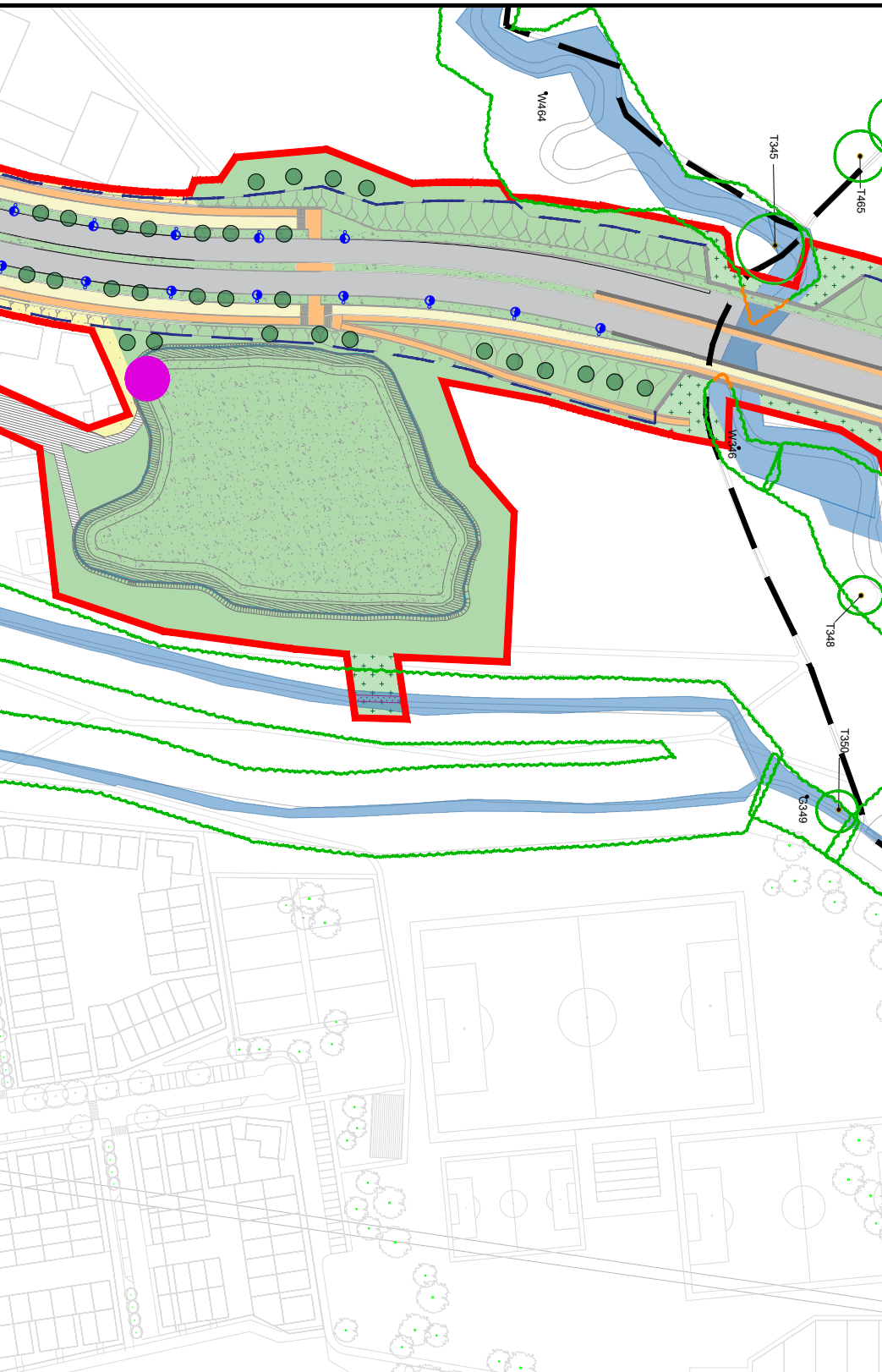


Native Hedgerow					
Hedgerow Habitat Planting - Regular Low Inc. Trees					
Hedge Species	Height (cm)	Age	Root		
<i>Acer campestre</i> (Field maple)	60-80	1+1	B		
<i>Crataegus monogyna</i> (Hawthorn)	60-80	1+1	B		
<i>Prunus spinosa</i> (Blackthorn)	60-80	1+1	B		
<i>Fagus sylvatica</i> (Beech)	60-80	1+1	B		
<i>Ilex aquifolium</i> (Holly)	60-80	1+1	B		
Maintenance - Trimmed at 1.6 high					
Tree Species (Within Hedgerow)	Code	Girth (cm)	Height (cm)	Clear stem (cm)	Root
<i>Acer campestre</i> (Field Maple)	Ac	10 to 12	200-250	180 mm	B
<i>Prunus avium</i> (Wild Cherry)	Pa	10 to 12	200-250	180 mm	B
<i>Prunus spinosa</i> (Blackthorn)	Sa	12 to 14	250-300	200 mm	B
<i>Quercus robur</i> (English Oak)	Qr	12 to 14	250-300	200 mm	B

Ditches	
EPF Wild Flowers for Pond Edges (Eurosgate or acceptable equivalent)	EM8
Seeding Rate (g/m ²)	10
Species	%

Wild Flowers	
<i>Angelica sylvestris</i> (Wild Angelica)	5.00
<i>Centaura nigra</i> (Common Knapsweed)	12.00
<i>Dipsacus filiform</i> (Wild Teasel)	3.00
<i>Eupatorium cannabinum</i> (Heim Agrimony)	1.00
<i>Filipendula ulmaria</i> (Meadowsweet)	10.00
<i>Galium album</i> (Hedge Bedstraw)	5.00
<i>Geum melle</i> (Water Aven)	3.00
<i>Iris pseudacorus</i> (Yellow Iris)	20.20
<i>Lathyrus pratensis</i> (Meadow Vetchling)	4.00
<i>Lytium salicaria</i> (Purple Loosestrife)	1.50
<i>Lycopus europaeus</i> (Gyrowort)	0.50
<i>Oenanthe pimpinelloides</i> (Corky-fruited Water-dropwort)	1.00
<i>Plantago lanceolata</i> (Ribwort Plantain)	3.00
<i>Prunella vulgaris</i> (Selfheal)	4.00
<i>Ranunculus acris</i> (Meadow Buttercup)	5.00
<i>Silene dioica</i> (Red Campion)	14.00
<i>Silene fls-cuculi</i> (Ragged Robin)	6.00

Specimen Tree Planting - 1B				
Species	SUDS	Girth (cm)	Height (cm)	Clear stem (cm)
Acer campestre (Field Maple)	Y	20 to 25	600-700	250 min
Acer campestre William Calwell (Field Maple)	Y	20 to 25	600-700	250 min
Acer x freemanii (Freeman Maple)	Y	20 to 25	600-700	250 min
Betula pendula (Birch)	Y	18 to 20	500-600	220 min
Carpinus betulus (Hornbeam)	Y	20 to 25	600-700	250 min
Corylus avellana (Hazel)	N	18 to 20	500-600	220 min
Ilex aquifolium (Holly)	Y	18 to 20	500-600	220 min
Liriodendron tulipifera (Tulip Tree)	Y	20 to 25	600-700	250 min
Prunus avium (Wild Cherry)	Y	20 to 25	600-700	250 min
Prunus avium Plena (Wild Cherry)	N	20 to 25	600-700	250 min
Prunus spinosa (Blackthorn)	Y	18 to 20	500-600	220 min
Quercus frainetto (Hungarian Oak)	Y	20 to 25	600-700	250 min
Quercus robur (Pendiculate Oak)	Y	20 to 25	600-700	250 min
Sorbus aucuparia (Rowan)	Y	18 to 20	500-600	220 min
Tilia cordata (Greenspire (Small Leaved Lime)	Y	20 to 25	600-700	250 min
Ulmus New Horizon (Eim)	Y	20 to 25	600-700	250 min



Lowland Mixed Deciduous Woodland Planting - Typical species								
Species (Latin)	(Common name)	Height (cm)	Age	Root / Container / Cell	%	Notes	Group size (Number of plants)	Species Density (Plants/m²)
Trees - Feathers - 15%								
<i>Quercus robur</i> (Pendunculate Oak)		80 - 100	2x	B	7	-	3-7	0.25
<i>Fagus sylvatica</i> (Beech)		80 - 100	2x	B	5	-	3-7	0.25
<i>Tilia x europaea</i> (Lime)		80 - 100	2x	B	3	-	3-7	0.25
Trees - Whips - 30%								
<i>Betula pendula</i> (Birch)		60 - 80	1+2	B	12	-	3-7	0.25
<i>Fagus sylvatica</i> (Beech)		60 - 80	1+2	B	12	-	3-7	0.25
<i>Tilia x europaea</i> (Lime)		60 - 80	1+2	B	6	-	3-7	0.25
Trees - Transplants - 25%								
<i>Quercus robur</i> (Pendunculate Oak)		60 - 80	1+1	B	11	-	5-9	0.25
<i>Fagus sylvatica</i> (Beech)		60 - 80	1+1	B	9	-	5-9	0.25
<i>Tilia x europaea</i> (Lime)		60 - 80	1+1	B	5	-	8-12	0.25
Shrubs - 30%								
<i>Crataegus monogyna</i> (Hawthorn)		40-60	1+1	B	6	-	3-5	1
<i>Ligustrum vulgare</i> (Privet)		40-60	1+1	B	3	-	3-5	1
<i>Rubus fruticosus</i> (Blackberry)		40-60	1+1	B	2	-	3-5	1
<i>Rosa canina</i> (Fried Rose)		40-60	1+1	B	2	-	3-5	1
<i>Corylus avellana</i> (Hazel)		40-60	1+1	B	4	-	3-5	1
<i>Cornus sanguinea</i> (Dogwood)		40-60	1+1	B	3	-	3-5	1
<i>Viburnum opulus</i> (Guelder Rose)		40-60	1+1	B	2	-	3-5	1
<i>Prunus spinosa</i> (Blackthorn)		40-60	1+1	B	8	-	3-5	1
					100			

Enhancement of Existing Vegetation to Other Neutral Grassland		
Species (Latin)	Common Name	%
EM Wildflower Meadow Mixture (Eurosgate or acceptable equivalent)		
Wildflowers	Seeding Rate (g/m ²)	10
<i>Achillea millefolium</i>	Yarrow	0.75
<i>Betonica officinalis</i>	Betony	0.75
<i>Centaura nigra</i>	Common Knapsweed	2.25
<i>Digitalis purpurea</i>	Wild Carrot	1.5
<i>Eupatorium cannabinum</i>	Lady's Bedstraw	0.4
<i>Galium verum</i>	Lady's Bedstraw	1.5
<i>Geranium pratense</i>	Meadow Crane's-bill	0.25
<i>Plantago lanceolata</i>	Ribwort Plantain	1.5
<i>Potentilla sanguisorba</i> ssp.	Sisal Burnet	1.5
<i>Potentilla sanguisorba</i>	Sisal Burnet	1.5
<i>Primula veris</i>	Cowslip	1.1
<i>Ranunculus acris</i>	Meadow Buttercup	1.2
<i>Ranunculus bulbosus</i>	Bulbous Buttercup	0.15
<i>Rumex acetosa</i>	Common Sorrel	0.4
<i>Silene vulgaris</i>	Bedstraw	0.75
Grasses		
<i>Agrostis capillaris</i>	Common Bent	8.5
<i>Cynosurus cristatus</i>	Crested Dogstail	29.75
<i>Festuca rubra</i>	Red Fescue	25.6
<i>Polygonum perfoliatum</i>	Snail's-head	4.25
<i>Poa nemoralis</i>	Wood Meadow-grass	17

Hawthorn Planting			
	Height (cm)	Age	Root
<i>Crataegus monogyna</i> (Hawthorn)	60-80	1+1	B




Woodland Seed Mix		

Species (Latin)	Common Name	%
EW1 Woodland Mixture (Emorsgate or acceptable equivalent)		
Seeding Rate (g/m ²)		
Wildflowers		
<i>Allium ursinum</i>	Ranunculus	10
<i>Alliaria petiolata</i>	Garlic Mustard	20
<i>Angelica sylvestris</i>	Wild Angelica	1
<i>Antirrhinum sylvestris</i>	Cow Parsley	0.5
<i>Aquilegia vulgaris</i>	Lords-and-Ladies	0.5
<i>Digitalis purpurea</i>	Foxglove	4
<i>Eupatorium cannabinum</i>	Hemp-agrimony	0.1
<i>Filipendula ulmaria</i>	Meadowsweet	0.8
<i>Galium album</i>	Hedge Bedstraw	1.5
<i>Geum urbanum</i>	Wood Awns	2.1
<i>Hyacinthoides non-scripta</i>	Bluebell	1.6
<i>Primula vulgaris</i>	Primrose	0.1
<i>Potentilla vulgaris</i>	Sedlitz	1
<i>Ranunculus acris</i>	Meadow Buttercup	0.4
<i>Silene dioica</i>	Red Campion	3
<i>Teucrium scorodonia</i>	Wood Sage	0.2
Grasses		
<i>Agrostis capillaris</i>	Common Bent	80
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	2.4
<i>Brachiopodium sylvaticum</i>	Fleas Brome	1.6
<i>Cynosurus cristatus</i>	Crested Dogtail	0.8
<i>Deschampsia cespitosa</i>	Tufted Hair-grass	48
<i>Festuca rubra</i>	Red Fescue	19.2
<i>Poa nemoralis</i>	Wood Meadow-grass	6.4

Woodland Planting (incl. bat hop over planting) - Typical species					
Species (Latin) (Common name)	Height (cm)	Age	Root / Cont.	Notes	Group size range (Number of plants)
Trees - Feathers - 20%					
<i>Quercus robur</i> (Pendunculate Oak)	80 - 100	2x	B		3-7
<i>Fagus sylvatica</i> (Beech)	80 - 100	2x	B		3-7
<i>Tilia x europaea</i> (Lime)	80 - 100	2x	B		3-7
Trees - Whips - 30%					
<i>Betula pendula</i> (Birch)	60 - 80	1+2	B		3-7
<i>Fagus sylvatica</i> (Beech)	60 - 80	1+2	B		3-7
<i>Tilia x europaea</i> (Lime)	60 - 80	1+2	B		3-7
Trees - Transplants - 25%					
<i>Quercus robur</i> (Pendunculate Oak)	60 - 80	1+1	B		5-9
<i>Fagus sylvatica</i> (Beech)	60 - 80	1+1	B		5-9
<i>Tilia x europaea</i> (Lime)	60 - 80	1+1	B		8-12
Shrubs - 25%					
<i>Crataegus monogyna</i> (Hawthorn)	40-60	1+1	B		3-5
<i>Ligustrum vulgare</i> (Privet)	40-60	1+1	B		3-5
<i>Rubus fruticosus</i> (Blackberry)	40-60	1+1	B		3-5
<i>Rosa canina</i> (Field Rose)	40-60	1+1	B		3-5
<i>Corylus avellana</i> (Hazel)	40-60	1+1	B		3-5
<i>Cornus sanguinea</i> (Dogwood)	40-60	1+1	B		3-5
<i>Viburnum opulus</i> (Guelder Rose)	40-60	1+1	B		3-5
<i>Prunus spinosa</i> (Blackthorn)	40-60	1+1	B		3-5
<i>Prunus institia</i> (Bullock)	40-60	1+1	B		3-5
					100

Grass Swales & Attenuation Ponds			
EM8	EM8 Meadow Mixture for Wetlands (Eurogate or acceptable equivalent)	Seeding Rate (g/m ²)	
		10	20
Species			
Wild Flowers			
	<i>Achillea millefolium</i> (Yarrow)	2.00	
	<i>Agrostis eupatorioides</i> (Agrostis)	0.60	
	<i>Centaura nigra</i> (Common Knapsweed)	3.60	
	<i>Filipendula ulmaria</i> (Meadowsweet)	1.00	
	<i>Galium verum</i> (Lady's Bedstraw)	2.00	
	<i>Geum melle</i> (Water Anem)	0.20	
	<i>Lathyrus pratensis</i> (Meadow Vetchling)	0.50	
	<i>Leontodon hispidus</i> (Rough Hawkbit)	0.10	
	<i>Leucanthemum vulgare</i> (Oxeye Daisy) (Moon Daisy))	0.10	
	<i>Lotus corniculatus</i> (Birdfoot Trefoil)	0.10	
	<i>Lotus pedunculatus</i> (Greater Birdfoot Trefoil)	0.40	
	<i>Plantago lanceolata</i> (Ribwort Plantain)	3.20	
	<i>Primula veris</i> (Cowslip)	0.20	
	<i>Prunella vulgaris</i> (Selfheal)	0.10	
	<i>Ranunculus acris</i> (Meadow Buttercup)	0.40	
	<i>Ranunculus minor</i> (Yellow Rattle)	1.40	
	<i>Rumex acetosa</i> (Common Sorrel)	1.20	
	<i>Sanguisorba officinalis</i> (Great Burnet)	1.00	
	<i>Silene loto-cuculi</i> (Ragged Robin)	0.30	
	<i>Succisa pratensis</i> (Devil's-bit Scabious)	0.10	
	<i>Vicia cracca</i> (Tufted Vetch)	0.40	
Grasses			
	<i>Agrostis capillaris</i> (Common Bent)	4.00	80
	<i>Arrhenatherum odoratum</i> (Sweet Vernal-grass)	4.00	
	<i>Carex diutius ssp.</i> <i>divisa</i> (Grey Sedge)	1.50	
	<i>Cynosurus cristatus</i> (Crested Dogstail)	34.4	
	<i>Deschampsia cespitosa</i> (Tufted Hair-grass)	1.50	
	<i>Festuca rubra</i> (Red Fescue)	20.0	
	<i>Hordeum secalinum</i> (Meadow Barley)	4.00	
	<i>Poa trivialis</i> (Rough-stalked Meadow-grass)	8.00	
	<i>Schedonorus arundinaceus</i> (Tall Fescue)	2.40	

LANDSCAPE KEY			
Detailed Phase 1 Boundary			
Existing Landscape Features			
	Public Right of Way		
	Retained existing trees		
	Other retained existing woody vegetation (incl. tree, shrubs, hedgerows)		
	Removed existing trees		
	Retained existing woody vegetation (incl. tree, shrubs, hedgerows)		
	Retained if possible trees		
	Retained if possible woody vegetation (incl. tree, shrubs, hedgerows)		
	Root Protection Area		
Enhancement of existing vegetation to Other Neutral Grassland (trees, woodlands, tree groups retained/enhanced as shown)			
Watercourse / Body			
Proposed Engineering Features (Refer to Engineering Reports for details)			
	Canals/Gravelly		
	Culverts		
	Attenuation basin		
	Existing lighting column related		
	Proposed fencing		
	Culvert structure		
	Bridge structure		
Proposed landscape features			
	Specimen tree planting		
	Grass seeding		
	Grass swales and attenuation ponds		
	Temporary seeding of embankments		
	Woodland planting		
	Lowland mixed deciduous woodland planting		
	Hedgerow planting		
	Bat Hop Over Areas		
	Native Hedgerow		
	Hibernian		
	Ditches		

	Native meadow
	Hibernian
	Ditches

Note: All hard copy drawings are to be checked against digital PDFs for consistency.

Appendix C

Landscape Outline Specification

To be read in conjunction with all relevant landscape proposals
(to be included when available during detailed design)

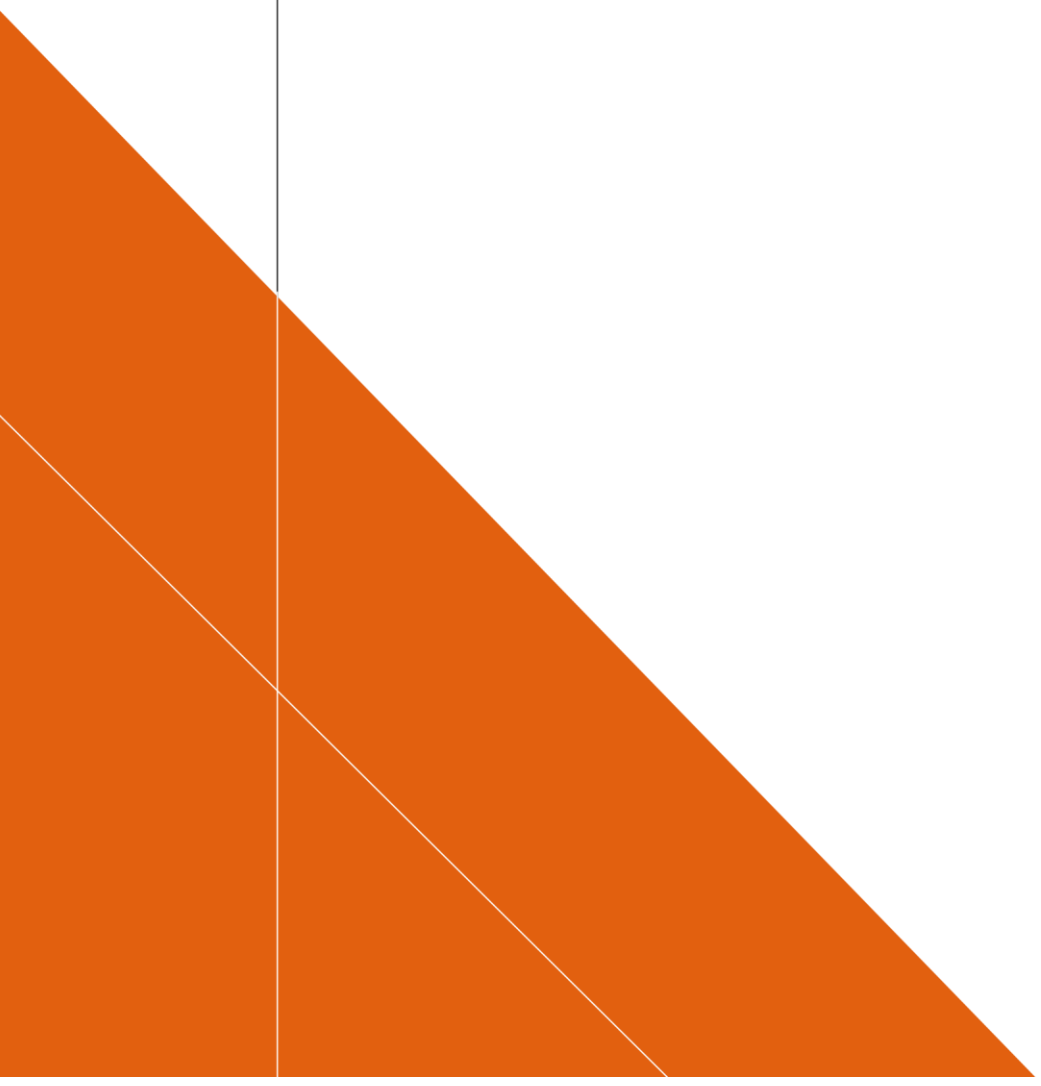
Appendix D

Phase 1 Habitat Plan

LAND WEST OF IFIELD

Extended Phase 1 Habitat Survey Report

OCTOBER 2019



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Figure 1: Phase 1 Habitat Survey Map

Figure 2: Statutory and Non-Statutory Designated Sites Location Plan

APPENDIX A : LEGISLATION AND POLICY

APPENDIX B : LOCAL RECORD CENTRE DATA

APPENDIX C : PHASE 1 TARGET NOTES

APPENDIX D : PHOTOGRAPHS

APPENDIX E : KEY SURVEYOR PEN PORTRAITS

Executive Summary

This report presents the findings of the Phase 1 habitat survey of land associated with a proposed housing development on an area referred to as Land West of Ifield, Crawley. This survey was undertaken by Arcadis Consulting (UK) Ltd on behalf of Homes England. The proposed development in this area comprises the construction of approximately 3000 residential dwellings, three schools (two primary and one secondary) and associated infrastructure

This report has been prepared to inform Homes England of any ecological constraints associated with the proposed development, inform the design process and outline appropriate mitigation and enhancement measures.

A desk study was undertaken in May 2018 to identify any existing information relating to the site and its surroundings.

Initially an extended Phase 1 habitat survey was undertaken between May and July 2018 to map the Phase 1 habitats present and to assess their potential to support protected species of plants and/ or animals. Access was obtained to an additional area of the site in Spring 2019, and an additional survey visit was conducted on 10 and 11 April 2019. In addition, these surveys recorded incidental signs of protected species.

There are three statutory designated sites and 10 non-statutory designated sites within 2km of the site. Ifield Brook Wood and Meadows Local Wildlife Site (LWS) is located entirely within the proposed development boundary and Hyde Hill LWS is located partially within the proposed development boundary, along the southern edge. Within 2km of the site are 20 ancient semi-natural woodland sites (as listed on the Ancient Woodland Inventory). There is one ancient woodland located within the proposed development boundary and three ancient woodlands located directly adjacent to the proposed development.

The site supported, semi-natural broadleaved woodland, plantation woodland, scrub, scattered trees, neutral semi-improved grassland, species-poor semi-improved grassland, marshy grassland, stands of Bracken and tall ruderal, ponds, ditches, the River Mole, Ifield Brook, Ifield Mill stream, arable fields, amenity grassland, ephemeral vegetation, introduced shrubs, hedgerow, buildings, a culvert and bridges.

It is anticipated that the proposed development could have a significant impact on Ifield Brook Wood and Meadows LWS and Hyde Hill LWS and it is advised that these sites are retained. The proposed development has the potential to lead to widespread habitat loss of woodland including areas of ancient woodland, scrub, ruderal vegetation, marshy grassland and semi-improved grassland, trees, and waterbodies which are considered to be of local value to biodiversity and suitable to support protected, notable and local priority species for nature conservation.

Invasive plant species Cherry Laurel, New Zealand Pigmyweed and Rhododendron have been recorded within the site. Any development within the site would need to ensure that the invasive plant species recorded are not disturbed and or spread, and a long-term management plan is implemented with an aim for eradication where possible.

1 Introduction and Background Information

Arcadis Consulting (UK) Ltd, working on behalf of Homes England, was instructed to undertake ecological surveys to inform an Environmental Impact Assessment (EIA) of a proposed masterplan for residential use on land to the west of Ifield, West Sussex.

The aim of the survey was to undertake an extended Phase 1 habitat survey within the site boundary. This report presents the findings of the extended Phase 1 habitat survey and, where appropriate, includes recommendations for further surveys and design considerations to inform the development of the scheme.

1.1 Site Location

The site is located to the west of Ifield, Crawley (central grid reference - TQ 24133 37360).

The site, which covers approximately 200ha in total, supports a range of habitats including semi-improved grassland, arable fields, amenity grassland, woodland, grazing pasture, a network of hedgerows and several ponds. The River Mole flows west to east through the north of the site, and Ifield Brook, runs flows south to north through the west of the site. Rusper Road passes through the south of the site.

The site is situated to the north-west of the A23 (Crawley Avenue) and is bordered by residential properties to the east, farmland to the west and woodland to the north and south.

An aerial image illustrating the site surveyed is presented in Image 1.



Image 1: Aerial imagery of the site

1.2 Proposed Development

The proposed development comprises the construction of approximately 3000 residential dwellings, three schools (two primary and one secondary) and associated infrastructure including a relief road extending north-east to south-west through the site.

2 Methodology

2.1 Desk study

A desk study was undertaken to identify any existing ecological information relating to the site and its surroundings. The Multi-Agency Geographic Information for the Countryside (MAGIC) website (Magic 2018) was used to search for statutory designated sites of nature conservation value within 2km of the site. The search buffer was extended to 10km for Special Areas of Conservation (SAC) sites designated for bats.

The Sussex Biodiversity Record Centre (SBRC 2018) were consulted in May 2018 to check whether they held any records of protected species or species of conservation concern within 2km of the site. This included a request for data for priority habitat and protected and/or notable species. This was extended to 5km for bat species records. A summary of the results of this search are displayed in Appendix B.

The MAGIC website was reviewed in order to identify any areas of ancient semi-natural woodland, restored ancient woodland and/or plantation on an ancient woodland site within 2km of the site.

2.2 Field Study

2.2.1 Phase 1 Habitat Survey

An extended Phase 1 habitat survey of the site was undertaken during May, June and July 2018 by Porscha Thompson ACIEEM, Siân Carr MCIEEM and Julie Player ACIEEM. This comprised, a walkover survey to identify and map Phase 1 habitats present within the site following the standard survey methodology (JNCC 2010). Following this, access to an additional area of the site was obtained, this area was surveyed by Brandon Murray (MCIEEM) on 10 and 11 April 2019. Pen portraits of the surveyors are presented in Appendix E. During these surveys dominant plant species were noted, as were any uncommon species or species indicative of particular habitat types, but there was no attempt to compile exhaustive species lists. Botanical names follow Stace (Stace 2010) for higher plants.

The Phase 1 habitat survey also included an assessment of the suitability of habitats for use by protected species or species of conservation concern including:

- The likely value of any aquatic and/or terrestrial habitat on site for use by breeding, foraging and hibernating amphibians, particularly with regard to protected species such as great crested newt (*Triturus cristatus*);
- The likely value of any terrestrial habitat on site for use by foraging and hibernating reptiles;
- The likely value of the site for commuting and foraging bats. Mature trees and structures/buildings were assessed for their suitability to support roosting and/or hibernating bats (albeit externally). The survey was undertaken in accordance with the survey methodology given in 'Bat Surveys: Good practice Guidelines' (Collins 2016). The assessments were undertaken by licensed surveyors (Julie Player, Class Licence Number: 2016-20113-CLS-CLS)
- The likely value and suitability of woodland, hedgerows and scrub vegetation for supporting dormice (*Muscardinus avellanarius*);
- The likely value of the site to support otter (*Lutra lutra*).
- The likely value of the site to support water vole (*Arvicola amphibius*).
- The likely value of the site to support badger (*Meles meles*).
- The likely value of the site for other protected or otherwise notable species or groups, including invertebrates was also assessed.

2.2.2 Grassland categorisation

Within the site, there were a range of grassland habitats. The identification of a grassland typologies with the Phase 1 classification definitions can be interpreted differently by different ecologists, therefore a standardised approach was utilised. This was based upon the methodology defined in the 'Save our magnificent meadows' methodology (Save our magnificent meadows 2018), which in turn is based upon the Higher Level Stewardship Farm Environment Plan (HLS FEP) (Natural England 2010). The HLS FEP is also a defining document for the Defra Biodiversity Metric (Defra 2012). Table 1 presents the categorisations utilised for each of the grassland habitat types.

Table 1 : Grassland identification descriptions utilised.

Grassland Type	Identification
Amenity grassland	This habitat is identified by its low species diversity, coupled with its management and usage (mown and utilised for amenity purposes).
Improved grassland	This habitat has a low grass species diversity (eight or less species per m ²) and a coverage of forbs and wildflowers (excluding White Clover (<i>Trifolium repens</i>), Creeping Buttercup (<i>Ranunculus repens</i>) and injurious weeds) of less than 10%, and is dominated by Perennial Ryegrass and Buttercup with more than 50% of the sward being these species or other agricultural species.
Species-poor semi-improved grassland	This is a transitional habitat, not being sufficiently species poor to be improved grassland but having too low a diversity to be classified as semi-improved neutral grassland. Within the classification utilised, this had 9 – 15 species per m ² and a cover of Perennial Ryegrass (<i>Lolium perenne</i>) and White Clover of less than 30% as per the semi-improved neutral grassland, but with less wildflower and forb diversity i.e. has less than five semi-improved grassland wildflower indicators and/or indicators of priority grassland occasional in the sward.
Semi-improved neutral grassland	Within the classification utilised, this habitat had 9 – 15 species per m ² and a cover of Perennial Ryegrass and White Clover of less than 30%, with sufficient species composition diversity to allow identification of this habitat as a neutral grassland. These largely showed less signs of improvement or intensive management than the species poor semi-improved grassland. This is separated from species poor semi improved grassland by having at least five semi-improved grassland wildflower indicators and/or indicators of priority grassland.
Unimproved grassland	N/A Not present within the site. Cover of rye-grasses and White Clover is less than 10%. The sward is species-rich, more than 15 vascular plant species per m ² . There is a high cover of wildflowers ² and sedges (more than 30%), excluding white clover, creeping buttercup and injurious weeds.

2.3 Survey Constraints

The Sussex Biodiversity Record Centre did not include records for badger or otter within their record search. However, subsequently a full survey for these species was conducted; details of these results can be found in WO1-AUK-XX-WS-RP-EC-0008-01-Badger Survey Report and WO1-AUK-XX-WS-RP-EC-0007-01-Otter and Water Vole Survey Report for reference.

Several areas within the proposed development boundary could not be accessed to undertake a full survey due to the areas being privately owned residential properties and buildings. Where this occurred, where possible, a survey was undertaken from public rights of way or an assessment made from aerial photographs. Areas which could not be accessed are presented in Figure 1.

3 Results

The results of the desk study and field survey are described below, with sites or features of nature conservation interest detailed as appropriate. The applicable legislation and policies for such sites and features are detailed in Appendix A.

Appendix B details a summary of the results of the local record centre data search, along with relevant legislation.

The Phase 1 habitat survey plan is presented in Figure 1, whilst the associated Target Notes, and Photographic Record are included in Appendix C and Appendix D respectively.

3.1 Designated Sites

3.1.1 Statutory Designated Sites

There are three statutory designated sites within 2km of the site, as listed in Table 1 below and displayed in Figure 2. The desk study returned no records of SAC sites designated for their interest in bats within 10 km of the proposed development.

Table 1: Statutory Designated Sites

Site Name	Reasons for Designation	Location in relation to site
House Copse Site of Special Scientific Interest (SSSI)	Ancient woodland dating back to 1816. Small leaved lime and hornbeam woodland which is almost unknown elsewhere in Southern England (Natural England 2018a)	664m south
Buchan Hill Ponds SSSI and Country Park	<p>Three ponds located on site are the best examples of Wealden hammer ponds on acid Tunbridge Wells sands, in West Sussex. Alder woodland surrounding the wetlands is nationally uncommon. The site supports 17 species of dragonfly which is classed as a nationally significant population. Two nationally uncommon species on site are (Natural England 2018b).</p> <ul style="list-style-type: none">• Haiky dragonfly (<i>Brachytron pratense</i>); and• Brilliant emerald (<i>Somatochlora metallica</i>) <p>The Country Park designation comprises of a larger overall area which also includes the Buchan Country Park Local Wildlife Site (LWS) described in the table below.</p>	1.6km south
Target Hill Park Local Nature Reserve (LNR)	Target Hill LNR has a mosaic of grassland, scrub and woodland habitats with a network of surfaced and mown grassy paths. There is a pond in the south of the site and wet flushes in the grassland and woodland nearby. The habitats on Target Hill are of relatively recent origin, but nevertheless are of high biodiversity value and a good range of native fauna and flora have colonised this former landfill site. Records for the site include some significant Biodiversity Action Plan (BAP) species on the site, such as adder (<i>Vipera berus</i>), dingy skipper (<i>Erynnis tages</i>) and grizzled skipper (<i>Pyrgus malvae</i>) (Natural England 2018c).	1.9km south east

3.2 Non-Statutory Designated Sites

There are 10 non-statutory designated sites within 2km of the site, as listed in Table 2 below and displayed in Figure 2.

Table 2: Non-Statutory Designated Sites

Site Name	Reasons for Designation	Location in relation to the proposed development
Ifield Brook Wood and Meadows LWS	The site incorporates relatively herb-rich meadows enclosed by thick hedges, Ifield Brook itself and some woodland. The value of the site lies in its combination of different habitats, the relatively unimproved nature of many of the fields and its proximity to a large town (Ref 2)	0m – within the proposed development boundary
Hyde Hill LWS	The site which lies just west of Crawley is of considerable local importance to nature conservation and has been selected as an urban SNCI. The combination of habitats, with semi-natural woodland, thick hedgerows, streams and rough grassland, is an important feature. The site supports uncommon plants and butterflies, plus a diversity of breeding birds (Ref 2).	0m – partially within the proposed development boundary
Ifield Pond and surroundings LWS	This large pond, situated on the edge of Crawley, is of considerable local importance notably on account of its birdlife, dragonflies and amphibians. The pond is bisected by a railway line. The main pond is south of the railway, though the area to the north is also of great wildlife value (Ref 2).	120m south
Willoughby Fields LWS	Willoughby Fields is a large site containing several unimproved grassland fields with a network of hedgerows, areas of scrub and small copses that lies between the River Mole and an unnamed stream on the outskirts of Langley Green in Crawley. A considerable amount of tree and hedge planting has been carried out on the site (Ref 2).	332m north east
Wood near Lower Prestwood Farm LWS	This woodland is dominated by Hornbeam (<i>Carpinus betulus</i>) and Ash (<i>Fraxinus excelsior</i>), mainly as trees grown from coppice. There are very few mature standards remaining as most have been felled. Birch (<i>Betula</i> sp.) and particularly Sycamore (<i>Acer pseudoplatanus</i>) are also frequent in some areas. The shrub layer, consisting of several species, forms variable cover and there is a dense species-rich ground flora (Ref 2).	463m north west
Orltons Copse LWS	The site consists of two large areas of oak (<i>Quercus</i> sp.) /Hornbeam woodland separated by smaller areas	897m north west

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Site Name	Reasons for Designation	Location in relation to the proposed development
	of oak/Hazel (<i>Corylus avellana</i>) and oak/Hazel/Ash woodland. There are several small streams throughout and a hay meadow. This mixture of habitats, provides for a rich bird community (Ref 2).	
Woldhurstlea Wood LWS	Woldhurstlea Wood is of considerable local importance to nature conservation. Much of this small wood is semi-natural and it has many characteristics of an ancient semi-natural woodland, including a rich ground flora. The birdlife is fairly diverse (Ref 2)	940m south east
Ewhurst Wood LWS	The wood is mostly oak, Ash and birch and has good structure and a diverse ground flora. It is of great importance as an area of semi-natural habitat in a heavily built-up area (Ref 2).	1.3km east
Kilnwood Copse LWS	This woodland is of variable structure but in the main, it consists of oak and Hornbeam. Unusually, Small-leaved Lime (<i>Tilia cordata</i>) is also present throughout. There are two small ponds included but these are overgrown and of little aquatic interest at present (Ref 2).	1.3km south west
Buchan Country Park LWS	The site consists of an area of woodland with an increasing area of heathland, a small meadow and three large lakes on the south west edge of Crawley. The site supports a number of species including the notable dead wood nesting solitary wasp <i>Ectemnius ruficornis</i> , notable waved black moth (<i>Parascotia fuliginaria</i>), high densities of reptiles such as adders (<i>Vipera berus</i>) and viviparous lizard (<i>Zootoca vivipara</i>), several rare dragonflies including brilliant emerald (<i>Somatochlora metallica</i>), water beetle <i>Ilybius Fenestratus</i> and dormouse (<i>Muscardinus avellanarius</i>). The site is also important for breeding redstart (<i>Phoenicurus phoenicurus</i>), woodcock (<i>Scolopax rusticola</i>) and tree pipit (<i>Anthus trivialis</i>) (Ref 2).	1.7km south east

There are 20 ancient semi-natural woodland sites (as recorded within the Ancient Woodland Inventory (AWI)) within 2km of the site. There is one ancient woodland located on site, in the southern area of Ifield Brook Wood and Meadows LWS. Three ancient woodlands are located directly adjacent to site, one to the south of Ifield Golf

Course, one north of the cattle fields and one, named the Grove, is located south of the river Mole, east of the red line boundary.

3.3 Plants and Habitats/ Flora

3.3.1 Woodland

Broadleaved Woodland

Areas of semi-natural broadleaved woodland were recorded throughout the site as large and small stands and as small strips between field boundaries. In the majority of areas oak was the dominant species; however, a diverse range of other species were frequently recorded including Ash, Field Maple (*Acer campestre*), Sycamore, willow (*Salix* sp.), Elder (*Sambucus nigra*), Hazel, Alder (*Alnus glutinosa*), Hawthorn (*Crataegus monogyna*) and Blackthorn (*Prunus spinosa*). In several areas, a dense understorey was recorded. Where this occurred Bramble (*Rubus fruticosus* agg.) was dominant with rose species (*Rosa* sp.), Honeysuckle (*Lonicera periclymenum*), and Common Nettle (*Urtica dioica*) also frequently recorded. In these areas limited ground flora species could be identified through the understorey. In areas where the understorey was less dense a broader range of ground flora species were recorded (Photo 1).

Within Ifield Brook and Meadows LWS the woodland tree species recorded were of a similar composition to the rest of the woodland areas with additional species recorded including Yew (*Taxus baccata*), laurel (*Prunus* sp.), Beech (*Fagus sylvatica*), Hornbeam and Silver Birch (*Betula pendula*). Within the majority of these areas the understorey was not particularly dense with a diverse ground flora comprising Ramsons (*Allium ursinum*), Wood Aven's (*Geum urbanum*), Ivy (*Hedera helix*), Bluebell (*Hyacinthoides* sp.), Dog's Mercury (*Mercurialis perennis*), Pignut (*Conopodium majus*), Red Campion (*Silene dioica*), Wood Dock (*Rumex sanguineus*), Wood Melick (*Melica uniflora*), Bramble, Hogweed (*Heracleum sphondylium*), Soft-rush (*Juncus effusus*), Cleavers (*Galium aparine*), Wood-sedge (*Carex sylvatica*), Primrose (*Primula vulgaris*), dandelion (*Taraxacum* agg.), Wood Speedwell (*Veronica montana*), Enchanter's-nightshade (*Circaea lutetiana*), Greater Stitchwort (*Stellaria holostea*), Rough Meadow-grass, Lord's-and-Ladies (*Arum maculatum*) and Honeysuckle.

Plantation Woodland

Two areas of semi-mature broadleaved plantation woodland containing trees of mixed ages were recorded along the north-western boundary of the site. In one area, oak was the dominant species with other tree species recorded including Field Maple, Hawthorn and Ash with mature oak trees recorded predominantly along the boundary of the woodland. The understorey within this area was scattered and consisted predominantly of Blackthorn, Holly (*Ilex aquifolium*), Hawthorn and Bramble. Ground flora recorded in this area comprised False-brome (*Brachypodium sylvaticum*), False Oat-grass (*Arrhenatherum elatius*), Remote Sedge (*Carex remota*), Grey Sedge (*Carex divulsa*), Yorkshire-fog (*Holcus lanatus*), Ground-ivy (*Glechoma hederacea*) and willowherb species (*Epilobium* sp.).

Species recorded in the other area comprised Hawthorn, Blackthorn, oak, Holly, Ash and Silver Birch, with mature oak and Ash trees scattered throughout the area. The ground flora recorded in this area comprised Remote Sedge, Pendulous Sedge (*Carex pendula*), Hedge Woundwort (*Stachys sylvatica*), Yellow Pimpernel (*Lysimachia nemorum*), Marsh Thistle (*Cirsium palustre*), Perforate St John's-wort (*Hypericum perforatum*), Primrose and Soft Rush.

Within Ifield Golf Course were several areas of young plantation woodland. These areas tended to be comprised of oak, cherry (*Prunus* sp.), willow, Hazel, Ash, Spindle (*Euonymus europaeus*), Hornbeam, Rowan (*Sorbus aucuparia*), Sweet Chestnut (*Castanea sativa*), Field Maple and Silver Birch. These areas had no or a very limited understorey of Bramble which typically occurred towards the woodland edge. The ground flora was typically grass species dominant and herb poor and comprised False Oat-grass, Sweet Vernal-grass (*Anthoxanthum odoratum*), Yorkshire-fog and Common Bent (*Agrostis capillaris*) (Photo 2).

One area of mixed plantation woodland was recorded within Ifield Golf Course which supported broadleaved and conifer species of varying size and age. Species recorded included willow, Hazel, oak, Silver Birch, Rowan and Conifer species. The boundary of the woodland and ground flora was grass dominant and comprised Yorkshire-fog, False Oat-grass and meadow-grass species (*Poa* spp.). Other species recorded included Common Bird's-foot-trefoil (*Lotus corniculatus*) and Creeping Cinquefoil (*Potentilla reptans*).

In the west of the site, two small areas of broadleaf plantation woodland were recorded (TN 95 and 100 in Appendix C). The most northerly of these was dominated by Ash, with Hawthorn and Blackthorn also present. The ground flora was predominantly Ramsons.

The southern of these woodlands was formed of Hawthorn, Holly and Ash. The ground flora was predominantly Common Nettle (*Urtica dioica*).

3.3.2 Scrub

Dense scrub and scattered scrub vegetation was recorded frequently across the site and typically occurred between grassland margins and woodland edges and along field boundaries (Photo 3). The stands typical comprised predominantly Bramble, a few stands of Blackthorn scrub were recorded including within Ifield Brook and Meadows LWS. Where this occurred, Blackthorn was the dominant species present. The structure was dense, with little ground flora.

Within the areas in the west of the site (TN94) There were areas of scrub formed on mounds of stored aggregate and soil. This scrub was predominantly Bramble and Elder.

3.3.3 Scattered Trees

Scattered trees were recorded across the whole site within semi-improved grassland fields, hedgerows and amenity grassland. Within Ifield Brook and Meadows LWS numerous trees or varying ages were recorded throughout the areas of neutral semi-improved grassland. Species recorded included oak, Hawthorn, Ash, Elder, Field Maple, willow, Walnut (*Juglans regia*) and lime (*Tilia* sp.) (Photo 4). Mature oak trees were recorded within the fields of species-poor semi-improved grassland in the northern section of the site. Within Ifield Golf Course numerous scattered trees were recorded of varying ages with a large variety of species recorded including oak, willow, Ash, cherry, lime, Hornbeam, Hazel, Elder, Turkey Oak (*Quercus cerris*), Sweet Chestnut (*Castanea sativa*), Silver Birch and a number of conifer species (Photos 5 and 6).

Further details of the scattered trees on the site are presented in the Arboricultural Report (Arcadis 2019a).

3.3.4 Semi-improved Grassland

3.3.4.1 Neutral Semi-improved Grassland

Significant areas of neutral semi-improved grassland were identified across the site, to the north, east and north west with a small section recorded in the centre.

Within Ifield Brook and Meadows LWS were large expanses of neutral semi-improved grassland along the eastern boundary of the site (Photo 7). The sward height was predominantly high with 2-3m wide mown paths and in some areas the sward was short and rabbit-grazed. The species identified throughout the area were predominantly consistent throughout the LWS. The grassland comprised abundant Meadow Foxtail (*Alopecurus pratensis*), Yorkshire-fog, False Oat-grass, Rough Meadow-grass (*Poa trivialis*), Tall Fescue (*Schedonorus arundinaceus*), Cock-s-foot (*Dactylis glomerata*), Sweet Vernal-grass, Annual Meadow-grass (*Poa annua*), Red Fescue (*Festuca rubra*). Other flora species recorded frequently include Meadow Vetchling (*Lathyrus pratensis*), Common Sorrel (*Rumex acetosa*), Common Vetch (*Vicia sativa*), White Clover (*Trifolium repens*), Lesser Stitchwort (*Stellaria graminea*) and Common Nettle. Species recorded occasionally included Red Clover (*Trifolium pratense*), Creeping Buttercup (*Ranunculus repens*), Meadow Buttercup (*Ranunculus acris*), Common Knapweed (*Centaurea nigra*), Ribwort Plantain (*Plantago lanceolata*), Greater Plantain (*Plantago major*), Common Bird's-foot-trefoil, Creeping Thistle (*Cirsium arvense*), Hogweed, Common Vetch, Tufted Vetch (*Vicia cracca*), Cleavers, Common Mouse-ear (*Cerastium fontanum*), Broadleaved Dock (*Rumex obtusifolius*), Pignut, Yellow Loosestrife (*Lysimachia vulgaris*), Germander Speedwell (*Veronica chamaedrys*). Rarely recorded species included Betony (*Betonica officinalis*), Ground-ivy, Field Speedwell (*Veronica persica*) and Crosswort (*Cruciata laevis*). Dampier areas were identified in a few locations. These areas supported a higher density of Soft-Rush in one area and Hemlock Water-dropwort (*Oenanthe crocata*), Water-pepper (*Persicaria hydropiper*) and Gypsywort (*Lycopus europaeus*) in another area.

Hay meadow fields were recorded in the north portion of the site. At the time of survey the field had been recently cut, but the grass on the field boundaries the grassland remained tall, therefore an species abundance for these fields could not be estimated. Species recorded were of a similar composition to Ifield Brook and Meadows LWS with additional species recorded including Perennial Rye-grass (*Lolium perenne*), Meadow Barely (*Hordeum secalinum*), Crested Dog's-tail (*Cynosurus cristatus*), Smooth Meadow-grass (*Poa pratensis*), Carnation Sedge (*Carex panicea*), Marsh Thistle and Greater Stitchwort (Photo 8).

A strip of neutral semi-improved grassland was also recorded between arable fields. Again, the grass species recorded within this field were similar to the species recorded in other areas of neutral semi-improved grassland with the addition of a large patch of Common Couch (*Elytrigia repens*) along the eastern boundary of the field. Hairy Tare (*Vicia hirsuta*), Bittersweet (*Solanum dulcamara*) and Cat's-ear (*Hypochaeris radicata*) were also recorded in this field.

3.3.4.2 Species Poor Semi-improved Grassland

Several fields throughout the site supported species-poor grassland including fields within the northern section. At the time of survey some of the fields had been recently cut and some were subject to cattle grazing, on the field margins the grassland remained tall, therefore a species abundance for these fields could not be estimated. Recorded grass species included Yorkshire-fog, Meadow Foxtail, Crested Dog's-tail, Perennial Rye-grass, Annual Meadow-grass, Smooth Meadow-grass and False Oat-grass. Forbs (non-grass species) recorded in these fields included Red Clover, Germander Speedwell, White Clover, Creeping Buttercup, Meadow Buttercup, Lesser Stitchwort and scattered Marsh Thistle (Photo 9).

Species-poor semi-improved grassland was recorded in several locations on the boundaries of the arable fields. In some of these areas Soft Brome was dominant, with False Oat-grass, Yorkshire-fog, Cock's-foot and Italian Rye-grass (*Lolium multiflorum*) also recorded. Forbs recorded included Hogweed, Cleavers and Cow Parsley (*Anthriscus sylvestris*). In other areas Common Bent, Yorkshire fog, Perennial Rye-grass, False Oat-grass Tufted Hair-grass (*Deschampsia cespitosa*) and Cock's-foot were recorded frequently with forbs including Cut-leaved Crane's-bill (*Geranium dissectum*), Creeping Buttercup, Broad-leaved Dock, Common Vetch, Hemlock Water-dropwort, Creeping Thistle and Meadow Buttercup also recorded (Photo 10).

Species-poor semi-improved grassland was recorded within Ifield Golf Course. This grassland was typically recorded on the edge of woodlands. The grass species composition was generally consistent throughout this part of the site with grass species frequently recorded including Yorkshire-fog, False Oat-grass, Meadow Foxtail, Sweet Vernal-grass, Rough Meadow-grass, Timothy (*Phleum pratense*), Common Bent, Red Fescue, Common Couch and Perennial Rye-grass. These areas of grassland were typically species-poor. Species recorded across the areas included Ribwort Plantain, Meadow Buttercup, Meadow Vetchling, Agrimony (*Agrimonia eupatoria*), Selfheal (*Prunella vulgaris*), Creeping Buttercup, Common Bird's-foot-trefoil, Common Knapweed, Spear Thistle (*Cirsium vulgare*), Creeping Thistle, Common Ragwort (*Senecio jacobaea*), Common Fleabane (*Pulicaria dysenterica*) and Betony (Photo 11).

An area of species-poor semi-improved grassland was present in the west of the site (TN97 and Photo 44). Species in this area include Yorkshire-fog and Cock's-foot.

3.3.5 Marshy Grassland

Several fields predominantly in the northern portion of the site, but also in the centre of the site supported marshy grassland. Smaller patches of marshy grassland were also recorded across the site.

Within the north-western portion of the site a large area of marshy grassland was recorded comprised predominantly of rushes; Soft-Rush, Hard Rush (*Juncus inflexus*) and Compact Rush (*Juncus conglomeratus*). Crested Dog's-tail, Creeping Bent (*Agrostis stolonifera*), Common Bent and Smooth Meadow-grass (*Poa pratensis*) were also present. Another two areas were identified in the north-eastern part of the site within a field of species-poor semi-improved grassland. These supported Soft-Rush, Hard Rush and Floating Sweet-grass (*Glyceria fluitans*).

3.3.6 Bracken

Several small areas of Bracken (*Pteridium aquilinum*) were recorded throughout the site, typically along field margins. Other species recorded in these areas comprised Common Nettle and Hogweed.

3.3.7 Tall Ruderal

Ruderal vegetation typically occurred between grassland margins and woodland/ scrub edges and along field boundaries. The stands typical comprised Common Nettle, Broad-leaved Dock or thistle species with Hogweed, Cleavers, willowherb species, Wild Teasel (*Dipsacus fullonum*) and Bramble also often recorded (Photo 12).

One area of tall ruderal vegetation was present in the west of the site within an uncultivated arable field. This is likely to be a temporary habitat and will be removed when agricultural production recommences.

3.3.8 Standing Water

3.3.8.1 Ponds

Seven ponds were recorded across the site, five within Ifield Golf Course and two within the wider site along the eastern boundary and northern section of the site. These permanent ponds ranged in size (Photos 13-19 and 49). The desk study identified additional waterbodies within 500m of the site boundary (approximately 29).