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Gatwick Airport Ltd

Gatwick Stream Flood Attenuation Development

Landscape, Access & Ecological Mitigation and Enhancement Strategy

November 2012

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Approved	
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Position	Director
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1.0 INTRODUCTION

1.1 Background

1.1.1 The Landscape, Access and Ecological Mitigation and Enhancement Strategy (LAEMES), sets out the mitigation and enhancement strategy to support the proposed construction and operation of a new flood attenuation development immediately adjacent to the Gatwick stream, for the Gatwick Airport estate (herein referred to as the Scheme, please refer to **Figure 1**, Location Plan and **Figure 2**, Aerial Photograph of the Scheme's extent). The new flood attenuation development is sited within the south western extent of Gatwick Airport's landholdings, east of the Brighton to London railway line (herein referred to as the Land East of the Railway Line, LERL).

1.1.2 The principal need for the flood attenuation development is to control surface water flows to reduce the risk of flooding to the airport. The proposed flood attenuation area would be capable of holding up to 186,000m^3 of flood water, during periods of heavy rainfall when flows in the Gatwick stream exceed 15m^3sec^{-1}. The proposed Scheme would involve the excavation of c.160,000m^3 of soil from the fields and the removal of significant lengths of hedgerow and trees forming the field boundaries, in order to create the required attenuation capacity. This would be followed by selective replanting of trees and hedgerows, and re-seeding to reinstate the grazing land. Attenuation capacity would be managed by a flow limiting control structure on the line of the Gatwick stream and associated earth bunds.

1.1.3 In order to facilitate the construction of the proposed flood attenuation development, the course of the Gatwick stream will be realigned along approximately 500m of its length as it runs north past the western boundary of the sewage treatment works (see **Figures 1** and 7). The realignment of the stream will seek to replicate the physical characteristics of the existing watercourse, through the establishment of riffle and pool sequences, in-channel deflectors and log weirs, as well as appropriate marginal and riparian planting. A key element of the Scheme will be to ensure that the new section of the stream, and the on-line control structures do not inhibit the free passage of fish, or their ability to recruit.

1.1.4 The LAEMES sets out the framework and mechanism for delivering the mitigation and broader environmental enhancement measures (**Figure 7**, Landscape & Ecological Proposals Plan) identified in the Ecological Appraisal Report[1] (EAR) for the proposed flood attenuation scheme.

[1] (2012). Gatwick Stream Flood Attenuation Development: Environmental Appraisal Report. Prepared for and on behalf of Gatwick Airport Ltd.

1.2 Landscape and Ecological Context

1.2.1 The site is located immediately east of the London to Brighton Railway line, and is bordered along the west by the Gatwick stream.

1.2.2 A narrow line of trees connects the northern boundary of the Site to Horleyland wood and a Thames Water Sewage Works lies to the east of the Gatwick stream. The site is bordered to the south by Radford road, with associated private residential properties.

1.2.3 Although adjoining intensively developed areas, the LERL remains rural in character with a mosaic of woodland, including Ancient Woodland, scrub, hedges, grassland and a number of small ponds located throughout the LERL.

1.2.4 The LERL, although not the site itself, is criss-crossed by public footpaths (See **Figure 3**), which connect to a wider network of footpaths that extend through Horleyland Wood and Upper Pickets Wood and connect to Balcombe Road (to the east), Radford Road (to the south) and Gatwick Airport (to the north). These provide an amenity for local residents and are a means of pedestrian access to the airport from residential areas to the south and east of the Airport. The site and surrounding woodlands are managed by Gatwick Greenspace on behalf of GAL.

1.3 Legislative Context

1.3.1 The primary legislative drivers for the protection of wildlife within the UK, and that are pertinent to this site are:

- Wildlife and Countryside Act 1981 (as amended)
- Countryside and Rights of Way Act 2000 (otherwise known as the CRoW Act)
- Natural Environment and Rural Communities Act 2006 (otherwise known as the NERC Act)
- Conservation of Habitats and Species Regulations 2010.

1.3.2 The requirements for complying with legislation designed to protect wildlife within a planning context is currently set out in the National Planning Policy Framework (NPPF). It is a requirement that the obligations set out in primary legislation are adhered to in relation to planning law and associated decision making processes.

1.3.3 A brief outline of current legislative protection for each species is set out under the relevant headings below.

1.4 Baseline Surveys

1.4.1 Surveys for habitats and a range of species groups, including those protected by law, have been undertaken across the proposed development site during 2012 to augment the surveys undertaken in 2011 to inform the construction of a new pollution lagoon in the LERL and the Gatwick Airport Ecology Review (CBA, 2010) provided historic data records derived from previous surveys of the site undertaken over the last 10-15 years. The results of these surveys are summarised in the EAR.

1.5 Strategy Constraints

1.5.1 This Strategy has been prepared in the context of Civil Aviation Authority guidelines for bird control. The document "CAP 680: Aerodrome Bird Control", Civil Aviation Authority (2002) also provides comprehensive guidance for current good practice in the management of airport landscapes in terms of bird hazard control.

1.6 Strategy Aims and Objectives

Access

1.6.1 The aim of the access strategy is ensure that opportunities for local footpath usage, both for informal recreation and for providing pedestrian access to the airport, are conserved and enhanced. Specific objectives are:

Objective 1

To ensure that a new pedestrian route is provided to connect the existing footpath network to the north of the STW in Horleyland Wood (including FP360Sy) with the existing public footpath (FP3377) that terminates on the southern edge of Radford Road (See **Figure 3**).

Objective 2

To ensure that a new pedestrian route is provided to connect FP360/1Sy (east of the STW access road) to FP3377 (south of Radford Road) via a wooden footbridge over the Gatwick Stream (See **Figure 3**). This connection will be implemented as part of the flood attenuation development.

Objective 3

To ensure that a new circular pedestrian route is provided between the site and the STW access road for dog-walkers and other recreational footpath users (See **Figure 3**). This connection will be implemented as part of the flood attenuation development.

Mitigation Strategy

1.6.2 The strategic objectives of the LAEMES are to ensure that the most appropriate mitigation strategy is adopted for each of the species. The strategic objectives are as follows:

- *Avoidance*: the opportunity to ensure that any development activity does not affect the species of interest in the first place. This may be through revised working methods or timing of certain activities within particular areas of the development site;
- *Reduction*: the opportunity to identify means for reducing overall impacts. This may be facilitated through incorporation of ecological protection methods within Construction Method Statements, working methods;
- *Habitat recreation*: the opportunity to recreate habitats that may otherwise be permanently lost as the result of development activities;
- *Prevention*: the incorporation of methods for preventing intentional harm being caused to species, or the reckless destruction of habitat, such as the use of protective fencing or the management of site drainage (as discussed in the CMP). These measures can also be enmeshed within existing plans and structures as part of the overall delivery of the project; and
- *Relocation / Translocation*: the opportunity to move and re-establish populations of species or habitats that are situated within areas defined as comprising part of the proposed development area.

1.6.3 To achieve the objectives of the strategy, a series of Method Statements have been prepared to address mitigation relating to both habitats and species that will be affected by the development of the proposed flood attenuation scheme. There are six components of the mitigation strategy for which Method Statements have been prepared. These are as follows:

- Hedgerows (**Section 3.1**);
- Bats (**Section 3.2**);
- Breeding birds (**Section 3.3**);
- Invasive plant species (**Section 3.4**); and,
- Gatwick stream (**Section 3.5**).

1.6.4 A Method Statement has also been prepared for the retention of trees to be retained on site and this is set out in a separate report prepared by Martin Dobson Associates Ltd[2].

Ecological Enhancement

1.6.5 In addition to the mitigation strategy, a series of enhancement measures have also been identified. The ecological enhancements relate to the flood attenuation scheme, but should be read in conjunction with the LAEMES for the new pollution lagoon project (CBA, 2011). Collectively the LAEMES provide a strategic overview of all the interventions to enhance the biodiversity of the LERL. This strategic overview will be further developed for Gatwick Airport Ltd (GAL) by Gatwick Greenspace, in a detailed Ecological Management Plan. It is anticipated

[2] Tree Survey, Arboricultural Impact Assessment and Method Statement, Martin Dobson Associates Ltd (Nov.2012)

that the delivery of these enhancements will significantly contribute towards GALs aims of achieving Biodiversity Benchmark status.

Landscape Enhancement

1.6.6 Landscape enhancement would be achieved through the provision of (1) new, off-site tree planting to enhance the vegetation structure and landscape amenity of the local landscape and (2) new pedestrian access to enhance the accessibility of this area of countryside by local residents. The off-site tree planting would be provided both along the western site boundary where there are gaps in the existing tree belt adjacent to the railway, and along the south-eastern edge of the STW to in-fill the existing gappy tree belt.

2.0 SITE DESCRIPTION

2.1 Introduction

2.1.1 This section provides a brief overview of the key features of ecological and landscape interest, as well as description of existing public access, as they relate to the proposed development site itself, as well as their relationship to the LERL as a whole.

2.2 Geology, Soils and Hydrology

2.2.1 The LERL is underlain by Weald Clay, from which develops a range of slowly permeable and seasonally wet clays and loam soils. It is drained by the Gatwick Stream which discharges into the River Mole north of the airport.

2.3 Habitats

Hedges

2.3.1 Hedges are distributed throughout the LERL, but the strongest network provides the field boundaries to the pasture in the south west of the Site adjoining the Gatwick Stream, and is located within the proposed development area. They comprise a network across a cattle-grazed field with species-poor improved grassland. In general they are quite similar in species composition but some have very large gaps and can be considered defunct hedgerows. Most of the hedges are unfenced and open to cattle grazing; a clear browse line can be observed where this has occurred. Some of the hedges support a ditch and most have a sparse woodland flora with bluebell *Hyacinthoides non-scripta*, and lords-and-ladies *Arum maculatum*.

2.3.2 The hedgerows also contain mature trees, especially pedunculate oak *Quercus robur*, and other species include hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, hazel *Corylus avellana*, dog rose *Rosa canina* and grey willow *Salix cinerea*. They appear to have been unmanaged for some time and many of them are now very gappy.

Grassland

2.3.3 The areas of grassland within the Site comprise a series of pastures either side of the Gatwick Stream. Although there is some variation both within and between pastures they are quite similar overall in species composition and consist of relatively species poor semi-improved grassland. It includes a range of common grass species including Yorkshire fog *Holcus lanatus*,

meadow grasses *Poa* species, cocksfoot *Dactylis glomerata*, perennial rye-grass *Lolium perenne*, common bent *Agrostis capillaris*, red fescue and meadow foxtail *Alopecurus pratensis*. Forbs are limited in terms of species and abundance and as a whole are typical of such grasslands. They include red and white clovers *Trifolium pratense* and *repens*, lesser stitchwort *Stellaria graminea*, common mouse-ear *Cerastium fontanum*, vetches *Vicia* species, buttercups *Ranunculus* species and plantains *Plantago* species. In disturbed areas thistles *Cirsium* species and docks *Rumex* species are frequent or abundant. This is most noticeable in the more northerly of the two fields immediately to the west of the access road to the water treatment works, which has been disturbed by recent works.

2.3.4 On the whole the most species rich of these fields is the most northerly one adjoining the Gatwick Stream. This supports a small number species characteristic of less improved grassland, including common knapweed *Centaurea nigra*, ox-eye daisy *Leucanthemum vulgare* and grass vetchling *Lathyrus nissiola*, albeit only patchily and in relatively small quantities.

Gatwick stream

2.3.5 The channel of the Gatwick Stream is relatively natural in form, with meanders, a bed of gravel and silt and pool and riffle features. There is little aquatic vegetation although small amounts of a water starwort *Callitriche* species are present in places. Due to the steep nature of the banks there is limited emergent or marginal vegetation, although hemlock water dropwort *Oenanthe crocata* is frequent and yellow iris and remote and pendulous sedge *Carex pendula* are present on the edge of the channel.

2.4 Species

Bats

2.4.1 At least six species of bat have been positively determined as being present within the LERL:

- 45 kHz pipistrelle;
- 55 kHz pipistrelle;
- long-eared bat;
- Natterer's;
- serotine; and,
- noctule.

2.4.2 Other *Myotis* species are considered likely to have been recorded, including whiskered/Brandt's and Daubenton's. Many of the mature trees present in the Site, especially those with features such as cracks and cavities or substantial growths of ivy, have the potential

to be used as roosts by bat species. The woodlands, scrub, hedges, ponds and the Gatwick Stream may also be used as foraging and commuting areas by bats.

Breeding Birds

2.4.3 A total of 24 breeding bird species have been recorded in the LERL in 2011, summarised in **Table 2.1** below breeding territories relate to surveys undertaken in 2011. Further surveys were undertaken in 2012 to verify the findings of the 2011 results. In total 20 bird species, two of which are of conservation concern (song thrush *Turdus philomelos* and starling *Sturnus vulgaris*), were considered to be breeding or possibly breeding within the proposed development site during 2012. Overall, however, breeding activity between the two years across the Site is considered to be broadly similar.

Table 2.1 - Breeding bird territory numbers (for the whole of the LERL).

Species	Scientific name	Breeding territories
Wood pigeon	*Columba palumbus*	Many
Great spotted woodpecker	*Dendrocopos major*	1
Willow warbler	*Phylloscopus trochilus*	1
Wren	*Troglodytes troglodytes*	17
Dunnock	*Prunella modularis*	1
Robin	*Erithacus rubecula*	15
Blackbird	*Turdus merula*	1
Song thrush	***Turdus philomelos***	**1**
Common whitethroat	*Sylvia communis*	4
Blackcap	*Sylvia atriacapilla*	15
Garden warbler	*Sylvia borin*	2
Common chiffchaff	*Phylloscopus collybitta*	6
Goldcrest	*Regulus regulus*	
Long-tailed Tit	*Aegithalos caudatus*	2
Blue tit	*Cyanistes caeruleus*	13
Great tit	*Parus major*	3
Black-billed Magpie	*Pica pica*	Many
Eurasian Jay	*Garrulus glandarius*	
Carrion crow	*Corvus corone*	Many
Chaffinch	*Fringilla coelebs*	2
European greenfinch	*Carduelis chloris*	
European goldfinch	*Carduelis carduelis*	3
Eurasian Jackdaw	*Corvus monedula*	
Common bullfinch	*Pyrrhula pyrrhula*	1

2.4.4 A further ten species were recorded and although not confirmed duringthe 2011 survey, may breed in the LERL; these were treecreeper *Certhia familiaris*, nuthatch *Sitta europaea*, mistle thrush *Turdus viscivorus,* buzzard *Buteo buteo,* stock dove *Columba oenas*, collared dove, house martin *Delichon urbica*, and barn swallow *Hirundo rustica*. In addition, records were made on single visits of lesser whitethroat *Sylvia curruca* which may have been a passage

migrant and house sparrow *Passer domesticus* which is likely to breed in houses near to the site.

Deer

2.4.5 Roe deer *Capreolus capreolus* are also present, remaining almost exclusively in the woodlands, although they can be observed in the grasslands at dawn and dusk.

2.5 Landscape Character

2.5.1 The STW has a semi-industrial character on account of the large-scale structures associated with this facility and this detracts from the rural character of adjacent land where views of these structures may be obtained. The large-scale buildings associated with the Gatwick Airport Office Park have a strong urban character and this imparts an urban fringe character to the western parts of the site. The visual appearance of the above buildings and structures are partially softened by intermittent belts of deciduous trees and shrubs, which provide a buffer between these built-up areas and the fields within the site.

2.5.2 Although adjoining these intensively developed areas, the site and other areas of the LERL remain predominantly rural in character with a mosaic of woodland, grassland, hedgerows and scrub. The site has a strong pastoral, semi-enclosed character, which is reinforced by evidence of past cattle grazing, remnants of strong field boundary hedgerows and the tree-lined Gatwick Stream. The areas of woodland east and west of the existing and new pollution control lagoons have a strong semi-natural, enclosed character. The Gatwick Stream, with its associated intermittent groups of mature trees, is a notable landscape feature in the local landscape. The frequent movement of trains and planes, together with vehicular traffic on Radford Road, detracts from the sense of tranquillity in the local landscape.

2.6 Access

2.6.1 The local area is criss-crossed by public footpaths, which connect to a wider network of footpaths that extend through Horleyland Wood and Upper Pickets Wood and connect to Balcombe Road (to the east), Radford Road (to the south) and Gatwick Airport (to the north). These provide an amenity for local residents and are a means of pedestrian access to the airport from residential areas to the south and east of the Airport.

3.0 METHOD STATEMENTS FOR THE MITIGATION OF NEGATIVE EFFECTS TO FEATURES OF ECOLOGICAL INTEREST

3.1 Hedgerows / Trees

On Site Status

3.1.1 8 hedgerows (H8-15) were identified within the Site boundaries that are likely to be affected by the proposed flood storage scheme (**Figure 4**). They comprise a network across a cattle-grazed field with species-poor improved grassland. In general they are quite similar in species composition but some have very large gaps and can be considered defunct hedgerows. Most of the hedges are unfenced and open to cattle grazing; a clear browse line can be observed where this has occurred. Some of the hedges support a ditch and most have a sparse woodland flora with bluebell *Hyacinthoides non-scripta*, and lords-and-ladies *Arum maculatum*.

3.1.2 H8 is a tall unmanaged hawthorn *Crataegus monogyna* hedge with two mature oak standards *Quercus robur*. There are several gaps in the line of the hedge beneath the oak canopies and a very sparse ground flora. The mature oaks are 20-25m tall and feature cracked bark and several cavities that could be potential bat roosts.

3.1.3 H9 is an old coppiced hedgerow featuring a central ditch with water running along its entire length. There is mature ash *Fraxinus excelsior* and pedunculate oak trees, other woody species include elder *Sambucus nigra*, rose *Rosa* spp., willow *Salix* spp., hawthorn and hazel *Corylus avellana*. Occasional pignut *Conopodium majus* features in the ground flora. It is connected to three other hedgerows and features a pond at the northern end.

3.1.4 H10 is a gappy defunct hedge consisting of scattered hawthorn and blackthorn *Prunus spinosa* bushes. These woody species are unmanaged and have become tall and leggy in overall shape due to the influence of cattle grazing. There is a dry ditch running along the length of the hedge and three mature oak standards. The ground flora is quite varied and includes bugle *Ajuga reptans* and wood anemone *Anemone nemorosa*.

3.1.5 H11 is a dense unmanaged hedge mainly comprised of hawthorn and blackthorn with mature oak standards. A dry ditch and barbed wire fence runs along its length and this appears to have prevented the cattle from browsing it as much as the other hedges. Overall it is quite uniform in structure and has possibly been managed more recently than the other hedges.

3.1.6 H12 is a defunct unmanaged hedge. It is very gappy and species-poor, mainly comprised of hawthorn and blackthorn with two pedunculate oak standards. The hedge has clearly suffered

from grazing at the ground level and 1m or so upwards. There is a dry ditch running along its length and dog's mercury *Mercurialis perennis* in the ground flora.

3.1.7 H13 is an unmanaged hedge with hazel coppice and hawthorn that looks like it has previously been laid. A ditch with water runs along the entire length of the hedgerow with the hazel bordering the east side and hawthorn on the west. There are several mature ash and pedunculate oak trees with numerous cavities and woodpecker holes. One of the oak trees has a major cavity caused by heartwood rot extending from the base all the way up the tree and has significant bat roost potential. The ground flora is sparse but features ramsons *Allium ursinum*.

3.1.8 H14 is a short section of dense unmanaged hedge with a dry ditch. There is one oak standard and a variety of other woody species such as holly *Ilex aquifolium*, hawthorn, blackthorn and hazel. The shrub layer includes bramble *Rubus fruticosus* and honeysuckle *Lonicera periclymenum*. The ground flora is sparse but also quite varied and features dog's mercury.

3.1.9 H15 is a short section of fenced hedgerow showing signs of former management such as coppicing and laying. It is fairly dense and comprised mainly of hazel and hawthorn. The ground flora includes common dog violet *Viola riviniana* and wood avens *Geum urbanum*.

3.1.10 Three of the eight hedgerows surveyed (H9, 13 and 14) meet the criteria for classification as Important Hedgerows under the Hedgerow Regulations 1997. Table 3.1 summarises the findings of the hedgerow survey and evaluation.

Table 3.1 Results of Hedgerow Survey and Evaluation

(Number of Woody Species, Associated Features and Important Hedgerows are as set out in Paragraph 7(3), 7(4) and 7(1) respectively of Schedule 1, Part II of the Hedgerows Regulations. Refer to Section 2.1).

Hedgerow No.	Hedgerow Length (m)	Number of Woody Species	Adjacent to a bridleway/footpath /road/byway	Number of Associated Features	Important Hedgerow
8	100	5	No	2	No
9	200	6	No	5	Yes
10	155	4	No	3	No
11	200	4.5	No	2	No
12	140	3.5	No	2	No
13	260	6	No	5	Yes
14	40	6	No	3	Yes
15	60	3	No	2	No

Legislative Protection

3.1.11 Hedgerows are protected under the Hedgerows Regulations 1997.

3.1.12 Under the Hedgerows Regulations 1997 it is against the law to remove or destroy certain hedgerows without permission from the local planning authority. The local planning authority is also the enforcement body for offences created by the Regulations.

3.1.13 Local planning authority permission is normally required before removing hedges that are at least 20 metres (66 feet) in length, more than 30 years old and contain certain plant species. The authority will assess the importance of the hedgerow using criteria set out in the regulations.

Mitigation Strategy

3.1.14 Many of the hedgerow plants will need to be removed as part of the delivery of the Scheme (as shown on **Figure 5**). It is intended, however, that a selection of the hedgerow plants (depending on size, age, condition) will be temporarily transplanted during the period of the construction phase, and then re-established in the blocks of tree / hedgerow planting, which will be undertaken once all the excavations are complete (**Figure 7**, Landscape and Ecological Proposals Plan).

3.1.15 The selected hedgerow plants would be reduced in height to approximately 4-5ft above ground level. This remaining stem will be sufficient to enable new growth to develop during both the temporary storage period and once the plants are re-established in their permanent positions. Once the crown of the plant has been reduced, the rootball will be lifted using a mechanical excavator, and transferred to a prepared plot at the edge of the development site. Once the rootballs have been moved, the plots will be back filled and, if necessary, the ground watered.

3.1.16 The condition of the rootballs will be monitored during the period of the construction works; it is anticipated that they will require watering during the drier months. Monitoring will also be undertaken to identify new growth and to ensure that the plants have remained healthy. Any transplants that fail will be identified and not transferred back to the permanent planting positions.

3.1.17 Following completion of the construction works, the rootballs will be transferred from their temporary positions and planted in prepared plots at their permanent locations. New hedgerow plants will also be planted where the transplants have failed, to ensure the overall coverage of hedgerow plants is maintained in the final planting scheme.

3.1.18 In the short term, the transplants will require protection. The new planting will be fenced to prevent access to the plants either by cattle or deer. In the longer term, the hedgerow plants will either be managed mechanically (i.e. flailed), or by traditional techniques such as

hedgelaying. This will be dependent on how the plants develop and whether laying could practically be undertaken.

3.1.19 Hedgerow plants and trees that have been identified for retention as part of the scheme (please see **Figure 5**) would be protected during the construction phase by the establishment of root protection zones. Details of the tree protection measures are set out in the separate Tree Survey Arboricultural Impact Assessment Report[3] but in summary would consist of physical barriers to prevent plant and/or machinery from damaging either the trees themselves, or their roots. For example, all construction activities within the vicinity of the retained trees would be restricted to ensure that:

- no machines track over the root zones;
- there is no potential for damage to trees resulting from accidental movements of excavator arms during earth moving activities;
- no compaction occurs during construction activities; and,
- no compaction occurs as the result of the permanent positioning of the earth bunds.

3.2 Bats

On Site Status

3.2.1 At least six species of bat have been positively determined as being present within the LERL. These species are:

- 45 kHz pipistrelle;
- 55 kHz pipistrelle;
- long-eared bat;
- Natterer's;
- serotine; and,
- noctule.

3.2.2 Other *Myotis* species are considered likely to have been recorded, including whiskered/Brandt's and Daubenton's, however, there is no reliable way of specifically determining whether such other *Myotis* species are present on the Site without catching the bats. Daubenton's and whiskered/Brandt's bats are relatively widespread species which would be expected to occur in the habitats of the LERL and the surrounding countryside.

Legislative Protection

3.2.3 All British bat species receive legal protection in the United Kingdom. The Wildlife and Countryside Act 1981 (WCA) (as amended) transposes into UK law the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention). The 1981 Act was

[3] Tree Survey, Arboricultural Impact Assessment and Method Statement, Martin Dobson Associates Ltd (Nov.2012)

recently amended by the Countryside and Rights of Way (CRoW) Act 2000 and the more recent Conservation of Habitats and Species Regulations 2010. All British bat species are listed under Schedule 5 of the 1981 Act, and are therefore subject to the provisions of Section 9, which makes it an offence to:

- Intentionally kill, injure or take a bat [Section 9(1)];
- Possess or control any live or dead specimen or anything derived from a bat [Section 9(2)]
- Intentionally or recklessly disturb a bat while it is occupying a structure or place which it uses for shelter or protection [Section 9(4)(b)];
- Intentionally or recklessly obstructs access to any structure or place which a bat uses for shelter or protection [Section 9(4)(c)]
- Sell, offer for sale, possess or transport for the purpose of sale or publish advertisements to buy or sell a bat [section 9(5)]

3.2.4 Bats are also included on Annex IV of Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora (known as the Habitats Directive). As a result of the UK ratifying this directive, all British bats are protected under The Conservation of Habitats and Species Regulations 2010 (the Habitat Regulations). Annex IV of the Habitats Directive requires member states to construct a system of protection as outlined in Article 12, this is done through Schedule 2 of the Regulations whereby Regulation 39 makes it an offence to:

- Deliberately capture or kill a bat [Regulation 39(1)(a)];
- Deliberately disturb a bat in such a way as to be likely to significantly affect i) the ability of any significant group of animals of that species to survive, breed or rear or nurture their young, OR ii) the local distribution of that species. [Regulation 39(1)(b)];
- Damage or destroy a breeding site or resting place of a bat [Regulation 39(1)(d)].

3.2.5 Under the law, a roost is any structure or place used for shelter or protection. This could be any structure, for example any building or mature tree. Bats use many roost sites and feeding areas throughout the year. These vary according to bat age, condition, gender and species, as well as season and weather. Since bats tend to re-use the same roosts for generations, the roost is protected whether the bats are present or not.

3.2.6 The UK is a signatory to the Agreement on the Conservation of Bats in Europe, set up under the Bonn Convention. The Fundamental Obligations of Article III of this Agreement require the protection of all bats and their habitats, including the identification and protection from damage or disturbance of important feeding areas for bats.

Biodiversity Action Plans

3.2.7 All the bats identified on the site are included in lists developed by the "UK Biodiversity Action Plan Steering Group Report" (HMSO 1995). Pipistrelles are a Priority Species, being of

'unfavourable conservation status' in Europe having suffered a 25-49% decline in numbers/range in Great Britain in the last 25 years (HM50, 1995). All other species found on the site are listed in the Long List of Globally Threatened/Declining Species and are of 'unfavourable conservation status' in Europe.

3.2.8 A Species Action Plan for pipistrelles is included in the Sussex Biodiversity Action Plan.

Mitigation Strategy

3.2.9 Three trees will need to be removed to facilitate the construction of the water control bunds which have been identified as having potential to support roosting bats (as discussed in the Environmental Assessment Report[4]). As a consequence, these trees will need to be removed during the period when bats are active during April. A series of emergence surveys will be undertaken for each tree to determine whether bats are present from mid-March onwards. If bats are positively identified using the trees, a Natural England European Protected species (EPS) licence would be required and no works would be undertaken to the trees until the licence is in place. However, if following these surveys, the risk of encountering bats is considered to be limited, works to the trees would be undertaken, under supervision of a suitably qualified ecologist, who specialises in bat work. Dusk and dawn surveys would also be undertaken on each tree the evening / morning immediately prior to the felling taking place; as so long as no bats are recorded, the tree would be section felled and reduced, rather than felled at the base. If bats are encountered during this process, works would cease immediately and Natural England contacted.

3.3 Breeding Birds

On Site Status

3.3.1 20 breeding bird species were recorded during the survey. A further ten species were recorded, but were believed not to be breeding. The bird community comprises mostly relatively common and widespread species typical of the habitats and features present. However, some of these species have experienced substantial declines.

3.3.2 Most records and probable breeding were associated with woody vegetation, including trees and hedges.

[4] CBA (2012). *Gatwick Stream Flood Attenuation Development: Environmental Appraisal Report*. Prepared for and on behalf of Gatwick Airport Ltd.

Legislative Protection

3.3.3 Birds are protected by four major pieces of legislation:

- EC Directive 79/409/EEC on the Conservation of Wild Birds 1979 ('the Birds Directive')
- The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended; 'the Habitats Regulations')
- The Wildlife and Countryside Act 1981 (WCA) (as amended)
- The Countryside and Rights of Way (CRoW) Act 2000

3.3.4 In the UK the provisions of the Birds Directive are implemented through the WCA and the Habitats Regulations. The WCA gives protection to all birds during the breeding season. Birds listed under Schedule 1 of the WCA are afforded protection at all times.

3.3.5 The CRoW Act strengthens aspects of the WCA, adding 'reckless' disturbance' of birds, including those listed under Schedule 1, during the breeding season is an offence.

3.3.6 No schedule 1 species were recorded during the survey and the habitats present are considered unlikely to support any such species.

Summary of Listings

3.3.7 The population status of bird species in the UK is identified in 'Birds of Conservation Concern'[5]. This categorises bird species into Red, Amber and Green lists using a number of criteria such as population size and trend.

3.3.8 Of the 20 breeding species recorded, one (song thrush *Turdus philomelos*) and starling *Sturnus vulgaris*), were considered to be breeding or possibly breeding within the proposed development site during 2012.

Biodiversity Action Plans

3.3.9 Two of the recorded species (song thrush and common bullfinch *Pyrrhula pyrrhula*) are listed in the UKBAP.

[5] Eaton MA, Brown AF, Noble DG, Musgrove AJ, Hearn R, Aebischer NJ, Gibbons DW, Evans A and Gregory RD, 2009. Birds of Conservation Concern 3: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man. British Birds 102, pp296–341.

Mitigation Strategy

3.3.10 All tree felling and removal of hedgerows should, as far as possible, be conducted outside the bird breeding season. Natural England and RSPB guidelines suggest March to August inclusive as the period during which the majority of breeding bird activity takes place in the UK. However, breeding birds are protected irrespective of the time of year and certain species, such as collared dove and song thrush, will breed throughout the year if the conditions are suitable.

3.3.11 It is highly likely that some site clearance works will need to occur within the bird breeding season. Under these circumstances, a suitably qualified ecologist will attend site immediately prior to the work being undertaken. The ecologist will assess the site to determine whether there is evidence of bird breeding in the affected areas.

3.3.12 In the event that breeding birds are recorded within any affected area, a 20m (radius) exclusion will be established around individual nests in order to avoid disturbance. Nests will be periodically monitored by the ecologist to determine when breeding is complete. Breeding is deemed to be complete when the young have fledged and left the nest. Particular care must be taken to determine whether adults have commenced a second brood.

3.4 Non-native invasive plant species

On Site Status

3.4.1 Himalyan balsma *Impatiens glandulifera* is present along the banks of the Gatwick stream.

Legal Status

3.4.2 In the UK there are two main pieces of legislation that cover Japanese knotweed, Himalayan balsam and giant hogweed. These are:

- Wildlife and Countryside Act, 1981 (as amended). Listed under Schedule 9, Section 14 of the Act, it is an offence to "plant or otherwise cause the species to grow in the wild" (please note that since the last report was completed Himalayan balsam has now been included under Schedule 9 of the W & CA 1981); and
- Environmental Protection Act, 1990

3.4.3 An offence under the Wildlife and Countryside Act can result in a criminal prosecution. An infringement under the Environmental Protection Act can result in enforcement action being taken by the Environment Agency which can result in an unlimited fine. One can also be held liable for costs incurred from the spread of knotweed into adjacent properties and for the

disposal of infested soil off site during development which later leads to the spread of knotweed onto another site.

Mitigation Strategy

3.4.4 The control and management of non-native invasive weed species is a specialist activity. As such, a specialist contractor, experienced in the management and disposal of invasive weed species would be appointed to develop a Site-specific eradication and control strategy. A plan would be prepared that sets out the management of excavated soil contaminated with Himlayan balsam and vehicle movements to control the potential transfer of contaminated soil, plant material and/or seeds off-site. In brief, control measures to prevent the spread or transfer of plants, seeds or ground contaminated with seeds would include:

- Continued physical and chemical control;
- Barriers and other control measures to prevent material entering the river;
- Agreed controls on the movement and stockpiling of soils on the site;
- The appropriate disposal and waste transfer of contaminated materials off-site; and,
- Control measures such as wheel and/or jet washing and cleaning prior to the movement of vehicles off-site.

3.4.5 The implementation and monitoring of appropriate control measures to manage invasive weed species on site and to prevent their transfer off site would include ongoing monitoring for the presence or re-establishment of invasive weed species for the long-term operation of the Site.

3.5 Gatwick Stream

On Site Status

3.5.1 The Gatwick stream is a tributary of the River Mole, draining into the Thames basin. The stream within the LERL is limited in terms of its overall ecological quality. With respect to its macroinvertebrate community, the stream supports mainly 'very common' species.

3.5.2 The stream supports a total of 8 fish species:

- Bullhead
- Brown trout
- Chub
- Common Bream
- Dace
- Perch
- Three spine stickleback
- Stone loach

3.5.3 The fish community has a reasonable diversity, including brown trout, which are an indicator of both water and hydromorphological quality. The results of the survey also show that bullhead are actively recruiting (or have done so in the last year), again indicating that conditions appear suitable for the on-going maintenance of those populations. Due to the low number of fish caught, including young of the year fish, this conclusion is tentative.

3.5.4 Overall a total of 12 macrophyte species were recorded, with water-pepper (*Persicaria hydropiper*), the bryophyte *Pellia endiviifolia* and and macroalgae with the greatest percentage cover of the surveyed sections of the stream.

Mitigation Strategy

3.5.5 The most significant threats to the status of the Gatwick stream are likely to arise during the construction process. It is important to protect the retained sections of the watercourse within the site, but to also ensure that the watercourse is protected to prevent it becoming a conduit for the transfer of pollutants, sediments and or oil spills, further downstream.

3.5.6 Prior to the commencement of construction, an Ecological Clerk of Works (ECoW) will be appointed to monitor construction work as it progresses. Prior to commencement, the ECoW will be responsible for providing the contractors a series of toolbox talks and briefings to ensure that everyone on site is informed and aware of potential ecological issues that could arise during construction works.

3.5.7 The construction area, including access and egress routes, all areas required for ancillary activities such as access and egress routes, storage, site cabins, turning areas, soil stockpiles etc. will be clearly delineated and established prior to the commencement of any works. These areas would be mown and/or strimmed of vegetation, prior to a topsoil strip and the laying down of a temporary surface. Where necessary, these working areas would be bunded in order to prevent slippage of material into the Gatwick stream.

3.5.8 All construction work will comply with industry standard good working practices. These practices will be set out in a Construction Management Plan (CMP) and will address the following issues:

- Construction working times (no works will be undertaken during evening or nigh times where lighting would be required);
- The use of machinery fitted with bog tracks or wheels, to reduce as far as possible, the effects of vibration;
- The safe storage and handling of fuel for machinery. This will include:
  - The proper use of bunded fuel tanks;
  - Designated (and where necessary, bunded) fueling areas;
  - The use of drip trays under machinery stored on site overnight;

- The provision of spill kits to deal with any leaks or spillages;
- The control and disposal of surface run-off following rain events;
- Periodic damping down during dry weather conditions to minimise dust generation;
- The battering of earth stockpiles, to prevent potential slippage into areas adjacent to the construction site and,
- Appropriate disposal of all waste materials generated during the construction works.

3.5.9 With respect to the ongoing operation of the scheme, the principal requirement will be to ensure the free passage of fish through the control structure at the downstream end of the realigned section of the Gatwick stream. Under normal flow conditions, fish will be able to swim freely up and down the course of the Gatwick stream as there would be no physical barriers preventing them from doing this. Under flood conditions, however, there will be free passage during flows up to 15 m^3sec^{-1} (approx the 1 in 50 year event). For inflows greater than 15 m^3sec^{-1}, a pair of sluice gates will progressively close to maintain the outflow from the control structure at 15 m^3sec^{-1} as the reservoir fills. Fish passage will still be possible in this situation, but the velocities will be increased.

3.5.10 In order to ensure that the realigned section of the Gatwick stream will provide suitable habitat for the fish population, a series of habitat enhancement measures are proposed relating to bankside and riparian planting, and physical modifications to the stream bed, including log weirs, riffle and pool sequences, and in-channel flow deflectors. These are discussed in further detail in **Section 4** below.

4.0 LANDSCAPE & ECOLOGICAL ENHANCEMENTS

4.1 Introduction

4.1.1 In addition to the mitigation measures to be carried out in relation to the construction of the new flood attenuation area a range of other management interventions will be delivered with the aim of enhancing the habitats and features present in the Site for a range of wildlife species.

4.1.2 Objectives and prescriptions for the relevant habitats and features are listed below.

4.2 Gatwick Stream – Realigned Section

4.2.1 The creation of new waterbodies in the vicinity of the airport's flight path is highly controlled, due to the risk of attracting flocking birds and consequent bird strikes. Additionally, a range of engineering requirements, to ensure that the stream operates within its design parameters (e.g. flows at which water begins to discharge into the flood attenuation area), also need to be taken into consideration. As such, opportunities for enhancing the realigned section of the Gatwick stream are constrained. Nevertheless, some interventions are possible in order to ensure that the realigned section is as 'naturalised' as possible and reflects the overall sinuous pattern of the existing watercourse. Enhancement opportunities are illustrated in **Figure 6**, (typical cross-sections).

4.2.2 **Objective 1**: Enhance the hydromorphological characteristics of the Gatwick stream through the design and installation of in-channel features designed to create irregular flow characteristics and aquatic habitat heterogeneity, which will help to support fish recruitment.

4.2.3 Prescription 1a. Install log weirs at intervals along the course of the channel to create pools and runs.

4.2.4 Prescription 1b. Install suitably sized riffle sequences to vary bed depth and water velocity within discrete sections of the watercourse.

4.2.5 Prescription 1c. Install in-channel, bankside log deflectors to aid the sinuous development of the stream channel. The deflectors will be securely pinned to the channel bottom/banks.

4.2.6 **Objective 2**. Enhance the riparian botanical diversity of the stream.

4.2.7 Prescription 2a. Undertake planting of a range of marginal and riparian plant species typical of the River Mole catchment. Examples are included in the table below:

Latin Name	English Name
Butomus umbellatus	Flowering rush
Caltha palustris	Marsh marigold
Cardamine pratensis	Cuckooflower
Carex acutiformis	Lesser pond sedge
Eupatorium cannabinum	Hemp agrimony
Filipendula ulmaria	Meadowsweet
Iris pseudacorus	Yellow flag
Juncus articulatus	Jointed rush
Juncus inflexus	Hard rush
Lychnis flos-cuculi	Ragged robin
Lycopus europaeus	Gypsywort
Mentha aquatic	Water mint
Myosotis scorpioides	Water forget-me-not
Petasites hybridus	Butterbur
Polygonum amphibium	Amphibious bistort
Ranunculus flammula	Lesser spearwort
Ranunculus sceleratus	Celery-leaved buttercup
Sagittaria latifolia	Arrowhead
Schoenoplectus lacustris	Common club rush
Sparganium emersum	Unbranched bur-reed
Sparganium erectum	Branched bur-reed
Veronica beccabunga	Brooklime

Prescription 2b. Augment the plug planting of marginal and riparian plug plants, listed in Prescription 2a by sowing a suitable seed mix, for example a mix that contains 20% native wildflower seed and 80% British wild grasses, such as the meadow mix supplied by, for example, Herbiseed.

4.2.8 Prescription 2c. Undertake new woodland planting, predominantly on the eastern bank of the realigned stream with a mix of willow species *Salix* spp., alder *Alnus glutinosa* and black poplar *Populus nigra*. Mixes of trees should be planted in irregular blocks to ensure that the future development of the canopy is uneven. Future rotational management of the trees, particularly the willow will help to create an uneven aged stand of trees which is beneficially both ecologically and from an aesthetic point of view.

4.3 Grassland Enhancement Areas

4.3.1 The grasslands within the proposed development site will be lost as a result of the excavation works. However, these grasslands are currently considered to be relatively species poor, therefore the opportunity to enhance the floral diversity of the fields will be taken when the ground is reinstated and reseeded for its restoration to grazing pasture.

4.3.2 The reinstated land will be hydroseeded, as this is likely to offer the most appropriate method for quickly establishing a new grassland sward, both in terms of germination times, and also in reducing the availability of seed which may attract flocking birds.

4.3.3 Seed mix composition would reflect the underlying clay geology and may be similar in composition to the commercial mixes offered by suppliers such as Emorsgate seeds (e.g. mixes EM3 or EM4). If a seed mix could be sourced from a closer supplier such as the Weald Meadow Initiative, then this would be preferable.

4.3.4 **Objective 3** Increase the species richness of the grasslands adjoining the Gatwick Stream.

4.3.5 Prescription 3a. Sow an appropriate seed mix, such as those described above, by hydroseeding. Appoint a suitably qualified contractor to undertake this work.

4.3.6 Prescriptions 3b. Control bulky and invasive weeds, including creeping thistle *Cirsium arvense*, spear thistle *Cirsium vulgare*, broadleaved dock *Rumex obtusifolius* and curled dock *Rumex crispus*, by repeated spot spraying using an appropriate herbicide during the establishment of the new sward.

4.3.7 Prescription 3c. Allow the sward to establish and develop prior to reintroducing cattle to the fields. Establishment may take 2-3 years, in which case it may be necessary to mechanically top the sward during the summer. If this is necessary, undertake any works using a machine fitted with bog tracks or low pressure tyres to prevent compaction of the ground, as this will inhibit germination by some species and will lead to the long term creation of areas of bare ground. Additionally, the use of heavy machinery may also result in the creation of depressions which may develop into ephemeral ponds, which needs to be avoided in order to prevent the risk of attracting waterfowl to the site.

4.3.8 Prescription 3d. In subsequent years the grassland should be managed as pasture in the first instance, with the possible introduction of hay meadow management in future years, subject to the views of Gatwick Safeguarding. These two approaches could be combined with some fields

managed as hay meadow and some as pasture and this could be rotated from year to year, with some compartments grazed, and others mechanically cut periodically.

4.3.9 In the immediate future, however, the fields should be managed as pasture grazing which should be at a sufficiently low intensity to allow some flowering and seeding to take place. Alternatively, grazing could be relaxed for periods of about eight weeks during spring/summer to allow this to happen. Ideally, the fields should be grazed with a relatively docile breed of cattle, such as longhorns.

4.3.10 Prescription 3e. Continue control of bulky and invasive weeds by spot spraying with an appropriate herbicide as required.

4.4 Gatwick Stream

4.4.1 The Gatwick Stream appears to be relatively unmodified and adds a significant element of habitat diversity to the area which is of value to a range of wildlife species. However, some parts of the channel and banks do appear to have been disturbed and the invasive alien plant species Himalayan balsam *Impatiens glandulifera* is present on the banks.

4.4.2 **Objective 4**. Enhance the Gatwick Stream and its features of interest.

4.4.3 Prescription 4a. Explore opportunities for re-profiling parts of the stream banks, for example to create bays or backwaters and to enable access, for example for educational activities. Areas of disturbed bank should be targeted for any such re-profiling and areas supporting a flora characteristic of relatively long periods free from disturbance, such as stands of bluebell and/or ramsons *Allium ursinum*, should be avoided.

4.4.4 Prescription 4b. Install 2 brush wood or log weirs, and 4 sets of in-channel deflectors at suitable locations in the channel, for example using logs, within the channel of the stream to diversify flow characteristics.

4.4.5 Prescription 4c. Lightly thin (20-30%) areas supporting woody vegetation. As far as possible and compatible with other objectives retain all mature trees and their characteristic features, including dead wood, cracks and cavities, and all standing and fallen dead wood.

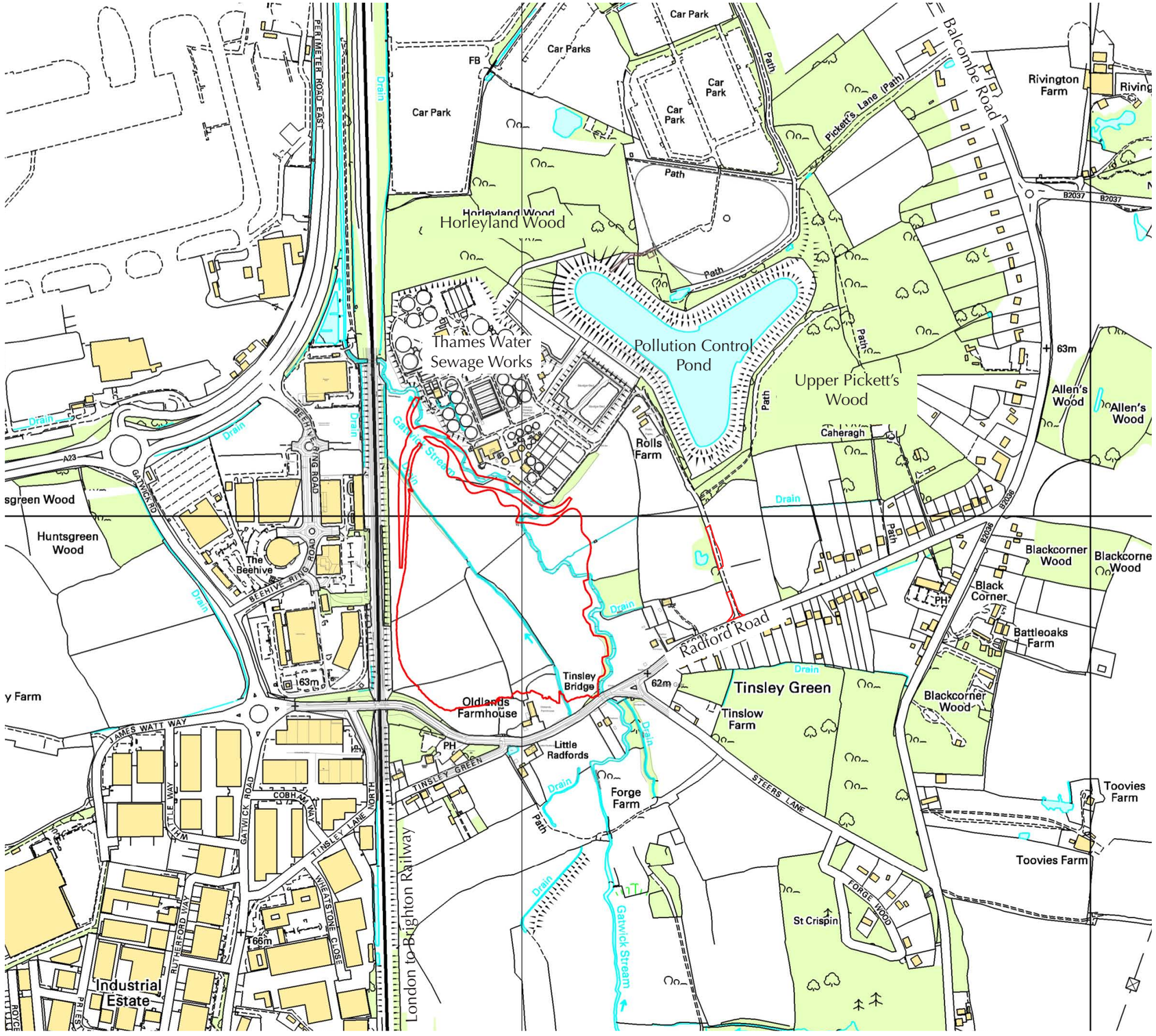
4.4.6 Prescription 4d. Control Himalayan balsam through regular strimming and/or hand pulling before flowering and seed set.

5.0 ACCESS ENHANCEMENTS

5.1.1 There are no public footpaths within the site although there is a long-term plan, agreed as part of an earlier planning application (Ref CR/2011/0620/FUL), to connect FP360/1Sy (east of the STW access road) to FP3377 (south of Radford Road) via a wooden footbridge over the Gatwick Stream (See **Figure 3**). This connection will be implemented as part of the flood attenuation development

5.1.2 One landscape enhancement measure, to be taken forward as part of these proposed works, will be to connect the existing footpath network to the north of the STW in Horleyland Wood (including FP360Sy) with the existing public footpath (FP3377) that terminates on the southern edge of Radford Road. This new route will initially pass through a narrow corridor of land between the STW and the eastern embankment of the railway line and then pass through the attenuation area to join the northern edge of Radford Road. A new timber footbridge will be provided to the north of the control structure for this new footpath to pass over the Gatwick Stream.

5.1.3 This new connection would be a significant enhancement in the opportunities for people to access the countryside for both recreational enjoyment and for health benefits.



KEY

Site boundary

CHRIS BLANDFORD ASSOCIATES
environment landscape planning

November 2012

GATWICK STREAM FLOOD ATTENUATION DEVELOPMENT

Gatwick Airport Ltd

FIGURE No 1

SITE LOCATION PLAN

KEY

Site boundary

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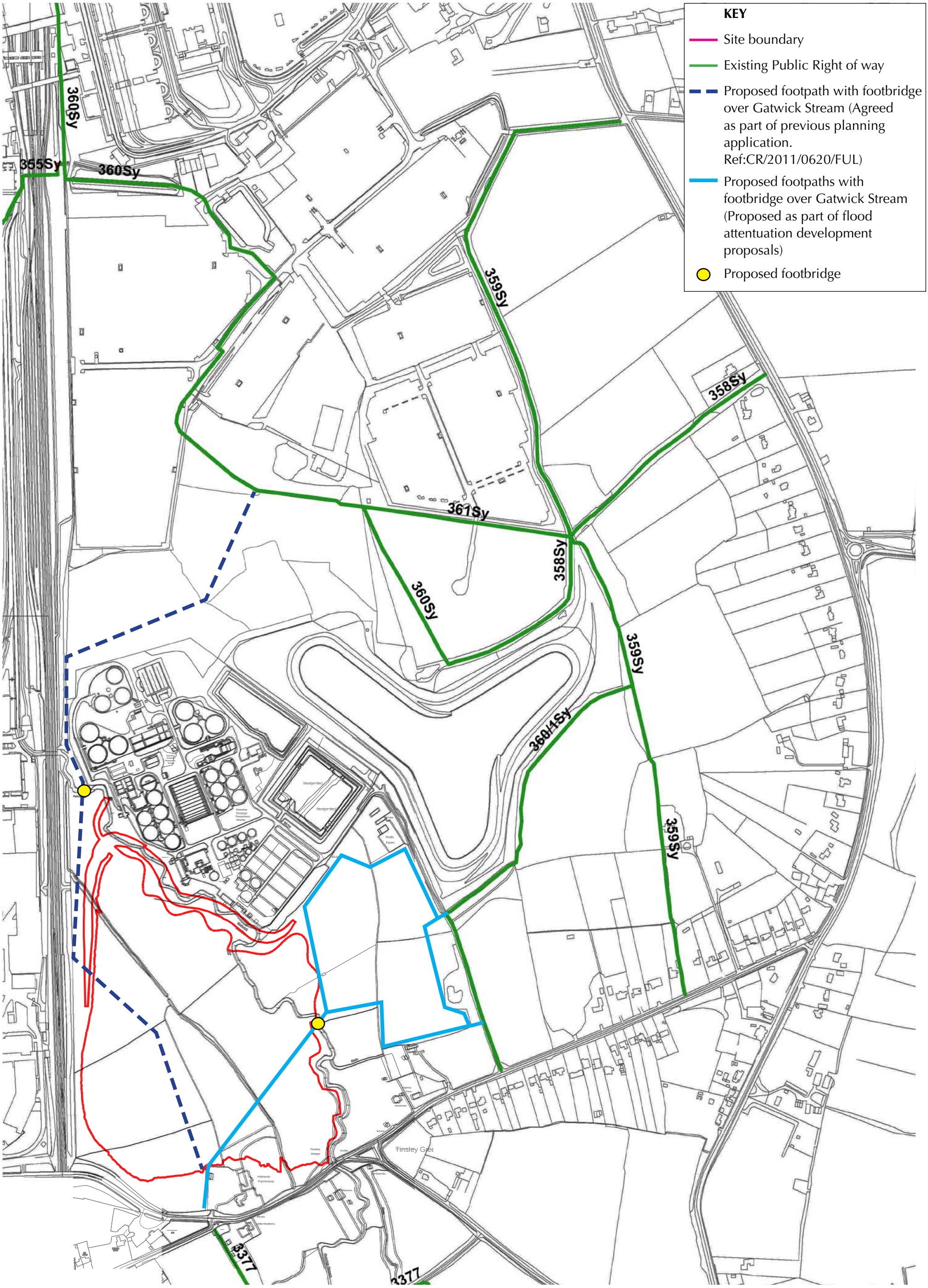
environment landscape planning

November 2012

GATWICK STREAM FLOOD ATTENUATION DEVELOPMENT

Gatwick Airport Ltd

FIGURE No 2
AERIAL PHOTOGRAPH



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November 2012

GATWICK STREAM FLOOD ATTENUATION DEVELOPMENT
Gatwick Airport Ltd

FIGURE No 3
RECREATIONAL ACCESS PROPOSALS

0 50 100 150 200 m

Key

H8-15 Hedgerow Number

Important Hedgerow

Yes

No

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GATWICK FLOOD STORAGE SCHEME
HEDGEROW SURVEY

FIGURE 4
Location and status of hedgerows on site

AUGUST 2012

Notes

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Key

- Proposed Site Boundary
- Existing Tree Retained
- Existing Tree Root Protection Area
- Existing Tree Removed
- Existing Hedgerow / Scrub Retained
- Existing Hedgerow Removed
- Existing Scrub/Rough Grassland Removed
- T40(A) Existing Tree Removed

Tree Protection Fencing - No Excavation
No Change in Level
No Storage of Soil

NOTES:

Refer to CBA Drawing 1113802-1-001 for tree category locations and 1113802-1-002 for proposed planting

Plan shows extent of root protection zones and position of fencing to enforce root protection areas. Within these areas there will be NO movement of soil. Trees to be removed are numbered and shaded orange. Trees to be retained are shaded blue.

Rev	Date	Drw	Revision or reason for Issue

Scale / North Point

N

0 10m 30m 50m

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Client
Gatwick Airport Ltd.

Project Title
Gatwick Stream Flood Attenuation Development

Drawing Series and Title
Vegetation Retention, Removal and Tree Protection Plan

Scale @ A1
1:1,000

Drawn
SG

Approved
SKi

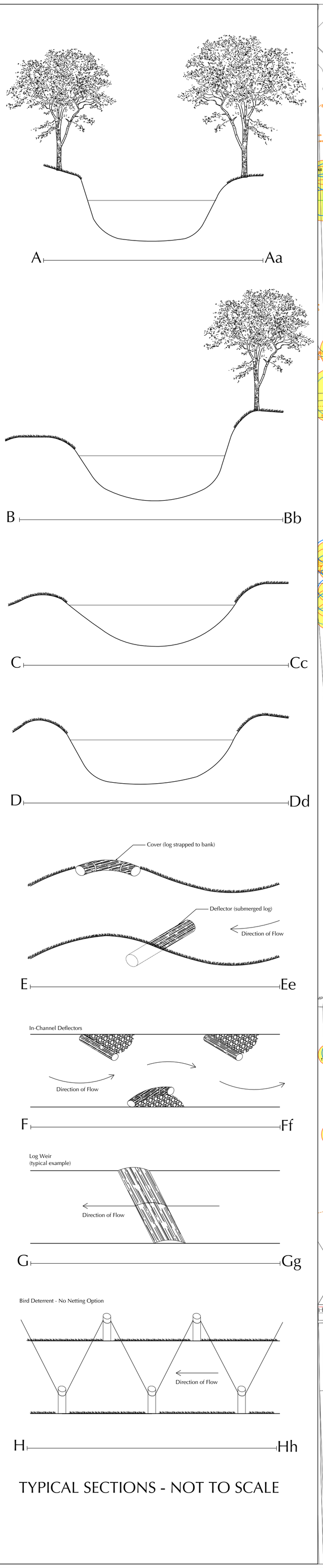
Date
Nov 2012

Drawing Status

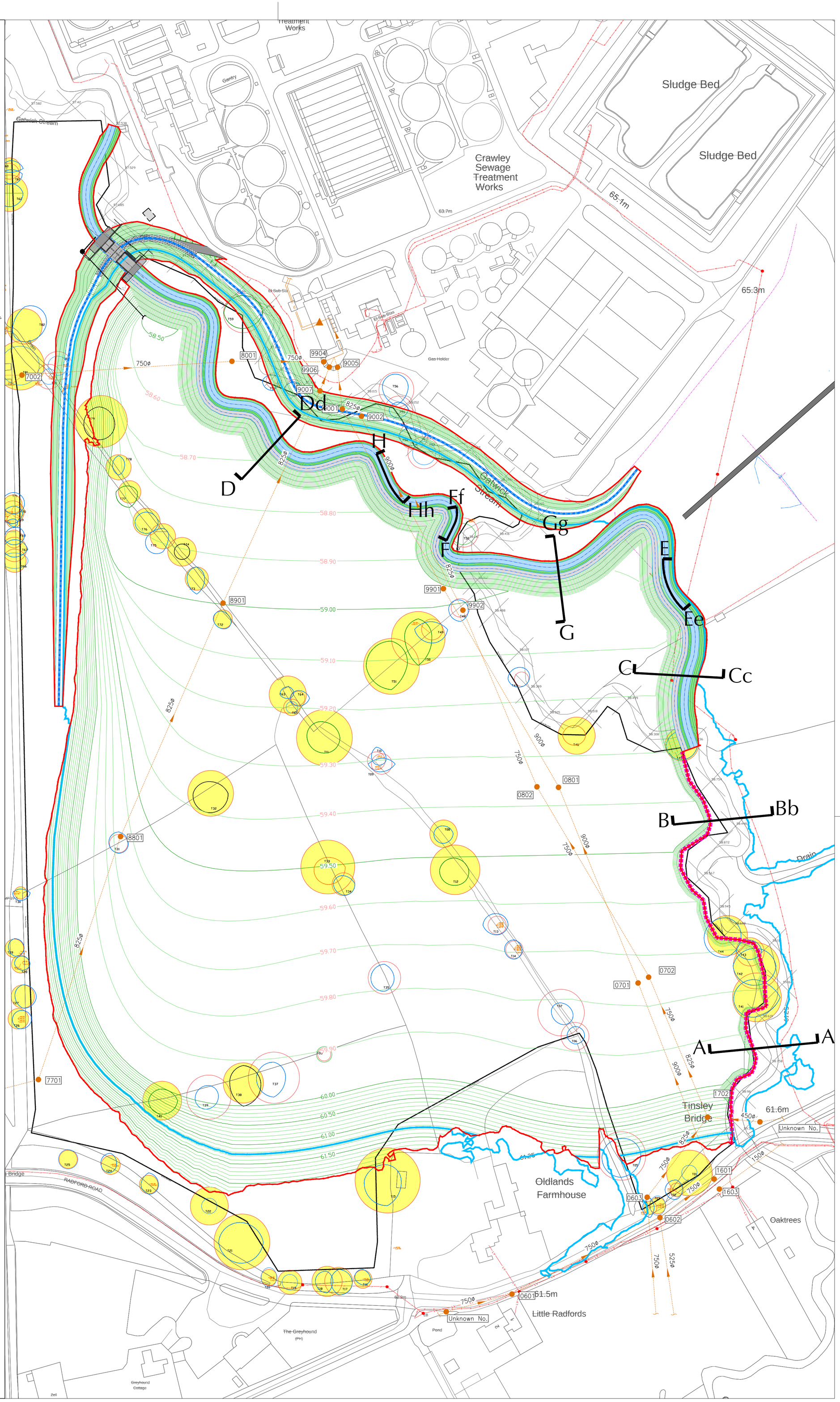
Drawing number
Figure 5

Revision
-

L:\projects\11113802 Gatwick Flood Storage Scheme temp\4 CAD\Work Stage 1\MDAL-02.dwg



TYPICAL SECTIONS - NOT TO SCALE



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Key

- Existing Trees Retained
- Existing Hedgerow / Scrub Retained
- Proposed Tree Planting *
- Proposed Hedgerow / Scrub Planting **
- Proposed Riparian Planting ***
- Proposed Security Fencing (1.75m high-metal)
- Proposed Post and Rail Fencing (1.2m high-timber)

Notes

Species mix for new planting restricted to Willow and Alder for aerodrome safeguarding (potential birdstrike) reasons.

* Proposed tree planting outside of flood attenuation area. (Species to consist of Willow and Alder 1.8m-2.4m high and planted at 2m centres.)

** Proposed shrub planting within flood attenuation area comprising either rootstock of existing trees and shrubs (temporarily translocated off site) or replacement planting (Groups of Willow and Alder 1.8m-2.4mhigh and planted at 2m centres.)

*** Riparian planting, Refer to adjacent schedule for species mix

RIPARIAN PLANTING MIX

Latin Name	Common Name
Butomus umbellatus	Flowering rush
Caltha palustris	Marsh marigold
Cardamine pratensis	Cuckooflower
Carex acutiformis	Lesser pond sedge
Eupatorium cannabinum	Hemp-agrimony
Filipendula ulmaria	Meadowsweet
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Schoenoplectus lacustris	Common club rush
Sparganium emersum	Unbranched bur-reed
Sparganium erectum	Branched bur-reed
Veronica beccabunga	Brooklime

PLANTING AREAS

Scrub / Hedgerow	
Total Existing on Site	13,435m|
Retained	1,254m|
Removed	12,181m|
Total Proposed	12,303m|

Rev	Date	Drw	Revision or reason for Issue

Scale / North Point

0 10m 30m 50m

N

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Project Title
Gatwick Stream Flood Attenuation Development

Drawing Series and Title
Typical Cross Sections

Scale @ A1
1:1,000

Drawn
SG

Approved
SKi

Date
Nov 2012

Drawing Status

Drawing number
11113802_Figure 6

Revision
-

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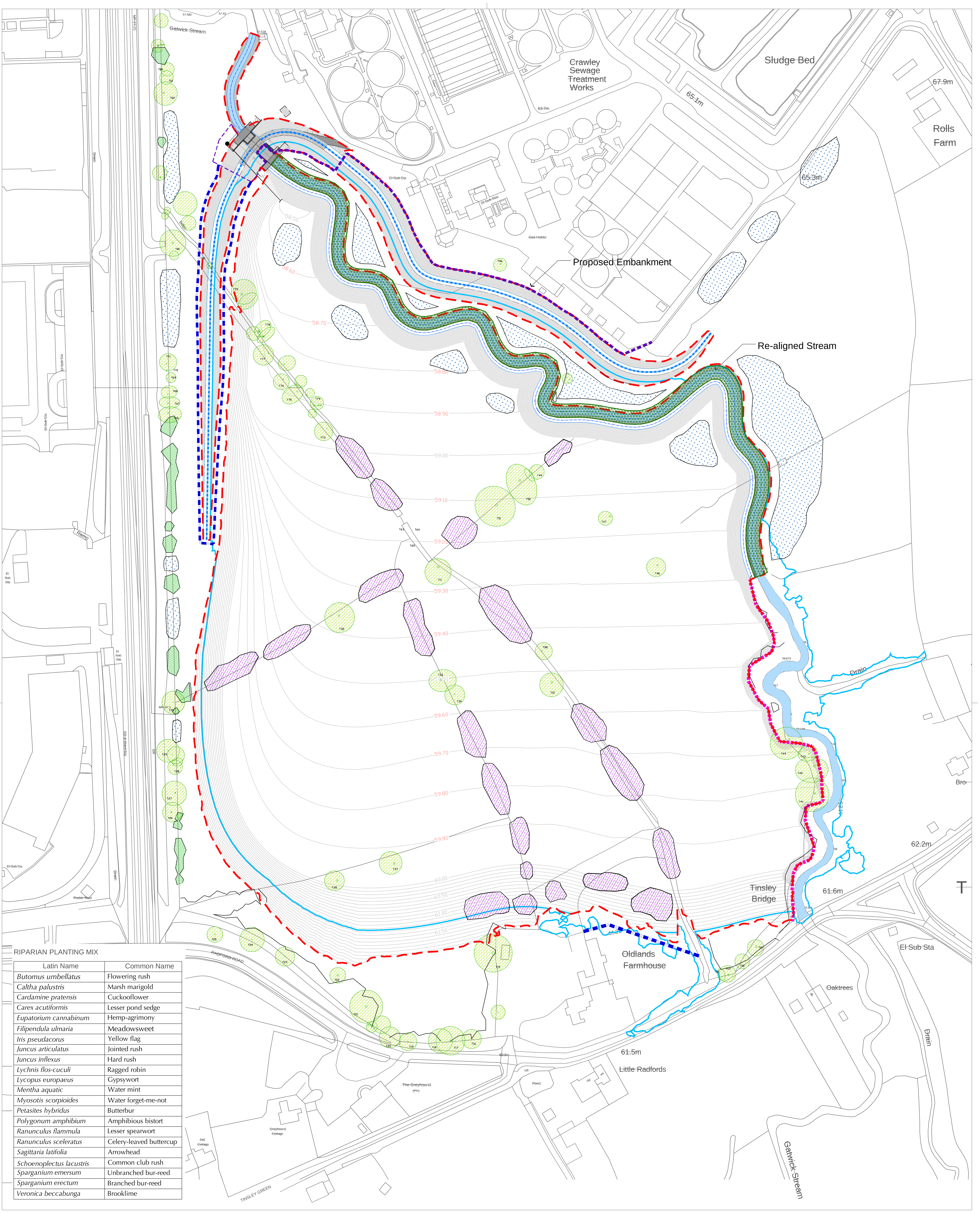

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*** Riparian planting, Refer to inset for schedule with species mix

Rev	Date	Drw	Revision or reason for Issue

Scale / North Point

0 10m 30m 50m

N

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Client
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Project Title
Gatwick Stream Flood Attenuation Development

Drawing Series and Title
Landscape & Ecological Proposals Plan

Scale @ A1 1:1,000 | Drawn SG | Approved SKi | Date Nov 2012 | Drawing Status

Drawing number Figure 7 | Revision -

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