.96

3.0 Hydraulic model

3.1 Hec-Ras model

A short steady state Hec-Ras model of the Jolpool Brook has been constructed to assess the flood risk at the two sites proposed to be included within the Burston and Sandon Neighbourhood Plan.

A topographic survey produced by Tower Surveys in May 2012, includes cross sections along the Jolpool Brook, starting to the north of the A51 and extending downstream of the two sites to the railway bridge. In order to gain a better understanding of the flood risk at the two sites, cross sections have been input into Hec-Ras down to cross section 1:104 (refer to Appendix B), just south of the second site.

A number of assumptions have been made within the model, these are described in the next section.

3.2 Assumptions within the model

The following assumptions have been made within the Hec-Ras model:

- Cross section 7 has been added upstream of the model, by copying the adjacent cross section and adjusting the elevation by extrapolation, as the topographic survey doesn't extend that far upstream
- Cross section 5.33 has been added by the interpolation function within the model, as the surveyors were unable to gain access to the downstream end of the culvert
- The high chords of the bridge have been estimated using the road levels of the A51(upstream) and Burston Road (downstream) as this information is unavailable on the topographic survey
- The invert level of the culvert has been estimated downstream
- The entrance loss coefficient has been assumed in the absence of any culvert shape details
- It is assumed that no manholes along the A51 feed into the culvert
- It is assumed that the footbridge adjacent to cross section 3 will have negligible impact on flood flows and on the overall flood risk at Site 2, therefore it has not been included in the hydraulic model.

3.3 Results

The ReFH estimated flows have been used to model water surface elevations at each cross section on the Jolpool Brook. The table below provides a summary of these water surface elevations

Predicted flood levels for the Jolpool Brook			
Model section	Annual probability (%)		
	5	1	1+cc
7	91.70	92.35	92.85
6	91.66	92.35	92.85
5.333	90.66	90.80	90.89
5	90.32	90.43	90.48
4	89.99	90.29	90.33
3	89.87	89.97	90.00
2	89.86	90.00	90.08
1	89.40	89.52	89.59

3.3.1. Site 1

The Jolpool Brook flows through a culvert past Site 1 and resurfaces approximately 15m downstream of the site. Therefore, the most relevant cross section to the site is cross section 6, which is approximately 30m upstream of the Site 1.

Ground levels at the site range between 91.75m AOD and 92.51m AOD. However, the A51 acts as a barrier preventing floodwater from reaching Site 1. Ground levels along the A51 range between 93.97m AOD and 94.84m AOD, over 1m higher than the 1% plus climate change flood level for the Jolpool Brook. It is more likely that the flood water upstream of the culvert will be contained by the A51 and will fill up the floodplain upstream rather than the road being overtopped by flood water from the Jolpool Brook. Therefore it is expected that Site 1 will remain dry during the most extreme flood events.

There is a residual risk of flooding due to a blockage of the culvert upstream of the site. The model output for a 50% blockage of the culvert indicates that the modelled water levels will overtop the A51 during the 1% and 1% plus climate change annual probability flood events. It is expected that the road will begin to overtop during the 3.33% annual probability flood event during a blockage scenario.

Residual risk, 50% blockage of culvert			
Model section	Annual probability (%)		
	5	1	1+cc
7	93.50	94.11	94.15
6	93.50	94.11	94.15

The site is at residual risk of flooding, however this does not mean the site is undevelopable. More detail is needed to determine the residual risk of flooding at the site and to enable recommendations for mitigation measures.

3.3.2. Site 2

The Jolpool Brook is located along the southern boundary of Site 2. Figure 4 below, demonstrates the predicted extent of each flood event at Site 2 (Appendix D).

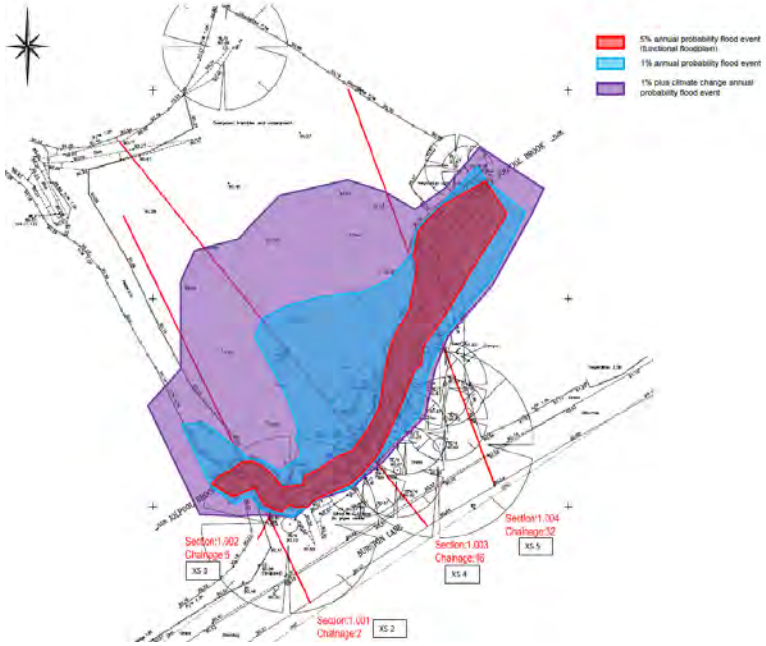

FIGURE 4: THE PREDICTED FLOOD EXTENT AT SITE 2, SEE APPENDIX D

The site is expected to flood during the 1% and 1% plus climate change flood event, whilst the 5% annual probability is expected to remain within the channel of the brook, along the majority of its course (Appendix D). The 5% annual probability flood event may come out of bank around a small section at cross section 5, however it is expected to re-enter the brook just downstream and remain in channel during the remainder of its flow through Site 2.

Paragraph 103 of National Planning Policy Framework states that 'within the site, the most vulnerable development is located in areas of lowest flood risk unless there are overriding reasons to prefer a different location. Therefore a sequential approach will need to be taken when locating development on Site 2.

The white area is the most appropriate area for development on the site, as no flood risk mitigation would be required (assuming that access is available outside the shaded area). More vulnerable developments such as residential dwellings would be suitable within this area.

Within the 1% (blue area) and 1% plus climate change (purple area) annual probability flood extents the most appropriate developments would be less vulnerable developments such as commercial buildings, amenity space or garden areas. However, by exception, if there is an overriding reason which deems that a more vulnerable development is required in this area, compensatory ground excavation will be needed to mitigate the loss of floodplain. Consideration will also need to be given to safe access routes in this area.

Finally, the 5% (red area) annual probability flood extent, indicates where development is inappropriate. No development should be permitted within this area.

The Environment Agency normally requires easement from the top of the river bank for emergency access and essential maintenance. Any proposed development at Site 2 will need to be located at least 8m away from the top of the bank of the Jolpool Brook.

The 50% blockage scenario is not expected to increase the flood levels expected at Site 2.

4.0 Conclusions

A high level assessment has been taken to assess the flood risk at two sites in Burston, Staffordshire, along the course of the Jolpool Brook. According to the Environment Agency's indicative flood map the sites are both located within Flood Zone 3.

The Environment Agency was unable to provide any modelled flood levels for the Jolpool Brook, therefore a simple Hec-Ras model has been created to assess the flood risk to both sites. As a preliminary approach has been taken to estimate the flood levels, a number of assumptions have been made within the model and a comparison with only the ReFH2 methodology for the hydrology has been undertaken.

The results indicate that due to the height of the A51, Site 1 is not likely to be affected by flooding during any flood event used within this assessment. However, a residual risk of blockage may cause some flooding to Site 1. Whereas, Site 2 will be affected by the 1% and 1% plus climate change annual probability flood events.

5.0 Recommendations

The following actions are recommended:

- If the two sites are to be developed, the following actions will be necessary:
  - Extend topographic survey
  - Produce a detailed hydraulic model using the extended survey to address the assumptions made in this preliminary assessment

- Confirm the culvert location in relation to Site 1
- Preparation of a flood risk assessment report, with sequential and exception tests, in accordance with the National Planning Policy Framework, for each site.

Appendix A – ReFH flow results

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UK Design Flood Estimation

Generated on Monday, June 22, 2015 10:37:52 AM by User
Printed from the ReFH Flood Modelling software package, version 2.0.5591.16293

Summary of estimate using the Flood Estimation Handbook revitalised flood hydrograph method (ReFH)

Site details Checksum: 0607-DAA8

Site name: Jolpool_Brook_Catchment_Descriptors

Easting: 393200

Northing: 330150

Country: England, Wales or Northern Ireland

Catchment Area (km²): 4.58

Using plotscale calculations: No

Site description: None

Model run: 20 year

Summary of results

FEH DDF Rainfall (mm):	40.53	Total runoff (ML):	34.77
Total Rainfall (mm):	27.20	Total flow (ML):	86.17
Peak Rainfall (mm):	7.40	Peak flow (m³/s):	2.24

Parameters

** Where the user has overriden a system-generated value, this original value is shown in square brackets after the value used.*

Rainfall parameters

Name	Value	User-defined?
Duration (hr)	4.5	No
Timestep (hr)	0.5	No
SCF(Seasonal correction factor)	0.7	No
ARF(Areal reduction factor)	0.96	No
Seasonality	Winter	n/a

Loss model parameters

Name	Value	User-defined?
Cini (mm)	111.3	No
Cmax (mm)	434.83	No
Use alpha correction factor	Yes	No
Alpha correction factor	0.96	No

Routing model parameters

Name	Value	User-defined?
Tp (hr)	2.54	No
Up	0.65	No
Uk	0.8	No

Baseflow model parameters

Name	Value	User-defined?
BF0 (m^3/s)	0.17	No
BL (hr)	40.12	No
BR	1.5	No

Urbanisation parameters

Name	Value	User-defined?
Urban area (km^2)	0.05	No
Urbext 2000	0.01	No
Urban runoff factor	0.7	No
Imperviousness factor	0.3	No
Tp scaling factor	0.5	No
Sewered area (km^2)	0.00	Yes
Sewer capacity (m^3/s)	0.00	Yes

Time series data

Time (hh:mm)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
00:00	0.777	0.000	0.193	0.000	0.169	0.169
00:30	1.459	0.000	0.367	0.007	0.167	0.173
01:00	2.712	0.000	0.695	0.032	0.165	0.197
01:30	4.955	0.000	1.312	0.093	0.164	0.257
02:00	7.399	0.000	2.065	0.220	0.165	0.385
02:30	4.955	0.000	1.453	0.459	0.169	0.627
03:00	2.712	0.000	0.819	0.802	0.178	0.980
03:30	1.459	0.000	0.448	1.187	0.194	1.381
04:00	0.777	0.000	0.241	1.553	0.216	1.769
04:30	0.000	0.000	0.000	1.838	0.244	2.082
05:00	0.000	0.000	0.000	1.964	0.276	2.240
05:30	0.000	0.000	0.000	1.911	0.308	2.219
06:00	0.000	0.000	0.000	1.745	0.338	2.082
06:30	0.000	0.000	0.000	1.524	0.364	1.888
07:00	0.000	0.000	0.000	1.288	0.385	1.673
07:30	0.000	0.000	0.000	1.072	0.403	1.475
08:00	0.000	0.000	0.000	0.896	0.416	1.312
08:30	0.000	0.000	0.000	0.745	0.426	1.171
09:00	0.000	0.000	0.000	0.609	0.433	1.043
09:30	0.000	0.000	0.000	0.482	0.438	0.920
10:00	0.000	0.000	0.000	0.362	0.441	0.803
10:30	0.000	0.000	0.000	0.250	0.441	0.690
11:00	0.000	0.000	0.000	0.151	0.439	0.590
11:30	0.000	0.000	0.000	0.078	0.436	0.513
12:00	0.000	0.000	0.000	0.035	0.431	0.466
12:30	0.000	0.000	0.000	0.013	0.427	0.439
13:00	0.000	0.000	0.000	0.003	0.421	0.425
13:30	0.000	0.000	0.000	0.000	0.416	0.416
14:00	0.000	0.000	0.000	0.000	0.411	0.411
14:30	0.000	0.000	0.000	0.000	0.406	0.406
15:00	0.000	0.000	0.000	0.000	0.401	0.401
15:30	0.000	0.000	0.000	0.000	0.396	0.396
16:00	0.000	0.000	0.000	0.000	0.391	0.391
16:30	0.000	0.000	0.000	0.000	0.386	0.386
17:00	0.000	0.000	0.000	0.000	0.381	0.381

Time (hh:mm)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
17:30	0.000	0.000	0.000	0.000	0.377	0.377
18:00	0.000	0.000	0.000	0.000	0.372	0.372
18:30	0.000	0.000	0.000	0.000	0.367	0.367
19:00	0.000	0.000	0.000	0.000	0.363	0.363
19:30	0.000	0.000	0.000	0.000	0.358	0.358
20:00	0.000	0.000	0.000	0.000	0.354	0.354
20:30	0.000	0.000	0.000	0.000	0.350	0.350
21:00	0.000	0.000	0.000	0.000	0.345	0.345
21:30	0.000	0.000	0.000	0.000	0.341	0.341
22:00	0.000	0.000	0.000	0.000	0.337	0.337
22:30	0.000	0.000	0.000	0.000	0.333	0.333
23:00	0.000	0.000	0.000	0.000	0.328	0.328
23:30	0.000	0.000	0.000	0.000	0.324	0.324
24:00	0.000	0.000	0.000	0.000	0.320	0.320
24:30	0.000	0.000	0.000	0.000	0.316	0.316
25:00	0.000	0.000	0.000	0.000	0.312	0.312
25:30	0.000	0.000	0.000	0.000	0.309	0.309
26:00	0.000	0.000	0.000	0.000	0.305	0.305
26:30	0.000	0.000	0.000	0.000	0.301	0.301
27:00	0.000	0.000	0.000	0.000	0.297	0.297
27:30	0.000	0.000	0.000	0.000	0.294	0.294
28:00	0.000	0.000	0.000	0.000	0.290	0.290
28:30	0.000	0.000	0.000	0.000	0.286	0.286
29:00	0.000	0.000	0.000	0.000	0.283	0.283
29:30	0.000	0.000	0.000	0.000	0.279	0.279
30:00	0.000	0.000	0.000	0.000	0.276	0.276
30:30	0.000	0.000	0.000	0.000	0.272	0.272
31:00	0.000	0.000	0.000	0.000	0.269	0.269
31:30	0.000	0.000	0.000	0.000	0.266	0.266
32:00	0.000	0.000	0.000	0.000	0.262	0.262
32:30	0.000	0.000	0.000	0.000	0.259	0.259
33:00	0.000	0.000	0.000	0.000	0.256	0.256
33:30	0.000	0.000	0.000	0.000	0.253	0.253
34:00	0.000	0.000	0.000	0.000	0.250	0.250
34:30	0.000	0.000	0.000	0.000	0.247	0.247
35:00	0.000	0.000	0.000	0.000	0.244	0.244

Time (hh:mm)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
35:30	0.000	0.000	0.000	0.000	0.241	0.241
36:00	0.000	0.000	0.000	0.000	0.238	0.238
36:30	0.000	0.000	0.000	0.000	0.235	0.235
37:00	0.000	0.000	0.000	0.000	0.232	0.232
37:30	0.000	0.000	0.000	0.000	0.229	0.229
38:00	0.000	0.000	0.000	0.000	0.226	0.226
38:30	0.000	0.000	0.000	0.000	0.223	0.223
39:00	0.000	0.000	0.000	0.000	0.220	0.220
39:30	0.000	0.000	0.000	0.000	0.218	0.218
40:00	0.000	0.000	0.000	0.000	0.215	0.215
40:30	0.000	0.000	0.000	0.000	0.212	0.212
41:00	0.000	0.000	0.000	0.000	0.210	0.210
41:30	0.000	0.000	0.000	0.000	0.207	0.207
42:00	0.000	0.000	0.000	0.000	0.205	0.205
42:30	0.000	0.000	0.000	0.000	0.202	0.202
43:00	0.000	0.000	0.000	0.000	0.200	0.200
43:30	0.000	0.000	0.000	0.000	0.197	0.197
44:00	0.000	0.000	0.000	0.000	0.195	0.195
44:30	0.000	0.000	0.000	0.000	0.192	0.192
45:00	0.000	0.000	0.000	0.000	0.190	0.190
45:30	0.000	0.000	0.000	0.000	0.187	0.187
46:00	0.000	0.000	0.000	0.000	0.185	0.185
46:30	0.000	0.000	0.000	0.000	0.183	0.183
47:00	0.000	0.000	0.000	0.000	0.181	0.181
47:30	0.000	0.000	0.000	0.000	0.178	0.178
48:00	0.000	0.000	0.000	0.000	0.176	0.176
48:30	0.000	0.000	0.000	0.000	0.174	0.174
49:00	0.000	0.000	0.000	0.000	0.172	0.172

Appendix

Catchment descriptors

Name	Value	User-defined value used?
Area (km²)	4.58	No
ALTBAR	152	No
ASPBAR	222	No
ASPVAR	0.44	No
BFIHOST	0.55	No
DPLBAR (km)	3.14	No
DPSBAR (mkm-¹)	62	No
FARL	1	No
LDP	5.49	No
PROPWET (mm)	0.44	No
RMED1H	10.6	No
RMED1D	30.8	No
RMED2D	38.5	No
SAAR (mm)	775	No
SAAR4170 (mm)	784	No
SPRHOST	32.88	No
Urbext2000	0.01	No
Urbext1990	0	No
URBCONC	0.41	No
URBLOC	0.21	No
Urban Area (km²)	0.05	No
DDF parameter C	-0.03	No
DDF parameter D1	0.37	No
DDF parameter D2	0.3	No
DDF parameter D3	0.34	No
DDF parameter E	0.31	No
DDF parameter F	2.35	No
DDF parameter C (1km grid value)	-0.03	No
DDF parameter D1 (1km grid value)	0.36	No
DDF parameter D2 (1km grid value)	0.31	No
DDF parameter D3 (1km grid value)	0.33	No
DDF parameter E (1km grid value)	0.31	No
DDF parameter F (1km grid value)	2.34	No

UK Design Flood Estimation

Generated on Monday, June 22, 2015 10:37:28 AM by User
Printed from the ReFH Flood Modelling software package, version 2.0.5591.16293

Summary of estimate using the Flood Estimation Handbook revitalised flood hydrograph method (ReFH)

Site details Checksum: 0607-DAA8

Site name: Jolpool_Brook_Catchment_Descriptors

Easting: 393200

Northing: 330150

Country: England, Wales or Northern Ireland

Catchment Area (km²): 4.58

Using plotscale calculations: No

Site description: None

Model run: 100 year

Summary of results

FEH DDF Rainfall (mm):	62.48	Total runoff (ML):	52.44
Total Rainfall (mm):	41.93	Total flow (ML):	130.08
Peak Rainfall (mm):	11.40	Peak flow (m³/s):	3.30

Parameters

** Where the user has overriden a system-generated value, this original value is shown in square brackets after the value used.*

Rainfall parameters

Name	Value	User-defined?
Duration (hr)	4.5	No
Timestep (hr)	0.5	No
SCF(Seasonal correction factor)	0.7	No
ARF(Areal reduction factor)	0.96	No
Seasonality	Winter	n/a

Loss model parameters

Name	Value	User-defined?
Cini (mm)	111.3	No
Cmax (mm)	434.83	No
Use alpha correction factor	Yes	No
Alpha correction factor	0.87	No

Routing model parameters

Name	Value	User-defined?
Tp (hr)	2.54	No
Up	0.65	No
Uk	0.8	No

Baseflow model parameters

Name	Value	User-defined?
BF0 (m^3/s)	0.17	No
BL (hr)	40.12	No
BR	1.5	No

Urbanisation parameters

Name	Value	User-defined?
Urban area (km^2)	0.05	No
Urbext 2000	0.01	No
Urban runoff factor	0.7	No
Imperviousness factor	0.3	No
Tp scaling factor	0.5	No
Sewered area (km^2)	0.00	Yes
Sewer capacity (m^3/s)	0.00	Yes

Time series data

Time (hh:mm)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
00:00	1.198	0.000	0.271	0.000	0.169	0.169
00:30	2.248	0.000	0.518	0.009	0.167	0.176
01:00	4.181	0.000	0.994	0.045	0.165	0.210
01:30	7.637	0.000	1.919	0.132	0.165	0.296
02:00	11.404	0.000	3.114	0.315	0.167	0.481
02:30	7.637	0.000	2.252	0.663	0.173	0.836
03:00	4.181	0.000	1.289	1.173	0.187	1.361
03:30	2.248	0.000	0.710	1.753	0.211	1.964
04:00	1.198	0.000	0.383	2.310	0.245	2.555
04:30	0.000	0.000	0.000	2.753	0.288	3.041
05:00	0.000	0.000	0.000	2.960	0.337	3.297
05:30	0.000	0.000	0.000	2.894	0.386	3.281
06:00	0.000	0.000	0.000	2.652	0.433	3.084
06:30	0.000	0.000	0.000	2.321	0.473	2.794
07:00	0.000	0.000	0.000	1.964	0.507	2.471
07:30	0.000	0.000	0.000	1.635	0.534	2.169
08:00	0.000	0.000	0.000	1.366	0.556	1.921
08:30	0.000	0.000	0.000	1.137	0.572	1.709
09:00	0.000	0.000	0.000	0.931	0.584	1.515
09:30	0.000	0.000	0.000	0.739	0.592	1.331
10:00	0.000	0.000	0.000	0.557	0.597	1.155
10:30	0.000	0.000	0.000	0.387	0.599	0.985
11:00	0.000	0.000	0.000	0.236	0.597	0.833
11:30	0.000	0.000	0.000	0.122	0.593	0.715
12:00	0.000	0.000	0.000	0.055	0.587	0.642
12:30	0.000	0.000	0.000	0.020	0.581	0.601
13:00	0.000	0.000	0.000	0.005	0.574	0.579
13:30	0.000	0.000	0.000	0.000	0.567	0.567
14:00	0.000	0.000	0.000	0.000	0.560	0.560
14:30	0.000	0.000	0.000	0.000	0.553	0.553
15:00	0.000	0.000	0.000	0.000	0.546	0.546
15:30	0.000	0.000	0.000	0.000	0.539	0.539
16:00	0.000	0.000	0.000	0.000	0.532	0.532
16:30	0.000	0.000	0.000	0.000	0.526	0.526
17:00	0.000	0.000	0.000	0.000	0.519	0.519

Time (hh:mm)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
17:30	0.000	0.000	0.000	0.000	0.513	0.513
18:00	0.000	0.000	0.000	0.000	0.507	0.507
18:30	0.000	0.000	0.000	0.000	0.500	0.500
19:00	0.000	0.000	0.000	0.000	0.494	0.494
19:30	0.000	0.000	0.000	0.000	0.488	0.488
20:00	0.000	0.000	0.000	0.000	0.482	0.482
20:30	0.000	0.000	0.000	0.000	0.476	0.476
21:00	0.000	0.000	0.000	0.000	0.470	0.470
21:30	0.000	0.000	0.000	0.000	0.464	0.464
22:00	0.000	0.000	0.000	0.000	0.458	0.458
22:30	0.000	0.000	0.000	0.000	0.453	0.453
23:00	0.000	0.000	0.000	0.000	0.447	0.447
23:30	0.000	0.000	0.000	0.000	0.442	0.442
24:00	0.000	0.000	0.000	0.000	0.436	0.436
24:30	0.000	0.000	0.000	0.000	0.431	0.431
25:00	0.000	0.000	0.000	0.000	0.425	0.425
25:30	0.000	0.000	0.000	0.000	0.420	0.420
26:00	0.000	0.000	0.000	0.000	0.415	0.415
26:30	0.000	0.000	0.000	0.000	0.410	0.410
27:00	0.000	0.000	0.000	0.000	0.405	0.405
27:30	0.000	0.000	0.000	0.000	0.400	0.400
28:00	0.000	0.000	0.000	0.000	0.395	0.395
28:30	0.000	0.000	0.000	0.000	0.390	0.390
29:00	0.000	0.000	0.000	0.000	0.385	0.385
29:30	0.000	0.000	0.000	0.000	0.380	0.380
30:00	0.000	0.000	0.000	0.000	0.376	0.376
30:30	0.000	0.000	0.000	0.000	0.371	0.371
31:00	0.000	0.000	0.000	0.000	0.366	0.366
31:30	0.000	0.000	0.000	0.000	0.362	0.362
32:00	0.000	0.000	0.000	0.000	0.357	0.357
32:30	0.000	0.000	0.000	0.000	0.353	0.353
33:00	0.000	0.000	0.000	0.000	0.349	0.349
33:30	0.000	0.000	0.000	0.000	0.344	0.344
34:00	0.000	0.000	0.000	0.000	0.340	0.340
34:30	0.000	0.000	0.000	0.000	0.336	0.336
35:00	0.000	0.000	0.000	0.000	0.332	0.332

Time (hh:mm)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
35:30	0.000	0.000	0.000	0.000	0.327	0.327
36:00	0.000	0.000	0.000	0.000	0.323	0.323
36:30	0.000	0.000	0.000	0.000	0.319	0.319
37:00	0.000	0.000	0.000	0.000	0.315	0.315
37:30	0.000	0.000	0.000	0.000	0.312	0.312
38:00	0.000	0.000	0.000	0.000	0.308	0.308
38:30	0.000	0.000	0.000	0.000	0.304	0.304
39:00	0.000	0.000	0.000	0.000	0.300	0.300
39:30	0.000	0.000	0.000	0.000	0.296	0.296
40:00	0.000	0.000	0.000	0.000	0.293	0.293
40:30	0.000	0.000	0.000	0.000	0.289	0.289
41:00	0.000	0.000	0.000	0.000	0.286	0.286
41:30	0.000	0.000	0.000	0.000	0.282	0.282
42:00	0.000	0.000	0.000	0.000	0.278	0.278
42:30	0.000	0.000	0.000	0.000	0.275	0.275
43:00	0.000	0.000	0.000	0.000	0.272	0.272
43:30	0.000	0.000	0.000	0.000	0.268	0.268
44:00	0.000	0.000	0.000	0.000	0.265	0.265
44:30	0.000	0.000	0.000	0.000	0.262	0.262
45:00	0.000	0.000	0.000	0.000	0.258	0.258
45:30	0.000	0.000	0.000	0.000	0.255	0.255
46:00	0.000	0.000	0.000	0.000	0.252	0.252
46:30	0.000	0.000	0.000	0.000	0.249	0.249
47:00	0.000	0.000	0.000	0.000	0.246	0.246
47:30	0.000	0.000	0.000	0.000	0.243	0.243
48:00	0.000	0.000	0.000	0.000	0.240	0.240
48:30	0.000	0.000	0.000	0.000	0.237	0.237
49:00	0.000	0.000	0.000	0.000	0.234	0.234
49:30	0.000	0.000	0.000	0.000	0.231	0.231
50:00	0.000	0.000	0.000	0.000	0.228	0.228
50:30	0.000	0.000	0.000	0.000	0.225	0.225
51:00	0.000	0.000	0.000	0.000	0.223	0.223
51:30	0.000	0.000	0.000	0.000	0.220	0.220
52:00	0.000	0.000	0.000	0.000	0.217	0.217
52:30	0.000	0.000	0.000	0.000	0.214	0.214
53:00	0.000	0.000	0.000	0.000	0.212	0.212

Time (hh:mm)	Rain (mm)	Sewer Loss (mm)	Net Rain (mm)	Runoff (m^3/s)	Baseflow (m^3/s)	Total Flow (m^3/s)
53:30	0.000	0.000	0.000	0.000	0.209	0.209
54:00	0.000	0.000	0.000	0.000	0.207	0.207
54:30	0.000	0.000	0.000	0.000	0.204	0.204
55:00	0.000	0.000	0.000	0.000	0.201	0.201
55:30	0.000	0.000	0.000	0.000	0.199	0.199
56:00	0.000	0.000	0.000	0.000	0.196	0.196
56:30	0.000	0.000	0.000	0.000	0.194	0.194
57:00	0.000	0.000	0.000	0.000	0.192	0.192
57:30	0.000	0.000	0.000	0.000	0.189	0.189
58:00	0.000	0.000	0.000	0.000	0.187	0.187
58:30	0.000	0.000	0.000	0.000	0.185	0.185
59:00	0.000	0.000	0.000	0.000	0.182	0.182
59:30	0.000	0.000	0.000	0.000	0.180	0.180
60:00	0.000	0.000	0.000	0.000	0.178	0.178
60:30	0.000	0.000	0.000	0.000	0.176	0.176
61:00	0.000	0.000	0.000	0.000	0.173	0.173
61:30	0.000	0.000	0.000	0.000	0.171	0.171

Appendix

Catchment descriptors

Name	Value	User-defined value used?
Area (km²)	4.58	No
ALTBAR	152	No
ASPBAR	222	No
ASPVAR	0.44	No
BFIHOST	0.55	No
DPLBAR (km)	3.14	No
DPSBAR (mkm-¹)	62	No
FARL	1	No
LDP	5.49	No
PROPWET (mm)	0.44	No
RMED1H	10.6	No
RMED1D	30.8	No
RMED2D	38.5	No
SAAR (mm)	775	No
SAAR4170 (mm)	784	No
SPRHOST	32.88	No
Urbext2000	0.01	No
Urbext1990	0	No
URBCONC	0.41	No
URBLOC	0.21	No
Urban Area (km²)	0.05	No
DDF parameter C	-0.03	No
DDF parameter D1	0.37	No
DDF parameter D2	0.3	No
DDF parameter D3	0.34	No
DDF parameter E	0.31	No
DDF parameter F	2.35	No
DDF parameter C (1km grid value)	-0.03	No
DDF parameter D1 (1km grid value)	0.36	No
DDF parameter D2 (1km grid value)	0.31	No
DDF parameter D3 (1km grid value)	0.33	No
DDF parameter E (1km grid value)	0.31	No
DDF parameter F (1km grid value)	2.34	No

Appendix B – Topographic survey

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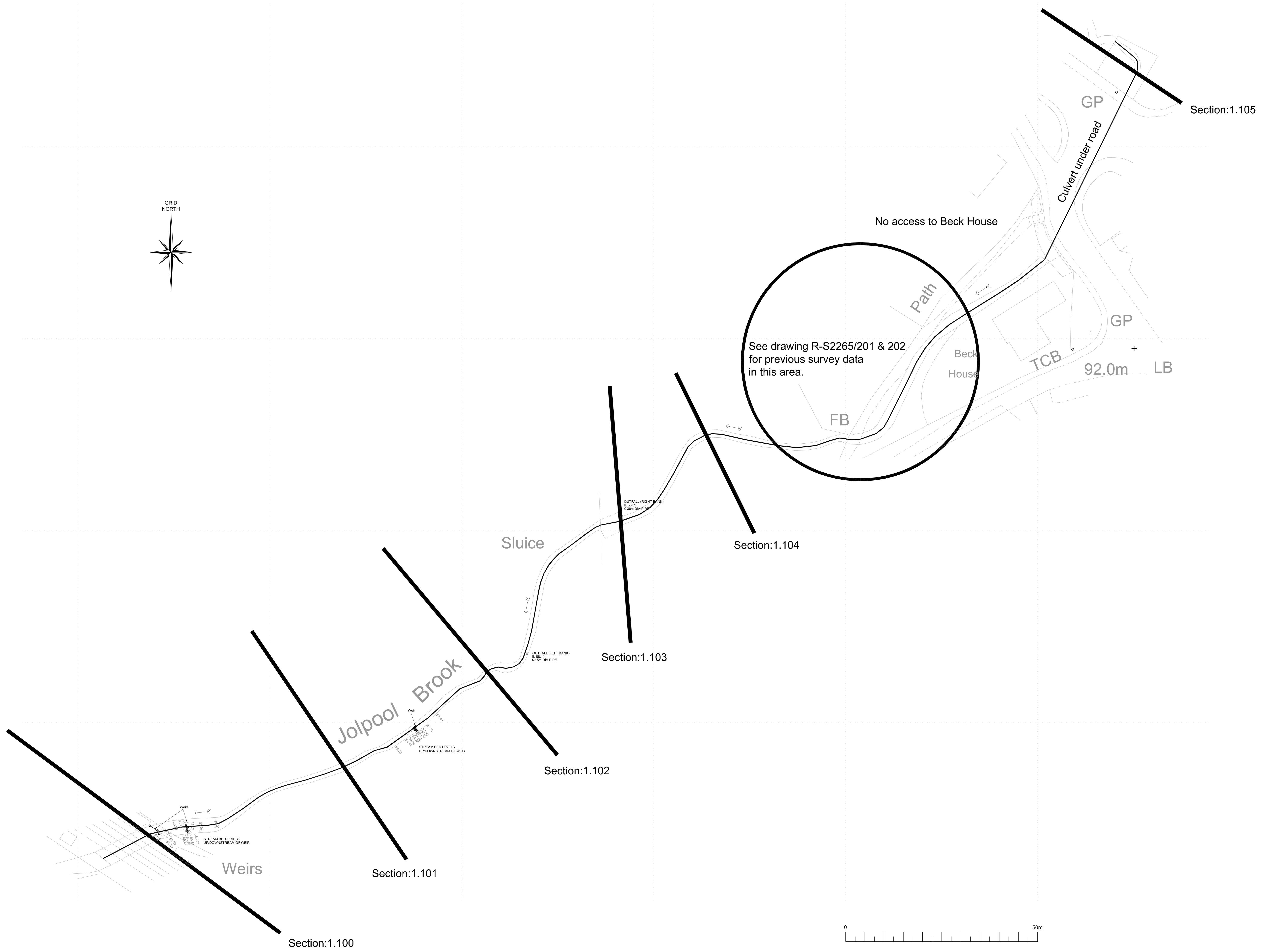


NOTES

A0

1. DATUM DETAILS
   SURVEY CONTROL:

   A) SURVEY GRID (HORIZONTAL):
   THIS SURVEY IS ORIENTATED TO ORDNANCE SURVEY GRID NORTH. THE SURVEY IS TO A PLANE GRID. HORIZONTAL MEASUREMENTS TAKEN FROM THIS SURVEY WILL BE GROUND DISTANCES.
   ORDNANCE SURVEY NATIONAL GRID HAS BEEN ESTABLISHED USING TRIMBLE VRS NOW NETWORK REAL TIME KINEMATIC (NRTK), USING TRIMBLE GPS SYSTEM FIRMWARE V4.12, ANTENNA R8-2 SERIAL NUMBER 4732136934, MOUNTED ON A 2 METRE POLE STABILISED USING A BI-POD DURING OCCUPATIONS.
   THE LOCAL SCALE FACTOR (LSF) APPLICABLE TO THIS SITE IS 0.99960172, CALCULATED USING STANDARD TABULATED DATA. THE SITE CENTRE CO-ORDINATES HAVE BEEN TAKEN AS BEING STN/1.
   (FOR THIS RELATIVELY LOW LEVL SITE, MEAN SEA LEVEL CORRECTIONS (MSL) ARE DEEMED TO BE INSIGNIFICANT AND HAVE THEREFORE NOT BEEN SUPPLIED)

   B) VERTICAL DATUM:
   ALTITUDES FOR THE CONTROL ARE BASED ON GPS DERIVED HEIGHTS FOR STATIONS STN/1 AND STN/2 AND CONVERTED TO ORTHOMETRIC HEIGHTS (ORDNANCE DATUM NEWYLN - ODN) USING OSGM02 TRANSFORMATION PARAMETERS AND ADJUSTED TO FIT ORTHOMETRIC LEVELLED HEIGHTS TO OBTAIN FINAL ODN HEIGHT VALUES.
   A CHECK TO A LOCAL OSBM LOCATED ON ST VINCENT COTTAGE HAS BEEN MADE AND A DISCREPENCY OF 57mm NOTED.

   C) GPS CONTROL:
   THE CO-ORDINATE SYSTEM USED FOR THE PRIMARY CONTROL IS OSGB36; THIS HAS BEEN CALCULATED FROM ETRS89 USING OSTN02 TRANSFORMATION PARAMETERS.

   OBSERVATIONS HAVE BEEN TAKEN ON THE FOLLOWING DATE: - 04/01/2012

2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH
   ALL OTHER RELEVANT DRAWINGS/DOCUMENTATION. NAMELY: R-S2265/202 - SECTIONS
3. CHECK SCALE BEFORE TAKING NON-FIGURED DIMENSIONS FROM THIS DRAWING.
4. IF IN DOUBT ASK.
5. CRITICAL DIMENSIONS AND HEIGHTS MUST BE CHECKED ON SITE
   PRIOR TO CONSTRUCTION.
6. OS COPYRIGHT
   REPRODUCED FROM THE ORDNANCE SURVEY MAP WITH THE PERMISSION OF THE CONTROLLER OF HER MAJESTY'S STATIONERY OFFICE, CROWN COPYRIGHT, TOWER SURVEYS, VIVIAN HSE, VIVIAN AVENUE, NOTTINGHAM. NG5 1AF. LICENCE No 100043548.

LEGEND

30.29	BED LEVEL		FENCE WITH DESCRIPTION
STN/4	SURVEY STATION	C/P	CHESTNUT PALING
		C/B	CLOSE BOARDED
		C/I	CORRUGATED IRON
	SAPLING	C/L	CHAIN LINK
		CBr	CRASH BARRIER
	BUSHES/SHRUB	Con/P	CONCRETE PANEL
		Elc	ELECTRIC
	HEDGE/AREA OF VEGETATION	Hrd	HOARDING
		H/M	HIT AND MISS
		I/R	IRON RAILING
	TREE (INDICATIVE ONLY)	Iwn	INTERWOVEN
		O/L	OVERLAP
	BUILDING	Pal	PALING
99.90	CONTOUR	P/W	POST AND WIRE
		P/R	POST AND RAIL
	BOREHOLE/PIEZOMETER	P/C	POST AND CHAIN
		P/Bw	POST AND BARBED WIRE
	TRIAL PIT	P/S	POST AND STRING
		W/M	WIRE MESH
	WEIR	W/P	WOODEN PANEL
	BANKING	OSBM VALUE	ORDNANCE SURVEY BENCH MARK
	GATE	TBM VALUE	TEMPORARY BENCH MARK/SITE DATUM
	STREAM CENTRELINE	OHC	OVERHEAD CABLE

ABBREVIATIONS

AC	AIR CONDITIONING UNIT	MKR	MARKER POST
B	BOLLARD	MH	MANHOLE
BB	BELISHA BEACON	MHC	MANHOLE - CIRCULAR
BL	BED LEVEL	MH(F)	MANHOLE-FOUL
BOP	BACK OF PATH	MH(S)	MANHOLE-SURFACE
BS	BUS STOP	MHT	MANHOLE-TRIANGULAR
BT	BRITISH TELECOM IC	OHC	OVERHEAD CABLE
CATV	CABLE TELEVISION IC	PB	PILLAR BOX
CC	CONTROL CABINET	PM	PARKING METER
CL	COVER LEVEL	P	POST
CrL	CROWN LEVEL	PYL	ELECTRIC PYLON
CP	CATCH PIT	RE	RODDING EYE
CPY	CANOPY LINE	RF	ROOF LEVEL
CTV	CABLE TELEVISION POINT	RG	RIDGE LEVEL
DK	DROP KERB	RS	ROAD SIGN
DP	DOWN WATER PIPE	RWL	RETAINING WALL
EC	ELECTRIC CABLE	SA	SOAK AWAY
ECB	ELECTRIC CONTROL BOX	SAP	SAPLING
EL	ELECTRIC MANHOLE	SC	STOP COCK
EP	ELECTRIC POLE	SEC	SECURITY CAMERA
ER	EARTH ROD	SGY	STRIP GULLY
EV	EAVES LEVEL	SP	SIGN POST
FFL	FINISHED FLOOR LEVEL	SV	STOP VALVE
FH	FIRE HYDRANT	TAP	WATER TAP
FL	FLOOR LEVEL	TCB	TELEPHONE CALL BOX
FLT	FLOOD LIGHT	TE	TREE
FW	FOUL WATER	THL	THRESHOLD LEVEL
G	GULLY	TL	TRAFFIC LIGHT
GP	GATE POST	TOF	TOP OF FENCE LEVEL
GV	GAS VALVE	TOW	TOP OF WALL LEVEL
IC	INSPECTION COVER	TP	TELEPHONE POLE
IL	INVERT LEVEL	TRP	TRIAL PIT
KB	KERB	UTL	UNABLE TO LIFT
KO	KERB OUTLET GULLY	VP	VENT PIPE
LB	LITTER BIN	WLV	WATER LEVEL
LP	LAMP POST/LIGHT COLUMN	WM	WATER METER
		WO	WASH OUT

GENERAL

NO ALLOWANCE HAS BEEN MADE FOR SUB SURFACE ENTRY INTO MANHOLES OR OTHER CHAMBERS OR VOIDS BELOW GROUND LEVEL. THEREFORE ANY DETAILS RELATING TO DEPTHS, SIZES ETC. ARE TAKEN FROM ABOVE GROUND AND AS SUCH WILL BE APPROXIMATE ONLY.

THE CONTRACTOR IS TO CHECK AND VERIFY ALL CRITICAL DIMENSIONS AND LEVELS BEFORE WORK STARTS.

BURIED SERVICES SHOWN ON THIS DRAWING MAY BE ASSUMED ROUTES AND WILL NORMALLY BE OF UNKNOWN CONDITION, CONTRACTORS SHOULD UNDERTAKE SUITABLE VALIDATION WORK AND TAKE PARTICULAR CARE DURING EXCAVATION WORK; SAFE DIGGING PRACTICES SHOULD BE FOLLOWED.

SHOULD THERE BE ANY CONFLICT BETWEEN THE DETAILS INDICATED ON THIS DRAWING AND THOSE INDICATED ON OTHER DRAWINGS, THEN TOWER SURVEYS SHOULD BE INFORMED PRIOR TO CONSTRUCTION ON SITE.

IT IS IMPORTANT TO NOTE THAT THE SAME ACCURACIES IMPLIED BY THE PLOTTING SCALE ARE EQUALLY APPLICABLE TO DIGITAL DATA SUPPLIED FOR CAD.

EVERY EFFORT IS MADE TO IDENTIFY ALL VISIBLE ABOVE GROUND FEATURES. HOWEVER, IT SHOULD BE BORNE IN MIND THAT THERE MAY BE ITEMS OBSCURED AT THE TIME OF SURVEY.

VISIBLE FEATURES IN THE VICINITY OF THE BOUNDARIES, AS SHOWN ON THIS SURVEY, MAY NOT REPRESENT THE EXTENT OF LEGALLY CONVEYED OWNERSHIP.

DESCRIPTION	REV	DATE	DRWN	APPR

DRAWING STATUS

INFORMATION

Tower Surveys Ltd
Chartered Surveyors
Geomatics-Land, Engineering & Building
RICS
1 LYME DRIVE
PARKLANDS
STOKE-ON-TRENT
ST4 6NW
TEL: 01782 667 550
FAX: 01782 667 501
info@towersurveys.co.uk
www.towersurveys.co.uk

CLIENT
MILWOOD LIMITED

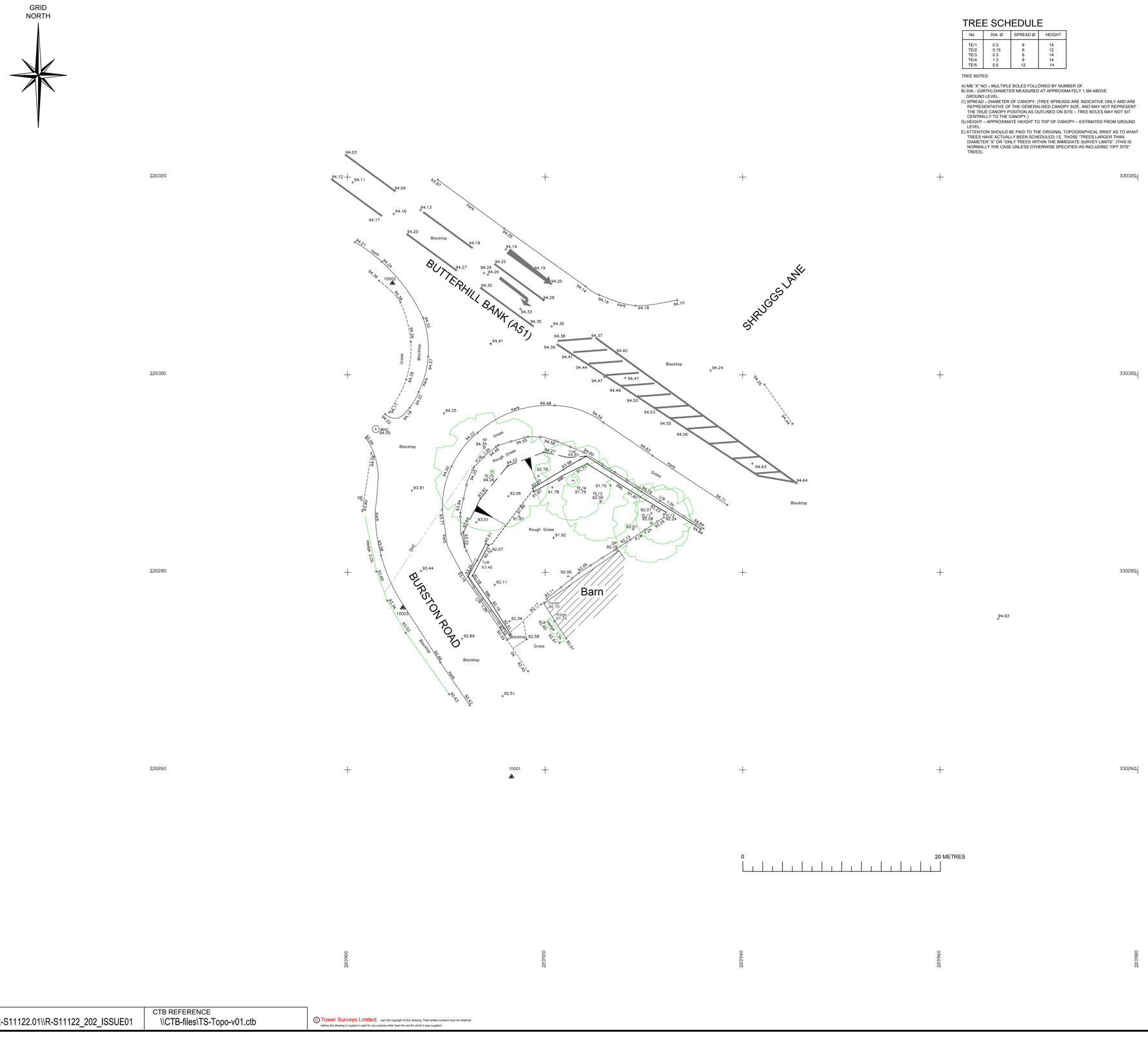
PROJECT TITLE
LAND OFF BURSTON LANE
BURSTON, NEAR STONE

DRAWING DETAIL
LOCATION PLAN AS OF 23/05/2012

DRAWN	PV	DATE	MAY 2012
PROJECT ENGINEER	PV		
CHECKED	JW	SCALE	1:500
APPROVED	PV	SHEET SIZE	A0
DRAWING NUMBER	R-S2265 / 204	REVISION	

CAD REFERENCE
\\2010Projects\R-S2265\R-S2265_203-204_ISSUE01

CTB REFERENCE
\\CTB-files\surv2007



TREE SCHEDULE

No.	DIA. Ø	SPREAD Ø	HEIGHT
TE/1	0.3	8	14
TE/2	0.15	6	12
TE/3	0.3	8	14
TE/4	1.3	8	14
TE/5	0.5	12	14

TREE NOTES:

A) MB "X" NO – MULTIPLE BOLES FOLLOWED BY NUMBER OF.
B) DIA - (GIRTH) DIAMETER MEASURED AT APPROXIMATELY 1.5M ABOVE GROUND LEVEL.
C) SPREAD – DIAMETER OF CANOPY. (TREE SPREADS ARE INDICATIVE ONLY AND ARE REPRESENTATIVE OF THE GENERALISED CANOPY SIZE, AND MAY NOT REPRESENT THE TRUE CANOPY POSITION AS OUTLINED ON SITE – TREE BOLES MAY NOT SIT CENTRALLY TO THE CANOPY.)
D) HEIGHT – APPROXIMATE HEIGHT TO TOP OF CANOPY – ESTIMATED FROM GROUND LEVEL.
E) ATTENTION SHOULD BE PAID TO THE ORIGINAL TOPOGRAPHICAL BRIEF AS TO WHAT TREES HAVE ACTUALLY BEEN SCHEDULED I.E. THOSE TREES LARGER THAN DIAMETER "X" OR "ONLY TREES WITHIN THE IMMEDIATE SURVEY LIMITS", (THIS IS NORMALLY THE CASE UNLESS OTHERWISE SPECIFIED AS INCLUDING "OFF SITE" TREES).

A1

NOTES

1. DATUM DETAILS

SURVEY CONTROL:

A) SURVEY GRID (HORIZONTAL):

THIS SURVEY IS ORIENTATED TO ORDNANCE SURVEY GRID NORTH. THE SURVEY IS TO A PLANE GRID. HORIZONTAL MEASUREMENTS TAKEN FROM THIS SURVEY WILL BE GROUND DISTANCES.

ORDNANCE SURVEY NATIONAL GRID HAS BEEN ESTABLISHED USING TRIMBLE VRS NOW NETWORK REAL TIME KINEMATIC (NRTK), USING TRIMBLE GPS SYSTEM FIRMWARE V4.12, ANTENNA R8-2 SERIAL NUMBER 4732139934, MOUNTED ON A 2 METRE POLE STABILISED USING A BI-POD DURING OCCUPATIONS.

THE LOCAL SCALE FACTOR (LSF) APPLICABLE TO THIS SITE IS 0.99960173, CALCULATED USING STANDARD TABULATED DATA. THE SITE CENTRE CO-ORDINATES HAVE BEEN TAKEN AS BEING STATION STN/2.

(FOR THIS RELATIVELY LOW LEVEL SITE, MEAN SEA LEVEL CORRECTIONS (MSL) ARE DEEMED TO BE INSIGNIFICANT AND HAVE THEREFORE NOT BEEN SUPPLIED)

B) VERTICAL DATUM:

ALTITUDES FOR THE CONTROL ARE BASED ON GPS DERIVED HEIGHTS FOR STATIONS STN/1 AND STN/2 AND CONVERTED TO ORTHOMETRIC HEIGHTS (ORDNANCE DATUM NEWLYN – ODN) USING OSGM02 TRANSFORMATION PARAMETERS AND ADJUSTED TO FIT ORTHOMETRIC LEVELLED HEIGHTS TO OBTAIN FINAL ODN HEIGHT VALUES.

C) GPS CONTROL:

THE CO-ORDINATE SYSTEM USED FOR THE PRIMARY CONTROL IS OSGB36; THIS HAS BEEN CALCULATED FROM ETRS89 USING OSTN02 TRANSFORMATION PARAMETERS.

OBSERVATIONS HAVE BEEN TAKEN ON THE FOLLOWING DATE: - 30/03/15

2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH
ALL OTHER RELEVANT DRAWINGS/DOCUMENTATION.
3. CHECK SCALE BEFORE TAKING NON-FIGURED DIMENSIONS FROM THIS DRAWING.
4. IF IN DOUBT ASK.
5. CRITICAL DIMENSIONS AND HEIGHTS MUST BE CHECKED ON SITE PRIOR TO CONSTRUCTION.

LEGEND

- SPOT LEVEL
- SURVEY STATION
- SAPLING
- TREE (INDICATIVE ONLY)
- BUILDING
- BANKING
- GATE
- FENCE WITH DESCRIPTION

C/B CLOSED BOARD
P/R POST AND RAIL
P/W POST AND WIRE

ABBREVIATIONS

CC	CONTROL CABINET	MH	MANHOLE
CL	COVER LEVEL	MHC	MANHOLE-CIRCULAR
COL	COLUMN	MHT	MANHOLE-TRIANGULAR
DK	DROP KERB	OHC	OVERHEAD CABLE
DP	DOWN PIPE	P	POST
EP	ELECTRICITY POLE	RWL	RETAINING WALL
FH	FIRE HYDRANT	SIL	SILT LEVEL
G	GULLY	SPB	SIGN POSTBOARD
GV	GAS VALVE	SV	STOP VALVE
GP	GATE POST	THL	THRESHOLD LEVEL
HCL	HEDGE CENTER LINE	TP	TELEPHONE POLE
IC	INSPECTION COVER	TOW	TOP OF WALL
IL	INVERT LEVEL	VP	VENT PIPE
KB	KERB	WL	WATER LEVEL
LP	LAMP POST	WM	WATER METER

STATION CO-ORDINATES

STATION	EASTING	NORTHING	LEVEL	DESCRIPTION
STN/1	393916.60	330259.31	92.24	SURVEY NAIL
STN/2	393904.55	330309.28	94.37	SURVEY NAIL
STN/3	393905.59	330276.43	93.25	SURVEY NAIL

UNLESS OTHERWISE STATED THE SURVEY STATIONS LISTED ABOVE ARE ONLY INTENDED TO BE USED FOR TOPOGRAPHICAL SURVEY AT THE STATED SCALE

DUE CONSIDERATION SHOULD BE GIVEN TO LONGTERM STABILITY OF SURVEY STATION MARKERS.

GENERAL

NO ALLOWANCE HAS BEEN MADE FOR SUB SURFACE ENTRY INTO MANHOLES OR OTHER CHAMBERS OR VOIDS BELOW GROUND LEVEL. THEREFORE ANY DETAILS RELATING TO DEPTHS, SIZES ETC. ARE TAKEN FROM ABOVE GROUND AND AS SUCH WILL BE APPROXIMATE ONLY.

THE CONTRACTOR IS TO CHECK AND VERIFY ALL BUILDING AND SITE DIMENSIONS, LEVELS AND SEWER INVERT LEVELS AT CONNECTION POINTS BEFORE WORK STARTS.

SHOULD THERE BE ANY CONFLICT BETWEEN THE DETAILS INDICATED ON THIS DRAWING AND THOSE INDICATED ON OTHER DRAWINGS, THE ENGINEER SHOULD BE INFORMED PRIOR TO CONSTRUCTION ON SITE.

IT IS IMPORTANT TO NOTE THAT THE SAME ACCURACIES IMPLIED BY THE PLOTTING SCALE ARE EQUALLY APPLICABLE TO DIGITAL DATA SUPPLIED FOR CAD.

EVERY EFFORT IS MADE TO IDENTIFY ALL VISIBLE ABOVE GROUND FEATURES. HOWEVER, IT SHOULD BE BORNE IN MIND THAT THERE MAY BE ITEMS OBSCURED AT THE TIME OF SURVEY.

VISIBLE FEATURES IN THE VICINITY OF THE BOUNDARIES, AS SHOWN ON THIS SURVEY, MAY NOT REPRESENT THE EXTENT OF LEGALLY CONVEYED OWNERSHIP.

DESCRIPTION	REV	DATE	DRWN	APPR

DRAWING STATUS

INFORMATION

Tower Surveys Ltd.
Chartered Surveyors
Geomatics • Land, Utilities, Engineering & Building
RICS
1 LYME DRIVE
PARKLANDS
STOKE-ON-TRENT
ST4 6NW
TEL:+44 (0)1782 667550
FAX:+44 (0)1782 667501
info@towersurveys.co.uk
www.towersurveys.co.uk
Regulated by RICS

CLIENT

MR N ASH

PROJECT TITLE

LAND AT JUNCTION A51 / BURSTON ROAD, BURSTON, STAFFORDSHIRE

DRAWING DETAIL

TOPOGRAPHICAL SURVEY AS OF 30/03/15

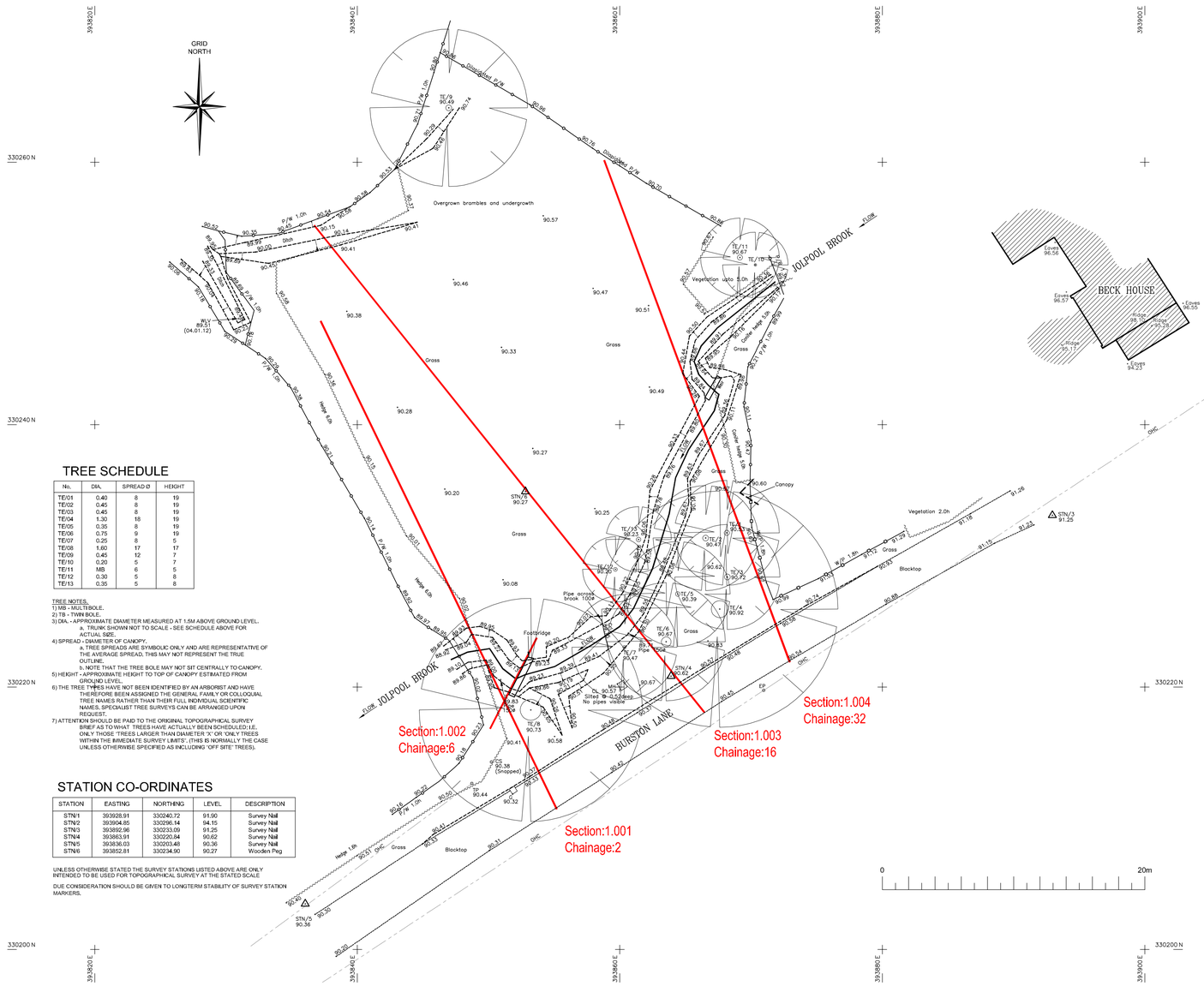
DRAWN	NW	DATE	MARCH 2015
PROJECT ENGINEER	PV		
CHECKED	PV	SCALE	1:200
APPROVED	PV		

DRAWING NUMBER: R-S11122 / 202

REVISION:

CAD REFERENCE
\\2015Projects\R-S11122.01\\R-S11122_202_ISSUE01

CTB REFERENCE
\\CTB-files\TS-Topo-v01.ctb



TREE SCHEDULE

No.	DIA.	SPREAD Ø	HEIGHT
TE/01	0.40	8	19
TE/02	0.45	8	19
TE/03	0.45	8	19
TE/04	1.30	18	19
TE/05	0.35	8	19
TE/06	0.75	9	19
TE/07	0.25	8	5
TE/08	1.60	17	17
TE/09	0.45	12	7
TE/10	0.20	5	7
T1	MB	6	5
TE/12	0.30	5	8
TE/13	0.35	5	8

TREE NOTES.
1) MB - MULTIBOLE.
2) TB - TWIN BOLE.
3) DIA. - APPROXIMATE DIAMETER MEASURED AT 1.5M ABOVE GROUND LEVEL.
   a. TRUNK SHOWN NOT TO SCALE - SEE SCHEDULE ABOVE FOR ACTUAL SIZE.
4) SPREAD - DIAMETER OF CANOPY.
   a. TREE SPREADS ARE SYMBOLIC ONLY AND ARE REPRESENTATIVE OF THE AVERAGE SPREAD. THIS MAY NOT REPRESENT THE TRUE OUTLINE.
   b. NOTE THAT THE TREE BOLE MAY NOT SIT CENTRALLY TO CANOPY.
5) HEIGHT - APPROXIMATE HEIGHT TO TOP OF CANOPY ESTIMATED FROM GROUND LEVEL.
6) THE TREE TYPES HAVE NOT BEEN IDENTIFIED BY AN ARBORIST AND HAVE THEREFORE BEEN ASSIGNED THE GENERAL FAMILY OR COLLOQUIAL TREE NAMES RATHER THAN HIGHER FULL INDIVIDUAL SCIENTIFIC NAMES. SPECIALIST TREE SURVEYS CAN BE ARRANGED UPON REQUEST.
7) ATTENTION SHOULD BE PAID TO THE ORIGINAL TOPOGRAPHICAL SURVEY BRIEF AS TO WHAT TREES HAVE ACTUALLY BEEN SCHEDULED I.E. ONLY THOSE 'TREES LARGER THAN DIAMETER 'X' OR 'ONLY TREES WITHIN THE IMMEDIATE SURVEY LIMITS'. (THIS IS NORMALLY THE CASE UNLESS OTHERWISE SPECIFIED AS INCLUDING 'OFF SITE' TREES).

STATION CO-ORDINATES

STATION	EASTING	NORTHING	LEVEL	DESCRIPTION
STN/1	393928.91	330240.72	91.90	Survey Nail
STN/2	393904.85	330296.14	94.15	Survey Nail
STN/3	393892.96	330233.09	91.25	Survey Nail
STN/4	393863.91	330220.84	90.62	Survey Nail
STN/5	393836.03	330203.48	90.36	Survey Nail
STN/6	393852.81	330234.90	90.27	Wooden Peg

UNLESS OTHERWISE STATED THE SURVEY STATIONS LISTED ABOVE ARE ONLY INTENDED TO BE USED FOR TOPOGRAPHICAL SURVEY AT THE STATED SCALE

DUE CONSIDERATION SHOULD BE GIVEN TO LONGTERM STABILITY OF SURVEY STATION MARKERS.

A1

NOTES

1. DATUM DETAILS
   SURVEY CONTROL:

   A) SURVEY GRID (HORIZONTAL):
   THIS SURVEY IS ORIENTATED TO ORDNANCE SURVEY GRID NORTH. THE SURVEY IS TO A PLANE GRID, HORIZONTAL MEASUREMENTS TAKEN FROM THIS SURVEY WILL BE GROUND DISTANCES.
   ORDNANCE SURVEY NATIONAL GRID HAS BEEN ESTABLISHED USING TRIMBLE VRS NOW NETWORK REAL TIME KINEMATIC (RRTK), USING TRIMBLE GPS SYSTEM FIRMWARE V4.12, ANTENNA R8-2 SERIAL NUMBER 4732136934, MOUNTED ON A 2 METRE POLE STABILISED USING A BA-POD DURING OCCUPATIONS.
   THE LOCAL SCALE FACTOR (LSF) APPLICABLE TO THIS SITE IS 0.99960172, CALCULATED USING STANDARD TABULATED DATA. THE SITE CENTRE CO-ORDINATES HAVE BEEN TAKEN AS BEING STN/1.
   (FOR THIS RELATIVELY LOW LEVL SITE, MEAN SEA LEVEL CORRECTIONS (MSL) ARE DEEMED TO BE INSIGNIFICANT AND HAVE THEREFORE NOT BEEN SUPPLIED)

   B) VERTICAL DATUM:
   ALTITUDES FOR THE CONTROL ARE BASED ON GPS DERIVED HEIGHTS FOR STATIONS STN/1 AND STN/2 AND CONVERTED TO ORTHOMETRIC HEIGHTS (ORDNANCE DATUM NEWLYN - ODN) USING OSGM02 TRANSFORMATION PARAMETERS AND ADJUSTED TO FIT ORTHOMETRIC LEVELLED HEIGHTS TO OBTAIN FINAL ODN HEIGHT VALUES.
   A CHECK TO A LOCAL OSBM LOCATED ON ST VINCENT COTTAGE HAS BEEN MADE AND A DISCREPENCY OF 57mm NOTED.

   C) GPS CONTROL:
   THE CO-ORDINATE SYSTEM USED FOR THE PRIMARY CONTROL IS OSGB36; THIS HAS BEEN CALCULATED FROM ETRS89 USING OSTN02 TRANSFORMATION PARAMETERS.

   OBSERVATIONS HAVE BEEN TAKEN ON THE FOLLOWING DATE:- 04/01/2012

2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH
   ALL OTHER RELEVANT DRAWINGS/DOCUMENTATION. NAMELY: R-S2265/202 - SECTIONS

3. CHECK SCALE BEFORE TAKING NON-FIGURED DIMENSIONS FROM THIS DRAWING.

4. IF IN DOUBT ASK.

5. CRITICAL DIMENSIONS AND HEIGHTS MUST BE CHECKED ON SITE PRIOR TO CONSTRUCTION.

6. OS COPYRIGHT
   REPRODUCED FROM THE ORDNANCE SURVEY MAP WITH THE PERMISSION OF THE CONTROLLER OF HER MAJESTY'S STATIONERY OFFICE, CROWN COPYRIGHT, TOWER SURVEYS, VIVIAN HSE, VIVIAN AVENUE, NOTTINGHAM, NG5 1AF. LICENCE No WL1005152

LEGEND

30.29	SPOT LEVEL		FENCE WITH DESCRIPTION
STN/4	SURVEY STATION	C/P	CHESTNUT PALING
		C/B	CLOSE BOARDED
	SAPLING	C/I	CORRUGATED IRON
	BUSHES/SHRUB	C/L	CHAIN LINK
		C/B	CONCRETE BARRIER
	HEDGE/AREA OF VEGETATION	C/mP	CONCRETE PANEL
		Ele	ELECTRIC
	TREE (INDICATIVE ONLY)	Hrd	HOARDING
	BUILDING	H/M	HIT AND MISS
	CONTOUR	I/R	IRON RAILING
		Iwn	INTERWOVEN
	BOREHOLE/PIEZOMETER	O/L	OVERLAP
	TRIAL PIT	Pal	PALING
RWL	RETAINING WALL	P/W	POST AND WIRE
		P/R	POST AND RAIL
	BANKING	P/C	POST AND CHAIN
		P/Bw	POST AND BARBED WIRE
	GATE	S/W	STRAND WIRING
	STILE	W/M	WIRE MESH
	ROCKFACE	W/P	WOODEN PANEL
	KERB LINE	OSBM VALUE	ORDNANCE SURVEY BENCH MARK
		TBM VALUE	TEMPORARY BENCH MARK/SITE DATUM
		OHC	OVERHEAD CABLE

ABBREVIATIONS

AC	AIR CONDITIONING UNIT	MKR	MARKER POST
B	BOLLARD	MH	MANHOLE
BB	BELISHA BEACON	MHC	MANHOLE - CIRCULAR
BL	BED LEVEL	MH(F)	MANHOLE-FOUL
BOP	BACK OF PATH	MH(S)	MANHOLE-SURFACE
BS	BUS STOP	MHT	MANHOLE-TRIANGULAR
BT	BRITISH TELECOM IC	OHC	OVERHEAD CABLE
CATV	CABLE TELEVISION IC	PB	PILLAR BOX
CC	CONTROL CABINET	PM	PARKING METER
CL	COVER LEVEL	P	POST
C/L	CROWN LEVEL	PYL	ELECTRIC PYLON
CP	CATCH PIT	RE	ROCKING EYE
CPY	CANOPY LINE	RF	ROOF LEVEL
CTV	CABLE TELEVISION POINT	RG	RIDGE LEVEL
DK	DROP KERB	RS	ROAD SIGN
DP	DOWN WATER PIPE	RWL	RETAINING WALL
EC	ELECTRIC CABLE	SA	SOAK AWAY
ECB	ELECTRIC CONTROL BOX	SAP	SAPLING
EL	ELECTRIC MANHOLE	SC	STOP COCK
EP	ELECTRIC POLE	SEC	SECURITY CAMERA
ER	EARTH ROD	SGY	STRIP GULLY
EV	EAVES LEVEL	SP	SIGN POST
FFL	FINISHED FLOOR LEVEL	SV	STOP VALVE
FH	FIRE HYDRANT	TAP	WATER TAP
FL	FLOOR LEVEL	TCB	TELEPHONE CALL BOX
FLT	FLOOD LIGHT	TE	TREE
FW	FOUL WATER	THL	THRESHOLD LEVEL
G	GULLY	TL	TRAFFIC LIGHT
GP	GATE POST	TOF	TOP OF FENCE LEVEL
GV	GAS VALVE	TOW	TOP OF WALL LEVEL
IC	INSPECTION COVER	TP	TELEPHONE POLE
IL	INVERT LEVEL	TRP	TRIAL PIT
KB	KERB	UTL	UNABLE TO LIFT
KO	KERB OUTLET GULLY	VP	VENT PIPE
LB	LITTER BIN	WLV	WATER LEVEL
LP	LAMP POST/LIGHT COLUMN	WM	WATER METER
		WO	WASH OUT

GENERAL

NO ALLOWANCE HAS BEEN MADE FOR SUB SURFACE ENTRY INTO MANHOLES OR OTHER CHAMBERS OR VOIDS BELOW GROUND LEVEL. THEREFORE ANY DETAILS RELATING TO DEPTHS, SIZES ETC. ARE TAKEN FROM ABOVE GROUND AND AS SUCH WILL BE APPROXIMATE ONLY.

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VISIBLE FEATURES IN THE VICINITY OF THE BOUNDARIES, AS SHOWN ON THIS SURVEY, MAY NOT REPRESENT THE EXTENT OF LEGALLY CONVEYED OWNERSHIP.

DESCRIPTION	REV	DATE	DRWN	APPR
SECTION LOCATIONS ADDED	A	11/01/12	PV	PV

DRAWING STATUS

INFORMATION

Tower Surveys
Chartered Surveyors
Geomatics and Engineering & Building
RICS
1 LYME DRIVE
PARKLANDS
STOKE-ON-TRENT
ST4 6NW
TEL: 01782 667 550
FAX: 01782 667 501
info@towersurveys.co.uk
www.towersurveys.co.uk

CLIENT
MILWOOD LIMITED

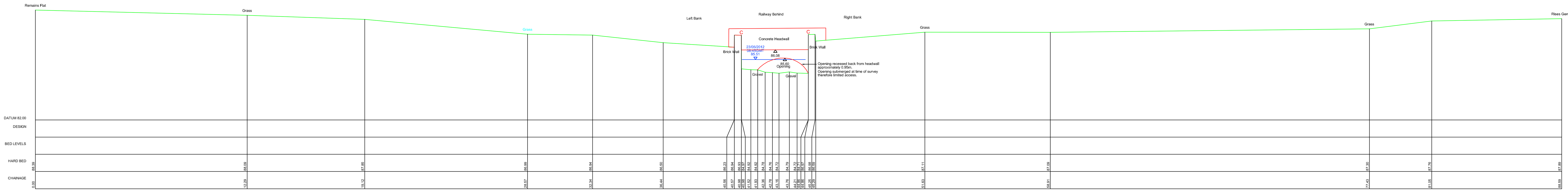
PROJECT TITLE
LAND OFF BURSTON LANE
BURSTON, NEAR STONE

DRAWING DETAIL
TOPOGRAPHICAL SURVEY AS OF 04/01/2012

DRAWN	JW	DATE	JANUARY 2012
PROJECT ENGINEER	PV		
CHECKED	PV	SCALE	1:200
APPROVED	PV	SHEET SIZE	A1

DRAWING NUMBER: ML / R-S2265 / 201
REVISION: A

CAD REFERENCE: \\2009Projects\R-S2265\R-S2265_201-202_ISSUE01
CTB REFERENCE: \\CTB-files\surv2007



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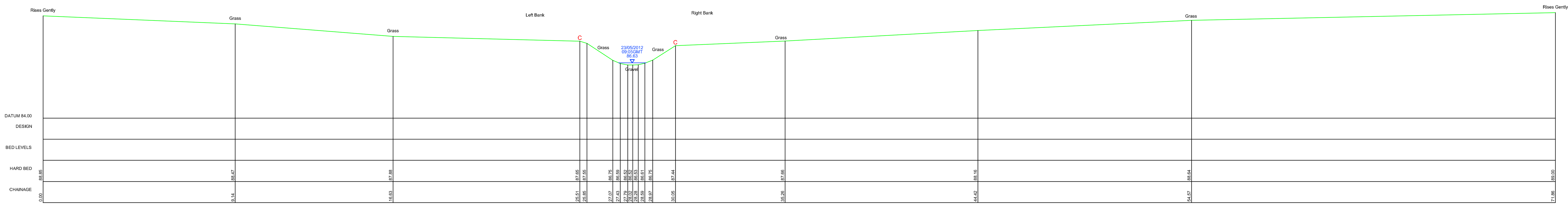
U/S of Railway Culvert



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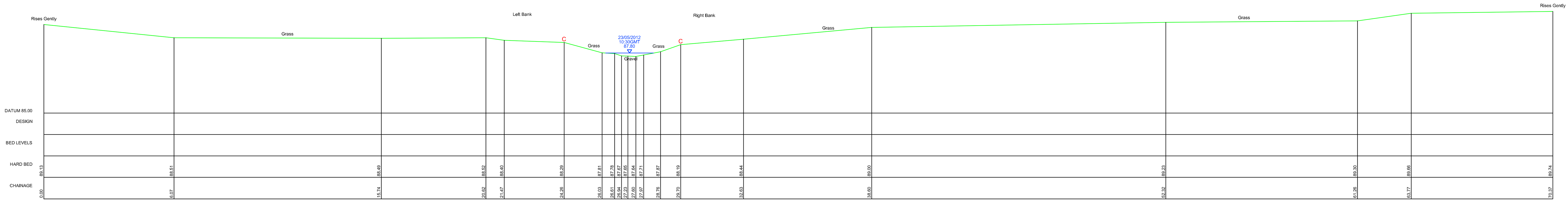
Open Channel



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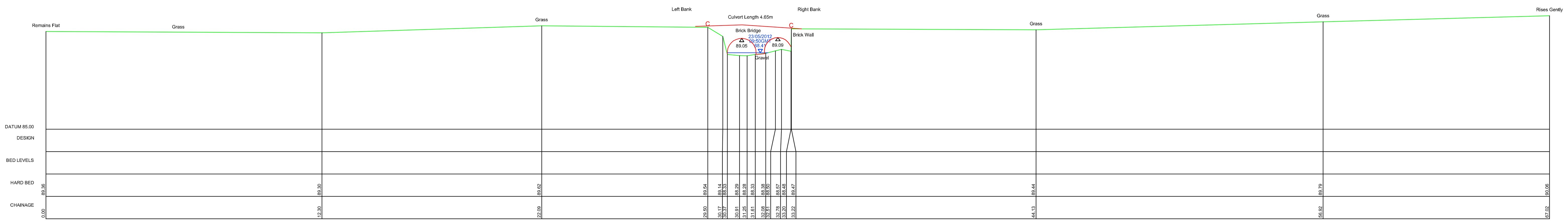
Open Channel



1.103
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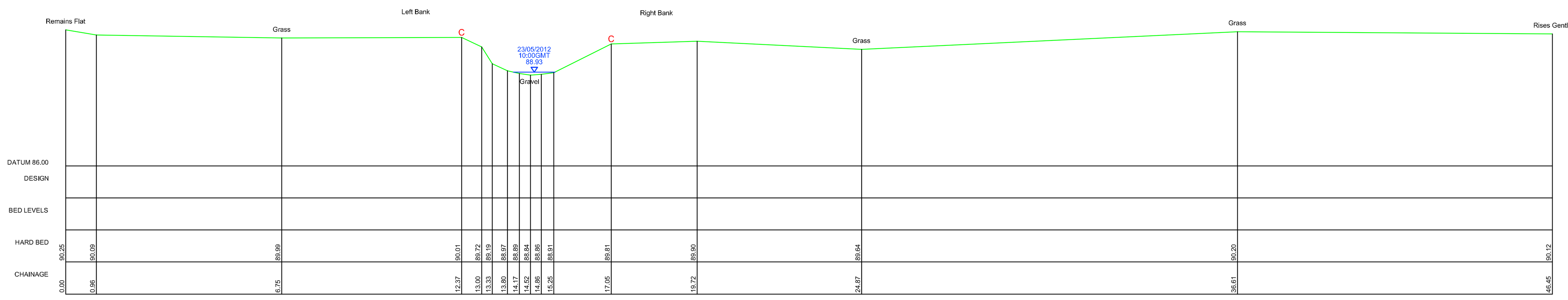
U/S of Track Bridge



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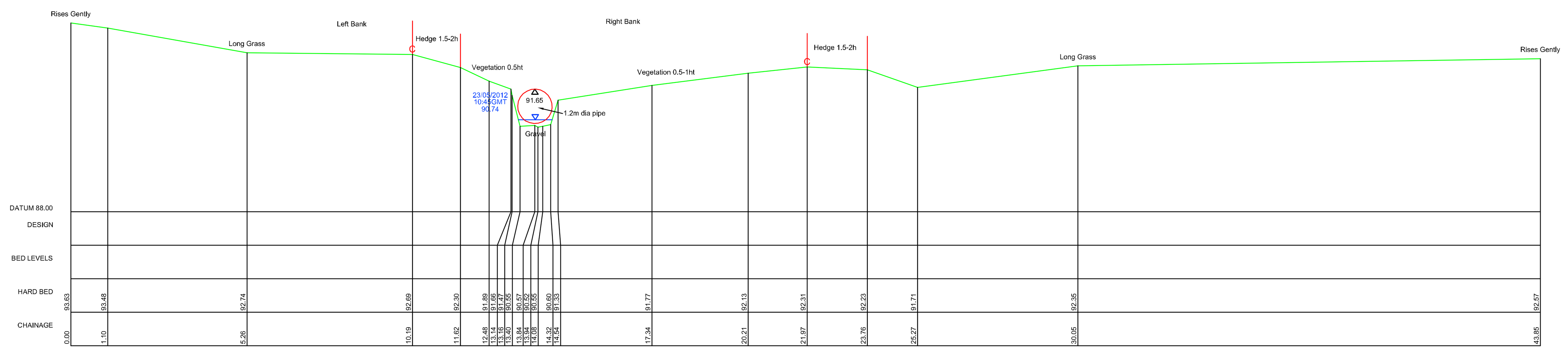
Open Channel



1.105
393937.53mE 330311.44mN Brg 304
U/S of Culvert under A51 Road

A0

NOTES

1. DATUM DETAILS
SURVEY CONTROL:

A) SURVEY GRID (HORIZONTAL):
THIS SURVEY IS ORIENTATED TO ORDNANCE SURVEY GRID NORTH. THE SURVEY IS TO A PLANE GRID. HORIZONTAL MEASUREMENTS TAKEN FROM THIS SURVEY WILL BE GROUND DISTANCES.
ORDNANCE SURVEY NATIONAL GRID HAS BEEN ESTABLISHED USING TRIMBLE VRS NOW NETWORK REAL TIME KINEMATIC (NRTK), USING TRIMBLE GPS SYSTEM FIRMWARE V4.12, ANTENNA R8-2 SERIAL NUMBER 4732136934, MOUNTED ON A 2 METRE POLE STABILISED USING A BI-POD DURING OCCUPATIONS.
THE LOCAL SCALE FACTOR (LSF) APPLICABLE TO THIS SITE IS 0.99960172, CALCULATED USING STANDARD TABULATED DATA. THE SITE CENTRE CO-ORDINATES HAVE BEEN TAKEN AS BEING STN/1.
(FOR THIS RELATIVELY LOW LEVL SITE, MEAN SEA LEVEL CORRECTIONS (MSL) ARE DEEMED TO BE INSIGNIFICANT AND HAVE THEREFORE NOT BEEN SUPPLIED)

B) VERTICAL DATUM:
ALTITUDES FOR THE CONTROL ARE BASED ON GPS DERIVED HEIGHTS FOR STATIONS STN/1 AND STN/2 AND CONVERTED TO ORTHOMETRIC HEIGHTS (ORDNANCE DATUM NEWYLN - ODN) USING OSGM02 TRANSFORMATION PARAMETERS AND ADJUSTED TO FIT ORTHOMETRIC LEVELLED HEIGHTS TO OBTAIN FINAL ODN HEIGHT VALUES.
A CHECK TO A LOCAL OSBM LOCATED ON ST VINCENT COTTAGE HAS BEEN MADE AND A DISCREPENCY OF 57mm NOTED.

C) GPS CONTROL:
THE CO-ORDINATE SYSTEM USED FOR THE PRIMARY CONTROL IS OSGB36; THIS HAS BEEN CALCULATED FROM ETRS89 USING OSTN02 TRANSFORMATION PARAMETERS.

OBSERVATIONS HAVE BEEN TAKEN ON THE FOLLOWING DATE: - 04/01/2012

2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS/DOCUMENTATION. NAMELY: R-S2265/202 - SECTIONS
3. CHECK SCALE BEFORE TAKING NON-FIGURED DIMENSIONS FROM THIS DRAWING.
4. IF IN DOUBT ASK.
5. CRITICAL DIMENSIONS AND HEIGHTS MUST BE CHECKED ON SITE PRIOR TO CONSTRUCTION.
6. OS COPYRIGHT

LEGEND

Symbol	Description
30.29	SPOT LEVEL
STN/4	SURVEY STATION
	SAPLING
	BUSHES/SHRUB
	HEDGE/AREA OF VEGETATION
	TREE (INDICATIVE ONLY)
	BUILDING
99.90	CONTOUR
	BOREHOLE/PIEZOMETER
	TRIAL PIT
RWL	RETAINING WALL
	BANKING
	GATE
	STILE
	ROCKFACE
	GROUND PROFILE
	FENCE WITH DESCRIPTION
C/P	CHESTNUT PALING
C/B	CLOSE BOARDED
C/I	CORRUGATED IRON
C/L	CHAIN LINK
CBr	CRASH BARRIER
Con/P	CONCRETE PANEL
Elc	ELECTRIC
Hrd	HOARDING
H/M	HIT AND MISS
I/R	IRON RAILING
Iwn	INTERWOVEN
O/L	OVERLAP
Pal	PALING
P/W	POST AND WIRE
P/R	POST AND RAIL
P/C	POST AND CHAIN
P/Bw	POST AND BARBED WIRE
P/S	POST AND STRING
W/M	WIRE MESH
W/P	WOODEN PANEL
OSBM VALUE	ORDNANCE SURVEY BENCH MARK
TBM VALUE	TEMPORARY BENCH MARK/SITE DATUM
OHC	OVERHEAD CABLE

ABBREVIATIONS

AC	AIR CONDITIONING UNIT	MKR	MARKER POST
B	BOLLARD	MH	MANHOLE
BB	BELISHA BEACON	MHC	MANHOLE - CIRCULAR
BL	BED LEVEL	MH(F)	MANHOLE-FOUL
BOP	BACK OF PATH	MH(S)	MANHOLE-SURFACE
BS	BUS STOP	MHT	MANHOLE-TRIANGULAR
BT	BRITISH TELECOM IC	OHC	OVERHEAD CABLE
CATV	CABLE TELEVISION IC	PB	PILLAR BOX
CC	CONTROL CABINET	PM	PARKING METER
CL	COVER LEVEL	P	POST
CrL	CROWN LEVEL	PYL	ELECTRIC PYLON
CP	CATCH PIT	RE	RODDING EYE
CPY	CANOPY LINE	RF	ROOF LEVEL
CTV	CABLE TELEVISION POINT	RG	RIDGE LEVEL
DK	DROP KERB	RS	ROAD SIGN
DP	DOWN WATER PIPE	RWL	RETAINING WALL
EC	ELECTRIC CABLE	SA	SOAK AWAY
ECB	ELECTRIC CONTROL BOX	SAP	SAPLING
EL	ELECTRIC MANHOLE	SC	STOP COCK
EP	ELECTRIC POLE	SEC	SECURITY CAMERA
ER	EARTH ROD	SGY	STRIP GULLY
EV	EAVES LEVEL	SP	SIGN POST
FFL	FINISHED FLOOR LEVEL	SV	STOP VALVE
FH	FIRE HYDRANT	TAP	WATER TAP
FL	FLOOR LEVEL	TCB	TELEPHONE CALL BOX
FLT	FLOOD LIGHT	TE	TREE
FW	FOUL WATER	THL	THRESHOLD LEVEL
G	GULLY	TL	TRAFFIC LIGHT
GP	GATE POST	TOF	TOP OF FENCE LEVEL
GV	GAS VALVE	TOW	TOP OF WALL LEVEL
IC	INSPECTION COVER	TP	TELEPHONE POLE
IL	INVERT LEVEL	TRP	TRIAL PIT
KB	KERB	UTL	UNABLE TO LIFT
KO	KERB OUTLET GULLY	VP	VENT PIPE
LB	LITTER BIN	WLV	WATER LEVEL
LP	LAMP POST/LIGHT COLUMN	WM	WATER METER
		WO	WASH OUT

GENERAL

NO ALLOWANCE HAS BEEN MADE FOR SUB SURFACE ENTRY INTO MANHOLES OR OTHER CHAMBERS OR VOIDS BELOW GROUND LEVEL. THEREFORE ANY DETAILS RELATING TO DEPTHS, SIZES ETC. ARE TAKEN FROM ABOVE GROUND AND AS SUCH WILL BE APPROXIMATE ONLY.

THE CONTRACTOR IS TO CHECK AND VERIFY ALL CRITICAL DIMENSIONS AND LEVELS BEFORE WORK STARTS.

BURIED SERVICES SHOWN ON THIS DRAWING MAY BE ASSUMED ROUTES AND WILL NORMALLY BE OF UNKNOWN CONDITION, CONTRACTORS SHOULD UNDERTAKE SUITABLE VALIDATION WORK AND TAKE PARTICULAR CARE DURING EXCAVATION WORK; SAFE DIGGING PRACTICES SHOULD BE FOLLOWED.

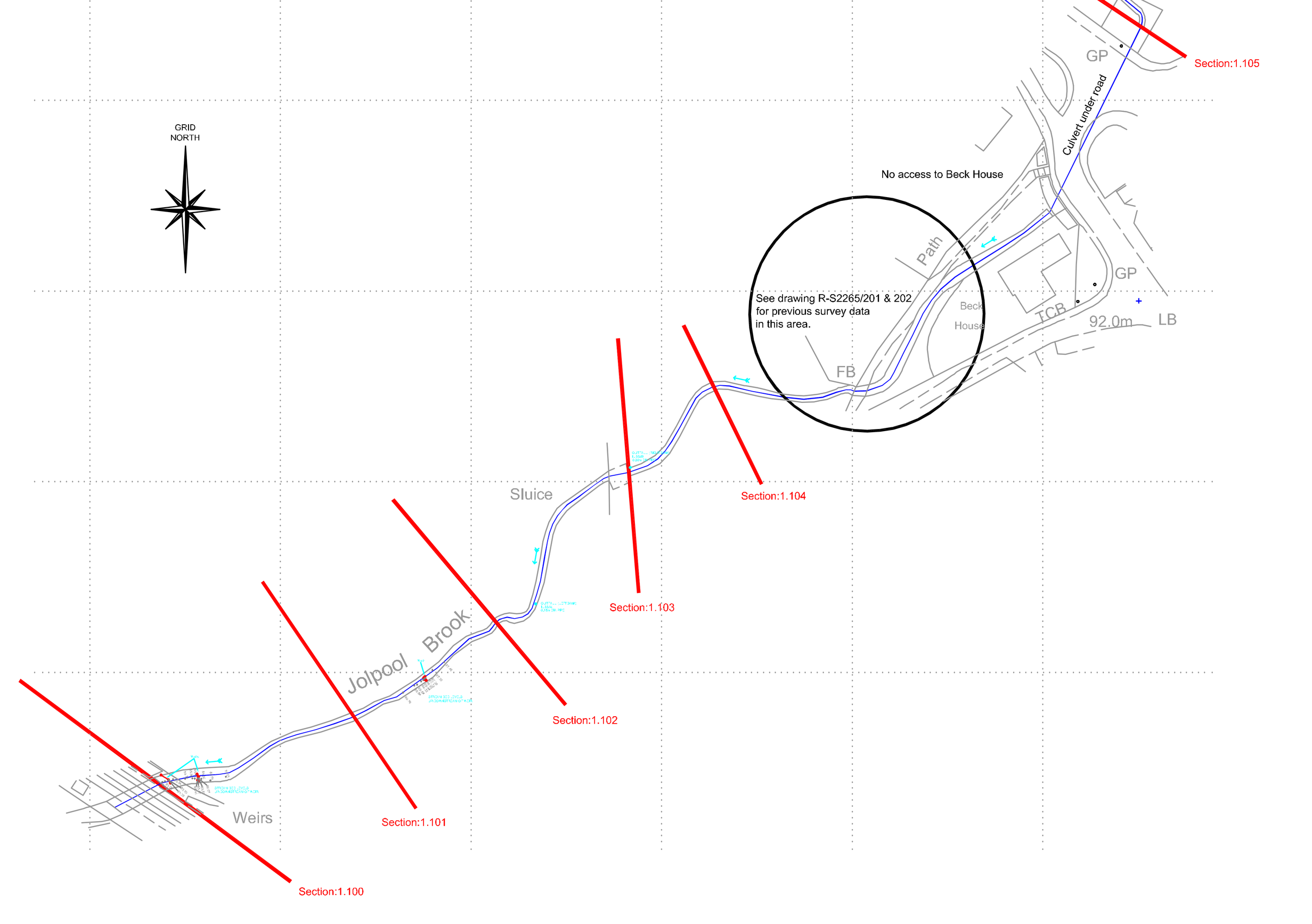
SHOULD THERE BE ANY CONFLICT BETWEEN THE DETAILS INDICATED ON THIS DRAWING AND THOSE INDICATED ON OTHER DRAWINGS, THEN TOWER SURVEYS SHOULD BE INFORMED PRIOR TO CONSTRUCTION ON SITE.

IT IS IMPORTANT TO NOTE THAT THE SAME ACCURACIES IMPLIED BY THE PLOTTING SCALE ARE EQUALLY APPLICABLE TO DIGITAL DATA SUPPLIED FOR CAD.

EVERY EFFORT IS MADE TO IDENTIFY ALL VISIBLE ABOVE GROUND FEATURES. HOWEVER, IT SHOULD BE BORNE IN MIND THAT THERE MAY BE ITEMS OBSCURED AT THE TIME OF SURVEY.

VISIBLE FEATURES IN THE VICINITY OF THE BOUNDARIES, AS SHOWN ON THIS SURVEY, MAY NOT REPRESENT THE EXTENT OF LEGALLY CONVEYED OWNERSHIP.

SECTION LOCATION PLAN SCALE 1:1250



0 10m

DESCRIPTION	REV	DATE	DRWN	APPR

DRAWING STATUS

INFORMATION

Tower Surveys Ltd
Chartered Surveyors
Geomatics-Land, Engineering & Building
RICS
1 LYME DRIVE
PARKLANDS
STOKE-ON-TRENT
ST4 6NW
TEL: 01782 667 550
FAX: 01782 667 501
info@towersurveys.co.uk
www.towersurveys.co.uk

CLIENT
MILWOOD LIMITED

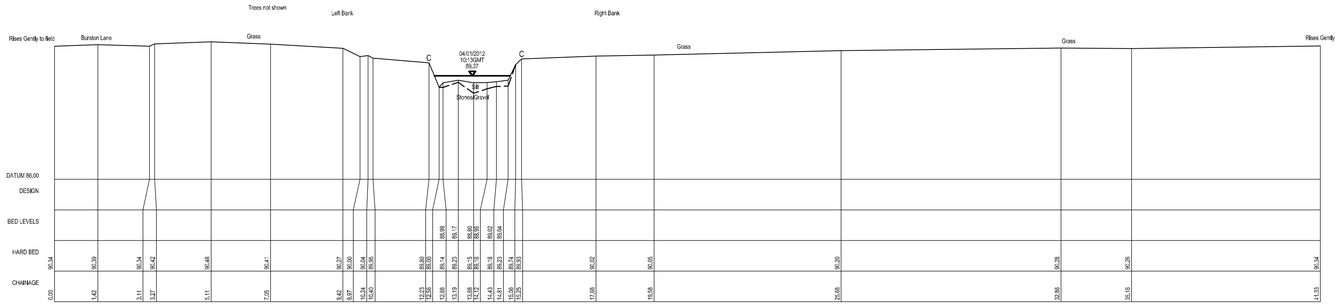
PROJECT TITLE
LAND OFF BURSTON LANE
BURSTON, NEAR STONE

DRAWING DETAIL
ADDITIONAL SECTIONS AS OF 23/05/2012

DRAWN	PV	DATE	MAY 2012
PROJECT ENGINEER	PV		
CHECKED	JW	SCALE	1:100
APPROVED	PV	SHEET SIZE	A0

DRAWING NUMBER R-S2265 / 203
REVISION

CAD REFERENCE \\2010Projects\R-S2265\R-S2265_203-204_ISSUE01
CTB REFERENCE \\CTB-files\surv2007



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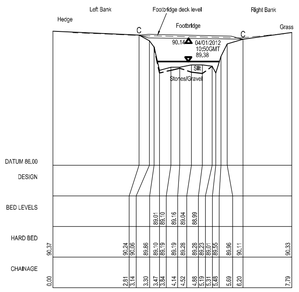
Chainage: 2.3
Open Channel



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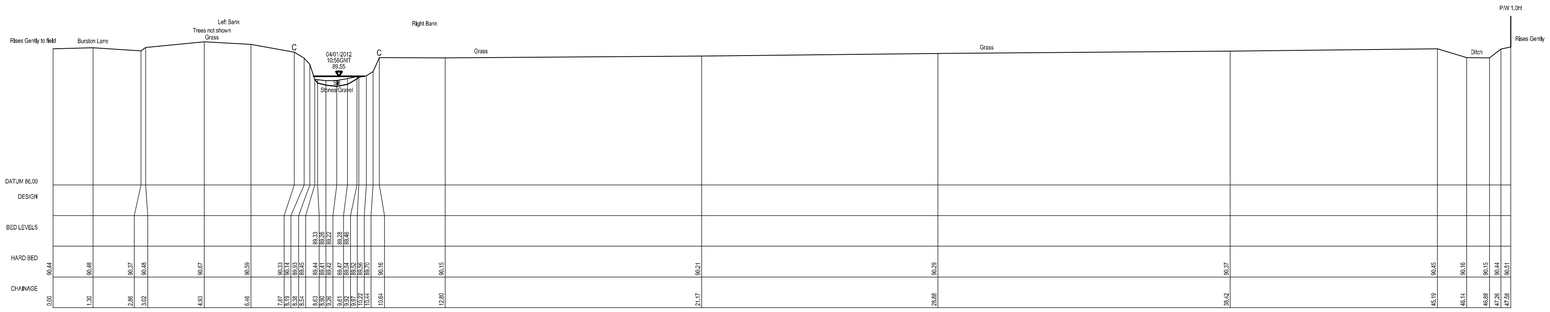
Downstream Footbridge



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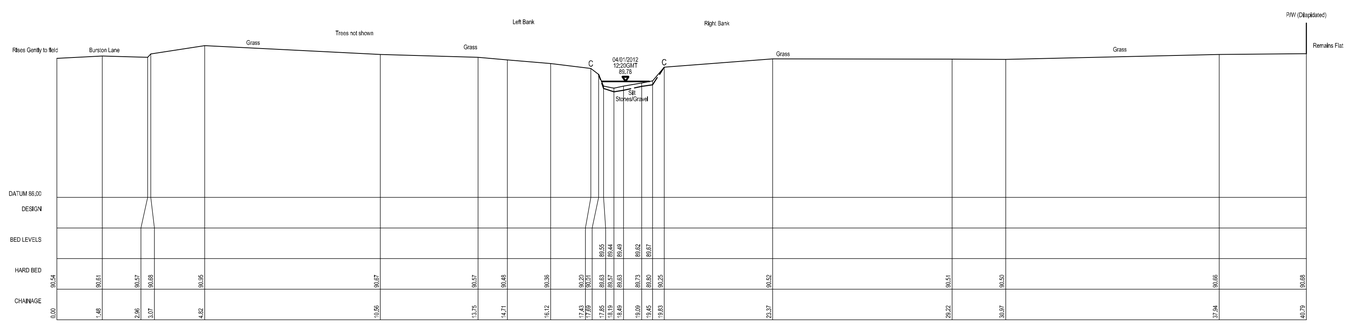
Open Channel



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Chainage: 31.7
Open Channel

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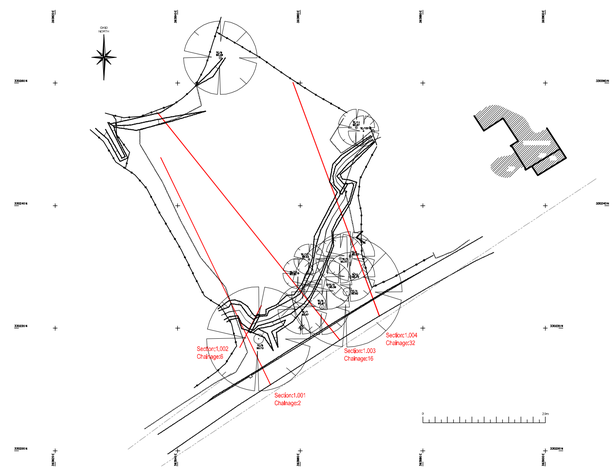

NOTES

A1

1. DATUM DETAILS
SURVEY CONTROL:

A) SURVEY GRID (HORIZONTAL):
THIS SURVEY IS ORIENTATED TO ORDNANCE SURVEY GRID NORTH. THE SURVEY IS TO A PLANE GRID, HORIZONTAL MEASUREMENTS TAKEN FROM THIS SURVEY WILL BE GROUND DISTANCES.
ORDNANCE SURVEY NATIONAL GRID HAS BEEN ESTABLISHED USING TRIMBLE VRS NOW NETWORK REAL TIME KINEMATIC (WRTK), USING TRIMBLE GPS SYSTEM FIRMWARE V4.12, ANTENNA R8-2 SERIAL NUMBER 4732136934, MOUNTED ON A 2 METRE POLE STABILISED USING A BIPOD DURING OCCUPATIONS.
THE LOCAL SCALE FACTOR (LSF) APPLICABLE TO THIS SITE IS 0.99960172, CALCULATED USING STANDARD TABULATED DATA. THE SITE CENTRE CO-ORDINATES HAVE BEEN TAKEN AS BEING STN/1.
(FOR THIS RELATIVELY LOW LEVL SITE, MEAN SEA LEVEL CORRECTIONS (MSL) ARE DEEMED TO BE INSIGNIFICANT AND HAVE THEREFORE NOT BEEN SUPPLIED)

B) VERTICAL DATUM:
ALTITUDES FOR THE CONTROL ARE BASED ON GPS DERIVED HEIGHTS FOR STATIONS STN/1 AND STN/2 AND CONVERTED TO ORTHOMETRIC HEIGHTS (ORDNANCE DATUM NEWYLN - ODN) USING OSGM02 TRANSFORMATION PARAMETERS AND ADJUSTED TO FIT ORTHOMETRIC LEVELLED HEIGHTS TO OBTAIN FINAL ODN HEIGHT VALUES.
A CHECK TO A LOCAL OSBM LOCATED ON ST VINCENT COTTAGE HAS BEEN MADE AND A DISCREPENCY OF 57mm NOTED.

C) GPS CONTROL:
THE CO-ORDINATE SYSTEM USED FOR THE PRIMARY CONTROL IS OSGB36; THIS HAS BEEN CALCULATED FROM ETRS89 USING OSTN02 TRANSFORMATION PARAMETERS.

OBSERVATIONS HAVE BEEN TAKEN ON THE FOLLOWING DATE:- 04/01/2012

2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH
ALL OTHER RELEVANT DRAWINGS/DOCUMENTATION, NAMELY: R-S2265/202 - SECTIONS

3. CHECK SCALE BEFORE TAKING NON-FIGURED DIMENSIONS FROM THIS DRAWING.

4. IF IN DOUBT ASK.

5. CRITICAL DIMENSIONS AND HEIGHTS MUST BE CHECKED ON SITE PRIOR TO CONSTRUCTION.

6. OS COPYRIGHT
REPRODUCED FROM THE ORDNANCE SURVEY MAP WITH THE PERMISSION OF THE CONTROLLER OF HER MAJESTY'S STATIONERY OFFICE, CROWN COPYRIGHT, TOWER SURVEYS, VIVIAN HSE, VIVIAN AVENUE, NOTTINGHAM, NG5 1AF. LICENCE No WL1005152

LEGEND

30.29	SPOT LEVEL		FENCE WITH DESCRIPTION
STN/4	SURVEY STATION	C/P	CHESTNUT PALING
		C/B	CLOSE BOARDED
	SAPLING	C/I	CORRUGATED IRON
	BUSHES/SHRUB	C/L	CHAIN LINK
		Con	CONCRETE BARRIER
	HEDGE/AREA OF VEGETATION	Con/P	CONCRETE PANEL
		Elc	ELECTRIC
	TREE (INDICATIVE ONLY)	Hrd	HOARDING
		H/M	HIT AND MISS
	BUILDING	I/R	IRON RAILING
		Iwn	INTERWOVEN
	CONTOUR	O/L	OVERLAP
		Pal	PALING
	BOREHOLE/PIEZOMETER	P/W	POST AND WIRE
		P/R	POST AND RAIL
	TRIAL PIT	P/C	POST AND CHAIN
		P/Bw	POST AND BARBED WIRE
RWL	RETAINING WALL	W/M	WIRE MESH
		W/F	WIRE STRETCH
		W/P	WOODEN PANEL
	BANKING	OSBM VALUE	ORDNANCE SURVEY BENCH MARK
	GATE	TBM VALUE	TEMPORARY BENCH MARK/SITE DATUM
	STILE	OHC	OVERHEAD CABLE
	ROCKFACE		
	KERB LINE		

ABBREVIATIONS

AC	AIR CONDITIONING UNIT	MKR	MARKER POST
B	BOLLARD	MH	MANHOLE
BB	BELISHA BEACON	MH(C	MANHOLE - CIRCULAR
BL	BED LEVEL	MH(F)	MANHOLE-FOUL
BOP	BACK OF PATH	MH(S)	MANHOLE-SURFACE
BS	BUS STOP	MHT	MANHOLE-TRIANGULAR
BT	BRITISH TELECOM IC	OHC	OVERHEAD CABLE
CATV	CABLE TELEVISION IC	PB	PILLAR BOX
CC	CONTROL CABINET	PM	PARKING METER
CL	COVER LEVEL	P	POST
C/L	CROWN LEVEL	PYL	ELECTRIC PYLON
CP	CATCH PIT	RE	ROCDDING EYE
CPY	CANOPY LINE	RF	ROOF LEVEL
CTV	CABLE TELEVISION POINT	RG	RIDGE LEVEL
DK	DROP KERB	RS	ROAD SIGN
DP	DOWN WATER PIPE	RWL	RETAINING WALL
EC	ELECTRIC CABLE	SA	SOAK AWAY
ECB	ELECTRIC CONTROL BOX	SAP	SAPLING
El	ELECTRIC MANHOLE	SC	STOP COCK
EP	ELECTRIC POLE	SEC	SECURITY CAMERA
ER	EARTH ROD	SGY	STRIP GULLY
EV	EAVES LEVEL	SP	SIGN POST
FFL	FINISHED FLOOR LEVEL	SV	STOP VALVE
FH	FIRE HYDRANT	TAP	WATER TAP
FL	FLOOR LEVEL	TCB	TELEPHONE CALL BOX
FLT	FLOOD LIGHT	TE	TREE
FW	FOUL WATER	THL	THRESHOLD LEVEL
G	GULLY	TL	TRAFFIC LIGHT
GP	GATE POST	TOF	TOP OF FENCE LEVEL
GV	GAS VALVE	TOW	TOP OF WALL LEVEL
IC	INSPECTION COVER	TP	TELEPHONE POLE
IL	INVERT LEVEL	TRP	TRIAL PIT
KB	KERB	UTL	UNABLE TO LIFT
KO	KERB OUTLET GULLY	VP	VENT PIPE
LB	LITTER BIN	WLV	WATER LEVEL
LP	LAMP POST/LIGHT COLUMN	WM	WATER METER
		WO	WASH OUT

GENERAL

NO ALLOWANCE HAS BEEN MADE FOR SUB SURFACE ENTRY INTO MANHOLES OR OTHER CHAMBERS OR VOIDS BELOW GROUND LEVEL. THEREFORE ANY DETAILS RELATING TO DEPTHS, SIZES ETC. ARE TAKEN FROM ABOVE GROUND AND AS SUCH WILL BE APPROXIMATE ONLY.

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VISIBLE FEATURES IN THE VICINITY OF THE BOUNDARIES, AS SHOWN ON THIS SURVEY, MAY NOT REPRESENT THE EXTENT OF LEGALLY CONVEYED OWNERSHIP.

DESCRIPTION	REV	DATE	DRWN	APPR

DRAWING STATUS

INFORMATION

Tower Surveys
Chartered Surveyors
Geomatics•Land, Engineering & Building
RICS
1 LYME DRIVE
PARKLANDS
STOKE-ON-TRENT
ST4 6NW
TEL: 01782 667 550
FAX: 01782 667 501
info@towersurveys.co.uk
www.towersurveys.co.uk

CLIENT
MILWOOD LIMITED

PROJECT TITLE
LAND OFF BURSTON LANE
BURSTON, NEAR STONE

DRAWING DETAIL
SECTIONS AS OF 04/01/2012

DRAWN	JW	DATE	JANUARY 2012
PROJECT ENGINEER	PV		
CHECKED	PV	SCALE	1:100
APPROVED	PV	SHEET SIZE	A1

DRAWING NUMBER: ML / R-S2265 / 202
REVISION:

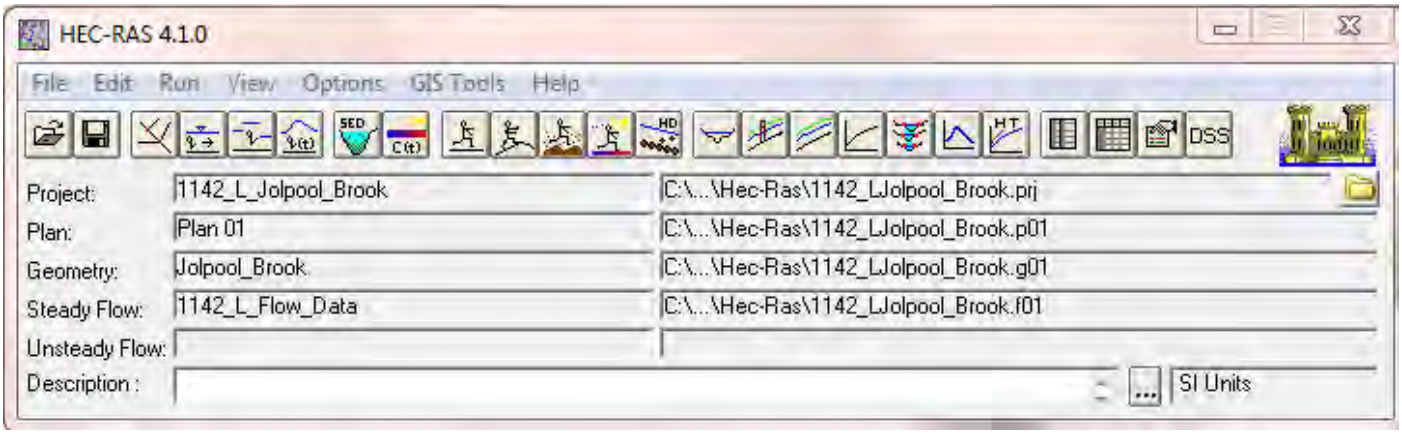
CAD REFERENCE
\\2009Projects\R-S2265\\R-S2265_201-202_ISSUE02

CTB REFERENCE
\\CTB-files\surv2007

Appendix C – Hydraulic model

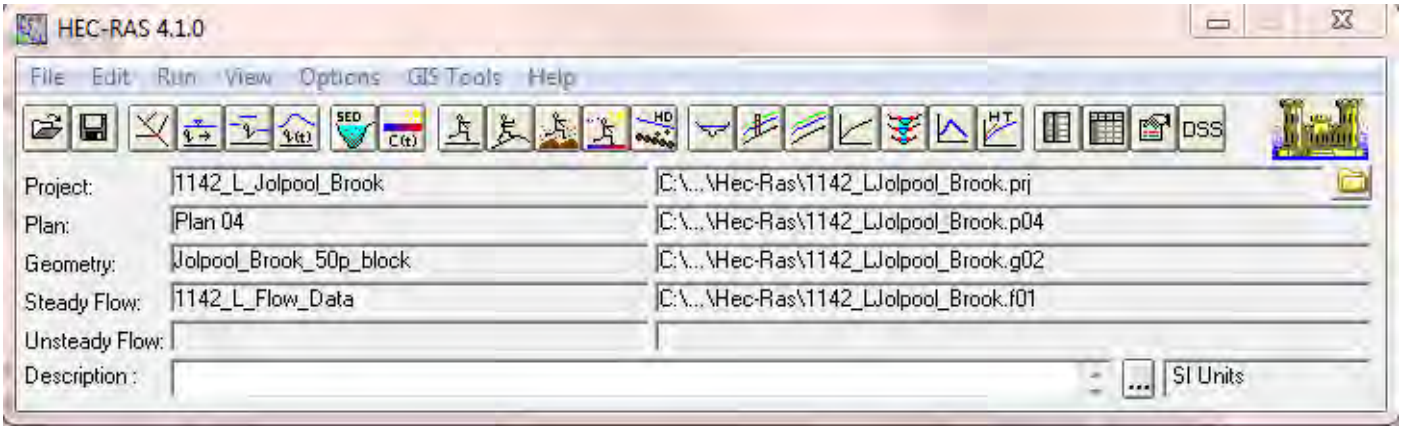
Steady flow analysis

The following files were used to create the Hec-Ras model:



Blockage scenario

The following files were used to create the blockage scenario in the Hec-Ras model.



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Appendix D – Flood extent at Site 2

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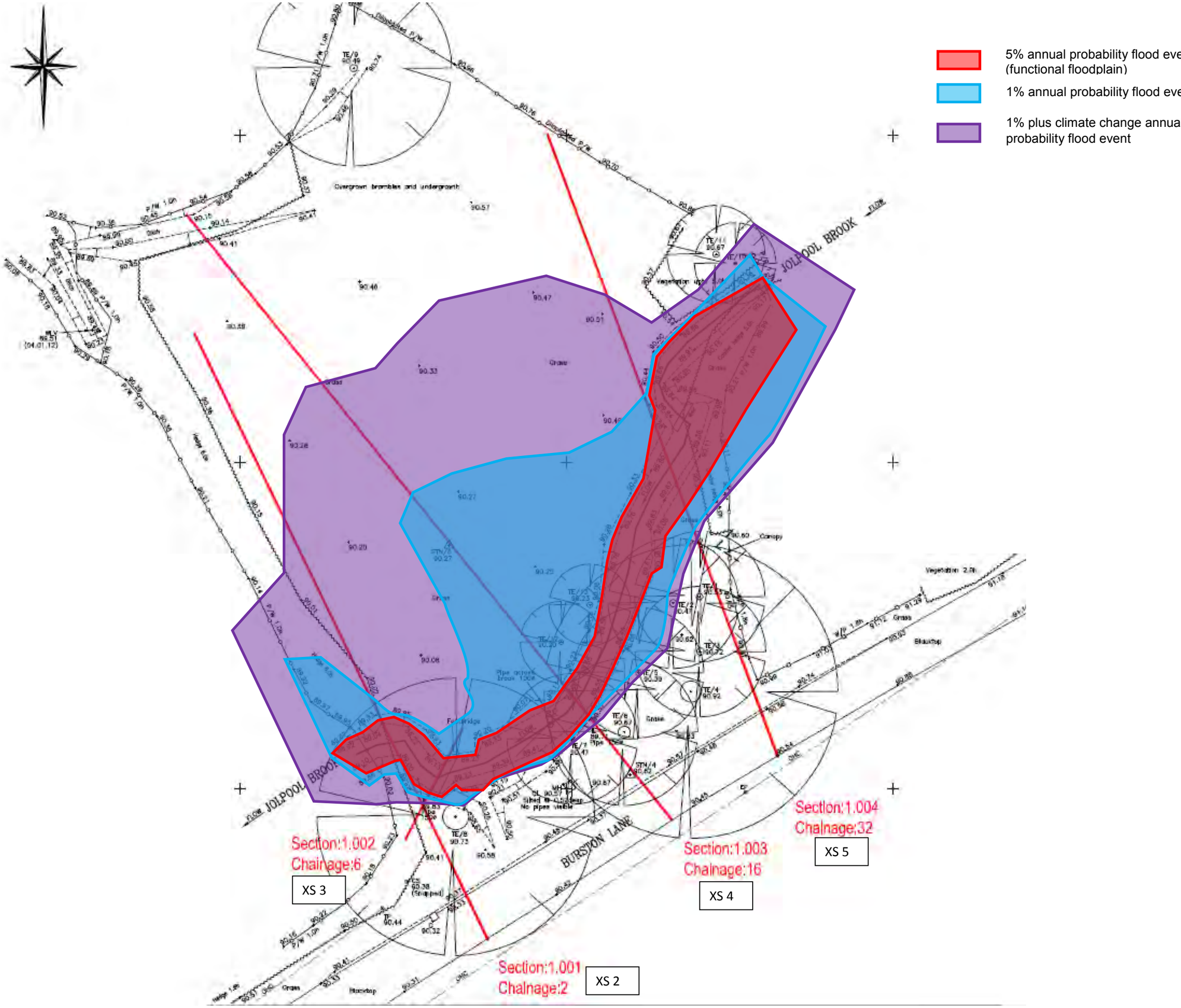
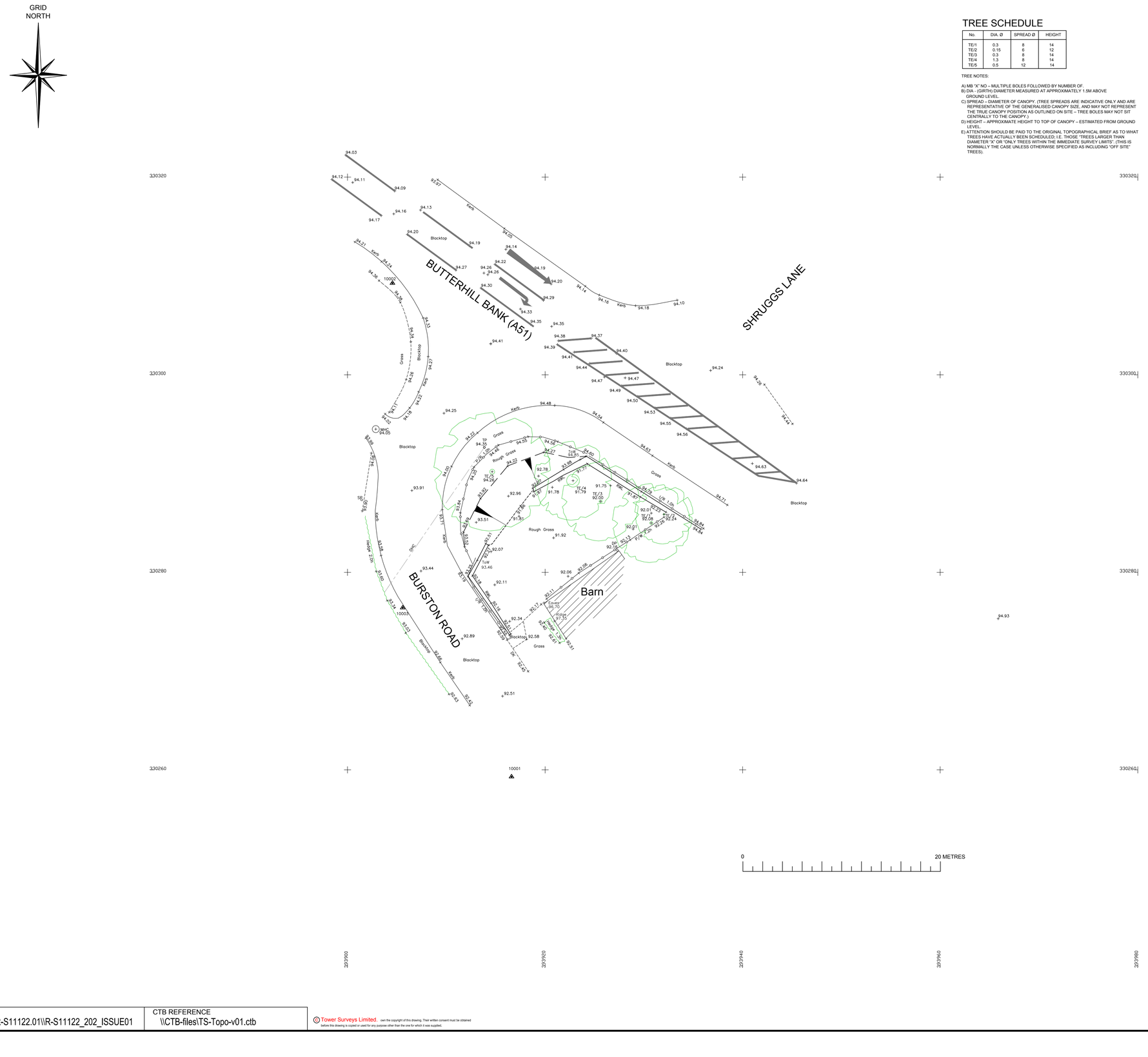
Flood risk to Burston Lane site





TREE SCHEDULE

No.	DIA. Ø	SPREAD Ø	HEIGHT
TE/1	0.3	8	14
TE/2	0.15	6	12
TE/3	0.3	8	14
TE/4	1.3	8	14
TE/5	0.5	12	14

TREE NOTES:

A) MB "X" NO – MULTIPLE BOLES FOLLOWED BY NUMBER OF.
B) DIA - (GIRTH) DIAMETER MEASURED AT APPROXIMATELY 1.5M ABOVE GROUND LEVEL.
C) SPREAD – DIAMETER OF CANOPY. (TREE SPREADS ARE INDICATIVE ONLY AND ARE REPRESENTATIVE OF THE GENERALISED CANOPY SIZE, AND MAY NOT REPRESENT THE TRUE CANOPY POSITION AS OUTLINED ON SITE – TREE BOLES MAY NOT SIT CENTRALLY TO THE CANOPY.)
D) HEIGHT – APPROXIMATE HEIGHT TO TOP OF CANOPY – ESTIMATED FROM GROUND LEVEL.
E) ATTENTION SHOULD BE PAID TO THE ORIGINAL TOPOGRAPHICAL BRIEF AS TO WHAT TREES HAVE ACTUALLY BEEN SCHEDULED I.E. THOSE TREES LARGER THAN DIAMETER "X" OR "ONLY TREES WITHIN THE IMMEDIATE SURVEY LIMITS", (THIS IS NORMALLY THE CASE UNLESS OTHERWISE SPECIFIED AS INCLUDING "OFF SITE" TREES).

A1

NOTES

1. DATUM DETAILS

SURVEY CONTROL:

A) SURVEY GRID (HORIZONTAL):

THIS SURVEY IS ORIENTATED TO ORDNANCE SURVEY GRID NORTH. THE SURVEY IS TO A PLANE GRID. HORIZONTAL MEASUREMENTS TAKEN FROM THIS SURVEY WILL BE GROUND DISTANCES.

ORDNANCE SURVEY NATIONAL GRID HAS BEEN ESTABLISHED USING TRIMBLE VRS NOW NETWORK REAL TIME KINEMATIC (NRTK), USING TRIMBLE GPS SYSTEM FIRMWARE V4.12, ANTENNA R8-2 SERIAL NUMBER 4732139934, MOUNTED ON A 2 METRE POLE STABILISED USING A BI-POD DURING OCCUPATIONS.

THE LOCAL SCALE FACTOR (LSF) APPLICABLE TO THIS SITE IS 0.99960173, CALCULATED USING STANDARD TABULATED DATA. THE SITE CENTRE CO-ORDINATES HAVE BEEN TAKEN AS BEING STATION STN/2.

(FOR THIS RELATIVELY LOW LEVEL SITE, MEAN SEA LEVEL CORRECTIONS (MSL) ARE DEEMED TO BE INSIGNIFICANT AND HAVE THEREFORE NOT BEEN SUPPLIED)

B) VERTICAL DATUM:

ALTITUDES FOR THE CONTROL ARE BASED ON GPS DERIVED HEIGHTS FOR STATIONS STN/1 AND STN/2 AND CONVERTED TO ORTHOMETRIC HEIGHTS (ORDNANCE DATUM NEWLYN – ODN) USING OSGM02 TRANSFORMATION PARAMETERS AND ADJUSTED TO FIT ORTHOMETRIC LEVELLED HEIGHTS TO OBTAIN FINAL ODN HEIGHT VALUES.

C) GPS CONTROL:

THE CO-ORDINATE SYSTEM USED FOR THE PRIMARY CONTROL IS OSGB36; THIS HAS BEEN CALCULATED FROM ETRS89 USING OSTN02 TRANSFORMATION PARAMETERS.

OBSERVATIONS HAVE BEEN TAKEN ON THE FOLLOWING DATE: - 30/03/15

2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH
ALL OTHER RELEVANT DRAWINGS/DOCUMENTATION.
3. CHECK SCALE BEFORE TAKING NON-FIGURED DIMENSIONS FROM THIS DRAWING.
4. IF IN DOUBT ASK.
5. CRITICAL DIMENSIONS AND HEIGHTS MUST BE CHECKED ON SITE PRIOR TO CONSTRUCTION.

LEGEND

- SPOT LEVEL
- SURVEY STATION
- SAPLING
- TREE (INDICATIVE ONLY)
- BUILDING
- BANKING
- GATE
- FENCE WITH DESCRIPTION

C/B CLOSED BOARD
P/R POST AND RAIL
P/W POST AND WIRE

ABBREVIATIONS

CC	CONTROL CABINET	MH	MANHOLE
CL	COVER LEVEL	MHC	MANHOLE-CIRCULAR
COL	COLUMN	MHT	MANHOLE-TRIANGULAR
DK	DROP KERB	OHC	OVERHEAD CABLE
DP	DOWN PIPE	P	POST
EP	ELECTRICITY POLE	RWL	RETAINING WALL
FH	FIRE HYDRANT	SIL	SILT LEVEL
G	GULLY	SPB	SIGN POSTBOARD
GV	GAS VALVE	SV	STOP VALVE
GP	GATE POST	THL	THRESHOLD LEVEL
HCL	HEDGE CENTER LINE	TP	TELEPHONE POLE
IC	INSPECTION COVER	TOW	TOP OF WALL
IL	INVERT LEVEL	VP	VENT PIPE
KB	KERB	WL	WATER LEVEL
LP	LAMP POST	WM	WATER METER

STATION CO-ORDINATES

STATION	EASTING	NORTHING	LEVEL	DESCRIPTION
STN/1	393916.60	330259.31	92.24	SURVEY NAIL
STN/2	393904.55	330309.28	94.37	SURVEY NAIL
STN/3	393905.59	330276.43	93.25	SURVEY NAIL

UNLESS OTHERWISE STATED THE SURVEY STATIONS LISTED ABOVE ARE ONLY INTENDED TO BE USED FOR TOPOGRAPHICAL SURVEY AT THE STATED SCALE

DUE CONSIDERATION SHOULD BE GIVEN TO LONGTERM STABILITY OF SURVEY STATION MARKERS.

GENERAL

NO ALLOWANCE HAS BEEN MADE FOR SUB SURFACE ENTRY INTO MANHOLES OR OTHER CHAMBERS OR VOIDS BELOW GROUND LEVEL. THEREFORE ANY DETAILS RELATING TO DEPTHS, SIZES ETC. ARE TAKEN FROM ABOVE GROUND AND AS SUCH WILL BE APPROXIMATE ONLY.

THE CONTRACTOR IS TO CHECK AND VERIFY ALL BUILDING AND SITE DIMENSIONS, LEVELS AND SEWER INVERT LEVELS AT CONNECTION POINTS BEFORE WORK STARTS.

SHOULD THERE BE ANY CONFLICT BETWEEN THE DETAILS INDICATED ON THIS DRAWING AND THOSE INDICATED ON OTHER DRAWINGS, THE ENGINEER SHOULD BE INFORMED PRIOR TO CONSTRUCTION ON SITE.

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VISIBLE FEATURES IN THE VICINITY OF THE BOUNDARIES, AS SHOWN ON THIS SURVEY, MAY NOT REPRESENT THE EXTENT OF LEGALLY CONVEYED OWNERSHIP.

DESCRIPTION	REV	DATE	DRWN	APPR

DRAWING STATUS

INFORMATION

Tower Surveys Ltd.
Chartered Surveyors
Geomatics • Land, Utilities, Engineering & Building
RICS
1 LYME DRIVE
PARKLANDS
STOKE-ON-TRENT
ST4 6NW
TEL:+44 (0)1782 667550
FAX:+44 (0)1782 667501
info@towersurveys.co.uk
www.towersurveys.co.uk
Regulated by RICS

CLIENT

MR N ASH

PROJECT TITLE

LAND AT JUNCTION A51 / BURSTON ROAD, BURSTON, STAFFORDSHIRE

DRAWING DETAIL

TOPOGRAPHICAL SURVEY AS OF 30/03/15

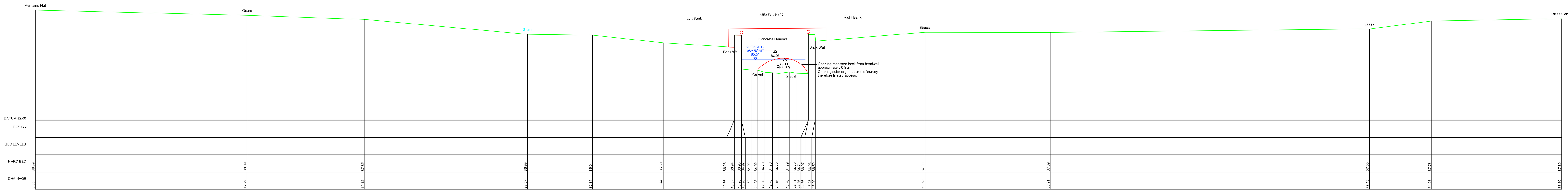
DRAWN	NW	DATE	MARCH 2015
PROJECT ENGINEER	PV		
CHECKED	PV	SCALE	1:200
APPROVED	PV		

DRAWING NUMBER: R-S11122 / 202

REVISION:

CAD REFERENCE
\\2015Projects\R-S11122.01\\R-S11122_202_ISSUE01

CTB REFERENCE
\\CTB-files\TS-Topo-v01.ctb



1.100
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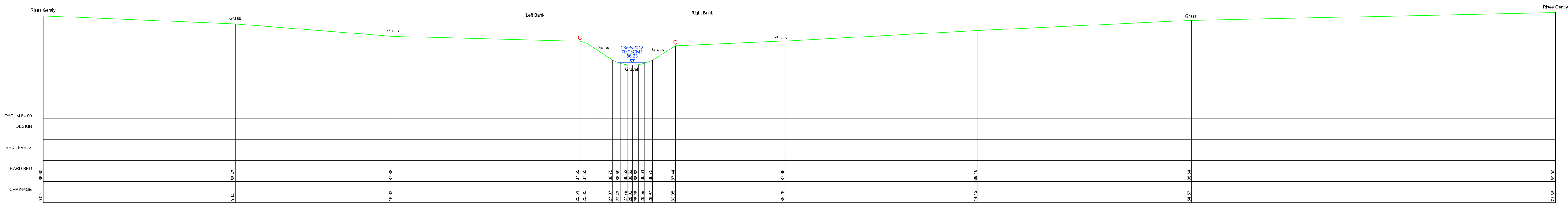
U/S of Railway Culvert



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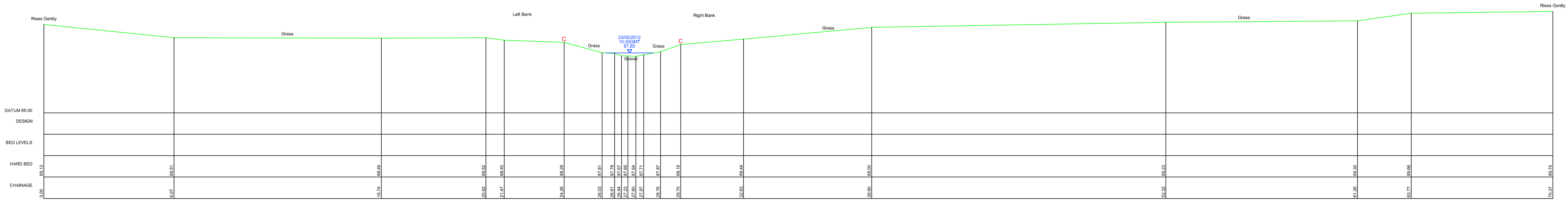
Open Channel



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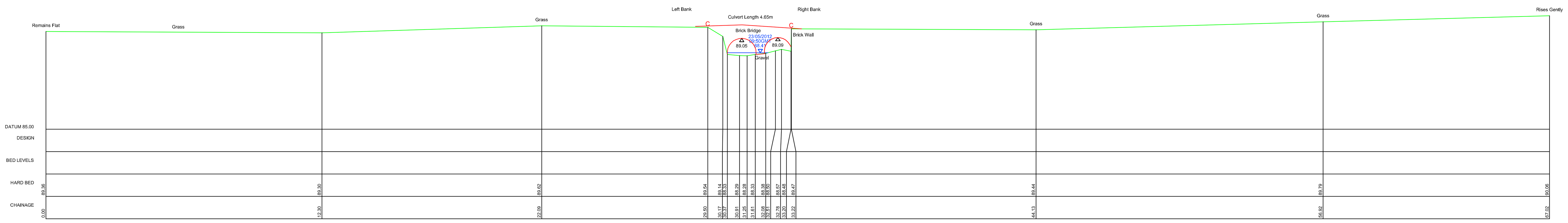
Open Channel



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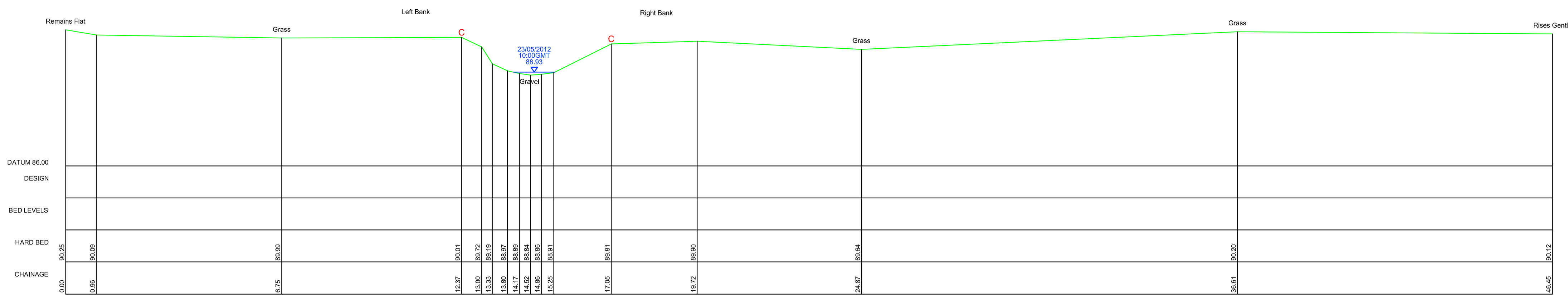

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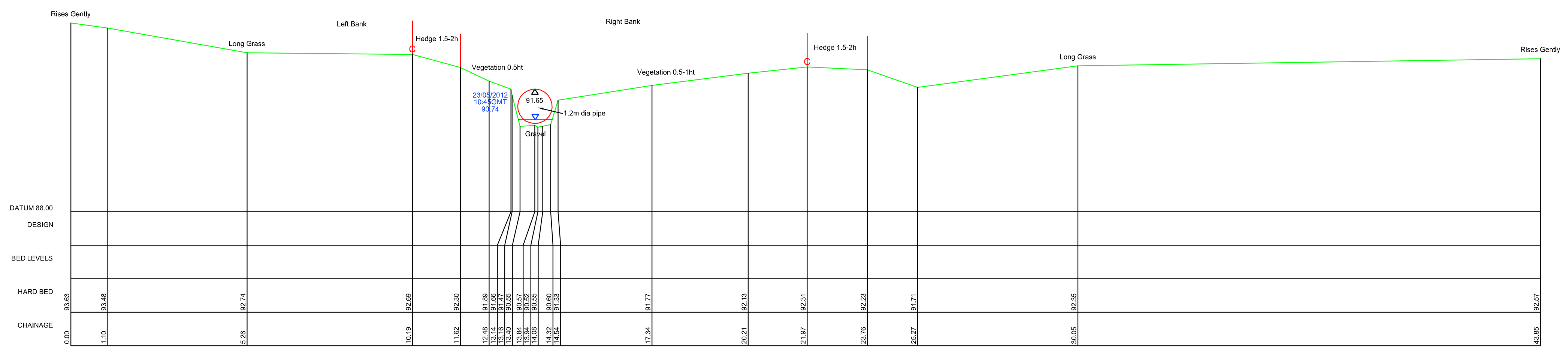

1.105
393937.53mE 330311.44mN Brg 304
U/S of Culvert under A51 Road

NOTES

A0

1. DATUM DETAILS
SURVEY CONTROL:

A) SURVEY GRID (HORIZONTAL):
THIS SURVEY IS ORIENTATED TO ORDNANCE SURVEY GRID NORTH. THE SURVEY IS TO A PLANE GRID. HORIZONTAL MEASUREMENTS TAKEN FROM THIS SURVEY WILL BE GROUND DISTANCES.
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LEGEND

Symbol	Description	Code	Fence description
30.29	SPOT LEVEL		FENCE WITH DESCRIPTION
STN/4	SURVEY STATION	C/P	CHESTNUT PALING
	SAPLING	C/B	CLOSE BOARDED
	BUSHES/SHRUB	C/I	CORRUGATED IRON
	HEDGE/AREA OF VEGETATION	C/L	CHAIN LINK
	TREE (INDICATIVE ONLY)	CBr	CRASH BARRIER
	BUILDING	Con/P	CONCRETE PANEL
99.90	CONTOUR	Elc	ELECTRIC
	BOREHOLE/PIEZOMETER	Hrd	HOARDING
	TRIAL PIT	H/M	HIT AND MISS
RWL	RETAINING WALL	I/R	IRON RAILING
	BANKING	Iwn	INTERWOVEN
	GATE	O/L	OVERLAP
	STILE	Pal	PALING
	ROCKFACE	P/W	POST AND WIRE
	GROUND PROFILE	P/R	POST AND RAIL
		P/C	POST AND CHAIN
		P/Bw	POST AND BARBED WIRE
		P/S	POST AND STRING
		W/M	WIRE MESH
		W/P	WOODEN PANEL
		OSBM VALUE	ORDNANCE SURVEY BENCH MARK
		TBM VALUE	TEMPORARY BENCH MARK/SITE DATUM
		OHC	OVERHEAD CABLE

ABBREVIATIONS

AC	AIR CONDITIONING UNIT	MKR	MARKER POST
B	BOLLARD	MH	MANHOLE
BB	BELISHA BEACON	MHC	MANHOLE - CIRCULAR
BL	BED LEVEL	MH(F)	MANHOLE-FOUL
BOP	BACK OF PATH	MH(S)	MANHOLE-SURFACE
BS	BUS STOP	MHT	MANHOLE-TRIANGULAR
BT	BRITISH TELECOM IC	OHC	OVERHEAD CABLE
CATV	CABLE TELEVISION IC	PB	PILLAR BOX
CC	CONTROL CABINET	PM	PARKING METER
CL	COVER LEVEL	P	POST
CrL	CROWN LEVEL	PYL	ELECTRIC PYLON
CP	CATCH PIT	RE	RODDING EYE
CPY	CANOPY LINE	RF	ROOF LEVEL
CTV	CABLE TELEVISION POINT	RG	RIDGE LEVEL
DK	DROP KERB	RS	ROAD SIGN
DP	DOWN WATER PIPE	RWL	RETAINING WALL
EC	ELECTRIC CABLE	SA	SOAK AWAY
ECB	ELECTRIC CONTROL BOX	SAP	SAPLING
EL	ELECTRIC MANHOLE	SC	STOP COCK
EP	ELECTRIC POLE	SEC	SECURITY CAMERA
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FL	FLOOR LEVEL	TCB	TELEPHONE CALL BOX
FLT	FLOOD LIGHT	TE	TREE
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G	GULLY	TL	TRAFFIC LIGHT
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IC	INSPECTION COVER	TP	TELEPHONE POLE
IL	INVERT LEVEL	TRP	TRIAL PIT
KB	KERB	UTL	UNABLE TO LIFT
KO	KERB OUTLET GULLY	VP	VENT PIPE
LB	LITTER BIN	WLV	WATER LEVEL
LP	LAMP POST/LIGHT COLUMN	WM	WATER METER
		WO	WASH OUT

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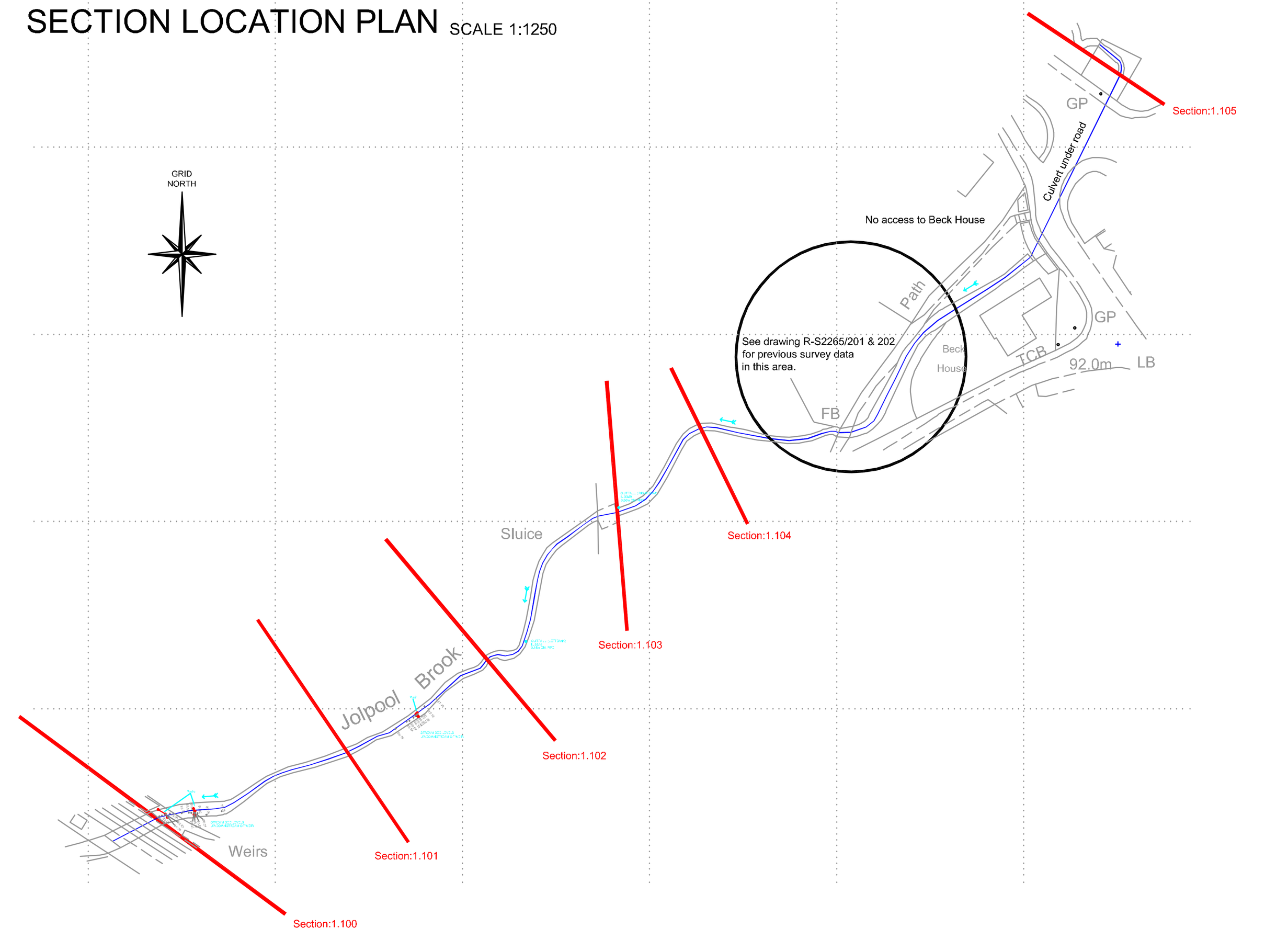
SECTION LOCATION PLAN SCALE 1:1250



DESCRIPTION	REV	DATE	DRWN	APPR

DRAWING STATUS

INFORMATION

Tower Surveys Ltd
Chartered Surveyors
Geomatics-Land, Engineering & Building
RICS
1 LYME DRIVE
PARKLANDS
STOKE-ON-TRENT
ST4 6NW
TEL: 01782 667 550
FAX: 01782 667 501
info@towersurveys.co.uk
www.towersurveys.co.uk

CLIENT
MILWOOD LIMITED

PROJECT TITLE
LAND OFF BURSTON LANE
BURSTON, NEAR STONE

DRAWING DETAIL
ADDITIONAL SECTIONS AS OF 23/05/2012

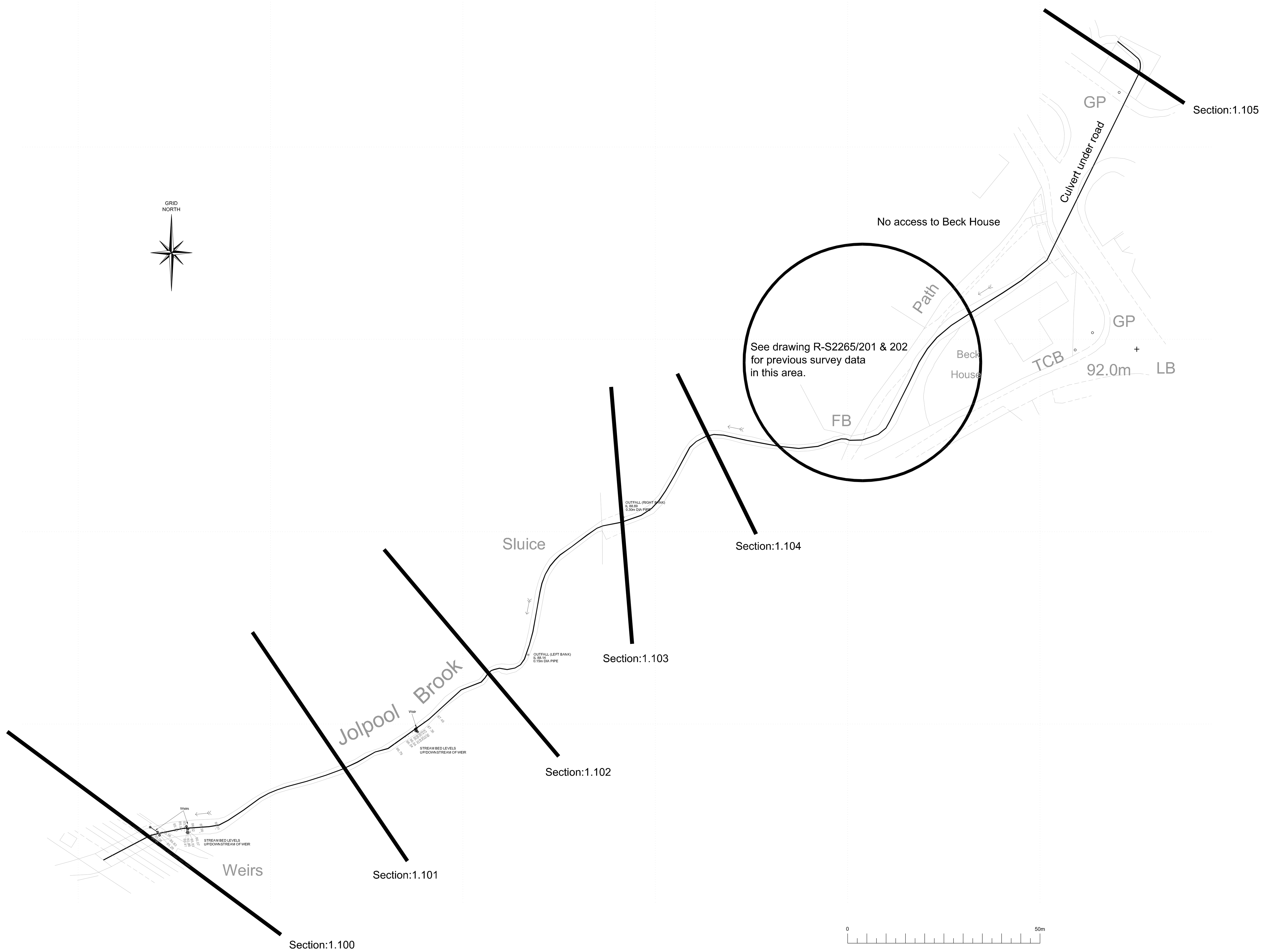
DRAWN	PV	DATE	MAY 2012
PROJECT ENGINEER	PV		
CHECKED	JW	SCALE	1:100
APPROVED	PV	SHEET SIZE	A0

DRAWING NUMBER R-S2265 / 203
REVISION

0 10m

CAD REFERENCE \\2010Projects\R-S2265\\R-S2265_203-204_ISSUE01

CTB REFERENCE \\CTB-files\surv2007



A0

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	BANKING	Iwn	INTERWOVEN
	GATE	O/L	OVERLAP
	STREAM CENTRELINE	Pal	PALING
		P/W	POST AND WIRE
		P/R	POST AND RAIL
		P/C	POST AND CHAIN
		P/Bw	POST AND BARBED WIRE
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DESCRIPTION	REV	DATE	DRWN	APPR

DRAWING STATUS

INFORMATION

Tower Surveys Ltd
Chartered Surveyors
Geomatics-Land, Engineering & Building
RICS
1 LYME DRIVE
PARKLANDS
STOKE-ON-TRENT
ST4 6NW
TEL: 01782 667 550
FAX: 01782 667 501
info@towersurveys.co.uk
www.towersurveys.co.uk

CLIENT
MILWOOD LIMITED

PROJECT TITLE
LAND OFF BURSTON LANE
BURSTON, NEAR STONE

DRAWING DETAIL
LOCATION PLAN AS OF 23/05/2012

DRAWN	PV	DATE	MAY 2012
PROJECT ENGINEER	PV		
CHECKED	JW	SCALE	1:500
APPROVED	PV	SHEET SIZE	A0
DRAWING NUMBER	R-S2265 / 204	REVISION	

CAD REFERENCE
\\2010Projects\R-S2265\\R-S2265_203-204_ISSUE01

CTB REFERENCE
\\CTB-files\surv2007

8.0 – Environment Agency correspondence 15th April 2015

Kev Ryder

From: Dingley, John [john.dingley@environment-agency.gov.uk]
Sent: 15 April 2015 16:11
To: Kev Ryder
Subject: FW: Sandon & Burston NP: Sites Affected by Flooding

Hi Kevin,

Having reviewed the information submitted the EA wishes to make the following comments:

Land adjacent to Burston Hall:
The Agency's flood maps indicate that the proposed development site referred to as 'Land adjacent to Burston Hall' is located within Flood Zones 2 and 3. Additional information has been provided in the form of a Flood Risk Assessment (FRA) for Burston Hall dated May 2009 which included results of hydraulic modelling of the Jolpool Brook. This provided some flood level information for the ordinary watercourse which runs through Burston.

The new information includes details of the location of cross sections related to the hydraulic model and topographic survey of the proposed development site. The FRA states the modelled levels indicate that flows on the Jolpool Brook remain in bank for the 1 in 100 year plus climate change event. It is suggested that the bridge may restrict flows and cause some overtopping but that these flows would be routed towards the River Trent or along the road but would not impact on the site. The topographic survey for the site indicates that levels are also higher than modelled flood levels on the River Trent.

The information provided therefore indicates that the Agency's published floodplain overestimates the extent of flooding in this location.

Based on the additional information provided we accept that flood risk on the site is likely to be lower than our current mapping indicates. Therefore the principle of development of two dwellings at this location is likely to be deliverable and policy compliant. However, prior to development further work will be required in order to provide a detailed flood outline for the Jolpool Brook to establish the impact this has on the site. We have not as yet reviewed the hydraulic model and this may need revisiting as part of any new application for development in this location. This additional information should form part of a site specific FRA to be submitted as part of a planning application, and will inform any mitigation measures that may be required to ensure the site is developed safely. A formal sequential test would also need to be undertaken to demonstrate that there are no other sites available.

Land at Burston Lane:
The Agency's flood maps indicate that the proposed development site referred to as 'Land at Burston Lane' is located within Flood Zone 3. Additional information in the form of a topographical survey and watercourse cross sections were provided as supporting evidence in January 2015. However, the floodplain information at this location is based on generalised JFlow mapping and we do not hold specific flood level data to inform development of this site. We note that the hydraulic modelling undertaken to date does not extend as far as the site in question. For us to be able to further comment on flood risk on this site we would need to see the Hydraulic Model extending to north of A51 to provide site specific flood levels.

Land at the Green Bungalow:
The Agency's flood maps indicate that the proposed development site referred to as '*Land at the Green Bungalow*' is located within Flood Zone 3. Additional information in the form of a topographical survey has been provided as supporting evidence. However, the floodplain information at this location is based on generalised JFlow mapping and we do not hold specific flood level data to inform development of this site. We note that the hydraulic modelling undertaken to date does not extend as far as the site in question. For us to be able to further comment on flood risk on this site we would need to see the Hydraulic Model extending to north of A51 to provide site specific flood levels.

In Summary:

We therefore recommend that the sites *'Land at Burston Lane'* and *'Land at the Green Bungalow'* are withdrawn from the plan and alternatives outside the floodplain are considered in preference. If no alternative sites outside the floodplain are available, the allocation of these sites would need to be supported by a Strategic Flood Risk Assessment (SFRA) ***PRIOR*** to the Neighbourhood Plan's adoption. This is required prior to the sites allocation to demonstrate that it is possible to bring the sites forward without being in conflict with national and local planning policy. The SFRA must demonstrate that the developments will be safe for their lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible reducing flood risk overall. A formal sequential test would need to be undertaken to demonstrate there are no other sites available. A detailed flood risk assessment may also be required in support of the planning application.

Following the submission of further information we consider that the site *'Land adjacent to Burston Hall'* could remain in the plan. However, a flood risk assessment will be required at detailed application stage and this should be reflected within a Neighbourhood Plan policy. The information submitted to the EA relating to the assessment of flood risk on this site will need to be submitted to the LPA in order for it to be formally included within the evidence base supporting the plan.

I hope this helps.

Should you have any further queries please get in touch.

Thanks.

John Dingley

8.1 – Environment Agency correspondence 23rd July 2015

Kev Ryder

From: Dingley, John [john.dingley@environment-agency.gov.uk]
Sent: 23 July 2015 14:50
To: Kev Ryder
Cc: Smith, Lucy J
Subject: RE: Burston and Sandon Neighbourhood Plan Sites - Hydraulic Assessment
Attachments: image001.jpg

Hi Kev,

We have reviewed the modelling submitted in support of the Burston & Sandon Neighbourhood Plan and wish to make the following comments.

This model covers 2 sites proposed for development within the NP area. Both are currently shown on the Environment Agency's flood maps as being located in Flood Zone 3, an area of land with a high probability of flooding. The modelling the Agency holds is high level jflow and as such does not provide detailed flood level information for these sites. In view of this, RAB consultants have produced a Hec Ras hydraulic model to provide further detail on the extant of flooding at these locations.

Results of the modelling indicates that due to the height of the A51, Site 1 is unlikely to be affected by flooding during any event used within this assessment. However, some flooding may occur if the culvert under the A51 were to become blocked. The modelling also confirms that Site 2 will flood during the 1 in 100 and 1 in 100 year (plus climate change) annual probability events.

It should be noted that the hydraulic modelling does not include the 1 in 1000 year event. As such the extent of Flood Zone 2 is unknown. Residential development is acceptable within Flood Zone 2 so long as appropriate mitigation is provided – floor levels should be set at least 600mm above the predicted 1 in 100 year flood level. A means of safe dry access to/from the site should also be identified. We therefore accept the principle of development in these two locations providing it is outside of Flood Zone 3. You will need to speak to the LPA to discuss any requirements regarding the sequential test and evidence base. It may be worthwhile re-drawing the site boundary to exclude any land within Flood Zone 3.

Our National Modelling Team have approved the Hec Ras Model deeming it fit for purpose. However, should the sites come forward for development in the future this modelling will need refining. This includes using the FEH Statistical method to assess the hydrology and provision of rationale for the final choice of method used. If the model is developed further it would be useful to undertake unsteady runs to capture attenuation upstream of the culvert and some sensitivity testing of the downstream boundary should be carried out with rationale of how it has been derived.

Hope this helps.

Regards,

John Dingley

8.2 - Environment Agency correspondence 30th July 2015

Kev Ryder

From: Dingley, John [john.dingley@environment-agency.gov.uk]
Sent: 30 July 2015 16:28
To: Kev Ryder
Cc: Smith, Lucy J
Subject: RE: Burston and Sandon Neighbourhood Plan Sites - Hydraulic Assessment
Attachments: image001.jpg

Hi Kev,

Just managed to speak to Lucy about this. We'd have no objections in principle to the proposed access road across the watercourse / within Flood Zone 3.

As I have already suggested, it may be prudent for you to speak to the LLFA about this (Staffordshire County Council) as they will ultimately approve/consent any such works and will be able to advise on a suitable design standard. They can be contacted at flood.team@staffordshire.gov.uk.

Your site boundary will have to be re-drawn to incorporate the proposed access road (if it doesn't already). You will also need to consider this in your work on the sequential test.

All other issues such as modelling for blockages etc can be addressed at the detailed application stage. If the proposed road were to flood (i.e. it couldn't be raised above the 1 in 100 year flood level) you may have to consider emergency access/egress arrangements.

Hope this helps.

John