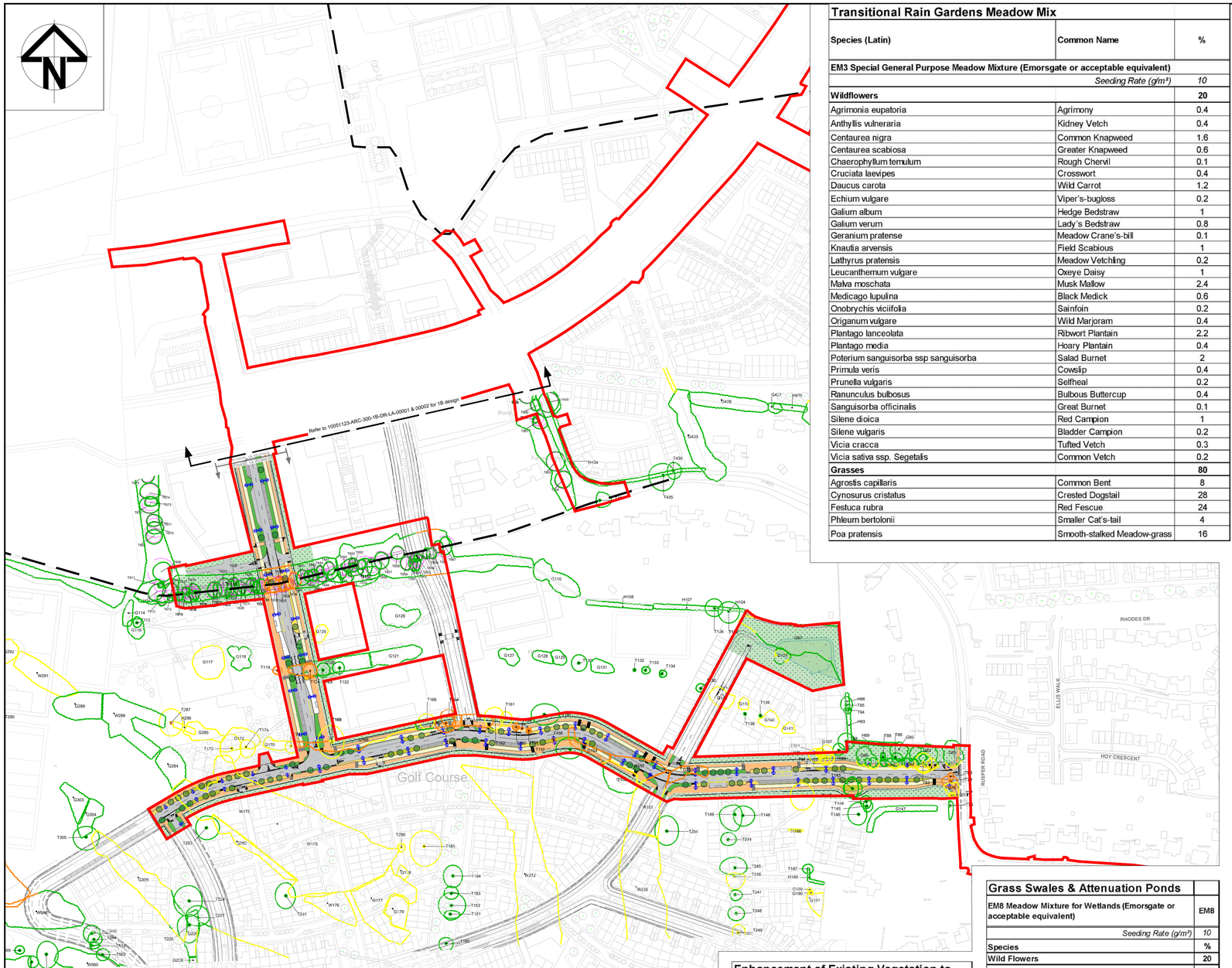

Transitional Rain Gardens Meadow Mix

Species (Latin)	Common Name	%
EM3 Special General Purpose Meadow Mixture (Emorsgate or acceptable equivalent)		
	Seeding Rate (g/m²)	*10*
Wildflowers		**20**
Agrimonia eupatoria	Agrimony	0.4
Anthyllis vulneraria	Kidney Vetch	0.4
Centaurea nigra	Common Knapweed	1.6
Centaurea scabiosa	Greater Knapweed	0.6
Chaerophyllum temulum	Rough Chervil	0.1
Cruciata laevipes	Crosswort	0.4
Daucus carota	Wild Carrot	1.2
Echium vulgare	Viper's-bugloss	0.2
Galium album	Hedge Bedstraw	1
Galium verum	Lady's Bedstraw	0.8
Geranium pratense	Meadow Crane's-bill	0.1
Knautia arvensis	Field Scabious	1
Lathyrus pratensis	Meadow Vetchling	0.2
Leucanthemum vulgare	Oxeye Daisy	1
Malva moschata	Musk Mallow	2.4
Medicago lupulina	Black Medick	0.6
Onobrychis viciifolia	Sainfoin	0.2
Origanum vulgare	Wild Marjoram	0.4
Plantago lanceolata	Ribwort Plantain	2.2
Plantago media	Hoary Plantain	0.4
Poterium sanguisorba ssp sanguisorba	Salad Burnet	2
Primula veris	Cowslip	0.4
Prunella vulgaris	Selfheal	0.2
Ranunculus bulbosus	Bulbous Buttercup	0.4
Sanguisorba officinalis	Great Burnet	0.1
Silene dioica	Red Campion	1
Silene vulgaris	Bladder Campion	0.2
Vicia cracca	Tufted Vetch	0.3
Vicia sativa ssp. Segetalis	Common Vetch	0.2
Grasses		**80**
Agrostis capillaris	Common Bent	8
Cynosurus cristatus	Crested Dogstail	28
Festuca rubra	Red Fescue	24
Phleum bertolonii	Smaller Cat's-tail	4
Poa pratensis	Smooth-stalked Meadow-grass	16

Meadow Rain Gardens

Species (Latin)	Common Name	%
EM3 Special General Purpose Meadow Mixture (Emorsgate or acceptable equivalent)		
	Seeding Rate (g/m²)	*10*
Wildflowers		**20**
Agrimonia eupatoria	Agrimony	0.4
Anthyllis vulneraria	Kidney Vetch	0.4
Centaurea nigra	Common Knapweed	1.6
Centaurea scabiosa	Greater Knapweed	0.6
Chaerophyllum temulum	Rough Chervil	0.1
Cruciata laevipes	Crosswort	0.4
Daucus carota	Wild Carrot	1.2
Echium vulgare	Viper's-bugloss	0.2
Galium album	Hedge Bedstraw	1
Galium verum	Lady's Bedstraw	0.8
Geranium pratense	Meadow Crane's-bill	0.1
Knautia arvensis	Field Scabious	1
Lathyrus pratensis	Meadow Vetchling	0.2
Leucanthemum vulgare	Oxeye Daisy	1
Malva moschata	Musk Mallow	2.4
Medicago lupulina	Black Medick	0.6
Onobrychis viciifolia	Sainfoin	0.2
Origanum vulgare	Wild Marjoram	0.4
Plantago lanceolata	Ribwort Plantain	2.2
Plantago media	Hoary Plantain	0.4
Poterium sanguisorba ssp sanguisorba	Salad Burnet	2
Primula veris	Cowslip	0.4
Prunella vulgaris	Selfheal	0.2
Ranunculus bulbosus	Bulbous Buttercup	0.4
Sanguisorba officinalis	Great Burnet	0.1
Silene dioica	Red Campion	1
Silene vulgaris	Bladder Campion	0.2
Vicia cracca	Tufted Vetch	0.3
Vicia sativa ssp. Segetalis	Common Vetch	0.2
Grasses		**80**
Agrostis capillaris	Common Bent	8
Cynosurus cristatus	Crested Dogstail	28
Festuca rubra	Red Fescue	24
Phleum bertolonii	Smaller Cat's-tail	4
Poa pratensis	Smooth-stalked Meadow-grass	16

Ornamental Rain Gardens - Typical species

Species (Latin)	Common Name	%
Achillea millefolium	Yarrow	2
Achillea 'Walther Funcke'	Yarrow	2
Betonica officinalis 'Hummelo'	Betony	2
Carex oshimensis 'Everest'	Japanese Sedge	20
Carex oshimensis 'Everillo'	Japanese Sedge	10
Sedum herbstfruede (Hylotelephium spectabile)	Stonecrop	2
Monarda didyma 'Bee Lieve'	Bergamot	2
Hakonechloa macra 'Aureola'	Golden Hakonechloa	20
Kniphofia 'Little Maid'	Red Hot Poker	5
Kniphofia 'Poco Red'	Red Hot Poker	5
Imperata cylindrica 'Rubra'	Japanese Blood Grasses	8
Geranium 'Light Dilys'	Cranebill	2
Geranium 'Rozanne'	Cranebill	2
Festuca glauca 'Blaufuchs'	Blue Fescue	8
Nepeta × faassenii	Cat Mint	5
Carex buchananii 'Red Rooster'	Sedge	5

Grass Swales & Attenuation Ponds

EM8 Meadow Mixture for Wetlands (Emorsgate or acceptable equivalent)	EM8
Seeding Rate (g/m²)	*10*
Species	**%**
Wild Flowers	**20**
Achillea millefolium (Yarrow)	2.00
Agrimonia eupatoria (Agrimony)	0.60
Centaurea nigra (Common Knapweed)	3.60
Filipendula ularia (Meadowsweet)	1.00
Galium verum (Lady's Bedstraw)	2.00
Geum rivale (Water Avens)	0.20
Lathyrus pratensis (Meadow Vetchling)	0.50
Leontodon hispidus (Rough Hawkbit)	0.10
Leucanthemum vulgare (Oxeye Daisy (Moon Daisy))	1.20
Lotus corniculatus (Birdsfoot Trefoil)	0.10
Lotus pedunculatus (Greater Birdsfoot Trefoil)	0.40
Plantago lancelata (Ribwort Plantain)	3.20
Primula veris (Cowslip)	0.20
Prunella vulgaris (Selfheal)	0.10
Ranunculus acris (Meadow Buttercup)	0.40
Rhinanthus minor (Yellow Rattle)	1.40
Rumex acetosa (Common Sorrel)	1.20
Sanguisorba officinalis (Great Burnet)	1.00
Silene flos-cuculi (Ragged Robin)	0.30
Succisa pratensis (Devil's-bit Scabious)	0.10
Vicia cracca (Tufted Vetch)	0.40
Grasses	**80**
Agrostis capillaris (Common Bent)	4.00
Anthoxanthum odoratum (Sweet Vernal-grass)	4.00
Carex divulsa subsp. divulsa (Grey Sedge)	1.60
Cynosurus cristatus (Crested Dogstail)	34.4
Deschampsia cespitosa (Tufted Hair-grass)	1.60
Festuca rubra (Red Fescue)	20.0
Hordeum secalinum (Meadow Barley)	4.00
Poa trivialis (Rough-stalked Meadow-grass)	8.00
Schedonorus arundinaceus (Tall Fescue)	2.40

Enhancement of Existing Vegetation to Other Neutral Grassland

Species (Latin)	Common Name	%
EM Wildflower Meadow Mixture (Emorsgate or acceptable equivalent)		
	Seeding Rate (g/m²)	10
Wildflowers		**15**
Achillea millefolium	Yarrow	0.75
Betonica officinalis	Betony	0.75
Centurea nigra	Common Knapweed	2.25
Daucus carota	Wild Carrot	1.5
Galium verum	Lady's Bedstraw	0.4
Geranium pratense	Meadow Crane's-bill	0.4
Leucanthemum vulgare	Oxeye Daisy	1.35
Plantago lanceolata	Ribwort Plantain	1.5
Poterium sanguisorba ssp sanguisorba	Salad Burnet	1.5
Primula veris	Cowslip	1
Prunella vulgaris	Selfheal	1.1
Ranunculus acris	Meadow Buttercup	1.2
Ranunculus bulbosus	Bulbous Buttercup	0.15
Rumex acetosa	Common Sorrel	0.4
Silene vulgaris	Bladder Campion	0.75
Grasses		**85**
Agrostis capillaris	Common Bent	8.5
Cynosurus cristatus	Crested Dogstail	29.75
Festuca rubra	Red Fescue	25.5
Phleum bertolonii	Smaller Cat's-tail	4.25
Poa nemoralis	Wood Meadow-grass	17

Ditches

EP1F Wild Flowers for Pond Edges (Emorsgate or acceptable equivalent)	EM8
Seeding Rate (g/m²)	*10*
Species	**%**
Wild Flowers	**20**
Angelica sylvestris (Wild Angelica)	5.00
Centurea nigra (Common Knapweed)	12.00
Dipsacus fullonum (Wild teasel)	3.00
Eupatorium cannabinum (Hemp Agrimony)	1.00
Filipendula ulmaria (Meadowsweet)	10.00
Galium album (Hedge Bedstraw)	5.00
Geum rivale (Water Avens)	3.00
Iris pseudacorus (Yellow Iris)	20.20
Lathyrus pratensis (Meadow Vetchling)	4.00
Lythrum salicaria (Purple Loosestrife)	1.50
Lycopus europeeus (Gypsywort)	0.50
Oenanthe pimpinelloides (Corky-fruited Water-dropwort)	1.00
Plantago lanceolata (Ribwort Plantain)	3.00
Prunella vulgaris (Selfheal)	4.00
Ranunculus acris (Meadow Buttercup)	5.00
Silene dioica (Red Campion)	14.00
Silene flos-cuculi (Ragged Robin)	6.00

Street Tree Planting - 1A

Species	SUDS	Girth (cm)	Height (cm)	Clear stem (cm)	Root
Acer campestre (Field Maple)	y	20 to 25	600-700	250 min	
Acer campestre 'William Caldwell' (Field Maple)	y	20 to 25	600-700	250 min	
Acer x freemanii (Freeman Maple)	y	20 to 25	600-700	250 min	
Alnus cordata (Italian Alder)	y	20 to 25	500-600	220 min	
Alnus incana 'Aurea' (Golden Alder)	y	20 to 25	500-600	220 min	
Alnus x spaethii (Spaeth's Alder)	y	18 to 20	500-600	220 min	
Amelanchier arborea 'Robin Hill' (Serviceberry)	y	18 to 20	500-600	220 min	
Betula albosinensis 'Fascination' (Chinese Birch / Paper Bark)	y	18 to 20	500-600	220 min	
Betula nigra (River Birch)	y	20 to 25	500-600	220 min	
Betula pendula (Birch)	y	18 to 20	500-600	220 min	
Carpinus betulus 'Fastigiata' (Hornbeam)	y	18 to 20	500-600	220 min	
Carpinus betulus (Hornbeam)	y	20 to 25	600-700	250 min	
Corylus avellana (Hazel)	y	20 to 25	500-600	220 min	
Corylus colurna (Turkish Hazel)	y	18 to 20	500-600	220 min	
Ginkgo biloba (Maidenhair Tree)	N	18 to 20	500-600	220 min	
Hamamelis intermedia (Witch Hazel)	y	18 to 20	500-600	220 min	
Liquidambar styraciflua (Sweet Gum)	y	18 to 20	500-600	220 min	
Liriodendron tulipifera (Tulip Tree)	y	20 to 25	600-700	250 min	
Pinus nigra 'Austriaca' (Austrian Pine)	N	20 to 25	600-700	250 min	
Pinus sylvestris (Scots Pine)	N	20 to 25	600-700	250 min	
Populus tremula (Aspen)	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 Padus (Bird Cherry)	y	20 to 25	500-600	220 min	
Quercus frainetto (Hungarian Oak)	y	20 to 25	600-700	250 min	
Quercus robur (Pendunculate Oak)	y	20 to 25	600-700	250 min	
Sorbus aucuparia (Rowan)	N	18 to 20	500-600	250 min	
Sorbus torminalis (Wild Service Tree)	y	18 to 20	500-600	250 min	
Tilia cordata 'Greenspire' (Small Leaved Lime)	y	20 to 25	500-600	220 min	
Ulmus 'New Horizon' (Elm)	y	20 to 25	500-600	220 min	

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
- Removed existing woody vegetation (inclu. tree, shrubs, hedgerows)
- Retained if possible trees
- Retained if possible woody vegetation (inclu. tree, shrubs, hedgerows)
- Root Protection Area
- Enhancement of existing vegetation to Other Neutral Grassland (trees, woodlands, tree groups retained/removed as shown)
- Watercourse / Body

Proposed Engineering Features (Refer to Engineers' Proposals for details)

- Carriageway
- Footway / Hardstanding
- Cycleway
- Attenuation Basin
- Lighting column
- Mobility Hub

Proposed Landscape Features

- Specimen tree planting
- Meadow rain gardens
- Ornamental rain gardens
- Transitional rain gardens
- Grass Swale
- Ditches

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

Rev	Date	Description	Prod.	Chk.	Rev.	App.
P09	23.06.25	Issued for planning	JL	AS	MH	MH
P08	28.05.25	Work in Progress	IDG	AS	MH	MH
P07	12.05.25	Issued for planning	IDG	AS	MH	MH
P06	04.04.25	Issued for planning	IDG	AS	MH	MH
P05	15.08.24	For Information	IDG	AS	MH	MH
P04	05.08.24	Updated layout	IDG	AS	MH	MH
P03	13.03.24	Preliminary	IDG	AS	MH	MH
P02	14.12.23	Preliminary	IDG	AS	BH	BH
P01	26.10.23	Preliminary	IDG	AS	BH	BH

Project:

West of Ifield

Site

Ifield, Crawley
West Sussex

Client

Homes England
Arpley House, 110 Birchwood Boulevard
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Drawing Title:

Phase 1B
Landscape Typologies Plan
Sheet 1 of 2

Designed: IDG	Signed: Digitally Signed	Date: 23.06.25	
Produced: IDG	Signed: Digitally Signed	Date: 23.06.25	
Checked: AS	Signed: Digitally Signed	Date: 23.06.25	
Reviewed: MH	Signed: Digitally Signed	Date: 23.06.25	
Approved: MH	Signed: Digitally Signed	Date: 23.06.25	
Design Stage: Detailed Design			
Original Size: A1	Grid: OS	Datum: AOD	
Suitability Code: A3	Scale: 1:2000	Project Number: 10051123	

Suitability Description:

Definition Design Stage Complete Authorized and Accepted

Drawing Number: 10051123 - ARC-300 - 1A - DR - LA - 00001

Revision: P09

Meadow Rain Gardens

Species (Latin)	Common Name	%
EM3 Special General Purpose Meadow Mixture (Emorsgate or acceptable equivalent)		
	Seeding Rate (g/m²)	*10*
Wildflowers		**20**
Agrimonia eupatoria	Agrimony	0.4
Anthyllis vulneraria	Kidney Vetch	0.4
Centaurea nigra	Common Knapweed	1.6
Centaurea scabiosa	Greater Knapweed	0.6
Chaerophyllum temulum	Rough Chervil	0.1
Cruciata laevipes	Crosswort	0.4
Daucus carota	Wild Carrot	1.2
Echium vulgare	Viper's-bugloss	0.2
Galium album	Hedge Bedstraw	1
Galium verum	Lady's Bedstraw	0.8
Geranium pratense	Meadow Crane's-bill	0.1
Knautia arvensis	Field Scabious	1
Lathyrus pratensis	Meadow Vetchling	0.2
Leucanthemum vulgare	Oxeye Daisy	1
Malva moschata	Musk Mallow	2.4
Medicago lupulina	Black Medick	0.6
Onobrychis viciifolia	Sainfoin	0.2
Origanum vulgare	Wild Marjoram	0.4
Plantago lanceolata	Ribwort Plantain	2.2
Plantago media	Hoary Plantain	0.4
Poterium sanguisorba ssp sanguisorba	Salad Burnet	2
Primula veris	Cowslip	0.4
Prunella vulgaris	Selfheal	0.2
Ranunculus bulbosus	Bulbous Buttercup	0.4
Sanguisorba officinalis	Great Burnet	0.1
Silene dioica	Red Campion	1
Silene vulgaris	Bladder Campion	0.2
Vicia cracca	Tufted Vetch	0.3
Vicia sativa ssp. Segetalis	Common Vetch	0.2
Grasses		**80**
Agrostis capillaris	Common Bent	8
Cynosurus cristatus	Crested Dogstail	28
Festuca rubra	Red Fescue	24
Phleum bertolonii	Smaller Cat's-tail	4
Poa pratensis	Smooth-stalked Meadow-grass	16

Ornamental Rain Gardens - Typical species

Species (Latin)	Common Name	%
Achillea millefolium	Yarrow	2
Achillea 'Walther Funcke'	Yarrow	2
Betonica officinalis 'Hummelo'	Betony	2
Carex oshimensis 'Everest'	Japanese Sedge	20
Carex oshimensis 'Everillo'	Japanese Sedge	10
Sedum herbstfruede (Hylotelephium spectabile)	Stonecrop	2
Monarda didyma 'Bee Lieve'	Bergamot	2
Hakonechloa macra 'Aureola'	Golden Hakonechloa	20
Kniphofia 'Little Maid'	Red Hot Poker	5
Kniphofia 'Poco Red'	Red Hot Poker	5
Imperata cylindrica 'Rubra'	Japanese Blood Grasses	10
Geranium 'Light Dilys'	Cranebill	2
Geranium 'Rozanne'	Cranebill	2
Festuca glauca 'Blaufuchs'	Blue Fescue	8
Nepeta × faassenii	Cat Mint	5
Carex buchananii 'Red Rooster'	Sedge	5

Specimen Tree Planting - 1B

ɔs	SUDS	Girth (cm)	Height (cm)	Clear stem (cm)
:ampestre (Field Maple)	Y	20 to 25	600-700	250 min
:ampestre 'William Caldwell' (Field Maple)	Y	20 to 25	600-700	250 min
: freemanii (Freeman Maple)	Y	20 to 25	600-700	250 min
pendula (Birch)	Y	18 to 20	500-600	220 min
ıus betulus (Hornbeam)	Y	20 to 25	600-700	250 min
ıs avellana (Hazel)	N	18 to 20	500-600	220 min
ɥuifolium (Holly)	Y	18 to 20	500-600	220 min
ɔndron tulipifera (Tulip Tree)	Y	20 to 25	600-700	250 min
s avium (Wild Cherry)	Y	20 to 25	600-700	250 min
s avium 'Plena' (Wild Cherry)	N	20 to 25	600-700	250 min
s spinosa (Blackthorn)	Y	18 to 20	500-600	220 min
us frainetto (Hungarian Oak)		20 to 25	600-700	250 min
us robur (Penduculate Oak)	Y	20 to 25	600-700	250 min
s aucuparia (Rowan)	Y	18 to 20	500-600	220 min
ordata 'Greenspire' (Small Leaved Lime)	Y	20 to 25	600-700	250 min
: 'New Horizon' (Elm)	Y	20 to 25	600-700	250 min

Grass Seeding

EM10 Tussock Meadow Mixture (Emorsgate or acceptable equivalent)	EM10
Seeding Rate (g/m²)	*10*
Species	**%**
Wild Flowers	**20**
Achillea millefolium (Yarrow)	0.8
Agrimonia eupatoria (Agrimony)	0.4
Arctium minus (Lesser Burdock)	0.1
Centaurea nigra (Common Knapweed)	1.4
Centaurea scabiosa (Greater Knapweed)	1.0
Chaerophyllum temulum (Rough Chervil)	0.8
Cruciata laevipes (Crosswort)	0.5
Daucus carota (Wild Carrot)	1.0
Dipsacus fullonum (Wild Teasel)	1.6
Filipendula ulmaria (Meadowsweet)	0.8
Galium album (Hedge Bedstraw)	1.8
Knautia arvensis (Field Scabious)	0.8
Leucanthemum vulgare (Oxeye Daisy)	1.6
Lotus corniculatus (Birdsfoot Trefoil)	0.4
Malva moschata (Musk Mallow)	1.6
Plantago lanceolata (Ribwort Plantain)	1.8
Poterium sanguisorba (Salad Burnet)	1.6
Silene dioica (Red Campion)	1.0
Vicia cracca (Tufted Vetch)	0.4
Tussock grasses	**80**
Alopecurus pratensis (Meadow Foxtail)	4.0
Cynosurus cristatus (Crested Dogstail)	20.0
Dactylis glomerata (Cocksfoot)	16.0
Festuca rubra ssp rubra (Strong-creeping Red Fescue)	12.0
Holcus lanatus (Yorkshire Fog)	8.0
Lolium perenne (Perennial Ryegrass)	4.0
Poa pratensis (Smooth-stalked Meadow-grass)	6.4
Schedonorus arundinaceus (Tall Fescue)	9.6

Ditches

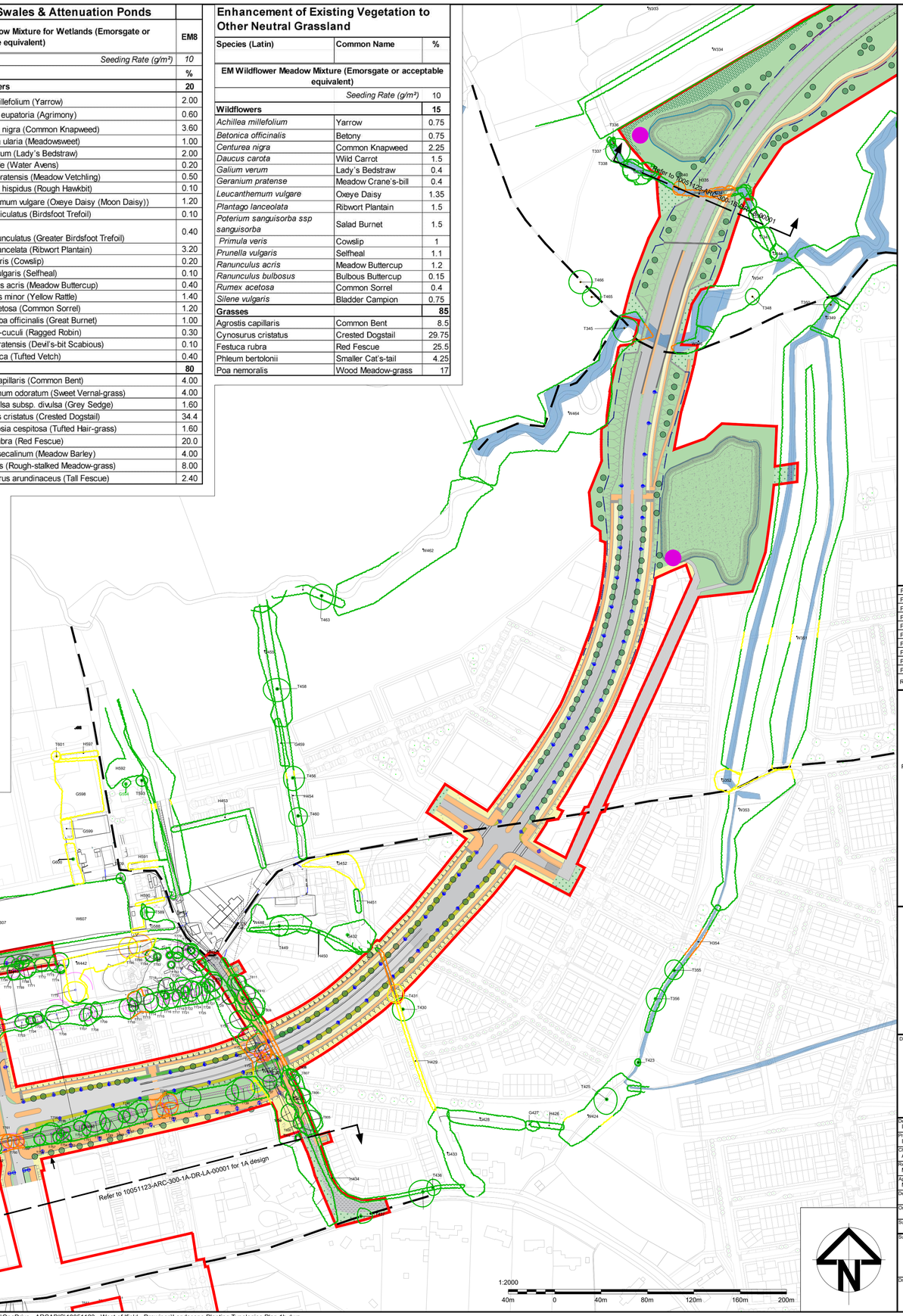
EP1F Wild Flowers for Pond Edges (Emorsgate or acceptable equivalent)	EM8
Seeding Rate (g/m²)	*10*
Species	**%**
Wild Flowers	**20**
Angelica sylvestris (Wild Angelica)	5.00
Centurea nigra (Common Knapweed)	12.00
Dipsacus fullonum (Wild teasel)	3.00
Eupatorium cannabinum (Hemp Agrimony)	1.00
Filipendula ulmaria (Meadowsweet)	10.00
Galium album (Hedge Bedstraw)	5.00
Geum rivale (Water Avens)	3.00
Iris pseudacorus (Yellow Iris)	20.20
Lathyrus pratensis (Meadow Vetchling)	4.00
Lythrum salicaria (Purple Loosestrife)	1.50
Lycopus europaeus (Gypsywort)	0.50
Oenanthe pimpinelloides (Corky-fruited Water-dropwort)	1.00
Plantago lanceolata (Ribwort Plantain)	3.00
Prunella vulgaris (Selfheal)	4.00
Ranunculus acris (Meadow Buttercup)	5.00
Silene dioica (Red Campion)	14.00
Silene flos-cuculi (Ragged Robi)n	6.00

Grass Swales & Attenuation Ponds

EM8 Meadow Mixture for Wetlands (Emorsgate or acceptable equivalent)	EM8
Seeding Rate (g/m²)	*10*
Species	**%**
Flowers	**20**
Achillea millefolium (Yarrow)	2.00
Agrimonia eupatoria (Agrimony)	0.60
Centaurea nigra (Common Knapweed)	3.60
Filipendula ularia (Meadowsweet)	1.00
Galium verum (Lady's Bedstraw)	2.00
Geum rivale (Water Avens)	0.20
Lathyrus pratensis (Meadow Vetchling)	0.50
Leontodon hispidus (Rough Hawkbit)	0.10
Leucanthemum vulgare (Oxeye Daisy (Moon Daisy))	1.20
Lotus corniculatus (Birdsfoot Trefoil)	0.10
Lotus pedunculatus (Greater Birdsfoot Trefoil)	0.40
Plantago lancelata (Ribwort Plantain)	3.20
Primula veris (Cowslip)	0.20
Prunella vulgaris (Selfheal)	0.10
Ranunculus acris (Meadow Buttercup)	0.40
Rhinanthus minor (Yellow Rattle)	1.40
Rumex acetosa (Common Sorrel)	1.20
Sanguisorba officinalis (Great Burnet)	1.00
Silene flos-cuculi (Ragged Robin)	0.30
Succisa pratensis (Devil's-bit Scabious)	0.10
Vicia cracca (Tufted Vetch)	0.40
ses	**80**
Agrostis capillaris (Common Bent)	4.00
Anthoxanthum odoratum (Sweet Vernal-grass)	4.00
Carex divulsa subsp. divulsa (Grey Sedge)	1.60
Cynosurus cristatus (Crested Dogstail)	34.4
Deschampsia cespitosa (Tufted Hair-grass)	1.60
Festuca rubra (Red Fescue)	20.0
Hordeum secalinum (Meadow Barley)	4.00
Poa trivialis (Rough-stalked Meadow-grass)	8.00
Schedonorus arundinaceus (Tall Fescue)	2.40

Enhancement of Existing Vegetation to Other Neutral Grassland

Species (Latin)	Common Name	%
EM Wildflower Meadow Mixture (Emorsgate or acceptable equivalent)		
	Seeding Rate (g/m²)	10
Wildflowers		**15**
Achillea millefolium	Yarrow	0.75
Betonica officinalis	Betony	0.75
Centurea nigra	Common Knapweed	2.25
Daucus carota	Wild Carrot	1.5
Galium verum	Lady's Bedstraw	0.4
Geranium pratense	Meadow Crane's-bill	0.4
Leucanthemum vulgare	Oxeye Daisy	1.35
Plantago lanceolata	Ribwort Plantain	1.5
Poterium sanguisorba ssp sanguisorba	Salad Burnet	1.5
Primula veris	Cowslip	1
Prunella vulgaris	Selfheal	1.1
Ranunculus acris	Meadow Buttercup	1.2
Ranunculus bulbosus	Bulbous Buttercup	0.15
Rumex acetosa	Common Sorrel	0.4
Silene vulgaris	Bladder Campion	0.75
Grasses		**85**
Agrostis capillaris	Common Bent	8.5
Cynosurus cristatus	Crested Dogstail	29.75
Festuca rubra	Red Fescue	25.5
Phleum bertolonii	Smaller Cat's-tail	4.25
Poa nemoralis	Wood Meadow-grass	17



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Drawing Title:

Phase 1B
Landscape Typologies Plan
Sheet 2 of 2

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Design Stage: Detailed Design

Original Size: A1	Grid: OS	Datum: AOD
Suitability Code: A3	Scale: 1:2000	Project Number: 10051123

Suitability Description:

Definition Design Stage Complete Authorized and Accepted

Drawing Number: 10051123 - ARC-300 - 1B - DR - LA - 00002

Revision: P10

Native Hedgerow

Hedgerow Habitat Planting - Regular Low Inc. Trees

Hedge Species	Height (cm)	Age	Root
Acer campestre (Field maple)	60-80	1+1	B
Crataegus monogyna (Hawthorn)	60-80	1+1	B
Prunus spinosa (Blackthorn)	60-80	1+1	B
Fagus sylvatica (Beech)	60-80	1+1	B
Ilex aquifolium (Holly)	60-80	1+1	B

Maintenance - Trimmed at 1.6 high

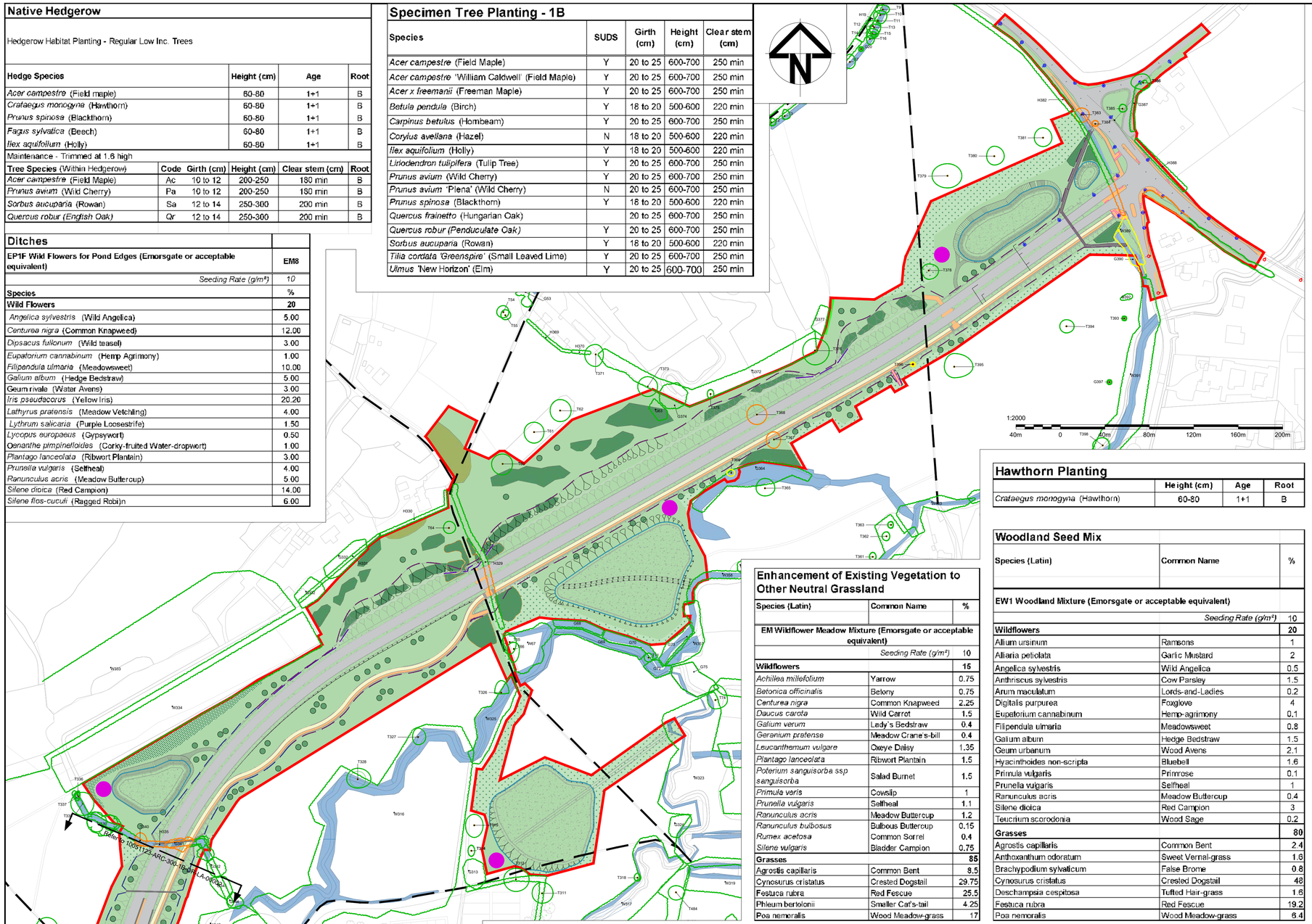
Tree Species (Within Hedgerow)	Code	Girth (cm)	Height (cm)	Clear stem (cm)	Root
Acer campestre (Field Maple)	Ac	10 to 12	200-250	180 min	B
Prunus avium (Wild Cherry)	Pa	10 to 12	200-250	180 min	B
Sorbus aucuparia (Rowan)	Sa	12 to 14	250-300	200 min	B
Quercus robur (English Oak)	Qr	12 to 14	250-300	200 min	B

Ditches

EP1F Wild Flowers for Pond Edges (Emorsgate or acceptable equivalent)	EM8
Seeding Rate (g/m²)	*10*
Species	%
Wild Flowers	**20**
Angelica sylvestris (Wild Angelica)	5.00
Centurea nigra (Common Knapweed)	12.00
Dipsacus fullonum (Wild teasel)	3.00
Eupatorium cannabinum (Hemp Agrimony)	1.00
Filipendula ulmaria (Meadowsweet)	10.00
Galium album (Hedge Bedstraw)	5.00
Geum rivale (Water Avens)	3.00
Iris pseudacorus (Yellow Iris)	20.20
Lathyrus pratensis (Meadow Vetchling)	4.00
Lythrum salicaria (Purple Loosestrife)	1.50
Lycopus europaeus (Gypsywort)	0.50
Oenanthe pimpinelloides (Corky-fruited Water-dropwort)	1.00
Plantago lanceolata (Ribwort Plantain)	3.00
Prunella vulgaris (Selfheal)	4.00
Ranunculus acris (Meadow Buttercup)	5.00
Silene dioica (Red Campion)	14.00
Silene flos-cuculi (Ragged Robi)n	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 Caldwell' (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)		20 to 25	600-700	250 min
Quercus robur (Penduculate 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' (Elm)	Y	20 to 25	600-700	250 min



Enhancement of Existing Vegetation to Other Neutral Grassland

Species (Latin)	Common Name	%
EM Wildflower Meadow Mixture (Emorsgate or acceptable equivalent)		
Seeding Rate (g/m²)		10
Wildflowers		**15**
Achillea millefolium	Yarrow	0.75
Betonica officinalis	Betony	0.75
Centurea nigra	Common Knapweed	2.25
Daucus carota	Wild Carrot	1.5
Galium verum	Lady's Bedstraw	0.4
Geranium pratense	Meadow Crane's-bill	0.4
Leucanthemum vulgare	Oxeye Daisy	1.35
Plantago lanceolata	Ribwort Plantain	1.5
Poterium sanguisorba ssp sanguisorba	Salad Burnet	1.5
Primula veris	Cowslip	1
Prunella vulgaris	Selfheal	1.1
Ranunculus acris	Meadow Buttercup	1.2
Ranunculus bulbosus	Bulbous Buttercup	0.15
Rumex acetosa	Common Sorrel	0.4
Silene vulgaris	Bladder Campion	0.75
Grasses		**85**
Agrostis capillaris	Common Bent	8.5
Cynosurus cristatus	Crested Dogstail	29.75
Festuca rubra	Red Fescue	25.5
Phleum bertolonii	Smaller Cat's-tail	4.25
Poa nemoralis	Wood Meadow-grass	17

Hawthorn Planting

	Height (cm)	Age	Root
Crataegus monogyna (Hawthorn)	60-80	1+1	B

Woodland Seed Mix

Species (Latin)	Common Name	%
EW1 Woodland Mixture (Emorsgate or acceptable equivalent)		
Seeding Rate (g/m²)		10
Wildflowers		**20**
Allium ursinum	Ramsons	1
Alliaria petiolata	Garlic Mustard	2
Angelica sylvestris	Wild Angelica	0.5
Anthriscus sylvestris	Cow Parsley	1.5
Arum maculatum	Lords-and-Ladies	0.2
Digitalis purpurea	Foxglove	4
Eupatorium cannabinum	Hemp-agrimony	0.1
Filipendula ulmaria	Meadowsweet	0.8
Galium album	Hedge Bedstraw	1.5
Geum urbanum	Wood Avens	2.1
Hyacinthoides non-scripta	Bluebell	1.6
Primula vulgaris	Primrose	0.1
Prunella vulgaris	Selfheal	1
Ranunculus acris	Meadow Buttercup	0.4
Silene dioica	Red Campion	3
Teucrium scorodonia	Wood Sage	0.2
Grasses		**80**
Agrostis capillaris	Common Bent	2.4
Anthoxanthum odoratum	Sweet Vernal-grass	1.6
Brachypodium sylvaticum	False Brome	0.8
Cynosurus cristatus	Crested Dogstail	48
Deschampsia cespitosa	Tufted Hair-grass	1.6
Festuca rubra	Red Fescue	19.2
Poa nemoralis	Wood Meadow-grass	6.4

Grass Swales & Attenuation Ponds

EM8 Meadow Mixture for Wetlands (Emorsgate or acceptable equivalent)	EM8
Seeding Rate (g/m²)	*10*
Species	%
Wild Flowers	**20**
Achillea millefolium (Yarrow)	2.00
Agrimonia eupatoria (Agrimony)	0.60
Centaurea nigra (Common Knapweed)	3.60
Filipendula ularia (Meadowsweet)	1.00
Galium verum (Lady's Bedstraw)	2.00
Geum rivale (Water Avens)	0.20
Lathyrus pratensis (Meadow Vetchling)	0.50
Leontodon hispidus (Rough Hawkbit)	0.10
Leucanthemum vulgare (Oxeye Daisy (Moon Daisy))	1.20
Lotus corniculatus (Birdsfoot Trefoil)	0.10
Lotus pedunculatus (Greater Birdsfoot Trefoil)	0.40
Plantago lancelata (Ribwort Plantain)	3.20
Primula veris (Cowslip)	0.20
Prunella vulgaris (Selfheal)	0.10
Ranunculus acris (Meadow Buttercup)	0.40
Rhinanthus minor (Yellow Rattle)	1.40
Rumex acetosa (Common Sorrel)	1.20
Sanguisorba officinalis (Great Burnet)	1.00
Silene flos-cuculi (Ragged Robin)	0.30
Succisa pratensis (Devil's-bit Scabious)	0.10
Vicia cracca (Tufted Vetch)	0.40
Grasses	**80**
Agrostis capillaris (Common Bent)	4.00
Anthoxanthum odoratum (Sweet Vernal-grass)	4.00
Carex divulsa subsp. divulsa (Grey Sedge)	1.60
Cynosurus cristatus (Crested Dogstail)	34.4
Deschampsia cespitosa (Tufted Hair-grass)	1.60
Festuca rubra (Red Fescue)	20.0
Hordeum secalinum (Meadow Barley)	4.00
Poa trivialis (Rough-stalked Meadow-grass)	8.00
Schedonorus arundinaceus (Tall Fescue)	2.40

Grass Seeding

EM10 Tussock Meadow Mixture (Emorsgate or acceptable equivalent)	EM10
Seeding Rate (g/m²)	*10*
Species	%
Wild Flowers	**20**
Achillea millefolium (Yarrow)	0.8
Agrimonia eupatoria (Agrimony)	0.4
Arctium minus (Lesser Burdock)	0.1
Centaurea nigra (Common Knapweed)	1.4
Centaurea scabiosa (Greater Knapweed)	1.0
Chaerophyllum temulum (Rough Chervil)	0.8
Cruciata laevipes (Crosswort)	0.5
Daucus carota (Wild Carrot)	1.0
Dipsacus fullonum (Wild Teasel)	1.6
Filipendula ulmaria (Meadowsweet)	0.8
Galium album (Hedge Bedstraw)	1.8
Knautia arvensis (Field Scabious)	0.8
Leucanthemum vulgare (Oxeye Daisy)	1.6
Lotus corniculatus (Birdsfoot Trefoil)	0.4
Malva moschata (Musk Mallow)	1.6
Plantago lancelata (Ribwort Plantain)	1.8
Poterium sanguisorba (Salad Burnet)	1.6
Silene dioica (Red Campion)	1.0
Vicia cracca (Tufted Vetch)	0.4
Tussock grasses	**80**
Alopecurus pratensis (Meadow Foxtail)	4.0
Cynosurus cristatus (Crested Dogstail)	20.0
Dactylis glomerata (Cocksfoot)	16.0
Festuca rubra ssp rubra (Strong-creeping Red Fescue)	12.0
Holcus lanatus (Yorkshire Fog)	8.0
Lolium perenne (Perennial Ryegrass)	4.0
Poa pratensis (Smooth-stalked Meadow-grass)	6.4
Schedonorus arundinaceus (Tall Fescue)	9.6

Lowland Mixed Deciduous Woodland Planting- Typical species

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

Woodland Planting (incl. bat hop over planting) - Typical species

Species (Latin) (Common name)	Height (cm)	Age	Root / Container / Cell	%	Notes	Group size range (Number of plants)	Species Density (Plants/m²)
Trees - Feathers - 20%				**20**			
Quercus robur (Pendunculate Oak)	80 - 100	2x	B	9	-	3-7	0.25
Fagus sylvatica (Beech)	80 - 100	2x	B	8	-	3-7	0.25
Tilia x europaea (Lime)	80 - 100	2x	B	3	-	3-7	0.25
Trees - Whips - 30%				**30**			
Betula pendula (Birch)	60 - 80	1+2	B	12	-	3-7	0.25
Fagus sylvatica (Beech)	60 - 80	1+2	B	12	-	3-7	0.25
Tilia x europaea (Lime)	60 - 80	1+2	B	6	-	3-7	0.25
Trees - Transplants - 25%				**25**			
Quercus robur (Pendunculate Oak)	60 - 80	1+1	B	11	-	5-9	0.25
Fagus sylvatica (Beech)	60 - 80	1+1	B	9	-	5-9	0.25
Tilia x europaea (Lime)	60 - 80	1+1	B	5	-	8-12	0.25
Shrubs - 25%				**25**			
Crataegus monogyna (Hawthorn)	40-60	1+1	B	2	-	3-5	1
Ligustrum vulgare (Privet)	40-60	1+1	B	3	-	3-5	1
Rubus fruticosa (Blackberry)	40-60	1+1	B	2	-	3-5	1
Rosa arvensis (Field Rose)	40-60	1+1	B	2	-	3-5	1
Corylus avellana (Hazel)	40-60	1+1	B	4	-	3-5	1
Cornus sanguinea (Dogwood)	40-60	1+1	B	3	-	3-5	1
Viburnum opulus (Guelder Rose)	40-60	1+1	B	2	-	3-5	1
Prunus spinosa (Blackthorn)	40-60	1+1	B	5	-	3-5	1
Prunus insititia (Bullace)	40-60	1+1	B	2	-	3-5	1
				100			

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Drawing Title:

Phase 1B
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Sheet 1 of 2

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Design Stage: Detailed Design			
Original Size: A1	Grid: OS	Datum: AOD	
Suitability Code: A3	Scale: 1:2000	Project Number: 10051123	

Suitability Description:

Definition Design Stage Complete Authorized and Accepted

Drawing Number:

10051123 - ARC-300 -
1B - DR - LA - 00001

Revision: P10

Appendix C: Biodiversity Metric

Appendix D: Condition Assessments for Post-construction Habitats (Created and Enhanced)

Table 9: Condition assessment criteria for rain garden habitat (created)

Condition Assessment Criteria		Criterion passed (Yes or No)	Notes (such as justification)
A	Vegetation structure is varied, providing opportunities for vertebrates and invertebrates to live, eat and breed. A single structural habitat component or vegetation type does not account for more than 80% of the total habitat area.	No	Single structural habitat component or vegetation type accounts for more than 80% of the total habitat area. This lack of diversity in vegetation structure can limit opportunities for vertebrates and invertebrates, as a more varied structure would provide a wider range of niches and resources
B	The habitat parcel contains different plant species that are beneficial for wildlife, for example flowering species providing nectar sources for a range of invertebrates at different times of year.	Yes	The habitat parcel contains a variety of plant species that are beneficial for wildlife, such as flowering species providing nectar sources throughout different times of the year. This diversity is important for supporting a range of invertebrates and other wildlife, ensuring that food resources are available across seasons.
C	Invasive non-native plant species (listed on Schedule 9 of WCA[1]) and others which are to the detriment of native wildlife (using professional judgement)[2] cover less than 5% of the total vegetated area[3]. **Note - to achieve Good condition, this criterion must be satisfied by a complete absence of invasive non-native species (rather than <5% cover).**	Yes	Invasive non-native plant species cover less than 5% of the total vegetated area, meeting the criteria for passing.

Condition Assessment Criteria	Criterion passed (Yes or No)	Notes (such as justification)			
Condition Assessment Result			**Condition Assessment Score**		
• Passes all 3 core criteria; AND • Meets the requirements for Good condition within criterion C.			Good (3)		
• Passes 2 of 3 core criteria; OR • Passes 3 of 3 core criteria but does not meet the requirements for Good condition within criterion C.			Moderate (2)	Yes	
• Passes 0 or 1 of 3 core criteria.			Poor (1)		

Table 10: Condition assessment criteria for urban tree habitat (created)

	Condition Assessment Criteria	Criterion passed (Yes or No)	Notes (such as justification)
A	The tree is a native species (or at least 70% within the block are native species).	Yes	At least 70% of the trees within the block are native, which supports local biodiversity and ecological balance
B	The tree canopy is predominantly continuous, with gaps in canopy cover making up <10% of total area and no individual gap being >5 m wide (individual trees automatically pass this criterion).	Yes	The tree canopy is continuous, with minimal gaps, indicating healthy growth and effective coverage, supporting a stable microclimate and offers shelter and habitat for various species.
C	The tree is mature (or more than 50% within the block are mature)[1].	No	Less than 50% within the block are mature
D	There is little or no evidence of an adverse impact on tree health by human activities (such as vandalism, herbicide or detrimental agricultural activity). And there is no current regular pruning regime, so the trees retain >75% of expected canopy for their age range and height.	Yes	There is minimal to no adverse impact from human activities, and the trees retain more than 75% of their expected canopy, suggesting they are in good health and able to perform ecological roles such as carbon sequestration and habitat provision.
E	Natural ecological niches for vertebrates and invertebrates are present, such as presence of deadwood, cavities, ivy or loose bark.	No	The lack of natural ecological niches such as deadwood, cavities, or loose bark indicates limited opportunities for supporting vertebrates and invertebrates, which could reduce biodiversity.
F	More than 20% of the tree canopy area is oversailing vegetation beneath.	Yes	The presence of more than 20% of the tree canopy area oversailing vegetation suggests a multi-layered habitat structure, which is beneficial for biodiversity by providing various niches and resources for different species.

Condition Assessment Criteria		Criterion passed (Yes or No)	Notes (such as justification)
Number of criteria passed		4	
Condition Assessment Result (out of 6 criteria)	**Condition Assessment Score**		
Passes 5 or 6 criteria	Good (3)		
Passes 3 or 4 criteria	Moderate (2)	Yes	
Passes 2 or fewer criteria	Poor (1)		

Table 11: Condition assessment criteria for broadleaved woodland habitat (created)

Condition Assessment Criteria						
Indicator		**Good (3 points)**	**Moderate (2 points)**	**Poor (1 point)**	**Score per indicator (Moderate condition)**	**Score per indicator (Good Condition)**
A	**Age distribution of trees**	Three age-classes[1] present.	Two age-classes[1] present.	One age-class[1] present.	2	2
B	**Wild, domestic and feral herbivore damage**	No significant browsing damage evident in woodland[2].	Evidence of significant browsing pressure is present in less than 40% of whole woodland[2].	Evidence of significant browsing pressure is present in 40% or more of whole woodland[2].	2	2
C	**Invasive plant species**	No invasive species[3] present in woodland.	Rhododendron *Rhododendron ponticum* or cherry laurel *Prunus laurocerasus* not present, and other invasive species[3] <10% cover.	Rhododendron or cherry laurel present, or other invasive species[3] ≥10% cover.	2	3
D	**Number of native tree species**	Five or more native tree or shrub species[4] found across woodland parcel.	Three to four native tree or shrub species[4] found across woodland parcel.	Two or less native tree or shrub species[4] across woodland parcel.	3	3
E	**Cover of native tree and shrub species**	>80% of canopy trees and >80% of understory shrubs are native[5].	50 - 80% of canopy trees and 50 - 80% of understory shrubs are native[5].	<50% of canopy trees and <50% of understory shrubs are native[5].	2	3

Condition Assessment Criteria						
F	**Open space within woodland**	10 - 20% of woodland has areas of temporary open space[6]. Unless woodland is <10ha, in which case 0 - 20% temporary open space is permitted[7].	21 - 40% of woodland has areas of temporary open space[6].	<10% or >40% of woodland has areas of temporary open space[6]. But if woodland <10ha has <10% temporary open space, please see Good category[7].	3	3
G	**Woodland regeneration**	All three classes present in woodland[8]; trees 4 - 7 cm Diameter at Breast Height (DBH), saplings and seedlings or advanced coppice regrowth.	One or two classes only present in woodland[8].	No classes or coppice regrowth present in woodland[8].	3	3
H	**Tree health**	Tree mortality 10% or less, no pests or diseases and no crown dieback[9].	11% to 25% tree mortality and or crown dieback or low-risk pest or disease present[9].	Greater than 25% tree mortality and or any high-risk pest or disease present[9].	2	3
I	**Vegetation and ground flora**	Recognisable NVC plant community[10] at ground layer present, strongly characterised by ancient woodland flora specialists.	Recognisable woodland NVC plant community[10] at ground layer present.	No recognisable woodland NVC plant community[10] at ground layer present.	2	3

Condition Assessment Criteria						
J	**Woodland vertical structure**	Three or more storeys across all survey plots, or a complex woodland[11].	Two storeys across all survey plots[11].	One or less storey across all survey plots[11].	2	3
K	**Veteran trees**	Two or more veteran trees[12] per hectare.	One veteran tree[12] per hectare.	No veteran trees[12] present in woodland.	1	1
L	**Amount of deadwood**	50% of all survey plots within the woodland parcel have deadwood, such as standing and fallen deadwood, large dead branches and or stems, branch stubs and stumps, or an abundance of small cavities[13].	Between 25% and 50% of all survey plots within the woodland parcel have deadwood, such as standing and fallen deadwood, large dead branches and or stems, stubs and stumps, or an abundance of small cavities[13].	Less than 25% of all survey plots within the woodland parcel have deadwood, such as standing and fallen deadwood, large dead branches and or stems, stubs and stumps, or an abundance of small cavities[13].	2	3
M	**Woodland disturbance**	No nutrient enrichment or damaged ground evident[14].	Less than 1 hectare in total of nutrient enrichment across woodland area, and or less than 20% of woodland area has damaged ground[14].	1 hectare or more of nutrient enrichment, and or 20% or more of woodland area has damaged ground[14].	2	3
Condition Assessment Result					**Moderate**	**Good**

Condition Assessment Criteria			
Total score >32 (33 to 39)			
Total score 26 to 32			
Total score <26 (13 to 25)			

Table 12: Condition assessment criteria for hawthorn *scrub habitat (created)*

	Condition Assessment Criteria	Criterion passed (Yes or No)	Notes (such as justification)
A	The parcel represents a good example of its habitat type - the appearance and composition of the vegetation closely matches its UKHab description (where in its natural range).[1] - At least 80% of scrub is native, - There are at least three native woody species[2], - No single species comprises more than 75% of the cover (except hazel Corylus avellana, common juniper Juniperus communis, sea buckthorn Hippophae rhamnoides (only in its restricted native range), or box Buxus sempervirens, which can be up to 100% cover).	Yes	The habitat will consist of native species with no single species comprising more than 75% on its own
B	Seedlings, saplings, young shrubs and mature (or ancient or veteran[3]) shrubs are all present.	No	This will be created hence not already present
C	There is an absence of invasive non-native plant species[4] (as listed on Schedule 9 of WCA[5]) and species indicative of suboptimal condition[6] make up less than 5% of ground cover.	Yes	Non-native invasive species will be actively managed to be kept under<5%
D	The scrub has a well-developed edge with scattered scrub and tall grassland and or forbs present between the scrub and adjacent habitat.	No	Not present
E	There are clearings, glades or rides present within the scrub, providing sheltered edges.	Yes	The created scrub will be managed to meet this criteria
Co	**Condition Assessment Score**		

	Condition Assessment Criteria	Criterion passed (Yes or No)	Notes (such as justification)
nditionAssessmentResult(outof5criteri			

	Condition Assessment Criteria	Criterion passed (Yes or No)	Notes (such as justification)
a)			
Passes 5 criteria	Good (3)		
Passes 3 or 4 criteria	Moderate (2)	Yes	

Condition Assessment Criteria		Criterion passed (Yes or No)	Notes (such as justification)
Passes 2 or fewer criteria	Poor (1)		

Table 13: Condition assessment criteria for Other neutral grasslands (created)

Condition Assessment Criteria		Criterion passed (Yes or No)	Notes (such as justification)
A	The parcel represents a good example of its habitat type, with a consistently high proportion of characteristic indicator species present relevant to the specific habitat type (and relative to Footnote 3 suboptimal species which may be listed in the UKHab description).[1] Note - this criterion is essential for achieving Moderate or Good condition for non-acid grassland types only.	Yes	The parcel is seeded with Emorsgate EM10 and represents a good example of the habitat type, with characteristic indicator species present.
B	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20% is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.	No	Sward height will be uniformly cut, preventing the creation of varied microclimates.
C	Cover of bare ground is between 1% and 5%, including localised areas, for example, rabbit warrens[2].	No	Bare ground will not be maintained, which is required for certain ecological functions.
D	Cover of bracken *Pteridium aquilinum* is less than 20% and cover of scrub (including bramble *Rubus fruticosus* agg.) is less than 5%.	Yes	Bracken and scrub cover are below the required thresholds, ensuring minimal competition for grassland species.

Condition Assessment Criteria		Criterion passed (Yes or No)	Notes (such as justification)
E	Combined cover of species indicative of suboptimal condition[3] and physical damage (such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities) accounts for less than 5% of total area. If any invasive non-native plant species[4] (as listed on Schedule 9 of WCA[5]) are present, this criterion is automatically failed.	Yes	Invasive species will be actively managed, and machinery or physical damage will be avoided.
Passes 5 criteria	Good (3)		
Passes 3 or 4 criteria	Moderate (2)	Yes	
Passes 2 or fewer criteria	Poor (1)		

Table 14: Condition assessment criteria for Ornamental Rain Garden

Condition Assessment Criteria		Criterion passed (Yes or No)	Notes (such as justification)
A	The parcel represents a good example of its habitat type - the appearance and composition of the vegetation closely matches its UKHab description (where in its natural range).[1] - At least 80% of scrub is native, - There are at least three native woody species[2], - No single species comprises more than 75% of the cover (except hazel *Corylus avellana*, common juniper *Juniperus communis*, sea buckthorn *Hippophae rhamnoides* (only in its restricted native range), or box *Buxus sempervirens*, which can be up to 100% cover).	Yes	This is targeted as a good example of this habitat
B	Seedlings, saplings, young shrubs and mature (or ancient or veteran[3]) shrubs are all present.	Yes	16 species have been finalised.
C	There is an absence of invasive non-native plant species[4] (as listed on Schedule 9 of WCA[5]) and species indicative of suboptimal condition[6] make up less than 5% of ground cover.	Yes	Invasives will be managed to a minimum and are <5% ground cover
D	The scrub has a well-developed edge with scattered scrub and tall grassland	No	The scrub will be uniformly maintained

Condition Assessment Criteria		Criterion passed (Yes or No)	Notes (such as justification)
	and or forbs present between the scrub and adjacent habitat.		
E	There are clearings, glades or rides present within the scrub, providing sheltered edges.	No	No clearings will be present
Condition Assessment Result (out of 5 criteria)	Condition Assessment Score		
Passes 5 criteria	Good (3)		
Passes 3 or 4 criteria	Moderate (2)	Yes	
Passes 2 or fewer criteria	Poor (1)		

Table 15: Condition assessment criteria for Modified grassland (enhanced to Moderate)

Condition Assessment Criteria		Criterion passed (Yes or No)	Notes (such as justification)
A	There are 6-8 vascular plant species per m^2 present, including at least 2 forbs (these may include those listed in Footnote 1). Note - this criterion is essential for achieving Moderate or Good condition. Where the vascular plant species present are characteristic of medium, high or very high distinctiveness grassland, or there are 9 or more of these characteristic species per m^2 (excluding those listed in Footnote 1), please review the full UKHab description to assess whether the grassland should instead be classified as a higher distinctiveness grassland. Where a grassland is classed as medium, high, or very high distinctiveness, please use the relevant condition sheet.	Yes	EM3 Special General Purpose meadow mixture is being utilised to meet this criterion.
B	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20% is more than 7 cm) creating microclimates which provide opportunities for vertebrates and invertebrates to live and breed.	Yes	Sward height is managed to create microclimates, with 20% of the sward less than 7 cm and 20% more than 7 cm, promoting habitat diversity for vertebrates and invertebrates.
C	Any scrub present accounts for less than 20% of the total grassland area. (Some	No	Scrub cover is present accounting more than 20% of the total area

Condition Assessment Criteria		Criterion passed (Yes or No)	Notes (such as justification)
	scattered scrub such as bramble *Rubus fruticosus* agg. may be present). Note - patches of scrub with continuous (more than 90%) cover should be classified as the relevant scrub habitat type.		
D	Physical damage is evident in less than 5% of total grassland area. Examples of physical damage include excessive poaching, damage from machinery use or storage, erosion caused by high levels of access, or any other damaging management activities.	Yes	Physical damage is evident in less than 5% of the grassland area, reflecting careful land management to minimize harm.
E	Cover of bare ground is between 1% and 10%, including localised areas (for example, a concentration of rabbit warrens)[2].	Yes	Bare ground is present at a level between 1% and 10%, supporting species that rely on exposed soil for burrowing, basking, or germination.
F	Cover of bracken *Pteridium aquilinum* is less than 20%.	No	Cover not maintained at 20%
G	There is an absence of invasive non-native plant species[3] (as listed on Schedule 9 of WCA[4]).	Yes	There are no invasive plant species present, indicating successful management practices to prevent ecological degradation.
Condition Assessment Result (out of 7 criteria)	**Condition Assessment Score**		
Passes 6 or 7 criteria including passing essential criterion A	Good (3)		

Condition Assessment Criteria		Criterion passed (Yes or No)	Notes (such as justification)
Passes 4 or 5 criteria including passing essential criterion A	Moderate (2)	Yes	
Passes 3 or fewer criteria; OR Passes 4 - 6 criteria (excluding criterion A)	Poor (1)		

*Table 16: Condition assessment criteria for Modified grassland (*enhanced to *Good)*

Condition Assessment Criteria		Criterion passed (Yes or No)	Notes (such as justification)
A	There are 6-8 vascular plant species per m^2 present, including at least 2 forbs (these may include those listed in Footnote 1). Note - this criterion is essential for achieving Moderate or Good condition. Where the vascular plant species present are characteristic of medium, high or very high distinctiveness grassland, or there are 9 or more of these characteristic species per m^2 (excluding those listed in Footnote 1), please review the full UKHab description to assess whether the grassland should instead be classified as a higher distinctiveness grassland. Where a grassland is classed as medium, high, or very high distinctiveness, please use the relevant condition sheet.	Yes	EM3 Special General Purpose meadow mixture is being utilised to meet this criterion.
B	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20% is more than 7 cm) creating microclimates which provide opportunities for vertebrates and invertebrates to live and breed.	Yes	Sward height is managed to create microclimates, with 20% of the sward less than 7 cm and 20% more than 7 cm, promoting habitat diversity for vertebrates and invertebrates.
C	Any scrub present accounts for less than 20% of the total grassland area. (Some scattered scrub such as bramble Rubus fruticosus agg. may be present). Note - patches of scrub with continuous	Yes	Scrub cover is minimal, occupying less than 20% of the grassland area. This ensures the dominance of grasses and forbs rather than woody vegetation.

Condition Assessment Criteria		Criterion passed (Yes or No)	Notes (such as justification)
	(more than 90%) cover should be classified as the relevant scrub habitat type.		
D	Physical damage is evident in less than 5% of total grassland area. Examples of physical damage include excessive poaching, damage from machinery use or storage, erosion caused by high levels of access, or any other damaging management activities.	Yes	Physical damage is evident in less than 5% of the grassland area, reflecting careful land management to minimize harm.
E	Cover of bare ground is between 1% and 10%, including localised areas (for example, a concentration of rabbit warrens)[2].	Yes	Bare ground is present at a level between 1% and 10%, supporting species that rely on exposed soil for burrowing, basking, or germination.
F	Cover of bracken Pteridium aquilinum is less than 20%.	Yes	Bracken cover is maintained below the threshold of 20%, ensuring it does not outcompete grassland species or create overly shaded areas.
G	There is an absence of invasive non-native plant species[3] (as listed on Schedule 9 of WCA[4]).	Yes	There are no invasive plant species present, indicating successful management practices to prevent ecological degradation.
Condition Assessment Result (out of 7 criteria)	**Condition Assessment Score**		
Passes 6 or 7 criteria including passing essential criterion A	Good (3)	Yes	

Condition Assessment Criteria		Criterion passed (Yes or No)	Notes (such as justification)
Passes 4 or 5 criteria including passing essential criterion A	Moderate (2)		
Passes 3 or fewer criteria; OR Passes 4 - 6 criteria (excluding criterion A)	Poor (1)		

Table 17: Condition assessment criteria for Embankment seeding (created)

Condition Assessment Criteria		Criterion passed (Yes or No)	Notes (such as justification)
A	There are 6-8 vascular plant species per m^2 present, including at least 2 forbs (these may include those listed in Footnote 1). Note - this criterion is essential for achieving Moderate or Good condition. Where the vascular plant species present are characteristic of medium, high or very high distinctiveness grassland, or there are 9 or more of these characteristic species per m^2 (excluding those listed in Footnote 1), please review the full UKHab description to assess whether the grassland should instead be classified as a higher distinctiveness grassland. Where a grassland is classed as medium, high, or very high distinctiveness, please use the relevant condition sheet.	Yes	The parcel is seeded with Emorsgate EM8 Meadow mixture for wetlands and represents a good example of the habitat type, with characteristic indicator species present.
B	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20% is more than 7 cm) creating microclimates which provide opportunities for vertebrates and invertebrates to live and breed.	No	Uniform sward height management prevents the formation of varied grassland structures, which are essential for creating diverse habitats for insects and small animals.

Condition Assessment Criteria		Criterion passed (Yes or No)	Notes (such as justification)
C	Any scrub present accounts for less than 20% of the total grassland area. (Some scattered scrub such as bramble *Rubus fruticosus* agg. may be present). Note - patches of scrub with continuous (more than 90%) cover should be classified as the relevant scrub habitat type.	Yes	Scrub cover is minimal, occupying less than 20% of the grassland area. This ensures the dominance of grasses and forbs rather than woody vegetation.
D	Physical damage is evident in less than 5% of total grassland area. Examples of physical damage include excessive poaching, damage from machinery use or storage, erosion caused by high levels of access, or any other damaging management activities.	Yes	Less than 5% of the site shows physical damage, demonstrating effective protection against activities like overgrazing, erosion, or machinery impacts.
E	Cover of bare ground is between 1% and 10%, including localised areas (for example, a concentration of rabbit warrens)[2].	No	Bare ground is absent, which limits opportunities for species that rely on exposed soil for burrowing, basking, or seed germination.
F	Cover of bracken *Pteridium aquilinum* is less than 20%.	Yes	Bracken cover is maintained below the threshold of 20%, ensuring it does not outcompete grassland species or create overly shaded areas.
G	There is an absence of invasive non-native plant species[3] (as listed on Schedule 9 of WCA[4]).	Yes	There are no invasive plant species present, indicating successful management practices to prevent ecological degradation.
Condition Assessment Result (out of 7 criteria)	**Condition Assessment Score**		

Condition Assessment Criteria		Criterion passed (Yes or No)	Notes (such as justification)
Passes 6 or 7 criteria including passing essential criterion A	Good (3)		
Passes 4 or 5 criteria including passing essential criterion A	Moderate (2)	Yes	
Passes 3 or fewer criteria; OR Passes 4 - 6 criteria (excluding criterion A)	Poor (1)		

Table 18: Condition assessment criteria for created hedgerow habitat

Condition Assessment				Criterion passed (Yes or No)
A1.	Height	>1.5 m average along length	The average height of woody growth estimated from base of stem to the top of the shoots, excluding any bank beneath the hedgerow, any gaps or isolated trees. Newly laid or coppiced hedgerows are indicative of good management and pass this criterion for up to a maximum of four years (if undertaken according to good practice). A newly planted hedgerow does not pass this criterion (unless it is >1.5 m height).	Yes
A2.	Width	>1.5 m average along length	The average width of woody growth estimated at the widest point of the canopy, excluding gaps and isolated trees. Outgrowths (such as blackthorn *Prunus spinosa* suckers) are only included in the width estimate when they are >0.5 m in height. Laid, coppiced, cut and newly planted hedgerows are indicative of good management and pass this criterion for up to a maximum of four years (if undertaken according to good practice).	Yes

Condition Assessment				Criterion passed (Yes or No)
B1.	Gap - hedge base	Gap between ground and base of canopy <0.5 m for >90% of length	This is the vertical 'gappiness' of the woody component of the hedgerow, and its distance from the ground to the lowest leafy growth. Certain exceptions to this criterion are acceptable (see page 65 of the Hedgerow Survey Handbook).	No
B2.	Gap - hedge canopy continuity	Gaps make up <10% of total length; and No canopy gaps >5 m	This is the horizontal 'gappiness' of the woody component of the hedgerow. Gaps are complete breaks in the woody canopy (no matter how small). Access points and gates contribute to the overall 'gappiness' but are not subject to the >5 m criterion (as this is the typical size of a gate).	Yes
C1.	Undisturbed ground and perennial vegetation	>1 m width of undisturbed ground with perennial herbaceous vegetation for >90% of length: · Measured from outer edge of hedgerow; and · Is present on one side of the hedgerow (at least).	This is the level of disturbance (excluding wildlife disturbance) at the base of the hedgerow. Undisturbed ground is present for at least 90% of the hedgerow length, greater than 1 m in width and must be present along at least one side of the hedgerow. This criterion recognises the value of the hedgerow base as a boundary habitat with the capacity to support a wide range of species. Cultivation, heavily trodden footpaths, poached ground etc. can limit available habitat niches.	No

Condition Assessment				Criterion passed (Yes or No)
C2.	Nutrient-enriched perennial vegetation	Plant species indicative of nutrient enrichment of soils dominate <20% cover of the area of undisturbed ground.	The indicator species used are nettles *Urtica* spp., cleavers *Galium aparine* and docks *Rumex* spp. Their presence, either singly or together, does not exceed the 20% cover threshold.	Yes
D1.	Invasive and neophyte species	>90% of the hedgerow and undisturbed ground is free of invasive non-native plant species (including those listed on Schedule 9 of WCA[3]) and recently introduced species.	Recently introduced species refer to plants that have naturalised in the UK since AD 1500 (neophytes). Archaeophytes count as natives. For information on archaeophytes and neophytes see the JNCC website[4], as well as the BSBI website[5] where the 'Online Atlas of the British and Irish Flora'[6] contains an up-to-date list of the status of species. For information on invasive non-native species see the GB Non-Native Secretariat website[7].	Yes
D2.	Current damage	>90% of the hedgerow or undisturbed ground is free of damage caused by human activities.	This criterion addresses damaging activities that may have led to or lead to deterioration in other attributes. This could include evidence of pollution, piles of manure or rubble, or inappropriate management practices (for example, excessive hedgerow cutting).	No
E1.	Tree class	There is more than one age-class (or morphology) of tree present (for example: young, mature, veteran and or ancient[8]), and there is on average at least one mature, ancient or veteran tree present per 20 - 50m of hedgerow.	This criterion addresses if there are a range of age-classes or morphologies which allow for replacement of trees and provide opportunities for different species.	No

Condition Assessment				Criterion passed (Yes or No)
E2.	Tree health	At least 95% of hedgerow trees are in a healthy condition (excluding veteran features valuable for wildlife). There is little or no evidence of an adverse impact on tree health by damage from livestock or wild animals, pests or diseases, or human activity.	This criterion identifies if the trees are subject to damage which compromises the survival and health of the individual specimens.	Yes
Good: No more than 2 failures in total AND No more than 1 failure in any functional group. Moderate: No more than 5 failures in total AND does not fail both attributes in more than one functional group (for example, fails attributes A1, A2, B1, C2 and E1 = Moderate condition). Poor: Fails a total of more than 5 attributes OR fails both attributes in more than one functional group (for example, fails attributes A1, A2, B1 and B2 = Poor condition)."				Moderate

Table 19: Condition assessment criteria for created and enhanced *ditches*

Condition Assessment Criteria		Criterion passed (Yes or No)	Notes (such as justification)
A	The ditch is of good water quality, with clear water (low turbidity) indicating no obvious signs of pollution.	Yes	The ditch has clear water (low turbidity) with no obvious signs of pollution.
B	A range of emergent, submerged and floating-leaved plants are present. As a guide >10 species of emergent, floating or submerged plants present in a 20 m ditch length.	Yes	More than 10 species of emergent, submerged, or floating-leaved plants identified in a 20 m ditch length.
C	There is less than 10% cover of filamentous algae and or duckweed *Lemna* spp. (these are signs of eutrophication).	Yes	Less than 10% cover of filamentous algae and/or duckweed (Lemna spp.), indicating low eutrophication.
D	A fringe of aquatic marginal vegetation is present along more than 75% of the ditch.	No	Marginal vegetation is present along less than 75% of the ditch.
E	Physical damage is evident along less than 5% of the ditch, with examples of damage including: excessive poaching, damage from machinery use or storage, or any other damaging management activities.	Yes	Physical Damage is kept to a minimum
F	Sufficient water levels are maintained - as a guide a minimum summer depth of approximately 50 cm in minor ditches and 1 m in main drains.	Yes	Water levels are sufficient, with a minimum summer depth of 50 cm in minor ditches and 1 m in main drains.
G	Less than 10% of the ditch is heavily shaded.	Yes	Less than 10% of ditch is shaded
H	There is an absence of non-native plant and animal species[1].	Yes	No non-native plant or animal species are present.
Passes 8 criteria	Good (3)		
Passes 6 or 7 criteria	Moderate (2)	Yes	
Passes 5 or fewer criteria	Poor (1)		

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APPENDIX 9
HABITATS SUBJECT TO ADDITIONALITY

Table 9.1: Baseline Habitats Subject to Additionality

Broad Habitat	Habitat Type	Area (hectares)	Condition	Total habitat units	Additional Justification
Heathland and shrub	Blackthorn scrub	0.02	Moderate	0.18	Hyde Hill LWS Buffer and/or AW Buffer
Grassland	Bracken	0.04	Condition Assessment N/A	0.09	Hyde Hill LWS Buffer and/or AW Buffer
Woodland and forest	Other woodland; broadleaved	0.33	Moderate	3.04	Hyde Hill LWS Buffer and/or AW Buffer
Urban	Developed land; sealed surface	0.01	N/A - Other	0.00	Hyde Hill LWS Buffer and/or AW Buffer
Woodland and forest	Lowland mixed deciduous woodland	1	Good	20.70	Hyde Hill LWS Buffer and/or AW Buffer
Woodland and forest	Lowland mixed deciduous woodland	0.09	Moderate	1.24	Hyde Hill LWS Buffer and/or AW Buffer
Grassland	Modified grassland	0.39	Moderate	1.79	Hyde Hill LWS Buffer and/or AW Buffer
Grassland	Modified grassland	0.44	Poor	1.01	Hyde Hill LWS Buffer and/or AW Buffer
Grassland	Other neutral grassland	0.13	Poor	0.60	Hyde Hill LWS Buffer and/or AW Buffer
Sparsely vegetated land	Tall forbs	0.1	Poor	0.23	Hyde Hill LWS Buffer and/or AW Buffer

Table 9.1: Baseline Habitats Subject to Additionality

Woodland and forest	Lowland mixed deciduous woodland	0.17	Good	3.52	Hyde Hill LWS Buffer only
Woodland and forest	Lowland mixed deciduous woodland	0.54	Moderate	7.45	Hyde Hill LWS Buffer only

Table 9.2: Post-Development Habitats Subject to Additionality

Broad Habitat	Habitat Type	Area (hectares)	Condition	Total habitat units	Intervention	Additional Justification
Heathland and shrub	Blackthorn scrub	0.02	Moderate	0.18	Retained	Hyde Hill LWS Buffer and/or AW Buffer
Grassland	Bracken	0.04	Condition Assessment N/A	0.09	Retained	Hyde Hill LWS Buffer and/or AW Buffer
Woodland and forest	Other woodland; broadleaved	0.33	Moderate	3.04	Retained	Hyde Hill LWS Buffer and/or AW Buffer
Woodland and forest	Lowland mixed deciduous woodland	1	Good	20.70	Retained	Hyde Hill LWS Buffer and/or AW Buffer
Woodland and forest	Lowland mixed deciduous woodland	0.09	Moderate	1.24	Enhanced	Hyde Hill LWS Buffer and/or AW Buffer
Grassland	Modified grassland	0.39	Moderate	1.79	Enhanced	Hyde Hill LWS Buffer and/or AW Buffer
Grassland	Modified grassland	0.40	Poor	1.01	Retained	Hyde Hill LWS Buffer and/or AW Buffer

Table 9.1: Baseline Habitats Subject to Additionality

Grassland	Modified grassland	0.04			Enhanced	Hyde Hill LWS Buffer and/or AW Buffer
Grassland	Other neutral grassland	0.13	Poor	0.60	Retained	Hyde Hill LWS Buffer and/or AW Buffer
Woodland and forest	Lowland mixed deciduous woodland	0.17	Good	3.52	Retained	Hyde Hill LWS Buffer only
Woodland and forest	Lowland mixed deciduous woodland	0.54	Moderate	7.45	Enhanced	Hyde Hill LWS Buffer only
Heathland and shrub	Mixed scrub	0.01	Moderate	0.07	Created	Assume create medium distinctiveness either mixed scrub or broadleaved woodland as per landscape plan for green space, Hyde Hill LWS Buffer and/or AW Buffer
Heathland and shrub	Mixed scrub	0.1	Moderate	0.72	Created	Assume create medium distinctiveness either mixed scrub or broadleaved woodland as per landscape plan for green space, Hyde Hill LWS Buffer and/or AW Buffer

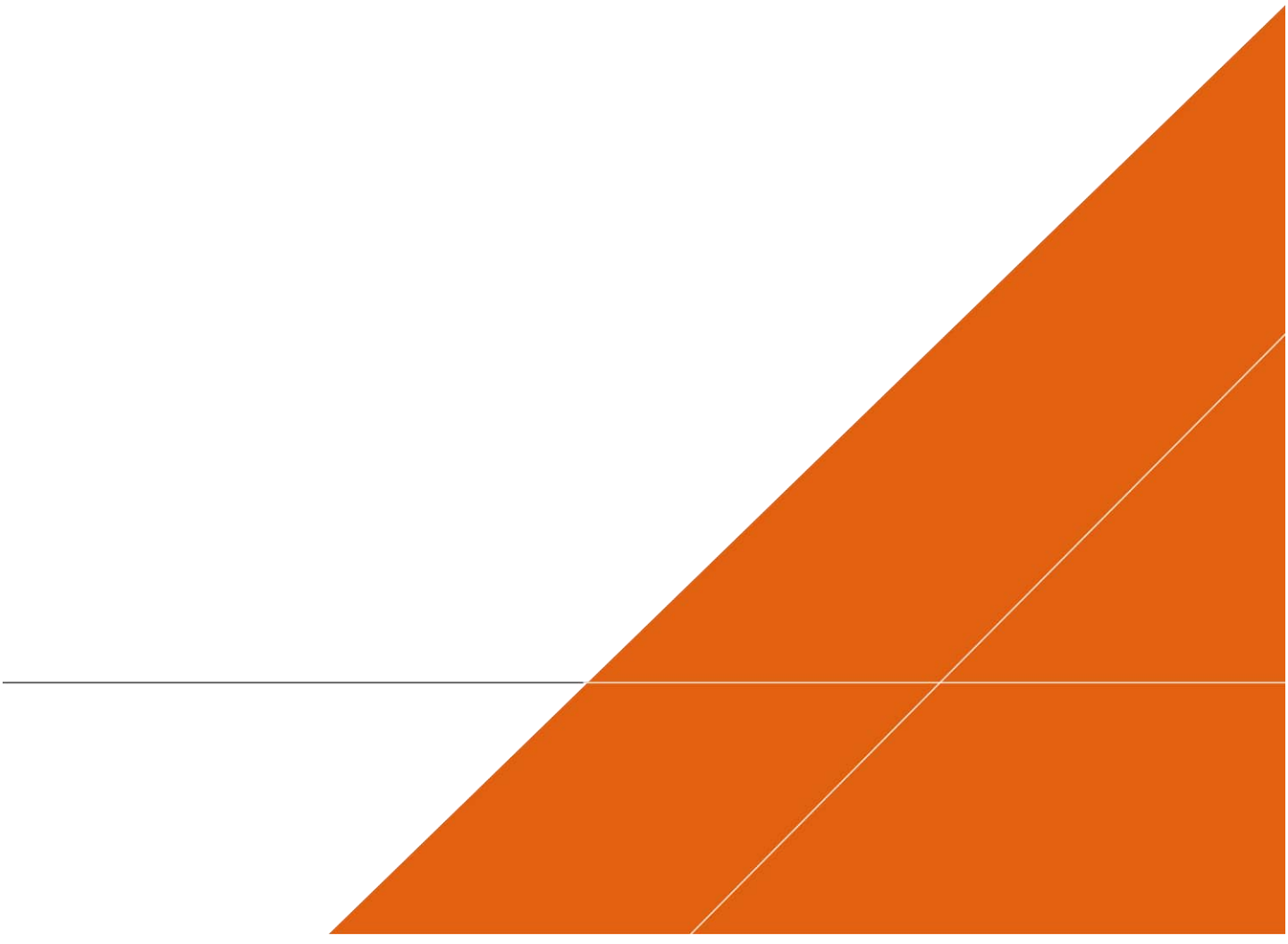
APPENDIX 8.2: LAND WEST OF IFIELD – EXTENDED PHASE 1 HABITAT SURVEY REPORT (OCTOBER 2019)

ARCADIS Design & Consultancy for natural and built assets

LAND WEST OF IFIELD

Extended Phase 1 Habitat Survey Report

OCTOBER 2019



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Land West of Ifield

Extended Phase 1 Habitat Survey Report

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Report Reference	WOI-AUK-XX-WS-RP-EC-0010-01-Extended Phase 1 Habitat Survey Report
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VERSION CONTROL

Version	Date	Author	Changes
01	October 2019	Brandon Murray	Issue of report

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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 Pigymyweed 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 (*Trifolium repens*), Creeping Buttercup (*Ranunculus repens*) and injurious weeds) of less than 10%, and is dominated by Perennial Rye-grass 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 Rye-grass (*Lolium perenne*) 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 Rye-grass 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 wildflowers2 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 WOI-AUK-XX-WS-RP-EC-0008-01-Badger Survey Report and WOI-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	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). • Hairy dragonfly (*Brachytron pratense*); and • Brilliant emerald (*Somatochlora metallica*) 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.	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 (*Vipera berus*), dingy skipper (*Erynnis tages*) and grizzled skipper (*Pyrgus malvae*) (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 (*Carpinus betulus*) and Ash (*Fraxinus excelsior*), mainly as trees grown from coppice. There are very few mature standards remaining as most have been felled. Birch (*Betula* sp.) and particularly Sycamore (*Acer pseudoplatanus*) 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 (*Quercus* sp.) /Hornbeam woodland separated by smaller areas	897m north west

Site Name	Reasons for Designation	Location in relation to the proposed development
	of oak/Hazel (*Corylus avellana*) 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 (*Tilia cordata*) is also present throughout. There are two small ponds included but these are over-grown 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 *Ectemnius ruficornis*, notable waved black moth (*Parascotia fuliginaria*), high densities of reptiles such as adders (*Vipera berus*) and viviparous lizard (*Zootoca vivipara*), several rare dragonflies including brilliant emerald (*Somatochlora metallica*), water beetle *Ilybius Fenestratus* and dormouse (*Muscardinus avellanarius*). The site is also important for breeding redstart (*Phoenicurus phoenicurus*), woodcock (*Scolopax rusticola*) and tree pipit (*Anthus trivialis*) (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 smalls 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 Avens (*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 (*Tila* 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*), Hogwee), 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 laevipes*). Damper 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 severral 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 dysenteric*a) 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).

Further details of the ponds within the site are presented in the Arcadis Great Crested Newt Survey Report (Arcadis 2019b).

3.3.8.2 Ditches

Numerous ditches and drains were recorded across the site, at the time of survey most were dry or held very little water (Photo 20). Two ditches within Ifield Brook and Meadows LWS and a ditch along the northern boundary of the site held water at the time of survey (Photo 21-23).

3.3.9 Running Water

3.3.9.1 Rivers

The River Mole was recorded through the northern section of the site flowing west to east through areas of broadleaved woodland, semi-improved grassland. The river had a moderate-flow and the water was clear and unpolluted. The channel was approximately 5m wide with little emergent wetland vegetation (Photo 24).

3.3.9.2 Streams

Ifield Brook and Ifield Mill Stream are located on the western section of the site flowing south to north through broadleaved woodland (Photo 25). The water was clear and unpolluted. The channel was approximately 2m wide and there was little emergent wetland vegetation.

Hyde Hill stream is on the southern boundary of Ifield Golf Course, at the time of the 2018 surveys the stream held very little water and was mostly dry.

3.3.10 Arable

Six arable fields were recorded within the southern and middle sections of the site. At the time of survey these fields supported Barley (*Hordeum vulgare*) (Photo 26).

3.3.11 Amenity Grassland

Within Ifield Golf Course were large expanses of amenity grassland (Photo 27). The grassland was regularly cut and maintained with a very short sward and abundances of species could not be estimated accurately. Grass species identified within these areas comprised Perennial Rye-grass, Yorkshire-fog, Annual Meadow-grass, fescue species and Rough Meadow-grass. Herbs recorded included White Clover, Ribwort Plantain, Dandelion, Common Bird's-foot-trefoil, Daisy, Selfheal and Creeping Buttercup.

Small areas of amenity grassland were recorded on the eastern boundary of the site surrounding Ifield Barn Arts Centre. Species recorded within these areas were of a similar composition recorded within Ifield Golf Course with additional species identified including Creeping Cinquefoil, Yarrow (*Achillea millefolium*) and Common Mouse-ear.

3.3.12 Ephemeral Vegetation

A small area of bare ground supporting ephemeral vegetation was recorded on the southern boundary of an arable field (Photo 28). Redshank and Broadleaved Plantain were abundant with Scarlet Pimpernel (*Anagalis arvensis*), and Pineappleweed (*Matricaria discoidea*) recorded occasionally.

3.3.13 Introduced Shrub

A single small stand of laurel was recorded along the western boundary of the site within Ifield Brook and Meadows LWS. Areas of ornamental planting at Ifield Golf Course comprised non-native shrub species and conifer trees.

3.3.14 Hedgerows

Thirty-eight hedgerows were recorded within the site. These were located within Ifield Golf Course, arable fields, and within the fields of semi-improved grassland. The most common woody species recorded within these hedgerows were Hawthorn, Blackthorn, Hazel and rose species. Other woody species recorded less frequently included Ash, Elder, Field Maple, Bridewort (*Spiraea agg*.), Spindle, Beech, Hornbeam, Holly, Yew and Snowberry (*Symphoricarpos albus*). Climbing species including Bramble, Black Bryony (*Tamus communis*) and Honeysuckle were recorded in several hedgerows.

The hedgerows supported a limited range of flora species. Frequently recorded species included False Oat-grass, Common Bent, Field Bindweed (*Convolvulus arvensis*), Broadleaved Dock, Cleavers, Common Nettle, Cow Parsley, Betony, Hogweed, Hedge Bedstraw (*Galium album*), Ivy and Cock's-foot. Species recorded infrequently included Lord's-and-Ladies, Wood Avens, Creeping Thistle, Spear Thistle, Timothy, Ground Ivy, Wild Strawberry,

Remote Sedge and willowherb species. In addition, some of the hedgerows had associated ditches which meant that the ground flora also included wetland species such as Hemlock Water Dropwort, Soft Rush, Yellow Iris (*Iris pseudacorus*) and Meadowsweet.

Many of the hedgerows also contained mature trees including oak, Sycamore, Horse-chestnut (*Aesculus hippocastanum*) and conifer species.

Further details of the hedgerows present within the site are presented in the Hedgerow Survey Report (Arcadis 2019c).

3.3.15 Buildings and Man-made Structures

Within the northern section of site were residential dwellings, derelict buildings (TN58) and in the south-western section were several storage sheds (TN 26). Due to access restrictions detailed surveys of these properties were not undertaken. Buildings were also recorded within Ifield Golf Course. These comprised a mixture of brick, breezeblock and metal buildings all with features suitable to support roosting bats (TN59 and 79, Photos 30-32). Buildings were recorded along the eastern boundary of the site (TN60, Photo 33). These included a mixture of brick and wooden buildings with features suitable to support roosting bats.

There were buildings in the west of the site, within the area surveyed in 2019. These included a storage barn (TN96 and Photograph 42), other barns and sheds used for business storage (Photograph 39) and a disused house (TN101 and Photo 47).

A culvert was recorded on the eastern side of Ifield Brook (TN 46, Photo 34) comprising concrete pipe with red brick head wall approximately 1m in diameter with a horizontal grill with large gaps on the entrance.

Wooden bridges and concrete bridges were recorded over watercourses throughout the site (TN27, 54, 75 and 77).

Further details of the structures present in the site are presented in the Breeding Bird Survey (in relation to barn owl roosting) (Arcadis 2019d) and the bat survey report (Arcadis 2019e).

3.3.16 Non-native Invasive Plant Species

The desk study returned records of invasive species within 2 km of the proposed development. One record was Cherry Laurel (*Prunus laurocerasus*) within the site in an area of woodland within Ifield Brook and Meadows LWS. During the Phase 1 habitat, Rhododendron (*Rhododendron ponticum*) was recorded in two locations on site (TN 24 and 57, Photo 34). New Zealand Pigmyweed (*Crassula helmsii*) was recorded in two ponds within Ifield Golf Course (TN63 and 64, Photo 35).

3.3.17 Protected Plant Species

The desk study returned records for protected and priority plant species within 2 km of the site. One record was Bluebell (*Hyacinthoides non-scripta*) within the site in Ifield Brook and Meadows LWS. During the Phase 1 habitat survey, Bluebell was recorded in Ifield Brook and Meadows LWS and also within an area of plantation woodland on the north-west boundary of the site.

3.4 Protected Fauna and/ or Species of Conservation Concern

3.4.1 Terrestrial Invertebrates

The desk study returned records of protected invertebrate species within 2 km of the site. Brown hairstreak (*Thecla betulae*) records were returned within Ifield Brook and Meadows LWS. Records of small heath (*Coenonympha pamphilus*), white admiral (*Limenitis camilla*), brown hairstreak, small heath and chalk hill blue (*Polyommatus coridon*) indicate their past presence on the western boundary of the site, north of Ifield Golf Course. Within Ifield Gold Course records of brown hair streak and small heath were provided in the western part of the course.

Of these species brown hairstreak, small heath and white admiral are Sussex LBAP species.

The grassland, scrub and woodland margins were considered suitable to support a diverse range of invertebrate species as well as the species-rich grassland meadows. The woodland and hedgerow habitats contained deadwood which could provide habitat for terrestrial invertebrate species.

Subsequent to the Phase 1 survey, invertebrate surveys were conducted. These are presented in the Invertebrate Survey Report (Arcadis 2019f).

3.4.2 Aquatic Invertebrates

The desk study returned no records of aquatic invertebrates within the site boundary or within 2 km of the site. Ponds, ditches and watercourses were recorded within the site which were considered likely to be of value to a diverse range of invertebrate species.

Subsequent to the Phase 1 survey, invertebrate surveys were conducted. These are presented in the Invertebrate Survey Report (Arcadis 2019f).

3.4.3 Fish

The desk study returned no records of fish species within 2 km of the site. There were historical records for bulhead (*Cottus gobio*) within watercourses of Ifield Brook and Meadows LWS. The River Mole and streams within the site were suitable to support this species and a range of other common fish.

3.4.4 Amphibians

The desk study returned records of great crested newt (*Triturus cristatus*), smooth newt, common toad (*Bufo bufo*) and common frog (*Rana temporaria*) within 2km of the site. Great crested newt records were identified within the site on the western edge of the site. Smooth newt (*Lissotriton vulgaris*), common toad and common frog were also recorded at the same location. Great crested newt were also recorded 660m, 670m, 751m and 840m northwest of the site.

Seven ponds (TN 25, 36, 61, 62, 63, 64 and 65, Photos 13-18) and three ditches (TN 66, 67 and 68, Photos 20-22) that contained water at the time of survey were recorded within the site and were assessed as suitable to support amphibian species including great crested newt. The terrestrial habitats in the vicinity of these ponds were assessed as likely to be of value to foraging and hibernating amphibians, particularly the areas of broadleaved woodland, scrub, semi-improved grassland and ruderal vegetation. Rubble piles, log piles and brash piles (TN1, 2, 3, 6,11,12,13,14,15,16, 23,41,44,45 and 55, Photo 36) were identified as potential hibernacula. The desk study identified additional waterbodies within 500m of the site (approximately 29).

Details of the ponds on and adjacent to the site and the surveys conducted in relation to these ponds are presented in the Great Crested Newt Survey Report (Arcadis 2019b).

3.4.5 Reptiles

The desk study returned records of reptiles within 2km of the site, with records within the site. These were slow-worm (*Anguis fragilis*) and grass snake (*Natrix helvetica*) on the western boundary of the site.

Incidental sightings of slow-worm (TN43) and grass snake (TN53) were recorded within the site during the Phase 1 habitat survey. Habitats throughout the site were considered suitable to support foraging and hibernating reptiles particularly the areas of broadleaved woodland, scrub, semi-improved grassland, ruderal vegetation and the field margins. Rubble piles, log piles and brash piles (TN1, 2, 3,6,11,12,13,14,15,16, 23,41,44,45 and 55, Photo 36) were identified as potential hibernacula.

Subsequent to the Phase 1 survey, reptile surveys were undertaken. These surveys are reported separately in the Reptile Survey Report (Arcadis 2019h).

3.4.6 Bird

The desk study returned records for a number of notable bird species within 2km of the site, of these confirmed breeding whitethroat (*Sylvia communis*) and green woodpecker (*Picus viridis*), red kite (*Milvus milvus*), kestrel (*Falco tinnunculus*), stock dove (*Columba oenas*) and skylark (*Alauda arvensis*) were recorded within or within close proximity of Ifield Brook and Meadows LWS. Records of tawny owl (*Strix aluco*) and cuckoo (*Cuculus canorus*) were also recorded on the western boundary of the site.

The desk study also returned records of notable bird species close to the site.

Table 3. Protected and notable bird species recorded within close to the site.

Notable Bird Species	Location in relation to the proposed development
Cuckoo Skylark	154m east

Notable Bird Species	Location in relation to the proposed development
Dunnock (*Prunella modularis*) Song thrush (*Turdus philomelos*) Starling (*Sturnus vulgaris*) House sparrow (*Passer domesticus*) Bullfinch (*Pyrrhula pyrrhula*) Yellow hammer (*Emberiza citrinella*) Reed bunting (*Emberiza schoeniclus*)	
Hobby (Falco subbuteo) Barn owl Kingfisher (*Alcedo atthis*) Lesser spotted woodpecker (*Dendrocopos minor*) Skylark Dunnock song thrush Starling House sparrow Linnet (*Linaria cannabina*) Bullfinch Yellow hammer.	253m west of Ifield Golf Course
Lesser spotted woodpecker Skylark Dunnock Song thrush Starling House sparrow, Linnet Bullfinch Yellow hammer	321m north
Kingfisher Song thrush Starling	402m north east

Incidental bird sightings were recorded during the Phase 1 habitat survey including robin (*Erithacus rubecula*), buzzard (*Buteo buteo*), red kite, kingfisher and kestrel. A likely nesting site comprised sand/clay bank with holes and bird droppings was recorded along Ifield Mill Stream (TN 47). Several trees were also recorded with bird boxes attached within Ifield Brook and Meadows LWS (TN 81, 82, 84 and 85).

The woodland, scattered trees, scrub and hedgerow habitats present throughout the site are likely to support breeding birds typical of these habitats and provide good foraging habitat. The areas of less disturbed neutral semi-improved grassland were suitable for ground nesting birds. It is possible that barn owl could use the derelict buildings in the northern section of the site (TN 58) and mature trees with suitable cavities for nesting. The grassland and arable field margins were suitable for foraging barn owl, although no evidence was recorded during

the Phase 1 habitat survey. The arable fields within the site were assessed as suitable to support foraging wintering bird species.

Following the Phase 1 survey, wintering and breeding bird surveys were undertaken. These are presented in full in the relevant reports (Arcadis 2019d and 2019g).

3.4.7 Bats

The desk study returned roost, foraging and commuting records of 17 bat species/groups within 5km of the site detailed in the table below:

Table 4. Bat species/groups recorded within 5 km of the site.

Common Name	Scientific Name
Unidentified bat species	*Chiroptera*
Myotis species	*Myotis* sp.
Daubenton's	*Myotis daubentonii*
Whiskered bat	*Myotis mystacinus*
Whiskered/Brandt's bat	*Myotis mystacinus/brandtii*
Brandt's Bat	*Myotis brandtii*
Natterer's Bat	*Myotis nattereri*
Bechstein's Bat	*Myotis bechsteinii*
Noctule	*Nyctalus noctula*
Leisler's	*Nyctalus leisleri*
Pipistrelle species	*Pipistrellus* sp.
Nathusius's Pipistrelle	*Pipistrellus nathusii*
Common Pipistrelle	*Pipistrellus pipistrellus*
Soprano Pipistrelle	*Pipistrellus pygmaeus*
Serotine	*Eptesicus serotinus*
Long-eared species	*Plecotus* sp.
Brown long-eared	*Plecotus auritus*

No records were identified within the site boundary. Numerous roosts, foraging and commuting records have been identified close to the site and have been detailed in the table below

Table 5. Bat records close to the site.

Species	Description
Common pipistrelle	Roost 207m eat of the proposed develop
Brown long-eared	Roost 220m north east of the proposed development.

Species	Description
Myotis species, noctule and common pipistrelle	Foraging and commuting records at Ifield Mill 350m east of the proposed development
Myotis species, Daubenton's, noctule, common pipistrelle, soprano pipistrelle and brown long-eared bat	Foraging and commuting records at Ifield Mill pond 415m south east of the proposed development.
Common pipistrelle, serotine and noctule	Common pipistrelle and serotine roost. Foraging and commuting activity for noctule and common pipistrelle at former Upper School Deerswood 457m east of the proposed development.

The woodlands and scattered trees were assessed as offering potential to support roosting bats; mature trees that could offer suitable roosting habitat were identified by the following Target Notes: TN 4, 9, 10, 19-22, 28-35, 37-40, 42, 49-52,56,70-74, 80-86.

Buildings within the site were identified as suitable to support roosting bats. On the eastern boundary these comprised connected buildings of brick and wood (TN 60, Photo 32). Within Ifield Golf Course the buildings were TN59 and 79, Photos 29-31. None of the derelict buildings and residential dwellings within the northern section of the site were subject to detailed building inspections due to access restrictions. However, given their age and condition it is anticipated that features suitable to support roosting bats would be present within these buildings (TN 58). In the south-western section were storage sheds (TN 26), these were not surveyed due to access restrictions.

A number of bridges were recorded over watercourses (TN 27, 54, 75, 77 and 78). These bridges had features accessible to bats and with suitable night time perching/roosting features. The culvert on the eastern side of Ifield Brook (TN 46) approximately 1m in diameter with a horizontal grill had large gaps on the entrance to allow access to bats.
The woodlands, hedgerows, watercourse, ponds, areas of scrub, ruderal vegetation, semi-improved grassland and field margins were suitable habitat for commuting and foraging bats.

Following the Phase 1 survey, bat surveys were undertaken. The results of these surveys are presented in the Bat Survey Report (Arcadis 2019e)

3.4.8 Hazel Dormouse

The desk study returned two records of dormice (*Muscardinus avellanarius*) within 2km of the site, 1.8km and 2km south east.

The woodlands and connecting hedgerow habitat were considered suitable to support this species, with a dense understorey and suitable food plants. There was also connectivity to suitable habitat in the wider landscape. It is possible dormice may be present within the site and may also use the site as a dispersal corridor.

Following the Phase 1 habitat survey dormouse surveys were undertaken. The results of these surveys are presented in the Dormouse Survey Report (Arcadis 2019i).

3.4.9 Water voles

The desk study returned no records of water vole (*Arvicola amphibius*) within 2km of the site. Most of the ditches within the site were dry at the time of survey. The sections of the River Mole that were less shaded by woodland were suitable to support water vole.

Following the Phase 1 survey, water vole surveys were undertaken. The results of these surveys are presented in the Otter and Water Vole Survey Report (Arcadis 2019j).

3.4.10 Otters

The watercourses within the site were suitable to support otters (*Lutra lutra*). A number of sites along the River Mole, Ifield Brook and Ifield Mill Stream contained suitable resting sites. The ponds and wet ditches were suitable foraging habitat.

Following the Phase 1 survey otter surveys were undertaken. The results of these surveys are presented in the Otter and Water Vole Survey Report (Arcadis 2019j).

3.4.11 Badgers

The woodlands, scrub and hedgerows within the were suitable for badger (*Meles meles*). A badger sett was recorded during the Phase 1 habitat survey within Ifield Brook and Meadows LWS (TN 48), a single entrance sett associated with a rabbit warren was recorded along the western boundary of the site (TN17, Photo 37). A potential badger sett was identified at the base of a mature oak tree with badger hairs and evidence of digging recorded at this location (TN69, Photo 38). Mammal paths were recorded throughout the site (TN 5 and 7).

Following the Phase 1 survey, badger surveys were undertaken. The results of these surveys are presented in the Badger Survey Report (Arcadis 2019k).

3.4.12 Red Squirrel

The desk study returned a single red squirrel (*Sciurus vulgaris*) record 28m west of the site within Ifieldwood along Rusper Road. Considering the decline in this species in the mainland of England and the lack of more recent records in the area, it is considered unlikely that this species is associated with the site.

3.4.13 Other Mammals

The desk study returned hedgehog (*Erinaceus europaeus*) records within 2km of the site. Two records were within the eastern part of the site at Furlong Farm and within Persimmon Controlled Land. Habitats present within the site were suitable to support this species included the woodland, hedgerows, and grassland.

A single harvest mouse (*Micromys minutus*) record was recorded at Gatwick Airport, north of the site. Habitats suitable to support harvest mouse present within the site included the hedgerows, and areas of grassland around the arable field margins.

Rabbits (*Oryctolagus cuniculus*) were recorded across the site with burrows identified in two locations (TN 17 and 18). Evidence of rabbit grazing was recorded in Ifield Brook and Meadows LWS.

4 Discussion

The desk study and field survey revealed the following ecological features of some value to nature conservation.

4.1 Designated sites

Ifield Brook Wood and Meadows LWS and Hyde Hill LWS are within the site. Ifield Pond and surroundings SINC, Willoughby Fields LWS and Wood near Lower Prestwood Farm LWS are located between 100m-500m of the site. These LWS are of county value to biodiversity and the proposed development could have a significant impact on these sites.

Crawley Borough Council has made a commitment to halting the overall decline in biodiversity by ensuring that developments minimise impacts to biodiversity and provide net gains where possible including establishing coherent ecological networks that are more resilient to current and future pressures. Proposals which will result in significant harm to biodiversity will be refused unless they can be located on alternative sites with less harmful impact; or the harm can be adequately mitigated, or, as a last resort, compensated for. To ensure a net gain in biodiversity, Crawley Borough Council has made a pledge that designated areas including locally designated sites will be conserved and enhanced where possible and the council will support their designation and management, therefore the proposed development may be in breach of the Local Development Plan (Crawley Borough Council 2015)

Horsham Council have made a similar pledge ensure that development does not cause a net loss in biodiversity and provides net gains in biodiversity where possible. All development proposals should seek to enhance existing biodiversity through a range of measures on or off the site and should create and manage new habitats where appropriate. Developments that will result in the loss of existing green infrastructure will be resisted unless new opportunities will be provided that mitigates or compensates for this loss to ensure ecosystem services within the area are retained. Where developments are anticipated to have a direct or indirect adverse impact on sites or features for biodiversity, they will be refused unless it can be demonstrated the reason for the development clearly outweighs the need to protect the value of the site and appropriate mitigation and compensation measures are provided (Horsham District Council 2015))

4.2 Plants and Habitats

Habitats recorded within the site include semi-natural and plantation broadleaved woodland, mixed plantation woodland, semi-improved grassland, marshy grassland, amenity grassland, dense and scattered scrub, ruderal vegetation, arable fields, scattered trees, hedgerows, short ephemeral vegetation, watercourse, waterbodies, buildings, bare ground and hard standing The proposed development has the potential to lead to widespread habitat loss, with potential impacts on biodiversity. These habitats are suitable to support protected, notable and local priority species of fauna. Loss of habitats would result in a loss of suitable resting, foraging and breeding habitats and ultimately potential loss of these species. It is advised that valuable habitats are retained (habitats of principal importance as identified in the Natural Environment and Rural communities Act (Anon,2006). These include: rivers, ponds, arable field margins, hedgerows and lowland mixed deciduous woodland. This will ensure maximum connectivity across the site is maintained, allowing species to continue to move across the site and avoiding habitat fragmentation.

The non-native invasive species Cherry Laurel, Rhododendron and New Zealand Pigmyweed have been recorded in locations across the site. If works occur in the vicinity of these species there is a risk of spread which in the case of the latter two species would be in contravention of legislation (Appendix A).

4.3 Species

Protected and notable species are known to be present on site. These include: brown hairstreak, small heath, white admiral, small heath, chalk hill blue, great crested newt, slow-worm, grass snake and badger. There is the potential that other protected and notable species may also be present on site including invertebrate species, breeding birds, roosting bats, dormouse, otter, water vole, harvest mouse and other mammal species.

Subsequent to the Phase 1 Habitat survey, dedicated species surveys were undertaken. For the assessment of the presence / absence and value of the site to these species please see the relevant reports (Arcadis 2019a – j).

5 Recommendations for General Mitigation and Possible Enhancements

5.1 Consultation

It is considered that any loss/damage to a LWS would have significance in nature conservation terms and would therefore require a robust mitigation strategy to address any potential impacts. Any proposed development would need to be in accordance with local policy, in addition to national policy and legislation and therefore it is recommended that consultation with Crawley Borough Council is at an early stage to ensure that the development does not result in a net loss of biodiversity.

It is advised that further consultation with the Sussex Wildlife Trust and Sussex Badger Trust is undertaken to obtain additional records for otters within 5km of the site and badgers within 2km of the site.

5.2 General Mitigation

The recommendations outlined below have been provided to minimise the ecological effects of the proposed development and deliver a net gain in biodiversity as required by legislation and policy (Appendix A).

- All contractors should attend a tool box talk prior to construction works commencing on the site. The toolbox talk should cover the ecological constraints on site (e.g. presence of protected species), mitigation (including areas to be avoided / undisturbed) and action to be taken in the event of discovering a protected species during works.

- The loss of and impacts to LWS habitat is considered significant and mitigation will be required. It is unlikely that there is enough space on site to ensure there is no overall reduction in biodiversity and an area for off-site compensatory habitat creation will need to be identified early during the design process through consultation.
- Where possible valuable habitats including hedgerows, woodland, scrub, grassland, ponds and watercourses should be retained.
- Standard good site practices and pollution control measures should be implemented during construction works, as outlined in Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors (CIRIA, 2001) and Environmental Good Practice on Site (CIRIA, 2015) to ensure that watercourses, ponds and ditches are not adversely affected by dust, uncontrolled surface water run-off, inappropriate storage of materials and inappropriate refuelling of machinery.
- Works should be undertaken outside of all tree root protection zones (RPZ) and tree protective fencing as described in section 6.2 of British Standard 5837:2012 (BSI 2012) should be installed (distance of fencing from trunk = 12x trunk diameter and at least at maximum canopy/branch distance for hedgerows) prior to plant and machinery arriving on site and construction works commencing. The fencing should remain intact throughout the duration of the works and only be removed upon completion.
- The invasive species Cherry Laurel, Rhododendron and New Zealand Pigmyweed have been recorded within the site. This would need to be managed in accordance with current best practice guidelines and legislation to ensure that these species are not spread in the wild.

5.3 Possible Enhancements

All development proposals will be expected to incorporate features to encourage biodiversity where appropriate, and where possible enhance existing features of nature conservation value within and around the development.

To ensure the Local Wildlife Sites remain in good condition in the long-term and continue to provide a valuable habitat for local biodiversity, appropriate long-term management should be implemented to ensure maximum connectivity is maintained, allowing species to continue to move across the site and avoiding habitat fragmentation.

- Where possible valuable habitats including hedgerows, woodland, scrub, grassland, ponds and watercourses should be retained, enhanced and extended and long-term appropriate management of these habitats should be implemented. This will help to maintain habitat connectivity and provide a variation of habitat types with structured diverse ranges of vegetation types which will provide suitable refuge and a varied foraging resource for invertebrates, nesting birds, reptiles, amphibians and mammals. Any new planting should be native and attractive to wildlife with long term management of both retained

and new habitats secured to provide benefit to wildlife and take into account seasonal and legislative constraints. This will also provide a visually attractive landscape that will be attractive to residents and other stakeholders e.g. footpath users.

- Within the proposed areas of strategic open space designated cycle and pedestrian routes should be incorporated to alleviate pressure on existing LWS and areas to be used for ecological mitigation This will allow the public to enjoy the open spaces but will limit impacts to biodiversity caused by, for example, disturbance and trampling.
- Green roofs and green walls could be incorporated into the design of new buildings (particularly those with flat roofs e.g. education/amenity buildings). This would help to recreate habitat lost as part of the proposed development works footprint by incorporating a variety of wildlife habitats within the roofs and walls, without impacting the masterplan overall layout.
- Where possible the provision of refuges, foraging resources and breeding and hibernation sites should be incorporated into the masterplan design. Cut/cleared vegetation from the working corridor could be used to create habitat piles within the retained habitat outside of the working corridor.
- The boundaries of development plots should allow for wildlife dispersal e.g. gaps in fences/walls for hedgehogs. Houses and other buildings should incorporate bird nesting and bat roosting features (e.g. integral nest boxes).
- As part of development, opportunities should be sought to create new habitats within the proposed development. This could include the installation of bat / bird boxes on retained trees and incorporating bird nesting and bat roosting features (e.g. integral nest boxes) into the design of buildings.

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Figure 1: Phase 1 Habitat Survey Map