Volume 6

ON BEHALF OF
Satnam Millennium Ltd

IN RESPECT OF

Outline application for a new residential neighbourhood including C2 and C3 uses; local employment (B1 use); local centre including food store up to 2000m², A1-A5 (inclusive) and D1 use class units of up to 600m² total (with no single unit of more than 200m2) and family restaurant/ pub of up to 800m2 (A3/A4 use); site for primary school; open space including sports pitches with ancillary facilities; means of access and supporting infrastructure at Peel Hall, Warrington

AT PEEL HALL, WARRINGTON

ADDENDUM TO ENVIRONMENTAL STATEMENT *(Volume 3)*

ADDENDUM TO ENVIRONMENTAL STATEMENT
IN RESPECT OF 'OPTION A' AND 'OPTION B' HIGHWAYS LAYOUT

DOCUMENTS AND FIGURES

January 2018

Landscape Institute
Registered practice

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DOCUMENT CONTROL

TITLE: VOLUME 6- Addendum to Environmental Statement,

Addendum to Environmental Statement, in respect of 'Option A' and 'Option B' highways layout- DOCUMENTS & FIGURES

PROJECT: Peel Hall, Warrington

JOB NO: 1820

CLIENT: Satnam Millennium Ltd

Prepared by: David Appleton / Dave Starkie	**31.01.18**
Checked by: David Appleton	**Date: 31.01.18**
Approved for distribution by: David Appleton	**Date: 31.01.18**

Document

Status	Description	Rev / date	By	Approved by	Issued to	Issue date	Comments
Final for Issue	**ENVIRONMENTAL STATEMENT ADDENDUM**	**-**	**DA**	**DA/DJS**	**CG/ PINs/ CLM**	**31.01.2018**	

Revisions to Final Document

Rev	Description	Rev date	By	Approved by	Issued to	Issue date	Comments

CONTENTS

DOCUMENTS AND FIGURES (Volume 6)

(Note: the following documents and figures are updates/ supplementary information, any appendices not listed can be found in the original ES Volume 3)

BASELINE DOCUMENT AND FIGURES- TAB NO. 1

APP 6A Parameters Plan Option A (1820_24) prepared by Appletons

APP 6B Parameters Plan Option B (1820_30) prepared by Appletons

APP 7 Agricultural Land Classification Map *(Replacing original ES Appendix APP 7)*

APP 14 Cross Section North-South Option A (1820_31) prepared by Appletons

APP 15 Cross Section North-South Option B (1820_34) prepared by Appletons

APP 16 Indicative Sports and Recreation Provision (1820_28) prepared by Appletons

APP 17 Site Location Plan (drawing number. 140367-D-002 Rev B) prepared by 3DReid

ECOLOGY- TAB NO.2

ECO 16 E-mail correspondence with GMEU

ECO 17 RECORD Data Search (*Updated from original ES Appendix 4)*

ECO 18 Bird Survey Map 1- 2017

ECO 19 Bird Survey Map 2- 2017

ECO 20 Comparative Extended Site Bat Survey Area

ECO 21 Extended Site Bat Survey Boundary Area

ECO 22 Activity Figures

ECO 23 Bats & Lighting

HYDROLOGY, DRAINAGE AND FLOOD RISK- TAB NO.3

HYD 6 Preliminary Water Framework Directive Assessment

LANDSCAPE AND VISUAL IMPACT- TAB NO.4

LND 10 Indicative Landscape Components Plan Option A (1820_25) prepared by Appletons

LND 11 Indicative Landscape Components Plan Option B (1820_29) prepared by Appletons

TRANSPORTATION AND HIGHWAYS- TAB NO.5

Option A Appendices:

T1 - Study area

T2 - Existing highway network

T3 - Existing bus network

T4 - Existing PRoW network

T5 - Illustrative plan showing the proposed road network within the development

T6 – Proposed Access Junctions

- 1107/08/P – Birch Avenue
- 1107/09/M – Poplars Avenue (west)
- 1107/10/N – Blackbrook Avenue/Mill Lane
- 1107/11/L – Mill Lane
- 1107/12/Q – Poplars Avenue (central)
- 1107/30/H – Grasmere Avenue

T7 – Enhanced bus provision

T8 - Illustrative pedestrian and cycle linkages

T9 - Proposed construction and highway phasing of Peel Hall

T10 – SATURN output files

T11 – Proposed Mitigation

Option B Appendices for Transportation and Highways:

T5B – Indicative through route and access points

T6B – Proposed Access Junctions

- 1107/08/P – Birch Avenue (same as Option A)
- 1107/10/N – Blackbrook Avenue/Mill Lane (same as Option A)
- 1107/11/L – Mill Lane (same as Option A)
- 1107/12/Q – Poplars Avenue (central) (same as Option A)
- 1107/30/H – Grasmere Avenue (same as Option A)
- 1107/46/B – Through route at Poplars Avenue (west)
- 1107/52/F – A49/Poplars Avenue

T8B – Illustrative pedestrian and cycle linkages

T9B - Proposed construction and highway phasing of Peel Hall

T11B - Proposed Mitigation

CULTURAL HERITAGE AND ARCHAEOLOGY

Refer to Original ES and Option B Addendum.

NOISE POLLUTION

Refer to Original ES and Option B Addendum.

AIR POLLUTION

Refer to Original ES and Option B Addendum.

SOCIO-ECONOMIC- TAB NO.6

S2 Summary Tables

BASELINE DOCUMENT AND FIGURES

APP 6A Parameters Plan Option A (1820_24)

APP 6B Parameters Plan Option B (1820_30)

APP 7 Agricultural Land Classification Map *(Replacing original ES Appendix APP 7)*

APP 14 Cross Section North-South Option A (1820_31)

APP 15 Cross Section North-South Option B (1820_34)

APP 16 Indicative Sports and Recreation Provision (1820_28)

APP 17 Site Location Plan (drawing number. 140367-D-002 Rev B) *(Replacing original ES Appendix APP13)*

KEYS

- Site Boundary
- Areas within Site boundary and excluded from the development
- Public right of way
- Boundary between the historic townships of Arbury and Houghton (Important Hedgerow)
- Boundary between the historic townships of Arbury and Winwick (Important Hedgerow)
- Peel Hall Manor Farm Moat Area (Archeological Feature)
- Gas Main and Easement
- 8m Water Vole buffer zone to Spa Brook.
- Existing Culvert
- Existing hedgerows to be retained
- Existing Pond to be retained
- Existing areas of woodland trees and vegetation to be retained.
- 10m Foraging bat corridor
- 40m Bufferzone to M62 (Air Quality & Noise)
- R. Developable Land to include for pedestrian and cycle links between plots.
- Indicative Road Line
- CH. Location for Care Home
- LC. Location for Local Centre
- EA. Location for Employment Area
- S. Location for Primary School
- Location for Community Facility
- Location for Bus Gate
- Proposed Tree/ Shrub Planting
- Proposed Sports Pitches/ Public Open Space
- A. Area suitable for apartments with mechanical ventilation
- Radley Common
- Existing areas of off site vegetation
- Proposed wildlife corridor
- Agreed Buffer with Woodland Trust to Radley Wood

*Note: Heights shown are proposed from ground level. Heights shown are fixed and take precedent over number of storeys shown.

PEEL HALL, WARRINGTON

Parameters Plan- **Option A**

FIGURE APP 6A

Project: PEEL HALL, WARRINGTON	
Title: Parameters Plan- **Option A**	
Client: Satnam Millennium Ltd	
Date: 21.10.15	Scale: 1:2,500@A1
Drawn: SW/ DS	Drawing No.: 1820_24
Checked: DA/ DS	Revision: Y

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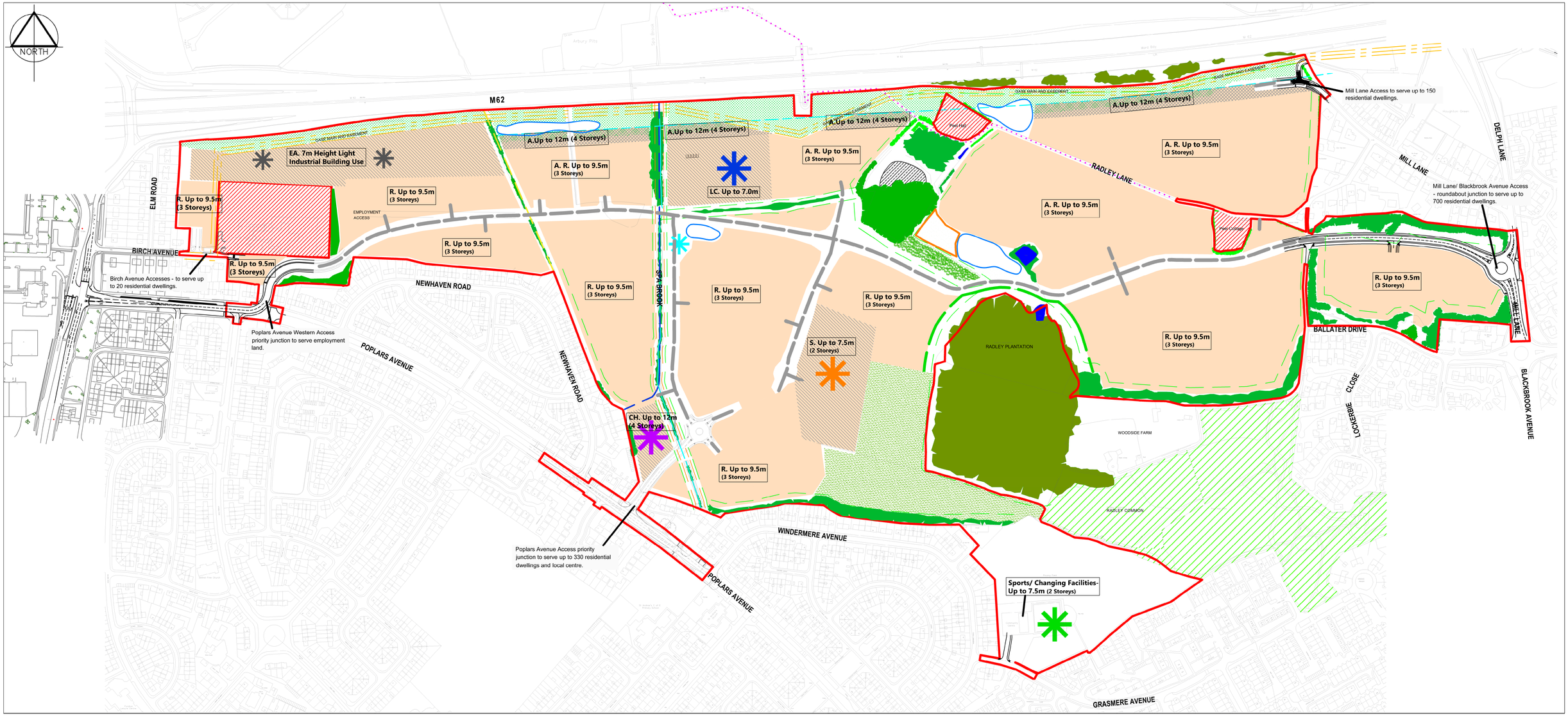

KEYS

- Site Boundary
- Boundary between the historic townships of Arbury and Winwick (Important Hedgerow)
- Existing Culvert
- 10m Foraging bat corridor
- CH. Location for Care Home
- Location for Community Facility
- Proposed Tree/ Shrub Planting
- Agreed Buffer with Woodland Trust to Radley Wood
- Areas within Site boundary and excluded from the development
- Peel Hall Manor Farm Moat Area (Archeological Feature)
- Existing hedgerows to be retained
- 40m Bufferzone to M62 (Air Quality & Noise)
- LC. Location for Local Centre
- Location for Bus Gate
- Existing areas of off site vegetation
- Public right of way
- Gas Main and Easement
- Existing Pond to be retained
- R. Developable Land to include for pedestrian and cycle links between plots.
- EA. Location for Employment Area
- Proposed Sports Pitches/ Public Open Space
- A. Area suitable for apartments with mechanical ventilation
- Boundary between the historic townships of Arbury and Houghton (Important Hedgerow)
- 8m Water Vole buffer zone to Spa Brook.
- Existing areas of woodland trees and vegetation to be retained.
- Indicative Road Line
- S. Location for Primary School
- Proposed wildlife corridor
- Radley Common

*Note: Heights shown are proposed from ground level. Heights shown are fixed and take precedent over number of storeys shown.

PEEL HALL, WARRINGTON

Parameters Plan- **Option B**

FIGURE APP 6B

Project	PEEL HALL, WARRINGTON
Title	Parameters Plan- **Option B**
Client	Satnam Millennium Ltd
Date	September 2017
Scale	1:2,500@A1
Drawn	SW/ DS
Drawing No.	1820_30
Checked	DA/ DS
Revision	B

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Key:

Site Boundary

Post 1988 Agricultural Land Classification (England) (date from Magicmap.com)

Grade 2

Grade 3A

Grade 3B

Grade 4

Other

PEEL HALL, WARRINGTON

APPENDIX APP7
Agricultural Land Classification
Scale: NTS

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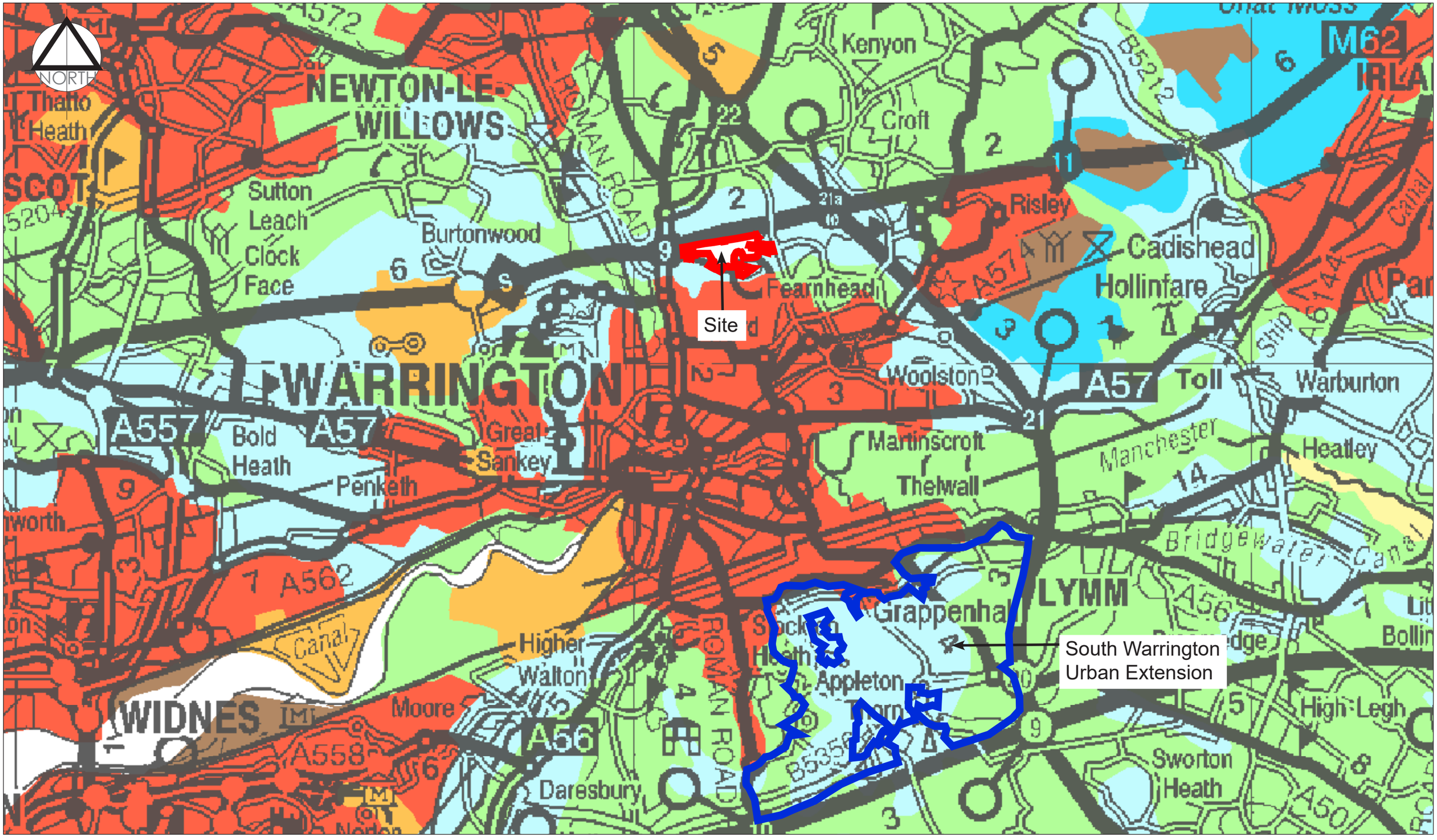
Landscape Architecture • Ecology • Enviromental Planning & Assessment • Aboriculture



Key:

Site Boundary

Map Extract Published by Natural England 2010- North West Region 1:250,000 Series Agricutlural Land Classification

Grade 1 | Grade 2 | Grade 3 | Grade 4 | Grade 5 | Non Agricultural | Urban

PEEL HALL, WARRINGTON

APPENDIX APP7
Wider Agricultural Land Classification Map
Scale: NTS

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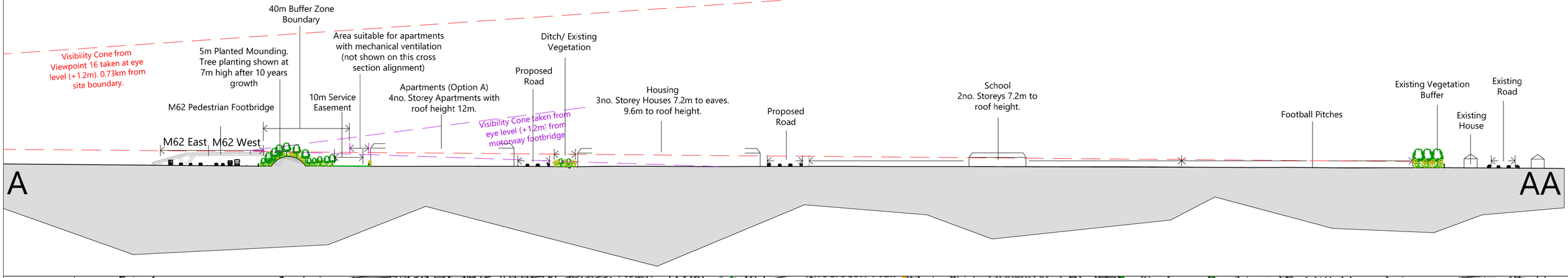
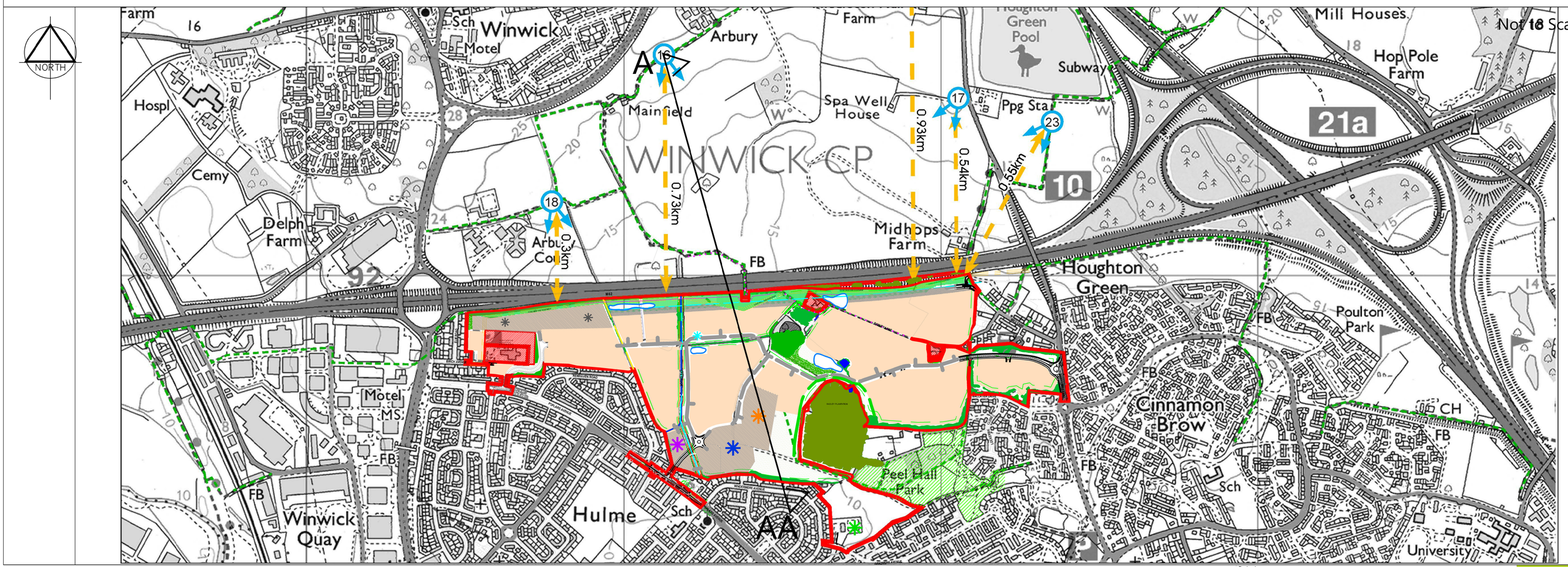
1:1,000@A1





PEEL HALL, WARRINGTON

Cross Section- Option A

FIGURE APP 14

Project	PEEL HALL, WARRINGTON
Title	Cross Section- Option A
Client	Satnam Millennium Ltd
Date: November 2017	Scale: 1:1,000@A1
Drawn: SW	Drawing No.: 1820_31
Checked: DA/ DS	Revision: A

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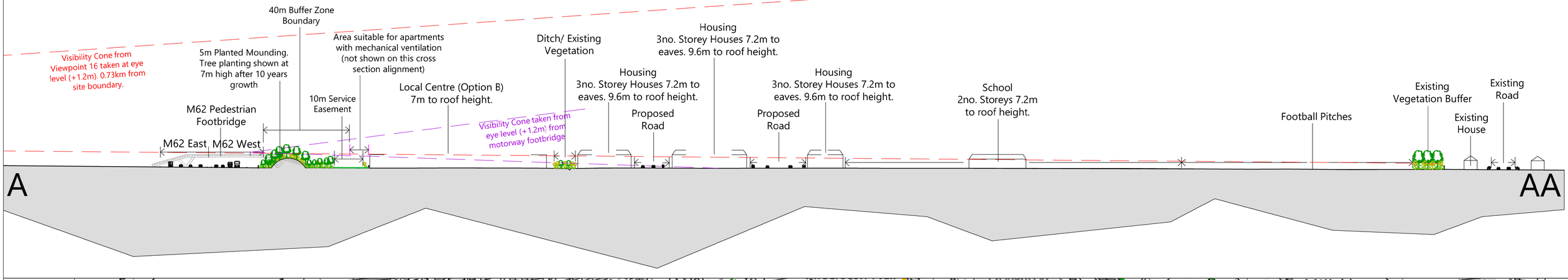
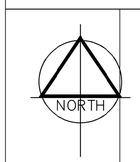
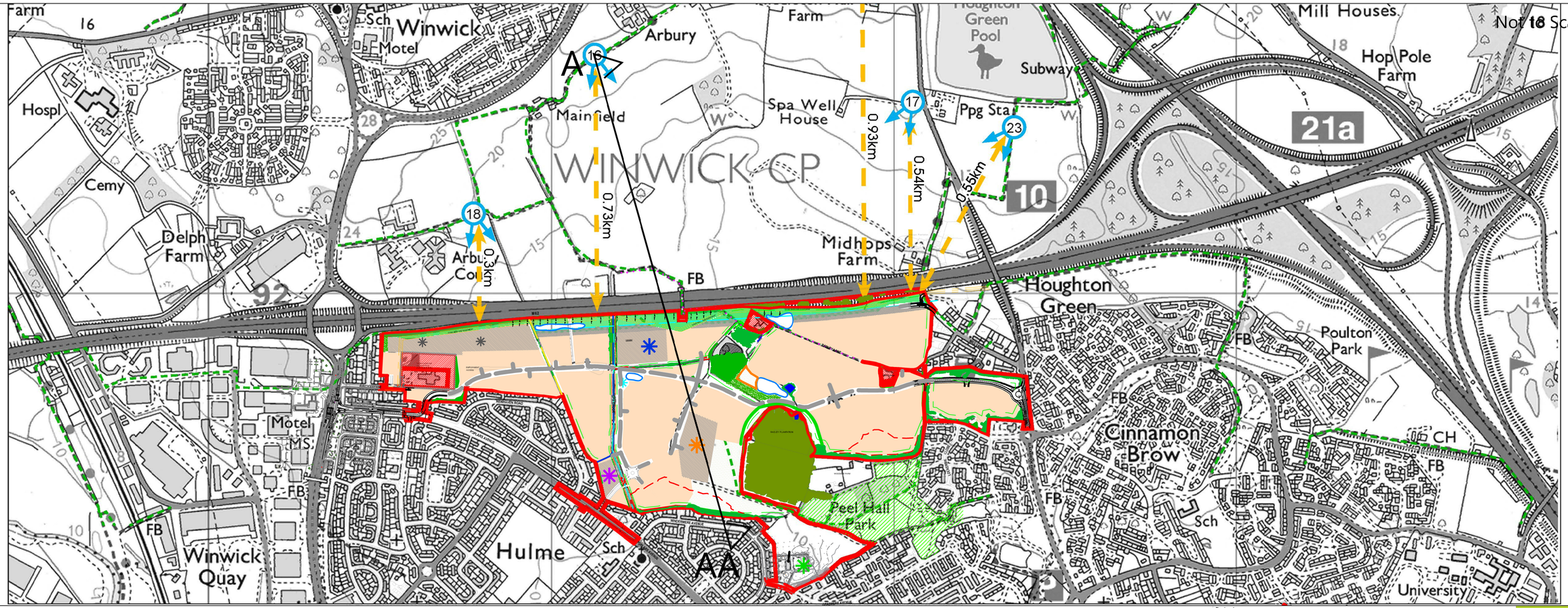
1:1,000@A1







PEEL HALL, WARRINGTON

Cross Section- Option B

FIGURE APP 15

Project	PEEL HALL, WARRINGTON
Title	Cross Section- Option B
Client	Satnam Millennium Ltd
Date: January 2018	Scale: 1:1,000@A1
Drawn: SW	Drawing No.: 1820_34
Checked: DA/ DS	Revision: B

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NORTH

SCHOOL

Full Size Football Grass Pitch (106x70m including runoff and barrier)

Pedestrian Access

Youth Pitch 7v7 (61x43m including runoff and barrier)

Existing Sports Pitches (3.2ha)

Youth Pitch 9v9 (80x50m including runoff and barrier)

Warrington Borough Council Former Sports Pitches (Radley Common)

Full Size Football Grass Pitch (106x70m including runoff and barrier)

New Community Facility with changing facilities.
Existing MUGA/ LEAP retained

Indicative access road

Proposed Overflow Car Parking Facilities

Proposed Car Parking Facilities

WINDERMERE AVENUE

POPLARS AVENUE

GRASMERE AVENUE

BALLATER DRIV

LOCKERBIE CLOSE

KEYS

- Site Boundary
- Proposed Footpath/ Re-surfacing existing
- Proposed Tree Planting
- Existing Trees

PEEL HALL, WARRINGTON

Indicative Sports and Recreation Provision

FIGURE APP 16

Project	PEEL HALL, WARRINGTON
Title	Indicative Sports and Recreation Provision
Client	Satnam Millennium Ltd
Date	28.06.16
Scale	1:1,250@A1
Drawn	SW/ DS
Drawing No.	1820_28
Checked	DA/ DS
Revision	J

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Notes

Do not scale from this drawing.

All dimensions are to be checked prior to construction and any discrepancies are to be identified to the Architect.

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N

0 50 100 150 200m

AREAS

TOTAL AREA	639,255 m2 156,97 acres

Note, all areas based on OS data, not measured surveys.

A	31.01.18	Red line boundary updated	MD
A	07.07.16	Issued for Planning	JHD

ISSUED FOR PLANNING

Revisions

Client

Satnam Millennium Ltd

Project

Peel Hall Masterplan

Title

Site Location Plan

Scale	Size	Date	Drawn	Checked
1:2500	A1	June'16	JHD	DB

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ECOLOGY

ECO 16 E-mail correspondence with GMEU

ECO 17 RECORD Data Search (Updated from original ES Appendix 4)

ECO 18 Bird Survey Map 1- 2017

ECO 19 Bird Survey Map 2- 2017

ECO 20 Comparative Extended Site Bat Survey Area

ECO 21 Extended Site Bat Survey Boundary Area

ECO 22 Activity Figures

ECO 23 Bats & Lighting

INCOMING EMAIL

From: devcontrol
To: Pearson, Pauline
Date: 28/09/2016 16:02:28
Subject: FW: App 2016/28492 Land at Peel Hall - Ecology response

Attachments:
(1) image001.png(14 B)

From: Derek Richardson [mailto:derek.richardson@tameside.gov.uk]
Sent: 26 September 2016 16:36
To: devcontrol
Subject: App 2016/28492 Land at Peel Hall - Ecology response

Dear Mike Davies

App 2016/28492, LAND AT PEEL HALL, LAND SOUTH OF M62 BOUNDED BY, ELM ROAD, BIRCH AVE, POPLARS AVE, NEWHAVEN ROAD, WINDERMERE AVE, GRASMERE AVE, MEREWOOD CLOSE, ETC., WARRINGTON

Thank you for consulting the Ecology Unit on the above application. I have visited the site and have the following comments relating to Ecology.

Survey effort

The Ecology surveys submitted as part of the application have been undertaken by suitably qualified consultants and are generally to appropriate and proportionate standards, given that this is an Outline application. No further surveys are needed prior to deciding this Outline application.

The Application Site

The application site is a very large area of open, semi-natural greenspace dominated by former farmland, which has not apparently been managed for productive agriculture for some years. As a result the open fields have in places become more rank, with scrub encroaching in places. The site retails something of a rural character, even with the M62 so close by. The rank grassland and tall ruderal vegetation that is in places replacing the agricultural grassland remains rather species poor in botanical terms, with the remaining grassland now probably best described as 'semi-improved'. The site, although large, is somewhat 'landlocked' between the M62 motorway to the north and large-scale built developments, largely residential, to the other boundaries. Local wildlife using the site will not therefore be easily displaced. The site clearly has value for the large local (human) population as an open area of semi-natural greenspace (it would appear from the large number of responses to the application – mainly negative - to have value both for passive and more active amenity use).

Impact on specially protected sites

The development of the application site will not affect any sites statutorily protected for their nature conservation value. One Local Wildlife Site – the Radley Plantation Woodland - is present within the expected zone of influence of the development. While the Plantation will not be directly affected by the scheme it may well be indirectly affected by the large increase in local population that will result if the

scheme is granted permission – by public disturbance, by encroachment and possibly by artificial lighting.

Impact on semi-natural habitats

The development has the potential to cause harm to the locally important habitats woodlands, watercourses, hedges, trees and open grassland. I note that the Landscape Parameters Plan (dwg. 1820_24) does appear to show the majority of the most important features as being retained as part of the scheme, which is welcomed, although they will inevitably become more fragmented and isolated by the built development. Large areas of more open habitats (grassland, scrub and ruderal vegetation) will be lost to the scheme.

Currently the plans do not appear to include the provision of any new, un-fragmented areas of semi-natural greenspace incorporated into the scheme that could be managed for people and for nature conservation. Much of the greenspace shown on the outline plans is existing space which will be retained. The proposed new strip of landscaping along the northern boundary will function much more as a noise and landscape screen between the motorway and the new development rather than functioning as an effective area for public recreation or wildlife.

Impact on protected and important Species

I would accept that the site is unlikely to currently support the protected species great crested newt, although it may once have done so. It has been shown to support valuable foraging habitat for local bat populations. Given the rather 'landlocked' nature of the site and the significant barrier of the M62 to the north the loss of certain habitats to the development (ponds, watercourses and woodlands), and the fragmentation of the landscape, without sufficient mitigation, is likely to affect the nature conservation status of local bat populations by reducing the local feeding resource.

The site is of value for a number of important bird species, including at least 8 'priority' species for conservation. Again, without sufficient mitigation, loss of and fragmentation of habitat is likely to affect the local population status of at least some of these species by reducing opportunities for feeding and nesting.

Conclusions

Currently I would regard the amount of mitigation and/or compensation for impacts on local nature conservation impacts as insufficient, albeit that this is an Outline application. I would **recommend** that proposals for a new, meaningful area of enhanced, un-fragmented, semi-natural greenspace should be put forward as compensation for lost habitats and green infrastructure.

If permission is to be granted to the development I would **recommend** –

- That space be set aside for a new, un-fragmented area of semi-natural greenspace that could be managed for people and wildlife.
- That a comprehensive, holistic Landscape and Habitat Creation and Management Plan should be prepared for the site. Once agreed, this Plan should be implemented in full. The Plan should include biodiversity enhancement measures and proposals to retain and/or create meaningful green corridors through the site to allow for species movement.
- That important habitat features (hedgerows, trees, woodlands, ponds and water courses) should be retained and protected as part of the scheme, or if lost, replaced. The Radley Plantation woodland and the Spa Brook should be 'buffered' with landscape screens of 8 - 10 metres.
- That, prior to any tree felling works required to facilitate the scheme any trees to be lost should be subject to further, closer inspection for their potential to support bat roosts.
- That new badger surveys should be required prior to any work commencing that could cause harm to badgers. Badgers are mobile in their habits.
- That no vegetation clearance or groundworks required to facilitate the scheme should commence

during the optimum period for bird nesting (March to July inclusive). All nesting birds, their eggs and young are specially protected under the terms of the Wildlife and Countryside Act 1981 (as amended). The site has the potential to support ground-nesting bird species in addition to birds that nest in trees and shrubs.

- That Lighting Plans for the scheme should be sympathetic to wildlife and should avoid directly lighting important habitats (woodlands, hedgerows, ponds and watercourses).

I hope that these comments are useful. Please contact me if you have any questions.

Yours sincerely
Derek Richardson

Derek Richardson
Principal Ecologist
Planning
Development and Investment
Place

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In addition you can search through the document for any particular text by using the standard Microsoft shortcut (Ctrl + F) and enter the text you are looking for.

Interpretation of the data

- Species maps: The species maps show the location of protected, notable and Invasive non-native species grouped by taxon. The numbers in brackets adjacent to the species names relate to the grid ID shown on the maps. Records with a grid reference accuracy of 10m square or above are minimised to a 100m square. Where there are more than 100 grid IDs on a map the grid references will be minimised to 1km. The full grid reference can be found within the full record in this report or in the excel spreadsheet of raw data.
- Attribute data: Where available all attribute data is provided with the records. Sex and life stage information as well as the record type all allow greater interpretation of information available. However it is not always possible to provide this information.
- Species designation Status: The species designation information provided within this enquiry output is based on the best available information provided through the JNCC: *Conservation designations of UK Taxa* list. Information on the limitations to this list is available here: (http://jncc.defra.gov.uk/page-3408)
- Site/habitat data: Due to changes in the NBN web services we are currently unable to provide site and observation data from the NBN, this does not affect local sites. Information for statutory sites can be found at http://www.natureonthemap.naturalengland.org.uk/MagicMap.aspx and sites and NBN taxa observations at https://spatial.nbnatlas.org.
  (please be aware of the NBN Atlas guidance for using data https://nbnatlas.org/help/guidance-using-data/).

317266

Peel Hall

SJ6141891748

Table of Contents

Using this document 1
Interpretation of the data 1
Table of Contents 3
Designated Species Summary 6
Species Report 11
AMPHIBIAN 11
Map 11
Common Frog (Rana temporaria) (1,3,5,6,7,8,9,10,11,12) 12
Common Toad (Bufo bufo) (2,5,10,12) 12
Smooth Newt (Lissotriton vulgaris) (4,5,8) 13
BIRD 14
Map 14
Canada Goose (Branta canadensis) (23,33,50,60,77) 15
House Sparrow (Passer domesticus) (9,30,31,33,47,48,49,50,60,62) 16
Kingfisher (Alcedo atthis) (20,77,82) 17
Black-headed Gull (Chroicocephalus ridibundus) (9,33,50,58,60,62,65,77,78) 18
Mistle Thrush (Turdus viscivorus) (30,33,48,49,50,60,62,73,77,80,84,85) 19
Kestrel (Falco tinnunculus) (2,3,4,6,11,13,15,16,18,22,25,26,29,30,31,33,39,41,45,48,49,50,52,54,57,60,70,77) 24
Grey Partridge (Perdix perdix) (30,31,33,46,49,50,60,64,66,67,77,78,94) 27
Meadow Pipit (Anthus pratensis) (8,30,31,33,48,49,60,78) 29
Herring Gull (Larus argentatus) (30,33,48,49,50,60,62,77) 29
Lapwing (Vanellus vanellus) (1,3,30,31,33,36,42,49,50,55,59,60,66,67,68,69,77,78) 30
Fieldfare (Turdus pilaris) (17,30,33,49,50,60,76,83,90) 33
Mallard (Anas platyrhynchos) (9,33,45,49,50,53,58,60,77,87,91,92) 33
Dunnock (Prunella modularis) (8,30,33,48,49,50,60,62,77,88) 37
Arctic Tern (Sterna paradisaea) (50,60) 42
Little Ringed Plover (Charadrius dubius) (50,60) 42
Little Grebe (Tachybaptus ruficollis) (50,59) 42
Common Gull (Larus canus) (30,33,49,50,60) 43
Corn Bunting (Emberiza calandra) (30,33,48,49,50,60) 44
Gadwall (Anas strepera) (50) 44
Hobby (Falco subbuteo) (33,50) 44
Greenshank (Tringa nebularia) (50) 45
Merlin (Falco columbarius) (33,50) 45
Golden Plover (Pluvialis apricaria) (30,49,60) 45
Brambling (Fringilla montifringilla) (30) 45
Barn Owl (Tyto alba) (30,33) 45
Lesser Black-backed Gull (Larus fuscus) (33,48,60,62,65) 45
Black Tern (Chlidonias niger) (50) 46
Black-necked Grebe (Podiceps nigricollis) (50,59,60,66) 46
Grey Wagtail (Motacilla cinerea) (40,50,56,77) 47
Bullfinch (Pyrrhula pyrrhula) (24,48,49,77) 47
Crane (Grus grus) (48) 52
Great Black-backed Gull (Larus marinus) (60,77) 52
Dunlin (Calidris alpina) (60,66) 55
House Martin (Delichon urbicum) (64,88) 55
Curlew (Numenius arquata) (77) 55

Marsh Tit (Poecile palustris) (77) 55
Goldeneye (Bucephala clangula) (60) 55
Green Sandpiper (Tringa ochropus) (60) 56
Starling (Sturnus vulgaris) (8,30,31,33,38,44,48,49,50,60,62,71,77,78,88) 56
Snipe (Gallinago gallinago) (12,28,30) 60
Tree Sparrow (Passer montanus) (30,31,33,49,50,60) 61
Peregrine (Falco peregrinus) (30,31,78) 61
Yellowhammer (Emberiza citrinella) (7,8,30,31,33,49,50,60) 62
Ringed Plover (Charadrius hiaticula) (50,60) 63
Shoveler (Anas clypeata) (60) 63
Slavonian Grebe (Podiceps auritus) (60) 63
Woodcock (Scolopax rusticola) (19,77) 63
Whinchat (Saxicola rubetra) (30) 63
Ruddy Duck (Oxyura jamaicensis) (50,60) 63
Yellow Wagtail (Motacilla flava) (66) 64
Pink-footed Goose (Anser brachyrhynchus) (49,98) 64
Song Thrush (Turdus philomelos) (8,10,21,30,33,35,37,48,49,50,60,77,83) 64
Whitethroat (Sylvia communis) (33,48,50,77) 68
Tufted Duck (Aythya fuligula) (50,58,60,65,66,78) 70
Willow Warbler (Phylloscopus trochilus) (30,45,48,49,50,60,77) 71
Reed Bunting (Emberiza schoeniclus) (9,30,33,49,50,60,77) 72
Teal (Anas crecca) (50,60,78) 74
Wheatear (Oenanthe oenanthe) (30,60,66) 74
Pochard (Aythya ferina) (50,58,60,66) 74
Redshank (Tringa totanus) (49,50,60) 75
Skylark (Alauda arvensis) (7,8,30,31,33,48,49,50,51,60,63,64) 75
Redwing (Turdus iliacus) (17,30,33,43,50,60,76,77,83,86,92,96) 76
Stock Dove (Columba oenas) (30,31,33,49,50,60,78) 78
Swift (Apus apus) (14,27,30,32,33,34,45,48,49,50,59,60,61,72,74,75,77,79,81,89,93,97) 78
Sand Martin (Riparia riparia) (5,50,59,60) 81
Swallow (Hirundo rustica) (30,33,45,48,49,50,60,62,77,80,95) 81
Oystercatcher (Haematopus ostralegus) (30,50,59,60,66,67,77) 84
BONY FISH (ACTINOPTERYGII) 86
Map 86
European Eel (Anguilla anguilla) (1) 87
FLOWERING PLANT 88
Map 88
Fringed Water-lily (Nymphoides peltata) (10) 89
Hairy Vetchling (Lathyrus hirsutus) (11) 89
Indian Balsam (Impatiens glandulifera) (1,5,7,14,15,21) 89
Floating Pennywort (Hydrocotyle ranunculoides) (13) 89
Japanese Knotweed (Fallopia japonica) (1,3,9,12,18) 89
Black Poplar (Populus nigra subsp. betulifolia) (20) 90
Bluebell (Hyacinthoides non-scripta) (16) 90
Grass Vetchling (Lathyrus nissolia) (2,4) 90
Himalayan Cotoneaster (Cotoneaster simonsii) (19) 90
Rhododendron (Rhododendron ponticum) (17) 90
Wall Cotoneaster (Cotoneaster horizontalis) (19) 90
New Zealand Pigmyweed (Crassula helmsii) (6,8) 91
INSECT - BUTTERFLY 92

Map 92
Large Tortoiseshell (Nymphalis polychloros) (1,2) 93
Ringlet (Aphantopus hyperantus) (3) 93
INSECT - MOTH 94
Map 94
Dot Moth (Melanchra persicariae) (8) 95
Centre-barred Sallow (Atethmia centrago) (3) 95
Cinnabar (Tyria jacobaeae) (1,2,4,5,6,7,8) 95
INSECT - TRUE FLY (DIPTERA) 96
Map 96
Keroplatus testaceus (Keroplatus testaceus) (1) 97
REPTILE 98
Map 98
Common Lizard (Zootoca vivipara) (2,3) 99
Red-eared Terrapin (Trachemys scripta) (1) 99
TERRESTRIAL MAMMAL 100
Map 100
Eurasian Badger (Meles meles) (13,20,28,29) 101
Brown Hare (Lepus europaeus) (2,5,9) 101
European Water Vole (Arvicola amphibius) (1,6,7,15,16,17,18,27) 101
American Mink (Neovison vison) (6) 101
Eastern Grey Squirrel (Sciurus carolinensis) (3,14,26) 102
Harvest Mouse (Micromys minutus) (4) 102
West European Hedgehog (Erinaceus europaeus) (8,10,11,12,19,21,22,23,25,30,31) 102
Pipistrelle (Pipistrellus pipistrellus) (24) 103
Site Boundary Report 104
Local Sites 104
Local Wildlife Sites 104
Winwick Old Quay / WA046 104
Map 104
Bewsey Meadows / WA002 105
Map 105
Croft Grasslands / WA006 106
Map 106
Gemini Washlands / WA010 107
Map 107
Houghton Green Pool / WA013 108
Map 108
Little and Big Moss Woods / WA019 109
Map 109
Radley Plantation and Pond / WA047 110
Map 110
Sankey Brook / WA049 111
Map 111
Sankey Canal Central / WA048 112
Map 112
Regionally Important Geodiversity Sites 113
Statutory Sites 113
Other Sites of Conservation Interest 113

Designated Species Summary

Taxa	Designation name	Occurrence in Cheshire tetrads between 2006-2017 (%)	Occurrence in Cheshire tetrads all years (%)
American Mink (Neovison vison)	Invasive Non-Native Species, Wildlife and Countryside Act Schedule 9	10%	22%
Arctic Tern (Sterna paradisaea)	Birds of Conservation Concern [RSPB] - Amber	1%	8%
Barn Owl (Tyto alba)	Local Biodiversity Action Plan Species, Wildlife and Countryside Act - Schedule 1, Birds of Conservation Concern [RSPB] - Amber, Wildlife and Countryside Act Schedule 9	23%	58%
Black Poplar (Populus nigra subsp. betulifolia)	Local Biodiversity Action Plan Species, IUCN Global Red List - Least Concern	14%	26%
Black Tern (Chlidonias niger)	Wildlife and Countryside Act - Schedule 1, Birds of Conservation Concern [RSPB] - Amber	<1%	9%
Black-headed Gull (Chroicocephalus ridibundus)	Birds of Conservation Concern [RSPB] - Amber	23%	41%
Black-necked Grebe (Podiceps nigricollis)	Local Biodiversity Action Plan Species, Wildlife and Countryside Act - Schedule 1, Birds of Conservation Concern [RSPB] - Amber	2%	4%
Bluebell (Hyacinthoides non-scripta)	Local Biodiversity Action Plan Species, Wildlife and Countryside Act - Shedule 8, IUCN Global Red List - Least Concern	31%	69%
Brambling (Fringilla montifringilla)	Wildlife and Countryside Act - Schedule 1	9%	23%
Brown Hare (Lepus europaeus)	Local Biodiversity Action Plan Species, NERC S41, UK BAP Priority Species	21%	80%
Bullfinch (Pyrrhula pyrrhula)	Local Biodiversity Action Plan Species, Birds of Conservation Concern [RSPB] - Amber, NERC S41	20%	70%
Canada Goose (Branta canadensis)	Invasive Non-Native Species, Wildlife and Countryside Act Schedule 9	26%	53%
Centre-barred Sallow (Atethmia centrago)	NERC S41, UK BAP Priority Species	1%	7%
Cinnabar (Tyria jacobaeae)	NERC S41, UK BAP Priority Species	13%	30%
Common Frog (Rana temporaria)	Wildlife and Countryside Act - Schedule 5	33%	63%
Common Gull (Larus canus)	Birds of Conservation Concern [RSPB] - Amber	9%	25%
Common Lizard (Zootoca vivipara)	Wildlife and Countryside Act - Schedule 5, NERC S41, UK BAP	5%	9%

	Priority Species		
Common Toad (Bufo bufo)	Wildlife and Countryside Act - Schedule 5, NERC S41, UK BAP Priority Species	23%	41%
Corn Bunting (Emberiza calandra)	Local Biodiversity Action Plan Species, Birds of Conservation Concern [RSPB] - Red, NERC S41	2%	38%
Crane (Grus grus)	Birds of Conservation Concern [RSPB] - Amber, Wildlife and Countryside Act Schedule 9	<1%	<1%
Curlew (Numenius arquata)	Birds of Conservation Concern [RSPB] - Amber, NERC S41, UK BAP Priority Species	14%	53%
Dot Moth (Melanchra persicariae)	NERC S41, UK BAP Priority Species	3%	14%
Dunlin (Calidris alpina)	Birds of Conservation Concern [RSPB] - Red	5%	15%
Dunnock (Prunella modularis)	Birds of Conservation Concern [RSPB] - Amber, NERC S41	29%	84%
Eastern Grey Squirrel (Sciurus carolinensis)	Wildlife and Countryside Act Schedule 9	31%	54%
Eurasian Badger (Meles meles)	Protection of Badgers Act 1992	59%	74%
European Eel (Anguilla anguilla)	NERC S41, UK BAP Priority Species	2%	6%
European Water Vole (Arvicola amphibius)	Local Biodiversity Action Plan Species, Wildlife and Countryside Act - Schedule 5, NERC S41, UK BAP Priority Species	13%	52%
Fieldfare (Turdus pilaris)	Wildlife and Countryside Act - Schedule 1, Birds of Conservation Concern [RSPB] - Red	19%	39%
Floating Pennywort (Hydrocotyle ranunculoides)	Invasive Non-Native Species, Wildlife and Countryside Act Schedule 9	2%	2%
Fringed Water-lily (Nymphoides peltata)	Invasive Non-Native Species, IUCN Global Red List - Least Concern, Nationally Scarce	4%	7%
Gadwall (Anas strepera)	Birds of Conservation Concern [RSPB] - Amber	6%	12%
Golden Plover (Pluvialis apricaria)	Birds of Conservation Concern [RSPB] - Amber	5%	17%
Goldeneye (Bucephala clangula)	Wildlife and Countryside Act - Schedule 1, Birds of Conservation Concern [RSPB] - Amber	6%	14%
Grass Vetchling (Lathyrus nissolia)	IUCN Global Red List - Least Concern, Locally Rare and Scare	2%	2%
Great Black-backed Gull (Larus marinus)	Birds of Conservation Concern [RSPB] - Amber	6%	16%
Green Sandpiper (Tringa ochropus)	Wildlife and Countryside Act - Schedule 1, Birds of Conservation Concern [RSPB] - Amber	5%	17%
Greenshank (Tringa nebularia)	Wildlife and Countryside Act -	3%	12%

	Schedule 1		
Grey Partridge (Perdix perdix)	Local Biodiversity Action Plan Species, Birds of Conservation Concern [RSPB] - Red, NERC S41, UK BAP Priority Species	8%	60%
Grey Wagtail (Motacilla cinerea)	Birds of Conservation Concern [RSPB] - Amber	14%	45%
Hairy Vetchling (Lathyrus hirsutus)	Nationally Rare	<1%	<1%
Harvest Mouse (Micromys minutus)	Local Biodiversity Action Plan Species, NERC S41, UK BAP Priority Species	1%	8%
Herring Gull (Larus argentatus)	Birds of Conservation Concern [RSPB] - Red	11%	33%
Himalayan Cotoneaster (Cotoneaster simonsii)	Wildlife and Countryside Act Schedule 9	1%	3%
Hobby (Falco subbuteo)	Wildlife and Countryside Act - Schedule 1	9%	17%
House Martin (Delichon urbicum)	Birds of Conservation Concern [RSPB] - Amber	23%	67%
House Sparrow (Passer domesticus)	Local Biodiversity Action Plan Species, Birds of Conservation Concern [RSPB] - Red, NERC S41, UK BAP Priority Species	35%	84%
Indian Balsam (Impatiens glandulifera)	Invasive Non-Native Species, Wildlife and Countryside Act Schedule 9	24%	36%
Japanese Knotweed (Fallopia japonica)	Invasive Non-Native Species, Wildlife and Countryside Act Schedule 9	18%	31%
Keroplatus testaceus (Keroplatus testaceus)	Nationally Scarce	<1%	<1%
Kestrel (Falco tinnunculus)	Birds of Conservation Concern [RSPB] - Amber	35%	80%
Kingfisher (Alcedo atthis)	Wildlife and Countryside Act - Schedule 1, Birds of Conservation Concern [RSPB] - Amber	15%	45%
Lapwing (Vanellus vanellus)	Local Biodiversity Action Plan Species, Birds of Conservation Concern [RSPB] - Red, NERC S41, UK BAP Priority Species	28%	79%
Large Tortoiseshell (Nymphalis polychloros)	Wildlife and Countryside Act - Schedule 5	<1%	<1%
Lesser Black-backed Gull (Larus fuscus)	Birds of Conservation Concern [RSPB] - Amber	12%	29%
Little Grebe (Tachybaptus ruficollis)	Birds of Conservation Concern [RSPB] - Amber	11%	29%
Little Ringed Plover (Charadrius dubius)	Wildlife and Countryside Act - Schedule 1	3%	13%
Mallard (Anas platyrhynchos)	Birds of Conservation Concern [RSPB] - Amber	42%	82%
Marsh Tit (Poecile palustris)	Birds of Conservation Concern	2%	29%

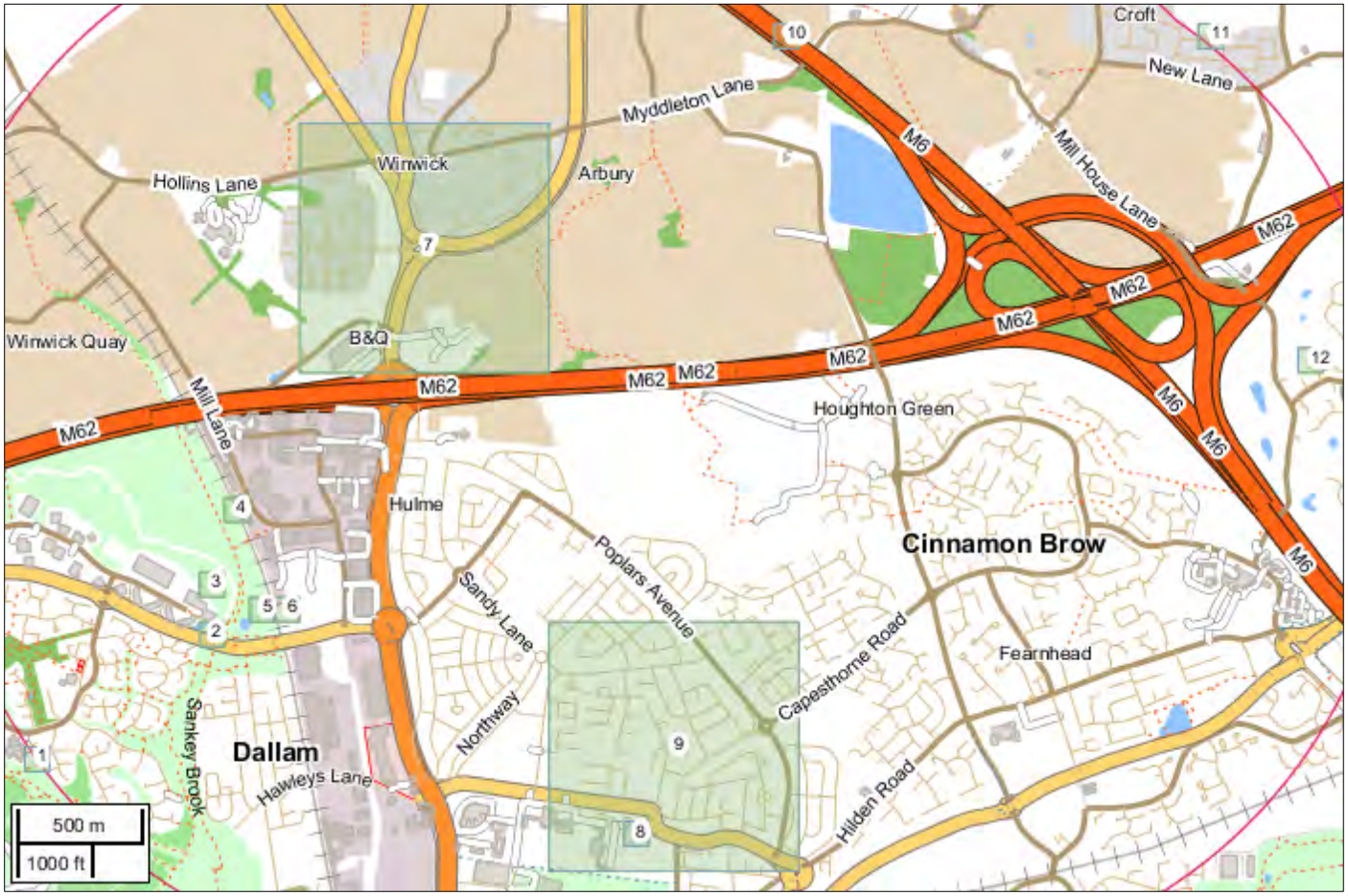
	[RSPB] - Red, NERC S41		
Meadow Pipit (Anthus pratensis)	Birds of Conservation Concern [RSPB] - Amber	13%	45%
Merlin (Falco columbarius)	Wildlife and Countryside Act - Schedule 1, Birds of Conservation Concern [RSPB] - Amber	6%	14%
Mistle Thrush (Turdus viscivorus)	Birds of Conservation Concern [RSPB] - Amber	23%	82%
New Zealand Pigmyweed (Crassula helmsii)	Invasive Non-Native Species, Wildlife and Countryside Act Schedule 9	5%	9%
Oystercatcher (Haematopus ostralegus)	Birds of Conservation Concern [RSPB] - Amber	13%	23%
Peregrine (Falco peregrinus)	Wildlife and Countryside Act - Schedule 1	11%	19%
Pink-footed Goose (Anser brachyrhynchus)	Birds of Conservation Concern [RSPB] - Amber	8%	15%
Pipistrelle (Pipistrellus pipistrellus)	Local Biodiversity Action Plan Species, Wildlife and Countryside Act - Schedule 5, Conservation (Habs and Sp) Regulations 2010 - Schedule 2	27%	54%
Pochard (Aythya ferina)	Birds of Conservation Concern [RSPB] - Amber	6%	19%
Red-eared Terrapin (Trachemys scripta)	Invasive Non-Native Species	<1%	<1%
Redshank (Tringa totanus)	Birds of Conservation Concern [RSPB] - Amber	9%	22%
Redwing (Turdus iliacus)	Wildlife and Countryside Act - Schedule 1, Birds of Conservation Concern [RSPB] - Red	18%	38%
Reed Bunting (Emberiza schoeniclus)	Local Biodiversity Action Plan Species, Birds of Conservation Concern [RSPB] - Amber, NERC S41, UK BAP Priority Species	19%	73%
Rhododendron (Rhododendron ponticum)	Invasive Non-Native Species, Wildlife and Countryside Act Schedule 9	19%	42%
Ringed Plover (Charadrius hiaticula)	Birds of Conservation Concern [RSPB] - Amber	4%	15%
Ringlet (Aphantopus hyperantus)	Local Biodiversity Action Plan Species	14%	15%
Ruddy Duck (Oxyura jamaicensis)	Invasive Non-Native Species, Wildlife and Countryside Act Schedule 9	3%	14%
Sand Martin (Riparia riparia)	Birds of Conservation Concern [RSPB] - Amber	7%	35%
Shoveler (Anas clypeata)	Birds of Conservation Concern [RSPB] - Amber	8%	18%
Skylark (Alauda arvensis)	Local Biodiversity Action Plan Species, Birds of Conservation Concern [RSPB] - Red, NERC S41	20%	85%

Slavonian Grebe (Podiceps auritus)	Wildlife and Countryside Act - Schedule 1, Birds of Conservation Concern [RSPB] - Amber	<1%	3%
Smooth Newt (Lissotriton vulgaris)	Wildlife and Countryside Act - Schedule 5	14%	35%
Snipe (Gallinago gallinago)	Birds of Conservation Concern [RSPB] - Amber	13%	54%
Song Thrush (Turdus philomelos)	Local Biodiversity Action Plan Species, Birds of Conservation Concern [RSPB] - Red	33%	87%
Starling (Sturnus vulgaris)	Local Biodiversity Action Plan Species, Birds of Conservation Concern [RSPB] - Red, NERC S41	30%	86%
Stock Dove (Columba oenas)	Birds of Conservation Concern [RSPB] - Amber	10%	65%
Swallow (Hirundo rustica)	Birds of Conservation Concern [RSPB] - Amber	44%	87%
Swift (Apus apus)	Birds of Conservation Concern [RSPB] - Amber	22%	81%
Teal (Anas crecca)	Birds of Conservation Concern [RSPB] - Amber	11%	28%
Tree Sparrow (Passer montanus)	Local Biodiversity Action Plan Species, Birds of Conservation Concern [RSPB] - Red, NERC S41, UK BAP Priority Species	10%	72%
Tufted Duck (Aythya fuligula)	Birds of Conservation Concern [RSPB] - Amber	13%	31%
Wall Cotoneaster (Cotoneaster horizontalis)	Wildlife and Countryside Act Schedule 9	2%	6%
West European Hedgehog (Erinaceus europaeus)	NERC S41, UK BAP Priority Species	24%	44%
Wheatear (Oenanthe oenanthe)	Birds of Conservation Concern [RSPB] - Amber	8%	32%
Whinchat (Saxicola rubetra)	Birds of Conservation Concern [RSPB] - Amber	3%	21%
Whitethroat (Sylvia communis)	Birds of Conservation Concern [RSPB] - Amber	17%	70%
Willow Warbler (Phylloscopus trochilus)	Birds of Conservation Concern [RSPB] - Amber	18%	83%
Woodcock (Scolopax rusticola)	Birds of Conservation Concern [RSPB] - Amber	8%	45%
Yellow Wagtail (Motacilla flava)	Birds of Conservation Concern [RSPB] - Red, NERC S41	5%	54%
Yellowhammer (Emberiza citrinella)	Local Biodiversity Action Plan Species, Birds of Conservation Concern [RSPB] - Red, NERC S41, UK BAP Priority Species	14%	77%

Species Report

AMPHIBIAN

Map



Common Frog (Rana temporaria) (1,3,5,6,7,8,9,10,11,12)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Orford - CP	SJ6190	9	26/06/2006	None	Present	Field Record
Westbrook - CP	SJ598910	5	14/03/2007	Spawn	30	Field Record
Westbrook - CP	SJ596911	3	14/03/2007	Breeding Pair	Common	Field Record
Westbrook - CP, Pond adjacent to Stanners Pool, Callands	SJ598910	5	04/04/2011	Adult	Present	Field Record
11 Chesterton Drive, Winwick	SJ6092	7	28/02/2012	None	Present	Field Record
11 Chesterton Drive	SJ6092	7	23/02/2012	None	7	Field Record
M6 Junction 21a	SJ619933	10	14/05/2008-26/09/2008	None	Present	Field Record
	SJ61309015	8	13/04/2014	None	Common	Field Record
M62 (northbound)	SJ640920	12	14/05/2008-26/09/2008	None	Present	Field Record
Garden, Wadeson Way	SJ636933	11	08/08/2010	Adult	1	Field Record
Whittle Hall - CP	SJ599910	6	22/03/2006	None	Common	Field Record
Westbrook - CP	SJ598910	5	14/03/2007	Pair	Copulating	Field Record
Westbrook - CP	SJ596911	3	14/03/2007	Pair	Common Breeding	Field Record
	SJ599910	6	22/03/2006	None	Common	Field Record
	SJ598910	5	14/03/2007	None	2	Field Record
Callands Ponds, Sankey Valley	SJ589904	1	14/03/2007	None	Common	Field Record
	SJ589904	1	14/03/2007	None	Common	Field Record

Common Toad (Bufo bufo) (2,5,10,12)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Westbrook - CP	SJ598910	5	14/03/2007	Spawn	30	Field Record
Westbrook - CP, Pond adjacent to Stanners Pool, Callands	SJ598910	5	04/04/2011	Adult	1	Field Record
Westbrook - CP, stanners pool	SJ598910	5	14/03/2007	Copulating Pair	30 Spawning	Field Record
M6 Junction 21a	SJ619933	10	14/05/2008-26/09/2008	None	Present	Field Record
M62 (northbound)	SJ640920	12	14/05/2008-26/09/2008	None	Present	Field Record

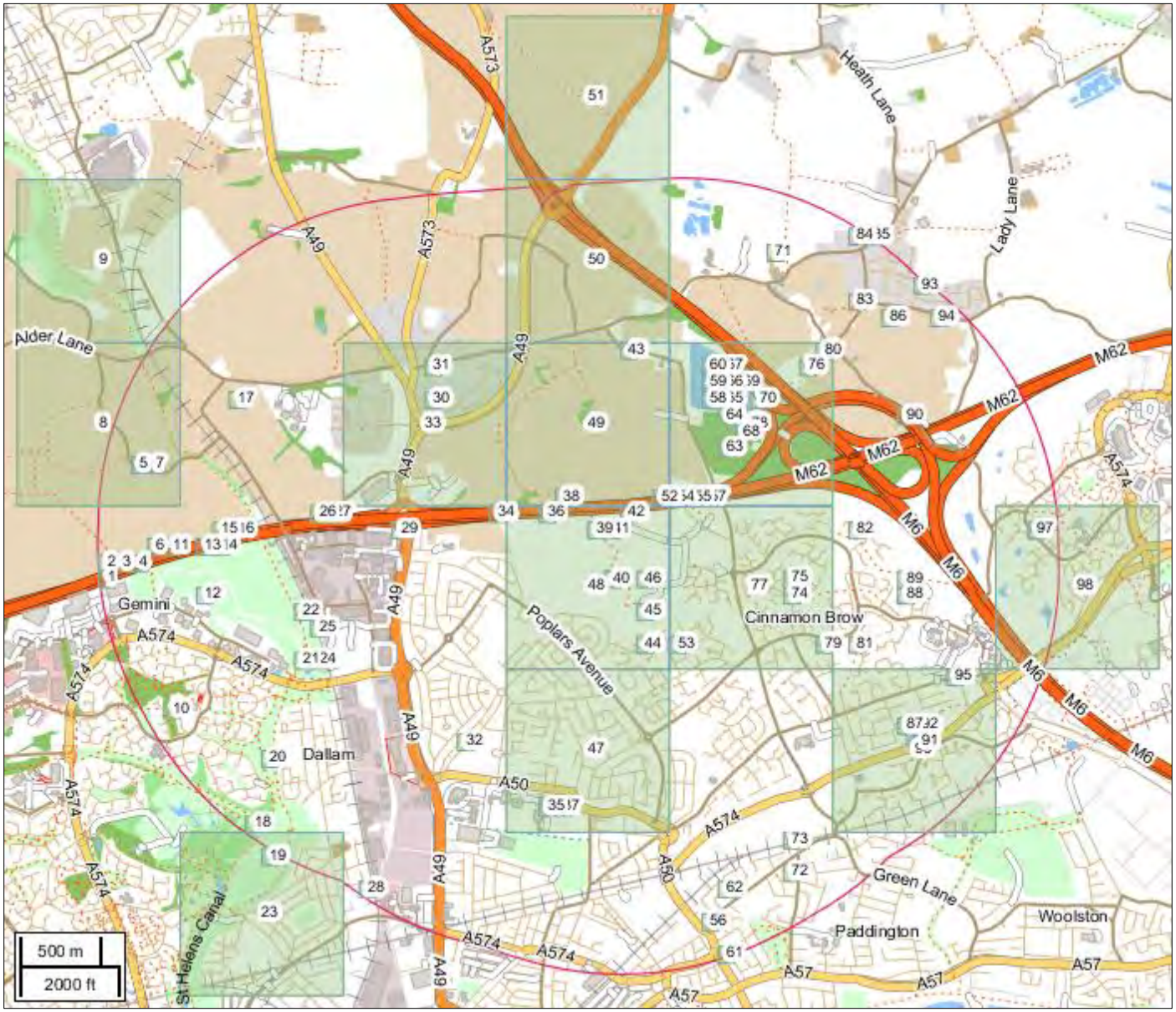
stanners pool	SJ598910	5	16/03/2009	None	6	Field Record
Gemini pond off cromwell avenue	SJ596909	2	16/03/2009	None	10	Field Record
Sankey Valley Park	SJ59609095	2	16/03/2008	None	1	Field Record

Smooth Newt (Lissotriton vulgaris) (4,5,8)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Westbrook - CP, Sankey Valley Park, Stanners Pool Area	SJ59869102	5	07/04/2011	Adult	10	Field Record
plot15	SJ61309015	8	13/04/2014	Juvenile	3	Field Record
plot 15	SJ61319016	8	16/11/2014	None	1	Field Record
Burtonwood & Winwick - CP	SJ597914	4	04/04/2006	None	Present	Field Record
	SJ597914	4	04/04/2006	None	Present	Field Record
Pond adjacent to Stanners Pool, Callands	SJ598910	5	04/04/2011	Adult	50	Field Record
Sankey Valley Park, Stanners Pool Area	SJ59869102	5	07/04/2011	Adult	10	Field Record

Map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Canada Goose (Branta canadensis) (23,33,50,60,77)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Houghton Green Pool	SJ6193	50	08/09/2011	None	2	Field Record
Houghton Green Pool	SJ6193	50	26/07/2011	None	4	Field Record
Myddleton Lane , Winwick	SJ6092	33	18/03/2011	None	3	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	06/2008-06/2008	None	Present	Field Record
	SJ622928	60	26/06/2012	None	21	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	03/2008-03/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2007-04/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	02/2007-02/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	10/2007-10/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	09/2007-09/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2007-05/2007	None	Present	Field Record
Hought Geen Pool SINC - pond	SJ622928	60	15/07/2012	None	20	Field Record

	SJ622928	60	25/02/2012	None	2	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	06/2007-06/2007	None	Present	Field Record
Bewsey & Whitecross - CP, In and alongside the canal	SJ5989	23	15/12/2012	None	12	Field Record

House Sparrow (Passer domesticus) (9,30,31,33,47,48,49,50,60,62)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Orford - CP	SJ6190	47	26/06/2006	None	Present	Field Record
	SJ622928	60	29/02/2012	None	26	Field Record
Houghton Green Pool	SJ6193	50	30/05/2011	None	20	Field Record
Houghton Green Pool	SJ6193	50	08/09/2011	None	60	Field Record
Houghton Green Pool	SJ6193	50	27/08/2011	None	175	Field Record
Houghton Green Pool	SJ6193	50	02/02/2011	None	30	Field Record
Arbury	SJ6193	50	25/09/2011	None	10	Field Record
Winwick	SJ605926	30	03/02/2012	None	14	Field Record
Winwick	SJ605926	30	01/02/2012	None	40	Field Record
Winwick	SJ605926	30	08/08/2012	None	24	Field Record
Winwick	SJ605926	30	06/08/2012	None	16	Field Record
Winwick, Myddleton Lane, Winwick	SJ6092	33	28/01/2011	None	8	Field Record
Winwick, Myddleton Lane, Winwick	SJ6092	33	29/01/2011	None	11	Field Record
Winwick	SJ605928	31	02/03/2012	None	18	Field Record
Hermitage Green Lane	SJ6092	33	09/08/2011	None	100	Field Record
Winwick	SJ605928	31	23/02/2012	None	40	Field Record
Winwick	SJ605928	31	21/02/2012	None	59	Field Record
Hermitage Green Lane	SJ6092	33	01/08/2011	None	12	Field Record
Winwick	SJ605926	30	26/08/2012	None	25	Field Record
Arbury	SJ6193	50	03/08/2011	None	25	Field Record

Houghton Green Pool	SJ6193	50	31/07/2011	None	71	Field Record
	SJ6192	49	02/04/2012	None	42	Field Record
	SJ6192	49	13/12/2012	None	19	Field Record
	SJ6192	49	16/08/2012	None	20	Field Record
	SJ6192	49	17/08/2012	None	12	Field Record
	SJ6192	49	11/01/2012	None	15	Field Record
Winwick	SJ6192	49	26/04/2012	None	20	Field Record
	SJ6192	49	23/04/2012	None	2	Field Record
	SJ6192	49	24/04/2012	None	57	Field Record
Winwick	SJ605926	30	29/11/2012	None	24	Field Record
Winwick	SJ6192	49	25/04/2012	None	12	Field Record
Warrington	SJ62338963	62	19/04/2015	Adult	2	Field Record
Warrington	SJ62328962	62	14/02/2015	Adult	2	Field Record
Warrington	SJ62328962	62	15/02/2015	Adult	4	Field Record
	SJ5893	9	24/02/2011	None	8	Field Record
	SJ6191	48	06/07/2014	None	37	Field Record
	SJ6191	48	29/06/2014	None	33	Field Record

Kingfisher (Alcedo atthis) (20,77,82)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Whittle Hall - CP	SJ595904	20	07/06/2006	None	Present	Field Record
Whittle Hall - CP, quarry pond, off north park brook rd, sankey valley park	SJ595904	20	07/06/2006	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	10/2008-10/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	09/2007-09/2007	None	Present	Field Record
Poulton North - CP, On Spittle Brook, at St Andrews Close	SJ631918	82	16/01/2014	Adult	1	Field Record

Black-headed Gull (Chroicocephalus ridibundus) (9,33,50,58,60,62,65,77,78)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Willow / Birch Natural Regeneration, Peel Hall Area - Comp 12	SJ6292	78	28/12/2006	None	35	Field Record
Houghton Green Pool	SJ6193	50	07/09/2011	None	12	Field Record
Houghton Green Pool	SJ6193	50	31/08/2011	None	24	Field Record
Houghton Green Pool	SJ6193	50	31/07/2011	None	5	Field Record
Houghton Green Pool	SJ6193	50	14/09/2011	None	138	Field Record
Houghton Green Pool	SJ6193	50	13/09/2011	None	46	Field Record
Arbury	SJ6193	50	25/09/2011	None	260	Field Record
Houghton Green Pool	SJ6193	50	17/09/2011	None	214	Field Record
Myddleton Lane , Winwick	SJ6092	33	18/03/2011	None	64	Field Record
Myddleton Lane	SJ6092	33	29/09/2011	None	216	Field Record
Hermitage Green Lane	SJ6092	33	01/08/2011	None	120	Field Record
Houghton Green Pool	SJ6193	50	09/04/2011	None	61	Field Record
Houghton Green Pool	SJ6193	50	19/08/2011	None	30	Field Record
Arbury	SJ6193	50	03/08/2011	None	150	Field Record
Winwick, Myddleton Lane, Winwick	SJ6092	33	29/01/2011	None	70	Field Record
	SJ623926	65	28/03/2013	Adult	20 Approx	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	03/2008-03/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	02/2008-02/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield	SJ6291	77	02/2007-02/2007	None	Present	Field Record

Park-Mill Lane-Radley common-Peel Hall Park, W						
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	01/2007-01/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	01/2008-01/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	12/2007-12/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	11/2007-11/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2008-05/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	03/2007-03/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2008-04/2008	None	Present	Field Record
Warrington	SJ62328962	62	14/02/2015	Adult	Present	Field Record
	SJ5893	9	24/02/2011	None	16	Field Record
	SJ622928	60	22/02/2014	Adult	C. 60	Field Record
	SJ622926	58	08/02/2011	None	150	Field Record

Mistle Thrush (Turdus viscivorus) (30,33,48,49,50,60,62,73,77,80,84,85)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Croft, In tree on	SJ632936	85	14/11/2014	Adult	1	Field Record

Lord St						
Radley Plantation	SJ6193	50	22/03/2011	None	2	Field Record
Houghton Green Pool	SJ6193	50	27/08/2011	None	1	Field Record
Houghton Green Pool	SJ6193	50	02/02/2011	None	3	Field Record
Winwick	SJ605926	30	01/02/2012	None	1	Field Record
Winwick	SJ605926	30	10/12/2012	None	4	Field Record
Winwick	SJ605926	30	09/02/2012	None	1	Field Record
Winwick	SJ605926	30	03/02/2012	None	2	Field Record
Winwick, Myddleton Lane, Winwick	SJ6092	33	29/01/2011	None	12	Field Record
Houghton Green Pool	SJ6193	50	11/02/2011	None	2	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	10/2008-10/2008	None	Present	Auditory Record
	SJ6192	49	13/12/2012	None	5	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	06/2008-06/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	03/2008-03/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2007-05/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	09/2008-09/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	09/2008-09/2008	None	Present	Field Record

Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	08/2008-08/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2007-04/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	03/2007-03/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2007-05/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	02/2007-02/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	02/2007-02/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	01/2008-01/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	01/2008-01/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	11/2007-11/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-	SJ6291	77	11/2007-11/2007	None	Present	Auditory Record

Peel Hall Park, W						
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	10/2007-10/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	09/2007-09/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	08/2007-08/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	07/2007-07/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	11/2008-11/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	07/2008-07/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	06/2008-06/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2008-05/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	02/2008-02/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield	SJ6291	77	01/2007-01/2007	None	Present	Field Record

Park-Mill Lane-Radley common-Peel Hall Park, W						
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	12/2007-12/2007	None	Present	Field Record
Croft, Smithy Brow, garden opposite bus stop	SJ631936	84	04/01/2013	Adult	1	Field Record
	SJ622928	60	29/02/2012	None	1	Field Record
	SJ622928	60	02/04/2012	None	3	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	07/2008-07/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	06/2007-06/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	12/2008-12/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	11/2008-11/2008	None	Present	Auditory Record
Winwick	SJ6192	49	26/04/2012	None	1	Field Record
Croft	SJ629929	80	28/03/2013	Adult	2	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	08/2008-08/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2008-05/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-	SJ6291	77	04/2008-04/2008	None	Present	Field Record

Radley common-Peel Hall Park, W						
Warrington	SJ62328962	62	14/02/2015	Adult	1	Field Record
Warrington	SJ62328962	62	15/02/2015	Adult	1	Field Record
	SJ6191	48	06/07/2014	None	2	Field Record
	SJ6191	48	29/06/2014	None	2	Field Record
	SJ62798997	73	29/08/2008	None	5	Field Record

Kestrel (Falco tinnunculus) (2,3,4,6,11,13,15,16,18,22,25,26,29,30,31,33,39,41,45,48,49,50,52,54,57,60,70,77)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Peel Cottage Lane	SJ6191	48	06/02/2014	None	2	Field Record
	SJ622928	60	23/04/2012	None	Present	Field Record
Houghton Green Pool	SJ6193	50	02/02/2011	None	1	Field Record
Houghton Green Pool	SJ6193	50	10/09/2011	None	2	Field Record
Houghton Green Pool	SJ6193	50	30/05/2011	None	1	Field Record
Houghton Green Pool	SJ6193	50	07/09/2011	None	2	Field Record
Houghton Green Pool	SJ6193	50	27/08/2011	None	1	Field Record
Houghton Green Pool	SJ6193	50	31/07/2011	None	1	Field Record
Houghton Green Pool	SJ6193	50	08/09/2011	None	2	Field Record
Houghton Green Pool	SJ6193	50	14/09/2011	None	Present	Field Record
Winwick	SJ605926	30	09/02/2012	None	1	Field Record
Winwick	SJ605926	30	01/02/2012	None	1	Field Record
Warrington	SJ603918	29	26/05/2011	None	1	Field Record
Hermitage Green Lane	SJ6092	33	09/08/2011	None	2	Field Record
Myddleton Lane	SJ6092	33	03/08/2011	None	1	Field Record
Coney Grove Woods	SJ59849190	26	05/08/2011	None	1	Field Record
Winwick, Myddleton Lane, Winwick	SJ6092	33	29/01/2011	None	2	Field Record
Myddleton Lane , Winwick	SJ6092	33	10/03/2011	None	1	Field Record

Winwick	SJ605928	31	02/03/2012	None	4	Field Record
Myddleton Lane	SJ6092	33	29/09/2011	None	3	Field Record
Myddleton Lane	SJ6092	33	27/09/2011	None	2	Field Record
Winwick	SJ605928	31	21/02/2012	None	2	Field Record
Hermitage Green Lane	SJ6092	33	01/08/2011	None	3	Field Record
Coney Grove Woods	SJ59399182	16	19/06/2012	None	1	Field Record
Coney Grove Woods	SJ59379181	16	16/03/2012	None	1	Field Record
Coney Grove Woods	SJ592918	15	31/03/2011	None	1	Field Record
Warrington	SJ59199178	13	05/07/2012	None	1	Field Record
Warrington	SJ585916	2	11/04/2012	None	1	Field Record
Warrington	SJ58999171	11	15/06/2012	None	1	Field Record
Warrington	SJ58899170	6	23/05/2012	None	1	Field Record
Warrington	SJ58799167	4	19/06/2012	None	1	Field Record
Warrington	SJ58699164	3	05/08/2011	None	1	Field Record
Myddleton Lane, Winwick	SJ6092	33	04/03/2011	None	1	Field Record
Myddleton Lane	SJ6092	33	30/07/2011	None	2	Field Record
Winwick	SJ605926	30	11/09/2012	None	2	Field Record
Winwick	SJ605926	30	09/09/2012	None	1	Field Record
Houghton Green Pool	SJ6193	50	03/08/2011	None	2	Field Record
Arbury	SJ6193	50	05/06/2011	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	10/2008-10/2008	None	Present	Field Record
Midhops Plantation	SJ62009202	54	11/06/2012	None	1	Field Record
John Parr Wild Flower Meadow	SJ618913	45	28/06/2012	None	Present	Field Record
Peel Cottage Lane, Peel Hall area	SJ615918	39	14/12/2011	Adult	1	Field Record
	SJ6192	49	21/09/2012	None	1	Field Record
	SJ6192	49	13/12/2012	None	1	Field Record
	SJ6192	49	16/08/2012	None	2	Field Record

	SJ6192	49	22/09/2012	None	1	Field Record
	SJ622928	60	11/09/2012	None	1	Field Record
	SJ622928	60	10/01/2012	None	1	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	03/2008-03/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2007-04/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	02/2007-02/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	01/2007-01/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	08/2008-08/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	12/2007-12/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	11/2007-11/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	09/2007-09/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-	SJ6291	77	12/2008-12/2008	None	Present	Field Record

Peel Hall Park, W						
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2007-05/2007	None	Present	Field Record
Culcheth, Glazebury & Croft - CP, By M6	SJ625926	70	26/12/2011	Adult	2	Field Record
Midhops Plantation	SJ622920	57	18/11/2011	None	1	Field Record
	SJ622928	60	06/02/2012	None	1	Field Record
	SJ622928	60	12/04/2012	None	1	Field Record
Winwick	SJ6192	49	26/04/2012	None	3	Field Record
Burtonwood & Winwick - CP, Peel Hall Farm area, Radley Lane, Warrington	SJ61639189	41	06/05/2013	Adult	1	Field Record
Midhops Plantation	SJ61939203	52	29/05/2012	None	1	Field Record
Over woods by Gulliver's world.	SJ594900	18	16/11/2010	Adult	1	Field Record
	SJ6191	48	06/07/2014	None	3	Field Record
	SJ6191	48	29/06/2014	None	3	Field Record
Dallam sluice	SJ597913	22	08/03/2009	None	1	Field Record
Pallam Sluice	SJ598912	25	08/03/2009	None	1	Field Record

Grey Partridge (Perdix perdix) (30,31,33,46,49,50,60,64,66,67,77,78,94)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
	SJ618915	46	15/08/2014	Adult	6	Field Record
	SJ622928	60	14/05/2012	None	2	Field Record
Houghton Green Pool	SJ6193	50	14/09/2011	None	57	Field Record
Houghton Green Pool	SJ6193	50	30/05/2011	None	1	Field Record
Houghton Green Pool	SJ6193	50	13/09/2011	None	16	Field Record
Houghton Green Pool	SJ6193	50	10/09/2011	None	16	Field Record
Winwick	SJ605926	30	05/02/2012	None	3	Field Record
Winwick	SJ605926	30	18/11/2012	None	3	Field Record
Winwick	SJ605926	30	01/02/2012	None	2	Field Record

Winwick	SJ605926	30	11/05/2012	None	6	Field Record
Myddleton Lane, Winwick	SJ6092	33	20/03/2011	None	2	Field Record
Myddleton Lane , Winwick	SJ6092	33	10/03/2011	None	2	Field Record
Winwick, Myddleton Lane, Winwick	SJ6092	33	08/02/2011	None	5	Field Record
Myddleton Lane, Winwick	SJ6092	33	08/03/2011	None	6	Field Record
Myddleton Lane, Winwick	SJ6092	33	01/03/2011	None	4	Field Record
Winwick	SJ605928	31	02/03/2012	None	4	Field Record
Winwick	SJ605928	31	23/02/2012	None	6	Field Record
Winwick	SJ605928	31	21/02/2012	None	4	Field Record
Myddleton Lane	SJ6092	33	30/07/2011	None	4	Field Record
Houghton Green Pool	SJ6193	50	25/09/2011	None	37	Field Record
Arbury	SJ6193	50	03/08/2011	None	16	Field Record
Houghton Green Pool	SJ6193	50	31/07/2011	None	15	Field Record
Houghton Green Pool	SJ6193	50	08/09/2011	None	67	Field Record
	SJ6192	49	02/04/2012	None	2	Field Record
Winwick	SJ6192	49	25/04/2012	None	2	Field Record
	SJ623928	67	04/04/2015	Adult	2	Field Record
	SJ623928	67	30/06/2012	Adult	2	Field Record
	SJ623927	66	10/09/2015	Adult	12	Field Record
	SJ623927	66	15/08/2015	Adult	8	Field Record
Winwick	SJ605926	30	08/10/2012	None	3	Field Record
Winwick	SJ605926	30	29/11/2012	None	3	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	02/2008-02/2008	None	Present	Field Record
	SJ623925	64	22/04/2012	Adult	2	Field Record
Croft, Stubble field	SJ636931	94	13/11/2016	Adult	9	Field Record
Willow / Birch Natural Regeneration, Peel Hall Area - Comp 12	SJ6292	78	28/12/2006	Adult	4	Field Record

	SJ622928	60	20/02/2012	None	2	Field Record
	SJ622928	60	06/02/2012	None	16	Field Record

Meadow Pipit (Anthus pratensis) (8,30,31,33,48,49,60,78)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Peel Cottage Lane	SJ6191	48	06/02/2014	None	5	Field Record
Winwick	SJ605926	30	09/10/2012	None	60	Field Record
Winwick	SJ605928	31	02/03/2012	None	1	Field Record
Winwick	SJ605926	30	29/11/2012	None	3	Field Record
Myddleton Lane	SJ6092	33	29/09/2011	None	24	Field Record
Winwick	SJ605926	30	15/01/2012	None	4	Field Record
	SJ6192	49	02/04/2012	None	2	Field Record
	SJ6192	49	13/12/2012	None	53	Field Record
Winwick	SJ605926	30	08/10/2012	None	40	Field Record
Winwick	SJ605926	30	10/12/2012	None	3	Field Record
	SJ6292	78	28/12/2006	None	13	Field Record
	SJ6292	78	28/12/2006	None	13	Field Record
	SJ622928	60	02/04/2012	None	2	Field Record
	SJ5892	8	24/02/2011	None	9	Field Record

Herring Gull (Larus argentatus) (30,33,48,49,50,60,62,77)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Peel Cottage Lane	SJ6191	48	06/02/2014	None	40	Field Record
	SJ622928	60	03/03/2012	None	12	Field Record
Houghton Green Pool	SJ6193	50	26/07/2011	None	1	Field Record
Winwick	SJ605926	30	03/02/2012	None	2	Field Record
Winwick	SJ605926	30	29/11/2012	None	7	Field Record
Winwick, Myddleton Lane, Winwick	SJ6092	33	29/01/2011	None	4	Field Record
Winwick	SJ605926	30	26/08/2012	None	10	Field Record
	SJ6192	49	10/01/2012	None	1	Field Record
	SJ622928	60	14/01/2012	None	8	Field Record
Burtonwood & Winwick - CP,	SJ6291	77	10/2007-10/2007	None	Present	Field Record

Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W						
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	07/2007-07/2007	None	Present	Field Record
	SJ622928	60	18/02/2012	None	10	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	06/2007-06/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2008-04/2008	None	Present	Field Record
Warrington	SJ62328962	62	14/02/2015	Adult	Present	Field Record

Lapwing (Vanellus vanellus) (1,3,30,31,33,36,42,49,50,55,59,60,66,67,68,69,77,78)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
	SJ622928	60	20/10/2014	Adult	9	Field Record
	SJ622928	60	14/05/2012	None	6	Field Record
	SJ622928	60	09/05/2012	None	2	Field Record
	SJ622928	60	23/04/2012	None	Present	Field Record
	SJ622928	60	21/04/2012	None	2	Field Record
Houghton Green Pool	SJ6193	50	20/03/2011	None	3	Field Record
Houghton Green Pool	SJ6193	50	30/05/2011	None	2	Field Record
Houghton Green Pool	SJ6193	50	05/04/2011	None	2	Field Record
Houghton Green Pool	SJ6193	50	27/08/2011	None	18	Field Record
Houghton Green Pool	SJ6193	50	03/08/2011	None	1	Field Record
Winwick	SJ605926	30	18/12/2012	None	210	Field Record
Winwick	SJ605926	30	09/02/2012	None	9	Field Record
Winwick	SJ605926	30	03/02/2012	None	19	Field Record
Winwick	SJ605926	30	29/01/2012	None	250	Field Record

Warrington	SJ61269197	36	21/02/2013	None	30	Field Record
Winwick, Myddleton Lane, Winwick	SJ6092	33	08/02/2011	None	30	Field Record
Myddleton Lane, Winwick	SJ6092	33	04/03/2011	None	6	Field Record
Myddleton Lane, Winwick	SJ6092	33	01/03/2011	None	4	Field Record
Myddleton lane	SJ6092	33	24/02/2011	None	2	Field Record
Winwick	SJ605928	31	02/03/2012	None	12	Field Record
Myddleton Lane	SJ6092	33	27/09/2011	None	51	Field Record
Winwick	SJ605928	31	21/02/2012	None	44	Field Record
Warrington	SJ586916	3	19/04/2011	None	1	Field Record
Warrington	SJ58599158	1	27/07/2012	None	1	Field Record
Winwick, Houghton Green Pool	SJ6193	50	17/02/2011	None	70	Field Record
Houghton Green Pool	SJ6193	50	26/07/2011	None	1	Field Record
Midhops Plantation	SJ62149205	55	15/05/2012	None	1	Field Record
Winwick	SJ6192	49	25/04/2012	None	2	Field Record
	SJ6192	49	13/12/2012	None	26	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	06/2008-06/2008	None	Present	Field Record
	SJ622928	60	16/04/2012	None	2	Field Record
	SJ622928	60	04/02/2012	None	17	Field Record
	SJ624927	69	22/04/2012	Adult	1	Field Record
	SJ623928	67	17/03/2012	Adult	2	Field Record
	SJ622927	59	04/04/2015	Adult	2	Field Record
Winwick	SJ605926	30	11/05/2012	None	10	Field Record
Winwick	SJ605926	30	15/05/2012	None	6	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2008-04/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield	SJ6291	77	01/2007-01/2007	None	Present	Field Record

Park-Mill Lane-Radley common-Peel Hall Park, W						
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2007-04/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	02/2007-02/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	07/2008-07/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2007-05/2007	None	Present	Field Record
	SJ622928	60	10/01/2012	None	1	Field Record
	SJ622928	60	03/03/2012	None	16	Field Record
	SJ622928	60	29/02/2012	None	102	Field Record
	SJ622928	60	18/02/2012	None	59	Field Record
	SJ622928	60	06/02/2012	None	192	Field Record
	SJ622928	60	02/04/2012	None	1	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	06/2007-06/2007	None	Present	Field Record
Adjacent field	SJ624924	68	28/03/2013	Adult	2	Field Record
Houghton Green Pool, Delph lane, Warrington	SJ6227792754	59	31/05/2013	Adult	8	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2008-05/2008	None	Present	Field Record
Peel Hall	SJ61729199	42	20/05/2011	None	1	Field Record
	SJ623927	66	02/02/2014	Adult	50 Approx	Field Record
	SJ623927	66	20/01/2014	Adult	18	Field Record

	SJ623927	66	16/01/2014	Adult	27	Field Record
	SJ6292	78	08/02/2011	None	12	Field Record

Fieldfare (Turdus pilaris) (17,30,33,49,50,60,76,83,90)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
	SJ593926	17	20/01/2012	None	60	Field Record
Houghton Green Pool	SJ6193	50	11/02/2011	None	47	Field Record
Houghton Green Pool	SJ6193	50	02/02/2011	None	30	Field Record
Winwick	SJ605926	30	09/02/2012	None	21	Field Record
Winwick	SJ605926	30	05/02/2012	None	1	Field Record
Winwick	SJ605926	30	03/02/2012	None	6	Field Record
Winwick	SJ605926	30	18/12/2012	None	62	Field Record
Winwick	SJ605926	30	10/12/2012	None	51	Field Record
Winwick, Myddleton Lane, Winwick	SJ6092	33	08/02/2011	None	40	Field Record
Winwick	SJ605926	30	29/11/2012	None	3	Field Record
Winwick, Houghton Green Pool	SJ6193	50	17/02/2011	None	35	Field Record
	SJ6192	49	13/12/2012	None	27	Field Record
Croft, Fields along Smithy Lane	SJ631932	83	28/03/2013	Adult	6 Approx	Field Record
	SJ622928	60	06/02/2012	None	4	Field Record
Culcheth, Glazebury & Croft - CP	SJ628928	76	02/02/2014	Adult	15 Approx	Field Record
Croft, Hop-pole Kennels	SJ634925	90	26/12/2013	Adult	9	Field Record

Mallard (Anas platyrhynchos) (9,33,45,49,50,53,58,60,77,87,91,92)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
	SJ622928	60	09/05/2012	None	1	Field Record
Houghton Green Pool	SJ6193	50	02/02/2011	None	55	Field Record
Houghton Green Pool	SJ6193	50	19/08/2011	None	70	Field Record
Houghton Green Pool	SJ6193	50	31/07/2011	None	27	Field Record

Houghton Green Pool	SJ6193	50	04/06/2011	None	4	Field Record
Houghton Green Pool	SJ6193	50	07/09/2011	None	66	Field Record
Houghton Green Pool	SJ6193	50	31/08/2011	None	42	Field Record
Houghton Green Pool	SJ6193	50	27/08/2011	None	82	Field Record
Winwick, Houghton Green Pool	SJ6193	50	17/02/2011	None	41	Field Record
Houghton Green Pool	SJ6193	50	12/02/2011	None	19	Field Record
Houghton Green Pool	SJ6193	50	13/09/2011	None	68	Field Record
Houghton Green Pool	SJ6193	50	25/09/2011	None	65	Field Record
Houghton Green Pool	SJ6193	50	17/09/2011	None	71	Field Record
Houghton Green Pool	SJ6092	33	20/03/2011	None	2	Field Record
Houghton Green Pool	SJ6193	50	03/08/2011	None	40	Field Record
Houghton Green Pool	SJ6193	50	26/07/2011	None	23	Field Record
Houghton Green Pool	SJ6193	50	08/09/2011	None	65	Field Record
John Parr Wild Flower Meadow	SJ618913	45	28/06/2012	None	Present	Field Record
	SJ6192	49	02/04/2012	None	1	Field Record
	SJ6192	49	21/09/2012	None	3	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	06/2008-06/2008	None	Present	Field Record
	SJ622928	60	10/01/2012	None	57	Field Record
	SJ622928	60	04/02/2012	None	64	Field Record
	SJ622928	60	14/01/2012	None	48	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	03/2008-03/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield	SJ6291	77	02/2008-02/2008	None	Present	Field Record

Park-Mill Lane-Radley common-Peel Hall Park, W						
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2007-05/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2008-04/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	02/2007-02/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2007-04/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	08/2008-08/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	01/2007-01/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	01/2008-01/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	12/2007-12/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	09/2007-09/2007	None	Present	Field Record
Burtonwood & Winwick - CP,	SJ6291	77	07/2007-07/2007	None	Present	Field Record

Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W						
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	10/2007-10/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	07/2007-07/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	09/2008-09/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2008-05/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	03/2007-03/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	08/2007-08/2007	None	Present	Field Record
	SJ622928	60	28/01/2012	None	49	Field Record
	SJ622928	60	03/03/2012	None	21	Field Record
	SJ622928	60	29/02/2012	None	29	Field Record
	SJ622928	60	20/02/2012	None	28	Field Record
	SJ622928	60	18/02/2012	None	48	Field Record
	SJ622928	60	06/02/2012	None	66	Field Record
	SJ622928	60	11/09/2012	None	66	Field Record
	SJ622928	60	28/03/2013	Adult	10 Approx	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-	SJ6291	77	06/2007-06/2007	None	Present	Field Record

Peel Hall Park, W						
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	12/2008-12/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	07/2008-07/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	11/2008-11/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	10/2008-10/2008	None	Present	Field Record
	SJ6192	49	23/04/2012	None	8	Field Record
Burtonwood & Winwick - CP, Grasmere Avenue, Warrington	SJ62039119	53	14/05/2013	Adult	2	Field Record
	SJ5893	9	24/02/2011	None	2	Field Record
	SJ635906	92	16/01/2014	Adult	25	Field Record
	SJ622926	58	22/02/2014	Adult	8	Field Record
Fearnhead	SJ63519060	92	13/06/2007	Adult	34	Field Record
Longbarn Pool	SJ63569061	92	13/06/2007	Adult Female	7	Field Record
Longbarn Pool	SJ63519057	91	13/06/2007	Adult	5	Field Record
Fearnhead	SJ63469063	87	13/06/2007	Adult	26	Field Record
	SJ622926	58	08/02/2011	None	Present	Field Record

Dunnock (Prunella modularis) (8,30,33,48,49,50,60,62,77,88)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
	SJ622928	60	09/05/2012	None	3	Field Record
Radley Plantation	SJ6193	50	29/08/2011	None	4	Field Record
Houghton Green Pool	SJ6193	50	12/02/2011	None	1	Field Record
Winwick, Myddleton Lane,	SJ6092	33	29/01/2011	None	2	Field Record

Winwick						
Houghton Green Pool	SJ6193	50	30/05/2011	None	1	Field Record
Winwick	SJ6192	49	26/04/2012	None	4	Field Record
	SJ6192	49	16/08/2012	None	1	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	06/2008-06/2008	None	Present	Field Record
Winwick	SJ605926	30	29/11/2012	None	4	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	03/2008-03/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	03/2008-03/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	02/2008-02/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2007-05/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2008-04/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2007-04/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	03/2007-03/2007	None	Present	Field Record
Burtonwood & Winwick - CP,	SJ6291	77	03/2007-03/2007	None	Present	Auditory Record

Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W						
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	02/2007-02/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	02/2007-02/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	08/2008-08/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	01/2007-01/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	01/2008-01/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	01/2008-01/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	12/2007-12/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	11/2007-11/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	11/2007-11/2007	None	Present	Auditory Record

Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	01/2007-01/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	09/2007-09/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	07/2007-07/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	07/2007-07/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	09/2008-09/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	10/2007-10/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	08/2007-08/2007	None	Present	Field Record
	SJ622928	60	29/02/2012	None	2	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	06/2007-06/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	12/2008-12/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield	SJ6291	77	12/2008-12/2008	None	Present	Auditory Record

Park-Mill Lane-Radley common-Peel Hall Park, W						
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	11/2008-11/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	11/2008-11/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	10/2008-10/2008	None	Present	Field Record
Stonehaven Drive	SJ63439142	88	10/05/2010	Adult	2	Field Record
	SJ6192	49	02/04/2012	None	2	Field Record
	SJ6192	49	23/04/2012	None	1	Field Record
Winwick	SJ6192	49	25/04/2012	None	3	Field Record
	SJ6192	49	24/04/2012	None	5	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2008-05/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2008-05/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	07/2008-07/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2008-04/2008	None	Present	Field Record
Warrington	SJ62328962	62	14/02/2015	Adult	2	Field Record
	SJ6191	48	08/07/2014	None	Present	Field Record
	SJ6191	48	06/07/2014	None	3	Field Record

	SJ6191	48	29/06/2014	None	8	Field Record
	SJ5892	8	24/02/2011	None	4	Field Record

Arctic Tern (Sterna paradisaea) (50,60)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
	SJ622928	60	25/04/2012	None	3	Field Record
Houghton Green Pool	SJ6193	50	09/09/2011	None	3	Field Record

Little Ringed Plover (Charadrius dubius) (50,60)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
	SJ622928	60	25/04/2012	None	7	Field Record
	SJ622928	60	21/04/2012	None	1	Field Record
Houghton Green Pool	SJ6193	50	04/06/2011	None	1	Field Record
Houghton Green Pool	SJ6193	50	29/07/2011	None	1	Field Record
Houghton Green Pool	SJ6193	50	28/05/2011	None	2	Field Record
Houghton Green Pool	SJ6193	50	06/04/2011	None	2	Field Record
Houghton Green Pool	SJ6193	50	26/07/2011	None	2	Field Record
	SJ622928	60	16/08/2012	None	1	Field Record
	SJ622928	60	26/06/2012	None	3	Field Record
	SJ622928	60	12/04/2012	None	2	Field Record
	SJ622928	60	16/04/2012	None	7	Field Record
	SJ622928	60	11/04/2012	None	2	Field Record
	SJ622928	60	04/04/2012	None	2	Field Record
	SJ622928	60	15/04/2012	None	3	Field Record

Little Grebe (Tachybaptus ruficollis) (50,59)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Houghton Green Pool	SJ6193	50	09/09/2011	None	7	Field Record
Houghton Green Pool	SJ6193	50	31/08/2011	None	5	Field Record
Houghton Green Pool	SJ6193	50	27/08/2011	None	4	Field Record

Houghton Green Pool	SJ6193	50	19/08/2011	None	3	Field Record
Houghton Green Pool	SJ6193	50	07/09/2011	None	5	Field Record
Houghton Green Pool	SJ6193	50	13/09/2011	None	3	Field Record
Houghton Green Pool	SJ6193	50	25/09/2011	None	4	Field Record
Houghton Green Pool	SJ6193	50	14/09/2011	None	3	Field Record
Houghton Green Pool	SJ62239278	59	29/09/2007	Adult	2	Field Record

Common Gull (Larus canus) (30,33,49,50,60)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Houghton Green Pool	SJ6193	50	17/09/2011	None	2	Field Record
Houghton Green Pool	SJ6193	50	27/08/2011	None	2	Field Record
Houghton Green Pool	SJ6193	50	31/07/2011	None	1	Field Record
Houghton Green Pool	SJ6193	50	07/09/2011	None	1	Field Record
Houghton Green Pool	SJ6193	50	13/09/2011	None	3	Field Record
Myddleton Lane, Winwick	SJ6092	33	04/03/2011	None	1	Field Record
Myddleton Lane, Winwick	SJ6092	33	25/02/2011	None	2	Field Record
Myddleton Lane	SJ6092	33	29/09/2011	None	Present	Field Record
Myddleton Lane	SJ6092	33	27/09/2011	None	Present	Field Record
Hermitage Green Lane	SJ6092	33	01/08/2011	None	1	Field Record
Myddleton Lane	SJ6092	33	30/07/2011	None	2	Field Record
Winwick	SJ605926	30	15/01/2012	None	8	Field Record
Winwick	SJ605926	30	09/09/2012	None	1	Field Record
Houghton Green Pool	SJ6193	50	14/09/2011	None	4	Field Record
	SJ6192	49	21/09/2012	None	5	Field Record
	SJ622928	60	11/09/2012	None	2	Field Record
	SJ622928	60	04/02/2012	None	9	Field Record
	SJ622928	60	28/01/2012	None	6	Field Record
	SJ622928	60	14/01/2012	None	9	Field Record

	SJ622928	60	05/03/2012	None	2	Field Record
Winwick	SJ605926	30	14/10/2012	None	3	Field Record
	SJ622928	60	03/03/2012	None	6	Field Record
	SJ622928	60	20/02/2012	None	3	Field Record
	SJ622928	60	18/02/2012	None	8	Field Record

Corn Bunting (Emberiza calandra) (30,33,48,49,50,60)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Houghton Green Pool	SJ6193	50	30/05/2011	None	3	Field Record
Winwick	SJ605926	30	16/05/2012	None	2	Field Record
Winwick	SJ605926	30	11/05/2012	None	1	Field Record
Winwick	SJ605926	30	15/05/2012	None	2	Field Record
Hermitage Green Lane	SJ6092	33	08/06/2011	None	2	Field Record
Arbury	SJ6193	50	05/06/2011	None	1	Field Record
Winwick	SJ6192	49	26/04/2012	None	2	Field Record
	SJ622928	60	26/06/2012	None	2	Field Record
	SJ6192	49	23/04/2012	None	1	Field Record
	SJ6191	48	29/06/2014	None	2	Field Record

Gadwall (Anas strepera) (50)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Houghton Green Pool	SJ6193	50	04/06/2011	None	4	Field Record
Houghton Green Pool	SJ6193	50	27/08/2011	None	8	Field Record
Winwick, Houghton Green Pool	SJ6193	50	17/02/2011	None	9	Field Record
Houghton Green Pool	SJ6193	50	19/08/2011	None	6	Field Record

Hobby (Falco subbuteo) (33,50)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Houghton Green Pool	SJ6193	50	08/09/2011	None	1	Field Record
Myddleton Lane	SJ6092	33	03/08/2011	None	1	Field Record

Greenshank (Tringa nebularia) (50)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Houghton Green Pool	SJ6193	50	07/09/2011	None	1	Field Record
Houghton Green Pool	SJ6193	50	31/08/2011	None	1	Field Record

Merlin (Falco columbarius) (33,50)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Houghton Green Pool	SJ6193	50	02/02/2011	None	Present	Field Record
Myddleton Lane , Winwick	SJ6092	33	10/03/2011	None	1	Field Record
Myddleton Lane, Winwick	SJ6092	33	04/03/2011	None	1	Field Record

Golden Plover (Pluvialis apricaria) (30,49,60)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Winwick	SJ605926	30	03/02/2012	None	28	Field Record
Winwick	SJ605926	30	29/01/2012	None	7	Field Record
	SJ6192	49	13/12/2012	None	2	Field Record
	SJ622928	60	06/02/2012	None	26	Field Record

Brambling (Fringilla montifringilla) (30)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Winwick	SJ605926	30	13/12/2012	None	1	Field Record
Winwick	SJ605926	30	02/12/2012	None	2	Field Record

Barn Owl (Tyto alba) (30,33)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Myddleton Lane	SJ6092	33	29/07/2011	None	1	Field Record
Winwick	SJ605926	30	06/09/2012	None	1	Field Record

Lesser Black-backed Gull (Larus fuscus) (33,48,60,62,65)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Winwick, Myddleton Lane,	SJ6092	33	29/01/2011	None	11	Field Record

Winwick						
	SJ623926	65	28/03/2013	Adult	5 Approx	Field Record
Warrington	SJ62328962	62	14/02/2015	Adult	Present	Field Record
	SJ6191	48	08/07/2014	None	1	Field Record
	SJ6191	48	06/07/2014	None	5	Field Record
	SJ6191	48	29/06/2014	None	53	Field Record
	SJ622928	60	22/02/2014	Adult	1	Field Record

Black Tern (Chlidonias niger) (50)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Houghton Green Pool	SJ6193	50	13/09/2011	None	2	Field Record
Houghton Green Pool	SJ6193	50	11/09/2011	None	1	Field Record

Black-necked Grebe (Podiceps nigricollis) (50,59,60,66)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Houghton Green Pool	SJ6193	50	26/07/2011	None	1	Field Record
Houghton Green Pool	SJ6193	50	09/04/2011	None	4	Field Record
Houghton Green Pool	SJ6193	50	06/04/2011	None	4	Field Record
Houghton Green Pool	SJ6193	50	05/04/2011	None	6	Field Record
Houghton Green Pool	SJ6193	50	02/04/2011	None	5	Field Record
Houghton Green Pool	SJ6193	50	01/04/2011	None	5	Field Record
Houghton Green Pool	SJ6193	50	26/03/2011	None	4	Field Record
Houghton Green Pool	SJ6193	50	20/03/2011	None	1	Field Record
Houghton Green Pool	SJ6193	50	19/03/2011	None	1	Field Record
	SJ622928	60	16/08/2012	None	1	Field Record
Houghton Green PS, Warrington	SJ622927	59	20/03/2009	None	2	Field Record
	SJ623927	66	23/03/2011	Adult	4	Field Record
	SJ623927	66	17/04/2011	Adult	3	Field Record

Grey Wagtail (Motacilla cinerea) (40,50,56,77)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Winwick, Houghton Green Pool	SJ6193	50	18/02/2011	None	1	Field Record
Burtonwood & Winwick - CP, Pond by metal gate	SJ616915	40	03/02/2016	None	1	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	03/2008-03/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	10/2007-10/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	09/2007-09/2007	None	Present	Field Record
Warrington	SJ62258947	56	15/02/2015	Adult	1	Field Record

Bullfinch (Pyrrhula pyrrhula) (24,48,49,77)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	10/2008-10/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	10/2008-10/2008	None	Present	Auditory Record
Westbrook - CP, Sankey Valley Park, Stanners Pool Area	SJ59869102	24	07/04/2011	None	2	Field Record
	SJ6192	49	11/01/2012	None	3	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-	SJ6291	77	06/2008-06/2008	None	Present	Field Record

Peel Hall Park, W						
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	06/2008-06/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2008-04/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	03/2008-03/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	09/2008-09/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	02/2008-02/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	02/2008-02/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2007-05/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2007-05/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	09/2008-09/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield	SJ6291	77	03/2008-03/2008	None	Present	Field Record

Park-Mill Lane-Radley common-Peel Hall Park, W						
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2007-04/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	03/2007-03/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	03/2007-03/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	02/2007-02/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	02/2007-02/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2007-04/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	01/2008-01/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	08/2008-08/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	12/2007-12/2007	None	Present	Field Record
Burtonwood & Winwick - CP,	SJ6291	77	11/2007-11/2007	None	Present	Field Record

Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W						
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	11/2007-11/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	08/2008-08/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	10/2007-10/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	01/2007-01/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	10/2007-10/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	09/2007-09/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	08/2007-08/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	08/2007-08/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	07/2007-07/2007	None	Present	Field Record

Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	07/2007-07/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	06/2007-06/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	07/2008-07/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	07/2008-07/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2008-04/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	12/2007-12/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	12/2008-12/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	06/2007-06/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	09/2007-09/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-	SJ6291	77	12/2008-12/2008	None	Present	Auditory Record

Peel Hall Park, W						
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	11/2008-11/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	11/2008-11/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2008-05/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2008-05/2008	None	Present	Auditory Record
	SJ6191	48	29/06/2014	None	3	Field Record
Sankey Valley Park, Stanners Pool Area	SJ59869102	24	07/04/2011	None	2	Field Record
Pond adjacent to Stanners Pool, Callands	SJ598910	24	04/04/2011	Breeding Pair	2	Field Record

Crane (Grus grus) (48)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Poplars & Hulme - CP, Hartford.	SJ6191	48	11/06/2012	None	2	Field Record

Great Black-backed Gull (Larus marinus) (60,77)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	06/2008-06/2008	None	Present	Field Record
	SJ622928	60	04/02/2012	None	3	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-	SJ6291	77	03/2008-03/2008	None	Present	Field Record

Peel Hall Park, W						
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	02/2008-02/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2007-05/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	02/2007-02/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2007-04/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	08/2008-08/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	01/2007-01/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	12/2007-12/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	11/2007-11/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	10/2007-10/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield	SJ6291	77	09/2007-09/2007	None	Present	Field Record

Park-Mill Lane-Radley common-Peel Hall Park, W						
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	07/2007-07/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2008-05/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	03/2007-03/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	06/2007-06/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	08/2007-08/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	12/2008-12/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	09/2008-09/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	07/2008-07/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	10/2008-10/2008	None	Present	Field Record
Burtonwood & Winwick - CP,	SJ6291	77	04/2008-04/2008	None	Present	Field Record

Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W						

Dunlin (Calidris alpina) (60,66)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
	SJ623927	66	19/04/2013	Adult Male	1	Field Record
	SJ622928	60	06/02/2012	None	2	Field Record

House Martin (Delichon urbicum) (64,88)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Poulton North - CP, stonehaven drive	SJ63479142	88	27/05/2015	None	2	Field Record
	SJ623925	64	30/06/2012	Adult	1	Field Record

Curlew (Numenius arquata) (77)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	02/2007-02/2007	None	Present	Field Record

Marsh Tit (Poecile palustris) (77)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	11/2007-11/2007	None	Present	Field Record

Goldeneye (Bucephala clangula) (60)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
	SJ622928	60	29/02/2012	None	1	Field Record
	SJ622928	60	25/02/2012	None	1	Field Record

Green Sandpiper (Tringa ochropus) (60)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
	SJ622928	60	15/04/2012	None	1	Field Record

Starling (Sturnus vulgaris) (8,30,31,33,38,44,48,49,50,60,62,71,77,78,88)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Houghton Green Pool	SJ6193	50	30/05/2011	None	1	Field Record
Houghton Green Pool	SJ6193	50	11/02/2011	None	90	Field Record
Houghton Green Pool	SJ6193	50	27/08/2011	None	3	Field Record
Houghton Green Pool	SJ6193	50	02/02/2011	None	65	Field Record
Houghton Green Pool	SJ6193	50	22/09/2011	None	140	Field Record
Winwick	SJ605926	30	08/10/2012	None	30	Field Record
Winwick	SJ605926	30	18/11/2012	None	60	Field Record
Winwick	SJ605926	30	09/10/2012	None	220	Field Record
Winwick	SJ605926	30	05/02/2012	None	35	Field Record
Winwick	SJ605926	30	10/12/2012	None	220	Field Record
Winwick	SJ605926	30	29/11/2012	None	155	Field Record
Myddleton Lane , Winwick	SJ6092	33	10/03/2011	None	700	Field Record
Winwick	SJ605928	31	02/03/2012	None	Present	Field Record
Winwick, Myddleton Lane, Winwick	SJ6092	33	29/01/2011	None	180	Field Record
Myddleton Lane	SJ6092	33	27/09/2011	None	200	Field Record
Myddleton Lane	SJ6092	33	29/09/2011	None	140	Field Record
Winwick	SJ605926	30	11/09/2012	None	650	Field Record
Winwick	SJ605926	30	26/08/2012	None	220	Field Record
Houghton Green Pool	SJ6193	50	08/09/2011	None	Present	Field Record
Arbury	SJ6193	50	25/09/2011	None	30	Field Record
	SJ6192	49	22/09/2012	None	180	Field Record
	SJ6192	49	02/04/2012	None	2	Field Record
	SJ6192	49	11/01/2012	None	17	Field Record
	SJ6192	49	21/09/2012	None	32	Field Record

	SJ6192	49	24/04/2012	None	2	Field Record
Winwick	SJ605926	30	05/12/2012	None	5	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	09/2008-09/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	03/2008-03/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	02/2008-02/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2007-05/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	09/2008-09/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	08/2008-08/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2007-04/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	03/2007-03/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	02/2007-02/2007	None	Present	Field Record

Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	01/2008-01/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	01/2008-01/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	12/2007-12/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	11/2007-11/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	10/2007-10/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	09/2007-09/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	09/2007-09/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	07/2007-07/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	06/2008-06/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-	SJ6291	77	05/2008-05/2008	None	Present	Field Record

Peel Hall Park, W						
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	02/2008-02/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	01/2007-01/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	12/2007-12/2007	None	Present	Field Record
	SJ622928	60	29/02/2012	None	20	Field Record
	SJ622928	60	06/02/2012	None	70	Field Record
	SJ622928	60	02/04/2012	None	5	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	07/2008-07/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	07/2008-07/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	06/2007-06/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	08/2007-08/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	12/2008-12/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-	SJ6291	77	11/2008-11/2008	None	Present	Field Record

Radley common-Peel Hall Park, W						
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	11/2008-11/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	10/2008-10/2008	None	Present	Field Record
Stonehaven Drive	SJ63439142	88	11/05/2010	Adult	2	Field Record
Warrington	SJ613920	38	22/11/2012	None	200	Field Record
Burtonwood & Winwick - CP, Grasmere Avenue, Warrington	SJ61869110	44	14/05/2013	Adult	8	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2008-04/2008	None	Present	Field Record
Warrington	SJ62328962	62	14/02/2015	Adult	4	Field Record
	SJ6265193584	71	2007	None	45	Field Record
	SJ6191	48	08/07/2014	None	3	Field Record
	SJ6191	48	29/06/2014	None	22	Field Record
	SJ6292	78	08/02/2011	None	30	Field Record
	SJ5892	8	24/02/2011	None	6	Field Record

Snipe (Gallinago gallinago) (12,28,30)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Winwick	SJ605926	30	29/11/2012	None	1	Field Record
Winwick	SJ605926	30	10/12/2012	None	2	Field Record
an area of land off Folly Lane, Warrington, WA5 0NJ	SJ60128960	28	12/12/2012	None	Present	Field Record
Gemini fields	SJ59129144	12	16/04/2009	Adult	1	Field Record

Tree Sparrow (Passer montanus) (30,31,33,49,50,60)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Houghton Green Pool	SJ6193	50	30/05/2011	None	2	Field Record
Winwick	SJ605926	30	18/11/2012	None	45	Field Record
Winwick	SJ605926	30	14/10/2012	None	10	Field Record
Winwick	SJ605926	30	09/02/2012	None	1	Field Record
Winwick	SJ605926	30	03/02/2012	None	32	Field Record
Winwick	SJ605926	30	01/02/2012	None	60	Field Record
Winwick	SJ605926	30	11/05/2012	None	15	Field Record
Winwick	SJ605926	30	14/05/2012	None	1	Field Record
Winwick	SJ605926	30	02/12/2012	None	60	Field Record
Winwick	SJ605926	30	29/11/2012	None	65	Field Record
Winwick, Myddleton Lane, Winwick	SJ6092	33	29/01/2011	None	35	Field Record
Myddleton Lane, Winwick	SJ6092	33	04/03/2011	None	48	Field Record
Winwick	SJ605928	31	02/03/2012	None	65	Field Record
Winwick	SJ605928	31	23/02/2012	None	65	Field Record
Winwick	SJ605928	31	21/02/2012	None	65	Field Record
Winwick	SJ6192	49	27/04/2012	None	3	Field Record
Winwick	SJ6192	49	26/04/2012	None	7	Field Record
Winwick	SJ6192	49	25/04/2012	None	6	Field Record
	SJ6192	49	23/04/2012	None	4	Field Record
Winwick	SJ605926	30	10/12/2012	None	60	Field Record
Winwick	SJ605926	30	15/05/2012	None	3	Field Record
	SJ622928	60	02/04/2012	None	10	Field Record

Peregrine (Falco peregrinus) (30,31,78)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Winwick	SJ605928	31	02/03/2012	None	1	Field Record
Winwick	SJ605926	30	11/09/2012	None	1	Field Record
Willow / Birch Natural Regeneration, Peel Hall Area - Comp 12	SJ6292	78	28/12/2006	Adult Male	1	Field Record

Yellowhammer (Emberiza citrinella) (7,8,30,31,33,49,50,60)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Houghton Green Pool	SJ6193	50	31/07/2011	None	1	Field Record
Winwick	SJ605926	30	01/02/2012	None	9	Field Record
Winwick	SJ605926	30	11/05/2012	None	9	Field Record
Winwick	SJ605926	30	16/05/2012	None	2	Field Record
Winwick	SJ605926	30	15/05/2012	None	2	Field Record
Winwick	SJ605928	31	02/03/2012	None	1	Field Record
Hermitage Green Lane	SJ6092	33	08/06/2011	None	2	Field Record
Waterworks Lane	SJ6092	33	25/09/2011	None	5	Field Record
Winwick	SJ605928	31	23/02/2012	None	Present	Field Record
Winwick	SJ605928	31	21/02/2012	None	11	Field Record
Winwick, Myddleton Lane, Winwick	SJ6092	33	29/01/2011	None	3	Field Record
Hermitage Green Lane	SJ6092	33	01/08/2011	None	2	Field Record
Causey bridges	SJ588922	7	22/04/2009	Adult	1	Field Record
Hermitage Green Lane	SJ6092	33	09/08/2011	None	2	Field Record
Hermitage Green Lane	SJ6092	33	31/07/2011	None	2	Field Record
Houghton Green Pool	SJ6193	50	30/05/2011	None	1	Field Record
Winwick	SJ6192	49	26/04/2012	None	4	Field Record
Winwick	SJ605926	30	08/10/2012	None	7	Field Record
Winwick	SJ605926	30	10/12/2012	None	3	Field Record
Winwick	SJ605926	30	29/11/2012	None	7	Field Record
	SJ622928	60	02/04/2012	None	6	Field Record
Winwick	SJ6192	49	25/04/2012	None	4	Field Record
Burtonwood & Winwick - CP, Causey bridges	SJ588922	7	22/04/2009	Adult	1	Field Record
	SJ5892	8	24/02/2011	None	4	Field Record

Ringed Plover (Charadrius hiaticula) (50,60)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Houghton Green Pool	SJ6193	50	26/07/2011	None	1	Field Record
	SJ622928	60	03/03/2012	None	2	Field Record
	SJ622928	60	25/02/2012	None	2	Field Record

Shoveler (Anas clypeata) (60)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
	SJ622928	60	06/02/2012	None	5	Field Record

Slavonian Grebe (Podiceps auritus) (60)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Houghton Green Flash	SJ622928	60	13/02/2006	None	1	Field Record

Woodcock (Scolopax rusticola) (19,77)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2007-04/2007	None	Present	Field Record
Bewsey & Whitecross - CP, Bewsey Meadows (old tip)	SJ595898	19	06/02/2009	Adult	1	Field Record

Whinchat (Saxicola rubetra) (30)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Winwick	SJ605926	30	11/05/2012	None	3	Field Record

Ruddy Duck (Oxyura jamaicensis) (50,60)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Houghton Green Pool	SJ6193	50	04/06/2011	None	1	Field Record
	SJ622928	60	29/02/2012	None	1	Field Record

Yellow Wagtail (Motacilla flava) (66)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
	SJ623927	66	19/04/2013	Adult	1	Field Record

Pink-footed Goose (Anser brachyrhynchus) (49,98)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
	SJ6192	49	13/12/2012	None	120	Field Record
Flying overhead	SJ6491	98	04/12/2013	None	600	Field Record

Song Thrush (Turdus philomelos) (8,10,21,30,33,35,37,48,49,50,60,77,83)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Houghton Green Pool	SJ6193	50	30/05/2011	None	3	Field Record
Houghton Green Pool	SJ6193	50	31/07/2011	None	1	Field Record
Houghton Green Pool	SJ6193	50	12/02/2011	None	3	Field Record
Winwick	SJ605926	30	10/12/2012	None	2	Field Record
Winwick, Myddleton Lane, Winwick	SJ6092	33	28/01/2011	None	1	Field Record
Winwick, Myddleton Lane, Winwick	SJ6092	33	29/01/2011	None	1	Field Record
Hermitage Green Lane	SJ6092	33	08/06/2011	None	3	Field Record
Radley Plantation	SJ6193	50	05/06/2011	None	4	Field Record
	SJ613901	37	16/05/2008	None	Present	Field Record
	SJ6192	49	11/01/2012	None	3	Field Record
	SJ6192	49	13/12/2012	None	2	Field Record
	SJ6192	49	24/04/2012	None	1	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	06/2008-06/2008	None	Present	Auditory Record
Winwick	SJ605926	30	29/11/2012	None	3	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-	SJ6291	77	07/2008-07/2008	None	Present	Auditory Record

Radley common-Peel Hall Park, W						
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2008-04/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	03/2008-03/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	03/2008-03/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	09/2008-09/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	02/2008-02/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2007-05/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2007-05/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	08/2008-08/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2007-04/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook	SJ6291	77	04/2007-04/2007	None	Present	Field Record

avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W						
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	03/2007-03/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	03/2007-03/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	02/2007-02/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	02/2007-02/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	01/2008-01/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	01/2008-01/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	12/2007-12/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	08/2007-08/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	07/2007-07/2007	None	Present	Field Record
Burtonwood &	SJ6291	77	07/2007-07/2007	None	Present	Auditory Record

Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W						
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	06/2008-06/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2008-05/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	02/2008-02/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	01/2007-01/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	12/2007-12/2007	None	Present	Field Record
Croft, Fields along Smithy Lane	SJ631932	83	28/03/2013	Adult	3	Field Record
	SJ622928	60	29/02/2012	None	2	Field Record
	SJ622928	60	02/04/2012	None	1	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	08/2008-08/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	07/2008-07/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-	SJ6291	77	06/2007-06/2007	None	Present	Field Record

Peel Hall Park, W						
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	06/2007-06/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	12/2008-12/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	12/2008-12/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	11/2008-11/2008	None	Present	Field Record
Winwick	SJ6192	49	26/04/2012	None	1	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2008-05/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2008-04/2008	None	Present	Field Record
	SJ6191	48	08/07/2014	Breeding Pair	3	Field Record
	SJ6191	48	10/07/2014	None	1	Field Record
	SJ6191	48	29/06/2014	None	5	Field Record
	SJ59739105	21	15/05/2008	None	1	Field Record
beech hedge north of site	SJ61289018	35	09/05/2010	Breeding Pair	2	Field Record
	SJ58919070	10	23/08/2008	None	1	Field Record
	SJ5892	8	24/02/2011	None	2	Field Record

Whitethroat (Sylvia communis) (33,48,50,77)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Houghton Green	SJ6193	50	30/05/2011	None	3	Field Record

Pool						
Hermitage Green Lane	SJ6092	33	08/06/2011	None	1	Field Record
Hermitage Green Lane	SJ6092	33	01/08/2011	None	2	Field Record
Arbury	SJ6193	50	03/08/2011	None	1	Field Record
Houghton Green Pool	SJ6193	50	31/07/2011	None	3	Field Record
Houghton Green Pool	SJ6193	50	29/07/2011	None	4	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	06/2008-06/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2008-04/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2008-05/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2007-05/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2007-05/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	08/2008-08/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	07/2008-07/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-	SJ6291	77	07/2008-07/2008	None	Present	Auditory Record

Radley common-Peel Hall Park, W						
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	06/2008-06/2008	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	07/2007-07/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	07/2007-07/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	06/2007-06/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	06/2007-06/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2008-05/2008	None	Present	Auditory Record
	SJ6191	48	06/07/2014	None	3	Field Record
	SJ6191	48	29/06/2014	None	5	Field Record

Tufted Duck (Aythya fuligula) (50,58,60,65,66,78)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Houghton Green Pool	SJ6193	50	17/09/2011	None	32	Field Record
Houghton Green Pool	SJ6193	50	31/08/2011	None	37	Field Record
Houghton Green Pool	SJ6193	50	27/08/2011	None	31	Field Record
Houghton Green Pool	SJ6193	50	07/09/2011	None	36	Field Record
Houghton Green Pool	SJ6193	50	12/02/2011	None	45	Field Record

Houghton Green Pool	SJ6193	50	19/08/2011	None	25	Field Record
Houghton Green Pool	SJ6193	50	29/07/2011	None	32	Field Record
Houghton Green Pool	SJ6193	50	26/07/2011	None	14	Field Record
	SJ622928	60	11/09/2012	None	24	Field Record
	SJ622928	60	10/01/2012	None	28	Field Record
	SJ622928	60	04/02/2012	None	2	Field Record
	SJ622928	60	28/01/2012	None	16	Field Record
	SJ622928	60	14/01/2012	None	21	Field Record
	SJ623926	65	28/03/2013	Adult	4 Approx	Field Record
	SJ623927	66	06/01/2012	None	23	Field Record
Willow / Birch Natural Regeneration, Peel Hall Area - Comp 12	SJ6292	78	28/12/2006	None	10	Field Record
	SJ622928	60	03/03/2012	None	17	Field Record
	SJ622928	60	29/02/2012	None	10	Field Record
	SJ622928	60	18/02/2012	None	31	Field Record
	SJ622928	60	17/03/2012	None	13	Field Record
	SJ622926	58	22/02/2014	Adult Male	1	Field Record
	SJ622926	58	08/02/2011	None	30	Field Record

Willow Warbler (Phylloscopus trochilus) (30,45,48,49,50,60,77)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
	SJ622928	60	09/05/2012	None	1	Field Record
Houghton Green Pool	SJ6193	50	30/05/2011	None	2	Field Record
Winwick	SJ605926	30	16/05/2012	None	1	Field Record
Arbury	SJ6193	50	03/08/2011	None	1	Field Record
John Parr Wild Flower Meadow	SJ618913	45	28/06/2012	None	Present	Field Record
Winwick	SJ6192	49	26/04/2012	None	1	Field Record
	SJ6192	49	24/04/2012	None	2	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2008-04/2008	None	Present	Auditory Record

Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2007-05/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2007-04/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2007-05/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2007-04/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	06/2007-06/2007	None	Present	Auditory Record
	SJ6191	48	29/06/2014	None	1	Field Record
	SJ6191	48	10/07/2014	None	1	Field Record

Reed Bunting (Emberiza schoeniclus) (9,30,33,49,50,60,77)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
	SJ622928	60	09/05/2012	None	2	Field Record
Houghton Green Pool	SJ6193	50	30/05/2011	None	2	Field Record
Arbury	SJ6193	50	05/06/2011	None	3	Field Record
Winwick	SJ605926	30	11/05/2012	None	2	Field Record
Winwick, Myddleton Lane, Winwick	SJ6092	33	29/01/2011	None	10	Field Record
Hermitage Green Lane	SJ6092	33	08/06/2011	None	1	Field Record
Houghton Green Pool	SJ6193	50	14/09/2011	None	1	Field Record
Winwick	SJ6192	49	25/04/2012	None	1	Field Record
	SJ6192	49	23/04/2012	None	4	Field Record

Winwick	SJ6192	49	27/04/2012	None	1	Field Record
Winwick	SJ6192	49	26/04/2012	None	2	Field Record
	SJ6192	49	26/06/2012	None	4	Field Record
	SJ6192	49	24/04/2012	None	1	Field Record
	SJ622928	60	26/06/2012	None	3	Field Record
Winwick	SJ605926	30	29/11/2012	None	3	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2007-05/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2007-05/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2007-04/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2007-04/2007	None	Present	Auditory Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	07/2007-07/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	07/2008-07/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2008-04/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2008-04/2008	None	Present	Auditory Record

Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	06/2007-06/2007	None	Present	Field Record
	SJ5893	9	24/02/2011	None	4	Field Record

Teal (Anas crecca) (50,60,78)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Houghton Green Pool	SJ6193	50	09/09/2011	None	2	Field Record
Houghton Green Pool	SJ6193	50	02/02/2011	None	15	Field Record
Houghton Green Pool	SJ6193	50	31/08/2011	None	2	Field Record
Houghton Green Pool	SJ6193	50	27/08/2011	None	1	Field Record
Houghton Green Pool	SJ6193	50	14/09/2011	None	1	Field Record
Houghton Green Pool	SJ6193	50	07/09/2011	None	2	Field Record
	SJ622928	60	04/02/2012	None	3	Field Record
Burtonwood & Winwick - CP	SJ6292	78	19/01/2006	None	65	Field Record
	SJ622928	60	06/02/2012	None	3	Field Record

Wheatear (Oenanthe oenanthe) (30,60,66)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
	SJ622928	60	21/04/2012	None	2	Field Record
Winwick	SJ605926	30	12/05/2012	None	4	Field Record
Winwick	SJ605926	30	16/05/2012	None	4	Field Record
Winwick	SJ605926	30	11/05/2012	None	5	Field Record
Winwick	SJ605926	30	15/05/2012	None	4	Field Record
	SJ623927	66	19/04/2013	Adult Male	1	Field Record

Pochard (Aythya ferina) (50,58,60,66)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
	SJ622928	60	02/05/2012	None	2	Field Record
Houghton Green Pool	SJ6193	50	08/09/2011	None	1	Field Record

Houghton Green Pool	SJ6193	50	14/09/2011	None	2	Field Record
Houghton Green Pool	SJ6193	50	13/09/2011	None	1	Field Record
	SJ622928	60	04/02/2012	None	9	Field Record
	SJ622928	60	14/01/2012	None	5	Field Record
	SJ623927	66	06/01/2012	None	6	Field Record
	SJ622928	60	09/05/2012	None	4	Field Record
	SJ622928	60	29/02/2012	None	2	Field Record
	SJ622928	60	18/02/2012	None	9	Field Record
	SJ622928	60	06/02/2012	None	13	Field Record
	SJ622926	58	22/02/2014	Adult Male	1	Field Record
	SJ622926	58	08/02/2011	None	Present	Field Record

Redshank (Tringa totanus) (49,50,60)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
	SJ622928	60	21/04/2012	None	1	Field Record
Houghton Green Pool	SJ6193	50	20/03/2011	None	1	Field Record
	SJ6192	49	21/09/2012	None	1	Field Record
	SJ622928	60	03/03/2012	None	1	Field Record
	SJ622928	60	11/04/2012	None	2	Field Record
	SJ622928	60	28/03/2013	Adult	2	Field Record
	SJ622928	60	04/04/2012	None	2	Field Record
	SJ622928	60	13/02/2006	None	5	Field Record

Skylark (Alauda arvensis) (7,8,30,31,33,48,49,50,51,60,63,64)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
	SJ622928	60	23/04/2012	None	1	Field Record
Houghton Green Pool	SJ6193	50	20/03/2011	None	3	Field Record
Houghton Green Pool	SJ6193	50	30/05/2011	None	1	Field Record
Houghton Green Pool	SJ6193	50	10/09/2011	None	5	Field Record
Arbury	SJ6193	50	05/06/2011	None	1	Field Record
Winwick	SJ605926	30	09/10/2012	None	11	Field Record

Winwick	SJ605926	30	10/12/2012	None	13	Field Record
Winwick	SJ605928	31	02/03/2012	None	1	Field Record
Winwick	SJ605928	31	23/02/2012	None	Present	Field Record
Causey Bridges	SJ588922	7	22/04/2009	Adult	>1	Field Record
Hermitage Green Lane	SJ6092	33	08/06/2011	None	6	Field Record
	SJ6192	49	02/04/2012	None	2	Field Record
	SJ6192	49	21/09/2012	None	11	Field Record
	SJ6192	49	26/06/2012	None	6	Field Record
Winwick	SJ6192	49	26/04/2012	None	5	Field Record
Winwick	SJ605926	30	08/10/2012	None	9	Field Record
	SJ623923	63	08/02/2011	None	3	Field Record
	SJ622928	60	26/06/2012	None	4	Field Record
	SJ6192	49	23/04/2012	None	5	Field Record
Winwick	SJ6192	49	25/04/2012	None	3	Field Record
	SJ6191	48	06/07/2014	None	2	Field Record
	SJ6191	48	29/06/2014	None	1	Field Record
Over field to S	SJ623925	64	23/03/2011	Adult	1	Field Record
Warrington	SJ6194	51	27/05/2009	None	Present	Field Record
	SJ5892	8	24/02/2011	None	2	Field Record

Redwing (Turdus iliacus) (17,30,33,43,50,60,76,77,83,86,92,96)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Croft, Horse paddocks on New Lane	SJ633931	86	28/12/2014	Adult	Abundant	Field Record
	SJ593926	17	20/01/2012	None	150	Field Record
Houghton Green Pool	SJ6193	50	12/02/2011	None	8	Field Record
Winwick	SJ605926	30	29/11/2012	None	14	Field Record
Winwick	SJ605926	30	09/02/2012	None	30	Field Record
Winwick	SJ605926	30	05/02/2012	None	23	Field Record
Winwick	SJ605926	30	18/12/2012	None	14	Field Record
Winwick	SJ605926	30	13/12/2012	None	1	Field Record
Winwick	SJ605926	30	10/12/2012	None	16	Field Record
Winwick, Myddleton Lane,	SJ6092	33	29/01/2011	None	8	Field Record

Winwick						
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	10/2008-10/2008	None	Present	Field Record
Winwick	SJ605926	30	05/12/2012	None	3	Field Record
Longbarn	SJ6390	96	26/01/2013	None	1	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	03/2007-03/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	09/2007-09/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	11/2008-11/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	02/2007-02/2007	None	Present	Field Record
Croft, Fields along Smithy Lane	SJ631932	83	28/03/2013	Adult	6 Approx	Field Record
	SJ622928	60	29/02/2012	None	3	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	12/2008-12/2008	None	Present	Field Record
Croft	SJ628928	76	20/01/2014	Adult	6	Field Record
Culcheth, Glazebury & Croft - CP	SJ628928	76	02/02/2014	Adult	40 Approx	Field Record
	SJ635906	92	16/01/2014	Adult	1	Field Record
	SJ617929	43	24/02/2011	None	2	Field Record

Stock Dove (Columba oenas) (30,31,33,49,50,60,78)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Willow / Birch Natural Regeneration, Peel Hall Area - Comp 12	SJ6292	78	28/12/2006	None	7	Field Record
	SJ622928	60	09/05/2012	None	2	Field Record
	SJ622928	60	21/04/2012	None	5	Field Record
Houghton Green Pool	SJ6193	50	11/02/2011	None	4	Field Record
Radley Plantation	SJ6193	50	29/08/2011	None	8	Field Record
Houghton Green Pool	SJ6193	50	07/09/2011	None	5	Field Record
Winwick, Myddleton Lane, Winwick	SJ6092	33	29/01/2011	None	4	Field Record
Myddleton Lane, Winwick	SJ6092	33	20/03/2011	None	26	Field Record
Myddleton Lane , Winwick	SJ6092	33	10/03/2011	None	1	Field Record
Winwick, Myddleton Lane, Winwick	SJ6092	33	08/02/2011	None	1	Field Record
Winwick	SJ605928	31	08/03/2012	None	2	Field Record
Winwick	SJ605926	30	09/09/2012	None	1	Field Record
Arbury	SJ6193	50	03/08/2011	None	4	Field Record
Houghton Green Pool	SJ6193	50	31/07/2011	None	4	Field Record
	SJ6192	49	02/04/2012	None	Present	Field Record
	SJ6192	49	22/09/2012	None	3	Field Record
	SJ622928	60	28/03/2012	None	1	Field Record

Swift (Apus apus) (14,27,30,32,33,34,45,48,49,50,59,60,61,72,74,75,77,79,81,89,93,97)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
	SJ622928	60	14/05/2012	None	80	Field Record
	SJ622928	60	02/05/2012	None	50	Field Record
	SJ622928	60	25/04/2012	None	Present	Field Record
Houghton Green Pool	SJ6193	50	30/05/2011	None	141	Field Record
Houghton Green Pool	SJ6193	50	19/08/2011	None	2	Field Record

Winwick	SJ605926	30	09/08/2012	None	65	Field Record
Winwick	SJ605926	30	08/08/2012	None	60	Field Record
Winwick	SJ605926	30	06/08/2012	None	70	Field Record
Winwick	SJ605926	30	12/06/2012	None	20	Field Record
Arbury Pits	SJ60959195	34	05/07/2012	None	1	Field Record
Myddleton Lane	SJ6092	33	04/06/2011	None	100	Field Record
Coney Grove Woods	SJ59909190	27	11/07/2012	None	1	Field Record
Warrington	SJ59229178	14	15/06/2012	None	2	Field Record
Myddleton Lane	SJ6092	33	30/07/2011	None	32	Field Record
Winwick	SJ605926	30	26/08/2012	None	1	Field Record
Houghton Green Pool	SJ6193	50	03/08/2011	None	20	Field Record
Houghton Green Pool	SJ6193	50	31/07/2011	None	64	Field Record
Poplars & Hulme - CP, Northway	SJ607905	32	17/07/2013	Adult	11	Field Record
John Parr Wild Flower Meadow	SJ618913	45	28/06/2012	None	Present	Field Record
	SJ6192	49	26/06/2012	None	40	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	06/2008-06/2008	None	Present	Field Record
	SJ622927	59	08/06/2009	Adult	30	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	09/2007-09/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	08/2007-08/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	07/2007-07/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-	SJ6291	77	07/2008-07/2008	None	Present	Field Record

Radley common-Peel Hall Park, W						
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2007-05/2007	None	Present	Field Record
	SJ622928	60	03/05/2012	None	150	Field Record
	SJ622928	60	19/05/2012	None	95	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	06/2007-06/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	08/2008-08/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2008-05/2008	None	Present	Field Record
Over Eaves Brow Rd	SJ635933	93	01/06/2011	Adult	3	Field Record
	SJ6191	48	06/07/2014	None	17	Field Record
	SJ6191	48	29/06/2014	None	86	Field Record
strawberry close	SJ642918	97	30/05/2009	Adult	3	Field Record
stonehaven drive	SJ634915	89	02/06/2009	Adult	5	Field Record
enfield park rd/stirrup close	SJ631911	81	05/06/2009	Adult	5	Field Record
enfield pk rd isherwood close	SJ629911	79	08/06/2009	Adult	6	Field Record
montrose close welsby close	SJ627915	75	31/05/2009	Adult	5	Field Record
perth close school	SJ627914	74	03/06/2009	Adult	6	Field Record
King Edward st/connaught ave/queens ave	SJ623892	61	04/06/2008	None	4	Field Record
King Edward st, connaught avee, queens ave	SJ623892	61	15/06/2008	None	7	Field Record
Bruche Avenue/Devonshire rd	SJ627897	72	04/06/2008	None	5	Field Record

Bruche Avenue/Devonshire rd	SJ627897	72	15/06/2008	None	3	Field Record

Sand Martin (Riparia riparia) (5,50,59,60)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
	SJ622928	60	19/05/2012	None	18	Field Record
	SJ622928	60	14/05/2012	None	34	Field Record
	SJ622928	60	03/05/2012	None	30	Field Record
	SJ622928	60	02/05/2012	None	18	Field Record
	SJ622928	60	21/04/2012	None	6	Field Record
Houghton Green Pool	SJ6193	50	05/04/2011	None	30	Field Record
Houghton Green Pool	SJ6193	50	07/09/2011	None	5	Field Record
	SJ622928	60	25/04/2012	None	35	Field Record
	SJ622928	60	30/06/2012	Adult	Several	Field Record
	SJ622928	60	12/04/2012	None	8	Field Record
	SJ622928	60	11/04/2012	None	30	Field Record
	SJ622928	60	04/04/2012	None	4	Field Record
	SJ622928	60	15/04/2012	None	4	Field Record
Houghton Green PS, Warrington	SJ622927	59	11/05/2010	None	6+	Field Record
Causeway Bridges Farm	SJ587922	5	22/04/2009	Adult	4	Field Record

Swallow (Hirundo rustica) (30,33,45,48,49,50,60,62,77,80,95)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
	SJ622928	60	19/05/2012	None	30	Field Record
	SJ622928	60	03/05/2012	None	60	Field Record
	SJ622928	60	02/05/2012	None	20	Field Record
	SJ622928	60	25/04/2012	None	70	Field Record
	SJ622928	60	21/04/2012	None	9	Field Record
Houghton Green Pool	SJ6193	50	27/08/2011	None	7	Field Record
Houghton Green Pool	SJ6193	50	30/05/2011	None	15	Field Record
Houghton Green Pool	SJ6193	50	28/08/2011	None	12	Field Record

Houghton Green Pool	SJ6193	50	08/09/2011	None	Present	Field Record
Houghton Green Pool	SJ6193	50	07/09/2011	None	30	Field Record
Radley Plantation	SJ6193	50	29/08/2011	None	29	Field Record
Houghton Green Pool	SJ6193	50	19/08/2011	None	20	Field Record
Houghton Green Pool	SJ6193	50	09/09/2011	None	12	Field Record
Houghton Green Pool	SJ6193	50	14/09/2011	None	4	Field Record
Houghton Green Pool	SJ6193	50	11/09/2011	None	60	Field Record
Houghton Green Pool	SJ6193	50	13/09/2011	None	11	Field Record
Winwick	SJ605926	30	09/08/2012	None	8	Field Record
Winwick	SJ605926	30	08/08/2012	None	6	Field Record
Winwick	SJ605926	30	06/08/2012	None	4	Field Record
Waterworks Lane	SJ6092	33	25/09/2011	None	21	Field Record
Winwick	SJ605926	30	19/09/2012	None	31	Field Record
Winwick	SJ605926	30	16/09/2012	None	130	Field Record
Winwick	SJ605926	30	11/09/2012	None	150	Field Record
Houghton Green Pool	SJ6193	50	31/08/2011	None	22	Field Record
Houghton Green Pool	SJ6193	50	31/07/2011	None	51	Field Record
John Parr Wild Flower Meadow	SJ618913	45	28/06/2012	None	Present	Field Record
	SJ6192	49	21/09/2012	None	145	Field Record
	SJ6192	49	16/08/2012	None	10	Field Record
	SJ6192	49	22/09/2012	None	Present	Field Record
	SJ6192	49	26/06/2012	None	10	Field Record
	SJ6192	49	24/04/2012	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	06/2008-06/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-	SJ6291	77	09/2008-09/2008	None	Present	Field Record

Peel Hall Park, W						
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2008-04/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2007-05/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	04/2007-04/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	08/2008-08/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	09/2007-09/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	08/2007-08/2007	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	07/2008-07/2008	None	Present	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	07/2007-07/2007	None	Present	Field Record
Croft	SJ629929	80	22/04/2012	Adult	1	Field Record
	SJ622928	60	23/04/2012	None	6	Field Record
	SJ622928	60	16/04/2012	None	55	Field Record
	SJ622928	60	12/04/2012	None	3	Field Record
	SJ622928	60	11/09/2012	None	34	Field Record

Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	06/2007-06/2007	None	Present	Field Record
	SJ6192	49	23/04/2012	None	1	Field Record
Burtonwood & Winwick - CP, Blackbrook avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W	SJ6291	77	05/2008-05/2008	None	Present	Field Record
Warrington	SJ62338963	62	08/04/2015	Adult	1	Field Record
	SJ6191	48	08/07/2014	None	14	Field Record
	SJ6191	48	06/07/2014	None	3	Field Record
	SJ6191	48	29/06/2014	None	6	Field Record
college building fearnhead lane	SJ637909	95	03/05/2009	Adult	5	Field Record
	SJ629929	80	16/07/2011	Adult	1	Field Record

Oystercatcher (Haematopus ostralegus) (30,50,59,60,66,67,77)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
	SJ622928	60	03/03/2012	None	2	Field Record
Houghton Green Pool	SJ6193	50	19/03/2011	None	1	Field Record
Winwick	SJ605926	30	15/05/2012	None	1	Field Record
Winwick	SJ605926	30	16/05/2012	None	1	Field Record
Winwick	SJ605926	30	11/05/2012	None	2	Field Record
Winwick, 1	SJ605926	30	12/05/2012	None	Present	Field Record
Winwick	SJ605926	30	09/09/2012	None	1	Field Record
Winwick, Houghton Green Pool	SJ6193	50	15/02/2011	None	1	Field Record
	SJ622928	60	20/02/2012	None	1	Field Record
	SJ622928	60	26/06/2012	None	1	Field Record
	SJ622928	60	11/04/2012	None	4	Field Record
	SJ623928	67	17/03/2012	Adult	2	Field Record
	SJ622927	59	04/04/2015	Adult	1	Field Record
	SJ623927	66	28/03/2013	Adult	2	Field Record
Burtonwood & Winwick - CP, Blackbrook	SJ6291	77	06/2008-06/2008	None	Present	Field Record

avenue-Enfield Park-Mill Lane-Radley common-Peel Hall Park, W						
	SJ622928	60	11/09/2012	None	1	Field Record
	SJ622928	60	12/04/2012	None	2	Field Record
	SJ622928	60	29/02/2012	None	2	Field Record
	SJ622928	60	25/02/2012	None	1	Field Record
	SJ622928	60	17/03/2012	None	2	Field Record
	SJ622928	60	28/03/2012	None	2	Field Record
	SJ622928	60	05/03/2012	None	2	Field Record
	SJ622928	60	04/04/2012	None	2	Field Record
	SJ622928	60	02/04/2012	None	2	Field Record
	SJ623927	66	23/03/2011	Adult	1	Field Record
	SJ623928	67	22/02/2014	Adult	2	Field Record

Map

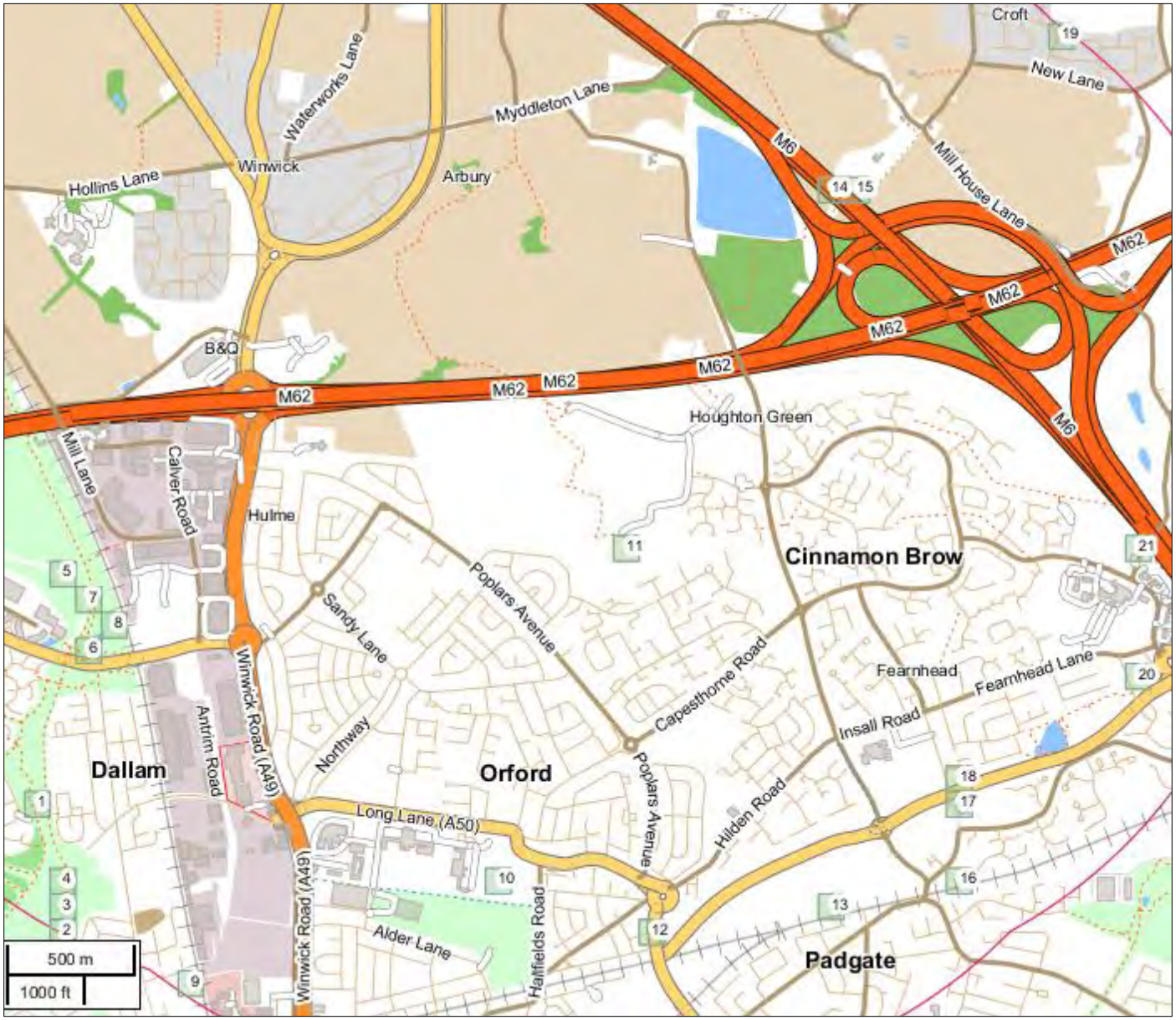
Longbarn Pool
Longbarn Pool
1
Birchwood Way (A574)
Harpers Road
Pasture Lane
20 m
100 ft

European Eel (Anguilla anguilla) (1)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Longbarn Pool	SJ6351790598	1	2006	Adult	Present	Field Record

Map


Croft
19
New Lane
Myddleton Lane
Waterworks Lane
Winwick
Arbury
Hollins Lane
M6
14
15
Mill House Lane
M62
M62
M62
M62
M62
M62
M62
B&Q
Houghton Green
M6
Mill Lane
Calver Road
Hulme
11
Cinnamon Brow
21
5
7
8
6
Sandy Lane
Poplars Avenue
Capesthorne Road
Fearnhead
Fearnhead Lane
20
Winwick Road (A49)
Antrim Road
Northway
Insall Road
Dallam
Orford
18
17
1
Long Lane (A50)
Poplars Avenue
Hilden Road
4
3
2
10
16
13
Alder Lane
Halfields Road
12
Padgate
500 m
1000 ft
9
Winwick Road (A49)

Fringed Water-lily (Nymphoides peltata) (10)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Orford Park, Alder Lane, Orford, Warrington	SJ61349007	10	28/08/2013	Flowering	Locally Frequent	Field Record

Hairy Vetchling (Lathyrus hirsutus) (11)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
John Parr Wild Flower Meadow	SJ618913	11	28/06/2012	None	Present	Field Record

Indian Balsam (Impatiens glandulifera) (1,5,7,14,15,21)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Culcheth, Glazebury & Croft - CP, M6 slip road embankment	SJ626927	14	29/09/2012	Flowering	Occasional	Field Record
	SJ63869139	21	2008	None	Present	Field Record
	SJ5974091145	7	2007	None	Present	Field Record
	SJ59649128	5	15/05/2008	None	Present	Field Record
	SJ59549031	1	23/08/2008	None	Present	Field Record
M6 bridge embankment	SJ627927	15	01/08/2009	Flowering	Abundant	Field Record

Floating Pennywort (Hydrocotyle ranunculoides) (13)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Bennets Rec ground pond	SJ62648999	13	15/07/2008	None	Dominant	Field Record

Japanese Knotweed (Fallopia japonica) (1,3,9,12,18)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Bewsey Main Tip TN12	SJ596899	3	24/06/2008	None	Present	Field Record
an area of land off Folly Lane, Warrington, WA5 0NJ	SJ60168961	9	12/12/2012	None	Dominant	Field Record
	SJ63119040	18	29/08/2008	None	Present	Field Record
	SJ61968989	12	28/08/2008	None	Present	Field Record

	SJ59549031	1	23/08/2008	None	Present	Field Record

Black Poplar (Populus nigra subsp. betulifolia) (20)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Poulton North - CP, hedge	SJ6382090820	20	2008	Male	1	Field Record
Poulton North - CP, hedge	SJ6381090810	20	2008	Male	1	Field Record

Bluebell (Hyacinthoides non-scripta) (16)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Copse, Padgate Community Centre, Station Road South, Padgate, Warrington	SJ63199008	16	02/03/2014	None	Occasional	Field Record

Grass Vetchling (Lathyrus nissolia) (2,4)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Bewsey Main Tip TN13	SJ596900	4	24/06/2008	None	Occasional	Field Record
Bewsey Main Tip TN11	SJ596898	2	24/06/2008	None	Frequent	Field Record

Himalayan Cotoneaster (Cotoneaster simonsii) (19)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Garden, Wadeson Way	SJ635933	19	13/06/2009	Flowering	Frequent	Field Record

Rhododendron (Rhododendron ponticum) (17)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Padgate Rectory, Station Rd. South, Padgate, Warrington, Cheshire.	SJ631903	17	12/08/2014	None	Present	Field Record

Wall Cotoneaster (Cotoneaster horizontalis) (19)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Croft, Garden, Wadeson Way	SJ635933	19	13/06/2009	Flowering	1	Field Record

New Zealand Pigmyweed (Crassula helmsii) (6,8)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
	SJ59869102	8	09/2008-09/2008	None	Dominant	Field Record
	SJ59789099	6	09/2008-09/2008	None	Present	Field Record

Map

Large Tortoiseshell (Nymphalis polychloros) (1,2)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
	SJ6273693589	1	2007	None	Present	Field Record
	SJ6272693669	2	2007	None	Present	Field Record

Ringlet (Aphantopus hyperantus) (3)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Southworth Hall, Croft	SJ6293	3	26/06/2012	None	1	Field Record

Map

Myddleton Lane
New Lane
Hollins Lane
Winwick
Arbury
Mill House Lane
M6
M62
B&Q
Houghton Green
Mill Lane
Calver Road
Hulme
Poplars Avenue
Sandy Lane
Cinnamon Brow
Fearnhead
200 m
1000 ft

Dot Moth (Melanchra persicariae) (8)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Croft, Wadeson Way	SJ637932	8	03/07/2014	Adult	1	Field Record

Centre-barred Sallow (Atethmia centrago) (3)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
11 chesterton drive, winwick	SJ6092	3	09/09/2012	None	1	Field Record

Cinnabar (Tyria jacobaeae) (1,2,4,5,6,7,8)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Westbrook - CP	SJ598909	2	06/06/2006	None	Common	Field Record
Gemini Business Park	SJ596909	1	10/07/2016	Larvae	Frequent	Field Record
John Parr Wild Flower Meadow	SJ618913	4	28/06/2012	None	Present	Field Record
Croft, Garden, Wadeson Way	SJ637932	8	11/06/2015	Adult	1	Field Record
	SJ625927	7	16/07/2011	Larvae	Frequent	Field Record
Edge of Houghton Green Pool	SJ621930	5	03/08/2012	None	Present	Field Record
	SJ625925	6	15/08/2015	Larvae	1	Field Record

Map

Chadwick Avenue
Wadeson Way
Eaves Brow Road
Gosling Road
1
Wadeson Way
Wadeson Way
New Lane
20 m
100 ft

Keroplatus testaceus (Keroplatus testaceus) (1)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Croft, Wadeson Way	SJ637932	1	18/08/2015	Adult Male	1	Field Record

Map

Croft
New Lane
Waterworks Lane
Myddleton Lane
Hollins Lane
Winwick
Arbury
M6
Mill House Lane
M62
B&Q
Houghton Green
Calver Road
Hulme
Poplars Avenue
Cinnamon Brow
200 m
1000 ft

Common Lizard (Zootoca vivipara) (2,3)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
M6 Junction 21a	SJ619933	2	14/05/2008-26/09/2008	None	Present	Field Record
M62 (northbound)	SJ640920	3	14/05/2008-26/09/2008	None	Present	Field Record

Red-eared Terrapin (Trachemys scripta) (1)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Sankey Valley Park, Stanners Pool Area	SJ59869102	1	07/04/2011	Adult	1	Field Record

Map

Myddleton Lane
Winwick
Arbury
Hollins Lane
New Lane
Mill House Lane
M6
M62
Winwick Quay
B&Q
Houghton Green
Hulme
Gemini
Cinnamon Brow
Poplars Avenue
Fearnhead
Callands
Sankey Brook
Northway
Orford
Hilden Road
Alder Lane
Winwick Road (A49)
Padgate
Green Lane
Lilford Avenue
Bewsey
Paddington
500 m
1000 ft

Eurasian Badger (Meles meles) (13,20,28,29)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
	[redacted]	13	31/01/2016	None	Present	[redacted]
	[redacted]	13	31/01/2016	None	Present	[redacted]
[redacted]	[redacted]	20	24/11/2015	None	Present	[redacted]
[redacted]	[redacted]	29	30/04/2015	None	1	[redacted]
[redacted]	[redacted]	28	08/04/2006	None	Present	[redacted]

Brown Hare (Lepus europaeus) (2,5,9)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Westbrook - CP	SJ598909	9	06/06/2006	Droppings	Rare	Dung/Droppings/Frass/Pellet, Etc.
	SJ595916	5	16/07/2008	None	Present	Faeces
Warrington	SJ58509156	2	04/04/2012	Dead	1	Field Record

European Water Vole (Arvicola amphibius) (1,6,7,15,16,17,18,27)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Gemini Ponds	SJ596909	6	04/06/2008	None	Present	Field Record
Phipps Brook	SJ584919	1	02/02/2009	None	Present	Field Record
Gemini Ponds	SJ596909	6	16/04/2009	None	Present	Burrow, Nesthole
Spittle Brook	SJ635915	27	17/04/2009	None	Present	Burrow, Nesthole
Padgate Brook	SJ623910	16	07/06/2009	None	1	Field Record
Padgate Brook	SJ625915	17	05/07/2009	None	Present	Latrine
Padgate Brook	SJ621899	15	02/05/2009	None	Present	Burrow, Nesthole
Padgate Brook	SJ626893	18	11/07/2008	None	Present	Field Record
Causey Brook	SJ596914	7	16/07/2008	None	Present	Field Record

American Mink (Neovison vison) (6)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Viewed from the footbridge immediately North of the	SJ59659097	6	07/10/2016	None	1	Field Record

Cromwell Avenue bridge over Sankey Brook

Eastern Grey Squirrel (Sciurus carolinensis) (3,14,26)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
John Parr Wild Flower Meadow	SJ618913	14	28/06/2012	None	Present	Field Record
	SJ635906	26	16/01/2014	Adult	1	Field Record
Big Moss Wood, Warrington	SJ592909	3	09/03/2006	None	Present	Field Record

Harvest Mouse (Micromys minutus) (4)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
disused canal full of reeds alongside Bewsey Meadow	SJ594899	4	22/11/2014	None	None	Field Record

West European Hedgehog (Erinaceus europaeus) (8,10,11,12,19,21,22,23,25,30,31)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
Birchwood Way	SJ629903	22	27/07/2014	Dead Immature	1	Dead On Road
	SJ6092	11	09/09/2012	Juvenile Male	1	Field Record
Bewsey & Whitecross - CP, 23a Bardsley Avenue, Warrington	SJ5987090443	8	01/06/2008	Adult	1	Field Record
Bewsey & Whitecross - CP, 23a Bardsley Avenue, Warrington	SJ5987090443	8	15/09/2007	Adult	1	Field Record
	SJ6092	11	14/08/2012	Juvenile Male	1	Field Record
Winwick, Burger King roundabout	SJ60299220	10	23/08/2015	Adult	1	Dead On Road
plot15	SJ61309015	12	30/03/2013	Dead Adult	1	Field Record
Mullion Grove, Longbarn	SJ6390	30	30/12/2012	None	1	Field Record
Kinross Close	SJ6291	21	28/06/2013	Adult	Present	Field Record
Birchwood Way	SJ635905	25	23/10/2015	Adult	1	Dead On Road
Birchwood Park Avenue	SJ631904	23	02/05/2014	Adult	1	Dead On Road
Birchwood Park Avenue	SJ626902	19	16/05/2014	Adult	1	Dead On Road

Birchwood Way	SJ639907	31	19/04/2014	Adult	1	Dead On Road
23a Bardsley Avenue, Warrington	SJ5987090443	8	01/06/2008	Adult	1	Field Record
23a Bardsley Avenue, Warrington	SJ5987090443	8	15/09/2007	Adult	1	Field Record

Pipistrelle (Pipistrellus pipistrellus) (24)

RECORD

Location	Grid ref.	Grid ID	Date	Sex/Stage	Abundance	Record type
5 betsyfield drive croft	SJ63479343	24	14/06/2011	None	1	Aural Bat Detector

Site Boundary Report

Local Sites

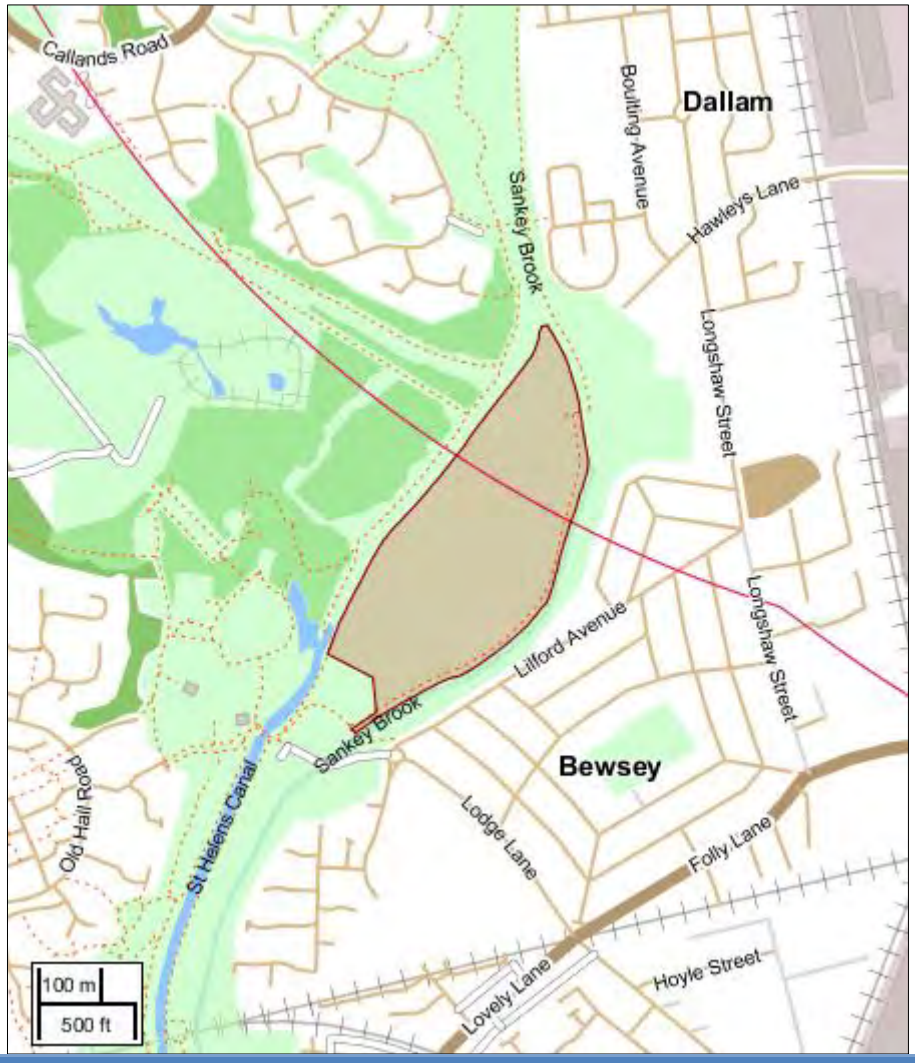
Local Wildlife Sites

Winwick Old Quay / WA046

Map

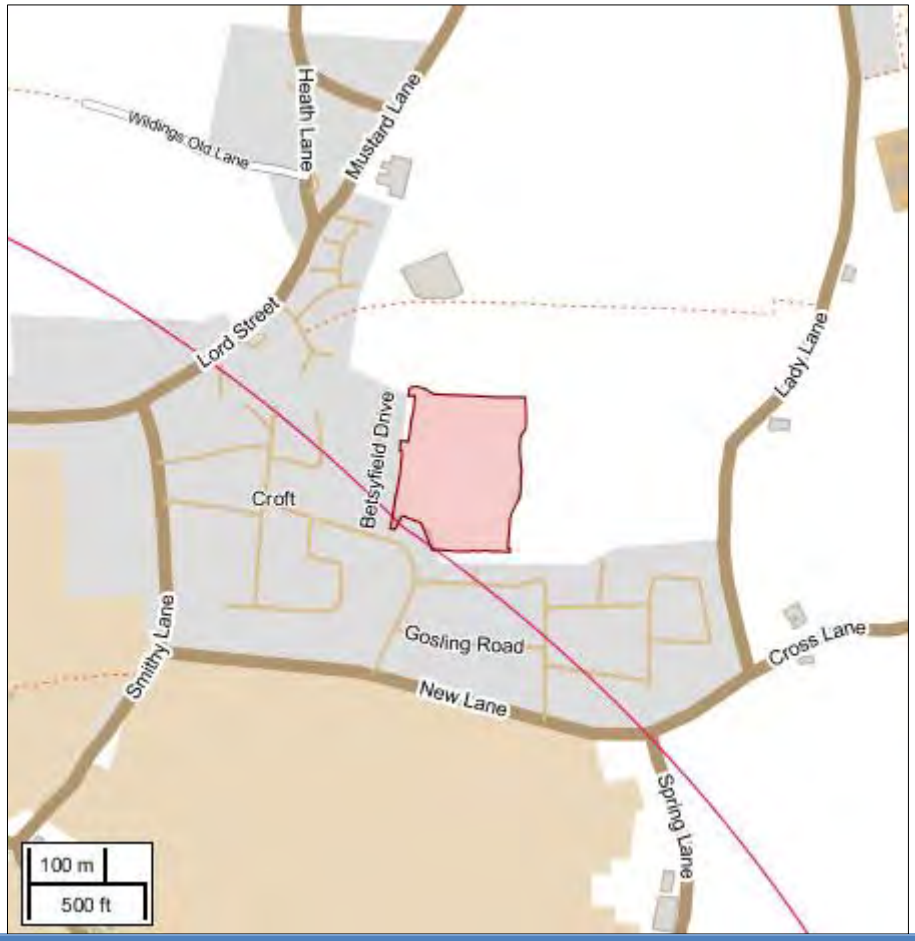
Site name	Winwick Old Quay
Site code	WA046
Authority	Warrington Local Wildlife Sites Partnership
Site centroid	SJ5971791086

Map



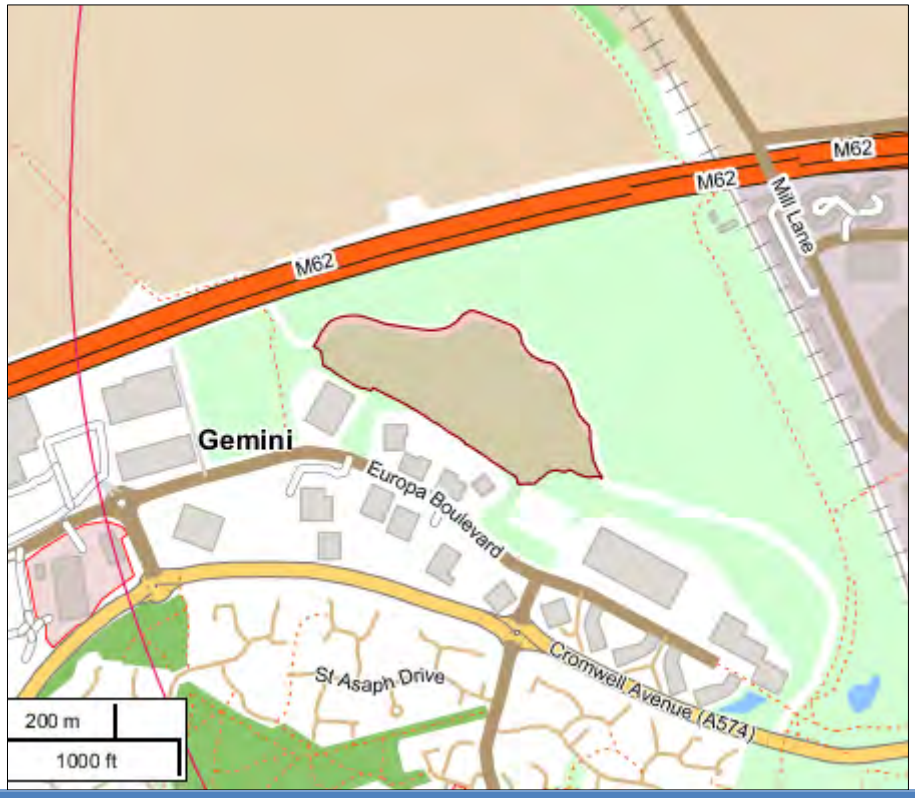
Site name	Bewsey Meadows
Site code	WA002
Authority	Warrington Local Wildlife Sites Partnership
Site centroid	SJ5952489785

Map



Site name	Croft Grasslands
Site code	WA006
Authority	Warrington Local Wildlife Sites Partnership
Site centroid	SJ6362693488

Map



Site name	Gemini Washlands
Site code	WA010
Authority	Warrington Local Wildlife Sites Partnership
Site centroid	SJ5922491433

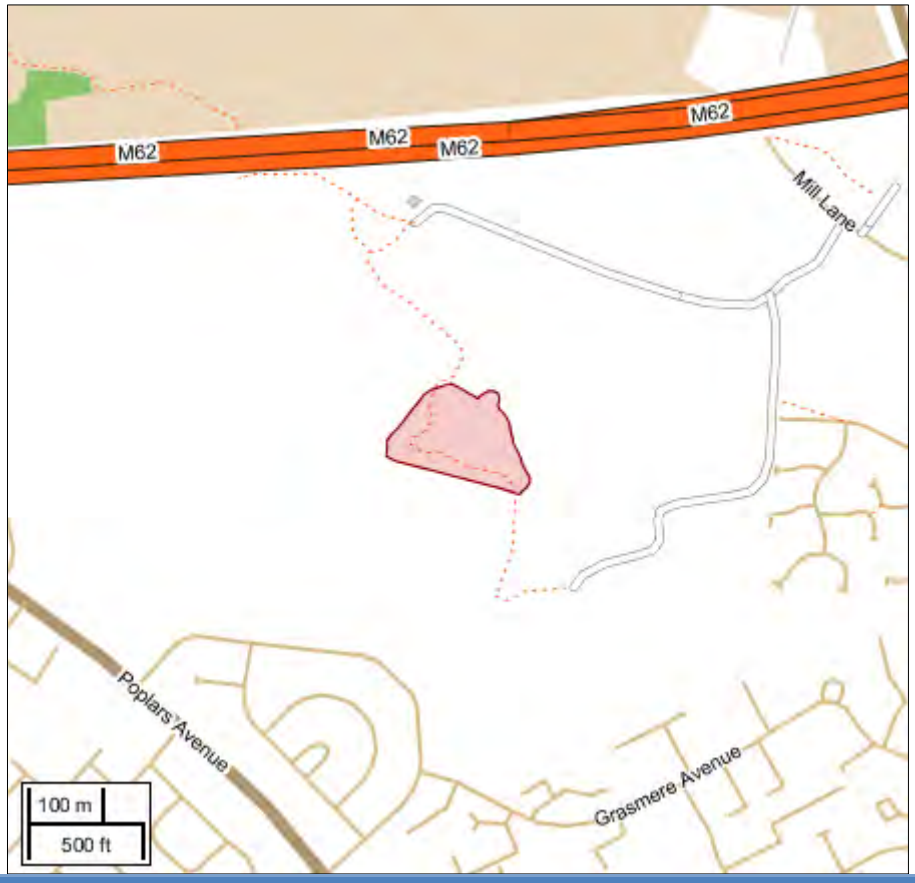
Map

Site name	Houghton Green Pool
Site code	WA013
Authority	Warrington Local Wildlife Sites Partnership
Site centroid	SJ6221392911

Map

Site name	Little and Big Moss Woods
Site code	WA019
Authority	Warrington Local Wildlife Sites Partnership
Site centroid	SJ5881490845

Map

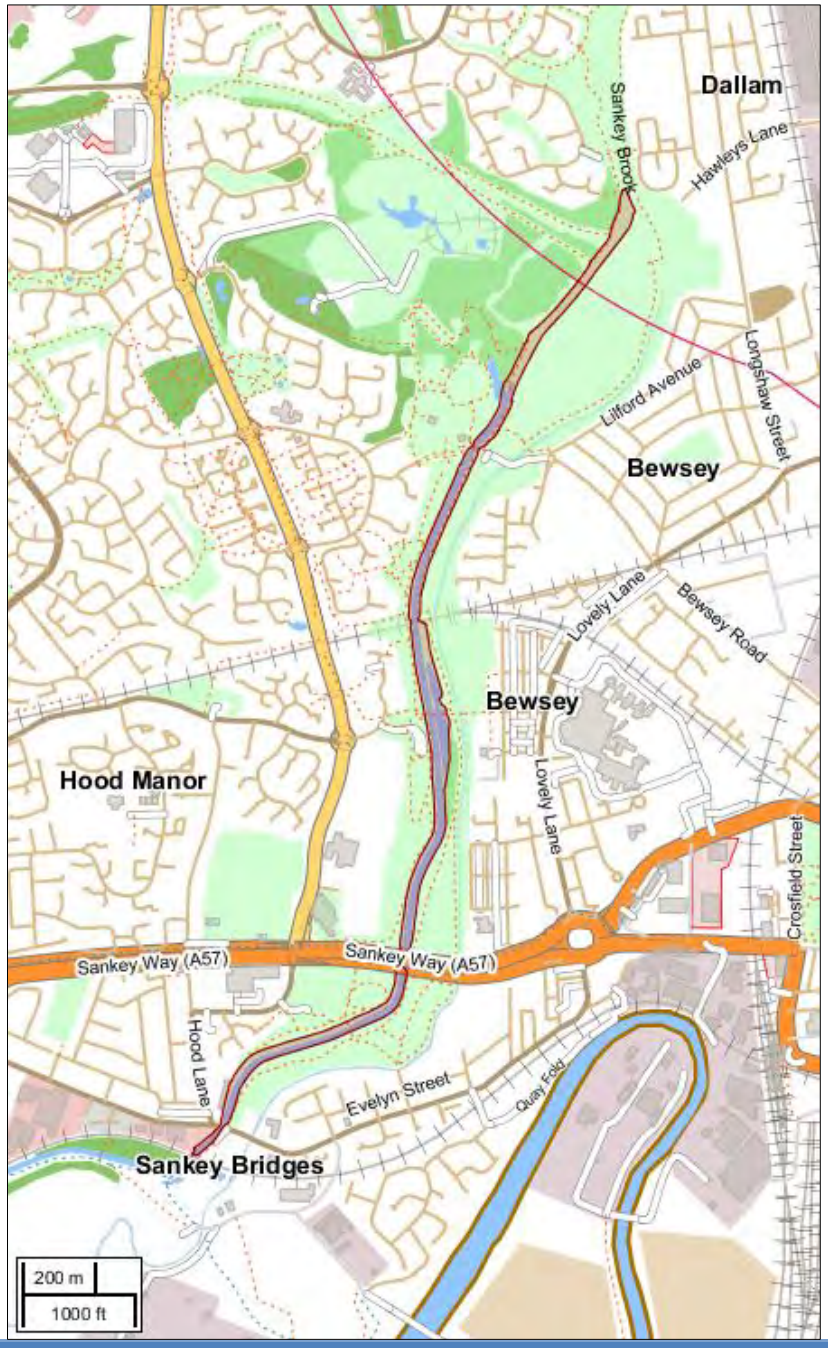


Site name	Radley Plantation and Pond
Site code	WA047
Authority	Warrington Local Wildlife Sites Partnership
Site centroid	SJ6172291629

Map

Site name	Sankey Brook
Site code	WA049
Authority	Warrington Local Wildlife Sites Partnership
Site centroid	SJ5956091051

Map



Site name	Sankey Canal Central
Site code	WA048
Authority	Warrington Local Wildlife Sites Partnership
Site centroid	SJ5907888908

Regionally Important Geodiversity Sites

There are no Cheshire Regionally Important Geodiversity Sites within this search area

Statutory Sites

Due to changes to the NBN we are currently unable to provide Statutory Site location maps. You can access these by visiting the NBN Atlas https://spatial.nbnatlas.org/ or MagicMap http://www.natureonthemap.naturalengland.org.uk/MagicMap.aspx (please be aware of the NBN Atlas guidance for using data https://nbnatlas.org/help/guidance-using-data/).

Other Sites of Conservation Interest

There are no Other Sites of Conservation Interest within this search area.

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The Biodiversity Information System for Cheshire, Halton, Warrington and Wirral

Patron: Professor David Bellamy
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Using this document

In order to navigate this document easily please enable the bookmark tool view using the bookmark icon on the left of your screen:

The bookmark functions within the pdf allow easy navigation through large reports. Bookmarks can be clicked on like hyperlinks taking the user directly to the relevant section.

Those bookmarks with a plus sign next to them (+) can be expanded by clicking on the plus sign. You can minimise these entries again by clicking on the resulting minus sign (-).

In addition you can search through the document for any particular text by using the standard Microsoft shortcut (Ctrl + F) and enter the text you are looking for.

Interpretation of the data

- Species maps: The species maps show the location of protected, notable and Invasive non-native species grouped by taxon. The numbers in brackets adjacent to the species names relate to the grid ID shown on the maps. Records with a grid reference accuracy of 10m square or above are minimised to a 100m square. Where there are more than 100 grid IDs on a map the grid references will be minimised to 1km. The full grid reference can be found within the full record in this report or in the excel spreadsheet of raw data.
- Attribute data: Where available all attribute data is provided with the records. Sex and life stage information as well as the record type all allow greater interpretation of information available. However it is not always possible to provide this information.
- Species designation Status: The species designation information provided within this enquiry output is based on the best available information provided through the JNCC: *Conservation designations of UK Taxa* list. Information on the limitations to this list is available here: (http://jncc.defra.gov.uk/page-3408)
- Site/habitat data: Due to changes in the NBN web services we are currently unable to provide site and observation data from the NBN, this does not affect local sites. Information for statutory sites can be found at http://www.natureonthemap.naturalengland.org.uk/MagicMap.aspx and sites and NBN taxa observations at https://spatial.nbnatlas.org.
  (please be aware of the NBN Atlas guidance for using data https://nbnatlas.org/help/guidance-using-data/).

S2

317266

Peel Hall

SJ6141891748

Table of Contents

Using this document 1
Interpretation of the data 1
Table of Contents 3
Designated Species Summary 5
Map 10
Species Summary Report 11
Species Grid Id Summary Report 11
AMPHIBIAN 11
BIRD 11
BONY FISH (ACTINOPTERYGII) 13
FLOWERING PLANT 13
INSECT - BUTTERFLY 14
INSECT - MOTH 14
INSECT - TRUE FLY (DIPTERA) 14
REPTILE 14
TERRESTRIAL MAMMAL 14
Grid Id Species Summary Report 15
1 - [SJ5890] 15
2 - [SJ5891] 15
3 - [SJ5892] 15
4 - [SJ5893] 15
5 - [SJ5989] 15
6 - [SJ5990] 15
7 - [SJ5991] 16
8 - [SJ5992] 16
9 - [SJ6089] 16
10 - [SJ6090] 17
11 - [SJ6091] 17
12 - [SJ6092] 17
13 - [SJ6189] 17
14 - [SJ6190] 17
15 - [SJ6191] 18
16 - [SJ6192] 18
17 - [SJ6193] 18
18 - [SJ6194] 19
19 - [SJ6289] 19
20 - [SJ6290] 19
21 - [SJ6291] 19
22 - [SJ6292] 20
23 - [SJ6293] 20
24 - [SJ6390] 21
25 - [SJ6391] 21
26 - [SJ6392] 21
27 - [SJ6393] 21
28 - [SJ6491] 22
29 - [SJ6492] 22
Site Boundary Report 23

Local Sites 23
Local Wildlife Sites 23
Winwick Old Quay / WA046 23
Map 23
Bewsey Meadows / WA002 24
Map 24
Croft Grasslands / WA006 25
Map 25
Gemini Washlands / WA010 26
Map 26
Houghton Green Pool / WA013 27
Map 27
Little and Big Moss Woods / WA019 28
Map 28
Radley Plantation and Pond / WA047 29
Map 29
Sankey Brook / WA049 30
Map 30
Sankey Canal Central / WA048 31
Map 31
Regionally Important Geodiversity Sites 32
Statutory Sites 32
Other Sites of Conservation Interest 32

Designated Species Summary

Taxa	Designation Name	Occurrence in Cheshire tetrads between 2006-2017 (%)	Occurrence in Cheshire tetrads all years (%)
American Mink (Neovison vison)	Invasive Non-Native Species, Wildlife and Countryside Act Schedule 9	10%	22%
Arctic Tern (Sterna paradisaea)	Birds of Conservation Concern [RSPB] - Amber	1%	8%
Barn Owl (Tyto alba)	Local Biodiversity Action Plan Species, Wildlife and Countryside Act - Schedule 1, Birds of Conservation Concern [RSPB] - Amber, Wildlife and Countryside Act Schedule 9	23%	58%
Black Poplar (Populus nigra subsp. betulifolia)	Local Biodiversity Action Plan Species	14%	26%
Black Tern (Chlidonias niger)	Wildlife and Countryside Act - Schedule 1, Birds of Conservation Concern [RSPB] - Amber	<1%	9%
Black-headed Gull (Chroicocephalus ridibundus)	Birds of Conservation Concern [RSPB] - Amber	23%	41%
Black-necked Grebe (Podiceps nigricollis)	Local Biodiversity Action Plan Species, Wildlife and Countryside Act - Schedule 1, Birds of Conservation Concern [RSPB] - Amber	2%	4%
Bluebell (Hyacinthoides non-scripta)	Local Biodiversity Action Plan Species, Wildlife and Countryside Act - Shedule 8	31%	69%
Brambling (Fringilla montifringilla)	Wildlife and Countryside Act - Schedule 1	9%	23%
Brown Hare (Lepus europaeus)	Local Biodiversity Action Plan Species, NERC S41, UK BAP Priority Species	21%	80%
Bullfinch (Pyrrhula pyrrhula)	Local Biodiversity Action Plan Species, Birds of Conservation Concern [RSPB] - Amber, NERC S41	20%	70%
Canada Goose (Branta canadensis)	Invasive Non-Native Species, Wildlife and Countryside Act Schedule 9	26%	53%
Centre-barred Sallow (Atethmia centrago)	NERC S41, UK BAP Priority Species	1%	7%
Cinnabar (Tyria jacobaeae)	NERC S41, UK BAP Priority Species	13%	30%
Common Frog (Rana temporaria)	Wildlife and Countryside Act - Schedule 5	33%	63%
Common Gull (Larus canus)	Birds of Conservation Concern [RSPB] - Amber	9%	25%
Common Lizard (Zootoca vivipara)	Wildlife and Countryside Act - Schedule 5, NERC S41, UK BAP Priority Species	5%	9%

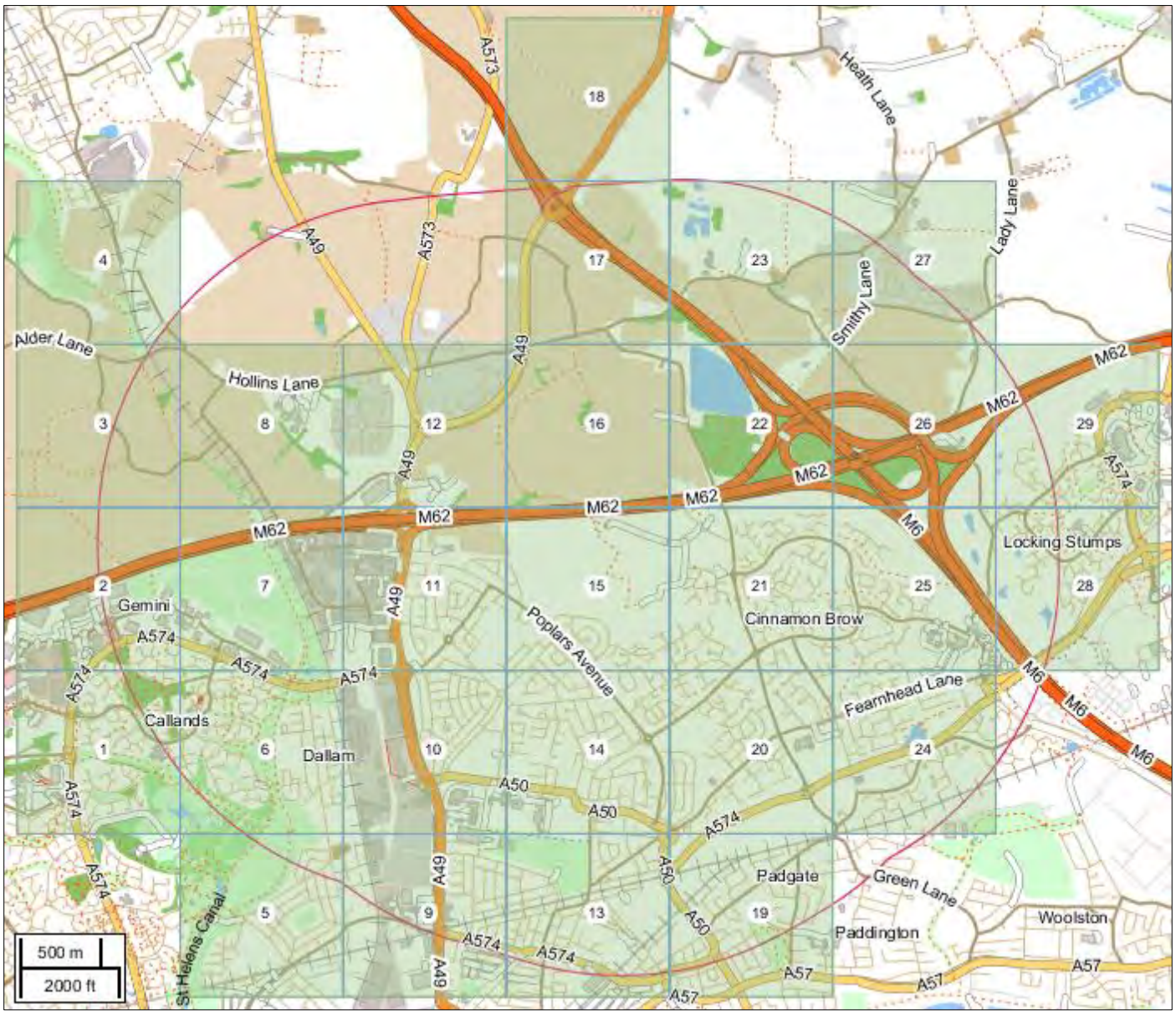
Common Toad (Bufo bufo)	Wildlife and Countryside Act - Schedule 5, NERC S41, UK BAP Priority Species	23%	41%
Corn Bunting (Emberiza calandra)	Local Biodiversity Action Plan Species, Birds of Conservation Concern [RSPB] - Red, NERC S41	2%	38%
Crane (Grus grus)	Birds of Conservation Concern [RSPB] - Amber, Wildlife and Countryside Act Schedule 9	<1%	<1%
Curlew (Numenius arquata)	Birds of Conservation Concern [RSPB] - Amber, NERC S41, UK BAP Priority Species	14%	53%
Dot Moth (Melanchra persicariae)	NERC S41, UK BAP Priority Species	3%	14%
Dunlin (Calidris alpina)	Birds of Conservation Concern [RSPB] - Red	5%	15%
Dunnock (Prunella modularis)	Birds of Conservation Concern [RSPB] - Amber, NERC S41	29%	84%
Eastern Grey Squirrel (Sciurus carolinensis)	Wildlife and Countryside Act Schedule 9	31%	54%
Eurasian Badger (Meles meles)	Protection of Badgers Act 1992	59%	74%
European Eel (Anguilla anguilla)	NERC S41, UK BAP Priority Species	2%	6%
European Water Vole (Arvicola amphibius)	Local Biodiversity Action Plan Species, Wildlife and Countryside Act - Schedule 5, NERC S41, UK BAP Priority Species	13%	52%
Fieldfare (Turdus pilaris)	Wildlife and Countryside Act - Schedule 1, Birds of Conservation Concern [RSPB] - Red	19%	39%
Floating Pennywort (Hydrocotyle ranunculoides)	Invasive Non-Native Species, Wildlife and Countryside Act Schedule 9	2%	2%
Fringed Water-lily (Nymphoides peltata)	Invasive Non-Native Species, Nationally Scarce	4%	7%
Gadwall (Anas strepera)	Birds of Conservation Concern [RSPB] - Amber	6%	12%
Golden Plover (Pluvialis apricaria)	Birds of Conservation Concern [RSPB] - Amber	5%	17%
Goldeneye (Bucephala clangula)	Wildlife and Countryside Act - Schedule 1, Birds of Conservation Concern [RSPB] - Amber	6%	14%
Grass Vetchling (Lathyrus nissolia)	Locally Rare and Scare	2%	2%
Great Black-backed Gull (Larus marinus)	Birds of Conservation Concern [RSPB] - Amber	6%	16%
Green Sandpiper (Tringa ochropus)	Wildlife and Countryside Act - Schedule 1, Birds of Conservation Concern [RSPB] - Amber	5%	17%
Greenshank (Tringa nebularia)	Wildlife and Countryside Act - Schedule 1	3%	12%

Grey Partridge (Perdix perdix)	Local Biodiversity Action Plan Species, Birds of Conservation Concern [RSPB] - Red, NERC S41, UK BAP Priority Species	8%	60%
Grey Wagtail (Motacilla cinerea)	Birds of Conservation Concern [RSPB] - Amber	14%	45%
Hairy Vetchling (Lathyrus hirsutus)	Nationally Rare	<1%	<1%
Harvest Mouse (Micromys minutus)	Local Biodiversity Action Plan Species, NERC S41, UK BAP Priority Species	1%	8%
Herring Gull (Larus argentatus)	Birds of Conservation Concern [RSPB] - Red	11%	33%
Himalayan Cotoneaster (Cotoneaster simonsii)	Wildlife and Countryside Act Schedule 9	1%	3%
Hobby (Falco subbuteo)	Wildlife and Countryside Act - Schedule 1	9%	17%
House Martin (Delichon urbicum)	Birds of Conservation Concern [RSPB] - Amber	23%	67%
House Sparrow (Passer domesticus)	Local Biodiversity Action Plan Species, Birds of Conservation Concern [RSPB] - Red, NERC S41, UK BAP Priority Species	35%	84%
Indian Balsam (Impatiens glandulifera)	Invasive Non-Native Species, Wildlife and Countryside Act Schedule 9	24%	36%
Japanese Knotweed (Fallopia japonica)	Invasive Non-Native Species, Wildlife and Countryside Act Schedule 9	18%	31%
Keroplatus testaceus (Keroplatus testaceus)	Nationally Scarce	<1%	<1%
Kestrel (Falco tinnunculus)	Birds of Conservation Concern [RSPB] - Amber	35%	80%
Kingfisher (Alcedo atthis)	Wildlife and Countryside Act - Schedule 1, Birds of Conservation Concern [RSPB] - Amber	15%	45%
Lapwing (Vanellus vanellus)	Local Biodiversity Action Plan Species, Birds of Conservation Concern [RSPB] - Red, NERC S41, UK BAP Priority Species	28%	79%
Large Tortoiseshell (Nymphalis polychloros)	Wildlife and Countryside Act - Schedule 5	<1%	<1%
Lesser Black-backed Gull (Larus fuscus)	Birds of Conservation Concern [RSPB] - Amber	12%	29%
Little Grebe (Tachybaptus ruficollis)	Birds of Conservation Concern [RSPB] - Amber	11%	29%
Little Ringed Plover (Charadrius dubius)	Wildlife and Countryside Act - Schedule 1	3%	13%
Mallard (Anas platyrhynchos)	Birds of Conservation Concern [RSPB] - Amber	42%	82%
Marsh Tit (Poecile palustris)	Birds of Conservation Concern [RSPB] - Red, NERC S41	2%	29%

Meadow Pipit (Anthus pratensis)	Birds of Conservation Concern [RSPB] - Amber	13%	45%
Merlin (Falco columbarius)	Wildlife and Countryside Act - Schedule 1, Birds of Conservation Concern [RSPB] - Amber	6%	14%
Mistle Thrush (Turdus viscivorus)	Birds of Conservation Concern [RSPB] - Amber	23%	82%
New Zealand Pigmyweed (Crassula helmsii)	Invasive Non-Native Species, Wildlife and Countryside Act Schedule 9	5%	9%
Oystercatcher (Haematopus ostralegus)	Birds of Conservation Concern [RSPB] - Amber	13%	23%
Peregrine (Falco peregrinus)	Wildlife and Countryside Act - Schedule 1	11%	19%
Pink-footed Goose (Anser brachyrhynchus)	Birds of Conservation Concern [RSPB] - Amber	8%	15%
Pipistrelle (Pipistrellus pipistrellus)	Local Biodiversity Action Plan Species, Wildlife and Countryside Act - Schedule 5, Conservation (Habs and Sp) Regulations 2010 - Schedule 2	27%	54%
Pochard (Aythya ferina)	Birds of Conservation Concern [RSPB] - Amber	6%	19%
Red-eared Terrapin (Trachemys scripta)	Invasive Non-Native Species	<1%	<1%
Redshank (Tringa totanus)	Birds of Conservation Concern [RSPB] - Amber	9%	22%
Redwing (Turdus iliacus)	Wildlife and Countryside Act - Schedule 1, Birds of Conservation Concern [RSPB] - Red	18%	38%
Reed Bunting (Emberiza schoeniclus)	Local Biodiversity Action Plan Species, Birds of Conservation Concern [RSPB] - Amber, NERC S41, UK BAP Priority Species	19%	73%
Rhododendron (Rhododendron ponticum)	Invasive Non-Native Species, Wildlife and Countryside Act Schedule 9	19%	42%
Ringed Plover (Charadrius hiaticula)	Birds of Conservation Concern [RSPB] - Amber	4%	15%
Ringlet (Aphantopus hyperantus)	Local Biodiversity Action Plan Species	14%	15%
Ruddy Duck (Oxyura jamaicensis)	Invasive Non-Native Species, Wildlife and Countryside Act Schedule 9	3%	14%
Sand Martin (Riparia riparia)	Birds of Conservation Concern [RSPB] - Amber	7%	35%
Shoveler (Anas clypeata)	Birds of Conservation Concern [RSPB] - Amber	8%	18%
Skylark (Alauda arvensis)	Local Biodiversity Action Plan Species, Birds of Conservation Concern [RSPB] - Red, NERC S41	20%	85%
Slavonian Grebe (Podiceps auritus)	Wildlife and Countryside Act - Schedule 1, Birds of Conservation	<1%	3%

	Concern [RSPB] - Amber		
Smooth Newt (Lissotriton vulgaris)	Wildlife and Countryside Act - Schedule 5	14%	35%
Snipe (Gallinago gallinago)	Birds of Conservation Concern [RSPB] - Amber	13%	54%
Song Thrush (Turdus philomelos)	Local Biodiversity Action Plan Species, Birds of Conservation Concern [RSPB] - Red	33%	87%
Starling (Sturnus vulgaris)	Local Biodiversity Action Plan Species, Birds of Conservation Concern [RSPB] - Red, NERC S41	30%	86%
Stock Dove (Columba oenas)	Birds of Conservation Concern [RSPB] - Amber	10%	65%
Swallow (Hirundo rustica)	Birds of Conservation Concern [RSPB] - Amber	44%	87%
Swift (Apus apus)	Birds of Conservation Concern [RSPB] - Amber	22%	81%
Teal (Anas crecca)	Birds of Conservation Concern [RSPB] - Amber	11%	28%
Tree Sparrow (Passer montanus)	Local Biodiversity Action Plan Species, Birds of Conservation Concern [RSPB] - Red, NERC S41, UK BAP Priority Species	10%	72%
Tufted Duck (Aythya fuligula)	Birds of Conservation Concern [RSPB] - Amber	13%	31%
Wall Cotoneaster (Cotoneaster horizontalis)	Wildlife and Countryside Act Schedule 9	2%	6%
West European Hedgehog (Erinaceus europaeus)	NERC S41, UK BAP Priority Species	24%	44%
Wheatear (Oenanthe oenanthe)	Birds of Conservation Concern [RSPB] - Amber	8%	32%
Whinchat (Saxicola rubetra)	Birds of Conservation Concern [RSPB] - Amber	3%	21%
Whitethroat (Sylvia communis)	Birds of Conservation Concern [RSPB] - Amber	17%	70%
Willow Warbler (Phylloscopus trochilus)	Birds of Conservation Concern [RSPB] - Amber	18%	83%
Woodcock (Scolopax rusticola)	Birds of Conservation Concern [RSPB] - Amber	8%	45%
Yellow Wagtail (Motacilla flava)	Birds of Conservation Concern [RSPB] - Red, NERC S41	5%	54%
Yellowhammer (Emberiza citrinella)	Local Biodiversity Action Plan Species, Birds of Conservation Concern [RSPB] - Red, NERC S41, UK BAP Priority Species	14%	77%

Map


A573
Heath Lane
18
A49
A573
17
23
27
Lady Lane
4
Alder Lane
Hollins Lane
Smithy Lane
M62
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8
12
16
22
26
29
A49
M62
M62
M62
M62
A574
M6
Locking Stumps
2
7
11
15
21
25
28
Gemini
A574
A49
Poplars Avenue
Cinnamon Brow
A574
A574
A574
M6
Fearnhead Lane
M6
M6
Callands
1
6
Dallam
10
14
20
24
A50
A50
A574
A574
A49
A50
Padgate
Green Lane
5
9
13
19
A50
Woolston
Paddington
St Helens Canal
A574
A574
A57
A57
A57
A49
500 m
2000 ft

Species Summary Report

Species Grid Id Summary Report

AMPHIBIAN

Taxon name	Grid ref. id
Common Toad	6 (2008-2009), 7 (2007-2011), 17 (2008), 29 (2008)
Common Frog	1 (2007), 7 (2006-2011), 12 (2012), 14 (2006-2014), 17 (2008), 27 (2010), 29 (2008)
Smooth Newt	7 (2006-2011), 14 (2014)

BIRD

Taxon name	Grid ref. id
Green Sandpiper	22 (2012)
Goldeneye	22 (2012)
Marsh Tit	21 (2007)
Curlew	21 (2007)
House Martin	22 (2012), 25 (2015)
Dunlin	22 (2012-2013)
Great Black-backed Gull	21 (2007-2008), 22 (2012)
Crane	15 (2012)
Bullfinch	7 (2011), 15 (2014), 16 (2012), 21 (2007-2008)
Grey Wagtail	15 (2016), 17 (2011), 19 (2015), 21 (2007-2008)
Black-necked Grebe	17 (2011), 22 (2009-2012)
Black Tern	17 (2011)
Lesser Black-backed Gull	12 (2011), 15 (2014), 19 (2015), 22 (2013-2014)
Barn Owl	12 (2011-2012)
Brambling	12 (2012)
Golden Plover	12 (2012), 16 (2012), 22 (2012)
Merlin	12 (2011), 17 (2011)
Canada Goose	5 (2012), 12 (2011), 17 (2011), 21 (2007-2008), 22 (2012)
Greenshank	17 (2011)
Hobby	12 (2011), 17 (2011)
Gadwall	17 (2011)
Corn Bunting	12 (2011-2012), 15 (2014), 16 (2012), 17 (2011), 22 (2012)
Common Gull	12 (2011-2012), 16 (2012), 17 (2011), 22 (2012)

Little Grebe	17 (2011), 22 (2007)
Little Ringed Plover	17 (2011), 22 (2012)
Arctic Tern	17 (2011), 22 (2012)
Dunnock	3 (2011), 12 (2011-2012), 15 (2014), 16 (2012), 17 (2011), 19 (2015), 21 (2007-2008), 22 (2012), 25 (2010)
Mallard	4 (2011), 12 (2011), 15 (2012), 16 (2012), 17 (2011), 21 (2007-2013), 22 (2011-2014), 24 (2007-2014)
Fieldfare	8 (2012), 12 (2011-2012), 16 (2012), 17 (2011), 22 (2012-2014), 26 (2013), 27 (2013)
Lapwing	2 (2011-2012), 12 (2011-2012), 15 (2011-2013), 16 (2012), 17 (2011), 21 (2007-2008), 22 (2011-2015)
Herring Gull	12 (2011-2012), 15 (2014), 16 (2012), 17 (2011), 19 (2015), 21 (2007-2008), 22 (2012)
Meadow Pipit	3 (2011), 12 (2011-2012), 15 (2014), 16 (2012), 22 (2006-2012)
Grey Partridge	12 (2011-2012), 15 (2014), 16 (2012), 17 (2011), 21 (2008), 22 (2006-2015), 27 (2016)
Kestrel	2 (2011-2012), 6 (2010), 7 (2009-2012), 11 (2011), 12 (2011-2012), 15 (2011-2014), 16 (2012), 17 (2011), 21 (2007-2008), 22 (2011-2012)
Mistle Thrush	12 (2011-2012), 15 (2014), 16 (2012), 17 (2011), 19 (2008-2015), 21 (2007-2008), 22 (2012-2013), 27 (2013-2014)
Black-headed Gull	4 (2011), 12 (2011), 17 (2011), 19 (2015), 21 (2007-2008), 22 (2006-2014)
Kingfisher	6 (2006), 21 (2007-2008), 25 (2014)
House Sparrow	4 (2011), 12 (2011-2012), 14 (2006), 15 (2014), 16 (2012), 17 (2011), 19 (2015), 22 (2012)
Stock Dove	12 (2011-2012), 16 (2012), 17 (2011), 22 (2006-2012)
Redwing	8 (2012), 12 (2011-2012), 16 (2011), 17 (2011), 21 (2007-2008), 22 (2012-2014), 24 (2013-2014), 27 (2013-2014)
Sand Martin	3 (2009), 17 (2011), 22 (2010-2012)
Swallow	12 (2011-2012), 15 (2012-2014), 16 (2012), 17 (2011), 19 (2015), 21 (2007-2008), 22 (2011-2012), 24 (2009)
Swift	7 (2012), 10 (2013), 11 (2012), 12 (2011-2012), 15 (2012-2014), 16 (2012), 17 (2011), 19 (2008), 21 (2007-2009), 22 (2009-2012), 25 (2009), 27 (2011), 28 (2009)
Oystercatcher	12 (2012), 17 (2011), 21 (2008), 22 (2011-2015)
Willow Warbler	12 (2012), 15 (2012-2014), 16 (2012), 17 (2011), 21 (2007-2008), 22 (2012)
Reed Bunting	4 (2011), 12 (2011-2012), 16 (2012), 17 (2011), 21 (2007-2008), 22 (2012)
Pochard	17 (2011), 22 (2011-2014)
Skylark	3 (2009-2011), 12 (2011-2012), 15 (2014), 16 (2012), 17 (2011), 18 (2009), 22 (2011-2012)
Redshank	16 (2012), 17 (2011), 22 (2006-2013)
Wheatear	12 (2012), 22 (2012-2013)

Teal	17 (2011), 22 (2006-2012)
Tufted Duck	17 (2011), 22 (2006-2014)
Song Thrush	1 (2008), 3 (2011), 7 (2008), 12 (2011-2012), 14 (2008-2010), 15 (2014), 16 (2012), 17 (2011), 21 (2007-2008), 22 (2012), 27 (2013)
Whitethroat	12 (2011), 15 (2014), 17 (2011), 21 (2007-2008)
Starling	3 (2011), 12 (2011-2012), 15 (2013-2014), 16 (2012), 17 (2011), 19 (2015), 21 (2007-2008), 22 (2011-2012), 23 (2007), 25 (2010)
Tree Sparrow	12 (2011-2012), 16 (2012), 17 (2011), 22 (2012)
Yellowhammer	3 (2009-2011), 12 (2011-2012), 16 (2012), 17 (2011), 22 (2012)
Peregrine	12 (2012), 22 (2006)
Snipe	7 (2009), 9 (2012), 12 (2012)
Ringed Plover	17 (2011), 22 (2012)
Ruddy Duck	17 (2011), 22 (2012)
Pink-footed Goose	16 (2012), 28 (2013)
Yellow Wagtail	22 (2013)
Whinchat	12 (2012)
Woodcock	5 (2009), 21 (2007)
Slavonian Grebe	22 (2006)
Shoveler	22 (2012)

BONY FISH (ACTINOPTERYGII)

Taxon name	Grid ref. id
European Eel	24 (2006)

FLOWERING PLANT

Taxon name	Grid ref. id
Himalayan Cotoneaster	27 (2009)
Grass Vetchling	5 (2008), 6 (2008)
Bluebell	24 (2014)
Black Poplar	24 (2008)
Japanese Knotweed	5 (2008), 6 (2008), 9 (2012), 13 (2008), 24 (2008)
Floating Pennywort	19 (2008)
Indian Balsam	6 (2008), 7 (2007-2008), 22 (2009-2012), 25 (2008)
Hairy Vetchling	15 (2012)
Fringed Water-lily	14 (2013)
Rhododendron	24 (2014)
New Zealand Pigmyweed	6 (2008), 7 (2008)

Wall Cotoneaster	27 (2009)

INSECT - BUTTERFLY

Taxon name	Grid ref. id
Large Tortoiseshell	23 (2007)
Ringlet	23 (2012)

INSECT - MOTH

Taxon name	Grid ref. id
Dot Moth	27 (2014)
Centre-barred Sallow	12 (2012)
Cinnabar	6 (2006-2016), 15 (2012), 22 (2011-2015), 23 (2012), 27 (2015)

INSECT - TRUE FLY (DIPTERA)

Taxon name	Grid ref. id
Keroplatus testaceus	27 (2015)

REPTILE

Taxon name	Grid ref. id
Common Lizard	17 (2008), 29 (2008)
Red-eared Terrapin	7 (2011)

TERRESTRIAL MAMMAL

Taxon name	Grid ref. id
Harvest Mouse	5 (2014)
Eurasian Badger	15 (2016), 20 (2015), 25 (2006), 26 (2015)
Eastern Grey Squirrel	6 (2006), 15 (2012), 24 (2014)
American Mink	6 (2016)
European Water Vole	2 (2009), 6 (2008-2009), 7 (2008), 19 (2008-2009), 21 (2009), 25 (2009)
Brown Hare	2 (2012), 6 (2006), 7 (2008)
West European Hedgehog	6 (2007-2008), 12 (2012-2015), 14 (2013), 20 (2014), 21 (2013), 24 (2012-2015)
Pipistrelle	27 (2011)

1 - [SJ5890]

Taxon group	Taxon name
AMPHIBIAN	Common Frog (Rana temporaria) (2007)
BIRD	Song Thrush (Turdus philomelos) (2008)

2 - [SJ5891]

Taxon group	Taxon name
BIRD	Lapwing (Vanellus vanellus) (2011-2012), Kestrel (Falco tinnunculus) (2011-2012)
TERRESTRIAL MAMMAL	European Water Vole (Arvicola amphibius) (2009), Brown Hare (Lepus europaeus) (2012)

3 - [SJ5892]

Taxon group	Taxon name
BIRD	Dunnock (Prunella modularis) (2011), Meadow Pipit (Anthus pratensis) (2011), Sand Martin (Riparia riparia) (2009), Skylark (Alauda arvensis) (2009-2011), Song Thrush (Turdus philomelos) (2011), Starling (Sturnus vulgaris) (2011), Yellowhammer (Emberiza citrinella) (2009-2011)

4 - [SJ5893]

Taxon group	Taxon name
BIRD	Mallard (Anas platyrhynchos) (2011), Black-headed Gull (Chroicocephalus ridibundus) (2011), House Sparrow (Passer domesticus) (2011), Reed Bunting (Emberiza schoeniclus) (2011)

5 - [SJ5989]

Taxon group	Taxon name
BIRD	Canada Goose (Branta canadensis) (2012), Woodcock (Scolopax rusticola) (2009)
FLOWERING PLANT	Grass Vetchling (Lathyrus nissolia) (2008), Japanese Knotweed (Fallopia japonica) (2008)
TERRESTRIAL MAMMAL	Harvest Mouse (Micromys minutus) (2014)

6 - [SJ5990]

Taxon group	Taxon name
AMPHIBIAN	Common Toad (Bufo bufo) (2008-2009)

BIRD	Kestrel (Falco tinnunculus) (2010), Kingfisher (Alcedo atthis) (2006)
FLOWERING PLANT	Grass Vetchling (Lathyrus nissolia) (2008), Japanese Knotweed (Fallopia japonica) (2008), Indian Balsam (Impatiens glandulifera) (2008), New Zealand Pigmyweed (Crassula helmsii) (2008)
INSECT - MOTH	Cinnabar (Tyria jacobaeae) (2006-2016)
TERRESTRIAL MAMMAL	Eastern Grey Squirrel (Sciurus carolinensis) (2006), American Mink (Neovison vison) (2016), European Water Vole (Arvicola amphibius) (2008-2009), Brown Hare (Lepus europaeus) (2006), West European Hedgehog (Erinaceus europaeus) (2007-2008)

7 - [SJ5991]

Taxon group	Taxon name
AMPHIBIAN	Common Toad (Bufo bufo) (2007-2011), Common Frog (Rana temporaria) (2006-2011), Smooth Newt (Lissotriton vulgaris) (2006-2011)
BIRD	Bullfinch (Pyrrhula pyrrhula) (2011), Kestrel (Falco tinnunculus) (2009-2012), Swift (Apus apus) (2012), Song Thrush (Turdus philomelos) (2008), Snipe (Gallinago gallinago) (2009)
FLOWERING PLANT	Indian Balsam (Impatiens glandulifera) (2007-2008), New Zealand Pigmyweed (Crassula helmsii) (2008)
REPTILE	Red-eared Terrapin (Trachemys scripta) (2011)
TERRESTRIAL MAMMAL	European Water Vole (Arvicola amphibius) (2008), Brown Hare (Lepus europaeus) (2008)

8 - [SJ5992]

Taxon group	Taxon name
BIRD	Fieldfare (Turdus pilaris) (2012), Redwing (Turdus iliacus) (2012)

9 - [SJ6089]

Taxon group	Taxon name
BIRD	Snipe (Gallinago gallinago) (2012)
FLOWERING PLANT	Japanese Knotweed (Fallopia japonica) (2012)

10 - [SJ6090]

Taxon group	Taxon name
BIRD	Swift (Apus apus) (2013)

11 - [SJ6091]

Taxon group	Taxon name
BIRD	Kestrel (Falco tinnunculus) (2011), Swift (Apus apus) (2012)

12 - [SJ6092]

Taxon group	Taxon name
AMPHIBIAN	Common Frog (Rana temporaria) (2012)
BIRD	Lesser Black-backed Gull (Larus fuscus) (2011), Barn Owl (Tyto alba) (2011-2012), Brambling (Fringilla montifringilla) (2012), Golden Plover (Pluvialis apricaria) (2012), Merlin (Falco columbarius) (2011), Canada Goose (Branta canadensis) (2011), Hobby (Falco subbuteo) (2011), Corn Bunting (Emberiza calandra) (2011-2012), Common Gull (Larus canus) (2011-2012), Dunnock (Prunella modularis) (2011-2012), Mallard (Anas platyrhynchos) (2011), Fieldfare (Turdus pilaris) (2011-2012), Lapwing (Vanellus vanellus) (2011-2012), Herring Gull (Larus argentatus) (2011-2012), Meadow Pipit (Anthus pratensis) (2011-2012), Grey Partridge (Perdix perdix) (2011-2012), Kestrel (Falco tinnunculus) (2011-2012), Mistle Thrush (Turdus viscivorus) (2011-2012), Black-headed Gull (Chroicocephalus ridibundus) (2011), House Sparrow (Passer domesticus) (2011-2012), Stock Dove (Columba oenas) (2011-2012), Redwing (Turdus iliacus) (2011-2012), Swallow (Hirundo rustica) (2011-2012), Swift (Apus apus) (2011-2012), Oystercatcher (Haematopus ostralegus) (2012), Willow Warbler (Phylloscopus trochilus) (2012), Reed Bunting (Emberiza schoeniclus) (2011-2012), Skylark (Alauda arvensis) (2011-2012), Wheatear (Oenanthe oenanthe) (2012), Song Thrush (Turdus philomelos) (2011-2012), Whitethroat (Sylvia communis) (2011), Starling (Sturnus vulgaris) (2011-2012), Tree Sparrow (Passer montanus) (2011-2012), Yellowhammer (Emberiza citrinella) (2011-2012), Peregrine (Falco peregrinus) (2012), Snipe (Gallinago gallinago) (2012), Whinchat (Saxicola rubetra) (2012)
INSECT - MOTH	Centre-barred Sallow (Atethmia centrago) (2012)
TERRESTRIAL MAMMAL	West European Hedgehog (Erinaceus europaeus) (2012-2015)

13 - [SJ6189]

Taxon group	Taxon name
FLOWERING PLANT	Japanese Knotweed (Fallopia japonica) (2008)

14 - [SJ6190]

Taxon group	Taxon name
AMPHIBIAN	Common Frog (Rana temporaria) (2006-2014), Smooth Newt (Lissotriton vulgaris) (2014)

BIRD	House Sparrow (Passer domesticus) (2006), Song Thrush (Turdus philomelos) (2008-2010)
FLOWERING PLANT	Fringed Water-lily (Nymphoides peltata) (2013)
TERRESTRIAL MAMMAL	West European Hedgehog (Erinaceus europaeus) (2013)

15 - [SJ6191]

Taxon group	Taxon name
BIRD	Crane (Grus grus) (2012), Bullfinch (Pyrrhula pyrrhula) (2014), Grey Wagtail (Motacilla cinerea) (2016), Lesser Black-backed Gull (Larus fuscus) (2014), Corn Bunting (Emberiza calandra) (2014), Dunnock (Prunella modularis) (2014), Mallard (Anas platyrhynchos) (2012), Lapwing (Vanellus vanellus) (2011-2013), Herring Gull (Larus argentatus) (2014), Meadow Pipit (Anthus pratensis) (2014), Grey Partridge (Perdix perdix) (2014), Kestrel (Falco tinnunculus) (2011-2014), Mistle Thrush (Turdus viscivorus) (2014), House Sparrow (Passer domesticus) (2014), Swallow (Hirundo rustica) (2012-2014), Swift (Apus apus) (2012-2014), Willow Warbler (Phylloscopus trochilus) (2012-2014), Skylark (Alauda arvensis) (2014), Song Thrush (Turdus philomelos) (2014), Whitethroat (Sylvia communis) (2014), Starling (Sturnus vulgaris) (2013-2014)
FLOWERING PLANT	Hairy Vetchling (Lathyrus hirsutus) (2012)
INSECT - MOTH	Cinnabar (Tyria jacobaeae) (2012)
TERRESTRIAL MAMMAL	Eurasian Badger (Meles meles) (2016), Eastern Grey Squirrel (Sciurus carolinensis) (2012)

16 - [SJ6192]

Taxon group	Taxon name
BIRD	Bullfinch (Pyrrhula pyrrhula) (2012), Golden Plover (Pluvialis apricaria) (2012), Corn Bunting (Emberiza calandra) (2012), Common Gull (Larus canus) (2012), Dunnock (Prunella modularis) (2012), Mallard (Anas platyrhynchos) (2012), Fieldfare (Turdus pilaris) (2012), Lapwing (Vanellus vanellus) (2012), Herring Gull (Larus argentatus) (2012), Meadow Pipit (Anthus pratensis) (2012), Grey Partridge (Perdix perdix) (2012), Kestrel (Falco tinnunculus) (2012), Mistle Thrush (Turdus viscivorus) (2012), House Sparrow (Passer domesticus) (2012), Stock Dove (Columba oenas) (2012), Redwing (Turdus iliacus) (2011), Swallow (Hirundo rustica) (2012), Swift (Apus apus) (2012), Willow Warbler (Phylloscopus trochilus) (2012), Reed Bunting (Emberiza schoeniclus) (2012), Skylark (Alauda arvensis) (2012), Redshank (Tringa totanus) (2012), Song Thrush (Turdus philomelos) (2012), Starling (Sturnus vulgaris) (2012), Tree Sparrow (Passer montanus) (2012), Yellowhammer (Emberiza citrinella) (2012), Pink-footed Goose (Anser brachyrhynchus) (2012)

17 - [SJ6193]

Taxon group	Taxon name
AMPHIBIAN	Common Toad (Bufo bufo) (2008), Common Frog (Rana temporaria) (2008)

BIRD	Grey Wagtail (Motacilla cinerea) (2011), Black-necked Grebe (Podiceps nigricollis) (2011), Black Tern (Chlidonias niger) (2011), Merlin (Falco columbarius) (2011), Canada Goose (Branta canadensis) (2011), Greenshank (Tringa nebularia) (2011), Hobby (Falco subbuteo) (2011), Gadwall (Anas strepera) (2011), Corn Bunting (Emberiza calandra) (2011), Common Gull (Larus canus) (2011), Little Grebe (Tachybaptus ruficollis) (2011), Little Ringed Plover (Charadrius dubius) (2011), Arctic Tern (Sterna paradisaea) (2011), Dunnock (Prunella modularis) (2011), Mallard (Anas platyrhynchos) (2011), Fieldfare (Turdus pilaris) (2011), Lapwing (Vanellus vanellus) (2011), Herring Gull (Larus argentatus) (2011), Grey Partridge (Perdix perdix) (2011), Kestrel (Falco tinnunculus) (2011), Mistle Thrush (Turdus viscivorus) (2011), Black-headed Gull (Chroicocephalus ridibundus) (2011), House Sparrow (Passer domesticus) (2011), Stock Dove (Columba oenas) (2011), Redwing (Turdus iliacus) (2011), Sand Martin (Riparia riparia) (2011), Swallow (Hirundo rustica) (2011), Swift (Apus apus) (2011), Oystercatcher (Haematopus ostralegus) (2011), Willow Warbler (Phylloscopus trochilus) (2011), Reed Bunting (Emberiza schoeniclus) (2011), Pochard (Aythya ferina) (2011), Skylark (Alauda arvensis) (2011), Redshank (Tringa totanus) (2011), Teal (Anas crecca) (2011), Tufted Duck (Aythya fuligula) (2011), Song Thrush (Turdus philomelos) (2011), Whitethroat (Sylvia communis) (2011), Starling (Sturnus vulgaris) (2011), Tree Sparrow (Passer montanus) (2011), Yellowhammer (Emberiza citrinella) (2011), Ringed Plover (Charadrius hiaticula) (2011), Ruddy Duck (Oxyura jamaicensis) (2011)
REPTILE	Common Lizard (Zootoca vivipara) (2008)

18 - [SJ6194]

Taxon group	Taxon name
BIRD	Skylark (Alauda arvensis) (2009)

19 - [SJ6289]

Taxon group	Taxon name
BIRD	Grey Wagtail (Motacilla cinerea) (2015), Lesser Black-backed Gull (Larus fuscus) (2015), Dunnock (Prunella modularis) (2015), Herring Gull (Larus argentatus) (2015), Mistle Thrush (Turdus viscivorus) (2008-2015), Black-headed Gull (Chroicocephalus ridibundus) (2015), House Sparrow (Passer domesticus) (2015), Swallow (Hirundo rustica) (2015), Swift (Apus apus) (2008), Starling (Sturnus vulgaris) (2015)
FLOWERING PLANT	Floating Pennywort (Hydrocotyle ranunculoides) (2008)
TERRESTRIAL MAMMAL	European Water Vole (Arvicola amphibius) (2008-2009)

20 - [SJ6290]

Taxon group	Taxon name
TERRESTRIAL MAMMAL	Eurasian Badger (Meles meles) (2015), West European Hedgehog (Erinaceus europaeus) (2014)

21 - [SJ6291]

Taxon group	Taxon name
BIRD	Marsh Tit (Poecile palustris) (2007), Curlew (Numenius arquata) (2007), Great Black-backed Gull (Larus marinus) (2007-2008), Bullfinch

	(Pyrrhula pyrrhula) (2007-2008), Grey Wagtail (Motacilla cinerea) (2007-2008), Canada Goose (Branta canadensis) (2007-2008), Dunnock (Prunella modularis) (2007-2008), Mallard (Anas platyrhynchos) (2007-2013), Lapwing (Vanellus vanellus) (2007-2008), Herring Gull (Larus argentatus) (2007-2008), Grey Partridge (Perdix perdix) (2008), Kestrel (Falco tinnunculus) (2007-2008), Mistle Thrush (Turdus viscivorus) (2007-2008), Black-headed Gull (Chroicocephalus ridibundus) (2007-2008), Kingfisher (Alcedo atthis) (2007-2008), Redwing (Turdus iliacus) (2007-2008), Swallow (Hirundo rustica) (2007-2008), Swift (Apus apus) (2007-2009), Oystercatcher (Haematopus ostralegus) (2008), Willow Warbler (Phylloscopus trochilus) (2007-2008), Reed Bunting (Emberiza schoeniclus) (2007-2008), Song Thrush (Turdus philomelos) (2007-2008), Whitethroat (Sylvia communis) (2007-2008), Starling (Sturnus vulgaris) (2007-2008), Woodcock (Scolopax rusticola) (2007)
TERRESTRIAL MAMMAL	European Water Vole (Arvicola amphibius) (2009), West European Hedgehog (Erinaceus europaeus) (2013)

22 - [SJ6292]

Taxon group	Taxon name
BIRD	Green Sandpiper (Tringa ochropus) (2012), Goldeneye (Bucephala clangula) (2012), House Martin (Delichon urbicum) (2012), Dunlin (Calidris alpina) (2012-2013), Great Black-backed Gull (Larus marinus) (2012), Black-necked Grebe (Podiceps nigricollis) (2009-2012), Lesser Black-backed Gull (Larus fuscus) (2013-2014), Golden Plover (Pluvialis apricaria) (2012), Canada Goose (Branta canadensis) (2012), Corn Bunting (Emberiza calandra) (2012), Common Gull (Larus canus) (2012), Little Grebe (Tachybaptus ruficollis) (2007), Little Ringed Plover (Charadrius dubius) (2012), Arctic Tern (Sterna paradisaea) (2012), Dunnock (Prunella modularis) (2012), Mallard (Anas platyrhynchos) (2011-2014), Fieldfare (Turdus pilaris) (2012-2014), Lapwing (Vanellus vanellus) (2011-2015), Herring Gull (Larus argentatus) (2012), Meadow Pipit (Anthus pratensis) (2006-2012), Grey Partridge (Perdix perdix) (2006-2015), Kestrel (Falco tinnunculus) (2011-2012), Mistle Thrush (Turdus viscivorus) (2012-2013), Black-headed Gull (Chroicocephalus ridibundus) (2006-2014), House Sparrow (Passer domesticus) (2012), Stock Dove (Columba oenas) (2006-2012), Redwing (Turdus iliacus) (2012-2014), Sand Martin (Riparia riparia) (2010-2012), Swallow (Hirundo rustica) (2011-2012), Swift (Apus apus) (2009-2012), Oystercatcher (Haematopus ostralegus) (2011-2015), Willow Warbler (Phylloscopus trochilus) (2012), Reed Bunting (Emberiza schoeniclus) (2012), Pochard (Aythya ferina) (2011-2014), Skylark (Alauda arvensis) (2011-2012), Redshank (Tringa totanus) (2006-2013), Wheatear (Oenanthe oenanthe) (2012-2013), Teal (Anas crecca) (2006-2012), Tufted Duck (Aythya fuligula) (2006-2014), Song Thrush (Turdus philomelos) (2012), Starling (Sturnus vulgaris) (2011-2012), Tree Sparrow (Passer montanus) (2012), Yellowhammer (Emberiza citrinella) (2012), Peregrine (Falco peregrinus) (2006), Ringed Plover (Charadrius hiaticula) (2012), Ruddy Duck (Oxyura jamaicensis) (2012), Yellow Wagtail (Motacilla flava) (2013), Slavonian Grebe (Podiceps auritus) (2006), Shoveler (Anas clypeata) (2012)
FLOWERING PLANT	Indian Balsam (Impatiens glandulifera) (2009-2012)
INSECT - MOTH	Cinnabar (Tyria jacobaeae) (2011-2015)

23 - [SJ6293]

Taxon group	Taxon name
BIRD	Starling (Sturnus vulgaris) (2007)
INSECT - BUTTERFLY	Large Tortoiseshell (Nymphalis polychloros) (2007), Ringlet (Aphantopus hyperantus) (2012)

INSECT - MOTH	Cinnabar (Tyria jacobaeae) (2012)

24 - [SJ6390]

Taxon group	Taxon name
BIRD	Mallard (Anas platyrhynchos) (2007-2014), Redwing (Turdus iliacus) (2013-2014), Swallow (Hirundo rustica) (2009)
BONY FISH (ACTINOPTERYGII)	European Eel (Anguilla anguilla) (2006)
FLOWERING PLANT	Bluebell (Hyacinthoides non-scripta) (2014), Black Poplar (Populus nigra subsp. betulifolia) (2008), Japanese Knotweed (Fallopia japonica) (2008), Rhododendron (Rhododendron ponticum) (2014)
TERRESTRIAL MAMMAL	Eastern Grey Squirrel (Sciurus carolinensis) (2014), West European Hedgehog (Erinaceus europaeus) (2012-2015)

25 - [SJ6391]

Taxon group	Taxon name
BIRD	House Martin (Delichon urbicum) (2015), Dunnock (Prunella modularis) (2010), Kingfisher (Alcedo atthis) (2014), Swift (Apus apus) (2009), Starling (Sturnus vulgaris) (2010)
FLOWERING PLANT	Indian Balsam (Impatiens glandulifera) (2008)
TERRESTRIAL MAMMAL	Eurasian Badger (Meles meles) (2006), European Water Vole (Arvicola amphibius) (2009)

26 - [SJ6392]

Taxon group	Taxon name
BIRD	Fieldfare (Turdus pilaris) (2013)
TERRESTRIAL MAMMAL	Eurasian Badger (Meles meles) (2015)

27 - [SJ6393]

Taxon group	Taxon name
AMPHIBIAN	Common Frog (Rana temporaria) (2010)
BIRD	Fieldfare (Turdus pilaris) (2013), Grey Partridge (Perdix perdix) (2016), Mistle Thrush (Turdus viscivorus) (2013-2014), Redwing (Turdus iliacus) (2013-2014), Swift (Apus apus) (2011), Song Thrush (Turdus philomelos) (2013)

FLOWERING PLANT	Himalayan Cotoneaster (Cotoneaster simonsii) (2009), Wall Cotoneaster (Cotoneaster horizontalis) (2009)
INSECT - MOTH	Dot Moth (Melanchra persicariae) (2014), Cinnabar (Tyria jacobaeae) (2015)
INSECT - TRUE FLY (DIPTERA)	Keroplatus testaceus (Keroplatus testaceus) (2015)
TERRESTRIAL MAMMAL	Pipistrelle (Pipistrellus pipistrellus) (2011)

28 - [SJ6491]

Taxon group	Taxon name
BIRD	Swift (Apus apus) (2009), Pink-footed Goose (Anser brachyrhynchus) (2013)

29 - [SJ6492]

Taxon group	Taxon name
AMPHIBIAN	Common Toad (Bufo bufo) (2008), Common Frog (Rana temporaria) (2008)
REPTILE	Common Lizard (Zootoca vivipara) (2008)

Site Boundary Report

Local Sites

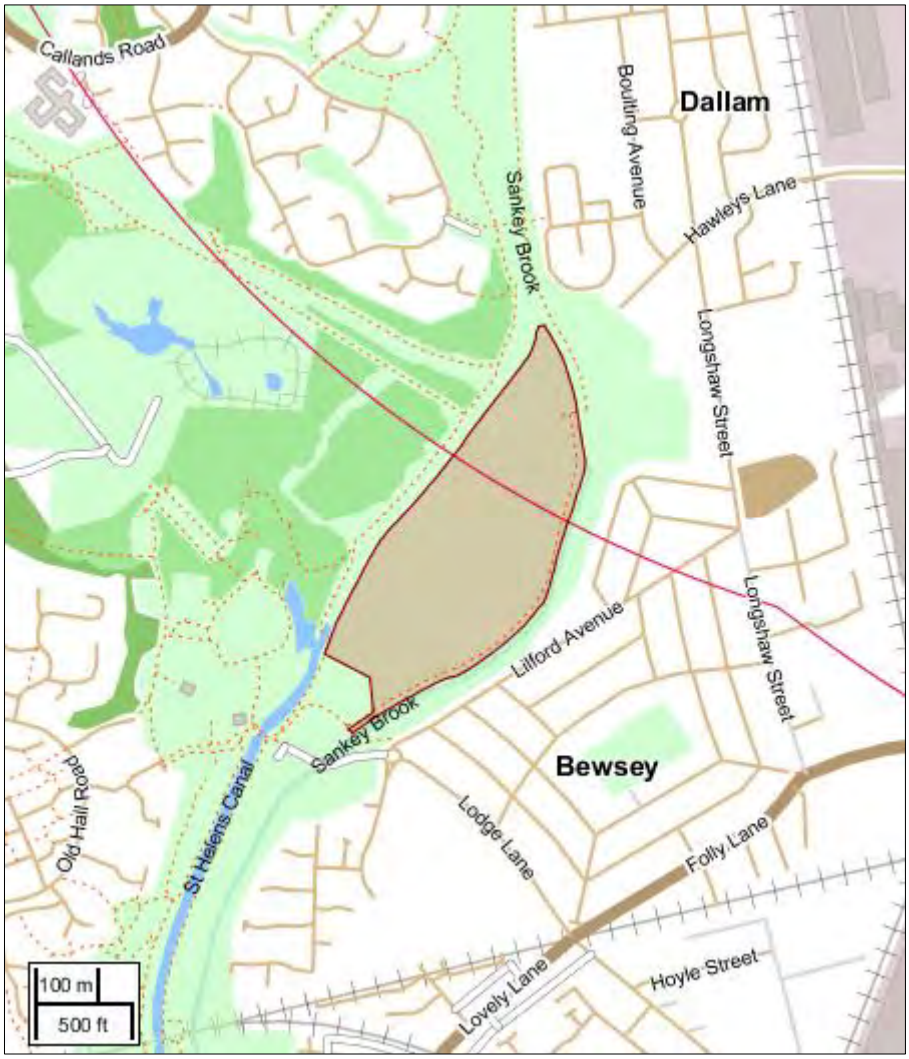
Local Wildlife Sites

Winwick Old Quay / WA046

Map

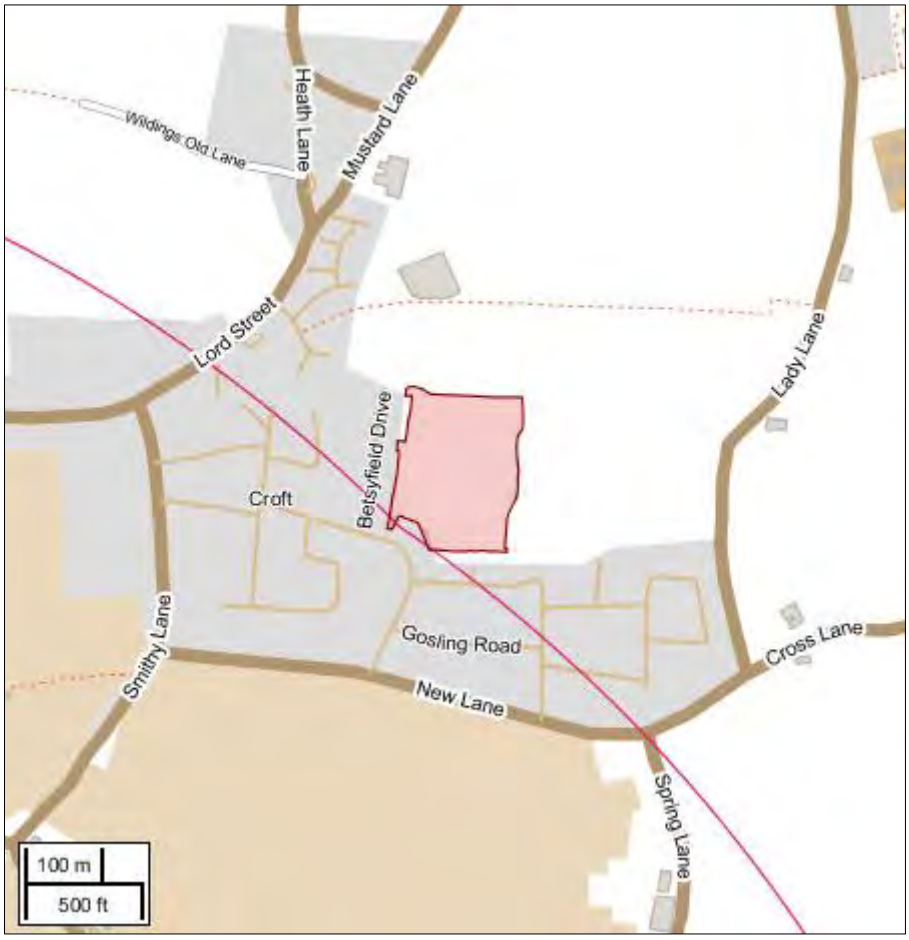
Site name	Winwick Old Quay
Site code	WA046
Authority	Warrington Local Wildlife Sites Partnership
Site centroid	SJ5971791086

Map



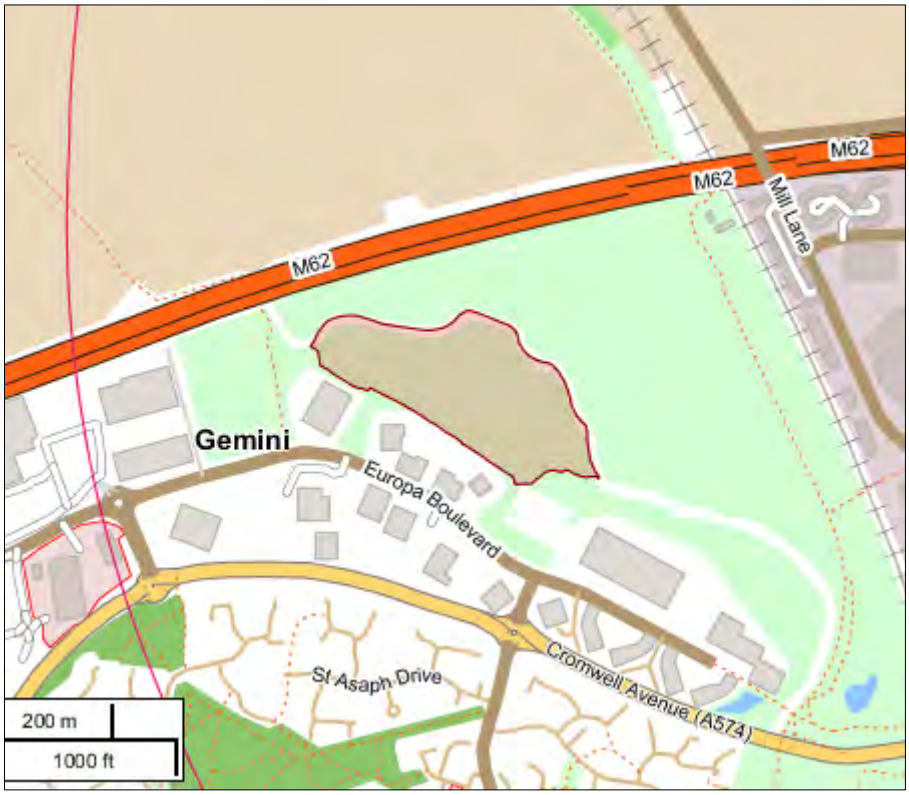
Site name	Bewsey Meadows
Site code	WA002
Authority	Warrington Local Wildlife Sites Partnership
Site centroid	SJ5952489785

Map



Site name	Croft Grasslands
Site code	WA006
Authority	Warrington Local Wildlife Sites Partnership
Site centroid	SJ6362693488

Map



Site name	Gemini Washlands
Site code	WA010
Authority	Warrington Local Wildlife Sites Partnership
Site centroid	SJ5922491433

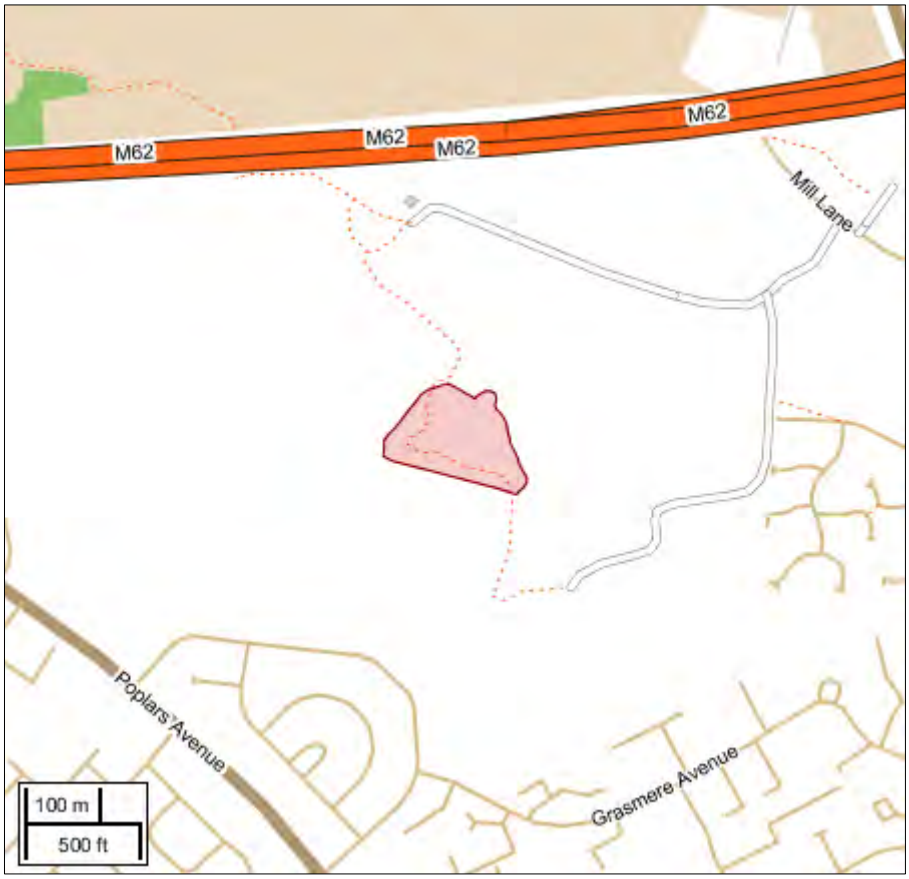
Map

Site name	Houghton Green Pool
Site code	WA013
Authority	Warrington Local Wildlife Sites Partnership
Site centroid	SJ6221392911

Map

Site name	Little and Big Moss Woods
Site code	WA019
Authority	Warrington Local Wildlife Sites Partnership
Site centroid	SJ5881490845

Map

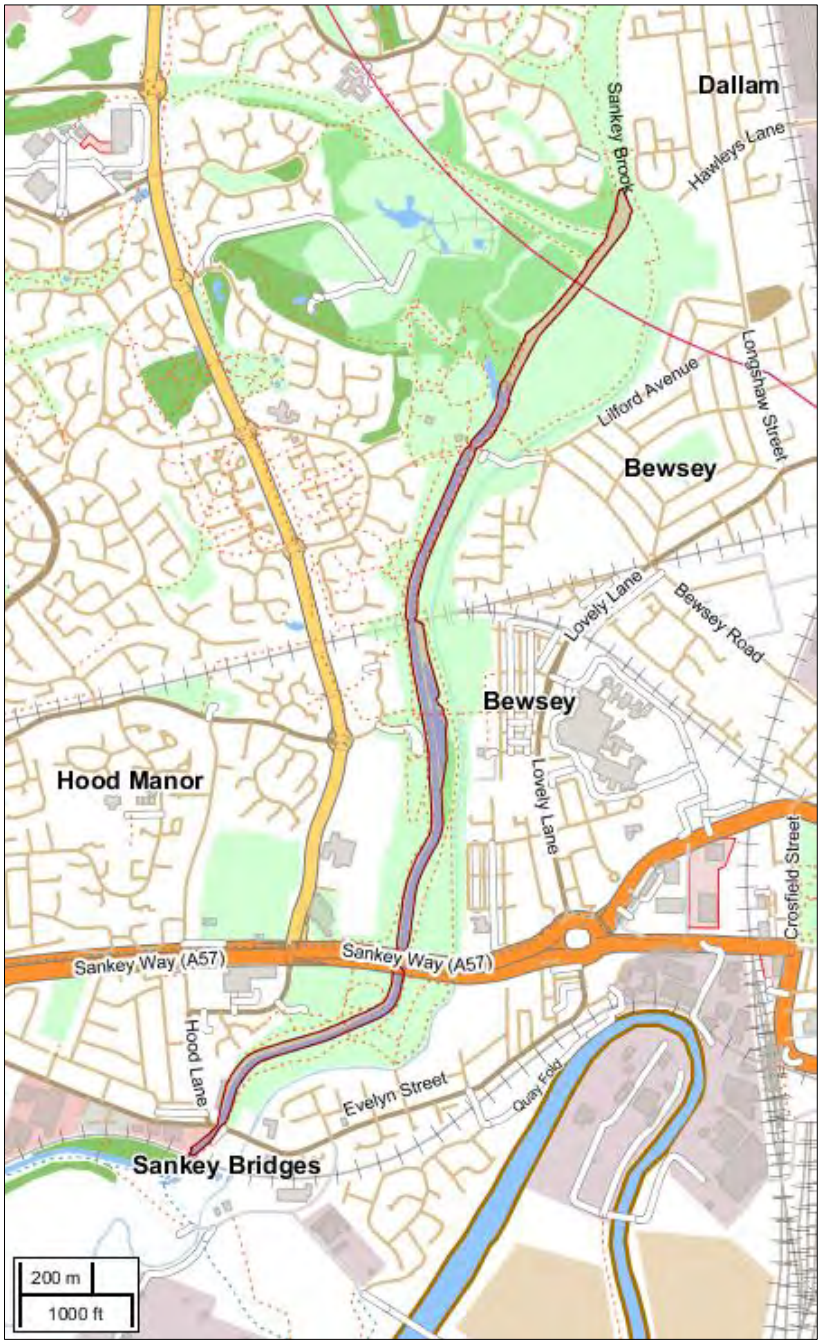


Site name	Radley Plantation and Pond
Site code	WA047
Authority	Warrington Local Wildlife Sites Partnership
Site centroid	SJ6172291629

Map

Site name	Sankey Brook
Site code	WA049
Authority	Warrington Local Wildlife Sites Partnership
Site centroid	SJ5956091051

Map



Site name	Sankey Canal Central
Site code	WA048
Authority	Warrington Local Wildlife Sites Partnership
Site centroid	SJ5907888908

Regionally Important Geodiversity Sites

There are no Cheshire Regionally Important Geodiversity Sites within this search area

Statutory Sites

Due to changes to the NBN we are currently unable to provide Statutory Site location maps. You can access these by visiting the NBN Atlas https://spatial.nbnatlas.org/ or MagicMap http://www.natureonthemap.naturalengland.org.uk/MagicMap.aspx (please be aware of the NBN Atlas guidance for using data https://nbnatlas.org/help/guidance-using-data/).

Other Sites of Conservation Interest

There are no Other Sites of Conservation Interest within this search area.

Site name: Bewsey Meadows	**Site code**: WA002

Site map:

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Ordnance Survey 100022848.

Site name: Bewsey Meadows	**Site code**: WA002
Ward: Bewsey and Whitecross **Area**: 12.2 ha **Date of Notification**: 16/01/2001 **Date of Revision**: 2010 **Status**: Local Wildlife Site	**Grid reference**: SJ59488976 **Ownership**: Warrington Borough Council

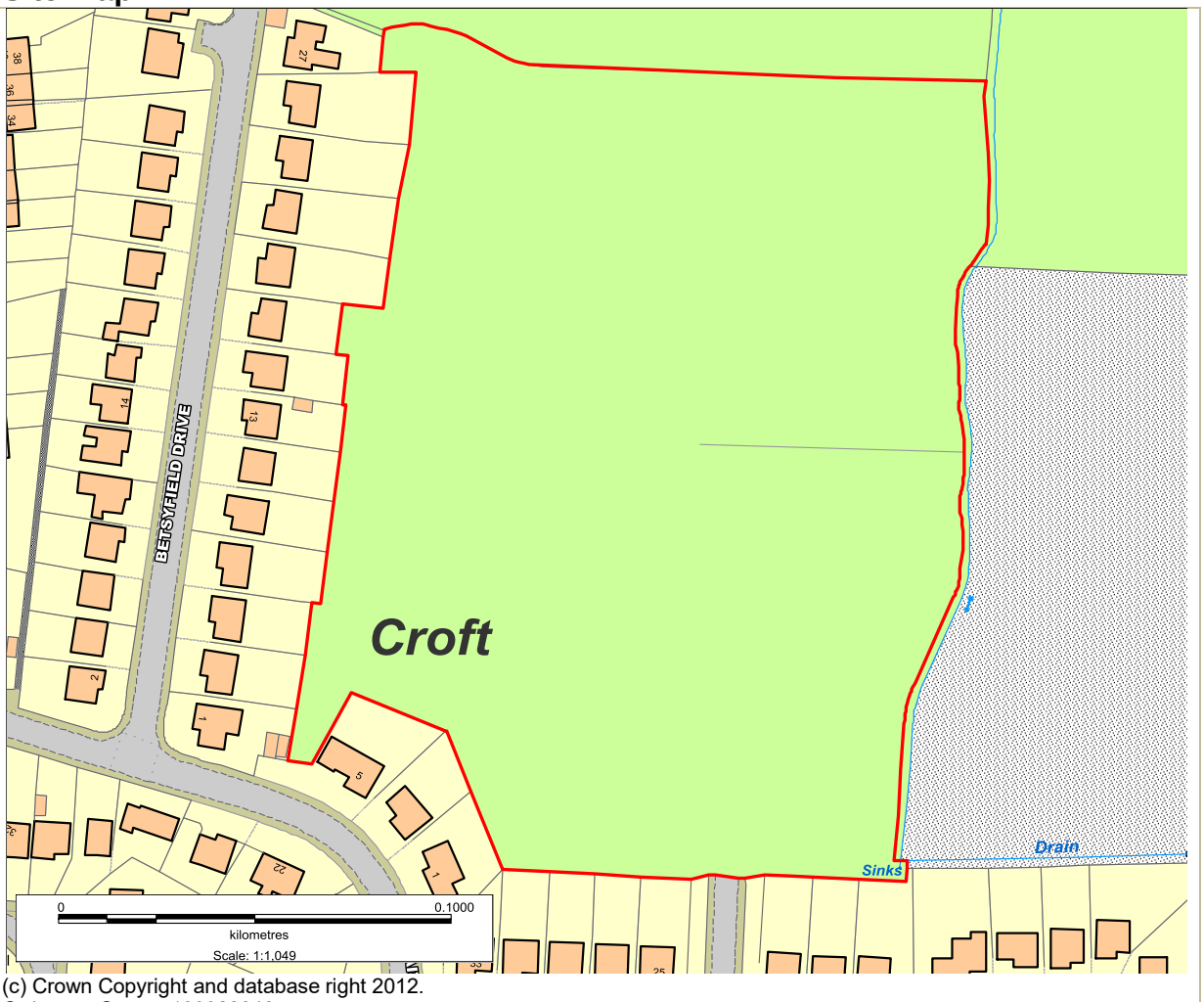
Description:

Bewsey Meadows is a former tip site which has naturally regenerated with scrub, coarse neutral grassland and scattered trees. The site hosts a large number of different habitats and the resulting mosaic is particularly important for bird, mammal and invertebrate populations. There are no ponds, however damp depressions do hold water owing to the sites clay cap. A diverse assemblage of floral species occurs although grasses and rushes dominate the sward. The damp areas of the site are dominated by tall grasses such as reed canary grass Phalaris arundinacea with smaller patches of reedbed which are beginning to scrub over. Parts of the site are in the mid stages of succession with willow and bramble scrub covering large areas. In addition to the numerous wildflowers, mammals and invertebrate species the site supports a rich bird life, including, a number of Red and Amber list and BAP species.

Criteria for selection:	H7 – Neutral Grassland H18 – Fens, Swamps, Bogs and Reedbeds
Most recent survey:	14/10/2010
Inventories:	

Site name: Croft Grasslands	**Site code**: WA006

Site map:



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Ordnance Survey 100022848.

Site name: Croft Grasslands	**Site code**: WA006
Ward: Culcheth, Glazebury and Croft **Area**: 3.0 ha **Date of Notification**: 05/09/2000 **Date of Revision**: 2010 **Status**: Local Wildlife Site	**Grid reference**: SJ635934 **Ownership**: Private

Description:

Since the last survey in 2003, the process of succession has continued so that the site now has the general character of a woodland. Oak, Ash and Hawthorn predominate.

A ride was cleared along the path which now has scrub and saplings and is a good area for butterflies. On the Western edge, one or two house-holders have created rough lawns within the site boundary.

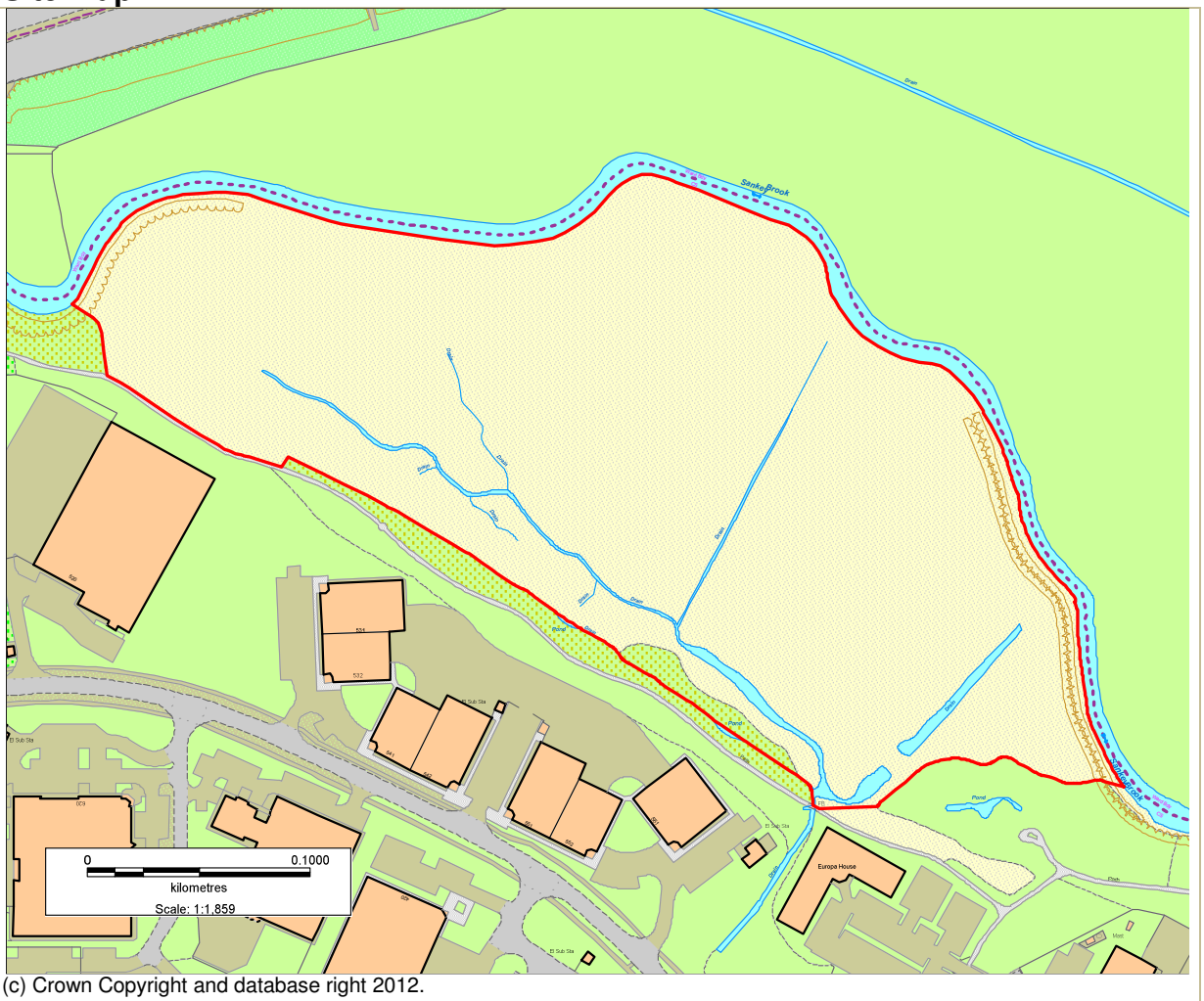
There are small patches of herb-rich damp grassland (albeit with some scrub encroachment) and extensive areas dominated by Hawthorn scrub. The site still supports numerous grassland species such as orchids, meadow vetching, blacknapweed and common birdsfoot trefoil.

There are good numbers of woodland birds such as bullfinch, jay and great spotted woodpecker which visit adjacent gardens. Willow tit has reportedly been identified on site.

Criteria for selection:	H7 – Neutral Grassland
Most recent survey:	July 2010
Inventories:	

Site name: Gemini Washlands	**Site code**: WA010

Site map:



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Ordnance Survey 100022848.

Site name: Gemini Washlands	**Site code**: WA010
Ward: Westbrook	**Grid reference**: SJ591915
Area: 8.0 ha	**Ownership**: Private
Date of Notification: 05/02/2002	
Date of Revision:	
Status: Local Wildlife Site	

Description:

Species present include: Couch grass *Agropyron repens*, Common bent grass *Agrostis repens*, Wild angelica *Angelica sylvestris*, Rosebay willow herb *Chamerion angustifolium*, Tufted hair grass *Deschampsia cespitosa*, Yorkshire fog *Holcus lanatus,* Soft rush *Juncus effusus*, Reed Canary grass *Phalaris arundinacea*, Stinging nettle *Urtica dioica,* Reed bunting *Emberiza schoeniclus*, Sedge warbler *Acrocephalus schoenobaenus,* Snipe *Gallinago gallinago.*

Criteria for selection: As of 2012 new selection criteria were adopted. All sites will be assessed as part of the ongoing resurveying programme against this updated criteria.

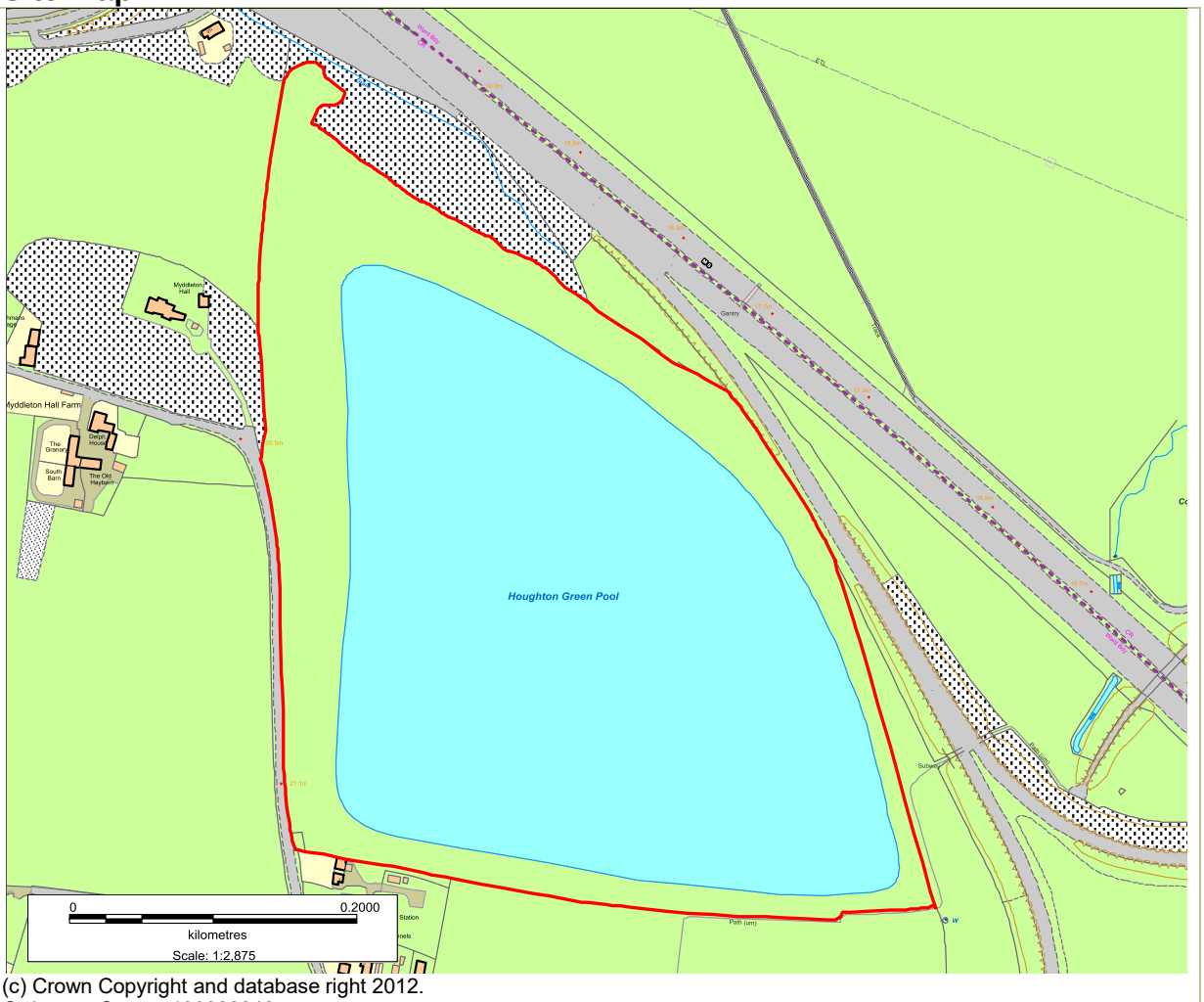
Habitats:	B Grassland & Marsh: marsh/marshy grassland C3 Tall herb & fern: tall ruderal F2.2 Swamp, marginal & inundation

Most recent survey:

Inventories:

Site name: Houghton Green Pool	**Site code**: WA013

Site map:



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Site name: Houghton Green Pool	**Site code**: WA013
Ward: Burtonwood and Winwick	**Grid reference**: SJ622927
Area: 15.6 ha	**Ownership**: Private
Date of Notification: 05/09/2000	
Date of Revision:	
Status: Local Wildlife Site	

Description:

The field was excavated in the 1960's by the present owner for spoil used in the construction of the M6 motorway. It is now a steep sided hollow 14 metres deep that until recently was pumped dry except in winter. Since pumping ceased it has become a large water body some 3 hectares in area and 5 metres deep, surrounded by grazed improved grassland. It now attracts significant and increasing numbers of wildfowl and waders.

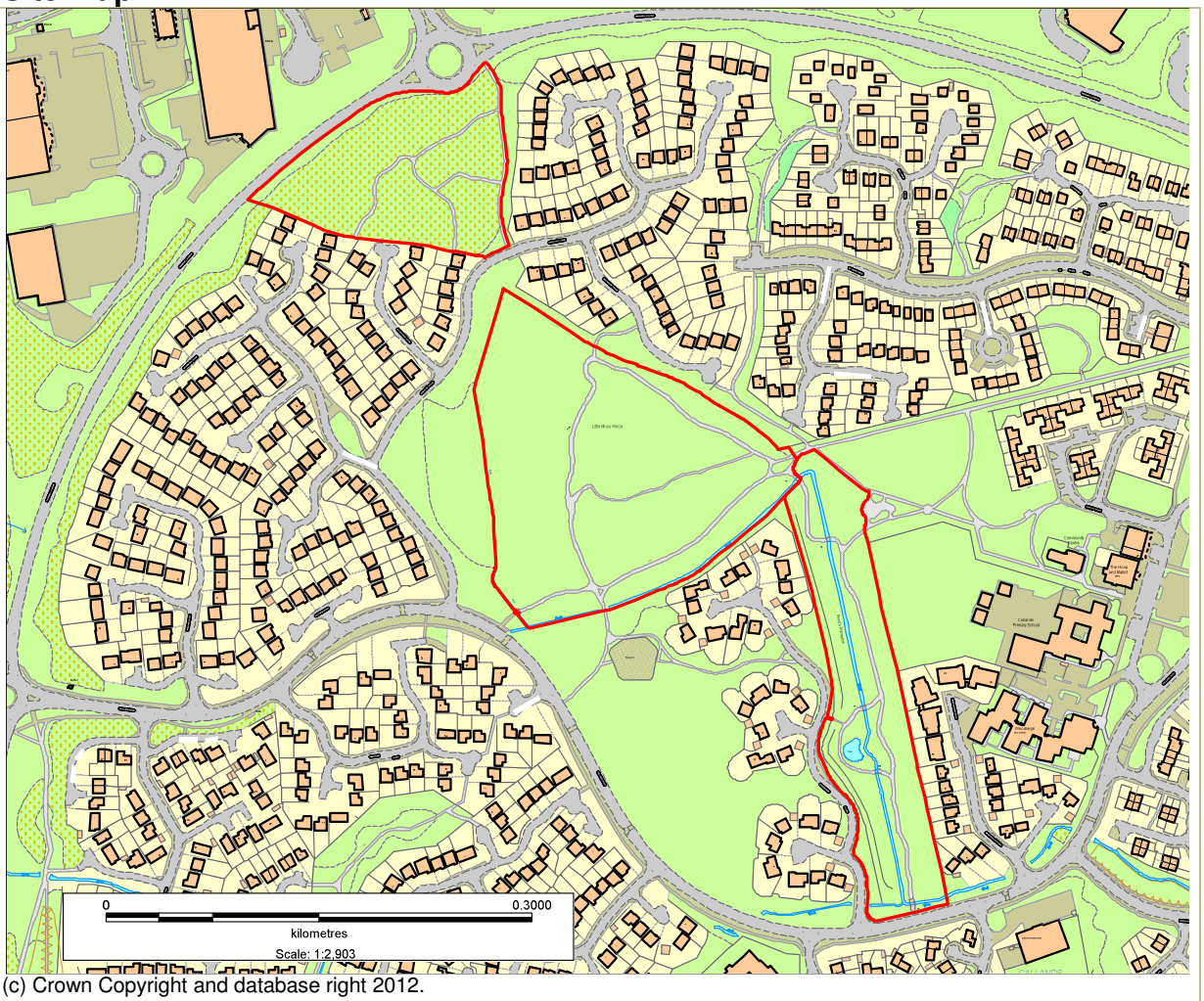
Species present include: Coot, Pochard, Tufted duck, Little grebe, Great crested grebe, Golden plover, Wigeon, Gadwall, Mallard, Pintail, Garganey, Shoveler, Ringed plover, Ruddy duck, Lapwing, Dunlin, Snipe, Redshank, Common sandpiper, Lesser yellowlegs. Various Gull species and passerines.

Criteria for selection: As of 2012 new selection criteria were adopted. All sites will be assessed as part of the ongoing resurveying programme against this updated criteria.

Habitats:	G1 Open Water: standing water B4 Grassland: improved J21 boundaries, intact hedge
Most recent survey:	
Inventories:	Deciduous Woodland BAP Priority Habitat Inventory for England

Site name: Little & Big Moss Woods	**Site code**: WA019

Site map:



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Site name: Little & Big Moss Woods	**Site code**: WA019
Ward: Westbrook	**Grid reference**: SJ589906
Area: 6 ha	**Ownership**: The Woodland Trust
Date of Notification: 05/09/2000	
Date of Revision:	
Status: Local Wildlife Site	

Description:

Three linked woodlands, partially established on relic mossland with pockets of sphagnum moss. The site is enclosed by residential and commercial development.

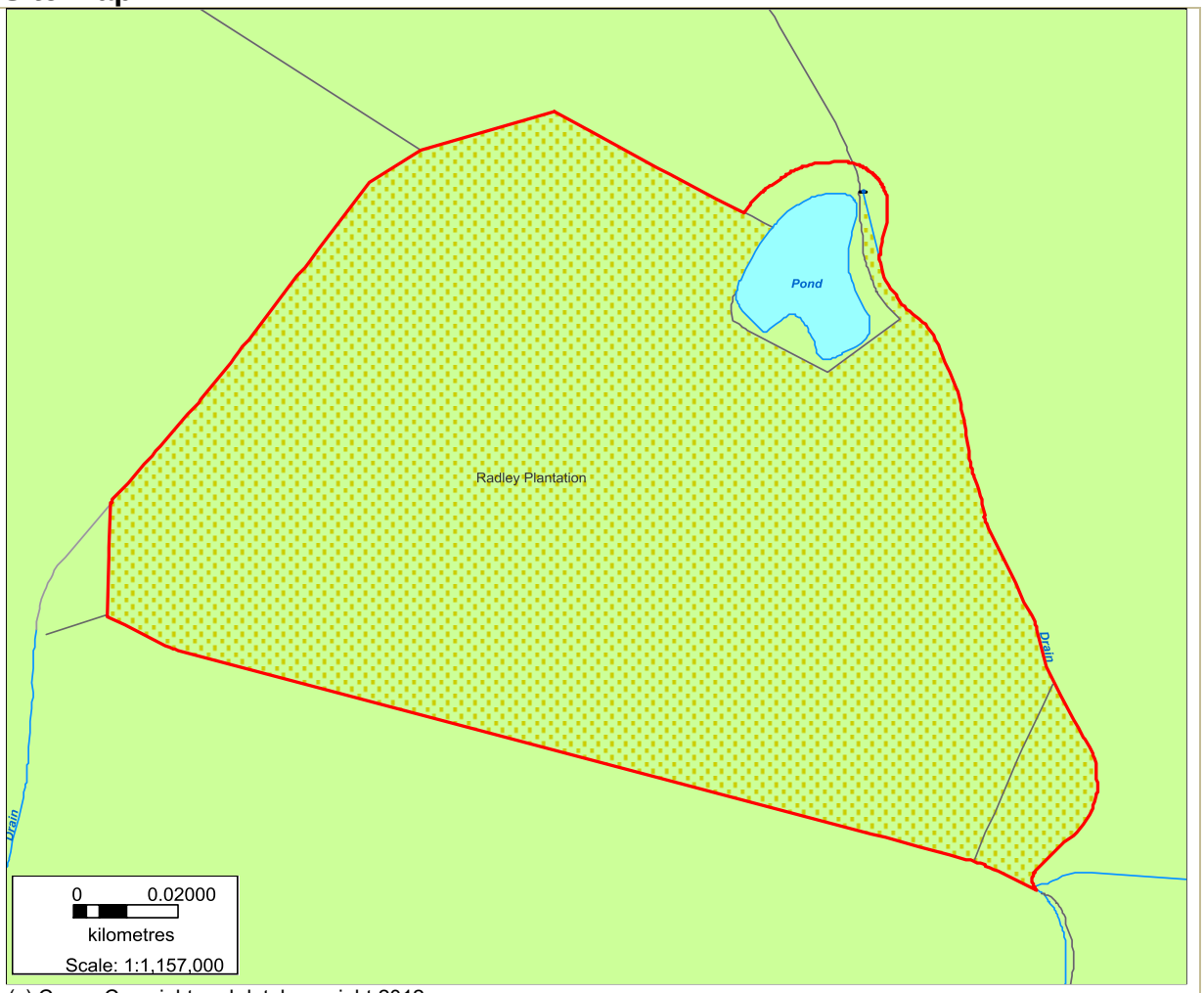
Seed plantation is predominantly Beech with Horse chestnut, Oak and Ash. Recent underplanting includes Hawthorn, Hazel, Rowan, Cherry and Blackthorn. There is diverse ground flora. Little Moss Wood has good species diversity with Beech, Birch, Alder, Pine and Pak with recent underplanting of Hazel and Rowan. Big Moss Wood is predominantly regenerated Birch over mossland peat, with a diverse ground flora of mosses, reeds and grasses.

Criteria for selection: As of 2012 new selection criteria were adopted. All sites will be assessed as part of the ongoing resurveying programme against this updated criteria.

Habitats:	A112 plantation G2 Open water: running water
Most recent survey:	
Inventories:	Deciduous Woodland BAP Priority Habitat Inventory for England

Site name: Radley Plantation and Pond **Site code**: WA047

Site map:



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Site name: Radley Plantation and Pond	**Site code**: WA047
Ward: Poplars and Hulme	**Grid reference**: SJ616915
Area: 1.70 ha	**Ownership**: The Woodland Trust
Date of Notification: 10/03/2014	
Date of Revision:	
Status: Local Wildlife Site	

Description:

Mixed broadleaf plantation, with a reasonably good structure although not conforming to any NVC community. Large, mature sycamore, pedunculate oak and ash form the main canopy with frequent mature wild cherry. There is evidence of ash regeneration and much under-planting.

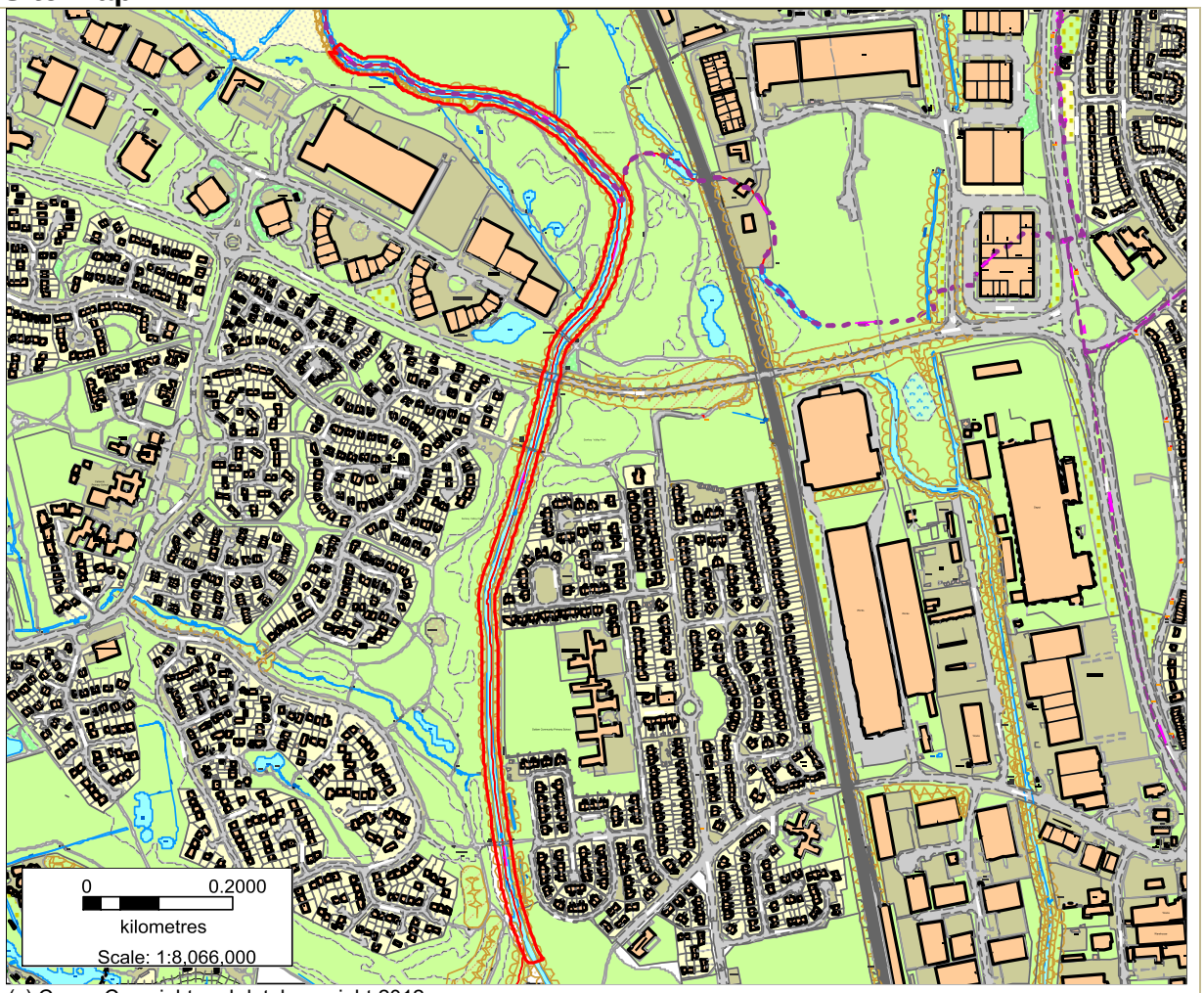
Hazel, hawthorn, rowan and field maple form the understorey. The ground flora of the plantation is typically impoverished. There is a pond of moderate to good quality in the north east corner which is becoming surrounded by scrub and Himalayan balsam.

A locally rare species of cranefly (*Prionocera subserricornis)* has been recorded by the pond.

Criteria for selection:	H20 Ponds and ditches H26 Accessible natural greenspace
Most recent survey:	04/09/2013
Inventories:	

Site name: Sankey Brook	**Site code**: WA049

Site map:



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Site name: Sankey Brook	**Site code**: WA049
Ward: Westbrook, Bewsey and Whitecross **Area**: 3.27 ha **Date of Notification**: 10/03/2014 **Date of Revision**: **Status**: Local Wildlife Site	**Grid reference**: SJ595907 **Ownership**: Warrington Borough Council

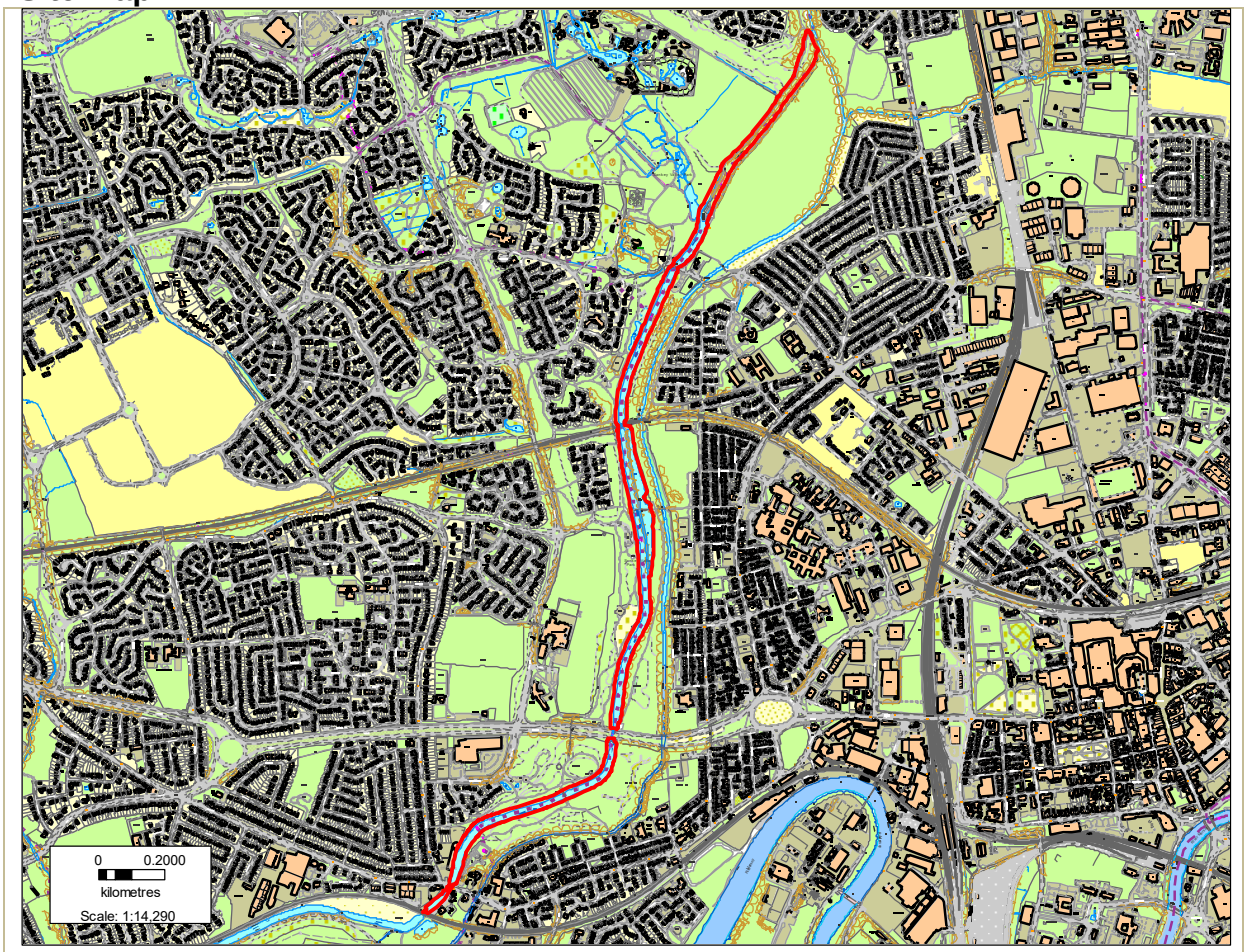
Description:

Sankey brook wildlife corridor provides a physical link between three wildlife sites, Bewsey LNR, Gemini Washlands and Winwick quay. Although the stream itself is of low wildlife value, its position in the landscape is crucially important as it provides a mechanism for species dispersal between the three sites as well as to the wider countryside to the north. The brook supports several wetland bird species including kingfisher, heron and moorhen.

Criteria for selection:	H24 Wildlife corridors/buffers
Most recent survey:	27/9/2013
Inventories:	

Site name: Sankey Canal Central	**Site code**: WA048

Site map:



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Site name: Sankey Canal Central	**Site code**: WA048
Ward: Bewsey and Whitecross; Westbrook; Great Sankey South; Whittle Hall **Area**: 9.76 ha **Date of Notification**: 10/03/2014 **Date of Revision**: **Status**: Local Wildlife Site	**Grid reference**: SJ590888 **Ownership**: Warrington Borough Council

Description:

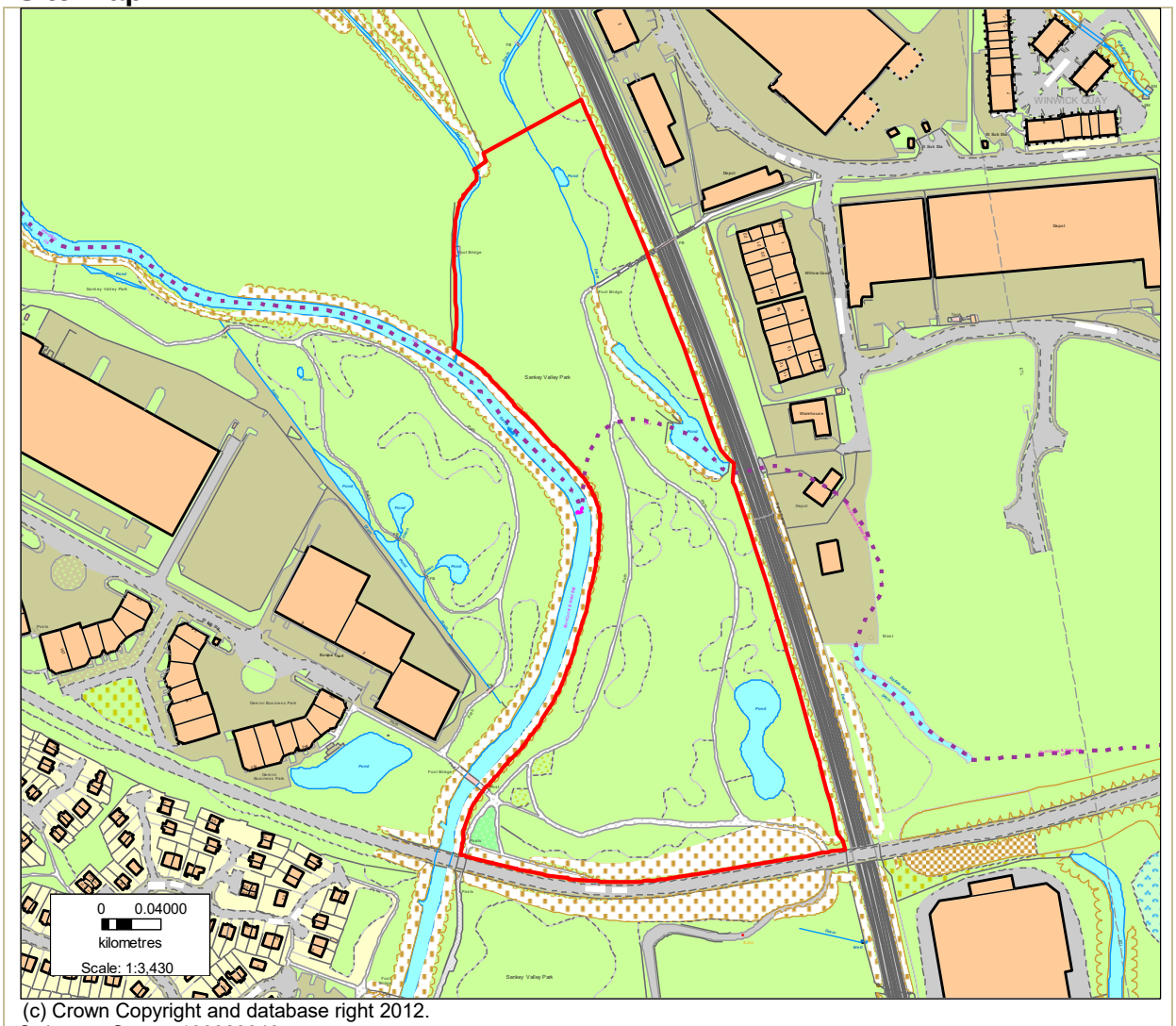
High quality disused canal with unpolluted water and an abundance of native aquatic and marginal flora. The canal, which is relatively undisturbed (low levels of fishing), acts as a linear pond. Significant areas of reed bed occur along its length with the most extensive located at Sankey Valley Nature Park and along a dry section of canal by Bewsey LNR.

The margins of the canal provide suitable habitat for small mammals [redacted]

Criteria for selection:	H18 Reedbeds H20 Ponds and ditches H26 Accessible natural greenspace
Most recent survey:	26/9/2013
Inventories:	

Site name: Winwick Old Quay **Site code**: WA046

Site map:



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Site name: Winwick Old Quay	**Site code**: WA046
Ward: Bewsey and Whitecross **Area**: 7.29 ha **Date of Notification**: 10/03/2014 **Date of Revision**: **Status**: Local Wildlife Site	**Grid reference**: SJ597911 **Ownership**: Warrington Borough Council

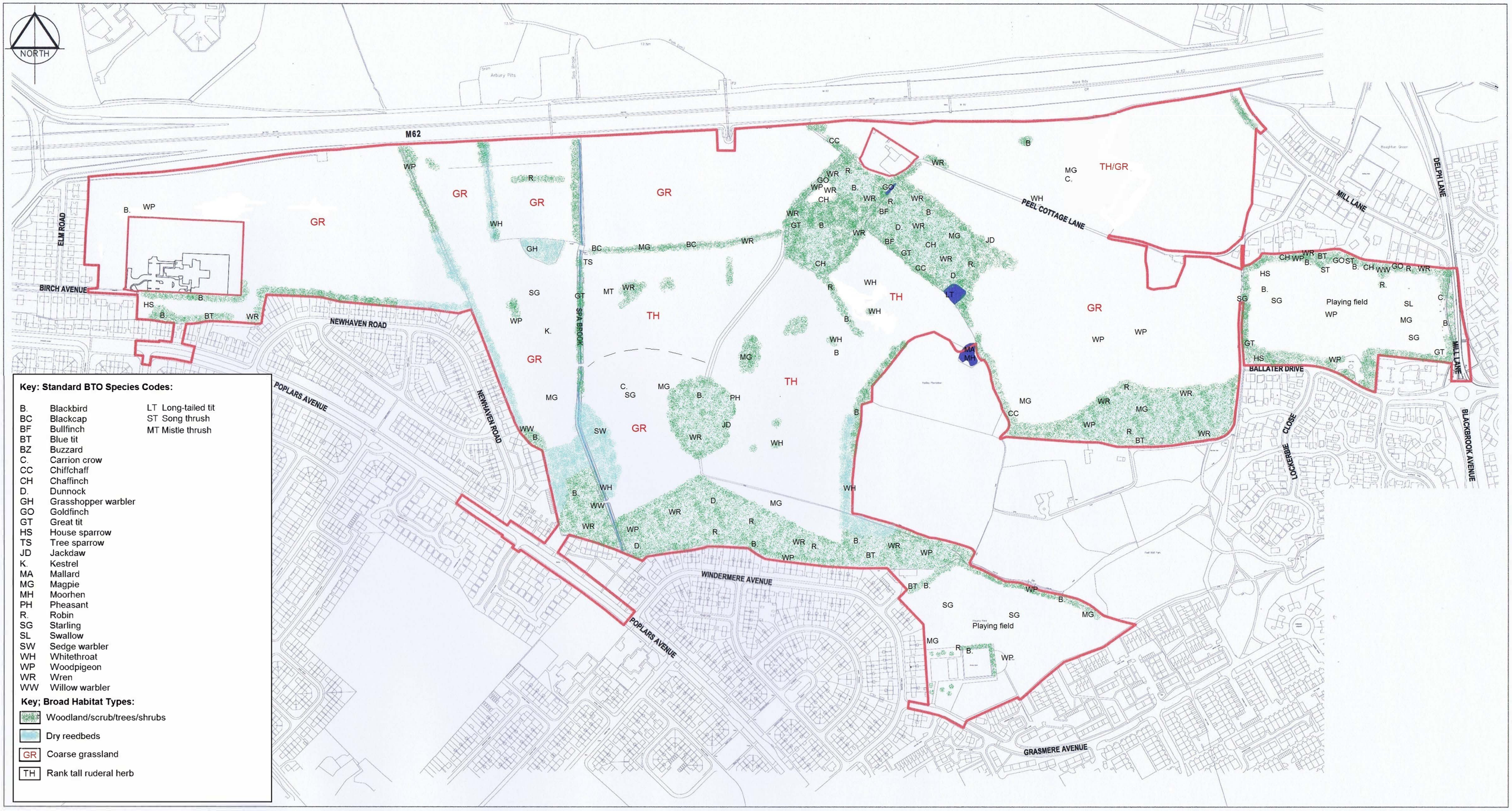
Description:

Winwick old quay has large areas of rank grassland which are succeeding to tall ruderal vegetation and scrub. Other parts of the site are closely mown and there are blocks of species poor plantation woodland.

There are several patches of species rich grassland which have probably been sown with species such as birdsfoot trefoils, cowslip , selfheal , yarrow, meadow vetchling, toadflax , wild carrot , ladies bedstraw , field scabious and the scarce grass vetchling. These areas are particularly important for terrestrial invertebrates.

Towards the eastern boundary there are a number of old ponds which are overgrown with typha (common reedmace) and Himalayan balsam dominates the surrounding areas. One pond has large areas of the non-native invasive *Crassula helmsii*. Stanner's pool is a well managed fishing pool and has a good variety of wetland vegetation, albeit probably introduced. The non-native invasive waterweed *Elodea* is present in Stanner's pool.

Criteria for selection:	H7 Neutral grassland H26 Accessible natural greenspace S13 Vascular plants
Most recent survey:	27/09/2013
Inventories:	



Key: Standard BTO Species Codes:

B.	Blackbird	LT	Long-tailed tit
BC	Blackcap	ST	Song thrush
BF	Bullfinch	MT	Mistle thrush
BT	Blue tit		
BZ	Buzzard		
C.	Carrion crow		
CC	Chiffchaff		
CH	Chaffinch		
D.	Dunnock		
GH	Grasshopper warbler		
GO	Goldfinch		
GT	Great tit		
HS	House sparrow		
TS	Tree sparrow		
JD	Jackdaw		
K.	Kestrel		
MA	Mallard		
MG	Magpie		
MH	Moorhen		
PH	Pheasant		
R.	Robin		
SG	Starling		
SL	Swallow		
SW	Sedge warbler		
WH	Whitethroat		
WP	Woodpigeon		
WR	Wren		
WW	Willow warbler		

Key; Broad Habitat Types:

- Woodland/scrub/trees/shrubs
- Dry reedbeds
- GR Coarse grassland
- TH Rank tall ruderal herb

PEEL HALL, WARRINGTON

BREEDING BIRD SURVEY MAP - VISIT 1- 2017

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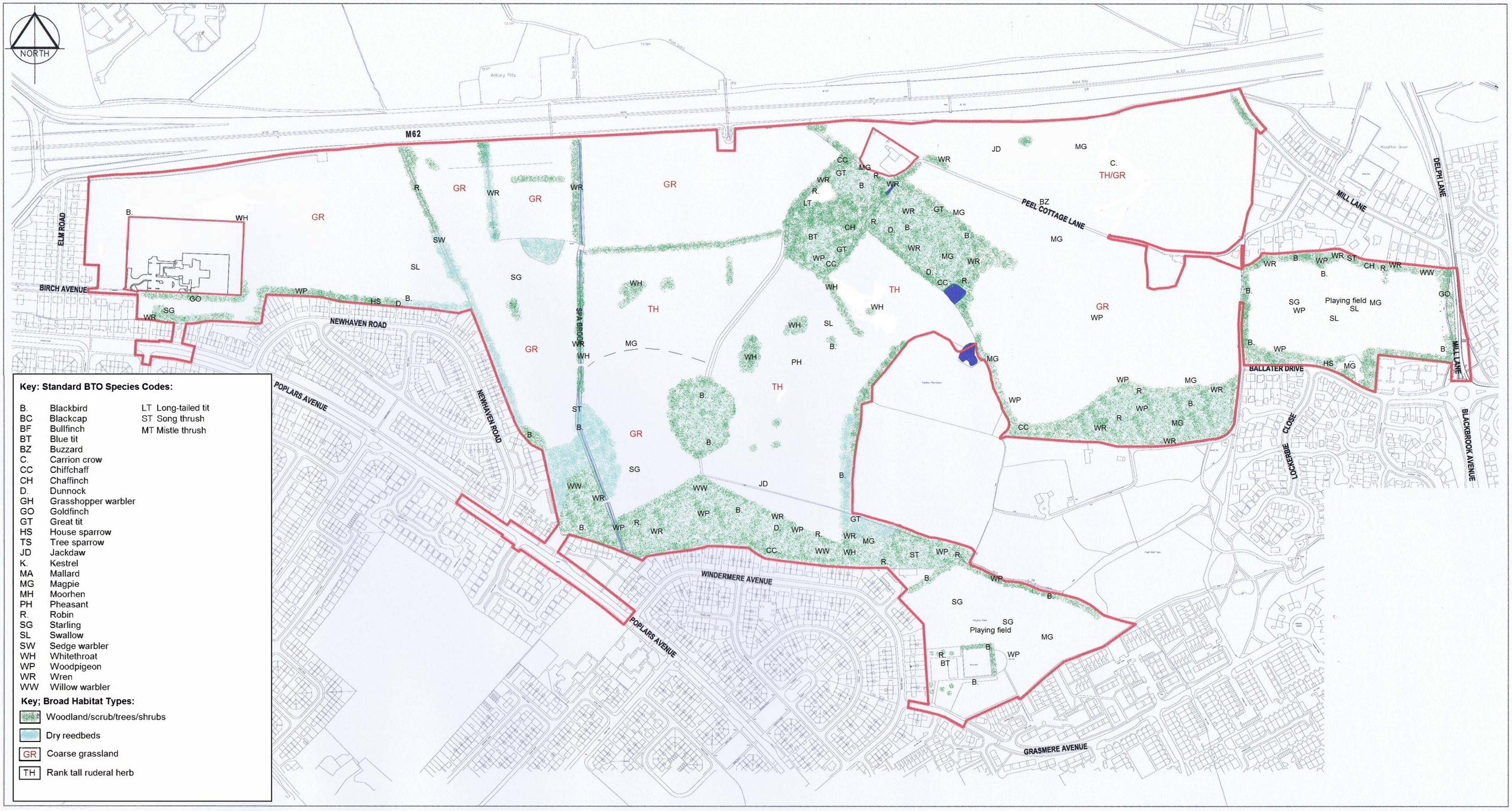

PEEL HALL, WARRINGTON

BREEDING BIRD SURVEY MAP - VISIT 2 - 2017

REVISIONS

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ECO 20 – Comparative Extended Site Bat Survey Area

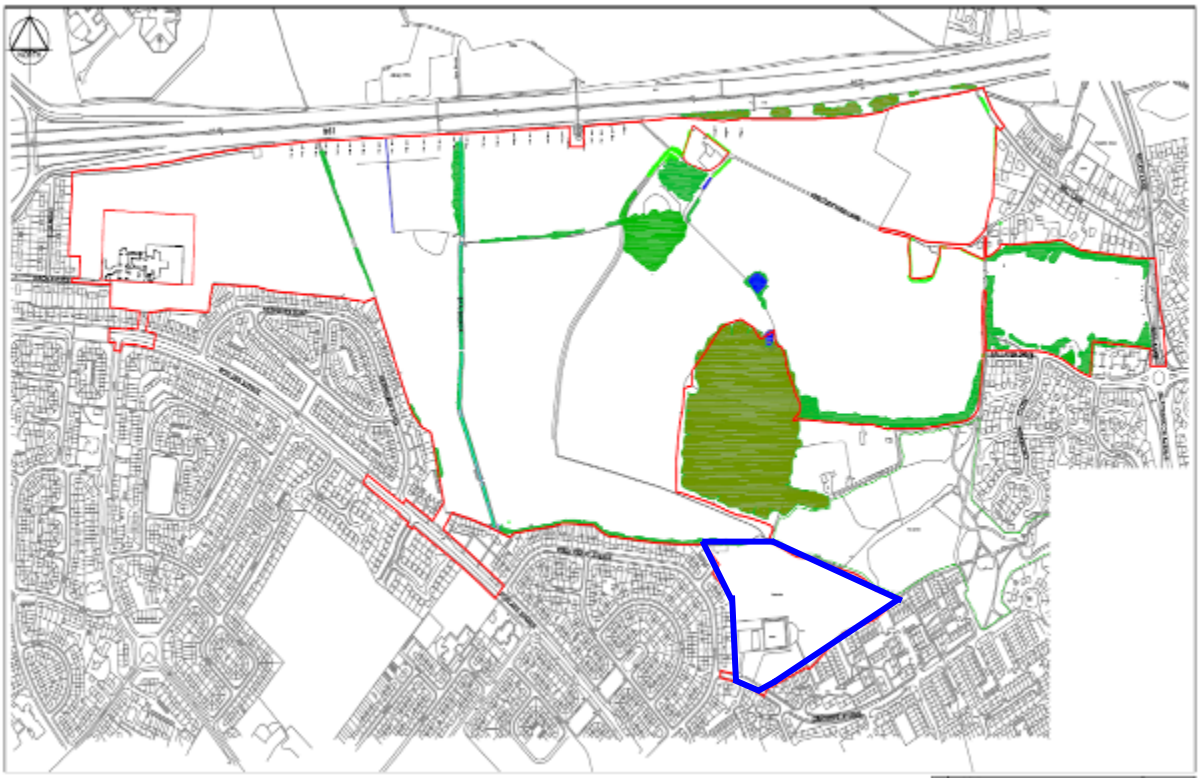

Figure 1: Comparative plan of site boundaries with extended site boundary

Main Site Boundaries

Approximate Extended Site Boundary

ECO 21 – Extended Site Bat Survey Boundary Area

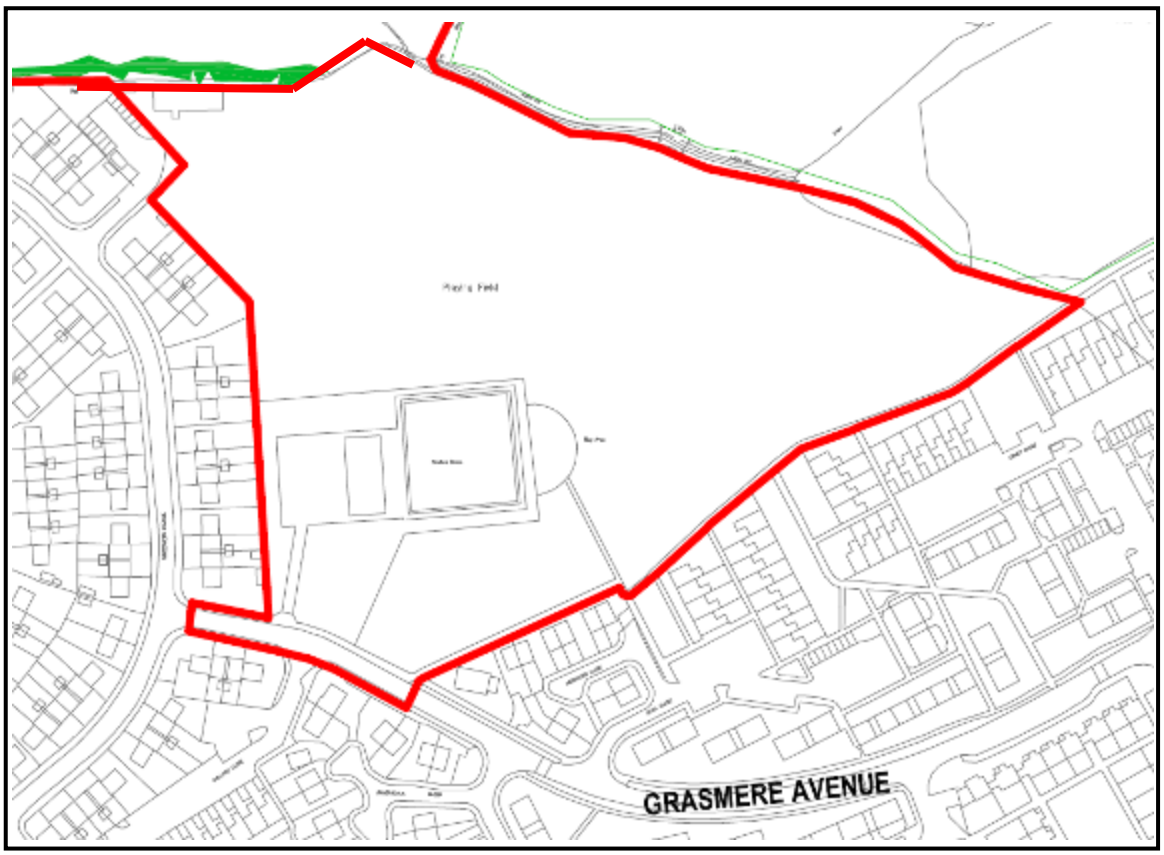

Figure 3: Extended Site Boundaries (indicating existing features on site)

ECO 22 – Bat Activity Figures

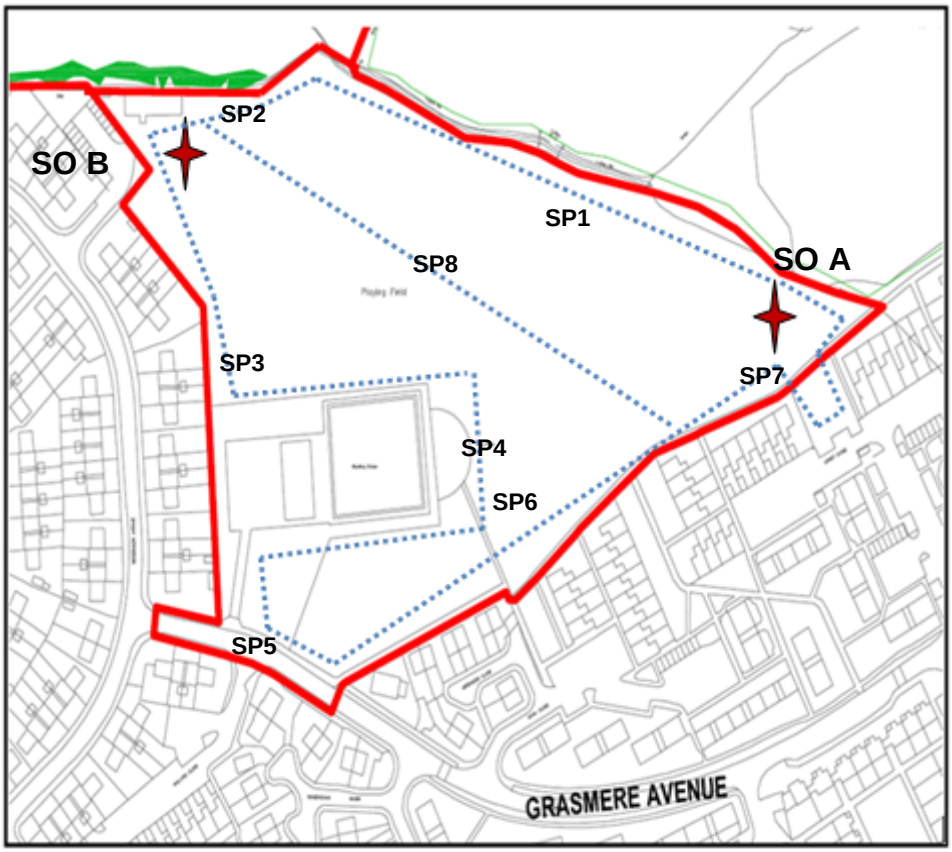

Figure 4: Static Observation Points and Transect Plan

Static observation points (S0)

Transects

Stopping Points SP

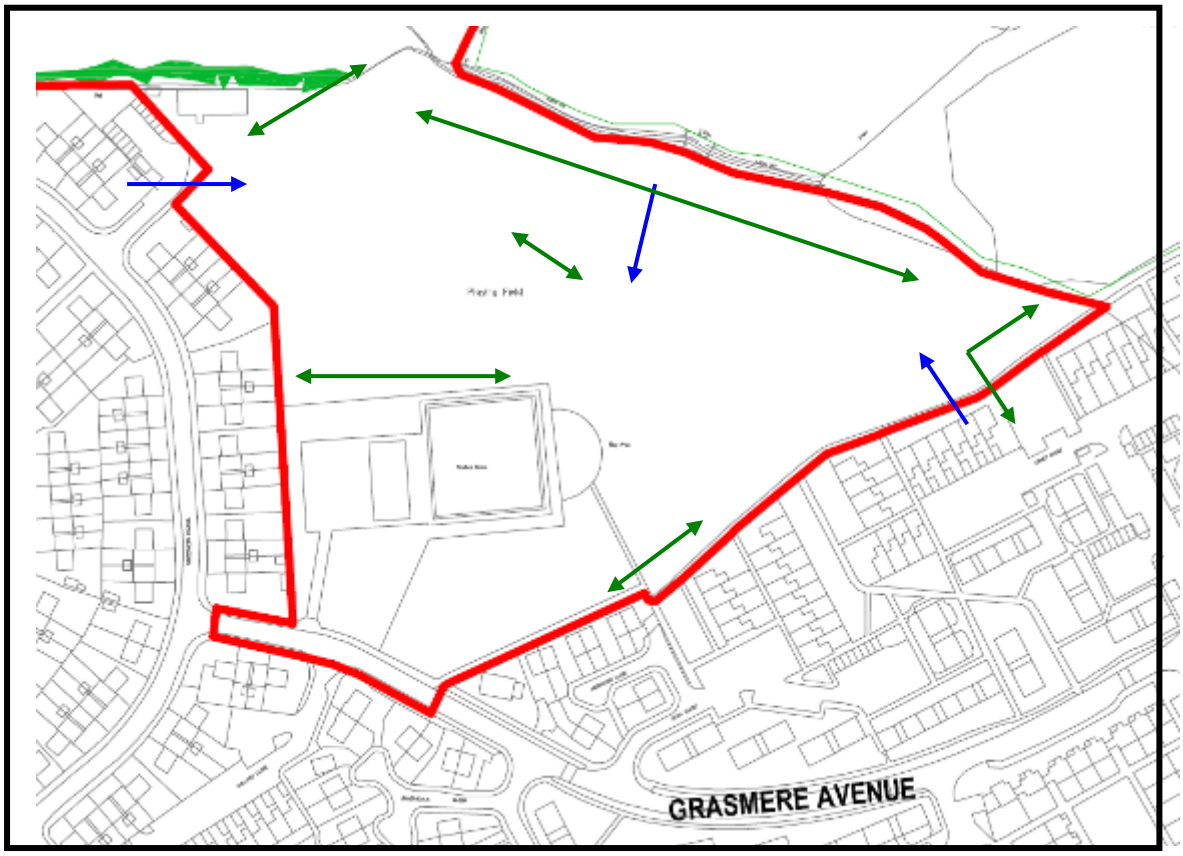

Figure 5: Bat Commuting and Foraging Paths with the Extended Boundary Site

Commuting activity (Common pipistrelle) →

Foraging activity (Common pipistrelle) ↔

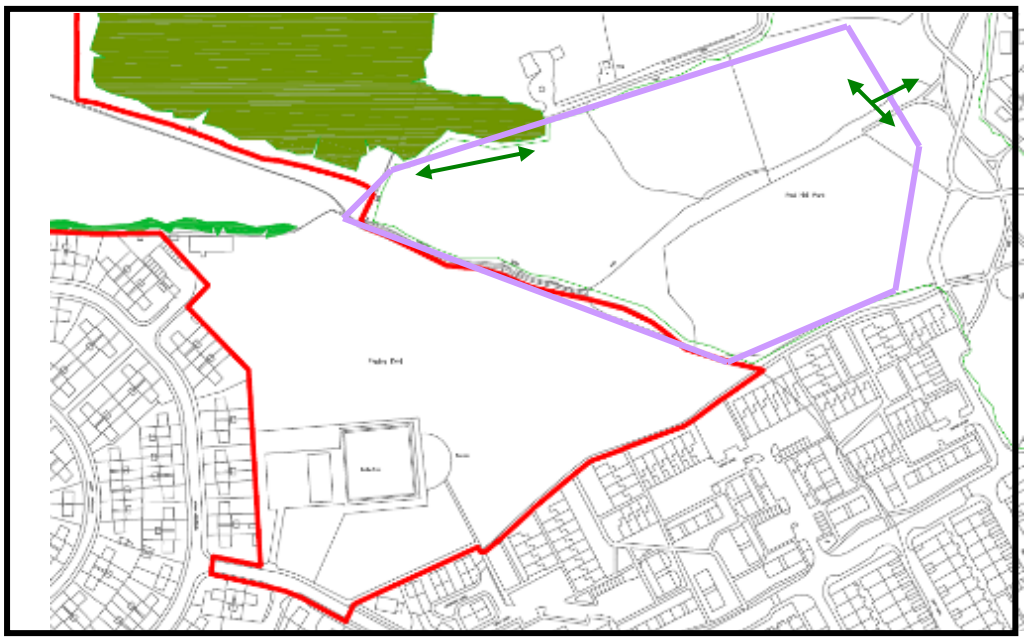

Figure 6: Comparative Survey Area with Foraging Activity

Comparative survey area

Foraging activity (Common pipistrelle)

Bats and Lighting

Overview of current evidence and mitigation

Edited by – Emma L Stone

Bats and Lighting Research Project, University of Bristol

www.batsandlighting.co.uk

Citation: Stone, E.L. (2013) Bats and lighting: Overview of current evidence and mitigation

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ARUP NATURAL ENGLAND SITA trust

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Foreword

These guidelines have been drafted in response to a rising number of developments and associated artificial lighting impacting upon bat populations in the UK. There is increasing evidence of the impacts of artificial lighting on ecosystems and, as nocturnal animals, bats are likely to be impacted negatively. These guidelines are borne out of research undertaken by Emma Stone during her PhD investigating the impacts of street lighting on bats and provide a synthesis of the issues and evidence-based advice of the potential impact of lighting on bats and possible mitigation strategies.

These guidelines have been drafted with input from experts in lighting (Institute of Lighting Professionals), bat surveys, ecology and mitigation (Bat Conservation Trust), legislation (Natural England) and bat research and mitigation (University of Bristol) to provide the best current evidence and thinking in the field of mitigation of the impacts of lighting on bats. This document is aimed at ecologists, lighting engineers, architects, planners and ecologists in Local Authorities and Statutory Nature Conservation Organisations such as Natural England, Scottish Natural Heritage or Natural Resources Wales.

Acknowledgements

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Contents

List of Contributors **6**

1 Introduction **7**

1.1 Urbanisation, lighting and bats 7
1.2 Aims and scope of this document 8

2 Bat Ecology, Legislation and Planning **10**

2.1 Ecology and behaviour of bats 10
2.2 Bat legislation 13
2.2.1 The Wildlife and Countryside Act (1981) (England and Wales) 13
2.2.2 The Conservation of Habitats and Species Regulations (2010) (England and Wales) 14
2.2.3 Conservation (Natural Habitats, & c.) Regulations 1994 (Scotland) 14
2.2.4 Local Planning Authorities (Scotland, England and Wales) 15
2.2.5 Resources 16
2.3 Lighting 16
2.3.1 Statutory Bodies 16
2.3.2 Legislation pertaining to lighting in Britain 17
2.3.3 The Highways Act 1980 (HA) 18
2.3.3.1 Crime and Disorder Act (1998) 19
2.3.4 Planning 19

3 Lighting **20**

3.1 Definitions and terminology 20
3.1.1 Definition of light 20
3.1.2 Lighting Terminology 20
3.2 Light types 22
3.2.1 Spectral composition of lights 24

3.3 Lighting trends and technologies in the UK 24
3.3.1 Street lighting (A roads, B roads, pedestrian lighting) 24
3.3.2 Changes in light types 26
3.3.3 Central Monitoring Systems (CMS) 27
3.3.4 Current initiatives (footpaths, cycle-ways, underpasses etc.) 27
4 Surveys 34
4.1 Introduction 34
4.2 Pre-development bat surveys (PrBS) 34
4.2.1 Types of survey 35
4.3 Pre-development lighting surveys (PrLS) 37
4.3.1 Proposed lighting scheme and predictions 37
4.3.2 Baseline light surveys 38
4.4 Key action points for baseline bat and lighting surveys 40
5 Impacts 42
5.1 Introduction 42
5.2 Predicting the impacts of lighting on bats 42
5.2.1 Considerations when predicting the impacts of lighting on bats 42
5.2.2 Summary of impacts according to bat behaviour 44
5.2.3 Summary of impacts by species 51
5.2.4 Key messages and recommendations: 52
5.2.5 Summary of impacts of light types on bats 53
6 Mitigation 56
6.1 Definition 56
6.2 Approach to mitigation of artificial lighting 56
6.3 Considerations 57
6.3.1 Standardised pre-development baseline surveys 57
6.3.2 Bats, behaviour and ecosystems 58
6.3.3 Public perceptions and requirements 58
6.3.4 Wider habitats/ecosystem level effects 58
6.4 Mitigation Strategies 59
6.4.1 No light 59

6.4.2 Variable lighting regimes (VLR) 59
6.4.3 Habitat creation 60
6.4.4 Spacing and height of units 61
6.4.5 Reducing intensity 63
6.4.6 Changing the light type 64
6.4.7 Reducing spill 65
6.5 Mitigation strategies by project 67
6.5.1 Pathway lighting: 67
6.5.2 Road lighting: 68
6.5.3 Security Lighting 69
6.5.4 Floodlighting 69
7 References 71

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1 Introduction

Emma L. Stone

1.1 Urbanisation, lighting and bats

Almost a quarter of bat species globally are threatened and the key underlying threat to populations is pressure on resources from increasing human populations (Mickleburgh *et al.* 2002). In Europe, disturbance and modification of habitats and roosts due to development and urbanisation is arguably the biggest threat to bat populations. Nine of the twelve threats to bats outlined in the 2010 UK report to the EUROBATS committee are related to urbanisation and development i.e. building demolition, building alteration, barn conversions, habitat loss in planning proposals, loss of farmland landscapes, lack of knowledge on mitigation approaches, impacts of wind turbines, habitat fragmentation and zero/low carbon new build development (Anon. 2010).

Urbanisation and development affect bat habitats, either through direct loss or disturbance from light and noise pollution or human activities. Changes in habitat affect the quantity, quality and connectivity of foraging, drinking and roosting resources available to bats. Linear landscape features such as hedgerows, river banks and canals are important for bats, often being used for foraging and commuting (Limpens & Kapteyn 1991; Verboom *et al.* 1999).

Increasing urbanisation often results in higher levels of light pollution. Light pollution is a rising global problem affecting every inhabited continent, covering 100% of the land area in many countries (Cinzano *et al.* 2001). In some areas electric lighting has increased nocturnal sky brightness by 20% (Hendry 1984). Worldwide artificial lighting is increasing by around 6% per annum (Hölker *et al.* 2010b), and there has been a 24% increase in light pollution in the UK between 1993 and 2000 (Figure 1.1)(Anon. 2003).

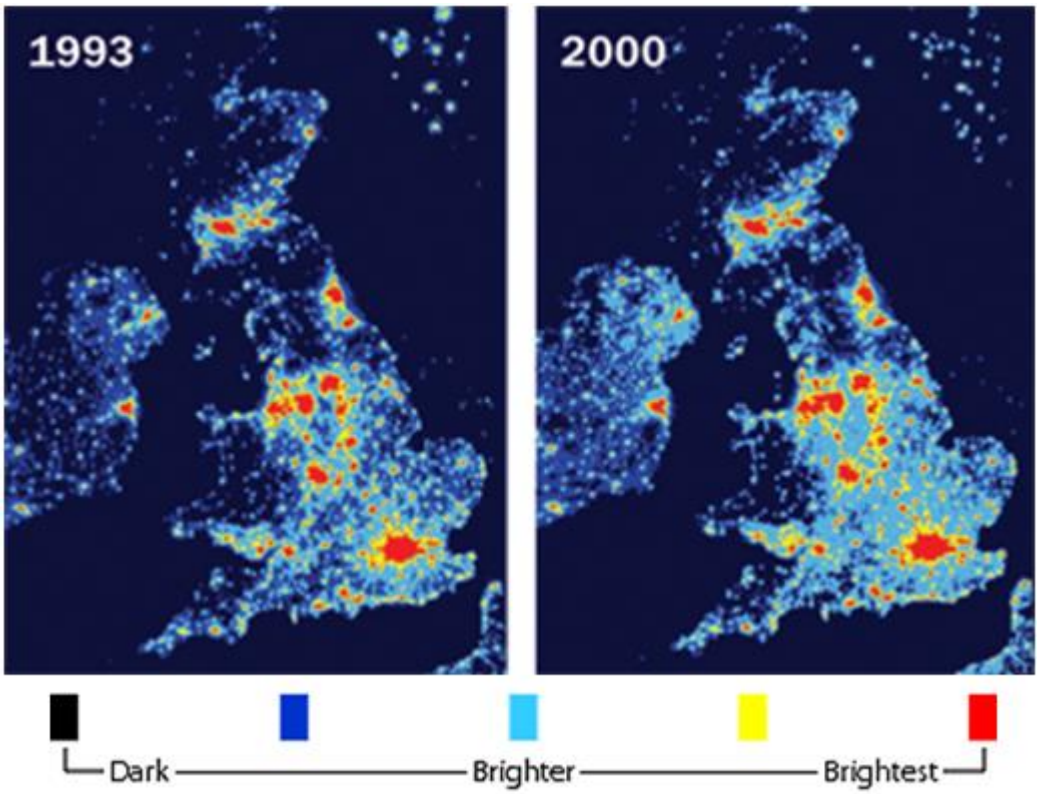

Figure 1.1. Levels of light pollution in Britain in 1993 and 2003: highest levels of light pollution are indicated with red, the black indicates no light pollution detected (Anon. 2003).

Bat habitats and roosts are under increasing pressure and disturbance from suburban development and its associated artificial lighting. Connectivity of habitat and foraging areas to roosts is fundamental to the survival of many bat populations (Verboom & Huitema 1997). Lighting schemes can damage bat foraging habitat directly through loss of land and spatial exclusion of bats due to high illuminance, or indirectly by severing commuting routes from roosts, through light spillage polluting hedgerows, tree lines and watercourses (Racey 2006). Lighting around roosts has also been shown to delay emergence, causing bats to miss the peak in insect prey abundance (Downs *et al.* 2003).

1.2 Aims and scope of this document

This document was developed during PhD research conducted by Emma Stone (2007-2011) investigating the impact of artificial lighting on bats. It provides best practice guidance relating to impact prediction and mitigation of artificial lighting on bats for the following users:

- Ecologists such as consultants involved in mitigating the impacts of development on bats;
- Lighting engineers and architects who may be developing lighting designs in support for planning applications in areas with bats;
- Planners and ecologists in local authorities who are responsible for reviewing planning applications affecting bats; and
- Statutory Nature Conservation Organisations such as Natural England, Scottish Natural Heritage or Natural Resources Wales who are responsible for reviewing, advising and implementing legislation affecting bats.

We provide an overview of the current evidence for the impacts of lighting on bats and outline potential mitigation strategies. Legislation refers to England, Scotland and Wales and does to include Northern Ireland. As research continues at pace we aim to update this guidance and build upon experience gained from case study examples. The recommendations are for guidance only and are based on current evidence at the time of printing.

2 Bat Ecology, Legislation and Planning

Katherine Walsh & Kelly Gunnell

2.1 Ecology and behaviour of bats

Bats are the only true flying mammals. They are warm-blooded, give birth and suckle their young. They are long-lived, intelligent and have a complex social life. In Britain there are 17 breeding bat species (Bat Conservation Trust 2012), all of which are small (most weigh less than a £1 coin) and eat insects.

Bats have evolved a number of unusual features, mainly connected with their ability to fly. Bat wings are formed from highly elastic skin stretched over greatly elongated finger bones, the legs and tail, though their thumbs remain free to help them cling on when roosting. Bats are not blind but have developed a highly sophisticated orientation system that allows them to avoid obstacles and catch tiny insects, which they seize in flight or pick off surfaces, even in complete darkness. In flight bats produce a stream of high-pitched calls and listen to the echoes to produce a sound picture of their surroundings. This is known as echolocation.

Bat behaviour can be divided into seven key categories: roosting, emergence, commuting, foraging, breeding, hibernation and swarming. Any potential impact or disturbance to bats should be evaluated against these behaviours.

- **Roosting**

The resting or sheltering places used by bats are known as roosts. Bats need a variety of places in which to roost, as they select and use different types of roosts at different times of the year, in order to suit their metabolic and social requirements. Bat roosts are either defined by their location, such as trees, buildings or underground roosts, or by their function, such as maternity, hibernation, swarming or feeding roosts, or by the time of year/day used, such as summer, winter, day or night roosts.

- **Emergence**

Bats spend the daylight hours resting inside a roost and emerge to feed at dusk. It is thought that the dependency on darkness for emergence is predation-avoidance behaviour. The timing of the emergence from the roost is critical as delayed emergence will reduce the amount of time available to forage at the time when the abundance of crepuscular insects is at its greatest. In the summer, which has short nights, any delays in feeding can reduce the opportunity to find enough food. (Jones & Rydell 1994; Verkem & Moermans 2002). Generally bat species that are more light tolerant tend to emerge earlier than light sensitive species.

- **Commuting**

The activity of flying between the roost and foraging area is known as commuting. Bats use set routes for commuting which are known as commuting corridors, flight paths or fly-ways. These routes tend to make use of linear features such as avenues of street trees, tree-lines along waterways, hedgerows, vegetated railway corridors, gardens and woodland edges as linkages in the landscape. These features are thought to act as navigation structures, provide cover from weather and predators, and also provide en-route foraging resources (Limpens & Kapteyn 1991; Verboom *et al.* 1999). Different bat species have varying degrees of dependency on these commuting features.

In general bats need to use the most efficient or economical route across the landscape to maximise foraging time. Obstruction or removal of a commuting feature, such as a tree-line, can mean that bats have to find alternative and less efficient routes to their foraging grounds. The more time a bat spends commuting rather than foraging, may negatively affect their energy reserves and thus overall fitness.

- **Foraging**

All UK bats eat insects. Their energy demands are such that bats need to eat a large proportion of their body weight in insects every night. *Pipistrellus pipistrellus* (our smallest species) is thought to eat about 3,000 midges in a single evening. Some bats specialise in catching large insects such as beetles or moths but others eat large numbers of very small insects, such as gnats, midges and mosquitoes (Dietz *et al.* 2009). Bats gather to feed

wherever there are lots of insects, so the best places for them include traditional pasture, woodland, marshes, ponds and slow-moving rivers (Mitchell-Jones 2004).

The shape of a bat's wing influences its manoeuvrability and thus the type of prey and habitat in which it forages. Some bats are better able to fly in cluttered environments, such as woodlands, taking prey from vegetation; these are known as gleaning bats. Other bat species prefer to forage in uncluttered spaces, such as open areas; these are known as aerial hawking bats. There are also perch hunters, which watch the surroundings from a hanging space and only fly off if they discover a prey animal (Dietz et al. 2009).

- **Breeding**

During the spring and summer period female bats gather together into maternity roosts for a few weeks to give birth and rear their young (called pups). Usually only one pup is born each year which is looked after carefully and suckled for between four and six weeks until it is old enough to fly and hunt on its own (Mitchell-Jones 2004). Once the pups are independent, the roost breaks up and the bats generally move to other roosts. Bats may gather together from a large area to form these maternity roosts, so any disturbance at the summer breeding site can affect bats from a wide surrounding area (Mitchell-Jones 2004). Many of these maternity roosts are used every summer as bats have a strong tradition of returning to the same site year after year.

- **Hibernation**

During the winter there are relatively few insects available to provide the bats with sustenance. In response, bats have a developed a strategy whereby they let their body temperature drop to close to that of their surroundings and slow their heart rate to only a few beats per minute. This prolonged torpor is known as hibernation and greatly reduces their energy requirements so that their food reserves last as long as possible. Bats don't hibernate right through the winter but may wake up and go out to feed and drink on mild evenings when insects are active (Altringham 1996).

Bats generally hibernate in cool, dark, humid places such as underground tunnels and cellars. They will begin to seek out appropriate sheltered winter roosts starting in September and October as the weather starts to get colder. They will remain in their winter roosts through to March/ April as the weather warms and insects become more available. If

a bat is unintentionally roused from hibernation, it will use up a significant amount of its energy reserves, which it is unable to replenish. This threatens bat survival therefore disturbance of hibernating bats should be avoided.

- **Swarming**

Swarming is the term used to describe the gathering of bats of both sexes in the autumn. The reason for this behaviour is not fully understood but it is most likely to be for mating (Dietz et al. 2009). The sites used for swarming are often used later in the year as hibernacula. Like most roosts, bats generally use the same sites each year.

2.2 Bat legislation

All British bats are protected by the Wildlife and Countryside Act 1981 (as amended) and by the Conservation (Natural Habitats &c.) Regulations 1994 ('the Habitats Regulations') as amended 2010.

2.2.1 The Wildlife and Countryside Act (1981) (England and Wales)

Under The Wildlife and Countryside Act (1981) (Schedule 5) in England and Wales it is an offence to:

i. Intentionally or recklessly disturb a bat while it is occupying a structure or place of shelter or protection;
ii. Intentionally or recklessly obstruct access to a structure or place used by a bat for protection or shelter;
iii. Sell, offer or expose for sale, or has in his possession or transports for the purpose of sale, any live or dead bat or any part of, or anything derived from a bat.

The Statutory Nature Conservation Agencies have a duty under the Wildlife and Countryside Act (1981) as amended, to notify any area of land, which in their opinion is of special interest by reason of any of its flora, fauna, or geological or physiographical features. Such areas are known as Sites of Special Scientific Interest (SSSIs). The guidelines for the selection of biological SSSIs are published by the JNCC. Chapter 13 relates to mammals and section 3.3 sets out guidance for the notification of bat sites. For further information, see; http://jncc.defra.gov.uk/page-2303 and http://jncc.defra.gov.uk/pdf/sssi_ptC13.pdf

2.2.2 The Conservation of Habitats and Species Regulations (2010) (England and Wales)

The Conservation of Habitats and Species Regulations (2010) transposes into law in England and Wales the Habitats and Species Directive (1992). Regulation 41 makes it an offence to:

i. Capture, injure or kill a bat deliberately;
ii. Disturb a bat deliberately (disturbance includes any disturbance which is likely to impair a bat's ability to: survive, to breed or reproduce, or to rear or nurture their young), hibernate or migrate (in the case of animals of a hibernating or migratory species);
iii. Affect significantly the local distribution or abundance of the species to which they belong;
iv. Damage or destroy a breeding site or resting place of a bat;
v. Possess, control, transport, exchange or sell a bat or parts of a bat, alive or dead.

All bats are European protected species as all are listed on Annex IV of the Habitats Directive. This means that member states are required to put in place a system of strict protection outlined in Article 12. Some species are also listed on Annex II of the Directive. Inclusion on Annex II relates to the designation of Special Areas of Conservation (SACs) and includes *Rhinolophus hipposideros* and *R. ferrumequinum*, *Barbastella barbastellus* and *Myotis bechsteinii*. Where these species occur outside SAC sites, inclusion on Annex II highlights their conservation significance.

2.2.3 Conservation (Natural Habitats, & c.) Regulations 1994 (Scotland)

The legislation in Scotland differs significantly in parts from that in England and Wales, noted above. The Wildlife and Countryside Act (1981) is no longer relevant to bat conservation in Scottish law. All bat species and their roosts are afforded full protection in Scotland by the Conservation (Natural Habitats, & c.) Regulations 1994 (as amended). It is an offence to: deliberately or recklessly kill, injure or capture a bat; deliberately or recklessly disturb or harass a bat; damage or destroy a bat roost; deliberately or recklessly obstruct

access to a bat roost or otherwise deny a bat the use of its roost; possess or transport a bat or any part of a bat; sell or exchange (or offer as such) a bat, or any part of a bat.

There are several specific offences of deliberate or reckless disturbance. These are:

i. Disturbing a bat in its roost;
ii. Disturbing a bat while it is breeding;
iii. Disturbing a bat in a manner that is, or in circumstances which are, likely to significantly affect the local distribution or abundance of its species;
iv. Disturbing a bat in a manner that is, or in circumstances which are, likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young;
v. Disturbing a bat while during migration or hibernation.

In all countries licences permit otherwise unlawful activities and can only be granted for certain purposes as set out in Regulation 53. Licences can only be issued by the relevant licensing authority where the proposed activity meets the criteria of the purpose, there is no satisfactory alternative and the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their range. These are commonly referred to as the 'three tests'.

2.2.4 Local Planning Authorities (Scotland, England and Wales)

Local Planning Authorities in Scotland, England and Wales have a duty to ensure that protected species issues are taken into account as a material consideration when determining planning applications. The National Planning Policy Framework (NPPF) (England), Technical Advice Note 5 (TAN5) (Wales) and Scottish Planning Policy provide guidance on protecting and enhancing biodiversity during the planning process. Paragraph 125 of the NPPF states:

> *By encouraging good design, planning policies and decisions should limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.*

Where European Protected Species are present and affected by development proposals, Local Planning Authorities must take into account the 'three tests' as set out in Article 16 of the Habitats Directive and outlined previously when determining planning applications.

Local Planning Authorities (LPA) have a duty to ensure that protected species issues are taken into account in the preparation of strategic and local development plans as set out under Regulation 9 (5) of the Conservation of Habitats and Species Regulations (2010). Section 40 of the Natural Environment and Rural Communities Act (2006) also places an obligation on Public Bodies such as LPAs to have due regard to the purpose of conserving biodiversity.

For further information see: http://www.legislation.gov.uk/ukpga/2006/16/contents (Natural Environment & Rural Communities Act, 2006)

2.2.5 Resources

For further information on legislation relating to bats, see: http://www.legislation.gov.uk/ukpga/1981/69/contents (Wildlife & Countryside Act, 1981); http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm (The Habitats Directive); and http://www.legislation.gov.uk/uksi/2010/490/contents/made (The Conservation of Habitats and Species Regulations, 2010).

2.3 Lighting

2.3.1 Statutory Bodies

Department for Environment Food and Rural Affairs (Defra) is responsible for policy on light pollution including statutory nuisance from artificial light In England and Wales. The **Department of Transport** (DoT) is responsible for street lighting policy and lighting on transport premises. **The Department for Communities and Local Government (DCLG)** is

responsible for policy in the planning regime. In Scotland the Scottish Executive are responsible for establishing lighting controls under the Envionrmental Protection Act 2007.

2.3.2 Legislation pertaining to lighting in Britain

There is no legal duty for a lighting authority to illuminate roads in Britain and lighting is installed because the perceived benefits outweigh the negatives. Recent research by The Highways Agency found that the safety benefits of motorway lighting were 1/3 lower than previously thought. Additional field trials to switch-off lights on motorways have found lower numbers of accidents when lights were off than when illuminated (http://www.highways.gov.uk/knowledge/30236.aspx).

The Highways Agency (HA) recently undertook a survey to establish a modern cost benefit for highway lighting and identified that a lit street is likely to reduce the accident rate by around 10%. Previously this was held to be around 30%. A number of authorities have been trialling part night lighting solutions and even complete removal. The results have been mixed but a significantly large number of projects have shown no detriment from implementation of these changes.

2.3.2.1 British Standards

The British Standard BS5489-1 2003 states that the role of street lighting is as follows:

"Road lighting encompasses the lighting of all types of highways and public thoroughfares, assisting traffic safety and ease of passage for all users. It also has a wider social role, helping to reduce crime and the fear of crime and can contribute to the commercial and social use at night of town centres and tourist locations. Road lighting should reveal all the features of the road and traffic that are important to the different types of road user, including pedestrians and police."

Light intensity: British Standard BS5489-1 2013 requires that variable lighting regimes are considered as part of the 5 stage design process. Variable lighting regimes vary the light intensity of road lighting. Emerging dimming technology fitted to lights enables lights to be dimmed so that light intensity can be reduced during periods of low traffic use. The BS5489-1 2013 also requires local conditions and aspects to be considered at stage 3 of the design process.

Light colour: The colour rendering capability of a lamp refers to the ability of a light source to show or “render” an object’s true colour (Schubert & Kim 2005). A colour-rendering index of 100 provides optimal rendering properties for human vision. BS5489 (2003) recommends the use of lamps with a colour rendering index (Ra) >20 for urban and residential roads. As low pressure sodium (SOX) lamps do not have any colour rendering properties they are not recommended for use in road lighting (Lockwood 2011).

2.3.2.2 Environmental Protection Act (EPA) (UK)

Artificial light from premises can have a detrimental impact on the quality of the local environment. Under section 79 of the Environmental Protection Act 1990 (amended 2007), local authorities have a duty to take reasonably practicable steps to investigate complaints of statutory nuisance, including: “Artificial light emitted from premises so as to be prejudicial to health or a nuisance”. The EPA applies to England, Wales and Scotland.

2.3.2.3 The Clean Neighbourhoods and Environment Act 2005 (CNEA)

Clause 102 of the CNEA 2005 targets lighting that is "either a nuisance or is detrimental to health" in England and Wales. However, lighting from transport facilities (including harbours, airports, transport depots) and street lighting are both excluded from the Act. Therefore much exterior lighting is still designed without professional advice or consideration of the social and environmental effects (Coatham 2005). In Scotland there are no specific legislative controls on light pollution, but the Scottish Executive are considering adding artificial light pollution to the list of Statutory Nuisances under Part III of the Environmental Protection Act.

2.3.3 The Highways Act 1980 (HA)

The Highways Act empowers local authorities in England and Wales to light roads, but does not make it a legal requirement. County councils have a duty of care to road users and have an obligation to light obstructions on the highway. A Highway Authority (e.g. the Highways Agency in England) would not be negligent for accidents arising from a failure to light a

highway unless the accident arises because the authority has failed to take reasonable steps to prevent objects it has placed in and around the highway from becoming a danger to the public.

2.3.3.1 Crime and Disorder Act (1998)

According to Section 17 of Crime and Disorder Act a Highway Authority in the UK (e.g. the Highways Agency in England) must consider the effect on crime and disorder in this exercise of reducing street lighting and the need to do all it reasonably can to prevent crime and disorder.

2.3.3.2 Road Traffic Regulation Act (1984)

Section 81 and 82 of the road Traffic Regulation Act (1984) states that unless provided by a separate order restricted roads, a 30mph speed limit automatically applies in any road in the UK containing a system of street lights placed not more than 200 yards apart, unless signposted with a different speed limit. There is no current law stating that these lights have to be switched on all night to be applicable. Therefore, motorists are advised that the usual 30mph speed limit will be in place regardless of whether the lights are switched on or off.

2.3.4 Planning

There is enormous variation as to how lighting is dealt with in the planning process across the country. Consideration of exterior lighting issues can be subject to planning control; conditions are often imposed on planning applications regarding the submission and implementation of lighting schemes.

3 Lighting

Stone, E.L.

3.1 Definitions and terminology

3.1.1 Definition of light

Light has been used by humans to illuminate the night and assist in navigation for over 2000 years (Anon. 2004). Light is defined by the Illuminating Engineering Society of North America (IESNA) as radiant energy that is capable of exciting the retina and producing a visual sensation. Each colour has a specific wavelength which is measured in nanometres (nm). One nanometre is a ten-millionth of a centimetre. Visible light is the relatively narrow band of electromagnetic radiation to which the eye is sensitive and occurs in a range of colours and extends from 380nm (violet) to 780 nm (red). The infrared range occurs from 780 nm to 1nm and is not visible to the human eye. Coloured objects only appear in colour if their colours are present in the spectrum of the light source (Anon. 2004). Light levels are generally measured in lux (see below). In sunlight light levels are around 100,000 lux, in the shade of a tree around 10,000 lux and at moonlight around 0.2 lux (Anon. 2004).

3.1.2 Lighting Terminology

The following definitions have been taken from (Anon. 2004), the Illuminating Engineering Society of North America (IESNA) and the Lighting Research Centre (www.lrc.rpi.edu).

Ballast: a device used with an electric-discharge lamp to obtain the necessary circuit conditions (voltage, current and waveform) for starting and operating (IESNA).

Candella (cd): the Standard International unit of luminous intensity. The intensity of a light source in a specific direction is measured in candelas. Each light source will have many different light intensities depending on the

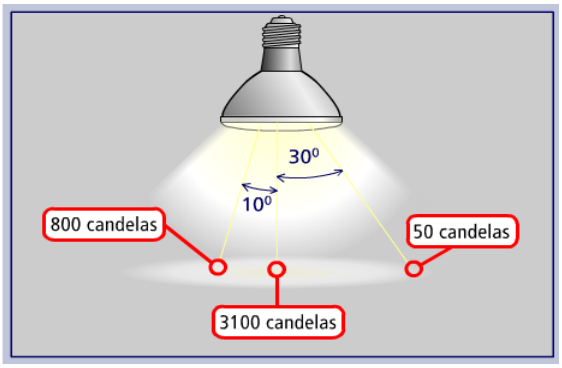

Figure 3.1. Differences in luminous intensity within a single light cone. Source:www.lrc.rpi.edu.

specific location at which intensity is measured within the light cone (Figure 3.1).

Correlated Colour Temperature (CCT): refers to the colour appearance of the light emitted by a light source and is measured in degrees Kelvin (K). The CCT of a light source is calculated by relating the colour of the lamp to the light colour of a reference source when heated to a particular temperature. CCT gives a general measure of the "coolness" or "warmth" of the light source: CCT ratings below 3200K are considered warm whereas ratings above 4000K are considered cool. CCT gives an indication of the general appearance of the light, but not its spectral power distribution, and so two lamps that appear the same may have different colour rendering properties.

Illuminance (E): is measured in lux (see below) and refers to the amount of luminous flux from a light source falling on a given surface and is measured on horizontal and vertical planes.

Luminance (L): relates to the brightness of an illuminated surface as perceived by the human eye and is measured in candelas per unit area (cd/m^2).

Luminaire: is the unit into which a lamp is fitted. Luminaires are required to comply with relevant European standards, but the light distribution outputs can vary considerably between different luminaire types.

Lumen (lm): defined by IESNA as the Standard International (SI) unit of luminous flux. The lumen rating can be considered as the measure of the summation of light output of a lamp. Ratings are determined and published by the lamp manufacturer.

Luminous flux (ϕ): refers to the rate at which light is emitted from a light source and is measured in lumens (see above).

Luminous intensity (I): is the amount of luminous flux radiating in a particular direction and is measured in candelas (see above). It is also termed the candlepower.

Lux (lx): is a measure of illuminance measured as the number of lumens (lm) per unit area (e.g. lux = lm/m^2).

Spectrum: refers to the wavelengths of electromagnetic radiation.

Wavelength: the distance between two corresponding points of a given wave. Wavelengths of light are measured in nanometers (1 nanometer = 1 billionth of a meter).

3.2 Light types

Lamps generate light by either thermal radiation or gas discharge (Anon. 2004).

Key light types are described below:

I. Incandescent lamps (IL)

Incandescent lamps generate light by resistance heating. They contain a tungsten filament in a glass bulb which is either evacuated or filled with nitrogen or inert gas (argon) (Anon. 2004).

II. Tungsten halogen lamps (THL)

Tungsten halogen lamps are a development of incandescent lamps. They are filled with halogen gas which prevents blackening of the bulb. THL have higher luminous efficacy and a longer service life compared to IL (Anon. 2004). THL are not used in new lighting schemes but may be encountered as security lights on a private household.

III. Discharge lamps

Generate light by electric discharge through a gas or vapour. The common discharge lamps are:

Low pressure sodium lamps (LPS, also known as Sodium Oxide (SOX)):
LPS emit an orange light and are often used in street lighting. Light is emitted at one wavelength and therefore has undesirable colour rendering for the human eye. LPS contains no ultraviolet (UV) light and the lamps tend to be large, which makes it more difficult to direct the light. In the UK LPS are gradually being replaced.

High pressure sodium lamps (HPS or SON):
HPS emit a pinkish yellow light and are commonly used as street lights. Light is emitted over a moderate band of long wavelengths including a small UV component.

The lamp is of medium size and the light can be more easily directed than LPS. HPS is whiter than LPS and has a larger component of UV light.

Metal halide (MH):

MH lights are small and this makes it easier to direct light where it is needed. MH lights emit less UV light than Mercury Lamps (below) but more than HPS. They have high luminous efficacy and excellent colour rendering. MH comes in three forms i) Quartz arc tube (HQI); ii) Ceramic arc tube (CDM-T) and iii) Cosmo, which is a new ceramic form. An example is Philips CosmoPolis lamps which are being installed in Cornwall. MH lights are becoming more popular for outdoor applications as they are more efficacious (lumens per watt) than HPS lamps and are better tuned to the spectral sensitivity of the human eye (Rea *et al.* 2009). The public consider areas illuminated with MH lamps to be brighter and safer than those lit with HPS lamps (Rea *et al.* 2009).

Mercury Lamps (MBF)*:*

These are bluish-white lamps which emit light over a moderate spectrum including a larger component of UV. They are now rare and are not used in new developments.

IV. Compact Fluorescent Lamps (CF)

CF lamps have good colour rendering, luminous efficacy and service life. The use of appropriate electronic ballasts for CF enable dimming control.

V. Light Emitting Diodes (LEDs)

LEDs lights are generated by passing electronic currents through solid-state crystal. LEDs produce monochromatic radiation and their colour tone is defined by the dominant wavelength (Figure 3.2), so LEDs can be red, orange, yellow, green, white and blue (Anon. 2005). LED light is produced in a narrow beam and is an instant light. LEDs are predicted to become the leading type of external lighting in the next ten years (Steele 2001; Steele 2010). The advantages of LEDs are their small dimensions, long lifespan, low failure rates and the lack of IR or UV radiation (Anon. 2005). In addition the light is more directional with low spill e.g. Monaro LED street lamps (DW Windsor Ltd) have a full horizontal cut off resulting in no light spill above or

behind the lamp. LEDs provide considerable flexibility for mitigating the ecological impacts of lighting as composite bundles of LED lights within a lamp can be switched off to direct light where it is needed.

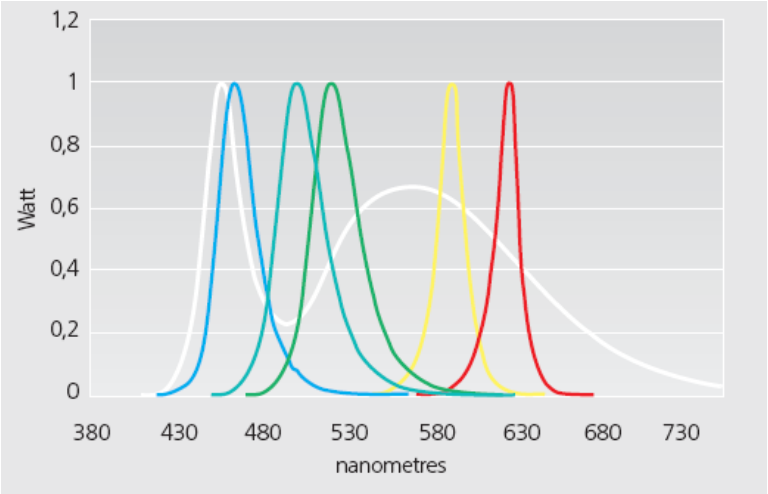

Figure 3.2. Spectra of coloured and white LEDS. Source: (Anon. 2005)

3.2.1 Spectral composition of lights

Street lights used in Britain can be divided into three categories based on their spectral outputs (Davies *et al.* 2013):

I. Narrow spectrum lights which do not emit UV (e.g. LPS);
II. Broad spectrum lights which emit little/no UV (e.g. HPS and LED); and
III. Broad spectrum lights which do emit UV (e.g. MH).

3.3 Lighting trends and technologies in the UK

3.3.1 Street lighting (A roads, B roads, pedestrian lighting)

There are over 7.5million street lights in the UK (Anon. 2009). Common light types used for external applications in the UK are described in Table 3.1.

Table 3.1. Common types of street light used in the Britain.

Light type	Colour	% UV	Correlated colour temperature (K)	Approx % of UK lighting stock
Low pressure sodium (LPS / SOX)	Yellow/orange	0.0	1807	44%
High pressure sodium (HPS / SON)	Pinkish / off white	0.3	2005-2108	41%
Compact fluorescent	Warm white	0.5-1.0	2766-5193	15%
Metal Halide (e.g. Philips CosmoPolis)	Blue-white	2.0-7.0	2720-4160 CosmoPolis 2720	N/A
Light emitting diode (LED)	White/warm -white	0.0	2800-7000	N/A

From Gaston *et al*.(2012); N/A = information not available.

In 2010 31% of UK street light columns had exceeded their lifespan (Anon. 2009). Many county councils and local authorities across Britain are conducting streetlight replacement programmes as part of the Highways Private Finance Initiative (PFI) scheme. In addition UK Climate Change Act (UK-CCA 2008) sets legally binding targets to reduce greenhouse gas emissions to levels at least 80% below those recorded in 1990 by 2050. As a result many county councils and local authorities have produced climate change strategies and action plans in order to meet Government targets.

The Carbon Reduction Commitment Energy Efficiency Scheme (CRC) is a mandatory carbon emissions reporting and pricing scheme with aims to reduce UK carbon emissions. The CRC was initiated in April 2010 and covers both private and public organisations using more than 6,000MWh of electricity per year. Although the direct relevance of the CRC will vary according to the category of the lighting supply (dynamic, passive and non-half hourly), it is likely to be a material consideration in the future management of road lighting (http://www.decc.gov.uk/en/content/cms/emissions/crc_efficiency/crc_efficiency.as_px).

Participants of the CRC are required to monitor their carbon emissions and purchase allowances for CO_2 emissions. The more CO_2 emitted the more allowances must be purchased providing a direct financial incentive to reduce carbon emissions. This has caused

councils to re-assess their street lighting policies with the primary intention of reducing CO_2 emissions. The majority of UK local authorities and councils have commenced lighting reduction strategies consisting of: switching off street lights completely; part night lighting schemes (PNL); and/or dimming schemes (Table 3.2).

In response to recommendations in a report on Artificial Light by the Royal Commission on Environmental Pollution (Anon. 2009), Defra conducted a review of fifteen Local Authorities (LA) and their experiences in implementing changes to road lighting strategies (Lockwood 2011). The review comprised a desktop study and a discussion group which was attended by 13 of the 15 LAs. Trials and initiatives implemented by LAs included:

i. switching selected road lights off;
ii. lighting roads for part of the night only;
iii. dimming the level of lighting during the early hours of the morning; and
iv. using new and evolving technologies such as a central management system (CMS) or light emitting diode (LED) lights.

The Highways Agency is responsible for maintaining and improving all England's motorways and trunk roads. The Highways Agency have commenced PNL schemes whereby lights are switched off between midnight and 5.00am (using remote dimming technology) on several sections of the motorway network (http://www.highways.gov.uk/knowledge/30236.aspx). This has resulted in 30% reductions of carbon and electricity consumption in each section with PNL. The Highways Agency have conducted a benefit assessment of the impacts of switching off lights and recorded lower numbers of road traffic accidents after PNL was installed. The Highways Agency has since revised its road lighting standards and guidance.

3.3.2 Changes in light types

People perceive areas illuminated with white light as safer, brighter and more comfortable than areas lit with yellow light (Knight 2010). White lights also have better colour rendering for the human eye when compared to HPS or LPS lights (Knight 2010). White light sources with a Colour Rendering Index of *R*a > 80 can be advantageous because of the improved

differentiation of colours, which enhances identification of objects and people (Lockwood 2011). As a result there has been a shift towards the use of white lights in outdoor lighting applications. For both new and on-going replacement schemes county and city councils in England are installing new white light units such as Philips CosmoPolis or WRTL IndelStela Lamps which have higher efficacy and thus lower CO_2 emissions (Table 3.2).

3.3.3 Central Monitoring Systems (CMS)

CMS are becoming increasingly popular and leading the way in the future management of lighting. CMS are electronic monitoring systems that allow two way communication with light units enabling the user to control and programme light units remotely. CMS enable remote switching or dimming to various degrees of brightness to facilitate part night lighting schemes.

CMS can save money through both dimming and switching off lights, and by automated performance monitoring. Automated monitoring enables identification of light unit failures and fault finding which reduces the requirement for onsite maintenance and night patrols, allowing operations managers to optimise their maintenance schedules. CMS gives considerable flexibility for wildlife managers, making it feasible to dim or switch off specific lights at selected times e.g. to avoid bat commuting or emergence times.

3.3.4 Current initiatives (footpaths, cycle-ways, underpasses etc.)

The development of LEDS has facilitated a growth in more flexible lighting approaches for many amenity applications such as footpaths, tow paths and cycle paths. Conventionally, areas are lit from above on a high column with the light directed downwards. LEDS are small and provide considerable flexibility. Examples include the use of LED based strip lighting for a towpath project where asymmetric LEDs are embedded in handrails along the path. The illuminated handrails provide sufficient light for pedestrian use of the path while directing light away from the water's edge to reduce light intrusion into the waterway (**Figure 3.3**).

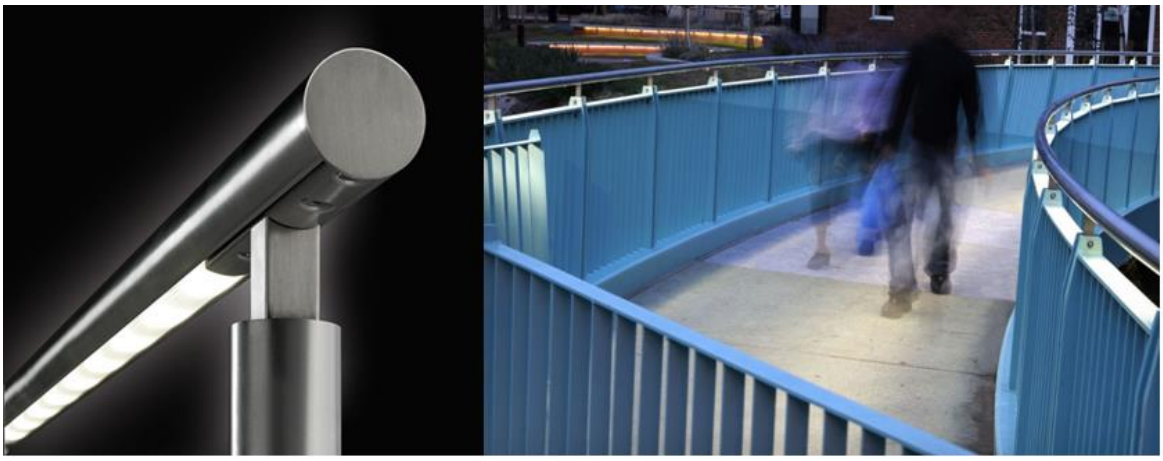

Figure 3.3. Garda LED illuminated balustrade (DW Windsor LTD)

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Table 3.2. County council lighting replacement/update schemes in England as obtained via direct contact with county councils in 2011/2012.

County Council	Details of scheme	Dimming	Part Night Lighting	Replacement	Switch Off Scheme	Est. CO_2 / energy saving	Comments
Buckinghamshire	Trial 2007-2010	Y	Y	Y – LED lights	N	N/A	Initial results show reduction in road collisions when lights where switched off (Lockwood 2011)
Cambridgeshire	2011-2015	N	N	Y – white discharge lamps 60% of units replaced	N	N/A	
Cumbria	No PFI but ongoing replacement using CosmoPolis since 2008	N	N	Y - ongoing replacement LPS and CosmoPolis for last 3 years; Like for like replacements and trialing white LED lights	N	N/A	
Cornwall	PFI 2009-2012	N	N	Y - replacing 100% of lamps with Philips CosmoPolis	N	N/A	
Derbyshire	2011-2015	N	Y - 12pm-5.30am	Y - white LED (WRTL IndelStela lights)	Y	N/A	
Devon	Scheme in operation, no details of dates	N	Y - 12.30pm - 5.30am	N	N	4000 t CO_2/year	
Dorset	PFI since 2011	N	Y - 12pm - 5.30am	Y- replacing 75% of stock – using SON, PLT, CosmoPolis or CDOTT Lamps and	N	Aiming to save £54.9million over 3 years from PNL;	

				not using LEDs		15% energy savings from replacement scheme	
East Sussex	Completed in December 2011	Y - 50% of lighting stock dimmed between 12pm - 6.00am	Y - between 12.30pm - 5.30am	Y – white light including PLT, CosmoPolis and LED	N/A	N/A	
Essex	Scheme in operation since 2007	Y – since 2007	Y – since 2007	Y - 70% to be replaced and CMS installed	N	PNL - £54,000/year and 312tonnes CO_2/year from PNL trials If extended to whole county would save between £600,000 and £2m/year	
Gloucestershire	Trials of LEDs 2009-2012	Y	Y - 12% of lights	Y - 65 LPS lamps and 104 HPS lamps replaced with LEDs and CMS installed	N	DS - 806t CO_2/year (£172, 800 / year)	
Hampshire	PFI 2010-2015	Y - by 25% for some lights – eventually all lights will be dimmed	N	Y – 50% of lamps (150,000) replaced with white LEDS and CMS installed	N	15% reduction in CO_2 over 25yrs; £181,000 saved between 2010 and 2011	
Hertfordshire	Since June 2010	N	Y - 60-70% of lighting	N/A	N/A	30-35% cost saving /year	
Kent	N – considering part night						

	lighting and dimming						
Lancashire	Scheme in operation, 2008-2012	Y - 80,000 HPS lamps on residential roads dimmed by 50% between 10pm-6am (using CMS); 27,100 lamps dimmed by 50% between midnight and 6am on main roads	Y - 600 HPS on the M65 motorway between 12pm - 5am	Y - 30,000 lamps replaced with StelaWhite LED (IDAL WRTL)	N	30% reduction in energy consumption	1000 illuminated road signs decommissioned and replaced with reflective signs
Leicestershire	April 2010 - 2014	Y - to 50% power for 3% of lights	Y - 60% of lights	N	Y - 15% of lights	3000tonnes CO_2/year (£700,000/year) Savings from dimming alone £70,000/year and 387tonnes/year.	
Lincolnshire	N/A						
Norfolk	PFI 2008-2028	Y - 11% of lights on main traffic routes between 8pm - 5.00am.	Y –24,000 street lights from 2010 (47% of lights)	Y -100% of lights will be white light sources by 2028; In residential areas 28,000 lanterns to white light with a mixture of CosmoPolis, PLL and PLT lamps; Son-t lamps installed on traffic routes; conducted trial of	N	Save £167,000/year	

				LED lamps in Kings Lynn in 2009 and installed 2,500 LEDs in Kings Lynn in 2011			
North Somerset	Scheme in operation, no details of dates	N	Y - 80% of lights	Y - 228 HPS lights changed to white ceramic metal halide lamps and CMS installed	N/A	25% reduction in CO_2 (750tonnes of CO_2) Saving £209, 000 from PNL	
North Yorkshire	April 2012-2016	N	Y -30,000 lights converted to PNL	Y - LED white lights (installed in new housing estates)	N/A	Total saving of £400,000 and >3000tonnes of CO_2	
Northamptonshire	PFI 2011-2016	Y	Y	Y - replacing bollards with LEDS	N/A	9500tonnes CO_2/year and 17.5kw of electricity/year	
Northumberland	N/A						
Nottinghamshire	October 2010 – 2014	Y	Y	N	Y	5,800tonnes/ year CO_2saved £1,25m / year	
Oxfordshire	N – no dedicated programme but ongoing replacements	N	N	Y - some use of LED white lights and HPS like for like as part of ongoing replacement	N	18% reduction in CO_2emissions from 2005 levels by 2012; total carbon saved 275 tonnes	
Somerset	PFI, no dates available	Y - reduce some lights by 50%	Y - PNL 20% of lights switched off from 12pm - 05.30am	N/A	N/A	N/A	

Staffordshire	PFI 2003-2028	N/A	N/A	Y - 60% of lamps changed to white 36 Watt PLL Compact Fluorescent Lamp	N/A	N/A	
Suffolk	2011-2013	Y - lights more than 6m high dimmed to 80% 9pm-1am and 60% power 1am-5am	Y - lights less than 6m high switched of between 12pm – 5.30am	Y - Telensa Intelligent lighting systems which allow remote control dimming	N/A	N/A	
Surrey	PFI March 2010-2035	N/A	N/A	Y - 79% of lights replaced; 21% of lights refurbished To white light and CMS installed	N/A	60,000tonnes of $CO_2$and 150million kw hours saved in total	
Warwickshire	Scheme in operation, no details of dates	N/A	Y – 80% to PNL between 12pm - 5.30am	Y – Philips CosmoPolis and LED	N/A	N/A	
West Sussex	PFI April 2010 - 2015	Y – dimmed by 40% power between 12pm - 5.30am	Y	Y – replacing 52,000 lighting columns, 2,600 lanterns and 11,500 illuminated signs	N/A	N/A	
Worcestershire	Scheme in operation, no details of dates	Y - 10% of stock	N	Y – Philips CosmoPolis, LED and CMS	N/A	N/A	

Symbols: CMS = Control Management System; PNL = Part Night Lighting Scheme; Y = yes; N = no; N/A = information not available.

4 Surveys

Emma L. Stone & Lisa Hundt

4.1 Introduction

Comprehensive standardised surveys before and after development are key to successful impact assessment and mitigation. Surveys should be standardised (using the same effort and timing) to ensure they are comparable before and after development. Failure to take account of the potential impacts of lighting on bats can result in failure to obtain a derogation licence and therefore should be considered in any development involving artificial light. However, the number of surveys required at each site will vary according to the scale of the proposed development, and should be proportional to the scale and likely impact of the development (see Table 4.1).

Pre development surveys for proposed lighting applications should include two elements:

- **Bat surveys:** to determine the amount, location and nature of bat use around the site; and
- **Lighting surveys**: to determine the baseline lighting levels in the areas used by bats prior to development.

4.2 Pre-development bat surveys (PrBS)

Comprehensive, appropriate and effective bat surveys are required to enable accurate assessments of potential impacts on bats and their populations. A survey is an essential part of the planning process and is required to provide adequate information to enable:

i. The developer to assess the possible impacts of the scheme and inform the design and mitigation strategy;
ii. Planning authorities to assess the likely effects of a development on bats and identify and stipulate any further information required on necessary avoidance, mitigation, compensation or enhancement measures in order to maintain the favourable conservation status of the species; and/or

iii. Ecologists to make an informed decision to be taken as to whether a European Protected Species (EPS) mitigation licence should be applied for; and/or

iv. Relevant licensing bodies to determine an application for an EPS licence that would then enable the lawful disturbance of bats or the damage/destruction of their roosts.

It is essential that the information gathered as part of a survey is of a standard that enables decisions on planning, mitigation and licensing to be taken. The overall aim of surveying at proposed sites is to collect robust data to allow an assessment of the potential impact of the proposed development on the bat species present on and around the site. This information is vital to allow the developer to decide whether to proceed with a development proposal or, where appropriate, how to modify the proposed layout. It is only then that the proposed development application can be submitted and determined by the appropriate authority.

Surveys must be designed to meet these key aims and provide all the relevant information needed for appropriate identification and subsequent assessment of the impacts. In designing the survey, it might also be useful to consider how the data can be used and presented as baseline data against which the scheme can be monitored once constructed.

Survey design will vary depending on the habitats present on and around a proposed site and may need adjustment throughout the survey period to continue to meet the aims. Best practice guidance on the methods used to undertake and design different bat surveys are detailed in the Bat Surveys Good Practice Guidelines (Hundt 2012). Additional considerations relating to the sampling of light are detailed below.

4.2.1 Types of survey

I. Roost surveys:

Roost surveys are conducted to determine potential roost sites for use by bats, which can include maternity and hibernation roosts. Roost surveys often include the following stages: preliminary roost assessment, presence/absence survey, and roost characterisation survey (Hundt 2012). It is important to record the numbers of bats emerging and the timing of emergence (first and last bat relative to sunset) during each survey. The timing and duration of bats flying around outside the roost (e.g. potential light sampling) should also be

recorded. This is crucial to development of potential mitigation strategies which may need to avoid lighting areas during emergence.

II. Activity Surveys:

These surveys are surveys of active bats carried out by using non-invasive measures, such as bat detectors (hand-held or unattended).

Activity surveys should be conducted to:

- Identify the key areas of the site which are used by bats for foraging, commuting and swarming;
- Determine the spatial extent of bat use over a site; and
- Assess changes in bat activity over time.

This information is important to enable predictions of impacts of lighting on foraging, commuting and swarming behaviour. The most common form of activity survey is by line transect. Line transects are carried out by a surveyor carrying a bat detector, who walks at a constant speed along a planned route and records bat echolocation calls for subsequent analysis, and/or the number of bat passes or species (Hundt 2012). A transect should aim to capture the key features of the site as identified during the scoping survey and should be designed so that they can be safely completed by the surveyor in the appropriate timeframe. Light levels should be measured at standard intervals along each transect using a light meter (section 4.3.2.2). The location of any artificial light sources close to a transect should be documented and mapped for inclusion in final survey reports. Other types of activity survey methods are detailed in the Bat Surveys Good Practice Guidelines (Hundt 2012).

Produce a quantified pre-development bat habitat use map (PrBM): Once all surveys have been completed a quantified bat habitat use map should be produced. This should outline:

I. Locations of species presence across the site;
II. Locations of key foraging, commuting and swarming sites, including an index of relative activity at each site (e.g. no of bats/hour along each hedge/at point counts in woodlands etc.);

III. Maps of changes in activity at key sites over time (within or between seasons); and

IV. Location of areas with light averse species (e.g. *R. hipposideros* and *Myotis* spp.).

To enable comparisons before and after development and between sites it is essential that survey reports always include detailed descriptions of methods used including:

I. The index of activity used (e.g. number of bat files/number of bat passes per hour);

II. How a bat pass/file was defined;

III. The time (relative to sunset) and the height at which light measurements were recorded;

IV. The make and model of all equipment including acoustic analysis software (e.g. bat detectors, light meter etc.);

V. Date, start and end times of all surveys; and

VI. The number of observers and detectors.

4.3 Pre-development lighting surveys (PrLS)

4.3.1 Proposed lighting scheme and predictions

To assess the impacts of proposed lighting applications on bats accurately, it is important to obtain comprehensive details of the proposed lighting scheme from the lighting professional/engineer. Information regarding the amount, type (including spectral content), and location of any lights to be installed is required. As with the pre-development bat surveys, the number and extent of lighting surveys conducted should be proportional to the scale of the development. Large scale developments involving landscape-level impacts including loss or changes in key habitat features (e.g. loss/alteration of hedgerows/woodland areas) and associated installation of new roads and lighting (including amenity, security and industrial lighting) will require more comprehensive pre-development lighting surveys than small scale developments (see Table 4.1).

The following information should be obtained from the lighting professional/engineer and presented in the survey report:

i. Number and location of proposed luminaires;
ii. Luminaire light distribution type;
iii. Lamp type, lamp wattage and spectral distribution ;
iv. Mounting height;
v. Orientation direction;
vi. Beam angle (between 0^{o} and 90^{o}, the higher the angle the greater potential for obtrusive light above the horizontal plane);
vii. Type of control gear (this will help inform mitigation and it will influence the possibility for remote management of light intensity and regime);
viii. Proposed lighting regime (timing and duration of illumination); and
ix. Projected light distribution maps of each lamp (engineers can provide map which predict the distribution of the light (lux levels) emitted from each lamp, see 4.3.2).

4.3.2 Baseline light surveys

Standardised comprehensive lighting surveys are essential for the accurate predictions of the impacts of lighting applications on bats. It is important to survey pre-development light levels in the areas to be impacted by the proposed lighting regime to be able to assess the relative change in illuminance as a result of the scheme.

4.3.2.1 Surveys by lighting engineers/contractors

Lighting engineers often assess the existing light levels on site prior to installation of lighting so as to ensure that any proposed lighting does not spill into new areas, thereby exceeding existing site conditions. It is advisable that the predictions and calculations produced by the lighting engineer/contractor are obtained and considered along with the pre-development bat survey results to inform the impact prediction and mitigation planning process. During the lighting design process lighting engineers often produce maps of predicted light levels beam distributions and a lamp layout plan. These include calculated predictions, obtrusive

light calculations, and surface colour schedules. These maps are important tools to enable accurate predictions of the impacts of lighting on bats.

4.3.2.2 Surveys by bat ecologists

In addition to the light surveys completed by lighting engineers/contractors, independent light surveys should be completed to assess specific areas currently or potentially used by bats. Lighting surveys should be completed either during or after bat surveys are conducted and focus on those habitat elements/areas currently and potentially used by bats (as identified during the bat activity surveys, section 4.2). It is important to ensure that light levels are recorded at all key areas used by bats on a site including:

i. Inside and outside roosts;
ii. Roost exits;
iii. Foraging sites; and
iv. Commuting routes (including potential alternative routes).

Light levels should be measured both within roosts (when conducting preliminary building checks) and externally as part of subsequent presence/absence and roost characterisation surveys (see below for guidance on how to record light levels). Readings at roost exit points should be taken at intervals throughout the emergence period of the bat species in question such that light levels are recorded for the period of time when bats normally leave the roost, as this is when they are most likely to be affected by light disturbance at the roost. It is important to assess ambient light levels along hedges and key habitat elements in areas/routes which are identified as possible alternative routes post development if existing routes are altered or removed. This information should be presented in the report including a map of light levels in relation to bat activity/use and including the times of the readings taken.

Measuring light: when recording light levels it is best practice to use a lux meter which can measure light levels at a resolution of 0.01 lux or lower (e.g. Konica Minolta T-10 illuminance meter, Konica Minolta Sensing, Inc.), enabling recording of light levels in dark areas. Light should be measured at the height at which the bats will be flying or if that is not

possible a standardised height (e.g.1.7m, approx. head height). The time (relative to sunset) and height at which the light level was recorded should be reported to enable comparison between studies.

Produce a predicted post-development light distribution map (PstLM): a lighting distribution map should be created for large scale developments. This should include information obtained from the lighting engineers/contractors (section 4.3.2.1) and from the ecologists lighting (section 0) and bat surveys (section 4.2). This map can be used to inform predictions of the impacts of lighting on bats in the area. This map should combine the bat habitat use maps with predicted light distribution maps and current light levels to estimate the amount and type of impacts on bats in the area. Information regards predicting the impacts of lighting on bats is outlined in section 5.

4.4 Key action points for baseline bat and lighting surveys

i. Conduct standardised **pre-development bat surveys** (PrBS) to identify areas used by bats for commuting, foraging and roosting;

ii. Produce a **quantified pre-development bat habitat use map** (PrBM) showing species presence and absence, key foraging, commuting and swarming sites, and an index of relative activity at each site (e.g. no of bats/hour along each hedge/ at point counts in woodlands etc.);

iii. Conduct **pre-development light surveys** (PrLS) to quantify existing light levels in areas used by bats;

iv. Obtain **predicted post-development light distribution maps** (PstLM) and detailed descriptions of the lighting scheme from the lighting contractor/engineer;

v. Produce **a predicted lighting impact map** for bats combining the information obtained in the PrBS, PrBM, PrLS and PstLM**;**

vi. Report the time and height at which light measurements were recorded to enable comparisons before and after development.

Table 4.1. Summary of estimated survey effort and reporting required according to development type (large, medium, small).

Scale of Development	Example development	Surveys required	Reports & Outputs
Large	Large scale habitat loss/alteration Creation of new roads and lighting in dark areas	Comprehensive PrBS and PrLS across site	PrBM PstLM Predicted light impact map
Medium	Some habitat loss /alteration Changes in light types/amount of light in areas used by bats	Medium scale PrBS and PrLS	PrBM PstLM Predicted light impact map
Small	Little/no habitat loss/change Minimal changes in light levels /types (E.g. single security light installed)	Small scale targeted surveys in area affected: PrBS PrLS	PrBM PstLM

5 Impacts

Stone, E.L

5.1 Introduction

Light pollution is a key biodiversity threat. It is listed within the top ten emerging issues in biodiversity conservation and has important implications for policy development and strategic planning (Hölker *et al.* 2010b). There has been increasing awareness of the ecological impacts of light pollution (Harder 2002; Longcore & Rich 2004; Smith 2009; Hölker *et al.* 2010a; Hölker *et al.* 2010b). Light pollution affects ecological interactions across a range of taxa and negatively affects critical animal behaviours including foraging, reproduction and communication (for reviews see Longcore & Rich 2004; Rich & Longcore 2006). Being nocturnal bats are among those species most likely to be impacted by lighting, although artificial light can impact all species and behaviours.

5.2 Predicting the impacts of lighting on bats

This is an emerging and complex area of research with many knowledge gaps remaining. There are many aspects of ecological light pollution which are yet to be investigated, such as the impacts of polarized light on wildlife (Horvath *et al.* 2009), and so a precautionary approach is important.

5.2.1 Considerations when predicting the impacts of lighting on bats

It is important to consider the following when predicting the impacts of lighting on bats:

i. Impacts may be cumulative

Lighting is one of many anthropogenic impacts on bats and so it is important to consider impacts of lighting in the context of the site and other conditions affecting the species or colony. For example even a small amount of lighting may have a disproportionate impact on bats at sites where there are already high levels of disturbance, therefore

impacts must be assessed in the context of other disturbances on the colony/roost in question.

ii. Impacts will vary according to site, species and behaviour

The impacts of lighting on bats is species specific and varies according to the specific behaviour being affected. Impacts on a site by site basis can be based on knowledge of the species involved and the type of behaviour affected.

iii. Impacts may occur over different temporal scales

Some impacts may occur over very short time frames making them more obvious (e.g. spatial avoidance) and therefore more likely to be recorded. However, lighting may impact behaviours over longer time scales (e.g. reduced breeding success) and may be harder to record and therefore underestimated. Therefore when predicting impacts an assessment must be made over the full range of potential time frames (seasons to generations).

iv. Impacts may occur at both the individual or population level

Lighting may impact on a few individuals in a colony or population, i.e. causing temporary avoidance of a commuting route used by a small percentage of bats occupying a roost. However, there may be effects at the population level, e.g. reduced juvenile growth rates due to reduced foraging or delayed emergence caused by lighting (e.g. see Boldogh *et al.* 2007).

v. Impacts may be indirect occurring at the ecosystem or community level

Lighting can impact bats via changes at the ecosystem level. Lighting may lead to a competitive advantage for some species which benefit from the increased foraging opportunities provided by moths attracted to lights with high UV content. This may lead to competitive exclusion of those species unable to take advantage of new artificially illuminated areas (Arlettaz *et al.* 2000).

Indirect effects include effects on bats' insect prey. Bats have a competitive advantage over moths at street lights (Svensson & Rydell 1998), which interferes with the relationship between predator and prey. Lighting causes direct mortality of insects. Currently there is little evidence of population level effects on insects (Fox 2013), but

even local reductions in insect prey caused by artificial lighting may reduce feeding opportunities for bats, particularly for bat species which avoid illuminated areas. Artificial light may also change the community composition of insects. Davies *et al.* (2012) found that areas illuminated by HPS lights contained higher numbers of predatory and scavenging insects (e.g. ground beetles, harvestmen, ants and woodlice). Therefore lighting could affect entire ecosystems through changes in trophic interactions, which may in turn affect ecosystem services.

5.2.2 Summary of impacts according to bat behaviour

A summary of the key bat behaviours and the likely nature of impacts caused by artificial light disturbance are provided in **Table 5.1**. However the following information must be used as a guide, as impacts will vary according to the site, species and light type in question. As evidence is limited we have compiled research from both UK and non UK bat species, to enable comparisons and predictions of likely impacts from similar species outside the UK.

Table 5.1. Impacts of lighting on bat behaviour, including evidence and implications

Behaviour	Impact	Description of impact	Evidence	Implications
Emergence / Roosting	Delayed emergence	External lights can delay the timing and prolong the duration of emergence for some species	Extended twilight caused delayed emergence in *Rhinolophus hipposideros* (McAney & Fairley 1988) and light intensity was an important factor determining the onset of emergence. External lighting reduced the number of *Pipistrellus pygmaeus* emerging from roosts (Downs *et al.* 2003).	Reduced foraging time and bats will be forced to compensate if possible. Bats may miss the peak in abundance of insects that occurs at dusk, thereby reducing the quality of foraging time, impacting the fitness of individuals and the roost as whole
	Spatial avoidance /roost abandonment	Bats may use alternative exit/entrances if available. Bats may abandon the roost or become entombed	A maternity roost of 1,000 -1,200 female *Myotis emarginatus* (non UK species) was abandoned after lighting spilled directly onto the entrance (Boldogh *et al.* 2007). Full illumination of roosts has been shown to cause sudden declines in bat numbers. Over 1000 bats died after a 40watt light was left on for two days inside a roost of *Myotis myotis* (non UK species) in Germany (Karl Kugelschafter pers. comm.). Numbers of *Myotis lucifugus* (non UK species) and *Eptesicus fuscus* (non UK species) declined by between 53-89% and 41-96% respectively upon installation of incandescent lamps (40 and 60 watts), cool fluorescent lamps (40 watts) and spotlights	Lighting which spills directly into a roost can cause roost abandonment or death and should be avoided. Such disturbance would constitute an offence. Illumination of the roost entrance can have consequences for predation and connectivity. Bats may be forced to use alternative exits if available. Alternative exits may be suboptimal in terms of predation risk. Alternative exits may increase predation risk due to their location in relation to the surrounding landscape (e.g. bats may be forced to fly across open areas or roads once leaving the exit) or due to their situation (e.g. located low to the ground or near a window sill enabling easy access for predators such as domestic cats). Forcing bats to use exits which increase

			(150 watts) inside nursery roosts (n = 3 *Myotis lucifugus* roosts; n = 6 *Eptesicus fuscus* roosts) (Laidlaw & Fenton 1971).	predation risk can cause increased mortality and in the worst case scenario result in severe reductions in colony numbers (e.g. domestic cats have killed all bats in a colony during one summer season).
	Reduced reproductive success	Internal and external lighting around a bat roost can impact on the fitness of the colony through reduced juvenile growth rates	Colonies of *Myotis emarginatus* (non UK species) nd *Myotis oxignathus* (non UK species) in buildings which were illuminated from the outside had lower juvenile growth rates than colonies in non-illuminated buildings (Boldogh *et al.* 2007).	Reduced fitness can impact the long term survival of a colony, making them more susceptible to other threats causing them to be at increased risk. Bats are long lived and slow to reproduce, meaning they take time to recover from population declines. Illumination of buildings occupied by bats and the immediate surrounds should be avoided.
Commuting	Spatial avoidance and habitat fragmentation	Light that spills onto bat commuting routes or flyways can cause avoidance behaviour for some species and fragment the network of commuting routes	Activity of *Rhinolophus hipposideros* and *Myotis* spp. was significantly reduced along commuting routes illuminated with HPS and LED street lights (Stone *et al.* 2009; 2011; 2012). *Rhinolophus hipposideros* and *Myotis* spp. avoided commuting routes illuminated with LEDs even at low light levels of 3.7 lux (Stone *et al.* 2012). In Canada and Sweden *Myotis* spp. were only recorded away from street lights (Furlonger *et al.* 1987; Rydell 1992).	Bats may be forced to use suboptimal routes which may force them to fly further to reach their foraging grounds resulting in increased energetic costs (due to increased flight time). Alternative commuting routes may be suboptimal in terms of vegetation cover, resulting in increased predation risk or exposure to the elements (wind and rain) with increased energetic costs. In some cases there may not be an alternative route available and bats may be cut off from their foraging areas, forcing them to abandon

			Despite the presence of street lit areas within their home range, lit areas were never used by *Rhinolophus ferrumequinum* (Jones & Morton 1992; Jones *et al.* 1995). Torchlight appeared to reduce activity of *Myotis daubentonii* foraging over two rivers in England (Monhemius 2001), although these results must be viewed with caution as the analysis failed to account for repeated measurements within sites.	their roost. Such disturbance disrupts the ecological functionality of the landscape by creating barriers to effective animal movement.
Foraging	Increased foraging	Some bat species actively forage at lights due to the higher numbers of insects (particularly moths) attracted to street lights, in particular low wavelength light (Eisenbeis 2006; van Langevelde *et al.* 2011).	Bats of the following genera have been recorded foraging at street lights: *Chalinolobus* (non UK species), *Eptesicus, Lasiurus* (non UK species)*, Mormopterus* (non UK species)*, Myotis, Nyctalus, Nyctinomops* (non UK species)*, Pipistrellus, Tadarida* (non UK species) and *Vespertilio* (non UK species). Higher densities of bats have been recorded in lit compared to unlit areas e.g. densities of *Pipistrellus pipistrellus* were 10 times higher in lit versus dark areas in England (Rydell & Racey 1995), and densities of *Eptesicus nilssoni* (non UK species) *were* 5-20 times higher in lit compared to dark areas in Sweden (Rydell 1991). The highest levels of bat activity in lit areas have been recorded at white lights (Blake *et al.* 1994; Rydell & Racey 1995; Avila-Flores &	Fast flying species adapted to forage in open areas (particularly bats of the genus *Eptesicus, Pipistrellus* and *Nyctalus*) may benefit from the increased foraging opportunities provided at lamps which attract high densities of insects. Bats foraging at street lights may be subject to increased mortality risk due to collision with vehicles: juveniles may be at higher risk of predation due to their slower and less agile flight (Racey & Swift 1985). The increased densities of insects at street lights may have ecosystem-level effects. Moths attracted to street lights have increased mortality (Frank 1988; Longcore & Rich 2004) and larger moths are more attracted to lights than smaller moths (van Langevelde *et al.* 2011). This size-dependant mortality risk can have cascading effects for trophic interactions

			Fenton 2005). This is reflected in the higher numbers of insects attracted to white lights with five times more insects recorded at white versus sodium lights (Rydell 1992). In contrast LPS lights do not appear to attract insects, with insect numbers as low as recorded on unlit streets (Rydell 1992). HPS lights attracted 57% fewer insects than white mercury lamps in Germany (Eisenbeis 2009).	and ecosystem services. In addition, the insect prey of bats may be attracted away from dark areas, potentially reducing prey availability for species that do not forage in lit areas.
	Reduced foraging	Illumination of foraging areas can prevent or reduce foraging activity causing bats to pass quickly through the lit area or avoid it completely. Lighting can disrupt the composition and abundance of insect prey.	Acoustic tracking experiments demonstrated that *Eptesicus bottae* (non UK species) failed to forage in areas under lit conditions (Polak *et al.* 2011). It has been suggested that the population decline in *Rhinolophus hipposideros* in Switzerland was caused by competitive exclusion by *Pipistrellus pipistrellus,* which was able to take advantage of the increased foraging opportunities provided by street lights (Arlettaz 2000). Kuijper et al. (2008) suggested that a halogen lamp (1000 watt) placed along the commuting route of pond bats *(Myotis dasycneme*) (non UK species) resulted in a 60% reduction in feeding buzzes. However, these results should be viewed with caution as the statistical analyses failed to account for	Artificial illumination in foraging habitats can effectively cause a loss of foraging areas for some bat species. This can have negative effects on bat communities by potentially causing competitive exclusion of less tolerant species, as more light tolerant species may out-compete them for aerial insect prey.

			repeated measurements within sites. Currently there is a lack of evidence on the impact of lighting on foraging activity of bat species.	
Hibernation	Spatial avoidance	The illumination of hibernation sites may cause spatial avoidance so that bats have to find alternative hibernation sites	There is currently no evidence of the impacts of lighting on hibernation sites, but evidence from summer roosts suggests that bats would avoid roosting at illuminated hibernation sites. Further research is required to understand the conservation and energetic consequences of illuminating hibernation sites	If bats were deterred from using hibernation sites, this could have significant conservation consequences, affecting overwinter survival. The abundance and availability of suitable hibernation sites is unknown and so illumination of hibernation sites should be avoided.
	Increased arousal from hiberation	It is likely that disturbance within a hibernation site will cause bats to arouse from torpor	At present there is no empirical evidence that light stimulates arousal in hibernating bats. Laboratory studies found that bats do not arouse when exposed to slight variations in light (Speakman *et al.* 1991) although this study only tested the effect of the light emitted from a 14 watt petzel head torch. This is not therefore be representative of the impacts of other light types on bat hibernation	If hibernating bats were disturbed on a regular basis this would result in significant energetic costs, reducing their overall fitness and ability to survive the winter and subsequent spring
Swarming	Spatial avoidance / reduced activity	Swarming is characterized by intense chasing flights in and around underground sites by large, transient, multi-species bat assemblages, primarily in August and September (Glover & Altringham 2008).	Typical swarming species in the Britain are *Myotis brandtii, Myotis daubentonii, Myotis mystacinus, Myotis nattereri, Myotis alcathoe* and *Plecotus auritus*. Although there is no direct evidence of the impact of light disturbance on swarming bats, experimental studies have shown that *Myotis* spp. avoided hedgerows illuminated with HPS	Swarming is the primary mating system for many bat species allowing gene flow between populations (Glover & Altringham 2008). Disruption and disturbance of swarming sites have caused population declines of bats across the world (Hutson *et al.* 2001). Bats have shown high fidelity to individual swarming sites, and so

		Light disturbance at swarming sites may cause avoidance behaviour and disrupt swarming behaviour for light sensitive species.	and LED street lights (Stone *et al.* 2009; 2011; 2012). Light disturbance at swarming sites can negatively affect the orientation ability of *Myotis lucifugus* (non UK species), causing them to collide with large objects (McGuire & Fenton 2010).	disruption of swarming behaviour at swarming sites could significantly disrupt breeding behaviour.

5.2.3 Summary of impacts by species

A summary of the key impacts per species according to behaviour types is provided in Table 5.1. These are based on current knowledge and may change as more evidence emerges, so are given as guidance only and specific levels of impact will vary on a site by site basis. Low impact does not mean there is no impact, but suggests that impact is likely to have a negligible impact on the population.

Table 5.2. Summary of predicted impacts of lighting for each species/group according to bat behaviour. Further research is required to have high confidence in many of these predictions and therefore they should be used as guidance only.

Impact / Behaviour	High	Medium	Low
Maternity roost	All species	-	-
Night roost	*Rhinolophus hipposideros* *Rhinolophus ferrumequinum* *Myotis* spp. *Plecotus* spp.	*Pipistrellus* spp. *Nyctalus* spp. *Eptesicus serotinus* *Barbastella barbastellus*	-
Emergence	All species	-	-
Foraging	*Rhinolophus hipposideros* *Rhinolophus ferrumequinum* *Myotis* spp. *Plecotus* spp.	-	*Pipistrellus* spp. *Nyctalus* spp. *Eptesicus serotinus* *Barbastella barbastellus*
Commuting	*Rhinolophus hipposideros* *Rhinolophus ferrumequinum* *Myotis* spp. *Plecotus* spp.	-	*Pipistrellus* spp. *Nyctalus* spp. *Eptesicus serotinus* *Barbastella barbastellus*
Swarming	All species	-	-
Hibernation	All species	-	-

5.2.4 Key messages and recommendations:

5.2.4.1 Emergence and roosting

- Current evidence demonstrates that external light disturbance at emergence and return will have negative impacts for bats (especially *Rhinolophus*, *Myotis*, and *Plecotus* spp.) and should be avoided.
- Internal illumination of roosts is likely to impact negatively on on long-term population growth and survival and should be avoided for all species.
- Direct illumination of a roost exit/entrance may cause roost abandonment for all species (particularly for *Rhinolophus* and *Myotis* spp.) and should be avoided.

5.2.4.2 Commuting

- Light disturbance along commuting routes will cause avoidance behaviour for *R. hipposideros* and *Myotis* spp. and should be avoided.

5.2.4.3 Foraging

- Light disturbance can reduce the availability of foraging areas for some species;
- A precautionary approach must be taken and illumination of foraging areas avoided, particularly for light sensitive species (Table 5.2).

5.2.4.4 Hibernation

- There is limited evidence of the impact of lighting on hibernating bats. However illumination of hibernation sites should be avoided during the hibernation period.

5.2.4.5 Swarming

- There is a lack of evidence regarding the impact of lighting on bat swarming behaviour and so illumination of known or potential swarming sites should be avoided under the precautionary principle.

A summary of the key impacts of light and recommendations according to bat use are provided in Figure 5.1.

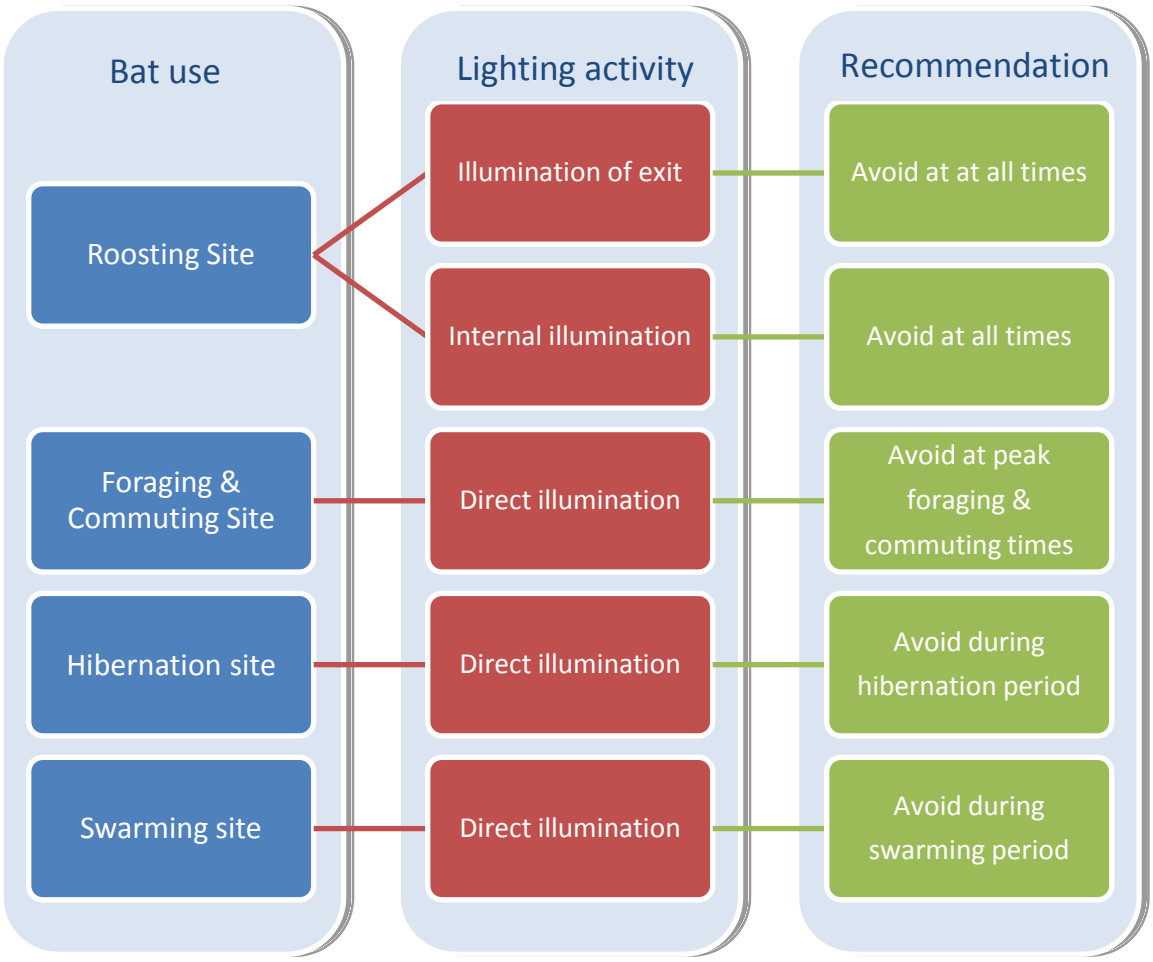


Figure 5.1. Summary of key impacts of light and recommendations according to bat behaviour

5.2.5 Summary of impacts of light types on bats

Light technology is rapidly developing and new light types are being installed and trialled across the UK. There is a general trend towards white light due to the increased colour rendering and increased perceived brightness for the human eye. Humans perceive white light as brighter than yellow light and so lower light intensities can be used to achieve the same perceived brightness. Commonly used emerging lamps include white LED (Philips Stela and DW Windsor Monaro), warm-white LED, and ceramic metal halide (e.g. Philips

CosmoPolis). Some companies are testing new light types to find a wildlife friendly lamp which has little or no impact on wildlife e.g. QL Philips Clearsky lamps which are said to prevent migrating birds from colliding with offshore platforms. To date no such product has been rigorously tested on bats. However, there is little evidence of the comparative impacts of different light types on different bat species and behaviours. A summary of the current evidence of the relative impacts of different light type son bats is provided in table 5.2.

Table 5.3. Summary of current evidence of the impacts of different light types on each UK bat species/group

Light type	**Species**	**Impact**	**Evidence**
White LED	*Rhinolophus hipposideros* and *Myotis* spp.	Reduced activity and spatial avoidance of commuting routes	Stone *et al*., 2012
Warm white LED	Unknown at present	Unknown - though likely to have less impact on light sensitive species than white light types	
Low pressure sodium	*Nyctalus noctula*	Increased activity and foraging	Rydell & Baagoe 1996
	Pipistrellus spp.	No significant increase in activity compared to dark areas	Blake *et al*., 1994
High pressure sodium	*Rhinolophus hipposideros and Myotis* spp.	Reduced activity and spatial avoidance of commuting routes; delayed commuting time	Stone *et al.,* 2009; 2011
	Pipistrellus spp., *Nyctalus noctula, Eptesicus serotinus*	Increased activity and foraging	Rydell & Baagoe 1996
Compact fluorescent	Unknown at present	Unknown - though likely to have a similar impact on light sensitive species as other white light types	
Mercury vapor lamps	*P. pipistrellus and Pipistrellus* spp. *Eptesicus* spp.	Increased activity (Rydell (1991) recorded increased activity of *Eptescius nilssoni* (a species not present in the UK) at mercury vapor lamps in Sweden in spring April – May)	Haffner & Stutz 1985; Blake *et al*. 1994, Rydell & Racey 1995.

Figure 5.2 provides a general summary of the **relative** impacts of light types on bats. However, there is a lack of evidence regarding the comparative impacts of different light types on bats and these summaries should be considered general rules of thumb until more detailed information is available.

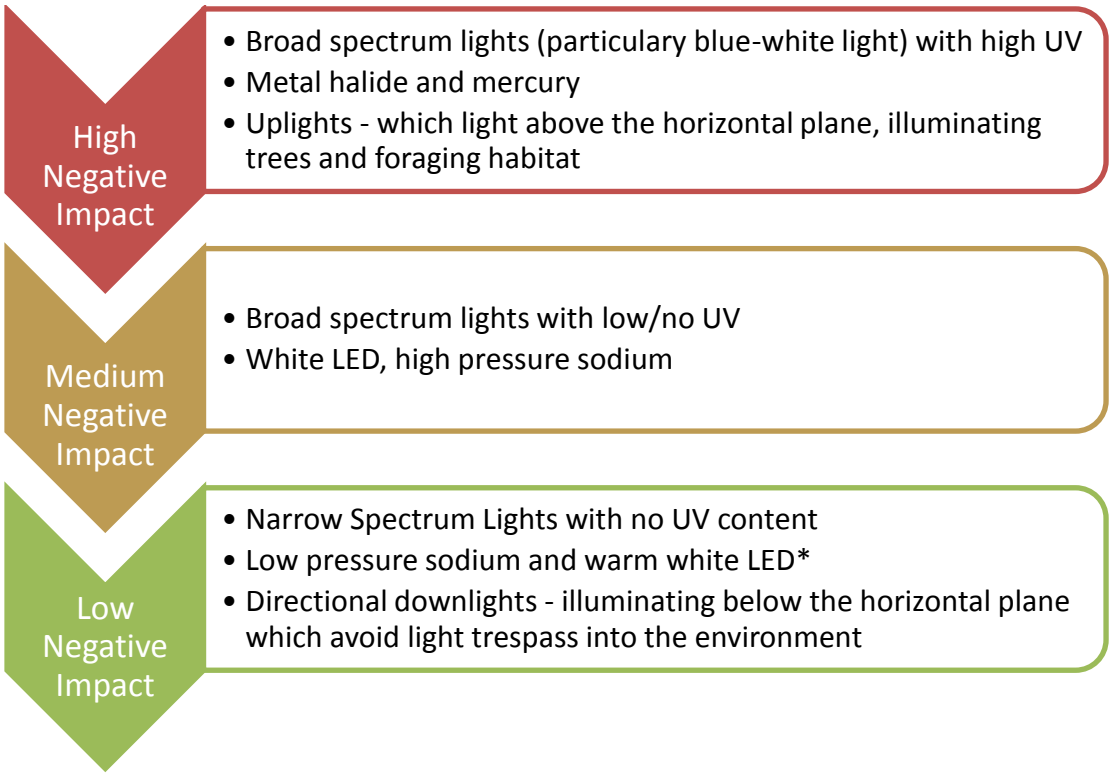


Figure 5.2. Summary of the relative impacts of light types on bats, * low relative attractiveness for insects compared to white light and therefore minimal impact on bats insect prey (Eisenbeis 2009).

6 Mitigation

6.1 Definition

Mitigation is defined in the EC Directive 85/337 as “measures envisaged in order to avoid, reduce and if possible remedy significant adverse effects” (CEC 1985). In accordance with Mitchell-Jones (2004), we use the term mitigation in its broadest sense, to incorporate both mitigation (practices to reduce or remove damage) and compensation (practices to offset potential negative effects/damage). As with other forms of mitigation, when mitigating the impacts of lighting on bats it is important to consider for following key principles:

Proportionality

The nature and extent of mitigation should be proportionate to the level of predicted impact and will therefore vary by site. It is important to avoid over-compensation or mitigation as this can cause increased conflict between bat conservation and humans.

Evidence-based actions

Proposed mitigation and compensation strategies should be based on evidence and rigorous appropriate pre-development site surveys for bats and lighting. Decision makers should consistently review current evidence for the best possible approach to ensure consistency and effectiveness of proposed strategies.

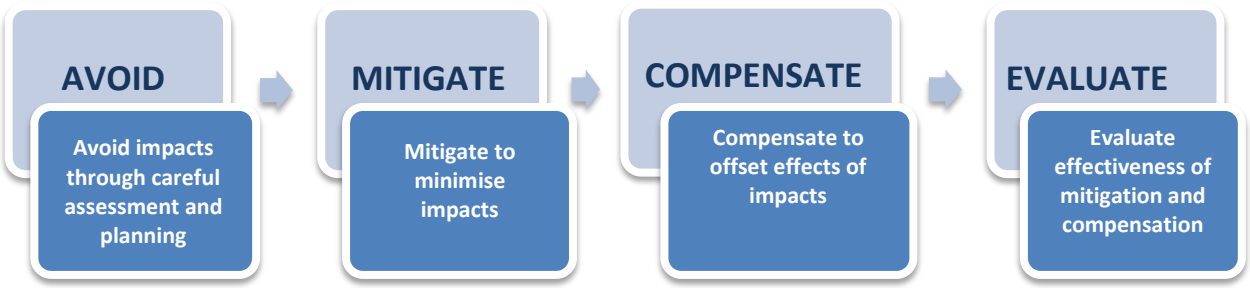
6.2 Approach to mitigation of artificial lighting

When mitigating the impacts of artificial lighting on bats it is important to ask the following key questions:

1. Do we need to light?
2. Where does the light need to be?
3. What is the light required for?
4. How much light is actually needed to perform the tasks required ?

5. When is the light required?

The following approach should be taken when developing a mitigation strategy:



6.3 Considerations

There are four key considerations which are important in developing effective strategies to mitigate the impacts of lighting on bats:

6.3.1 Standardised pre-development baseline surveys

It is important to conduct standardised surveys of light levels (lux) and bat activity and use at the pre-development and mitigation stage to inform and improve the mitigation process (section 4). Standardised surveys can then be repeated post-mitigation to facilitate monitoring and evaluation of the effectiveness of mitigation to ensure that the mitigation has been correctly installed, is operating properly and is having the intended effect. It will also allow the permitting authorities and licensing agencies to assess whether work has been completed according to the permission or license. Ecologists should work closely with lighting engineers and planners at an early stage to inform the development, design and installation of lighting schemes before they are installed. At this stage lighting engineers can use computer-based software to predict the distribution and intensity of the light from installations on a schematic diagram of each site. This can be very useful in both predicting impacts and planning mitigation.

6.3.2 Bats, behaviour and ecosystems

Species specific responses: many bat species respond in different ways to light disturbance. Some bats are light averse (section 5) whilst others actively forage in lit areas. In addition, the magnitude of the impact of lighting may vary between species. Therefore mitigation designed for one species may not be suitable for other species occupying the same site. This needs to be considered carefully when planning effective mitigation strategies.

Behavioural considerations: the impact of lighting on bats may vary according to the behavioural use of the site in question. This was highlighted in section 5 where the impacts were shown according to different bat behaviours (roosting, foraging, swarming, hibernating, and commuting).

6.3.3 Public perceptions and requirements

Good mitigation has to be effective for both bats and the public. It is important to consider and manage the public perception of safety in the area which is often associated with light levels. High levels of crime and vandalism often lead to public pressure for increased illumination. In such cases it is important to meet the public requirements while considering the requirements for bat use on site, to avoid increasing the conflict between bats and humans. A good understanding of the public requirements and usage patterns on the site can allow for effective proportional mitigation which meets the needs of both the public and wildlife (e.g. dimming during periods of low public use).

6.3.4 Wider habitats/ecosystem level effects

Mitigation should take into account measures to avoid/compensate/mitigate at the landscape and ecosystem level. Bat populations function as part of the entire ecosystem and therefore mitigation should ensure ecosystem level functioning is retained. Bats should be able to fly safely between their roosts and their foraging grounds along interconnected flight paths.

6.4 Mitigation Strategies

Mitigation strategies will vary on a site by site basis according to the required level of lighting, use of the area, the surrounding habitat, the species of bat and specific behaviour affected.

6.4.1 No light

Where possible the ideal scenario would be to have no light at all at locations used by bats. This may be possible with good planning and involvement of lighting engineers at the survey and pre-planning stage. This may involve switching off existing units on site and ensuring areas used by bats have no new light units installed and will have no light trespass from nearby lights. If possible sites should contain light exclusion zones (dark areas) which are interconnected to allow bats to move freely from their roosts along commuting routes to their foraging grounds without being subject to artificial illumination.

6.4.2 Variable lighting regimes (VLR)

In many cases it is not feasible to have light exclusion zones in all in the areas occupied by bats at a site. In such cases new generation lighting controlled by CMS systems (see section 3.3.3) may be preferable to enable variable lighting regimes (VLR) to suit both human and wildlife use of the site. VLR involve switching off or dimming lights for periods of the night. Many county councils are adopting VLR using CMS controlled units, switching off/dimming lights when human activity is low (e.g. 12.30 – 5.30am). This technology could also be used to create a lighting regime that switches off lights during periods of high bat activity, such as commuting or emergence. Lights can also be dimmed (e.g. to 30% power) for periods of the night to reduce illumination and spill. The exact regime of lighting at a site will depend on the nature of public use and type and amount of bat activity, and will therefore vary between sites. However, the effectiveness of VLRs is reliant upon rigorous and appropriate bat surveys prior to development (section 4.2), to establish the timing of bat activity around the site, followed by comprehensive post-development monitoring to evaluate effectiveness. There is currently a lack of research on the impact of VLR on bats and

therefore comprehensive post-development monitoring will be key to evaluating the effectiveness of such strategies.

Lights can also be fitted with movement sensors which switch lights on as people walk by and switch them off when as people pass. Such lights will reduce the overall lit time for the environment, potentially reducing the impact on bats and insects. Further research is required to assess impacts of these schemes on bats.

6.4.3 Habitat creation

Light barriers: vegetation can be planted (e.g. hedgerows or trees) to reduce light spill so acts as a light barrier. Careful consideration should be given to the minimum size of the habitat required to restrict any light trespass when used as a light barrier. The size and depth of the corridor will vary according to the distance from the light source, light intensity, light spread and light type. The effectiveness of using dark corridors as light barriers is therefore dependent upon comprehensive pre-development light surveys (section 4.3) to understand the extent and level of light around the site.

Dark corridors: dark corridors can be created to encourage/guide bats away from lit areas or around lit obstacles (such as roads). Corridors should be placed with consideration for the use of the landscape as a whole in relation to key commuting routes, linking foraging sites and roosts. Therefore comprehensive pre-development bat surveys (section 4.2) determine the effectiveness of dark corridors as this information can be used to ensure they are well connected and functional. Corridors can be composed of man-made or natural materials (e.g. fences, brick walls, tree lines or hedges). Corridors with outgrown vegetation (e.g. **Figure 6.1**) are preferable as they create dark fly ways sheltered from predators and the elements. Heavily clipped low hedges or tree-lines are less suitable.

Figure 6.1. Examples of two dark corridors used by bats in Devon, England (© E.Stone)

To increase their effectiveness dark corridors should be:

i. Well-connected within the bat landscape – linking to existing flight paths, roosts or foraging areas;
ii. Outgrown with mature vegetation providing shelter for bats from the weather and predators as they fly;
iii. Planted with native species to encourage insect populations, thereby allowing bats to forage along the corridors;
iv. Located away from roads to avoid traffic noise which will reduce the foraging efficiency of passive listening bats (Schaub 2008); and
v. Monitored/maintained long-term to ensure they remain functional, e.g. have not been removed or altered in a way that will reduce effectiveness.

6.4.4 Spacing and height of units

Increasing the spacing between light units can reduce the intensity and spread of the light to minimise the area illuminated and give bats an opportunity to fly in relatively dark areas between lights. Reducing the height of light units will keep the light as close to the ground as possible, reducing the volume of illuminated space. This will also give bats a chance to fly

over the light units in the dark area above the light (as long as the light does not spill above the vertical plane). There are many low level lighting options for pedestrian and cycle path lighting which minimise spill and reduce overall illumination including: low level illuminated bollards (**Figure 6.2**), down-lights, handrail lighting (**Figure 6.3**) or footpath lighting.

Figure 6.2. Pharola illuminated bollard. DW Windsor Ltd.

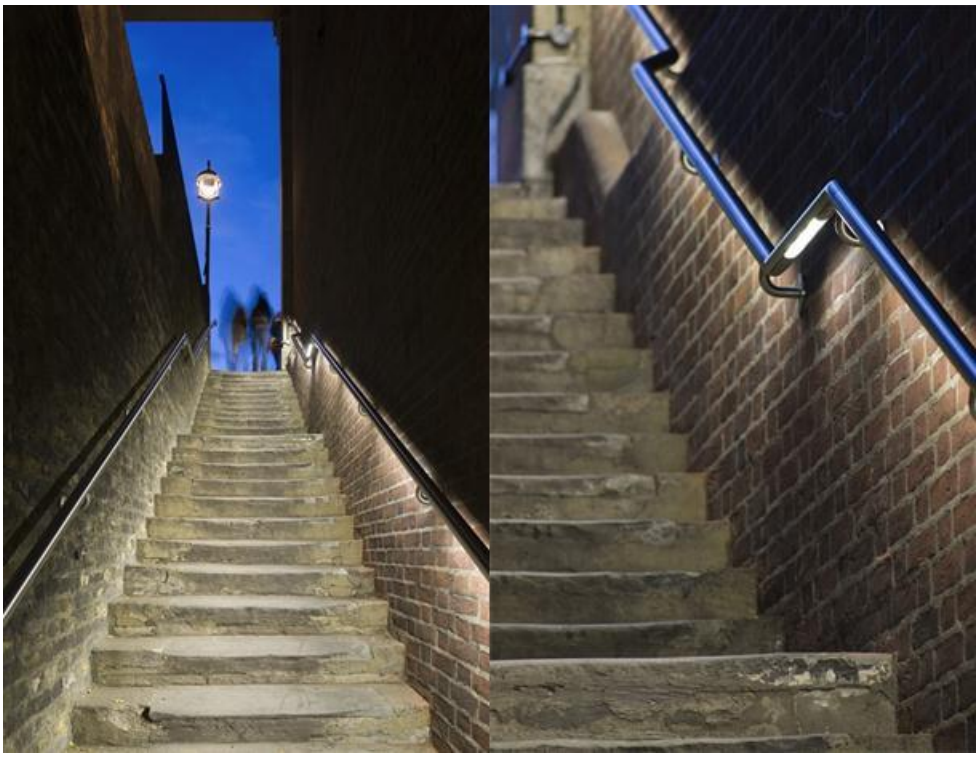


Figure 6.3. LED handrail Essex Street steps, WC2. DW Windsor Ltd.

6.4.5 Reducing intensity

Reducing light intensity will reduce the overall amount and spread of illumination. For some bat and insect species this may be sufficient to minimise disturbance or the magnitude of any negative impacts. However, some species may require very low light levels to have little/no impact on bat behaviour. Stone *et al*., (2012) found that levels as low as 3.6lux caused spatial avoidance of a preferred commuting route by *Rhinolophus hipposideros.* Average light levels recorded along preferred commuting routes of *Rhinolophus hipposideros* under natural unlit conditions were 0.04 lux across eight sites (Stone 2011). When mitigating the impacts of lighting for such species very low lux levels may not be suitable for human needs. In such cases reducing intensity may not be an option and alternative strategies may be preferable (e.g. dark corridors or light barriers). Currently there is a lack of evidence regarding the light levels below which there are no/reduced impacts on bats. Responses of bats to light levels are likely to vary between species and between behaviours. A “light threshold” below which there is little impact on bats may not exist for some species which may be light averse regardless of intensity (e.g. possibly *Rhinolophus hipposideros*).

Light levels at the site should be considered in the context of the light levels (lux data) recorded during pre-development lighting and bat surveys. Where possible post-development light levels should be as close to the mean naturally occurring light levels recorded at key areas of bat use on the site pre-development. Where this is not possible, a precautionary approach should be taken to keep light levels as low as possible, until further research is completed.

Light intensity can be reduced by:

- *Dimming*: CMS technology can be used to reduce the power of lights on request (e.g. by 80%) and can be used as part of a VLR for periods of high bat activity (section 6.4.2);
- *Changing the light source:* new technologies such as ceramic metal halide (e.g. Philips CosmoPolis, 45 watts) often have a lower wattage compared to old lamp types (e.g. HPS, 75 watts), and can be used to reduce light intensity. However, there is a trade-off between reduced intensity and the pattern of light distribution. Some older light types such as HPS, produce a heterogeneous light environment whereby light intensity declines steeply away from the light source. However some new technologies such as LEDs produce a uniform light distribution resulting in a loss of dark refuges between the lamps (Gaston *et al.* 2012). In such cases it may be preferable to increase the spacing between the units to create dark refuges. In addition when changing the light source it is important to consider the effects of the spectral content of the light (section 3.2); or
- *Creating light barriers:* light intensity can be reduced at a particular site by creating a light barrier which restricts the amount of light reaching the sensitive area. Barriers can be in the form of newly planted vegetation (section 6.4.3), walls, fences or buildings.

6.4.6 Changing the light type

When selecting a light type it is important to consider the colour appearance and rendering of the lamps in relation to human and bat vision. Different light types are likely to have

different effects on bats, and these effects will be species and behaviour specific. Choosing the light type (colour/spectral distribution) will inevitably be a compromise between the environmental and public requirements. Currently there is a lack of evidence of the comparative impacts of light types on bats. However, the following key principles can reduce potential negative impacts on bats and wildlife in general:

- *Avoid blue-white short wavelength lights*: these have a significant negative impact on the insect prey of bats. Use alternatives such as warm-white (long wavelength) lights as this will reduce the impact on insects and therefore bats
- *Avoid lights with high UV content:* (e.g. metal halide or mercury light sources), or reduce/completely remove the UV content of the light. UV has a high attractiveness to insects leading to direct insect mortality at street lights thereby reducing the availability of insect prey (Frank 2006; Bruce-White & Shardlow 2011). Use UV filters or glass housings on lamps which filter out a lot of the UV content.

6.4.7 Reducing spill

Lighting should be directed only where it is needed to avoid trespass (spilling of light beyond the boundary of area being lit) (ILP 2011). Attention should be paid to avoid the upward spread of light near to and above the horizontal plane to minimise trespass and sky glow. It is important to avoid lighting above 90^0 and 100^0 (Figure 6.4).

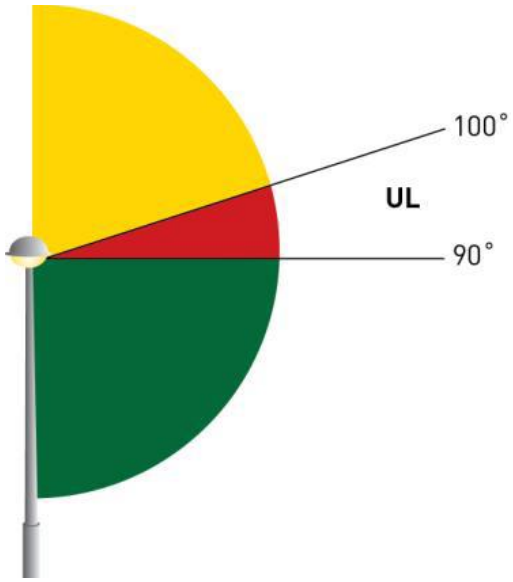


Figure 6.4. Critical luminaire angles for minimising sky glow, showing the upward light output zone (UL) which is between 90^{o} and 100^{o} above the horizontal (ILP 2011)

Trespass can be minimised either prior to installation with careful lighting design and selection of appropriate lamp units, or post installation using a range of lamp modifications to restrict and direct light.

Prior to installation:

- Ensure a low beam angle of the lights (ideally less than 70^{0} above the horizontal) (ILP, 2011)
- Install full horizontal cut off units (with no light more than 90^{0} above the horizontal)
- Avoid the use of upward light (e.g. ground recessed luminaires or ground mounted floodlights up-lighting trees, buildings and vegetation)
- For security lighting use 'variable aim' luminaries which allow you to change the beam angle by moving the lamp
- LED lamps allow for directional lighting as individual/groups of LED bulbs can be switched off to direct light to specific angles and most luminaires are full cut off

Post installation:

- Install directional accessories on existing light units to direct light away from sensitive areas and minimise spill (e.g. baffles, hoods and louvres, Figure 6.5)

- Where possible change the angle of the lamp housing to reduce the angle of the beam below 70^0

Figure 6.5. Luminaire accessories to direct light: (a) shield "barn doors"; (b) cowl (hood); (c) shield; and (d) external louvre. Images from Philips and Thorn (ILP 2011)

6.5 Mitigation strategies by project

6.5.1 Pathway lighting:

Hand rail LED lights can be used to illuminate foot/cycle paths which direct the light at the floor at a very low level, with no horizontal and upward spill. Lights can be full lateral cut off (i.e. directed away from a river towards the footpath), blue/white light should be avoided. Small bollard lights can be installed which have low mounting heights (Figure 6.2).

6.5.2 Road lighting:

LED units can be used to direct the light into small target areas. Composite LEDs can be switched off to reduce/direct the light beam to specific areas. New design down lights can be used to ensure minimal sky glow and limited trespass (Figure 6.6).

Figure 6.6. Down lights installed to reduce spill on A470 Cross Foxes to Maes-y-helmau, Wales (©Jill Jackson)

6.5.3 Security Lighting

No bat roost (including access points) should be directly illuminated. If it is considered necessary to illuminate a building known to be used by roosting bats, the lights should be positioned to avoid the sensitive areas. Close offset accent lighting causes less light pollution; it is more specific and can be designed to avoid bat sensitive areas, and better highlights the features of the subject of the illumination. Low wattage lamps are preferable (<70W) as they reduce glare, energy consumption and minimise impacts on bats. Lights can be fitted with movement sensors which turn the light on when the sensor is triggered. These are preferable as lights will be illuminated only when needed reducing the amount lit time.

6.5.4 Floodlighting

Low level lighting can be used to illuminate sports pitches and car parks. It is important to ensure the light is directed to the ground below the horizontal and away from surrounding vegetation (Figure 6.4). Or where new lights are being installed LEDs and new directional, full cut off lights can be used, or cowls and hoods (Figure 6.5) can be fitted to existing units to reduce light trespass. Ensuring lights are only illuminated when the area is in use will reduce impact on bats.

6.5.5 Riverside lighting

Directional lighting can be used to reduce spill onto the water surface and surrounding vegetation. London's Arcadia was granted funding to implement a lighting scheme to would reduce native impacts on nocturnal species. The Arcadia Project was implemented in consultation with local communities and designed by Philips Ltd. Ambient levels of 20lux were achieved by installing 30Watt LED lamps along the Warren Footpath (Figure 6.7). CMS were installed allowing lights to be remotely monitored and individually controlled. Bespoke dimming regimes can be installed or selected luminaires switched off or dimmed to1-5lux during periods of low pedestrian use.

Figure 6.7. LED lamps installed along Warren Footpath, London to reduce spill onto surrounding vegetation (© Alison Fure).

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HYDROLOGY, DRAINAGE AND FLOOD RISK

HYD 6 Preliminary Water Framework Directive Assessment

Satnam Millennium Limited

Peel Hall,
Warrington

Project Reference: 1506-45/TN/03

Water Framework Directive – Preliminary Assessment

Transport Planning Associates

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1 INTRODUCTION

1.1 The Water Framework Directive (Directive 2000/60/EC) is a European Union directive that commits European Union member states to achieve good qualitative and quantitative status of all water bodies by 2015. The directive is cover by legislation cited as the Water Environment (Water Framework Directive) (England and Wales) Regulations 2003, which came into force in January 2004.

1.2 The Directive brought about the introduction of River Basin Districts, based on spatial catchments as opposed to administrative boundaries, with the aim being to achieve a 'good status' for all ground and surface waters (rivers, lakes, transitional waters, and coastal waters) in the EU, which are assessed according to the following criteria:

- Biological quality (fish, benthic invertebrates, aquatic flora);
- Hydromorphological quality such as river bank structure, river continuity or substrate of the river bed;
- Physical-chemical quality such as temperature, oxygenation and nutrient conditions; and
- Chemical quality that refers to environmental quality standards for river basin specific pollutants.

1.3 If a project is predicted to result in an adverse impact to the ‘good status’ of water quality then justification for the development is required along with adequate mitigation measures.

1.4 The aim of this preliminary assessment is to assess whether the proposed development is Water Framework Directive compliant such that it will not result in an adverse impact on water quality, either during construction or once occupied.

2 SITE LOCATION AND RIVER BASIN

2.1 The proposed development site falls within the Sankey and Glaze areas of the North West River Basin.

2.2 The site is not directly connected to a waterbody that forms part of the river basin. Topographical survey information confirms that there are a series of minor watercourses, including the Spa Brook, located within the application boundary.

2.3 The nearest major watercourse to the development is the Mersey (Bollin confluence to Howley Weir), locally known as the Cinnamon Brook, which is located approximately 125m to the east of the site.

2.4 Information extracted from the EA website indicates that the Mersey is classified as 'Heavily Modified' in terms of its hydromorphological, with 'Moderate' ecological potential and 'Good' chemical qualities.

2.5 Given that the ecological and chemical qualities of the Mersey are classified as good then it is necessary to ensure that the development does not impact on this, in terms of dynamics of flow, fish, invertebrates, ammonia, dissolved oxygen, pH, temperature, copper and zinc.

2.6 Mitigation measures to be considered include the following:

- Retain aquatic and riparian habitats;
- Control of vegetation;
- Control of pollutants;
- Consideration of structural changes; and
- Enhance ecological features.

3 PRELIMINARY ASSESSMENT

3.1 Table 3.1 provides an assessment of the previously identified mitigation measures in terms of works in and around the proposed development site aimed at achieving a situation where there is no change in the current ecological and chemical status of the Mersey

Table 3.1 Supportive Measures

Mitigation Measure	Comments
Retain aquatic and riparian habitats	Significant improvements (clearing, regrading and landscaping) of the watercourses are proposed that will improve the current habitat of the ditches to ensure no downstream impact
Control of vegetation	Management of the ditches will be ongoing to ensure the potential for the spread of invasive species of vegetation is minimised.
Control of pollutants	SUD's features will be introduced as part of the development proposal to ensure water treatment of any surface water runoff that will enter the local watercourse. Temporary measures to control runoff during construction will be put in place.
Consideration of structural changes	The discharge of surface water from the development site is proposed to be restricted to limit any change in current flow dynamics. Site specific additional storage capacity is proposed as part of the development works.
Enhance ecological features	Landscaping features as part of the development proposal should help improve local ecology

3.2 Overall, the proposed development is not considered to have an impact on the current quality of the Mersey.

DOCUMENT SIGNATURE AND REVIEW SHEET

	Prepared By:	Checked By:	Approved for issue
Name	Tim Hornby	John Hopkins	John Hopkins
Signature	TH	JH	JH
Date	05.01.18	05.01.18	05.01.18

Document Review

Revision	Date	Description	Checked By

LANDSCAPE AND VISUAL IMPACT

LND 10 Indicative Landscape Components Plan Option A (1820_25)

LND 11 Indicative Landscape Components Plan Option B (1820_29)

NORTH

M62 Motorway

Mounding

Attenuation Pond

Mounding

Peel Hall

Attenuation Pond

Peel Hall Moat

RADLEY LANE

Peel Cottage

DELPH LANE

MILL LANE

Fairheaven/ The Alders

ELM ROAD

BIRCH AVENUE

Attenuation Pond

Public Open Space

Attenuation Pond

Spa Brook

NEWHAVEN ROAD

POPLARS AVENUE

Radley Plantation

BALLATER DRIVE

LOCKERBIE CLOSE

Woodside Farm

Radley Common

Peel Hall Park

WINDERMERE AVENUE

POPLARS AVENUE

Sports Pitches

GRASMERE AVENUE

Key:

- Existing Trees and Vegetation to be retained
- Proposed Tree/ Shrub Planting
- Proposed sport pitches/ public open space
- Developable Land
- M62 Motorway
- Proposed Roads (indicative route)
- Proposed Pedestrain Pavements (indicative route)
- Public Right of Way
- Proposed footpath network
- Existing Housing
- Proposed Waterbodies
- Areas of existing vegetation to be removed

PEEL HALL, WARRINGTON

Indicative Landscape Components Plan- Option A

APPENDIX LND 10

Project: PEEL HALL, WARRINGTON	
Title: Indicative Landscape Components Plan- Option A	
Client: Satnam Millennium Ltd	
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NORTH

M62 Motorway

Mounding

Attenuation Pond

Fairheaven/ The Alders

EMPLOYMENT ACCESS

SHARED CYCLEWAY FOOTWAY

Peel Hall

Peel Hall Moat

Attenuation Pond

Public Open Space

Peel Cottage

MILL LANE

RADLEY LANE

ELM ROAD

BIRCH AVENUE

NEWHAVEN ROAD

POPLARS AVENUE

Spa Brook

Bus Gate

Radley Plantation

BALLATER DRIVE

LOCKERBIE CLOSE

Woodside Farm

Radley Common

Peel Hall Park

WINDERMERE AVENUE

Sports Pitches

GRASMERE AVENUE

Key:

- Existing Trees and Vegetation to be retained
- Proposed Tree/ Shrub Planting
- Proposed sport pitches/ public open space
- Developable Land
- M62 Motorway
- Proposed Roads (indicative route)
- Proposed Pedestrain Pavements (indicative route)
- Public Right of Way
- Proposed footpath network
- Existing Housing
- Proposed Waterbodies
- Areas of existing vegetation to be removed

PEEL HALL, WARRINGTON

Indicative Landscape Components Plan- Option B

APPENDIX LND 11

Project: PEEL HALL, WARRINGTON	
Title: Indicative Landscape Components Plan- Option B	
Client: Satnam Millennium Ltd	
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TRANSPORTATION AND HIGHWAYS

Option A Appendices:

T1 Study area

T2 Existing highway network

T3 Existing bus network

T4 Existing PRoW network

T5 Illustrative plan showing the proposed road network within the development

T6 Proposed Access Junctions

- 1107/08/P – Birch Avenue
- 1107/09/M – Poplars Avenue (west)
- 1107/10/N – Blackbrook Avenue/Mill Lane
- 1107/11/L – Mill Lane
- 1107/12/Q – Poplars Avenue (central)
- 1107/30/H – Grasmere Avenue

T7 Enhanced bus provision

T8 Illustrative pedestrian and cycle linkages

T9 Proposed construction and highway phasing of Peel Hall

T10 SATURN output files

T11 Proposed Mitigation

Option B Appendices for Transportation and Highways:

T5B Indicative through route and access points

T6B Proposed Access Junctions

- 1107/08/P – Birch Avenue (same as Option A)
- 1107/10/N – Blackbrook Avenue/Mill Lane (same as Option A)
- 1107/11/L – Mill Lane (same as Option A)
- 1107/12/Q – Poplars Avenue (central) (same as Option A)
- 1107/30/H – Grasmere Avenue (same as Option A)
- 1107/46/B – Through route at Poplars Avenue (west)
- 1107/52/F – A49/Poplars Avenue

T8B Illustrative pedestrian and cycle linkages

T9B Proposed construction and highway phasing of Peel Hall

T11B Proposed Mitigation

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KEY:

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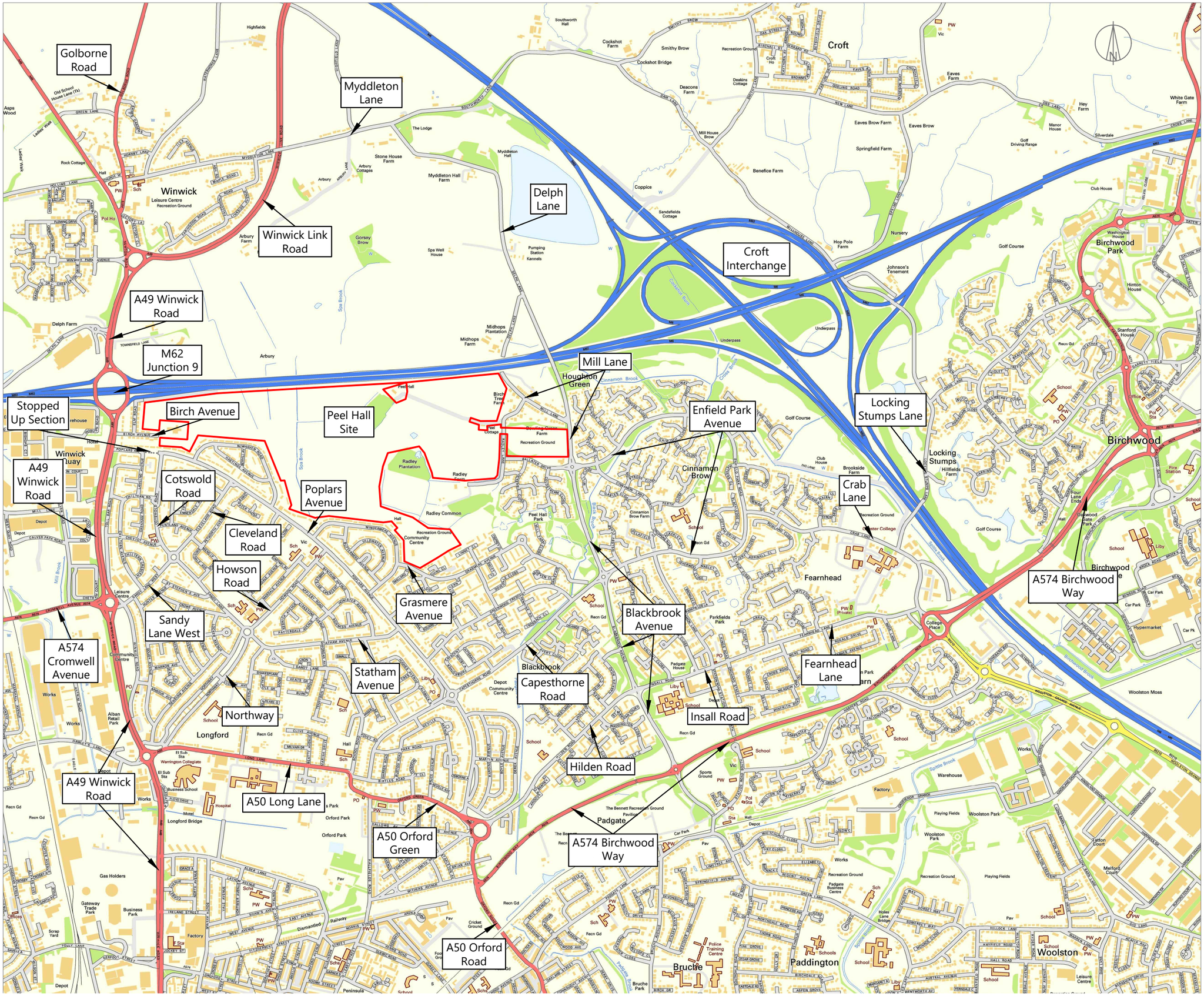

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EXISTING HIGHWAY NETWORK WITHIN STUDY AREA

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10/01/18	FB	DT

This map shows services that operate on Monday to Saturday between 7am and 7pm. We operate a number of other services not shown, these are either infrequent or run only during the mornings, evenings or on Sundays.

Earlestown
Vulcan Village
22
Newton-le-Willows Station
22
Myddleton Lane
19
Croft
Culcheth
Glazebury
19 28.28A
Leigh
25
Gorse Covert
Winwick
Gemini Retail Park
Gemini Business Park
17.17A
17C 18
Callands
17 17C
17 17A 18
Callands Road
Sandy Lane/ Cromwell Avenue
Westbrook Crescent
17
17A
17C
18
Westbrook Centre
Gullivers World
17.17A
17C.18
16.16A
Dallam
Longshaw Street
16A
16
Troutbeck Avenue
Folly Lane
Warrington General Hospital
16
16A
Lovely Lane
Crosfields
19
22
19
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21
22
Collegiate Institute
20 21
Orford Park
Winwick Road
Orford Lane
Orford Avenue
Orford Green
Hallfields Road
25
O'Leary Street
Battersby Lane
Smith Drive
Marsh House Lane
17.17A
17C.23.23A
23.23A
Cinnamon Brow
Enfield Park Road (North)
23
23A
Croppers Road
Orange Grove
23A
ORFORD
20 21
Cotswold Road
Poplars Avenue
Northway
Greenwood Crescent
Statham Avenue
Fisher Avenue
Capesthorne Road
20
21
Padgate Campus (Crab Lane)
Enfield Park Road (South)
28
28A
H.M.P. Risley
Risley Road*
Faraday Street*
17A 17C
*Daten Avenue
17A
17C
*Birchwood Park
Chadwick Place
25
28
28A
Oakwood
17.17A.17C
17A
25
28
Birchwood Centre
Locking Stumps
Heathfield House
17.25.28
Birchwood Station
Roberts Fold
Birchwood Way
17
17A
17C
Fearnhead Lane
Insall Road
Hilden Road
Orford Road
Cinnamon Lane
23
23A
28
28A
Harpers Road
*Only journeys on services 17A (morning) 17C (evening) will serve Risley Industrial Estate and Birchwood Park.
Padgate Station
Padgate Lane
Epping Drive
4A
Holes Lane
Hillock Lane
Woolston
4A
Holes Lane
3
Martinscroft
Dam Lane
Bruche Bridge
Cemetery
Parish Church
1 2 3 4A 28 28A
Kingsway North
1
2
Farrell Street
10
Bretton Avenue
Kingsway South
River Mersey
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WESTY
Richmond Avenue
Whitley Avenue
Victoria Park
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Thelwall Lane 1.11.12
Reynolds Street
Thelwall Lane
11 12
Thelwall Lane
Edgewater Park
10
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12
Latchford Village
LATCHFORD
Chester Road
Wilderspool Causeway
11A
11
12
Gainsborough Road
11 12
Loushers Lane
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Wash Lane
Manchester Ship Canal
Hunts Lane
Pilling Gardens
Altrincham
Victoria Square
5
35
Ackers Road
5 6
35
GRAPPENHALL
6
Chester Road
Stockport Road
Bradshaw Lane
Thelwall New Road
THELWALL
All Saints Drive
6
Thelwall Brook
Bowdon
5
35
Dunham Massey
5
Warburton
Little Bollington
35
Broomedge
Eagle Brow
Lymm Cross
Statham
5
35
Barsbank Lane
Lymm Church
Higher Lane
LYMM
STOCKTON HEATH
Grappenhall Road
6c
Cobbs Estate
6
Lumb Brook Road
Shadewood Crescent
London Bridge
6.6c
7.8.9
45.46
Grappenhall Heys
8
Appleton
9
45
46
Dudlows Green
Longwood Road
Owen's Corner
7
Wrights Green
8 9
Hatton
8.9
Hatton Lane
Stretton
7 8
Appleton Thorn
45
46
Lower Stretton
46
Antrobus
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Higher Wincham
45
Lostock Gralam
Northwich
45.46
46
Comberbach
Anderton
Barnton
Winnington
GREAT SANKEY
Tankersley Grove
14
15
Dorchester Road
Cromwell Avenue
Lingley Green
Sankey Station
Park Road
Highfield Avenue
14
15
Sankey Bridges
Bridge Street
CENTRAL WARRINGTON
Coronation Drive
Penketh Lane Ends
Meeting Lane
Greystone Road
32A
14
15
32A
Stocks Lane
14
15
32A
Widnes Road
32A
Crown & Cushion
PENKETH
Chapel Road
Station Road
Tannery Lane
32A
13
Whittle Hall
Whittle Avenue
13
Chapelford
Twenty Acre Road
Old Hall
Canons Road
17.17A
17C.18
River Mersey
Manchester Ship Canal

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1, 2		17, 17A, 17C	
3		18	
4A		19	
5		20, 21	
6, 6C		22	
7		23, 23A	
8, 9		25	
10		28, 28A	
11, 12		32A	
13		35	
14, 15		45, 46	
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All services operate to and from Warrington Interchange located at Golden Square Shopping Centre.

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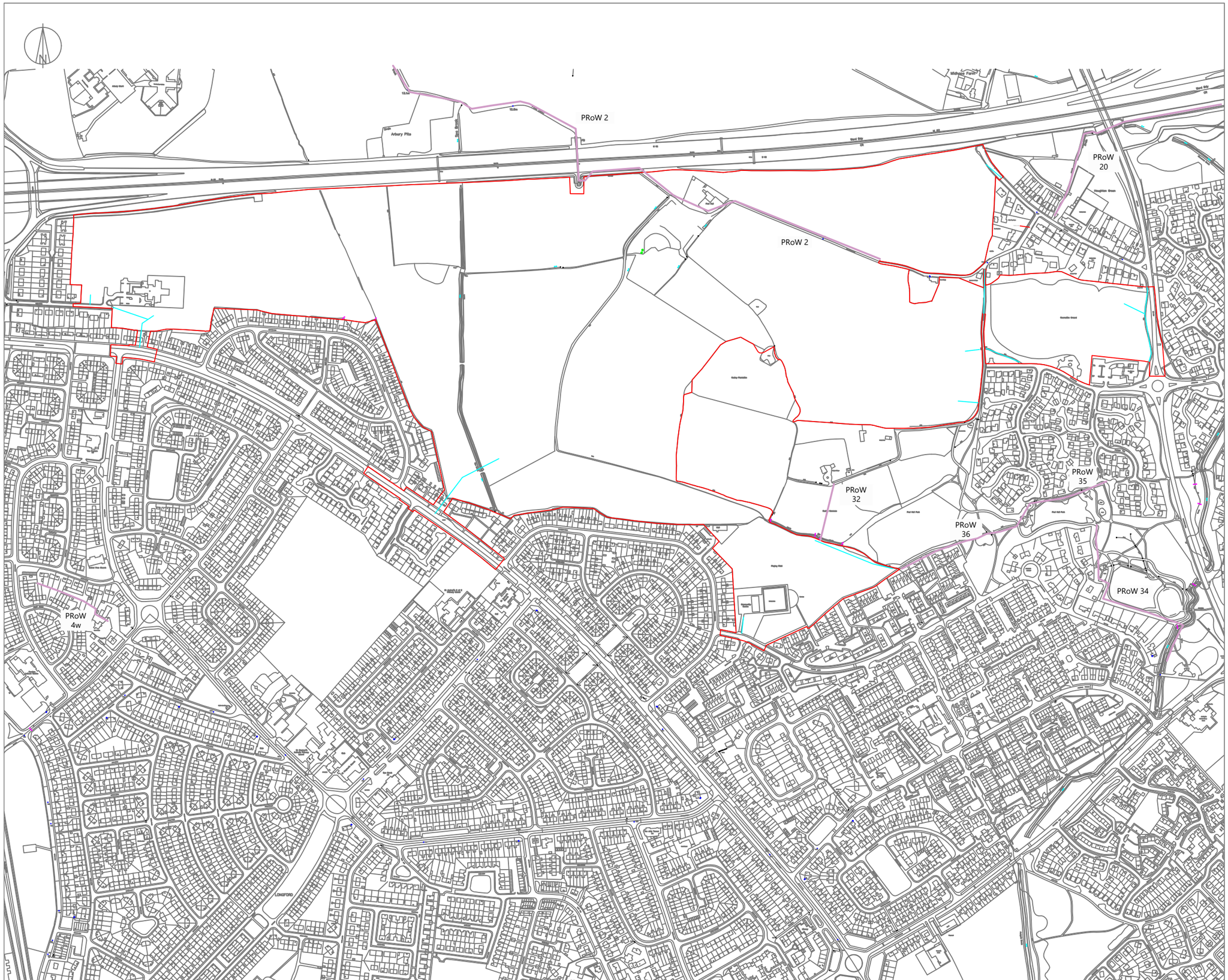

NOTES:
Reproduced from Appletons Peel Hall Indicative Landscape Components Plan

KEY:

Proposed Linkages

Existing PRoW

Site Boundary

ISSUE	REASON FOR REVISION	DATE

PROJECT:
PEEL HALL, WARRINGTON

CLIENT:
SATNAM MILLENNIUM LTD

PROJECT REFERENCE:	DRAWING NUMBER:	SCALE:
1107	ES T4	NOT TO SCALE

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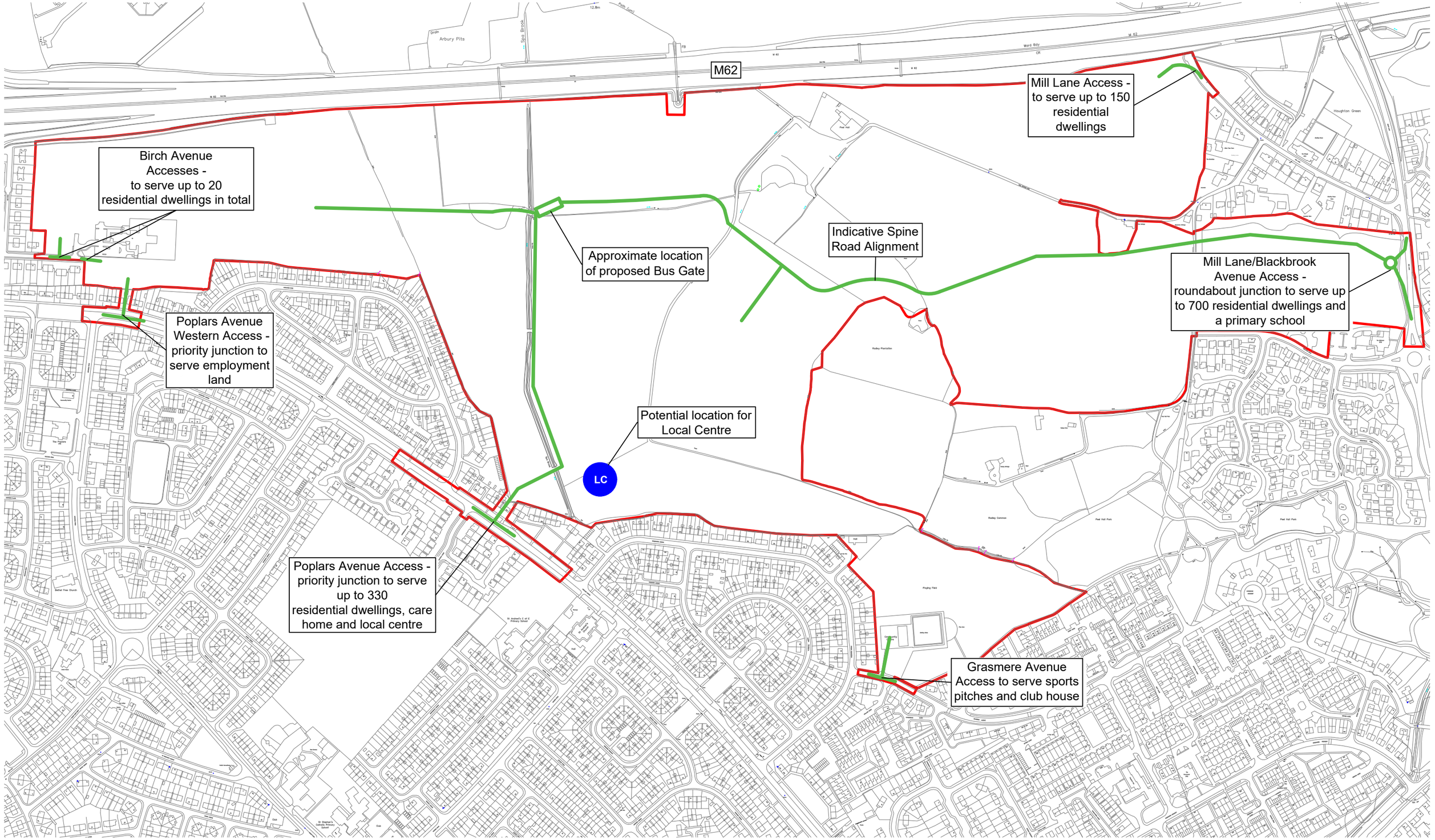
TITLE:
EXISTING PRoW NETWORK AND PROPOSED LINKAGES

DATE:	DRAWN BY:	CHECKED:
24/01/18	FB	DT



NOTES:

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ISSUE	REASON FOR REVISION	DATE
G	Update to location of local centre	16/01/18
F	Amendment to annotation	10/05/17
E	Amendment to annotations	10/05/16
D	Amendment to bus gate location	04/05/16
C	Amendment to dwelling numbers at access points	12/04/16
B	Alteration to dwelling numbers at access points	04/03/16
A	Reduction in number of dwellings shown off Birch Avenue	19/02/16

DATE:	DRAWN BY:	CHECKED:
12/01/15	FB	DT

PROJECT:

PEEL HALL, WARRINGTON

CLIENT:

SATNAM

TITLE:

PROPOSED ACCESS POINTS AND INDICATIVE SPINE ROAD

PROJECT REFERENCE:	DRAWING NUMBER:	SCALE:
1107	19	Not to scale

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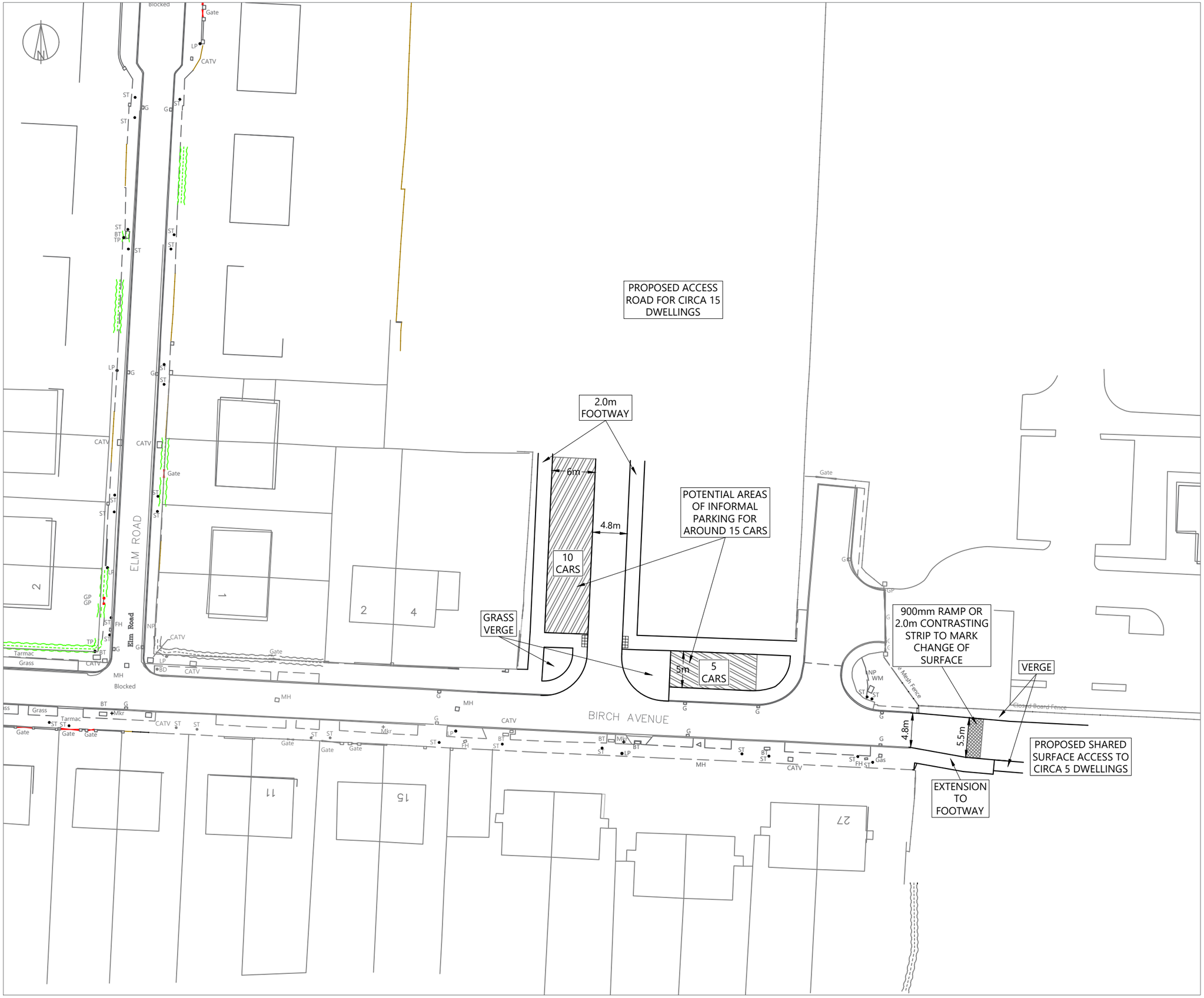

NOTES:

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ISSUE	REASON FOR REVISION	DATE

PROJECT:

PEEL HALL, WARRINGTON

CLIENT:

SATNAM MILLENNIUM LTD

PROJECT REFERENCE:	DRAWING NUMBER:	SCALE:
1107	08/P	1:500 @ A3

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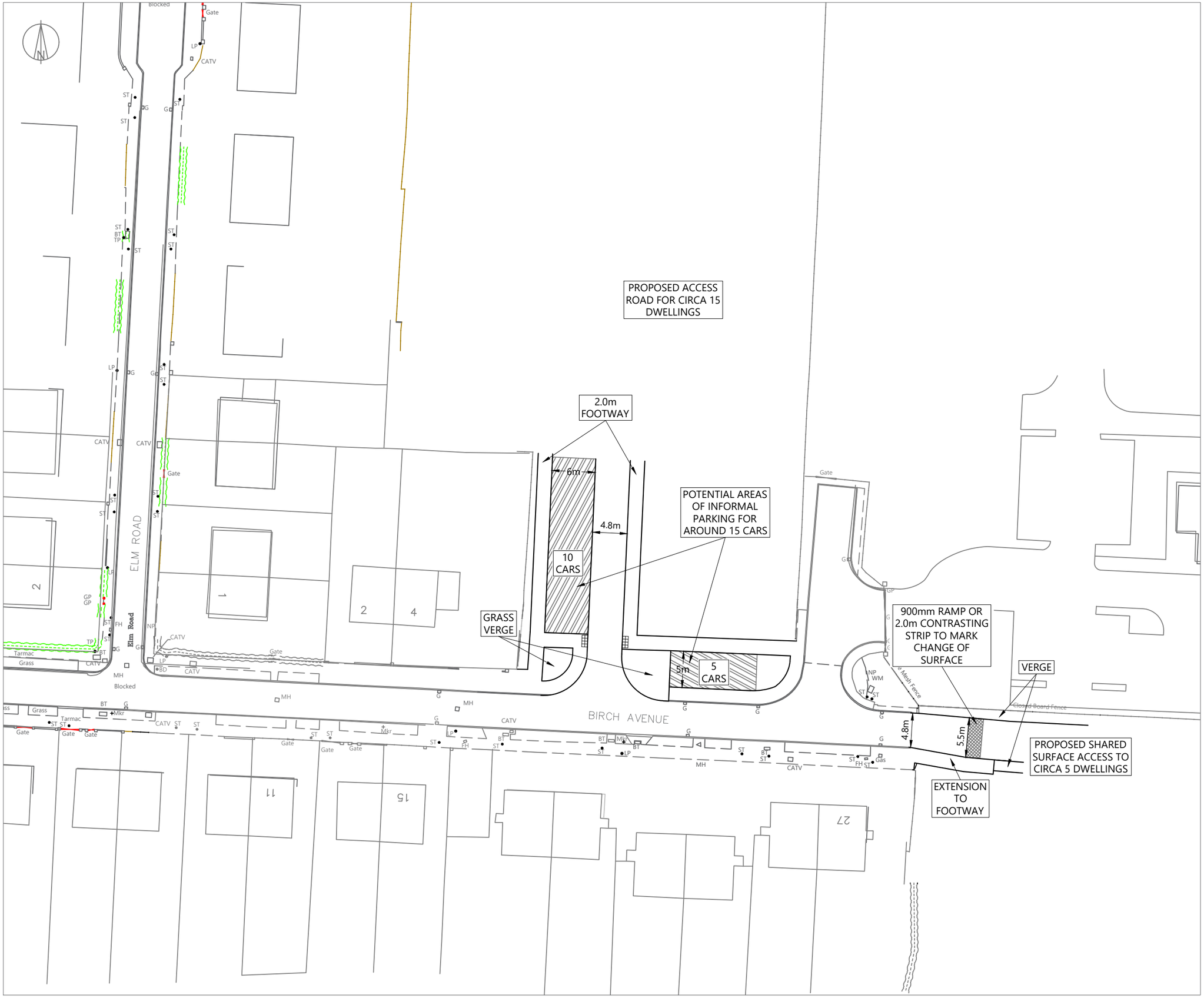
TITLE:

PROPOSED ACCESS TO RESIDENTIAL LAND AT BIRCH AVENUE

DATE:	DRAWN BY:	CHECKED:
03/02/17	FB	DT



NOTES:

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ISSUE	REASON FOR REVISION	DATE

PROJECT:

PEEL HALL, WARRINGTON

CLIENT:

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PROJECT REFERENCE:	DRAWING NUMBER:	SCALE:
1107	08/P	1:500 @ A3

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TITLE:

PROPOSED ACCESS TO RESIDENTIAL LAND AT BIRCH AVENUE

DATE:	DRAWN BY:	CHECKED:
03/02/17	FB	DT

TURNING HEAD AND EMERGENCY ACCESS LINK TO WIDER SITE

3.5m SHARED FOOTWAY-CYCLEWAY

1.0m VERGE

2.0m FOOTWAY

7.3m

ALTERATION TO EXISTING KERB LINE TO WIDEN CARRIAGEWAY THROUGH THE BEND

POPLARS AVENUE

COTSWOLD ROAD

NEWHAVE

El Sub Sta

1:1,000 @ A3

1:500 @ A3

NOTES:

Drawing based on Geomatic Surveys Ltd topographical survey 01532/01 dated 27/07/15.

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KEY:

Parking Areas (number of cars that can be accommodated) 6

ISSUE	REASON FOR REVISION	DATE

PROJECT:

PEEL HALL, WARRINGTON

CLIENT:

SATNAM MILLENNIUM LTD

PROJECT REFERENCE:	DRAWING NUMBER:	SCALE:
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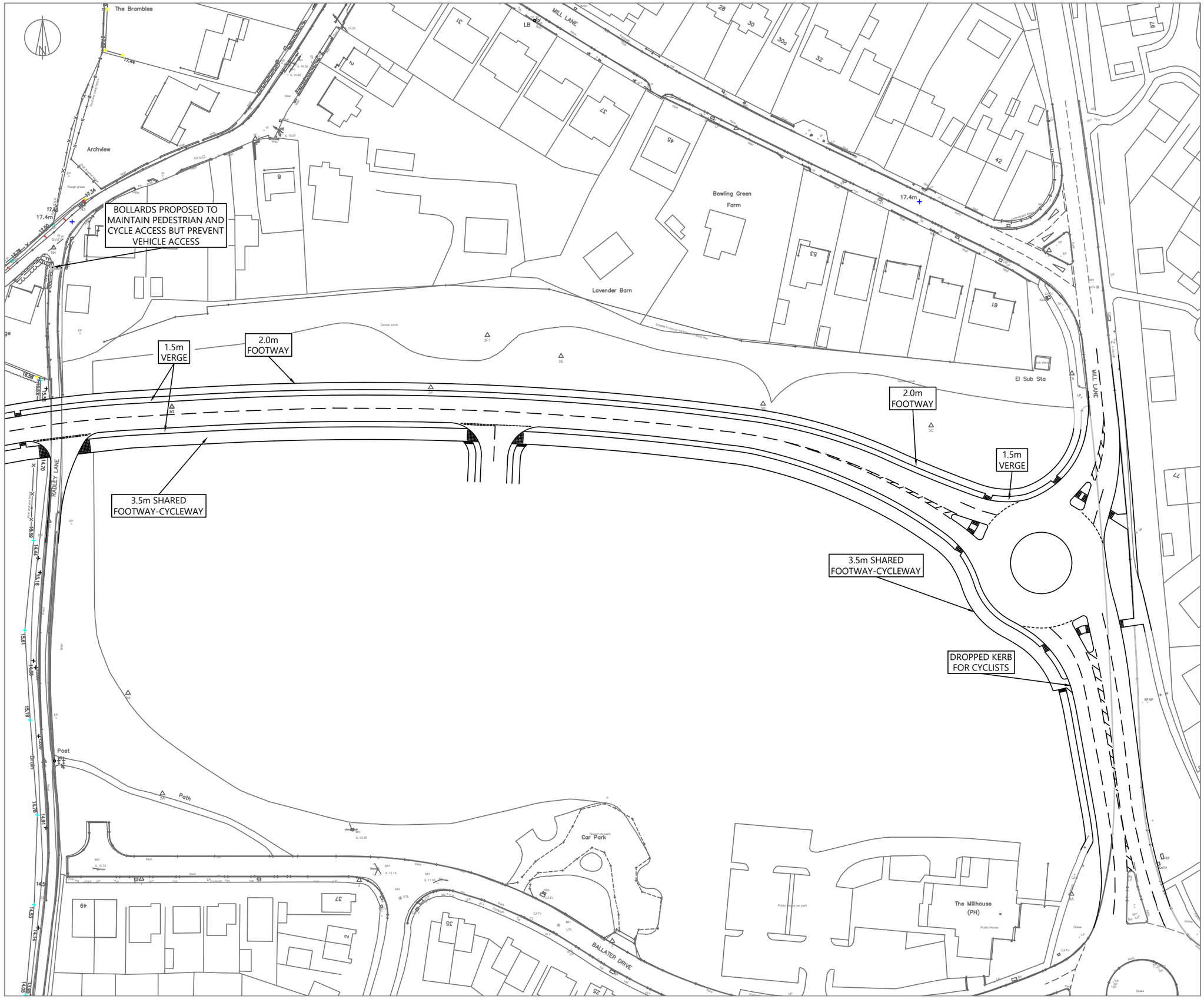
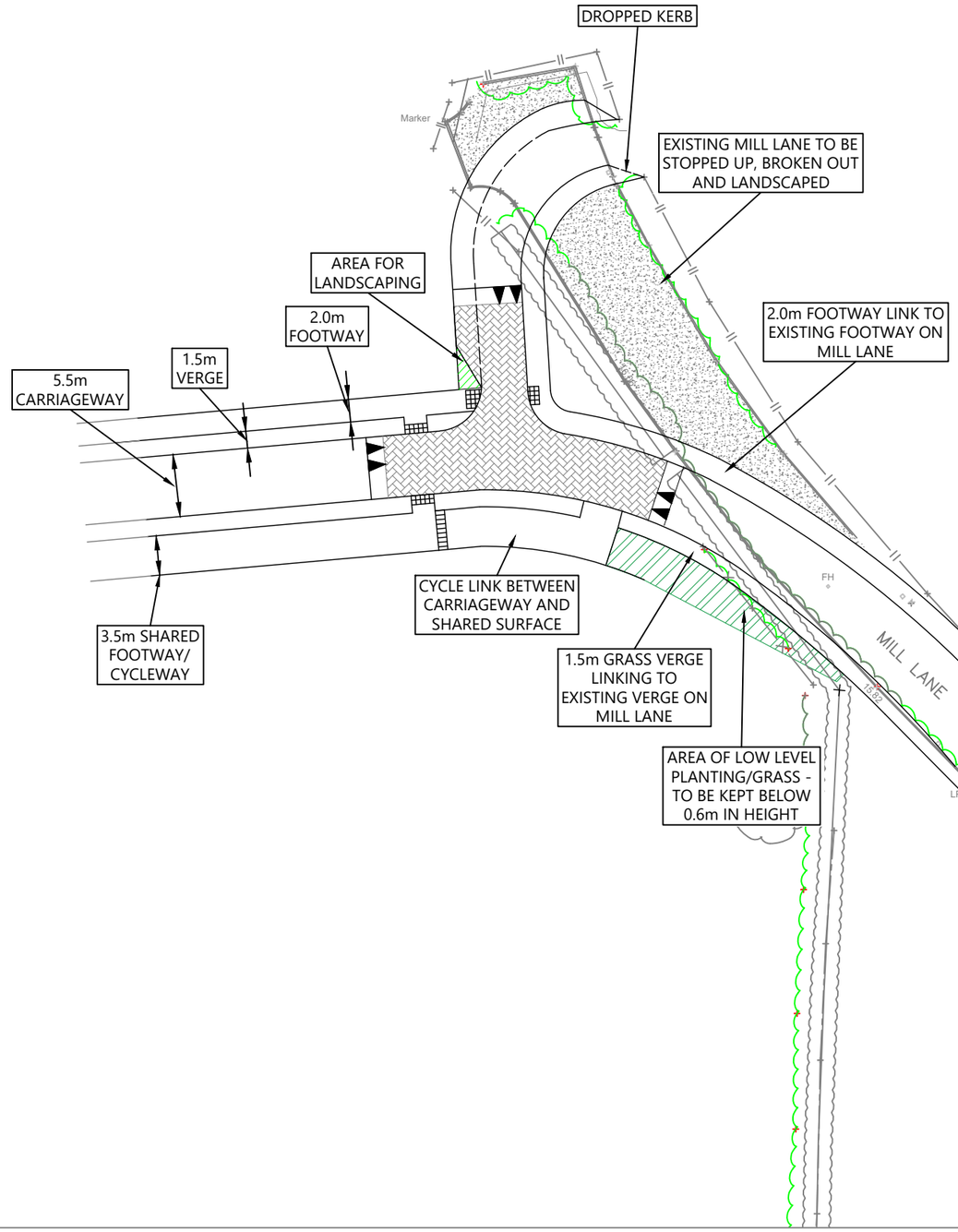
TITLE:

PROPOSED ACCESS TO EMPLOYMENT LAND AT POPLARS AVENUE

DATE:	DRAWN BY:	CHECKED:
03/02/17	FB	DT


The Brambles
Archview
BOLLARDS PROPOSED TO MAINTAIN PEDESTRIAN AND CYCLE ACCESS BUT PREVENT VEHICLE ACCESS
1.5m VERGE
2.0m FOOTWAY
3.5m SHARED FOOTWAY-CYCLEWAY
RADLEY LANE
MILL LANE
Bowling Green Farm
Lavender Barn
El Sub Sta
2.0m FOOTWAY
1.5m VERGE
3.5m SHARED FOOTWAY-CYCLEWAY
DROPPED KERB FOR CYCLISTS
Post
Path
Car Park
BALLATER DRIVE
The Millhouse (PH)
Public House car park
Public House
Dense scrub
Rough grass
Grass
Ditch
Kerb
Fence
Hedge
Wall
Step
Track
Edge of Road
Drain
Manhole
Gully
Catch Pit
Inspection Chamber
Telegraph Pole
Lamp Post
Traffic Light
Sign
Bollard
Tree
Shrub
Bench
Bus Stop
Gate
Pedestrian Guardrail
Vehicle Barrier
Overhead Wire
Underground Telecom
Underground Electricity
Underground Gas
Underground Water
Underground Drainage
Underground Unknown
Underground Fibre Optic
Underground Cable TV
Underground Traffic Signal
Underground Street Lighting
Underground Pedestrian Crossing
Underground Bus Stop
Underground Telephone
Underground Electricity Substation
Underground Gas Valve
Underground Water Valve
Underground Drainage Valve
Underground Unknown Valve
Underground Fibre Optic Valve
Underground Cable TV Valve
Underground Traffic Signal Valve
Underground Street Lighting Valve
Underground Pedestrian Crossing Valve
Underground Bus Stop Valve
Underground Telephone Valve
Underground Electricity Substation Valve



Drawing based on Powers & Tiltman topographical survey 6297_01 dated 25/07/11.

PROJECT:

PEEL HALL, WARRINGTON

CLIENT:

SATNAM MILLENNIUM LTD

PROJECT REFERENCE:	DRAWING NUMBER:	SCALE:
1107	11/L	1:500 @A3

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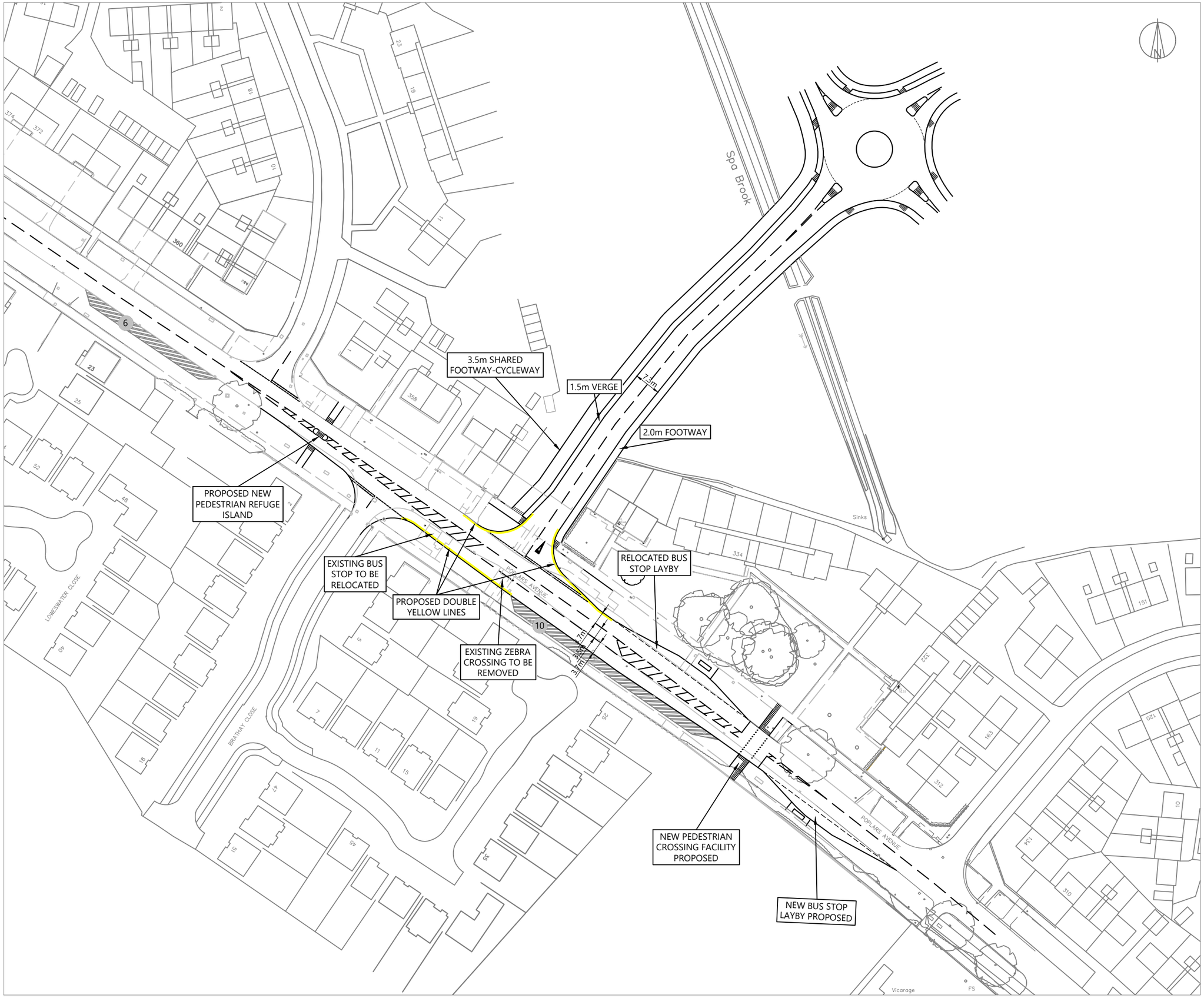
TITLE:

PROPOSED ACCESS AT MILL LANE

DATE:	DRAWN BY:	CHECKED:
03/02/17	BL	DT



NOTES:

Drawing based on Appletons plan 140367-B-001G dated January 2016.

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KEY:

Parking Areas (number of cars that can be accommodated) 6

ISSUE	REASON FOR REVISION	DATE

PROJECT:

PEEL HALL, WARRINGTON

CLIENT:

SATNAM MILLENNIUM LTD

PROJECT REFERENCE:	DRAWING NUMBER:	SCALE:
1107	12/Q	1:1,000 @ A3

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TITLE:

PROPOSED ACCESS FROM POPLARS AVENUE TO RESIDENTIAL LAND AND LOCAL CENTRE

DATE:	DRAWN BY:	CHECKED:
03/02/17	FB	DT

NOTES:

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ISSUE	REASON FOR REVISION	DATE

PROJECT:

PEEL HALL, WARRINGTON

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PROJECT REFERENCE:	DRAWING NUMBER:	SCALE:
1107	30/H	1:500 @ A3

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TITLE:

PROPOSED ALTERATIONS TO EXISTING ACCESS AT GRASMERE AVENUE

DATE:	DRAWN BY:	CHECKED:
15/01/18	BL	FB

networkwarrington
warrington's local bus company

LATER PHASES
Post - Spine Road

NOTES:
Reproduced from Appletons Peel Hall Indicative Landscape Components Plan

KEY:

Existing PRoW

Proposed Pedestrian Links

Proposed Shared Footway/Cycleway

ISSUE	REASON FOR REVISION	DATE

PROJECT:
PEEL HALL, WARRINGTON

CLIENT:
SATNAM MILLENNIUM LTD

PROJECT REFERENCE:	DRAWING NUMBER:	SCALE:
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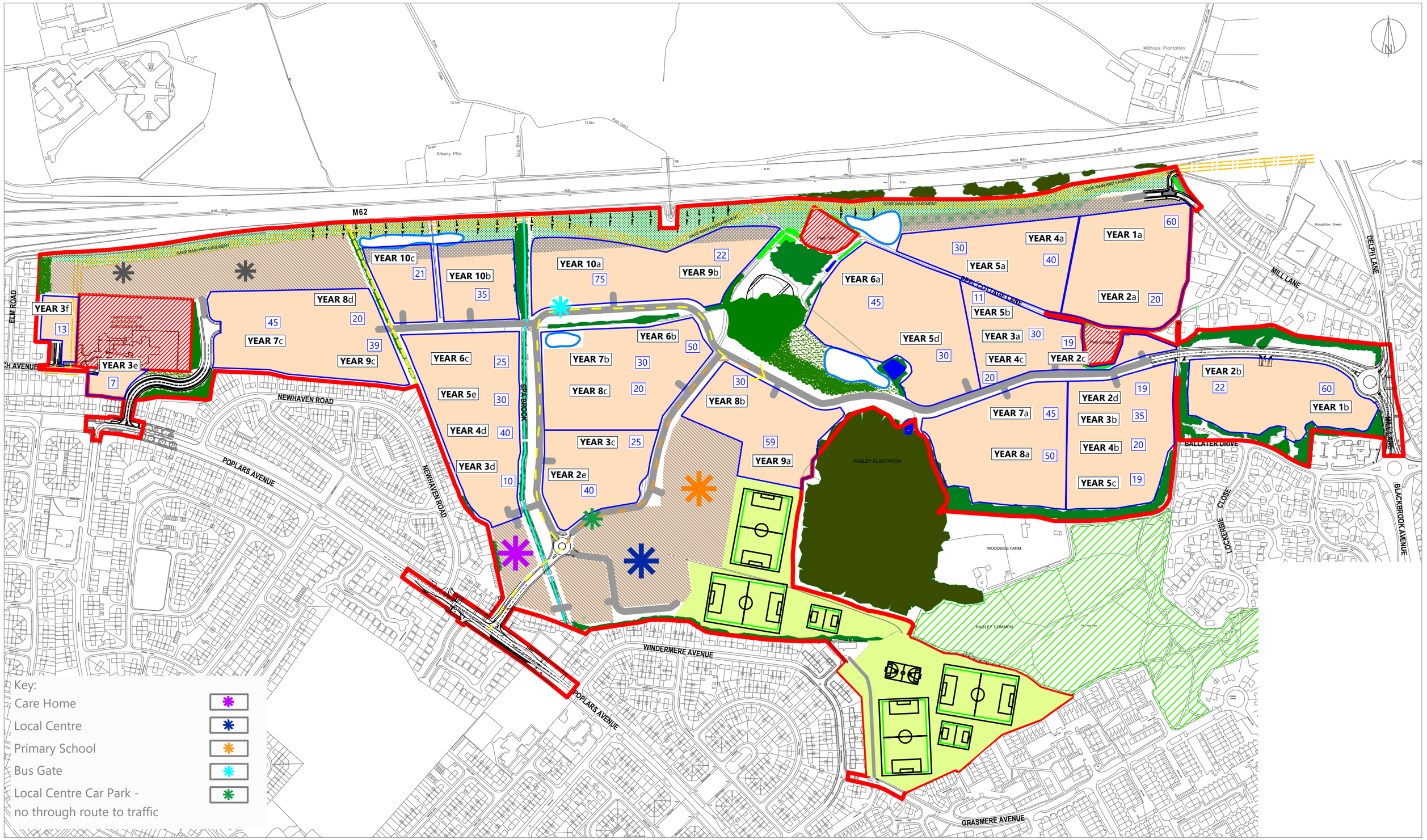
TITLE:
ILLUSTRATIVE PLAN SHOWING PROPOSED PEDESTRIAN AND CYCLE LINKAGES - OPTION A

DATE:	DRAWN BY:	CHECKED:
26/01/18	FB	DT



NOTES:
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KEY:
Indicative Year Numbering — YEAR 8b
Indicative Number of units Completed at Year End — 12
Initial Bus Link
End Bus Link

Phasing subject to detailed phasing plan to be submitted at Reserved Matters stage

ISSUE	REASON FOR REVISION	DATE

DATE:	DRAWN BY:	CHECKED:
11/05/17	FB	FB

PROJECT: PEEL HALL, WARRINGTON

CLIENT: SATNAM MILLENNIUM LTD

TITLE: INDICATIVE HIGHWAYS BUILD OUT PLAN

PROJECT REFERENCE:	DRAWING NUMBER:	SCALE:
1107	27/G	NOT TO SCALE

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APPROXIMATE SITE BOUNDARY SHOWN

Junction 1 - Winwick Link Road/Newton Road/A49
Junction 2 - A49/Delph Lane Retail Park
Junction 3 - M62 Junction 9
Junction 4 - Cromwell Avenue/Calver Road
Junction 5 - A49/Sandy Lane West
Junction 6 - A49/A50
Junction 7 - A50/Hallfields Road
Junction 8 - Blackbrook Avenue/Insall Road/Hilden Road
Junction 9 - A574 Birchwood Way/A50 Oreford Road
Junction 10 - A49/Birch Avenue
Junction 11 - Cotswold Road/Through-Route Alignment
Junction 12 - Cleveland Road/Poplars Avenue
Junction 13 - Howson Road/Poplars Avenue
Junction 14 - Statham Avenue/Poplars Avenue
Junction 15 - A50 Orford Green/Poplars Avenue
Junction 16 - Sandy Lane/Northway
Junction 17 - A50/Northway
Junction 18 - Sandy Lane West/Cotswold Road/Cleveland Road/Sandy Lane
Junction 19 - Cromwell Avenue/Europa Boulevard/Callands Road
Junction 20 - Capesthorne Road/Poplars Avenue
Junction 21 - A50 Orford Green/Hilden Road/A50 Orford Road
Junction 22 - Ballater Drive/Mill Lane/Enfield Park Road/Blackbrook Avenue
Junction 23 - Capesthorne Road/Blackbrook Avenue/Enfield Park Road
Junction 24 - Birchwood Way/Blackbrook Avenue
Junction 25 - Enfield Park Road/Crab Lane
Junction 26 - Birchwood Way/Crab Lane/Woolston Grange Avenue
Junction 27 - Birchwood Way/Oakwood Gate
Junction PH1 - Employment site access priority junction with Cotswold Rd and Poplars Ave
Junction PH2 - Site access ghost right turn priority junction with Poplars Avenue
Junction PH3 - Windermere Avenue priority junction with Poplars Avenue
Junction PH4 - Mill Lane priority junction with Delph Lane
Junction PH5 - Peel Hall site access roundabout junction with Mill Lane
Junction PH6 - Peel Hall Through-Route A49/Poplars Avenue signalised junction

ISSUE	REASON FOR REVISION	DATE
A	Junction annotations added (SATURN model)	29/09/17

PROJECT:

PEEL HALL, WARRINGTON

CLIENT:

SATNAM MILLENNIUM LTD

PROJECT REFERENCE:	DRAWING NUMBER:	SCALE:
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TITLE:

STUDY AREA

DATE:	DRAWN BY:	CHECKED:
27/01/15	FB	DT

Do Minimum Actual Flows

Junction	Road	Movement	Base Model								2025 Do Minimum								2030 Do Minimum							
			AM PEAK 0800 - 0900				PM PEAK 1700-1800				AM PEAK 0800 - 0900				PM PEAK 1700-1800				AM PEAK 0800 - 0900				PM PEAK 1700-1800			
			Cars	LGV	HGV	All Traffic	Cars	LGV	HGV	All Traffic	Cars	LGV	HGV	All Traffic	Cars	LGV	HGV	All Traffic	Cars	LGV	HGV	All Traffic	Cars	LGV	HGV	All Traffic
Southworth Lane / Delph Lane / Myddleton Lane	Southworth Lane	Left to Delph Lane	79	3	3	85	56	4	0	61	93	3	3	99	162	16	0	178	97	4	3	104	187	17	4	208
		W/B to Myddleton Lane	142	14	5	161	382	24	3	409	167	17	6	190	348	17	3	368	173	18	6	197	343	18	0	361
	Delph Lane	Left to Myddleton Lane	183	0	0	183	323	31	14	368	237	0	0	237	451	35	16	502	249	0	0	249	472	38	17	527
		E/B to Southworth Lane	28	0	0	28	23	0	0	23	56	5	5	66	27	0	0	27	73	6	5	84	28	0	0	28
	Myddleton Lane	E/B to Southworth Lane	335	26	18	379	159	17	0	176	352	26	15	393	181	19	0	199	340	25	15	379	186	20	0	205
		Right to Delph Lane	375	26	13	413	231	16	0	247	472	41	14	527	289	18	0	307	472	42	14	528	297	19	0	316
Newton Road / A49 / Winwick Park Avenue	Newton Road	Left to A49 (East)	657	85	52	794	712	49	13	773	729	85	60	875	706	45	14	765	758	89	63	910	712	48	12	772
	A49 (East)	Left to A49 (South)	526	101	131	759	721	90	38	848	618	120	154	892	840	104	44	988	643	124	160	927	872	111	45	1028
	A49 (South)	Left to Winwick Park Avenue	852	143	183	1178	1630	143	37	1810	941	160	206	1307	1686	152	40	1879	944	166	209	1318	1699	152	40	1891
	Winwick Park Avenue	Left to Newton Road	70	0	5	75	33	4	2	39	82	0	6	88	38	5	3	46	85	0	6	91	40	5	3	48
		E/B to A49 (East)	82	0	0	82	29	5	0	34	96	0	0	96	34	6	0	40	100	0	0	100	35	6	0	41
A49 / Delph Lane	A49 (North)	S/B to A49 (South)	977	162	182	1322	1104	95	50	1249	1077	176	210	1463	1129	95	55	1279	1117	182	217	1516	1117	97	53	1267
		Right to Delph Lane	59	6	0	64	113	11	0	124	68	7	0	74	126	11	0	138	70	7	0	77	127	13	0	140
	A49 (South)	Left to Delph Lane	178	30	0	208	155	42	0	197	205	34	0	239	164	44	0	208	209	35	0	244	165	47	0	212
		N/B to A49 (North)	793	143	178	1114	1491	126	27	1644	868	159	200	1227	1523	133	29	1685	867	164	202	1233	1529	133	29	1691
	Delph Lane	Left to A49 (North)	59	0	5	64	139	17	10	166	73	1	6	80	162	20	12	194	78	1	6	85	168	20	12	200
		Right to A49 (South)	138	51	0	188	169	17	0	187	158	58	0	216	197	21	0	218	162	62	0	224	205	21	0	226
A49 / Birch Avenue (20 Dwellings)	A49 (North)	Left to Birch Avenue	15	5	0	20	19	0	0	19	17	6	0	22	21	0	0	21	17	6	0	22	22	0	0	22
		S/B to A49 (South)	1442	191	261	1894	1198	132	83	1412	1559	201	288	2048	1294	145	93	1532	1604	207	295	2106	1321	151	93	1565
	Birch Avenue	Left to A49 (South)	19	3	0	22	12	2	0	14	22	4	0	26	15	2	0	17	23	4	0	27	15	2	0	17
A49 / Sandy Lane West / A574	A49 (North)	Left to Sandy Lane West	100	13	8	121	221	24	5	250	186	25	9	220	272	26	6	304	223	33	10	265	284	27	5	316
		Entry to roundabout	1361	181	253	1795	989	110	78	1177	1396	180	280	1855	1037	121	87	1245	1405	178	286	1869	1053	126	88	1267
	Sandy Lane West	Left to A49 (South)	29	4	19	51	52	0	0	52	29	5	17	51	58	0	0	58	31	5	17	52	65	0	0	65
		Entry to roundabout	329	25	6	360	457	25	12	494	377	30	23	430	643	41	19	702	389	30	29	447	684	41	23	749
	A49 (South)	Left to A574	240	38	45	323	434	4	3	441	272	45	48	365	434	12	4	449	283	46	50	378	435	12	3	451
		Entry to roundabout	595	130	238	963	1269	130	63	1461	722	154	272	1148	1425	138	66	1629	753	164	276	1193	1443	138	65	1645
	A574	Left to A49 (North)	243	46	96	385	369	17	15	401	284	57	112	453	430	20	17	467	295	57	118	470	446	20	18	484
		Entry to Roundabout	714	70	66	850	627	46	0	673	845	82	79	1006	729	53	0	782	877	85	79	1042	757	56	0	813
Cotswold Road / Cleveland Road / Sandy Lane / Sandy Lane West	Cotswold Road	Left to Cleveland Road	21	0	0	21	12	0	0	12	26	0	0	26	14	0	0	14	29	0	0	29	14	0	0	14
		S/B to Sandy Lane	43	0	0	43	30	0	0	30	50	0	0	50	35	0	0	35	52	0	0	52	36	0	0	36
		Right to Sandy Lane West	43	2	10	55	34	0	3	37	51	2	12	65	40	0	3	43	51	2	12	65	41	0	3	44
	Cleveland Road	Left to Sandy Lane	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		W/B to Sandy Lane West	176	20	9	205	250	25	8	283	204	25	22	251	402	40	14	456	210	25	28	263	439	41	18	498
		Right to Cotswold Road	0	0	0	0	5	4	0	10	0	0	0	0	7	5	0	12	0	0	0	0	7	5	0	12
	Sandy Lane	Left to Sandy Lane West	74	0	0	74	135	0	1	136	76	0	0	76	156	0	2	158	78	0	0	78	162	0	2	164
		N/B to Cotswold Road	9	0	0	9	32	0	0	32	10	0	0	10	36	0	0	36	11	0	0	11	36	0	0	36
		Right to Cleveland Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sandy Lane West	Left to Cotswold Road	14	0	1	16	63	0	0	63	16	0	2	18	73	0	0	73	16	0	2	18	75	0	0	75
		E/B to Cleveland Road	247	15	9	272	192	24	0	216	331	22	15	368	218	27	0	245	348	23	15	387	224	27	0	251
		Right to Sandy Lane	39	1	0	40	44	0	0	44	126	14	1	140	95	0	0	95	148	20	5	173	104	0	0	104
Poplars Avenue / Cleveland Road	Poplars Avenue (East)	Left to Cleveland Road	138	16	1	155	213	30	5	248	165	20	20	205	361	45	10	416	171	20	26	216	396	46	14	456
		W/B to Poplars Avenue (West)	40	0	0	40	61	0	0	61	47	0	0	47	71	0	0	71	48	0	0	48	74	0	0	74
	Cleveland Road	Left to Poplars Avenue (West)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Right to Poplars Avenue (East)	214	15	7	236	187	24	0	211	294	22	13	329	213	27	0	240	313	23	13	349	218	27	0	246
	Poplars Avenue (West)	E/B to Poplars Avenue (East)	31	10	0	41	48	0	0	48	37	12	0	49	56	0	0	56	39	12	0	51	58	0	0	58
		Right to Cleveland Road	8	0	2	10	4	0	0	4	9	0	2	11	5	0	0	5	9	0	2	11	5	0	0	5
Poplars Avenue / Howson Road	Poplars Avenue (East)	Left to Howson Road	25	3	7	36	44	5	0	49	44	16	8	68	74	6	0	80	49	16	9	73	77	6	0	82
		W/B to Poplars Avenue (West)	158	16	1	175	274	30	5	309	188	20	20	228	432	45	10	487	195	20	26	240	469	46	14	530
	Howson Road	Left to Poplars Avenue (West)	20	0	0	20	0	0	0	0	23	0	0	23	0	0	0	0	24	0	0	24	0	0	0	0
		Right to Poplars Avenue (East)	74	11	0	85	40	7	0	47	89	13	0	102	67	9	0	76	93	14	0	106	82	11	0	92
	Poplars Avenue (West)	E/B to Poplars Avenue (East)	245	15	7	267	213	24	0	237	332	22	13	367	244	27	0	271	353	24	13	389	251	28	0	279
		Right to Howson Road	0	10	0	10	22	0	0	22	0	12	0	12	25	0	0	25	0	11	0	11	25	0	0	25
Mill Lane / Enfield Park Road / Blackbrook Avenue / Ballater Drive	Mill Lane	Left to Enfield Park Road	164	0	5	169	60	0	0	60	175	0	5	181	69	0	0	69	177	0	5	183	72	0	0	72
		S/B to Blackbrook Avenue	337	39	10	387	211	20	0	231	412	54	11	477	364	34	0	397	416	55	11	482	394	35	4	433
		Right to Ballater Drive	0	0	0	0	17	0	0	17	0	0	0	0	20	0	0	20	0	0	0	0	20	0	0	20
	Enfield Park Road	Left to Blackbrook Avenue	88	11	0	99	45	6	0	51	104	13	0	117	52	7	0	59	108	13	0	121	54	7	0	61
		W/B to Ballater Drive	7	0	0	7	30	6	0	36	8	0	0	8	35	7	0	42	9	0	0	9	36	7	0	43
		Right to Mill Lane	67	0	0	67	153	9	0	162	79	0	0	79	178	10	0	188	82	0	0	82	185	11	0	196
	Blackbrook Avenue	Left to Ballater Drive	13	0	0	13	45	0	0	45	16	0	0	16	52	0	0	52	16	0	0	16	54	0	0	54
		N/B to Mill Lane	119	0	0	119	209	22	14	245	185	5	5	195	318	25	16	359	208	6	5	220	334	27	17	378
		Right to Enfield Park Road	26	0	0	26	92	0	0	92	30	0	0	30	114	0	0	114	31	0	0	31	117	0	0	117
	Ballater Drive	Left to Mill Lane	35	0	0	35	0	0	0	0	42	0	0	42	0	0	0	0	43	0	0	43	0	0	0	0
		E/B to Enfield Park Road	22	0	0	22	0	0	0	0	26	0	0	26	0	0	0	0	27	0	0	27	0	0	0	0
		Right to Blackbrook Avenue	26	0	0	26	21	0	0	21	31	0	0	31	24	0	0	24	32	0	0	32	25	0	0	25
Blackbrook Avenue / Enfield Park Road / Capesthorne Road	Blackbrook Avenue (North)	Left to Enfield Park Road	39	16	0	55	15	0	0	15	43	18	0	61	17	0	0	17	44	18	0	62	17	0	0	17
		S/B to Blackbrook Avenue (South)	216	15	8	238	152	26	0	178	236	17	8	261	192	30	0	222	243	17	8	268	198	31	0	229
		Right to Capesthorne Road	196	19	3	218	110	0	0	110	267	33	3	302	231	11	0	242	269	33	3	305	258	12	4	273
	Enfield Park Road	Left to Blackbrook Avenue (South)	60	8	0	68	34	0	0	34	70	9	0	79	52	0	0	52	74	10	0	84	57	0	0	57
		W/B to Capesthorne Road	199	4	0	204	312	8	0	320	233	5	0	238	412	10	0	422	240	5	0	245	468	10	0	478
		Right to Blackbrook Avenue (North)	19	0	0	19	14	3	12	29	22	0	0	22	41	3	14	58	23	0	0	23	42	3	15	59
	Blackbrook Avenue (South)	Left to Capesthorne Road	71	12	0	83	89	0	0	89	83	14	0	97	93	0	0	93	84	15	0	99	93	0	0	93
		N/B to Blackbrook Avenue (North)	102	0	0	102	178	7	2	187	120	0	0	120	205	8	2	215	124	0	0	124	212	9	2	223
		Right to Enfield Park Road	26	0	0	26	28	0	0	28	30	0	0	30	32	0	0	32	33	0	0	33	33	0	0	33
	Capesthorne Road	Left to Blackbrook Avenue (North)	36	0	0	36	154	12	0	167	88	5	5	98	238	14	0	252	108	6	5	119	251	15	0	267
		E/B to Enfield Park Road	252	22	0	274	155	25	0	180	337	27	0	364	181	29	0	210	354	27	0	381	187	29	0	217
		Right to Blackbrook Avenue (South)	36	5	0	41	54	7	0	61	41	6	0	47	62	8	0	70	42	6	0	48	66	9	0	75
Poplars Avenue / Capesthorne Road	Poplars Avenue (North)	Left to Capesthorne Road (East)	77	16	0	93	59	12	0	71	157	24	5	186	91	15	0	106	178	25	5	208	106	16	0	122
		S/B to Poplars Avenue (South)	166	23	7	196	73	7	0	80	165	14	8	187	84	8	0	92	166	15	8	189	86	9	0	95
		Right to Capesthorne Road (West)	29	0	0	29	65	0	0	65	40	0	0	40	75	0	0	75	41	0	0	41	77	0	0	77
	Capesthorne Road (East)	Left to Poplars Avenue (South)	137	24	3	164	69	0	0	69	219	40	0	259	87	0	0	87	219	41	0	260	125	0	0	125
		W/B to Capesthorne Road (West)	188	0	0	188	309	0	0	309	214	0	0	214	356	0	0	356	220	0	0	220	369	0	0	369
		Right to Poplars Avenue (North)	42	3	0	45	76	8	0	84	39	3	3	45	227	20	0	248	42	3	3	48	257	21	4	282
	Poplars Avenue (South)	Left to Capesthorne Road (West)	11	0	0	11	38	8	0	46	7	0	0	7	43	10	0	53	7	0	0	7	44	10	0	54
		N/B to Poplars Avenue (North)	70	14	1	84	109	25	3	136	99	17	17	132	125	28	8	161	102	17	23	141	129	28	9	166
		Right to Capesthorne Road (East)	74	2	0	76	96	12	0	108	106	2	0	108	146	13	0	159	117	2	0	119	145	13	0	158
	Capesthorne Road (West)	Left to Poplars Avenue (North)	9	0	0	9	49	0	0	49	10	0	0	10	57	0	0	57	11	0	0	11	59	0	0	59
		E/B to Capesthorne Road (East)	183	0	0	183	178	13	0	191	215	0	0	215	207	15	0	222	223	0	0	223	215	16	0	231
		Right to Poplars Avenue (South)	100	3	0	103	60	0	0	60	117	4	0	121	70	1	0	70	122	4	0	126	72	0	0	72
	A49 (North)	Left to Long Lane	68	8	0	76	212	15	11	239	40	3	0	42	253	18	12	283	41	3	0	44	258	18	12	288
		S/B to A49 (South)	1229	191	223	1644	736	96	7	839	1271	196	239	1706	834	108	9	951	1268	194	241	1702	857	112	9	978
		Right to Hawleys Lane	171	0	41	212	161	21	26	208	113	0	7	121	72	6	0	77	115	0	7	122	73	6	0	79
		Left to A49 (South)	340	24	14	378	254	19	0	273	489	44	24	557	306	22	0	328	525	51	25	601	317	23	0	340

A49 / Long Lane / Hawleys Lane	Long Lane	W/B to Hawleys Lane	125	0	3	128	104	16	0	120	134	0	0	134	110	12	0	122	136	0	0	136	109	14	0	124
		Right to A49 (North)	71	3	36	109	64	0	5	68	81	2	26	109	83	6	0	89	86	2	21	109	86	5	0	92
	A49 (South)	Left to Hawleys Lane	40	6	0	46	66	3	0	69	47	7	0	54	77	3	0	80	49	7	0	56	80	3	0	83
		N/B to A49 (North)	608	127	178	913	1293	112	37	1442	741	153	212	1105	1449	130	44	1623	772	160	221	1153	1500	134	44	1679
		Right to Long Lane	183	21	3	207	216	23	0	239	197	21	3	222	319	26	0	346	203	21	0	224	336	28	0	363
	Hawleys Lane	Left to A49 (North)	156	38	69	263	346	22	24	392	120	26	0	146	274	17	0	291	125	28	0	153	284	17	0	301
		E/B to Long Lane	43	3	0	46	120	6	0	126	50	4	0	54	71	7	0	78	52	4	0	56	68	7	0	75
		Right to A49 (South)	37	11	0	48	73	4	0	78	44	13	0	57	85	5	0	90	46	14	0	60	88	5	0	93
Blackbrook Avenue / Insall Road / Hilden Road	Blackbrook Avenue (North)	Left to Insall Road	0	0	0	0	7	0	0	7	0	0	0	0	8	0	0	8	0	0	0	0	8	0	0	8
		S/B to Blackbrook Avenue (South)	289	28	8	325	231	33	0	264	323	31	9	363	295	38	0	333	333	32	8	373	308	40	0	348
		Right to Hilden Road	17	0	0	17	7	0	0	7	19	0	0	19	8	0	0	8	20	0	0	20	8	0	0	8
	Insall Road	Left to Blackbrook Avenue (South)	128	9	0	137	73	0	0	73	150	10	0	160	76	0	0	76	156	10	0	165	78	0	0	78
		W/B to Hilden Road	158	0	0	158	134	0	0	134	197	0	0	197	163	0	0	163	214	0	0	214	168	0	0	168
		Right to Blackbrook Avenue (North)	0	0	0	0	27	0	0	27	0	0	0	0	20	0	0	20	0	0	0	0	17	0	0	17
	Blackbrook Avenue (South)	Left to Hilden Road	46	7	0	53	50	0	0	50	40	2	0	42	59	0	0	59	32	2	0	34	61	0	0	61
		N/B to Blackbrook Avenue (North)	151	17	0	168	189	7	2	198	177	20	0	197	220	8	2	230	184	21	0	205	228	9	2	239
		Right to Insall Road	20	0	0	20	54	5	0	60	96	0	0	96	37	0	0	37	100	0	0	100	39	0	0	39
	Hilden Road	Left to Blackbrook Avenue (North)	14	0	0	14	98	0	0	98	16	0	0	16	113	0	0	113	17	0	0	17	115	0	0	115
		E/B to Insall Road	149	0	0	149	106	10	0	116	190	0	0	190	152	18	0	170	247	1	0	248	153	18	0	171
		Right to Blackbrook Avenue (South)	15	0	0	15	11	0	0	11	9	0	0	9	0	0	0	0	12	0	0	12	1	0	0	1
A50 / Hilden Road / Orford Road / Smith Drive	A50	Left to Hilden Road	740	92	9	841	694	57	11	761	881	105	8	994	789	67	13	869	896	111	8	1015	830	68	13	910
	Hilden Road	Left to Orford Road	234	12	0	246	211	10	0	221	295	13	0	308	268	11	0	279	304	15	0	319	280	13	0	293
	Orford Road	Left to Smith Drive	577	50	18	645	709	53	7	769	698	65	22	785	828	66	8	902	729	65	23	817	820	67	9	895
	Smith Drive	Left to A50	208	0	0	208	350	29	0	379	244	0	0	244	408	33	0	441	254	0	0	254	423	35	0	458
Blackbrook Avenue / A574	Blackbrook Avenue (North)	Left to A574 (East)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		S/B to Blackbrook Avenue (South)	398	34	8	440	293	33	0	327	442	38	9	489	334	38	0	373	456	39	9	504	348	40	0	388
		Right to A574 (West)	35	3	0	37	21	0	0	21	39	3	0	42	36	0	0	36	44	3	0	47	38	0	0	38
	A574 (East)	Left to Blackbrook Avenue (South)	209	25	16	251	227	14	3	243	239	29	18	286	259	16	4	278	245	29	19	293	263	16	4	283
		W/B to A574 (West)	280	37	12	329	542	11	0	553	332	44	14	389	589	12	0	600	340	44	13	398	570	11	0	581
		Right to Blackbrook Avenue (North)	21	8	0	29	22	0	0	22	18	8	0	26	25	0	0	25	10	8	0	18	25	0	0	25
	Blackbrook Avenue (South)	Left to A574 (West)	165	4	4	173	177	15	2	194	202	9	5	216	206	18	2	226	212	9	5	226	214	18	2	234
		N/B to Blackbrook Avenue (North)	196	16	0	213	250	7	2	259	295	14	0	309	291	8	2	301	307	15	0	322	302	9	2	313
		Right to A574 (East)	233	16	14	263	129	23	0	152	201	19	16	236	180	26	0	206	207	20	17	244	186	29	0	215
	A574 (West)	Left to Blackbrook Avenue (North)	0	0	0	0	22	5	0	28	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
		E/B to A574 (East)	438	33	25	496	387	18	4	409	475	40	29	544	502	21	5	528	433	39	31	502	519	21	5	545
		Right to Blackbrook Avenue (South)	163	24	5	192	227	13	11	251	199	28	6	232	269	15	13	296	204	30	6	240	277	17	13	307
A50 / A574	A50 (North)	Left to A574	281	33	5	319	350	26	11	387	310	38	6	354	421	30	13	464	265	39	6	310	436	31	13	480
		S/B to A50 (South)	308	46	2	356	271	27	0	299	355	53	2	409	302	32	0	335	363	56	2	420	312	33	0	345
	A574	Left to A50 (South)	165	30	12	206	384	11	0	395	195	33	14	242	438	12	0	450	204	35	14	252	447	12	0	459
		Right to A50 (North)	315	14	4	333	357	15	2	373	378	23	5	406	381	16	2	399	391	22	5	419	356	16	2	374
	A50 (South)	N/B to A50 (North)	261	36	14	312	352	39	6	396	319	43	17	379	445	51	6	502	337	43	18	399	462	52	7	521
		Right to A574	319	24	25	369	286	11	4	300	363	29	29	421	350	6	5	361	372	29	31	432	362	6	5	373
Crab Lane / A574 / Woolston Grange Avenue	Crab Lane	Entry to Roundabout	306	48	0	354	555	9	0	564	374	57	0	431	630	10	0	641	441	58	0	499	624	11	0	635
	A574 (East)	Entry to Roundabout	928	101	85	1114	1323	61	25	1410	1000	106	89	1196	1330	58	23	1412	994	104	90	1188	1330	58	24	1412
	Woolston Grange Avenue	Entry to Roundabout	1100	78	55	1233	775	94	31	900	1292	91	64	1447	916	110	36	1062	1343	96	68	1507	950	115	37	1102
	A574 (West)	Entry to Roundabout	671	49	39	759	516	41	4	561	677	59	45	780	682	47	5	735	640	59	47	747	705	50	5	760
A49 / Golborne Road	A49 (North)	Left to Golborne Road	91	4	0	95	54	6	0	60	117	5	0	123	63	8	0	71	124	5	0	129	65	8	0	73
		Ahead to A49 (South)	369	45	24	438	347	23	0	370	424	52	28	504	405	27	0	432	438	55	29	522	420	28	0	448
	Golborne Road	Left to A49 (South)	288	40	28	355	365	26	13	403	306	34	32	371	302	18	13	333	320	34	33	387	293	20	11	324
		Right to A49 (North)	44	0	0	44	20	1	19	40	51	0	0	51	40	1	21	62	53	0	0	53	48	2	22	71
	A49 (South)	Ahead to A49 (North)	298	35	0	333	736	69	17	822	326	38	0	364	747	72	18	836	331	40	0	372	737	70	17	824
		Right to Golborne Road	263	38	51	351	327	22	10	359	261	38	51	350	309	22	11	342	250	37	52	338	308	23	10	341
Europa Boulevard / A574 / Callands Road	Europa Boulevard	Entry to Roundabout	198	33	32	263	298	8	9	315	233	39	37	309	347	10	11	368	242	40	40	322	361	10	11	382
	A574 (East)	Entry to Roundabout	513	66	64	643	934	63	15	1013	589	77	73	739	56	11	0	67	607	77	74	757	58	11	0	69
	Callands Road	Entry to Roundabout	361	22	12	395	145	13	3	161	429	28	14	471	1067	68	17	1153	446	28	15	489	1094	72	17	1183
	A574 (West)	Entry to Roundabout	440	42	59	541	484	36	25	545	521	50	70	641	653	45	29	727	541	51	73	665	677	47	30	754
Calver Road / A574	Calver Road	Left to A574 (East)	298	65	66	429	532	28	0	560	350	77	79	506	619	33	0	652	364	79	80	523	643	34	0	677
	A574 (East)	W/B to A574 (West)	513	66	64	643	934	63	15	1013	589	77	73	739	1067	68	17	1153	607	77	74	757	1094	72	17	1183
		Right to Calver Road	202	19	45	266	363	6	32	401	232	22	52	306	413	7	37	457	239	23	53	315	424	7	37	468
	A574 (West)	Left to Calver Road	76	11	7	94	97	4	10	111	89	13	8	110	113	5	12	130	92	13	9	114	117	5	12	134
		E/B to A574 (East)	659	52	95	806	464	35	15	514	779	62	112	953	540	40	17	597	808	63	118	989	560	42	18	620
A49 North		left turn to M62 east	95	28	22	145	124	8	4	135	106	30	25	161	151	9	4	164	106	32	25	162	152	8	5	165
		Stright on to A49 South	1020	185	160	1365	1150	104	46	1300	1083	195	178	1456	1175	107	52	1334	1083	194	178	1456	1169	110	49	1327
M62 East		left turn to A49 south	508	81	130	720	410	47	53	510	596	93	152	841	477	54	63	594	622	100	159	881	496	58	64	618
		right turn to A49 north	150	34	3	187	242	40	9	291	175	38	4	217	282	46	11	339	179	41	4	224	293	50	11	354
A49 South		left turn to M62 west	209	39	90	338	322	16	14	353	247	47	106	400	462	29	16	507	256	47	109	413	489	30	20	539
		straight on to A49 north	710	113	240	1063	1296	116	66	1478	790	129	277	1196	1413	132	75	1620	817	135	287	1239	1437	132	75	1644
M62 West		left turn to A49 north	483	78	42	603	499	26	10	536	490	72	48	610	540	39	11	591	498	65	48	611	567	34	11	613
		right turn to A49 south	303	29	17	349	357	71	12	440	437	54	20	511	457	74	15	546	466	66	23	556	468	84	16	568
Junction 9		East bound Internal	2955		1036	3991	3694		767	4461	3345	0	1217	4562	4168	0	895	5063	3476	0	1265	4741	4327	87	928	5342
		Westbound Internal	3647		1024	4672	4420		363	4783	3931	0	1203	5134	5027	0	423	5450	4085	0	1250	5335	5220	127	439	5786
Junction 10		Eastbound Mainline towards Manchester	1451		650	2101	2425		465	2891	1584	0	760	2344	2735	0	537	3272	1641	0	788	2429	2830	66	555	3451
		Eastbound On Slip	2034		511	2546	1754		360	2114	2274	0	598	2872	1959	0	415	2375	2356	0	620	2977	2027	73	428	2528
		Westbound On Slip M6 Northbound	1729		543	2271	1768		170	1938	1847	0	638	2485	2034	0	198	2232	1919	0	663	2582	2112	74	206	2392
		Westbound Main Line before M6 Northbound merge	2692		615	3307	3242		256	3498	2854	0	721	3575	3752	0	299	4051	2967	0	750	3717	3895	161	308	4364
		Westbound On Slip M6 Southbound	481		98	578	458		18	476	525	0	114	639	531	0	21	552	546	0	119	665	552	19	22	593
		Westbound Junction Start	2211		517	2729	2881		238	3118	2329	0	607	2936	3221	0	278	3499	2421	0	631	3052	3344	142	286	3772
Mill Lane / Mill Lane	Peel Hall Mill Lane	Left to Mill Lane NB	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Right to Delph Lane SB	57	11	0	68	41	0	0	41	55	13	0	68	19	0	0	19	57	13	0	70	20	0	0	20
	Mill Lane North	North Ahead to Mill Lane	483	29	15	527	272	20	0	292	532	42	16	590	434	34	0	467	536	43	16	595	467	35	4	506
		North Right to Peel Hall	0	0	0	0	15	0	0	15	0	0	0	0	18	0	0	18	0	0	0	0	18	0	0	18
	Mill Lane South	South Left to Peel Hall	11	0	0	11	41	0	0	41	12	0	0	12	19	0	0	19	13	0	0	13	19	0	0	19
		South Ahead	211	0	0	211	371	31	14	416	293	5	5	303	478	35	16	528	321	6	5	332	499	38	17	554

Do Minimum Link Counts Actual Flows

Junction	Road	Traffic Direction	Base Model								2025 Do Minimum								2030 Do Minimum							
			AM PEAK 0800 - 0900				PM PEAK 1700-1800				AM PEAK 0800 - 0900				PM PEAK 1700-1800				AM PEAK 0800 - 0900				PM PEAK 1700-1800			
			Cars	LGV	HGV	All Traffic	Cars	LGV	HGV	All Traffic	Cars	LGV	HGV	All Traffic	Cars	LGV	HGV	All Traffic	Cars	LGV	HGV	All Traffic	Cars	LGV	HGV	All Traffic
Southworth Lane / Delph Lane / Myddleton Lane	Southworth Lane	Westbound Junction Entry	221	17	8	246	438	28	3	469	260	20	9	289	510	33	3	546	270	22	9	301	530	35	4	569
		Eastbound Junction Exit	363	26	18	407	182	17	0	199	408	31	20	458	207	19	0	226	412	31	21	463	213	20	0	233
	Delph Lane	Northbound Junction Entry	211	0	0	211	346	31	14	391	293	5	5	303	478	35	16	528	321	6	5	332	499	38	17	554
		Southbound Junction Exit	454	29	15	498	287	20	0	307	565	44	17	626	451	34	0	485	569	46	17	631	484	36	4	524
	Myddleton Lane	Eastbound Junction Entry	709	52	30	792	390	33	0	423	824	66	29	920	470	37	0	506	812	66	29	907	483	38	0	521
		Westbound Junction Exit	325	14	5	344	705	55	17	777	404	17	6	427	799	52	19	870	422	18	6	446	814	56	17	887
Newton Road / A49 / Winwick Park Avenue	Newton Road	Southbound Junction Entry	657	85	52	794	712	49	13	773	729	85	60	875	706	45	14	765	758	89	63	910	712	48	12	772
		Northbound Junction Exit	561	73	51	684	1062	91	27	1180	588	75	51	714	1056	94	29	1178	582	77	52	710	1045	93	27	1165
	A49 (East)	Westbound Junction Entry	526	101	131	759	721	90	38	848	618	120	154	892	840	104	44	988	643	124	160	927	872	111	45	1028
		Eastbound Junction Exit	543	88	139	770	702	82	12	797	616	100	158	873	760	90	14	863	632	104	161	897	771	90	14	875
	A49 (South)	Northbound Junction Entry	852	143	183	1178	1630	143	37	1810	941	160	206	1307	1686	152	40	1879	944	166	209	1318	1699	152	40	1891
		Southbound Junction Exit	1036	168	182	1386	1217	106	50	1372	1145	183	210	1538	1256	106	55	1417	1186	189	217	1592	1244	110	53	1406
	Winwick Park Avenue	Eastbound Junction Entry	152	0	5	157	62	9	2	74	178	0	6	184	72	11	3	86	185	0	6	191	75	11	3	89
		Westbound Junction Exit	47	0	0	47	126	10	0	136	53	0	0	53	133	11	0	144	55	0	0	55	132	11	0	143
A49 / Delph Lane	A49 (North)	Southbound Junction Entry	1036	168	182	1386	1217	106	50	1372	1145	183	210	1538	1256	106	55	1417	1186	189	217	1592	1244	110	53	1406
		Northbound Junction Entry	853	143	183	1178	1630	143	37	1810	941	160	206	1307	1685	153	41	1879	945	165	208	1319	1697	153	41	1891
	A49 (South)	Northbound Junction Entry	972	173	178	1322	1646	168	27	1841	1074	192	200	1466	1687	177	29	1893	1076	199	202	1477	1694	179	29	1903
		Southbound Junction Exit	1115	213	182	1510	1273	112	50	1435	1235	234	210	1679	1327	116	55	1498	1279	244	217	1740	1322	118	53	1492
	Delph Lane	Eastbound Junction Entry	197	51	5	252	308	34	10	353	231	59	6	296	359	41	12	412	240	63	6	309	373	41	12	426
		Westbound Junction Exit	237	36	0	273	268	53	0	321	273	40	0	313	290	55	0	345	279	41	0	320	292	60	0	352
A49 / Birch Avenue	A49 (North)	Southbound Junction Entry	1457	196	261	1914	1217	132	83	1431	1576	207	288	2070	1316	145	93	1553	1621	213	295	2129	1343	151	93	1587
	Birch Avenue	Eastbound Junction Entry	19	3	0	22	12	2	0	14	22	4	0	26	15	2	0	17	23	4	0	27	15	2	0	17
		Westbound Junction Exit	15	5	0	20	19	0	0	19	17	6	0	22	21	0	0	21	17	6	0	22	22	0	0	22
A49 / Sandy Lane West / A574	A49 (North)	Southbound Junction Entry	1461	194	261	1916	1210	134	83	1427	1581	205	288	2075	1309	147	93	1549	1628	211	295	2134	1337	153	93	1583
		Northbound Junction Exit	967	182	329	1479	1623	132	80	1835	1093	212	383	1688	1880	161	90	2132	1131	219	395	1746	1932	162	94	2188
	Sandy Lane West	Westbound Junction Entry	358	29	24	411	508	25	12	546	406	35	40	481	701	41	19	760	419	35	46	500	748	41	23	813
		Eastbound Junction Exit	375	30	11	416	164	0	0	164	554	50	19	623	464	26	6	495	595	58	23	676	483	27	5	515
	A49 (South)	Northbound Junction Entry	835	168	283	1285	1703	134	66	1902	995	199	320	1513	1859	149	69	2078	1035	209	326	1571	1878	150	68	2096
		Southbound Junction Exit	1469	199	264	1932	1110	132	44	1286	1500	198	287	1985	1200	149	51	1399	1500	196	289	1985	1229	155	51	1434
	A574	Eastbound Junction Entry	957	117	162	1235	996	63	15	1074	1129	139	191	1459	1159	73	17	1249	1172	142	198	1511	1203	76	18	1297
		Westbound Junction Exit	715	85	109	909	1298	69	47	1413	821	99	124	1044	1480	75	54	1609	845	100	127	1072	1518	78	55	1651
Cotswold Road / Cleveland Road / Sandy Lane / Sandy Lane West	Cotswold Road	Southbound Junction Entry	107	2	10	119	76	0	3	79	127	2	12	141	89	0	3	92	132	2	12	146	92	0	3	95
		Northbound Junction Exit	23	0	1	25	101	4	0	105	27	0	2	29	116	5	0	121	27	0	2	29	119	5	0	124
	Cleveland Road	Westbound Junction Entry	176	20	9	205	255	30	8	293	204	25	22	251	409	45	14	468	210	25	28	263	446	46	18	511
		Eastbound Junction Entry	269	15	9	293	204	24	0	228	357	22	15	394	232	27	0	259	377	23	15	415	238	27	0	265
	Sandy Lane	Northbound Junction Entry	83	0	0	83	167	0	1	168	86	0	0	86	192	0	2	194	89	0	0	89	198	0	2	200
		Southbound Junction Exit	82	1	0	83	74	0	0	74	176	14	1	191	130	0	0	130	200	20	5	225	140	0	0	140
	Sandy Lane West	Eastbound Junction Entry	301	17	10	328	299	24	0	324	473	36	18	527	386	27	0	413	512	44	22	578	403	27	0	430
		Westbound Junction Exit	293	22	19	334	419	25	12	456	330	27	34	391	598	40	19	657	340	27	40	406	642	41	23	706
Poplars Avenue / Cleveland Road	Poplars Avenue (East)	Northbound Junction Entry	178	16	1	195	274	30	5	309	211	20	20	251	432	45	10	487	219	20	26	264	469	46	14	530
		Southbound Junction Exit	245	25	7	277	235	24	0	259	331	34	13	378	269	27	0	295	352	35	13	400	276	27	0	304
	Cleveland Road	Southbound Junction Entry	214	15	7	236	187	24	0	211	294	22	13	329	213	27	0	240	313	23	13	349	218	27	0	246
		Northbound Junction Exit	146	16	3	165	217	30	5	252	174	20	22	216	365	45	10	421	180	20	28	228	401	46	14	461
	Poplars Avenue (West)	Eastbound Junction Entry	39	10	2	51	52	0	0	52	47	12	2	61	60	0	0	60	49	12	2	62	63	0	0	63
		Westbound Junction Exit	40	0	0	40	61	0	0	61	47	0	0	47	71	0	0	71	48	0	0	48	74	0	0	74
Poplars Avenue / Howson Road	Poplars Avenue (East)	Northbound Junction Entry	183	19	8	210	319	35	5	358	232	36	28	296	506	51	10	567	244	36	35	314	546	52	14	612
		Southbound Junction Exit	319	26	7	352	253	31	0	284	421	35	13	469	311	36	0	347	446	37	13	495	333	38	0	371
	Howson Road	Eastbound Junction Entry	94	11	0	105	40	7	0	47	112	13	0	125	67	9	0	76	117	14	0	130	82	11	0	92
		Westbound Junction Exit	25	13	7	45	66	5	0	71	44	27	8	80	99	6	0	105	49	27	9	85	102	6	0	108
	Poplars Avenue (West)	Southbound Junction Entry	245	25	7	277	235	24	0	259	332	34	13	378	269	27	0	296	353	35	13	400	276	28	0	304
		Northbound Junction Exit	178	16	1	195	274	30	5	309	211	20	20	251	432	45	10	487	219	20	26	264	469	46	14	530
Mill Lane / Enfield Park Road / Blackbrook Avenue / Ballater Drive	Mill Lane	Southbound Junction Entry	500	39	15	555	288	20	0	308	587	54	16	657	453	34	0	487	593	55	16	664	486	35	4	525
		Northbound Junction Exit	221	0	0	221	362	31	14	407	305	5	5	315	496	35	16	547	334	6	5	345	519	38	17	574
	Enfield Park Road	Westbound Junction Entry	162	11	0	173	228	21	0	249	192	13	0	205	265	24	0	289	199	13	0	212	275	25	0	300
		Eastbound Junction Entry	211	0	5	216	152	0	0	152	231	0	5	237	183	0	0	183	235	0	5	241	189	0	0	189
	Blackbrook Avenue	Northbound Junction Entry	157	0	0	157	346	22	14	382	230	5	5	240	484	25	16	525	256	6	5	267	505	27	17	549
		Southbound Junction Exit	451	50	10	511	277	26	0	303	547	67	11	624	440	41	0	481	556	68	11	635	473	42	4	519
	Ballater Drive	Eastbound Junction Entry	83	0	0	83	21	0	0	21	98	0	0	98	24	0	0	24	102	0	0	102	25	0	0	25
		Westbound Junction Exit	20	0	0	20	92	6	0	98	24	0	0	24	107	7	0	114	25	0	0	25	111	7	0	118
Blackbrook Avenue / Enfield Park Road / Capesthorne Road	Blackbrook Avenue (North)	Southbound Junction Entry	451	50	10	511	277	26	0	303	546	67	11	624	440	41	0	481	555	69	11	635	473	42	4	519
		Northbound Junction Exit	157	0	0	157	346	22	14	382	230	5	5	240	484	25	16	525	256	6	5	267	505	27	17	549
	Enfield Park Road	Westbound Junction Entry	279	12	0	291	360	11	12	383	325	14	0	339	505	13	14	531	337	15	0	352	566	13	15	594
		Eastbound Junction Entry	317	38	0	355	197	25	0	222	410	44	0	455	230	29	0	259	432	45	0	476	238	29	0	267
	Blackbrook Avenue (South)	Northbound Junction Entry	198	12	0	210	295	7	2	304	233	14	0	246	330	8	2	340	242	15	0	257	338	9	2	349
		Southbound Junction Exit	312	28	8	347	241	33	0	274	348	32	8	388	306	38	0	344	360	33	8	400	321	40	0	361
	Capesthorne Road	Eastbound Junction Entry	324	27	0	351	364	44	0	408	466	37	5	509	481	51	0	532	505	38	5	548	504	54	0	558
		Westbound Junction Exit	466	35	3	504	511	8	0	520	582	51	3	637	737	20	0	757	592	53	3	648	818	21	4	843
Poplars Avenue / Capesthorne Road	Poplars Avenue (North)	Southbound Junction Entry	272	39	7	318	198	19	0	217	362	38	13	413	250	23	0	272	385	40	13	439	270	24	0	294
		Northbound Junction Exit	120	16	1	137	234	33	3	269	148	20	20	188	410	49	8	466	154	20	25	199	445	49	12	507
	Capesthorne Road (East)	Westbound Junction Entry	367	27	3	397	454	8	0	463	472	43	3	518	671	20	0	692	481	44	3	528	751	21	4	776
		Eastbound Junction Entry	334	18	0	352	333	37	0	370	478	26	5	509	444	43	0	487	518	27	5	550	466	45	0	511
	Poplars Avenue (South)	Northbound Junction Entry	155	16	1	172	243	45	3	290	212	19	17	247	315	51	8	373	226	19	23	267	318	51	9	378
		Southbound Junction Exit	403	50	9	463	202	7	0	209	501	57	8	567	241	8	0	249	507	60	8	575	283	9	0	292
	Capesthorne Road (West)	Eastbound Junction Entry	291	3	0	294	286	13	0	299	342	4	0	346	333	16	0	349	355	4	0	359	346	16	0	362
		Westbound Junction Exit	229	0	0	229	413	8	0	421	261	0	0	261	475	10	0	484	268	0	0	268	491	10	0	500
A49 / Long Lane / Hawleys Lane	A49 (North)	Southbound Junction Entry	1469	199	264	1932	1110	132	44	1286	1424	198	246	1869	1159	132	21	1312	1424	196	247	1868	1188	136	21	1345
		Northbound Junction Exit	835	168	283	1285	1703	134	66	1902	941	181	238	1360	1806	153	44	2003	983	190	242	1415	1871	157	44	2071
	Long Lane	Westbound Junction Entry	537	27	52	616	422	35	5	461	704	46	49	800	500	39	0	539	747	52	46	846	513	42	0	555
		Eastbound Junction Entry	293	32	3	329	549	44	11	603	287	28	3	318	643	51	12	707	296	28	0	324	662	53	12	727
	A49 (South)	Northbound Junction Entry	831	154	182	1166	1575	137	37	1749	985	181	215	1381	1846	159	44	2049	1023	188	221	1432	1916	165	44	2125
		Southbound Junction Exit	1607	227	237	2070	1064	119	7	1191	1804	252	262	2319	1226	135	9	1369	1839	258	266	2362	1262	139	9	1410
	Hawleys Lane	Eastbound Junction Entry	236	52	69	357	539	33	24	596	214	43	0	257	429	29	0	458	222	46	0	268	440	29	0	469
		Westbound Junction Exit	337	6	44	387	331	40	26	397	295	7	7	309	258	20	0	279	300	7	7	313	263	23	0	286
Blackbrook Avenue / Insall Road / Hilden Road	Blackbrook Avenue (North)	Southbound Junction Entry	306	28	8	342	244	33	0	278	342	31	9	382	311	38	0	349	353	32	8	394	325	40	0	364
		Northbound Junction Exit	165	17	0	182	314	7	2	323	193	20	0	213	353	8	2	362	200	22	0	222	360	9	2	371
	Insall Road	Westbound Junction Entry	286	9	0	295	233	0	0	233	348	10	0	358	259	0	0	259	370	10	0	380	263	0	0	263
		Eastbound Junction Entry	169	0	0	169	167	15	0	182	286	0	0	286	197	18	0	215	347	1	0	348	200	18	0	218
	Blackbrook Avenue (South)	Northbound Junction Entry	217	24	0	242	294	12	2	308	313	22	0	335	316	8	2	326	316	24	0	340	327	9	2	338
		Southbound Junction Exit	433	37	8	477	315	33	0	348	482	41	9	532	371	38	0	409	500	42	8	551	386	40	0	426
	Hilden Road	Eastbound Junction Entry	178	0	0	178	215	10	0	225	215	0	0	215	265	18	0	283	275	1	0	276	269	18	0	287
		Westbound Junction Exit	221	7	0	228	191	0	0	191	257	2	0	259	230	0	0	230	266	2	0	269	237	0	0	237
	A50	Eastbound Junction Entry	740	92	9	841	694	57	11	761	881	105	8	994	789	67	13	869	896	111	8	1015	830	68	13	910
		Westbound Junction Entry	699	74	21	794	814	55	8	877	878	87	22	986	931	62	8	1001	910	90	23	1023	949	65	9	1023
	Hilden Road	Westbound Junction Entry	234	12	0	246	211	10	0	221	295	13	0	308	268	11	0	279	304	15	0	319	280	13	0	293

A50 / Hilden Road / Orford Road / Smith Drive	Hilden Road	Eastbound Junction Exit	182	0	0	182	300	33	0	333	240	7	0	247	931	62	8	1001	299	7	0	306	949	65	9	1023
	Orford Road	Northbound Junction Entry	577	50	18	645	709	53	7	769	698	65	22	785	828	66	8	902	729	65	23	817	820	67	9	895
		Southbound Junction Exit	589	79	7	675	621	54	11	686	665	91	8	764	723	62	13	798	628	95	8	731	748	64	13	825
	Smith Drive	Eastbound Junction Entry	208	0	0	208	350	29	0	379	244	0	0	244	408	33	0	441	254	0	0	254	423	35	0	458
		Westbound Junction Exit	289	0	0	289	228	7	0	235	335	0	0	335	262	8	0	269	346	0	0	346	270	8	0	278
Blackbrook Avenue / A574	Blackbrook Avenue (North)	Southbound Junction Entry	433	37	8	477	315	33	0	348	482	41	9	532	371	38	0	409	500	42	9	551	386	40	0	426
		Northbound Junction Exit	217	24	0	242	294	13	2	308	313	22	0	335	316	8	2	326	316	23	0	340	328	9	2	339
	A574 (East)	Westbound Junction Entry	510	71	28	609	791	24	3	818	589	81	32	702	872	27	4	903	595	81	33	709	858	27	4	889
		Eastbound Junction Entry	671	49	39	759	516	41	4	561	677	59	45	780	682	47	5	735	640	59	48	747	705	50	5	760
	Blackbrook Avenue (South)	Northbound Junction Entry	594	36	18	648	556	45	4	605	698	42	21	761	677	52	4	733	726	44	22	792	702	56	4	762
		Southbound Junction Exit	770	83	29	882	747	60	14	821	880	95	33	1008	862	69	16	947	906	97	34	1037	889	72	16	978
	A574 (West)	Eastbound Junction Entry	601	57	30	688	636	37	15	688	674	67	35	776	771	36	18	825	637	68	36	742	797	38	18	853
		Westbound Junction Exit	480	43	16	539	740	26	2	768	573	56	19	647	831	30	2	862	596	56	18	670	821	29	2	853
A50 / A574	A50 (North)	Southbound Junction Entry	589	79	7	675	621	54	11	686	665	91	8	764	723	62	13	798	628	95	8	731	748	64	13	825
		Northbound Junction Exit	577	50	18	645	709	53	8	769	697	66	22	785	826	67	8	901	729	65	23	817	818	68	9	895
	A574	Westbound Junction Entry	480	43	16	539	741	25	2	768	573	56	19	647	819	28	2	849	595	57	18	670	803	28	2	833
		Eastbound Junction Exit	601	57	30	688	636	37	15	688	674	67	35	776	771	36	18	825	637	68	37	742	798	37	18	853
	A50 (South)	Northbound Junction Entry	581	60	39	681	638	49	10	697	682	72	46	800	795	57	11	863	709	72	49	830	824	58	12	894
		Southbound Junction Exit	472	76	13	562	656	38	0	694	549	86	16	651	740	44	0	784	567	90	16	672	759	45	0	804
Crab Lane / A574 / Woolston Grange Avenue	Crab Lane	Southbound Junction Entry	306	48	0	354	555	9	0	564	374	57	0	431	630	10	0	641	441	58	0	499	624	11	0	635
		Northbound Junction Exit	631	18	26	675	336	34	0	370	621	20	29	670	432	37	0	469	638	21	31	690	457	39	0	496
	A574 (East)	Westbound Junction Entry	928	101	85	1114	1323	61	25	1410	1000	106	89	1196	1330	58	23	1412	994	104	90	1188	1330	58	24	1412
		Eastbound Junction Exit	1172	110	94	1377	857	100	34	991	1377	128	107	1612	1069	112	39	1220	1412	130	112	1654	1099	118	40	1257
	Woolston Grange Avenue	Northbound Junction Entry	1100	78	55	1233	775	94	31	900	1292	91	64	1447	916	110	36	1062	1343	96	68	1507	950	115	37	1102
		Southbound Junction Exit	691	78	31	800	1184	47	23	1254	745	83	33	862	1186	47	22	1256	746	83	34	863	1196	47	23	1267
	A574 (West)	Eastbound Junction Entry	671	49	39	759	516	41	4	561	677	59	45	780	682	47	5	735	640	59	47	747	705	50	5	760
		Westbound Junction Exit	510	71	28	609	791	24	3	818	589	81	32	702	872	27	4	903	595	81	33	709	858	27	4	889
A49 / Golborne Road	A49 (North)	Southbound Junction Entry	461	49	24	534	401	29	0	430	541	57	28	626	467	35	0	502	563	60	29	652	485	36	0	521
		Northbound Junction Exit	342	35	0	377	755	71	36	862	377	38	0	415	787	73	38	899	384	40	0	424	785	72	38	895
	Golborne Road	Westbound Junction Entry	332	40	28	399	384	27	32	443	357	34	32	422	343	19	34	396	372	34	33	440	340	21	33	394
		Eastbound Junction Exit	354	42	51	447	381	28	10	419	379	43	51	473	372	30	11	413	374	42	52	468	373	31	10	414
	A49 (South)	Northbound Junction Entry	561	73	51	684	1062	91	27	1180	588	75	51	714	1056	94	29	1178	582	77	52	710	1045	93	27	1165
		Southbound Junction Exit	657	85	52	793	712	49	13	773	730	85	60	875	707	45	13	765	758	89	62	910	713	48	11	772
Europa Boulevard / A574 / Callands Road	Europa Boulevard	Southbound Junction Entry	198	33	32	263	298	8	9	315	233	39	37	309	347	10	11	368	242	40	40	322	361	10	11	382
		Northbound Junction Exit	229	13	23	266	48	10	0	58	268	16	27	310	56	11	0	67	278	17	28	322	58	11	0	69
	A574 (East)	Westbound Junction Entry	513	66	64	643	934	63	15	1013	589	77	73	739	56	11	0	67	607	77	74	757	58	11	0	69
		Eastbound Junction Exit	735	62	102	900	562	39	25	625	868	75	120	1063	653	45	29	727	900	76	127	1103	677	47	30	754
	Callands Road	Northbound Junction Entry	361	22	12	395	145	13	3	161	429	28	14	471	1067	68	17	1153	446	28	15	489	1094	72	17	1183
		Southbound Junction Exit	58	10	13	81	243	28	0	271	66	13	15	94	278	30	0	309	68	12	15	96	286	32	0	318
	A574 (West)	Eastbound Junction Entry	440	42	59	541	484	36	25	545	521	50	70	641	653	45	29	727	541	51	73	665	677	47	30	754
		Westbound Junction Exit	490	77	28	595	1008	44	28	1079	569	90	32	691	1160	48	32	1240	589	90	33	712	1194	50	32	1277
Calver Road / A574	Calver Road	Southbound Junction Entry	298	65	66	429	532	28	0	560	350	77	79	506	619	33	0	652	364	79	80	523	643	34	0	677
		Northbound Junction Exit	278	30	52	360	461	10	42	512	321	35	60	415	526	12	49	587	331	36	62	429	541	12	49	602
	A574 (East)	Westbound Junction Entry	715	85	109	909	1298	69	47	1413	821	99	124	1044	1481	75	54	1609	845	99	127	1072	1518	78	55	1651
		Eastbound Junction Exit	957	117	162	1235	996	63	15	1074	1129	139	191	1459	1159	73	17	1249	1172	142	198	1511	1203	76	18	1297
	A574 (West)	Eastbound Junction Entry	735	62	102	900	562	39	25	625	868	75	120	1063	653	45	29	727	900	76	127	1103	677	47	30	754
		Westbound Junction Exit	513	66	64	643	934	63	15	1013	589	77	73	739	1067	68	17	1153	607	77	74	757	1094	72	17	1183
A49 North		Southbound Junction Entry	1115	213	182	1510	1273	112	50	1435	1189	225	202	1616	1326	116	55	1498	1189	226	203	1618	1321	118	53	1492
		Northbound Junction Exit	972	173	178	1322	1646	168	27	1841	1074	192	200	1466	1687	177	29	1893	1076	199	202	1477	1694	179	29	1903
M62 East		Westbound Off Slip	659	115	134	907	651	87	62	801	771	131	156	1058	759	100	74	933	801	141	163	1105	788	108	75	971
		Eastbound On Slip	454	77	126	656	482	44	59	585	514	86	143	743	526	47	62	635	522	89	146	757	528	47	61	636
A49 South		Northbound Junction Entry	919	152	329	1400	1618	132	80	1830	1037	175	383	1596	1875	161	90	2126	1073	183	395	1651	1926	162	94	2182
		Southbound Junction Exit	1457	196	261	1914	806	85	30	921	975	115	140	1230	843	92	33	967	993	114	141	1248	853	94	33	979
M62 West		Eastbound Off Slip	786	107	59	952	856	98	22	976	928	126	68	1122	997	113	26	1136	964	131	71	1166	1035	118	27	1180
		Westbound On Slip	554	134	133	820	915	71	41	1026	627	152	150	929	1038	80	44	1162	642	156	153	952	1059	82	46	1187
Junction 9		Eastbound M62	2955	0	1036	3991	3694	0	767	4461	3345	0	1217	4562	4168	0	895	5063	3476	0	1265	4741	4327	87	928	5342
		Westbound M62	3647	0	1024	4672	4420	0	363	4783	3931	0	1203	5134	5027	0	423	5450	4085	0	1250	5335	5220	127	439	5786
Junction 10		Eastbound Mainline towards Manchester	1451	0	650	2101	2425	0	465	2891	1584	0	760	2344	2735	0	537	3272	1641	0	788	2429	2830	66	555	3451
		Eastbound On Slip	2034	0	511	2546	1754	0	360	2114	2274	0	598	2872	1959	0	415	2375	2356	0	620	2977	2027	73	428	2528
		Westbound On Slip M6 Northbound	1729	0	543	2271	1768	0	170	1938	1847	0	638	2485	2034	0	198	2232	1919	0	663	2582	2112	74	206	2392
		Westbound Main Line before M6 Northbound merge	2692	0	615	3307	3242	0	256	3498	2854	0	721	3575	3752	0	299	4051	2967	0	750	3717	3895	161	308	4364
		Westbound On Slip M6 Southbound	481	0	98	578	458	0	18	476	525	0	114	639	531	0	21	552	546	0	119	665	552	19	22	593
		Westbound Junction Start	2211	0	517	2729	2881	0	238	3118	2329	0	607	2936	3221	0	278	3499	2421	0	631	3052	3344	142	286	3772
Mill Lane / Mill Lane	Peel Hall Mill Lane	Eastbound Junction Entry	57	11	0	68	41	0	0	41	55	13	0	68	19	0	0	19	57	13	0	70	20	0	0	20
		Westbound Junction Exit	11	0	0	11	56	0	0	56	12	0	0	12	36	0	0	36	13	0	0	13	38	0	0	38
	Mill Lane North	Southbound Junction Entry	483	29	15	527	287	20	0	307	532	42	16	590	451	34	0	485	536	43	16	595	485	35	4	524
		Northbound Junction Exit	211	0	0	211	371	31	14	416	293	5	5	303	478	35	16	528	321	6	5	332	499	38	17	554
	Mill Lane South	Northbound Junction Entry	221	0	0	221	412	31	14	457	305	5	5	315	496	35	16	547	334	6	5	345	519	38	17	574
		Southbound Junction Exit	540	40	15	595	314	20	0	333	587	55	16	657	453	34	0	487	593	56	16	664	486	35	4	525
Northway	Northway (Sandy Lane End)	Northbound	33	3	3	40	146	0	0	146	19	0	3	22	140	1	0	141	20	0	0	20	148	2	0	150
		Southbound	54	8	14	76	72	0	0	72	151	31	24	206	83	0	0	83	180	37	25	242	85	0	0	85
	Northway (Long Lane End)	Northbound	33	3	3	40	146	0	0	146	19	0	3	22	140	1	0	141	20	0	0	20	148	2	0	150
		Southbound	133	12	14	159	29	4	0	34	243	36	24	303	34	5	0	39	276	42	26	344	35	5	0	40

Do Something Actual Flows

Junction	Road	Movement	2025 Do Something								2030 Do Something								2030 Do Something Through Route							
			AM PEAK 0800 - 0900				PM PEAK 1700-1800				AM PEAK 0800 - 0900				PM PEAK 1700-1800				AM PEAK 0800 - 0900				PM PEAK 1700-1800			
			Cars	LGV	HGV	All Traffic	Cars	LGV	HGV	All Traffic	Cars	LGV	HGV	All Traffic	Cars	LGV	HGV	All Traffic	Cars	LGV	HGV	All Traffic	Cars	LGV	HGV	All Traffic
Southworth Lane / Delph Lane / Myddleton Lane	Southworth Lane	Left to Delph Lane	97	3	3	103	156	16	0	172	104	4	3	111	194	17	3	213	127	8	3	138	194	17	4	215
		W/B to Myddleton Lane	167	17	6	190	357	17	3	377	173	18	6	197	342	18	1	361	149	14	6	169	343	18	0	361
	Delph Lane	Left to Myddleton Lane	277	0	0	277	468	35	16	519	328	0	0	328	508	37	17	562	326	0	0	326	493	37	16	546
		E/B to Southworth Lane	60	3	5	68	28	0	0	28	82	6	5	92	30	0	0	30	94	6	22	121	54	8	0	62
	Myddleton Lane	E/B to Southworth Lane	351	27	15	392	180	19	0	198	344	25	15	384	186	20	0	205	330	24	0	354	165	13	0	177
		Right to Delph Lane	471	41	14	526	322	18	0	339	469	42	14	524	359	19	0	378	480	41	13	534	366	19	0	385
Newton Road / A49 / Winwick Park Avenue	Newton Road	Left to A49 (East)	768	85	60	913	717	44	14	775	837	88	62	988	719	47	13	779	800	85	63	947	711	47	11	769
	A49 (East)	Left to A49 (South)	622	120	154	896	846	104	44	994	647	124	160	931	884	111	45	1040	647	124	160	931	885	111	45	1041
	A49 (South)	Left to Winwick Park Avenue	943	160	205	1309	1667	148	40	1855	947	164	208	1319	1690	148	40	1879	940	165	193	1298	1659	141	40	1840
	Winwick Park Avenue	Left to Newton Road	82	0	6	88	38	5	3	46	85	0	6	91	40	5	3	48	85	0	6	91	40	5	3	48
		E/B to A49 (East)	96	0	0	96	34	6	0	40	100	0	0	100	35	6	0	41	100	0	0	100	35	6	0	41
A49 / Delph Lane	A49 (North)	S/B to A49 (South)	1109	175	209	1494	1136	94	55	1286	1175	180	217	1572	1124	96	53	1273	1140	178	218	1536	1124	97	51	1272
		Right to Delph Lane	68	7	0	74	125	11	0	136	70	7	0	77	125	13	0	138	70	7	0	77	127	13	0	139
	A49 (South)	Left to Delph Lane	204	33	0	238	158	42	0	201	208	35	0	243	160	45	0	205	209	35	0	243	159	45	0	204
		N/B to A49 (North)	873	160	199	1232	1501	129	30	1659	874	164	202	1239	1516	129	30	1675	863	164	186	1212	1487	122	30	1639
	Delph Lane	Left to A49 (North)	71	0	6	77	164	20	12	196	75	0	6	81	172	20	12	204	79	0	6	85	169	20	12	201
		Right to A49 (South)	160	59	0	219	198	21	0	219	166	63	0	229	207	21	0	228	161	63	0	224	210	21	0	231
A49 / Birch Avenue (20 Dwellings)	A49 (North)	Left to Birch Avenue	21	6	0	27	30	0	0	30	21	5	0	26	30	0	0	30	21	5	0	27	30	0	0	30
		S/B to A49 (South)	1588	197	287	2072	1314	143	93	1550	1642	203	291	2136	1358	148	94	1600	1659	206	310	2175	1380	155	93	1629
	Birch Avenue	Left to A49 (South)	33	4	0	37	21	2	0	23	34	4	0	38	21	2	0	23	34	4	0	38	21	2	0	23
A49 / Sandy Lane West / A574	A49 (North)	Left to Sandy Lane West	226	27	10	263	302	26	8	335	273	33	10	317	325	26	7	358	256	39	3	298	263	14	5	282
		Entry to roundabout	1396	174	277	1846	1033	120	85	1238	1403	173	282	1858	1055	124	87	1266	1445	166	290	1901	1085	114	77	1276
	Sandy Lane West	Left to A49 (South)	53	5	24	82	115	0	0	115	56	5	24	85	97	0	0	97	31	5	17	53	78	0	0	78
		Entry to roundabout	446	30	22	498	749	38	18	805	499	30	25	553	782	40	20	842	391	30	10	431	578	27	21	625
	A49 (South)	Left to A574	272	45	48	365	434	12	3	450	282	46	50	378	439	11	4	453	282	46	51	379	433	19	3	456
		Entry to roundabout	766	154	276	1196	1449	138	70	1657	790	163	284	1238	1460	139	69	1669	794	163	278	1235	1462	129	65	1657
	A574	Left to A49 (North)	284	57	112	453	430	20	17	467	295	57	118	470	446	20	18	484	346	57	122	526	476	20	18	514
		Entry to Roundabout	888	82	82	1053	743	53	0	796	925	85	83	1094	781	56	0	837	874	84	79	1038	752	56	0	808
Cotswold Road / Cleveland Road / Sandy Lane / Sandy Lane West	Cotswold Road	Left to Cleveland Road	30	0	0	30	14	0	0	14	31	0	0	31	14	0	0	14	27	0	0	27	14	0	0	14
		S/B to Sandy Lane	50	0	0	50	35	0	0	35	52	0	0	52	36	0	0	36	52	0	0	52	36	0	0	36
		Right to Sandy Lane West	52	2	12	66	40	0	3	43	52	2	12	66	41	0	3	44	35	2	12	49	42	0	3	45
	Cleveland Road	Left to Sandy Lane	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		W/B to Sandy Lane West	297	25	28	349	562	38	14	614	344	25	30	399	569	40	15	624	239	25	9	272	325	27	15	367
		Right to Cotswold Road	6	0	0	6	10	5	0	15	6	0	0	6	8	5	0	13	23	0	18	41	7	5	0	12
	Sandy Lane	Left to Sandy Lane West	76	0	0	76	156	0	2	158	79	0	0	79	161	0	2	163	60	0	0	60	162	0	2	164
		N/B to Cotswold Road	11	0	0	11	37	0	2	38	12	0	0	12	41	0	2	43	30	0	0	30	39	0	0	39
		Right to Cleveland Road	0	0	0	0	5	0	0	5	0	0	0	0	3	0	0	3	0	0	0	0	0	0	0	0
	Sandy Lane West	Left to Cotswold Road	66	0	9	75	71	0	3	74	64	0	9	73	77	0	2	78	20	0	2	22	73	0	0	73
		E/B to Cleveland Road	387	20	15	421	267	26	0	293	378	20	14	413	295	27	0	322	303	18	7	328	178	14	0	192
		Right to Sandy Lane	123	17	0	140	94	0	0	94	170	21	4	195	97	0	0	97	195	30	4	230	100	0	0	100
Poplars Avenue / Cleveland Road	Poplars Avenue (East)	Left to Cleveland Road	233	20	17	270	492	43	5	540	278	20	20	317	492	44	7	544	221	20	24	265	282	31	12	325
		W/B to Poplars Avenue (West)	54	0	2	56	74	0	0	74	56	0	2	58	74	0	0	74	48	0	0	48	74	0	0	74
	Cleveland Road	Left to Poplars Avenue (West)	2	0	0	2	15	0	0	15	1	0	0	1	8	0	0	8	1	0	0	1	1	0	0	1
		Right to Poplars Avenue (East)	359	20	12	391	250	27	0	277	349	21	12	381	284	27	0	311	264	18	5	287	171	14	0	185
	Poplars Avenue (West)	E/B to Poplars Avenue (East)	39	12	0	51	64	0	0	64	41	12	0	53	66	0	0	66	40	12	0	52	58	0	0	58
		Right to Cleveland Road	44	0	11	55	41	0	5	46	44	0	11	55	42	0	4	46	11	0	2	13	5	0	0	5
Poplars Avenue / Howson Road	Poplars Avenue (East)	Left to Howson Road	67	16	8	90	86	6	0	91	120	26	9	155	97	6	0	103	111	24	9	144	92	6	0	98
		W/B to Poplars Avenue (West)	300	20	19	339	704	42	5	752	334	20	21	375	694	44	7	746	257	20	24	301	410	31	11	453
	Howson Road	Left to Poplars Avenue (West)	39	0	0	39	27	0	0	27	35	0	0	35	23	0	0	23	29	0	0	29	10	0	0	10
		Right to Poplars Avenue (East)	96	13	0	109	92	14	0	106	109	14	0	123	134	18	0	152	108	14	0	121	59	10	0	69
	Poplars Avenue (West)	E/B to Poplars Avenue (East)	441	20	12	473	429	27	0	456	496	21	12	530	407	28	0	435	362	18	5	384	230	14	0	245
		Right to Howson Road	27	12	0	38	37	0	0	37	24	11	0	36	36	0	0	36	13	11	0	25	30	0	0	30
Mill Lane / Enfield Park Road / Blackbrook Avenue / Ballater Drive	Mill Lane	Left to Enfield Park Road	177	0	6	183	70	0	0	70	186	0	6	192	72	0	0	72	186	0	6	192	114	0	0	114
		S/B to Blackbrook Avenue	586	55	11	652	472	34	0	506	781	58	11	851	633	36	3	671	811	58	17	886	569	49	12	630
		Right to Ballater Drive	0	0	0	0	20	0	0	20	0	0	0	0	21	0	0	21	0	0	0	0	23	0	0	23
	Enfield Park Road	Left to Blackbrook Avenue	105	13	0	118	52	7	0	59	109	13	0	122	54	7	0	61	108	13	0	121	54	7	0	61
		W/B to Ballater Drive	8	0	0	8	35	7	0	42	9	0	0	9	36	7	0	43	9	0	0	9	36	7	0	43
		Right to Mill Lane	79	0	0	79	178	10	0	188	83	0	0	83	185	11	0	196	85	0	0	85	185	11	0	196
	Blackbrook Avenue	Left to Ballater Drive	15	0	0	15	52	0	0	52	16	0	0	16	53	0	0	53	16	0	0	16	51	0	0	51
		N/B to Mill Lane	270	3	5	278	495	25	16	536	426	6	5	436	690	26	17	733	397	3	5	405	734	29	16	779
		Right to Enfield Park Road	30	0	0	30	113	0	0	113	31	0	0	31	116	0	0	116	31	0	0	31	73	0	0	73
	Ballater Drive	Left to Mill Lane	42	0	0	42	0	0	0	0	43	0	0	43	0	0	0	0	43	0	0	43	0	0	0	0
		E/B to Enfield Park Road	26	0	0	26	0	0	0	0	27	0	0	27	0	0	0	0	27	0	0	27	0	0	0	0
		Right to Blackbrook Avenue	31	0	0	31	24	0	0	24	32	0	0	32	25	0	0	25	32	0	0	32	25	0	0	25
Blackbrook Avenue / Enfield Park Road / Capesthorne Road	Blackbrook Avenue (North)	Left to Enfield Park Road	89	18	0	107	46	0	0	46	146	19	0	165	79	0	0	79	180	20	0	199	105	14	0	119
		S/B to Blackbrook Avenue (South)	290	20	8	318	230	30	0	260	342	19	8	370	269	31	0	300	350	17	14	381	287	43	13	343
		Right to Capesthorne Road	343	30	3	376	273	11	0	283	435	33	3	471	364	12	3	378	422	34	3	459	255	0	0	255
	Enfield Park Road	Left to Blackbrook Avenue (South)	74	9	0	83	63	0	0	63	75	10	0	85	59	0	0	59	72	10	0	82	39	0	0	39
		W/B to Capesthorne Road	230	5	0	235	530	10	0	540	236	5	0	241	513	9	0	522	235	5	0	240	458	7	0	465
		Right to Blackbrook Avenue (North)	49	0	0	49	119	3	14	136	79	0	0	79	191	3	14	208	90	0	0	90	262	6	14	281
	Blackbrook Avenue (South)	Left to Capesthorne Road	82	14	0	96	129	3	0	132	84	15	0	99	93	0	0	93	76	14	0	90	102	0	0	102
		N/B to Blackbrook Avenue (North)	136	0	0	136	239	8	2	249	160	0	0	160	260	9	2	271	169	0	0	169	278	9	1	288
		Right to Enfield Park Road	32	0	0	32	35	0	0	35	56	0	0	57	33	0	0	33	74	3	0	77	33	0	0	33
	Capesthorne Road	Left to Blackbrook Avenue (North)	131	3	5	139	302	14	0	316	234	6	5	245	408	15	0	423	184	3	5	192	319	15	0	334
		E/B to Enfield Park Road	386	27	0	412	204	30	0	234	397	26	0	423	216	29	0	245	365	25	0	391	195	16	0	210
		Right to Blackbrook Avenue (South)	39	6	0	45	76	8	0	84	8	0	0	8	72	9	0	80	1	0	0	1	49	0	0	49
Poplars Avenue / Capesthorne Road	Poplars Avenue (North)	Left to Capesthorne Road (East)	229	23	5	257	185	19	0	204	308	25	5	338	263	22	0	285	214	21	3	238	56	1	0	57
		S/B to Poplars Avenue (South)	205	13	8	226	196	8	0	204	203	13	8	224	143	9	0	152	171	13	2	186	107	9	0	116
		Right to Capesthorne Road (West)	41	0	0	41	78	0	0	78	43	0	0	43	80	0	0	80	42	0	0	42	79	0	0	79
	Capesthorne Road (East)	Left to Poplars Avenue (South)	222	37	0	259	102	0	0	102	238	35	0	273	86	0	0	86	274	38	0	313	199	9	0	208
		W/B to Capesthorne Road (West)	215	0	0	215	364	1	0	365	226	0	0	226	370	0	0	370	225	0	0	225	373	0	0	373
		Right to Poplars Avenue (North)	108	3	3	114	386	22	0	408	208	13	3	224	439	21	3	463	164	11	3	179	185	7	0	192
	Poplars Avenue (South)	Left to Capesthorne Road (West)	7	0	0	7	34	9	0	43	7	0	0	7	43	10	0	53	7	0	0	7	45	10	0	54
		N/B to Poplars Avenue (North)	158	17	16	190	254	24	3	281	152	16	18	186	204	27	2	233	123	16	21	161	163	28	9	200
		Right to Capesthorne Road (East)	123	2	0	125	133	8	0	141	150	2	0	152	158	6	0	163	170	3	2	174	252	14	0	266
	Capesthorne Road (West)	Left to Poplars Avenue (North)	12	0	0	12	58	0	0	58	17	0	0	17	61	0	0	61	16	0	0	16	60	0	0	60
		E/B to Capesthorne Road (East)	217	0	0	217	211	16	0	227	227	0	0	227	222	16	0	238	229	0	0	229	222	16	0	238
		Right to Poplars Avenue (South)	117	4	0	121	68	0	0	68	118	4	0	122	71	0	0	71	118	4	0	122	72	0	0	72
	A49 (North)	Left to Long Lane	42	3	0	45	266	18	12	296	51	4	0	55	285	18	12	315	52	4	0	57	217	7	0	224
		S/B to A49 (South)	1287	189	242	1718	865	108	8	981	1287	189	243	1719	867	111	8	986	1282	183	244	1709	873	111	8	993
		Right to Hawleys Lane	112	0	7	119	71	6	0	77	113	0	7	120	73	6	0	79	114	0	7	121	73	6	0	79
		Left to A49 (South)	493	48	23	564	308	22	0	329	516	52	24	591	319	22	0	342	539	60	25	623	316	23	0	338

A49 / Long Lane / Hawleys Lane	Long Lane	W/B to Hawleys Lane	135	0	0	135	107	18	0	125	137	0	0	137	109	19	0	129	136	0	0	136	106	19	0	125
		Right to A49 (North)	78	2	29	109	93	2	5	101	82	2	27	111	94	1	6	101	84	2	22	108	88	0	0	89
	A49 (South)	Left to Hawleys Lane	47	7	0	54	77	3	0	80	49	7	0	56	80	3	0	83	49	7	0	56	80	3	0	83
		N/B to A49 (North)	784	153	213	1150	1472	130	43	1645	809	160	223	1192	1526	135	44	1705	812	160	223	1195	1531	135	46	1712
		Right to Long Lane	197	21	4	222	324	26	2	352	203	21	0	224	327	27	2	356	202	21	0	223	323	27	0	349
	Hawleys Lane	Left to A49 (North)	121	26	0	147	275	17	0	292	126	28	0	154	285	17	0	302	126	28	0	154	291	17	0	308
		E/B to Long Lane	50	4	0	54	71	7	0	78	52	4	0	56	69	7	0	76	52	4	0	56	68	7	0	75
		Right to A49 (South)	44	13	0	57	85	5	0	90	46	14	0	60	89	5	0	94	46	14	0	60	88	5	0	93
Blackbrook Avenue / Insall Road / Hilden Road	Blackbrook Avenue (North)	Left to Insall Road	0	0	0	0	8	0	0	8	0	0	0	0	8	0	0	8	0	0	0	0	32	12	0	44
		S/B to Blackbrook Avenue (South)	366	33	9	408	351	38	0	389	368	27	8	403	359	40	0	399	376	26	14	416	335	31	13	379
		Right to Hilden Road	30	1	0	31	14	0	0	14	51	2	0	53	37	0	0	37	41	1	0	41	13	0	0	13
	Insall Road	Left to Blackbrook Avenue (South)	150	10	0	160	76	0	0	76	137	9	0	146	91	0	0	91	133	9	0	142	76	0	0	76
		W/B to Hilden Road	212	0	0	212	164	0	0	164	245	1	0	245	204	0	0	204	238	1	0	239	159	0	0	159
		Right to Blackbrook Avenue (North)	1	3	0	4	20	0	0	20	5	3	0	8	18	0	0	18	16	3	0	19	26	0	0	26
	Blackbrook Avenue (South)	Left to Hilden Road	31	2	0	33	59	0	0	59	1	0	0	1	60	0	0	60	1	0	0	1	61	0	0	61
		N/B to Blackbrook Avenue (North)	192	17	0	209	273	11	3	286	232	19	0	251	264	9	2	275	230	21	0	250	282	9	1	292
		Right to Insall Road	96	0	0	96	28	0	0	29	104	0	0	104	38	0	0	38	104	0	0	104	29	0	0	30
	Hilden Road	Left to Blackbrook Avenue (North)	17	0	0	17	133	0	0	133	22	0	0	22	127	0	0	127	32	0	0	32	129	0	0	129
		E/B to Insall Road	200	0	0	200	145	18	0	162	200	1	0	201	151	19	0	170	176	0	0	176	135	7	0	142
		Right to Blackbrook Avenue (South)	9	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A50 / Hilden Road / Orford Road / Smith Drive	A50	Left to Hilden Road	904	100	8	1012	895	66	12	974	917	100	7	1024	855	68	13	935	918	103	2	1023	870	65	0	935
	Hilden Road	Left to Orford Road	303	14	0	317	277	11	0	288	361	18	0	378	341	13	0	354	357	17	0	374	268	13	0	280
	Orford Road	Left to Smith Drive	752	65	22	839	915	63	8	986	835	67	23	925	892	66	8	967	831	68	22	922	901	66	9	976
	Smith Drive	Left to A50	245	0	0	245	409	33	0	442	254	0	0	254	426	35	0	461	255	0	0	255	425	35	0	460
Blackbrook Avenue / A574	Blackbrook Avenue (North)	Left to A574 (East)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		S/B to Blackbrook Avenue (South)	474	38	9	521	362	38	0	400	472	33	8	513	385	40	0	425	482	32	14	528	391	31	13	434
		Right to A574 (West)	50	5	0	55	63	0	0	63	22	2	0	24	62	0	0	62	15	2	0	17	19	0	0	19
	A574 (East)	Left to Blackbrook Avenue (South)	239	29	18	286	251	16	3	270	238	28	19	285	246	15	3	264	231	28	18	277	266	15	3	285
		W/B to A574 (West)	349	44	14	406	529	11	0	540	355	45	13	413	535	11	0	546	343	44	13	400	559	11	0	570
		Right to Blackbrook Avenue (North)	7	5	0	12	24	0	0	24	0	4	0	4	24	0	0	24	1	6	0	7	24	0	0	24
	Blackbrook Avenue (South)	Left to A574 (West)	211	9	5	225	236	15	2	253	247	9	5	261	248	18	2	268	248	10	5	263	232	18	3	252
		N/B to Blackbrook Avenue (North)	313	14	0	327	337	11	3	350	337	15	0	352	340	9	2	351	335	14	0	349	348	9	1	359
		Right to A574 (East)	200	19	16	235	189	26	0	215	184	20	17	221	186	29	0	215	184	20	17	221	195	29	0	224
	A574 (West)	Left to Blackbrook Avenue (North)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		E/B to A574 (East)	452	39	28	520	508	21	5	533	463	38	30	530	521	21	5	546	475	39	30	544	511	21	5	537
		Right to Blackbrook Avenue (South)	214	28	6	247	317	15	13	345	274	35	6	314	305	17	13	335	261	35	0	296	279	26	0	304
A50 / A574	A50 (North)	Left to A574	307	38	6	351	473	29	12	515	394	44	6	443	465	31	13	509	397	45	0	443	431	40	0	471
		S/B to A50 (South)	382	50	2	434	315	32	0	348	431	55	2	488	316	33	0	349	440	56	2	498	356	33	0	389
	A574	Left to A50 (South)	206	35	14	255	450	11	0	461	178	33	13	224	451	11	0	463	167	32	13	212	420	11	0	431
		Right to A50 (North)	404	22	5	432	349	13	2	364	445	24	5	474	357	15	2	374	438	25	5	468	363	15	2	381
	A50 (South)	N/B to A50 (North)	347	43	17	407	564	51	7	622	389	44	18	451	533	52	7	592	392	44	18	454	535	52	7	594
		Right to A574	358	29	29	416	352	6	5	363	342	28	31	401	362	6	5	373	339	28	31	397	359	6	5	370
Crab Lane / A574 / Woolston Grange Avenue	Crab Lane	Entry to Roundabout	459	56	0	515	643	11	0	654	501	57	0	559	683	11	0	694	483	57	0	540	744	11	0	755
	A574 (East)	Entry to Roundabout	1003	106	89	1198	1348	56	23	1426	999	104	89	1192	1357	54	22	1434	1034	105	89	1229	1357	54	22	1434
	Woolston Grange Avenue	Entry to Roundabout	1334	91	64	1489	967	110	36	1113	1417	96	68	1581	1006	115	37	1158	1419	96	68	1583	1006	115	37	1158
	A574 (West)	Entry to Roundabout	652	58	44	755	696	47	5	748	647	58	47	751	707	49	5	761	660	59	47	765	706	50	5	761
A49 / Golborne Road	A49 (North)	Left to Golborne Road	125	5	0	130	67	8	0	75	134	5	0	139	71	8	0	79	132	5	0	137	72	8	0	80
		Ahead to A49 (South)	439	52	28	518	405	27	0	432	454	55	29	538	422	28	0	450	455	55	29	539	420	28	0	448
	Golborne Road	Left to A49 (South)	330	33	32	394	312	18	14	344	383	33	33	450	298	19	12	329	345	30	33	408	291	20	10	321
		Right to A49 (North)	63	0	0	63	30	1	21	52	74	0	0	74	26	1	21	48	74	0	0	74	27	1	21	50
	A49 (South)	Ahead to A49 (North)	325	37	0	362	740	70	17	827	330	40	0	370	737	69	16	822	336	41	0	376	774	72	17	864
		Right to Golborne Road	267	39	51	356	312	21	10	344	262	37	52	350	308	22	10	340	259	37	37	333	301	17	11	328
Europa Boulevard / A574 / Callands Road	Europa Boulevard	Entry to Roundabout	233	39	37	309	347	10	11	368	242	40	40	322	361	10	11	382	242	40	40	322	361	10	11	382
	A574 (East)	Entry to Roundabout	616	76	74	766	1088	67	19	1175	657	76	75	809	1130	71	19	1220	655	76	75	807	1131	71	19	1222
	Callands Road	Entry to Roundabout	441	28	16	485	171	14	4	188	458	28	17	503	177	15	4	196	458	28	17	503	177	15	4	196
	A574 (West)	Entry to Roundabout	553	50	72	675	572	42	29	643	579	51	75	705	600	43	30	673	580	51	75	706	601	43	30	674
Calver Road / A574	Calver Road	Left to A574 (East)	350	77	79	506	623	33	0	656	364	79	80	523	651	34	0	685	364	79	80	523	651	34	0	685
	A574 (East)	W/B to A574 (West)	616	76	74	766	1088	67	19	1175	657	76	75	809	1130	71	19	1220	655	76	75	807	1131	71	19	1222
		Right to Calver Road	235	22	51	308	414	7	36	456	243	23	53	319	425	7	37	469	242	23	53	317	426	7	37	469
	A574 (West)	Left to Calver Road	89	13	8	110	113	5	12	130	92	13	9	114	117	5	12	134	92	13	9	114	117	5	12	134
		E/B to A574 (East)	822	62	116	1000	550	40	17	607	856	63	121	1041	576	42	18	636	856	63	121	1041	577	42	18	637
A49 North		left turn to M62 east	105	30	24	158	151	9	4	164	104	31	24	158	155	8	5	168	105	32	24	161	145	8	4	158
		Stright on to A49 South	1092	190	174	1456	1184	106	51	1341	1098	187	172	1456	1175	108	49	1332	1091	189	176	1456	1188	109	48	1346
M62 East		left turn to A49 south	604	93	152	849	491	54	62	608	631	100	159	890	509	58	64	631	633	100	159	892	514	58	64	636
		right turn to A49 north	177	38	4	219	282	46	10	338	181	41	4	226	293	50	11	354	179	41	4	224	287	50	11	348
A49 South		left turn to M62 west	270	46	106	422	494	29	16	539	284	47	108	439	513	29	19	561	307	51	109	467	478	28	19	524
		straight on to A49 north	796	129	277	1201	1479	131	76	1687	821	135	286	1242	1481	132	76	1688	827	135	287	1248	1399	123	72	1594
M62 West		left turn to A49 north	497	65	48	610	560	30	12	601	494	64	50	608	588	32	12	632	494	80	34	607	576	43	11	630
		right turn to A49 south	441	61	22	524	456	83	17	556	480	67	23	569	483	86	17	586	479	51	39	570	494	75	18	587
Junction 9		East bound Internal	3345	0	1217	4562	4168	0	894	5062	3476	0	1265	4741	4327	0	928	5255	3476	0	1265	4741	4327	0	928	5255
		Westbound Internal	3931	0	1203	5134	5027	0	423	5450	4085	0	1250	5335	5220	0	439	5659	4085	0	1250	5335	5220	0	439	5659
Junction 10		Eastbound Mainline towards Manchester	1582	0	759	2342	2751	0	535	3286	1640	0	786	2426	2834	0	553	3387	1641	0	787	2428	2832	0	552	3384
		Eastbound On Slip	2273	0	598	2870	1968	0	414	2381	2355	0	619	2974	2028	0	426	2454	2357	0	620	2977	2028	0	426	2454
		Westbound On Slip M6 Northbound	1851	0	638	2489	2039	0	198	2237	1924	0	663	2587	2116	0	206	2322	1924	0	663	2587	2117	0	206	2323
		Westbound Main Line before M6 Northbound merge	2860	0	721	3581	3761	0	298	4059	2973	0	750	3723	3904	0	308	4212	2973	0	750	3723	3904	0	308	4212
		Westbound On Slip M6 Southbound	526	0	114	640	532	0	21	553	547	0	119	666	553	0	22	575	547	0	119	666	553	0	22	575
		Westbound Junction Start	2334	0	607	2941	3229	0	277	3505	2426	0	631	3057	3352	0	286	3638	2426	0	631	3057	3351	0	286	3637
Mill Lane / Mill Lane (150 Dwellings northeast of Peel Hall)	Peel Hall Mill Lane	Left to Mill Lane NB	12	0	0	12	7	0	0	7	12	0	0	12	7	0	0	7	12	0	0	12	7	0	0	7
		Right to Delph Lane SB	122	13	0	135	58	0	0	58	124	13	0	137	59	0	0	59	124	13	0	137	59	0	0	59
	Mill Lane North	North Ahead to Mill Lane	529	41	16	587	450	33	0	484	534	43	16	593	524	35	3	562	566	46	16	628	531	36	4	571
		North Right to Peel Hall	6	0	0	6	28	0	0	28	6	0	0	6	29	0	0	29	6	0	0	6	29	0	0	29
	Mill Lane South	South Left to Peel Hall	39	0	0	39	81	0	0	81	39	0	0	39	81	0	0	81	39	0	0	39	81	0	0	81
		South Ahead	325	3	5	333	488	35	16	539	398	6	5	408	532	37	17	586	408	6	22	436	540	45	16	600
Mill Lane / Blackbrook Avenue (700 Dwellings and Primary School)	Peel Hall Access	Left to Mill Lane North	24	0	0	24	15	0	0	15	58	0	0	58	38	0	0	38	100	3	19	122	86	7	0	93
		Right to Mill Lane South	126	0	0	126	73	0	0	73	348	0	0	348	191	0	0	191	357	1	6	364	289	25	12	326
	Mill Lane North	Ahead to Mill Lane South	638	54	16	709	489	34	0	523	623	56	16	695	535	35	3	573	642	55	16	714	417	24	0	441
		Right to Peel Hall Access	13	0	0	13	19	0	0	19	35	0	0	35	48	0	0	48	48	4	0	51	173	12	4	189
	Mill Lane South	Left to Peel Hall Access	51	0	0	51	119	0	0	119	173	0	0	173	300	0	0	300	178	0	2	180	385	3	0	387
		Ahead to Mill Lane North	340	3	5	348	554	35	16	605	379	6	5	390	575	37	17	629	348	3	3	353	535	37	16	588
POP West Peel Hall Access / Poplars Ave (330 Dwellings, Care Home and Local Centre)	Cotswold Road	Left to Peel Hall Access	54	0	8	61	1	0	4	5	52	0	7	59	8	0	4	12	12	0	0	12	12	0	0	12
		Ahead to Poplars	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	293	29	5	327	216	14	0	230
	Peel Hall Access	Left to Poplars	35	0	9	44	45	0	5	50	35	0	9	44	45	0	4	49	83	0	0	83	45	0	0	45
		Right to Cotswold Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	0	0	18	18	0	0	18
	Poplars Avenue	Ahead to Cotswold Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	251	20	24	295	338	31	11	381
		Right to Peel Hall Access	9	0	2	11	17	0	0	17	8	0	2	10	9	0	0	9	35	0	0	35	82	0	0	82

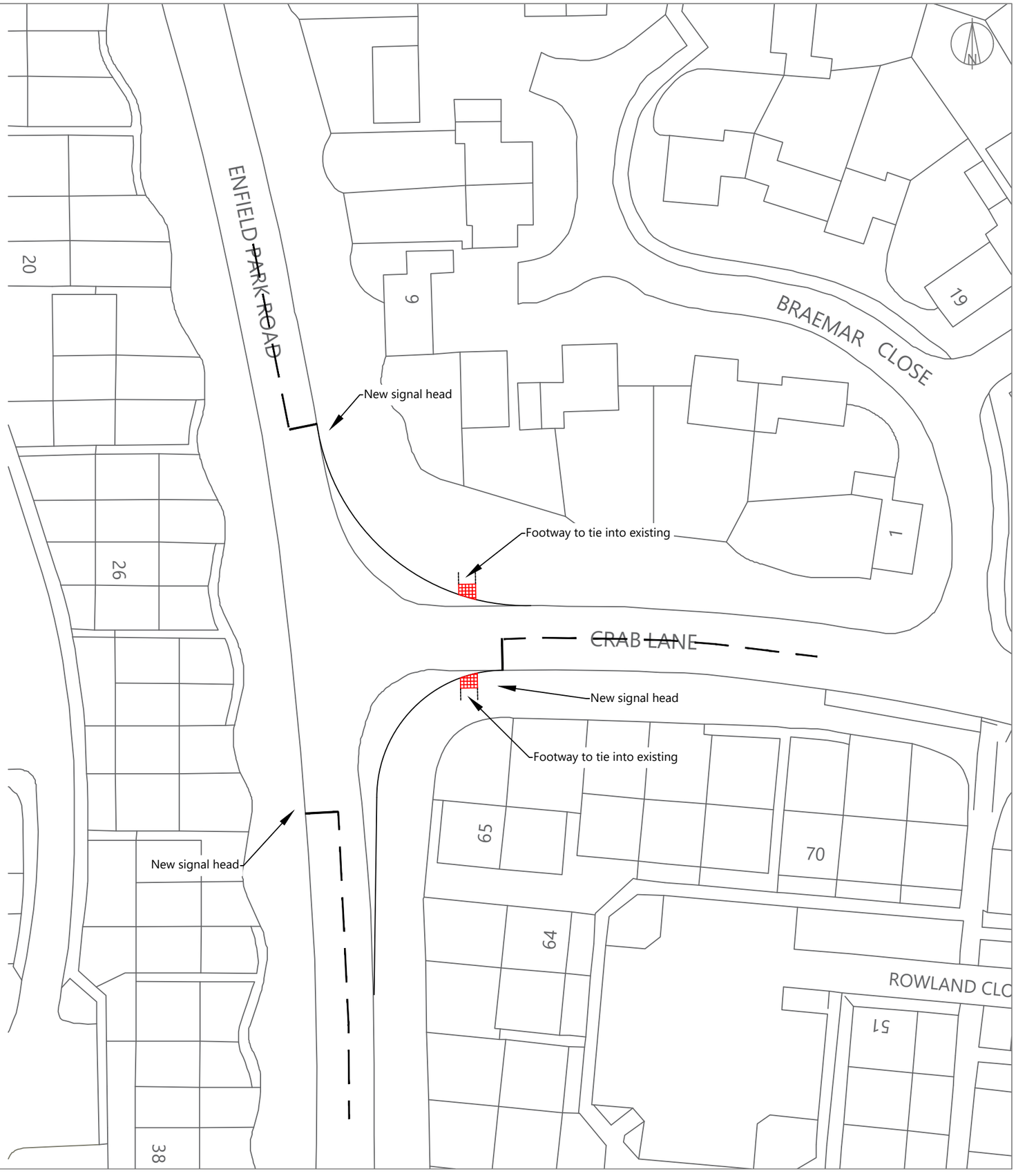
POP cenral Poplars Avenue West (Employment Land)	Poplars East	Left to Peel Hall Access	71	0	0	71	18	0	0	18	32	0	0	32	26	0	0	26							
		Ahead to Poplars West	328	31	12	372	296	27	0	323	359	32	12	403	324	27	0	351							
	Peel Hall Access	Left to Poplars West	140	0	0	140	170	0	0	170	163	0	0	163	120	0	0	120							
		Right to Poplars East	33	0	0	33	128	0	0	128	35	0	0	35	61	0	0	61							
	Poplars West	Ahead to Poplars East	254	20	19	293	438	42	5	486	298	20	21	339	505	44	7	557							
		Right to Peel Hall Access	85	0	0	85	293	0	0	293	71	0	0	71	212	0	0	212							
Grassmere Avenue (Sports Pitches and Club House)	Poplars Eastbound	Left to Grasmere/ Windermere	123	0	0	123	92	14	0	106	119	0	0	119	92	14	0	106	114	0	0	114	89	14	0	104
		Ahead to Poplars	414	33	13	460	429	27	0	456	487	35	12	534	450	31	0	481	356	32	5	392	200	10	0	210
	Windermere/ Grasmere	Left to Poplars Westbound	46	0	0	46	45	0	0	45	48	0	0	48	46	0	0	46	52	0	0	52	46	0	0	46
		Right to Poplars Eastbound	150	23	8	181	113	2	2	118	151	23	9	183	118	2	2	122	147	23	9	179	117	2	2	121
	Poplars Westbound	Ahead to Poplars Eastbound	217	13	19	248	676	46	3	726	304	23	21	348	674	48	5	727	222	21	24	267	385	35	9	429
		Right to Grasmere/ Windermere	52	0	0	52	30	0	0	30	59	0	0	59	30	0	0	30	64	0	0	64	33	0	0	33
Peel Hall Access/ Poplars Ave/ Cotswold	Cotswold Road	Left to Poplars New																	63	0	18	81	0	0	0	0
	Peel Hall Access	Ahead to Poplars																	166	4	9	178	315	15	8	338
	Poplars Avenue	Ahead to Peel Hall Access																	183	4	31	218	250	31	15	296
A49 / Thorugh Route	A49 North	Left to Peell Hall Access Road																	81	3	23	106	175	30	13	219
		Straight on Southbound to A49																	1602	206	286	2094	1226	127	80	1433
	Peel Hall Access Road	Left turn to A49 South																	110	0	9	119	123	0	2	125
		Right turn to A49 North																	118	4	18	140	192	15	6	213
	A49 South	Straight on Northbound to A49																	1015	183	378	1575	1816	147	91	2053
		Right turn to Peel Hall Access Road																	104	1	8	113	75	0	2	77

Do Soemthing Link Counts Actual Flows

Junction	Road	Traffic Direction	2025 Do Something								2030 Do Something								2030 Do Something Through Route							
			AM PEAK 0800 - 0900				PM PEAK 1700-1800				AM PEAK 0800 - 0900				PM PEAK 1700-1800				AM PEAK 0800 - 0900				PM PEAK 1700-1800			
			Cars	LGV	HGV	All Traffic	Cars	LGV	HGV	All Traffic	Cars	LGV	HGV	All Traffic	Cars	LGV	HGV	All Traffic	Cars	LGV	HGV	All Traffic	Cars	LGV	HGV	All Traffic
Southworth Lane / Delph Lane / Myddleton Lane	Southworth Lane	Westbound Junction Entry	264	20	9	293	513	33	3	550	277	22	9	308	536	35	4	575	276	22	9	307	537	35	4	576
		Eastbound Junction Exit	410	30	20	460	207	19	0	226	426	30	20	476	216	20	0	235	424	30	22	476	219	20	0	239
	Delph Lane	Northbound Junction Entry	337	3	5	345	495	35	16	546	410	6	5	420	539	37	17	593	420	6	22	448	547	45	16	607
		Southbound Junction Exit	569	44	17	629	478	34	0	512	573	46	17	635	553	36	3	591	607	49	16	672	560	36	4	600
	Myddleton Lane	Eastbound Junction Entry	822	67	29	918	501	36	0	538	813	66	29	908	545	38	0	583	810	65	13	889	530	32	0	562
		Westbound Junction Exit	444	17	6	467	825	52	20	896	501	18	6	525	851	55	18	924	476	14	6	496	835	55	16	906
Newton Road / A49 / Winwick Park Avenue	Newton Road	Southbound Junction Entry	768	85	60	913	717	44	14	775	837	88	62	988	719	47	13	779	800	85	63	947	711	47	11	769
		Northbound Junction Exit	592	76	51	719	1052	92	27	1171	592	77	52	720	1045	91	27	1163	595	78	37	710	1075	89	28	1192
	A49 (East)	Westbound Junction Entry	622	120	154	896	846	104	44	994	647	124	160	931	884	111	45	1040	647	124	160	931	885	111	45	1041
		Eastbound Junction Exit	623	99	158	880	758	88	15	861	647	104	161	912	768	89	16	872	651	105	162	918	789	91	16	896
	A49 (South)	Northbound Junction Entry	943	160	205	1309	1667	148	40	1855	947	164	208	1319	1690	148	40	1879	940	165	193	1298	1659	141	40	1840
		Southbound Junction Exit	1177	181	209	1568	1262	105	55	1422	1245	187	217	1649	1249	109	53	1411	1211	184	218	1613	1250	110	51	1412
	Winwick Park Avenue	Eastbound Junction Entry	178	0	6	184	72	11	3	86	185	0	6	191	75	11	3	89	185	0	6	191	75	11	3	89
		Westbound Junction Exit	53	0	0	53	130	11	0	141	55	0	0	55	129	11	0	140	55	0	0	55	136	11	0	147
A49 / Delph Lane	A49 (North)	Southbound Junction Entry	1177	181	209	1568	1262	105	55	1422	1245	187	217	1649	1249	109	53	1411	1211	184	218	1613	1250	110	51	1412
		Northbound Junction Exit	944	160	205	1309	1665	149	42	1855	948	164	208	1319	1688	149	42	1879	942	164	192	1298	1656	142	42	1840
	A49 (South)	Northbound Junction Entry	1077	193	199	1469	1659	171	30	1860	1082	198	202	1481	1676	174	30	1880	1071	198	186	1456	1646	167	30	1843
		Southbound Junction Exit	1270	234	209	1713	1335	115	55	1505	1341	243	217	1801	1331	117	53	1501	1302	240	218	1760	1334	118	51	1503
	Delph Lane	Eastbound Junction Entry	231	59	6	296	362	41	12	415	240	63	6	309	379	41	12	432	240	63	6	309	379	41	12	432
		Westbound Junction Exit	272	40	0	312	283	54	0	337	278	41	0	319	285	58	0	343	279	41	0	320	286	58	0	343
A49 / Birch Avenue	A49 (North)	Southbound Junction Entry	1609	202	287	2098	1344	143	93	1580	1663	208	291	2162	1388	148	94	1630	1681	211	310	2202	1410	155	93	1659
	Birch Avenue	Eastbound Junction Entry	33	4	0	37	21	2	0	23	34	4	0	38	21	2	0	23	34	4	0	38	21	2	0	23
		Westbound Junction Exit	21	6	0	27	30	0	0	30	21	5	0	26	30	0	0	30	21	5	0	27	30	0	0	30
A49 / Sandy Lane West / A574	A49 (North)	Southbound Junction Entry	1621	201	287	2110	1335	145	93	1573	1676	207	292	2175	1379	151	94	1624	1701	205	294	2200	1348	128	82	1558
		Northbound Junction Exit	1129	212	383	1723	1986	160	93	2239	1180	219	394	1793	2012	161	95	2268	1194	220	386	1800	1910	147	93	2150
	Sandy Lane West	Westbound Junction Entry	499	35	46	580	863	38	18	920	555	35	48	638	879	40	20	939	423	35	26	484	656	27	21	703
		Eastbound Junction Exit	658	50	26	734	508	26	8	542	697	56	28	782	546	26	7	580	619	62	14	696	183	0	0	183
	A49 (South)	Northbound Junction Entry	1038	198	324	1560	1883	150	74	2107	1073	209	334	1616	1899	150	73	2122	1076	209	329	1615	1895	149	69	2112
		Southbound Junction Exit	1517	192	289	1998	1252	148	50	1450	1527	193	290	2011	1265	153	51	1469	1525	187	292	2004	1209	142	38	1390
	A574	Eastbound Junction Entry	1173	139	195	1506	1173	73	17	1263	1220	142	201	1564	1227	76	18	1321	1221	142	201	1564	1228	76	18	1322
		Westbound Junction Exit	851	98	126	1074	1502	74	55	1631	901	99	128	1128	1555	78	56	1688	898	99	128	1124	1557	78	56	1691
Cotswold Road / Cleveland Road / Sandy Lane / Sandy Lane West	Cotswold Road	Southbound Junction Entry	132	2	12	146	88	0	3	91	136	2	12	150	92	0	3	95	114	2	12	128	93	0	3	96
		Northbound Junction Exit	83	0	9	92	118	5	4	127	81	0	9	91	126	5	4	135	73	0	20	93	120	5	0	125
	Cleveland Road	Westbound Junction Entry	303	25	28	355	573	43	14	629	350	25	30	404	578	45	15	637	262	25	26	313	332	31	15	379
		Eastbound Junction Entry	417	20	15	451	285	26	0	311	410	20	14	445	312	27	0	339	330	18	7	355	192	14	0	206
	Sandy Lane	Northbound Junction Entry	88	0	0	88	197	0	3	201	91	0	0	91	205	0	4	209	90	0	0	90	201	0	2	203
		Southbound Junction Exit	173	17	0	190	128	0	0	128	222	21	4	247	133	0	0	133	248	30	4	282	136	0	0	136
	Sandy Lane West	Eastbound Junction Entry	575	37	25	636	432	26	3	461	612	42	27	681	468	27	2	497	518	48	13	579	351	14	0	365
		Westbound Junction Exit	425	27	40	491	759	38	18	815	475	27	42	544	771	40	20	831	333	27	21	380	529	27	20	576
Poplars Avenue / Cleveland Road	Poplars Avenue (East)	Northbound Junction Entry	287	20	19	326	566	43	5	614	333	20	21	374	566	44	7	618	269	20	24	313	356	31	12	399
		Southbound Junction Exit	398	32	12	442	314	27	0	341	390	32	12	434	350	27	0	377	304	30	5	339	229	14	0	243
	Cleveland Road	Southbound Junction Entry	361	20	12	393	265	27	0	292	350	21	12	382	292	27	0	319	265	18	5	287	171	14	0	186
		Northbound Junction Exit	277	20	28	325	534	43	10	586	322	20	30	372	534	44	11	590	232	20	26	278	287	31	12	330
	Poplars Avenue (West)	Eastbound Junction Entry	84	12	11	106	105	0	5	110	85	12	11	108	108	0	4	111	51	12	2	65	63	0	0	63
		Westbound Junction Exit	56	0	2	58	89	0	0	89	57	0	2	59	82	0	0	82	49	0	0	49	75	0	0	75
Poplars Avenue / Howson Road	Poplars Avenue (East)	Northbound Junction Entry	367	35	27	429	790	48	5	843	454	46	30	530	791	50	7	848	369	44	33	445	502	37	11	551
		Southbound Junction Exit	537	33	12	582	521	41	0	562	606	35	12	653	542	45	0	587	469	32	5	506	290	24	0	314
	Howson Road	Eastbound Junction Entry	135	13	0	148	119	14	0	133	144	14	0	158	157	18	0	175	136	14	0	150	69	10	0	79
		Westbound Junction Exit	94	27	8	129	122	6	0	128	144	37	9	190	133	6	0	139	125	36	9	169	122	6	0	128
	Poplars Avenue (West)	Southbound Junction Entry	468	32	12	512	466	27	0	493	521	33	12	566	444	28	0	471	375	30	5	409	261	14	0	275
		Northbound Junction Exit	339	20	19	378	731	42	5	779	370	20	21	411	717	44	7	769	286	20	24	330	420	31	11	463
Mill Lane / Enfield Park Road / Blackbrook Avenue / Ballater Drive	Mill Lane	Southbound Junction Entry	763	55	17	835	562	34	0	596	968	58	17	1042	726	36	3	764	997	58	22	1078	706	49	12	767
		Northbound Junction Exit	390	3	5	399	674	35	16	724	552	6	5	563	875	37	17	929	526	3	5	534	919	40	16	975
	Enfield Park Road	Westbound Junction Entry	193	13	0	206	265	24	0	289	201	13	0	214	275	25	0	300	202	13	0	215	275	25	0	300
		Eastbound Junction Entry	233	0	6	239	183	0	0	183	244	0	6	249	189	0	0	189	244	0	6	249	188	0	0	188
	Blackbrook Avenue	Northbound Junction Entry	315	3	5	323	660	25	16	701	473	6	5	483	859	26	17	902	444	3	5	452	859	29	16	903
		Southbound Junction Exit	722	68	11	801	549	41	0	590	923	71	11	1005	712	43	3	757	952	71	17	1039	648	56	12	716
	Ballater Drive	Eastbound Junction Entry	98	0	0	98	24	0	0	24	102	0	0	102	25	0	0	25	102	0	0	102	25	0	0	25
		Westbound Junction Exit	24	0	0	24	107	7	0	114	24	0	0	24	110	7	0	117	25	0	0	25	110	7	0	117
Blackbrook Avenue / Enfield Park Road / Capesthorne Road	Blackbrook Avenue (North)	Southbound Junction Entry	722	68	11	801	549	41	0	590	923	71	11	1005	712	43	3	757	952	71	17	1039	648	56	13	717
		Northbound Junction Exit	315	3	5	323	660	25	16	701	473	6	5	483	860	26	16	902	444	3	5	452	859	29	15	903
	Enfield Park Road	Westbound Junction Entry	353	14	0	367	712	12	14	738	390	15	0	405	763	12	14	790	398	14	0	412	759	12	14	786
		Eastbound Junction Entry	506	44	0	551	286	30	0	315	599	45	0	644	328	29	0	357	619	48	0	667	333	29	0	362
	Blackbrook Avenue (South)	Northbound Junction Entry	250	14	0	264	403	11	3	416	300	15	0	315	386	9	2	396	320	17	0	336	413	9	1	423
		Southbound Junction Exit	403	34	8	446	369	38	0	407	425	29	8	462	400	40	0	440	423	27	14	464	376	43	13	431
	Capesthorne Road	Eastbound Junction Entry	556	36	5	596	582	51	0	633	638	32	5	675	696	53	0	748	550	28	5	584	562	30	0	593
		Westbound Junction Exit	656	49	3	708	931	23	0	955	755	53	3	811	969	21	3	993	733	53	3	789	815	7	0	822
Poplars Avenue / Capesthorne Road	Poplars Avenue (North)	Southbound Junction Entry	475	36	13	523	458	27	0	486	554	38	12	604	486	31	0	517	428	35	5	467	242	10	0	251
		Northbound Junction Exit	278	20	19	316	698	46	3	748	376	30	21	427	703	48	5	757	303	28	24	355	409	35	9	453
	Capesthorne Road (East)	Westbound Junction Entry	545	40	3	588	852	23	0	875	672	48	3	723	894	21	3	918	663	50	3	716	757	16	0	773
		Eastbound Junction Entry	569	25	5	599	529	43	0	572	686	27	5	717	643	44	0	687	613	24	5	642	530	30	0	561
	Poplars Avenue (South)	Northbound Junction Entry	288	19	16	322	422	40	3	465	309	18	18	345	404	42	2	449	300	19	23	342	460	51	9	520
		Southbound Junction Exit	544	55	8	606	366	8	0	374	559	52	8	619	300	9	0	308	563	56	2	621	378	17	0	396
	Capesthorne Road (West)	Eastbound Junction Entry	346	4	0	350	337	16	0	353	361	4	0	365	354	16	0	370	362	4	0	366	354	16	0	370
		Westbound Junction Exit	263	0	0	263	476	10	0	486	275	0	0	275	493	10	0	503	274	0	0	274	496	10	0	506
A49 / Long Lane / Hawleys Lane	A49 (North)	Southbound Junction Entry	1441	192	249	1882	1203	131	21	1355	1451	193	250	1893	1225	134	21	1380	1448	187	251	1886	1163	123	9	1295
		Northbound Junction Exit	983	181	242	1405	1840	149	49	2038	1017	190	250	1457	1904	153	50	2108	1022	190	245	1457	1911	153	46	2109
	Long Lane	Westbound Junction Entry	707	50	52	808	508	42	5	555	735	53	51	839	522	43	6	572	759	62	47	867	510	42	0	552
		Eastbound Junction Entry	289	28	4	321	661	51	14	726	307	29	0	336	681	52	14	747	306	29	0	335	607	40	0	648
	A49 (South)	Northbound Junction Entry	1028	181	217	1426	1873	159	45	2077	1061	188	223	1472	1933	165	46	2144	1062	188	223	1473	1934	165	46	2145
		Southbound Junction Exit	1824	250	265	2339	1258	134	8	1401	1848	254	267	2370	1275	138	8	1422	1866	257	269	2392	1277	139	8	1424
	Hawleys Lane	Eastbound Junction Entry	215	43	0	258	431	29	0	460	223	46	0	269	442	29	0	471	223	46	0	269	447	29	0	476
		Westbound Junction Exit	294	7	7	308	255	26	0	281	299	7	7	312	262	28	0	290	299	7	7	312	259	28	0	286
Blackbrook Avenue / Insall Road / Hilden Road	Blackbrook Avenue (North)	Southbound Junction Entry	397	34	9	439	373	38	0	411	418	29	8	455	405	40	0	445	416	27	14	457	381	43	13	436
		Northbound Junction Exit	210	20	0	230	425	11	3	439	259	22	0	281	409	9	2	420	278	24	0	302	436	9	1	446
	Insall Road	Westbound Junction Entry	363	13	0	376	260	0	0	260	387	13	0	400	313	0	0	313	387	13	0	400	261	0	0	261
		Eastbound Junction Entry	297	0	0	297	181	18	0	199	304	1	0	305	197	19	0	216	280	0	0	280	196	18	0	215
	Blackbrook Avenue (South)	Northbound Junction Entry	319	19	0	338	360	11	3	373	337	19	0	356	362	9	2	373	335	21	0	356	372	9	1	382
		Southbound Junction Exit	525	43	9	576	428	38	0	466	504	36	8	549	451	40	0	491	509	35	14	558	411	31	13	455
	Hilden Road	Eastbound Junction Entry	226	0	0	226	277	18	0	295	221	1	0	222	279	19	0	297	208	0	0	208	264	7	0	270
		Westbound Junction Exit	274	3	0	277	236	0	0	236	296	3	0	299	301	0	0	301	280	2	0	282	233	0	0	233
	A50	Eastbound Junction Entry	904	100	8	1012	895	66	12	974	917	100	7	1024	855	68	13	935	918	103	2	1023	870	65	0	935
		Westbound Junction Exit	935	87	22	1043	1050	59	8	1117	914	79	22	1016	1069	65	9	1143	903	81	22	1007	1038	65	9	1112

A50 / Hilden Road / Orford Road / Smith Drive	Hilden Road	Westbound Junction Entry	303	14	0	317	277	11	0	288	361	18	0	378	341	13	0	354	357	17	0	374	268	13	0	280
		Eastbound Junction Exit	247	6	0	253	390	45	0	434	281	9	0	291	392	45	0	438	277	8	0	286	367	34	0	401
	Orford Road	Northbound Junction Entry	752	65	22	839	915	63	8	986	835	67	23	925	892	66	8	967	831	68	22	922	901	66	9	976
		Southbound Junction Exit	689	87	8	785	789	61	12	863	825	99	8	932	781	64	13	858	837	101	2	940	787	73	0	860
	Smith Drive	Eastbound Junction Entry	245	0	0	245	409	33	0	442	254	0	0	254	426	35	0	461	255	0	0	255	425	35	0	460
		Westbound Junction Exit	333	0	0	333	268	8	0	276	344	0	0	344	272	8	0	279	342	0	0	342	271	8	0	279
Blackbrook Avenue / A574	Blackbrook Avenue (North)	Southbound Junction Entry	524	43	9	576	426	38	0	463	494	35	8	537	447	40	0	487	497	34	14	545	410	31	13	453
		Northbound Junction Exit	319	19	0	338	361	11	3	375	337	19	0	356	363	9	2	374	335	21	0	356	373	9	1	383
	A574 (East)	Westbound Junction Entry	595	77	32	704	804	27	3	834	593	77	32	703	804	26	3	834	575	78	31	684	849	26	3	879
		Eastbound Junction Entry	652	58	44	755	696	47	5	748	647	58	47	751	707	50	5	761	659	59	47	765	706	50	5	761
	Blackbrook Avenue (South)	Northbound Junction Entry	723	42	21	786	761	52	5	818	768	44	22	834	774	56	4	834	767	44	22	833	775	56	4	835
		Southbound Junction Exit	926	95	33	1054	931	68	16	1015	984	96	33	1113	937	72	16	1024	974	95	32	1101	936	72	16	1023
	A574 (West)	Eastbound Junction Entry	666	67	34	767	825	36	17	878	736	73	36	845	826	37	18	881	736	74	30	840	790	46	5	841
		Westbound Junction Exit	611	57	19	686	828	26	2	856	623	57	18	698	845	29	2	876	606	56	18	680	809	29	3	841
A50 / A574	A50 (North)	Southbound Junction Entry	689	87	8	785	789	61	12	863	825	99	8	932	781	64	13	858	837	101	2	940	787	73	0	860
		Northbound Junction Exit	752	65	22	839	913	64	8	986	834	68	23	925	890	67	9	966	830	69	23	921	898	67	9	975
	A574	Westbound Junction Entry	610	57	19	686	799	25	2	826	622	57	18	698	808	27	2	837	605	57	18	680	783	27	2	812
		Eastbound Junction Exit	666	67	35	767	826	35	17	878	736	73	36	845	827	37	18	881	736	73	31	840	790	46	5	841
	A50 (South)	Northbound Junction Entry	705	72	46	823	916	57	11	984	731	72	49	852	895	58	12	965	730	72	49	851	895	58	12	965
		Southbound Junction Exit	588	85	16	689	765	44	0	809	609	88	15	713	768	44	0	812	607	88	15	710	776	44	0	821
Crab Lane / A574 / Woolston Grange Avenue	Crab Lane	Southbound Junction Entry	459	56	0	515	643	11	0	654	501	57	0	559	683	11	0	694	483	57	0	540	744	11	0	755
		Northbound Junction Exit	649	22	29	701	607	37	0	644	654	23	30	707	666	38	0	704	643	20	29	691	670	38	0	707
	A574 (East)	Westbound Junction Entry	1003	106	89	1198	1348	56	23	1426	999	104	89	1192	1357	54	22	1434	1034	105	89	1229	1357	54	22	1434
		Eastbound Junction Exit	1417	127	106	1650	1082	111	38	1231	1433	125	108	1667	1129	116	39	1285	1441	124	106	1672	1131	117	39	1287
	Woolston Grange Avenue	Northbound Junction Entry	1334	91	64	1489	967	110	36	1113	1417	96	68	1581	1006	115	37	1158	1419	96	68	1583	1006	115	37	1158
		Southbound Junction Exit	762	83	33	878	1163	45	22	1230	774	82	33	889	1158	45	22	1224	773	82	33	888	1166	45	22	1233
	A574 (West)	Eastbound Junction Entry	652	58	44	755	696	47	5	748	647	58	47	751	707	49	5	761	660	59	47	765	706	50	5	761
		Westbound Junction Exit	595	77	32	704	804	27	3	834	593	77	32	703	804	26	3	834	575	78	31	684	849	26	3	879
A49 / Golborne Road	A49 (North)	Southbound Junction Entry	563	57	28	648	471	35	0	506	588	60	29	677	492	36	0	528	587	60	29	676	492	36	0	528
		Northbound Junction Exit	388	37	0	425	770	71	37	879	404	40	0	444	763	70	38	870	410	41	0	451	802	73	39	914
	Golborne Road	Westbound Junction Entry	393	33	32	457	343	19	34	396	457	33	33	524	324	20	33	377	419	30	33	482	319	21	32	371
		Eastbound Junction Exit	392	44	51	486	379	29	10	419	396	42	52	489	379	30	10	419	391	42	37	470	373	25	11	409
	A49 (South)	Northbound Junction Entry	592	76	51	719	1052	92	27	1171	592	77	52	720	1045	91	27	1163	595	78	37	710	1075	89	28	1192
		Southbound Junction Exit	768	85	60	913	717	45	14	775	837	88	62	988	720	47	12	779	800	85	62	947	711	48	10	769
Europa Boulevard / A574 / Callands Road	Europa Boulevard	Southbound Junction Entry	233	39	37	309	347	10	11	368	242	40	40	322	361	10	11	382	242	40	40	322	361	10	11	382
		Northbound Junction Exit	274	16	29	318	56	11	0	67	286	17	30	332	0	0	0	0	286	17	29	332	1646	167	30	1843
	A574 (East)	Westbound Junction Entry	616	76	74	766	1088	67	19	1175	657	76	75	809	1130	71	19	1220	655	76	75	807	1131	71	19	1222
		Eastbound Junction Exit	911	75	124	1110	663	45	29	737	948	76	130	1155	0	0	0	0	948	76	130	1155	529	45	59	634
	Callands Road	Northbound Junction Entry	441	28	16	485	171	14	4	188	458	28	17	503	177	15	4	196	458	28	17	503	177	15	4	196
		Southbound Junction Exit	71	13	15	99	277	30	0	307	79	12	15	106	0	0	0	0	78	12	15	106	903	98	34	1035
	A574 (West)	Eastbound Junction Entry	553	50	72	675	572	42	29	643	579	51	75	705	600	43	30	673	580	51	75	706	601	43	30	674
		Westbound Junction Exit	587	90	32	708	1183	48	34	1264	623	90	33	746	0	0	0	0	622	90	33	745	1041	78	44	1164
Calver Road / A574	Calver Road	Southbound Junction Entry	350	77	79	506	623	33	0	656	364	79	80	523	651	34	0	685	364	79	80	523	651	34	0	685
		Northbound Junction Exit	324	35	59	418	527	12	48	586	336	35	62	433	542	12	49	602	334	35	61	431	543	12	49	603
	A574 (East)	Westbound Junction Entry	850	98	126	1074	1502	74	55	1631	901	99	128	1128	1554	78	56	1688	898	99	128	1124	1557	78	56	1691
		Eastbound Junction Exit	1172	139	195	1506	1173	73	17	1263	1220	142	201	1564	1227	76	18	1321	1220	142	201	1564	1228	76	18	1322
	A574 (West)	Eastbound Junction Entry	911	75	124	1110	663	45	29	737	948	76	130	1155	693	47	30	770	948	76	130	1155	694	47	30	771
		Westbound Junction Exit	616	76	74	766	1088	67	19	1175	657	76	75	809	1130	71	19	1220	655	76	75	807	1131	71	19	1222
A49 North		Southbound Junction Entry	1197	220	198	1614	1335	115	56	1505	1202	217	195	1614	1330	117	54	1501	1196	220	201	1616	1333	118	52	1503
		Northbound Junction Exit	1077	193	199	1469	2219	171	30	2419	1082	198	202	1481	1676	174	30	1880	1071	198	186	1456	1646	167	30	1843
M62 East		Westbound Off Slip	781	131	156	1068	773	100	73	946	812	141	163	1116	801	108	75	984	812	141	163	1116	801	108	75	984
		Eastbound On Slip	511	85	142	739	549	46	61	656	519	88	144	751	532	45	60	637	523	88	145	757	529	45	59	634
A49 South		Northbound Junction Entry	1066	175	383	1623	1973	160	93	2226	1105	182	394	1682	1993	161	95	2249	1133	187	395	1715	1877	151	90	2118
		Southbound Junction Exit	1000	111	139	1250	856	90	34	980	1024	110	138	1273	886	92	34	1012	1041	113	156	1310	903	98	34	1035
M62 West		Eastbound Off Slip	938	126	70	1134	1016	113	28	1158	973	131	73	1177	1070	118	29	1217	973	131	73	1177	1070	118	29	1217
		Westbound On Slip	645	151	149	945	1071	79	45	1196	661	155	152	967	1074	81	46	1201	669	157	154	979	1041	78	44	1164
Junction 9		Eastbound M62	3345	0	1217	4562	4168	0	894	5062	3476	0	1265	4741	4327	0	928	5255	3476	0	1265	4741	4327	0	928	5255
		Westbound M62	3931	0	1203	5134	5027	0	423	5450	4085	0	1250	5335	5220	0	439	5659	4085	0	1250	5335	5220	0	439	5659
Junction 10		Eastbound Mainline towards Manchester	1582	0	759	2342	2751	0	535	3286	1640	0	786	2426	2834	0	553	3387	1641	0	787	2428	2832	0	552	3384
		Eastbound On Slip	2273	0	598	2870	1968	0	414	2381	2355	0	619	2974	2028	0	426	2454	2357	0	620	2977	2028	0	426	2454
		Westbound On Slip M6 Northbound	1851	0	638	2489	2039	0	198	2237	1924	0	663	2587	2116	0	206	2322	1924	0	663	2587	2117	0	206	2323
		Westbound Main Line before M6 Northbound merge	2860	0	721	3581	3761	0	298	4059	2973	0	750	3723	3904	0	308	4212	2973	0	750	3723	3904	0	308	4212
		Westbound On Slip M6 Southbound	526	0	114	640	532	0	21	553	547	0	119	666	553	0	22	575	547	0	119	666	553	0	22	575
		Westbound Junction Start	2334	0	607	2941	3229	0	277	3505	2426	0	631	3057	3352	0	286	3638	2426	0	631	3057	3351	0	286	3637
Mill Lane / Mill Lane	Peel Hall Mill Lane	Eastbound Junction Entry	134	13	0	147	65	0	0	65	136	13	0	149	66	0	0	66	136	13	0	149	66	0	0	66
		Westbound Junction Exit	45	0	0	45	109	0	0	109	45	0	0	45	110	0	0	110	45	0	0	45	110	0	0	110
	Mill Lane North	Southbound Junction Entry	536	41	16	593	478	33	0	512	540	43	16	599	553	35	3	591	573	46	16	634	560	36	4	600
		Northbound Junction Exit	337	3	5	345	495	35	16	546	410	6	5	420	539	37	17	593	420	6	22	448	547	45	16	607
	Mill Lane South	Northbound Junction Entry	364	3	5	372	569	35	16	620	437	6	5	448	613	37	17	667	447	6	22	475	621	45	16	681
		Southbound Junction Exit	651	54	16	721	508	33	0	542	657	56	16	729	583	35	3	621	690	59	16	765	590	36	4	630
Mill Lane / Blackbrook Avenue (700 Dwellings and Primary School)	Peel Hall Access	Eastbound Junction Entry	150	0	0	150	88	0	0	88	406	0	0	406	229	0	0	229	457	4	25	486	375	32	12	420
		Westbound Junction Exit	63	0	0	63	139	0	0	139	208	0	0	208	348	0	0	348	226	4	2	232	558	14	4	576
	Mill Lane North	Southbound Junction Entry	651	54	16	721	508	34	0	542	657	56	16	729	583	35	3	621	690	59	16	765	590	36	4	630
		Northbound Junction Exit	364	3	5	372	569	35	16	620	437	6	5	448	613	37	17	667	447	6	22	475	621	44	16	681
	Mill Lane South	Northbound Junction Entry	390	3	5	399	673	35	16	724	552	6	5	563	875	37	17	929	526	3	5	534	919	40	16	975
		Southbound Junction Exit	764	54	16	835	562	34	0	596	970	56	16	1042	726	35	3	764	999	56	22	1078	706	49	12	767
Peel Hall Access / Poplars Ave (330 Dwellings, Care Home and Local Centre)	Cotswold Road	Southbound Junction Entry	54	0	8	61	1	0	4	5	52	0	7	59	8	0	4	12	305	29	5	338	228	14	0	243
		Northbound Junction Exit	9	0	2	11	17	0	0	17	8	0	2	10	9	0	0	9	52	0	0	52	100	0	0	100
	Peel Hall Access	Southbound Junction Entry	35	0	9	44	45	0	5	50	35	0	9	44	45	0	4	49	101	0	0	101	63	0	0	63
		Northbound Junction Exit	62	0	10	72	18	0	4	22	60	0	9	69	17	0	4	21	46	0	0	46	95	0	0	95
	Poplars Avenue	Northbound Junction Entry	9	0	2	11	17	0	0	17	8	0	2	10	9	0	0	9	286	20	24	330	420	31	11	463
		Southbound Junction Exit	35	0	9	44	45	0	5	50	35	0	9	44	45	0	4	49	376	29	5	409	261	14	0	275
Poplars Avenue West (Employment Land)	Poplars East	Westbound Junction Entry	399	31	12	443	314	27	0	341	391	32	12	435	350	27	0	378								
		Eastbound junction Exit	287	20	19	326	566	42	5	614	333	20	21	374	566	44	7	618								
	Peel Hall Access	Southbound Junction Entry	173	0	0	173	298	0	0	298	198	0	0	198	181	0	0	181								
		Northbound Junction Exit	156	0	0	156	311	0	0	311	103	0	0	103	238	0	0	238								
	Poplars West	Eastbound Junction Entry	339	20	19	378	731	42	5	779	370	20	21	411	717	44	7	769								
		Westbound Junction Exit	468	31	12	512	466	27	0	493	522	32	12	566	444	27	0	471								
Grassmere Avenue (Sports Pitches and Club House)	Poplars East	Westbound Junction Entry	537	33	13	582	521	41	0	562	606	35	12	653	542	45	0	587	470	32	5	506	290	24	0	314
		Eastbound Junction Exit	367	36	27	429	790	48	5	843	454	46	30	530	791	50	7	848	369	44	33	445	502	37	11	551
	Grasmere/Windermere	Southbound Junction Entry	196	23	8	227	158	2	2	162	199	23	9	231	164	2	2	168	199	23	9	231	164	2	2	168
		Northbound Junction Exit	175	0	0	175	122	14	0	136	177	0	0	177	122	14	0	136	178	0	0	178	123	14	0	137
	Poplars West	Eastbound Junction Entry	269	13	19	300	706	46	3	756	362	23	21	406	704	48	5	757	286	21	24	331	418	35	9	463
		Westbound Junction Exit	460	33	13	505	473	27	0	501	535	35	12	582	496	31	0	527	408	32	5	444	247	10	0	256
Peel Hall Access/ Poplars Ave/ Cotswold	Cotswold Road	Northbound Junction Entry																	63	0	18	81	0	0	0	0
	Peel Hall Access	Westbound Junction Entry																	166	4	9	178	315	15	8	338
		Eastbound Junction Exit																	229	4	26	259	315	15	8	338
	Poplars Avenue	Eastbound Junction Entry																	183	4	31	218	250	31	15	296

	Poplars Avenue	Westbound Junction Exit																	183	4	31	218	250	31	15	296
A49 / Thorugh Route	A49 North	Southbound Junction Entry																	1683	208	309	2200	1401	157	94	1652
		Northbound Junction Exit																	1133	187	395	1715	2008	161	97	2266
	Peel Hall Access Road	Westbound Junction Entry																	229	4	27	259	315	15	8	338
		Eastbound Junction Exit																	184	4	31	219	250	30	15	296
	A49 South	Northbound Junction Entry																	1119	184	386	1688	1891	147	93	2130
		Southbound Junction Exit																	1712	206	295	2213	1349	127	82	1558
Northway	Northway (Sandy Lane End)	Northbound	25	0	4	28	186	6	2	193	25	0	0	25	213	9	2	224	22	0	0	22	141	1	0	141
		Southbound	191	34	24	249	88	0	0	88	282	48	24	355	93	0	0	93	300	56	25	381	94	0	0	94
	Northway (Long Lane End)	Northbound	25	0	4	28	186	6	2	193	25	0	0	25	213	9	2	224	22	0	0	22	141	1	0	141
		Southbound	284	39	24	347	39	5	0	44	378	54	25	456	44	5	0	49	399	61	25	485	41	5	0	46



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PROJECT:
PEEL HALL, WARRINGTON

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PROJECT REFERENCE:	DRAWING NUMBER:	SCALE:
1107	70	1:500 @ A3

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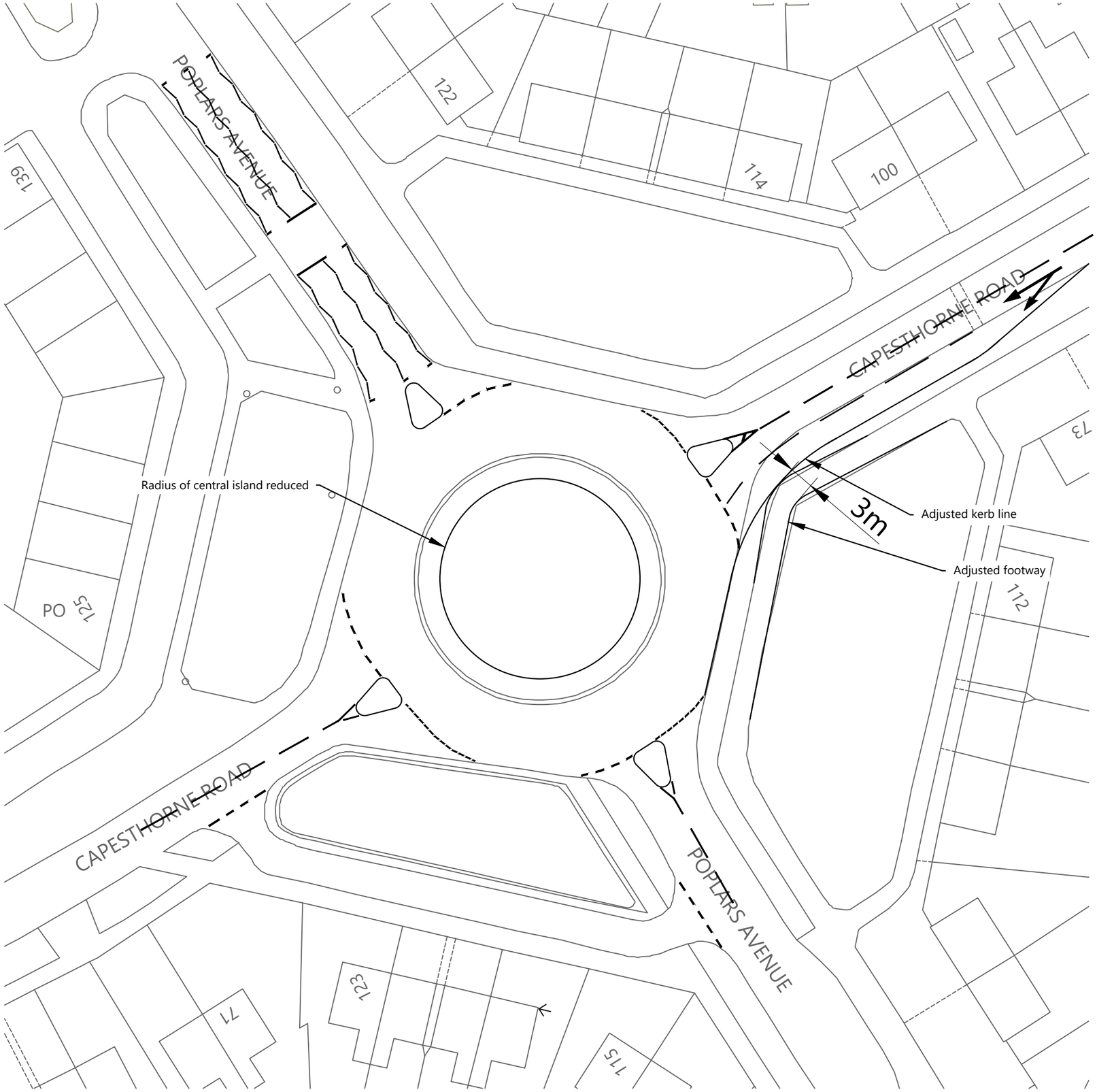
TITLE:
PEEL HALL POTENTIAL MITIGATION - CRAB LANE/ENFIELD PARK ROAD

DATE:	DRAWN BY:	CHECKED:
20/12/17	BL	FB



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Note: Location of traffic islands estimated.

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1107	71/A	1:500 @ A3

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TITLE:

PEEL HALL POTENTIAL MITIGATION - CAPESTHORNE ROAD/POPLARS AVENUE

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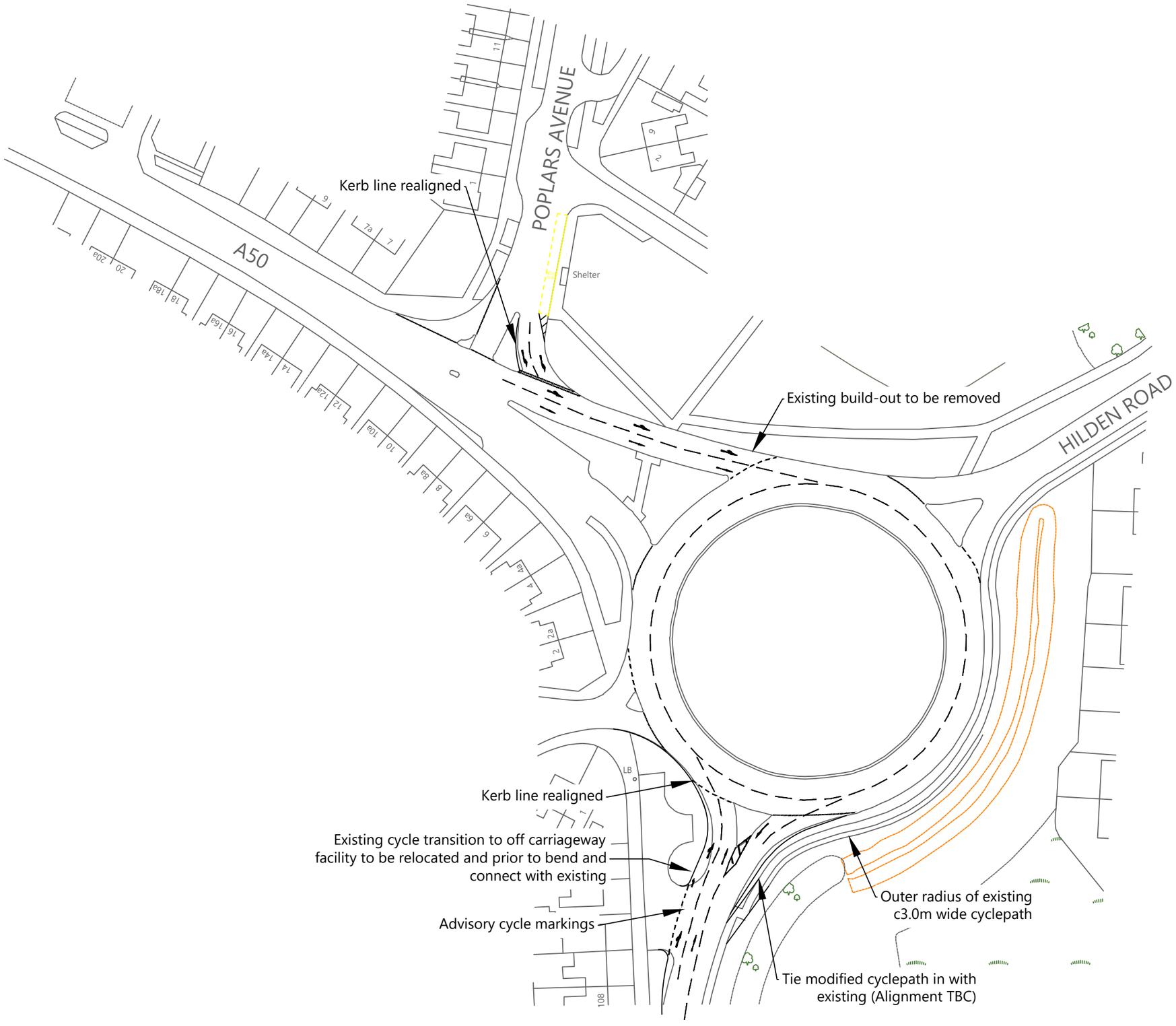

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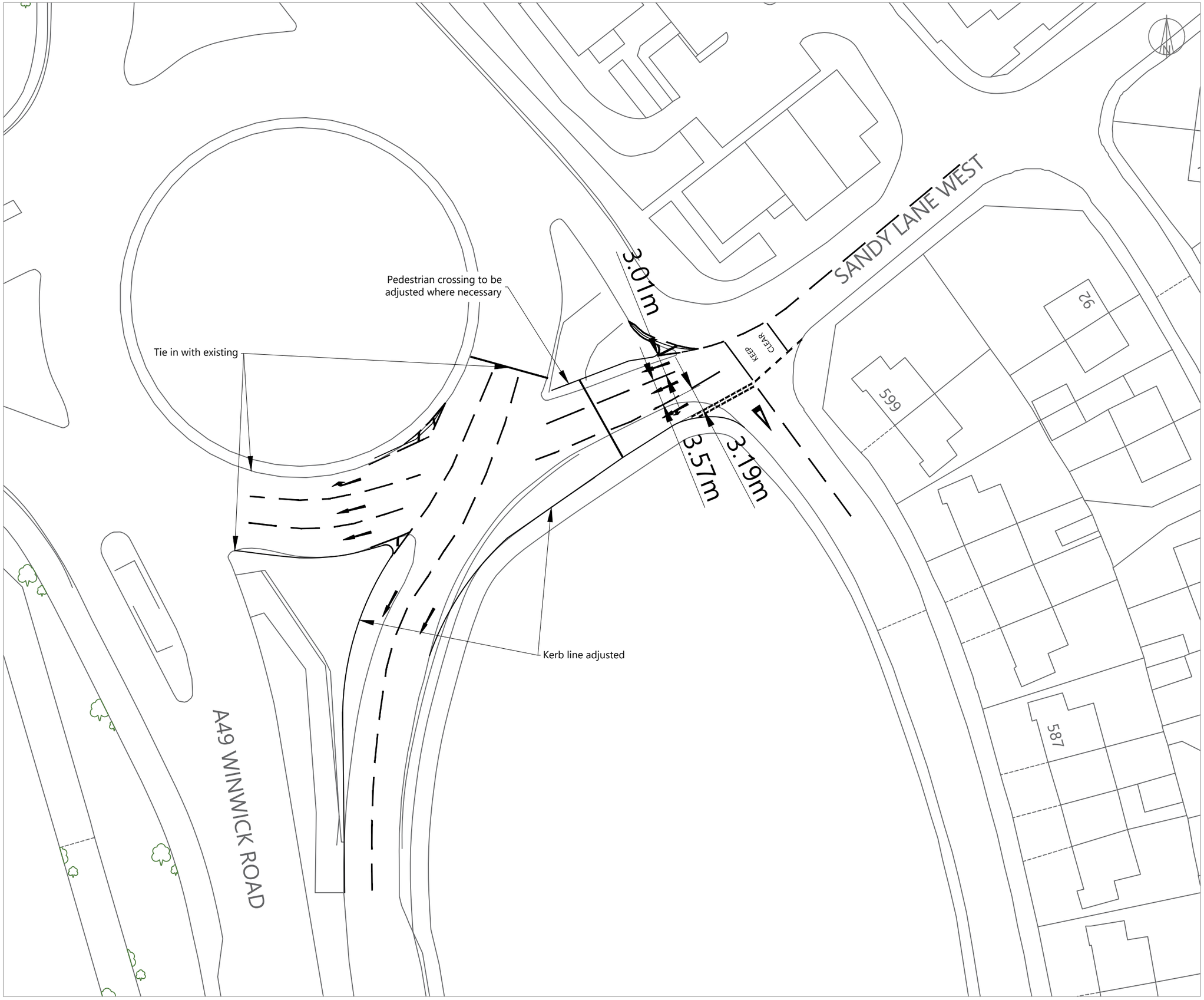
PEEL HALL POTENTIAL MITIGATION - A50/HILDEN ROAD/POPLARS AVENUE WITH POTENTIAL IMPROVEMENTS

DATE:	DRAWN BY:	CHECKED:
20/12/17	BL	FB



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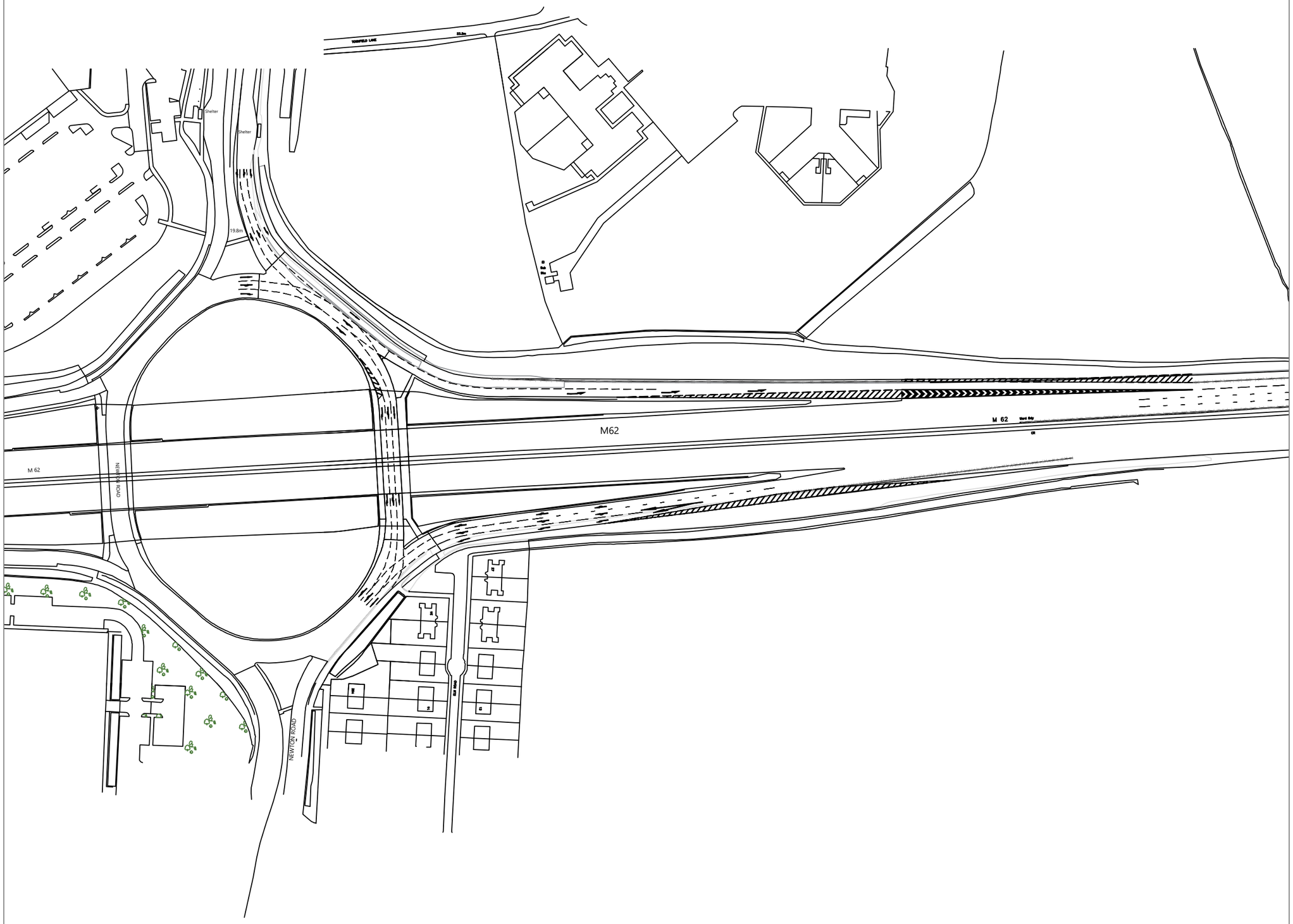
TITLE:

PEEL HALL POTENTIAL MITIGATION - SANDY LANE WEST/A49

DATE:	DRAWN BY:	CHECKED:
23/01/18	BL	FB



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TITLE:

PEEL HALL - JUNCTION 9 M62 WITH POTENTIAL IMPROVEMENTS OVERVIEW

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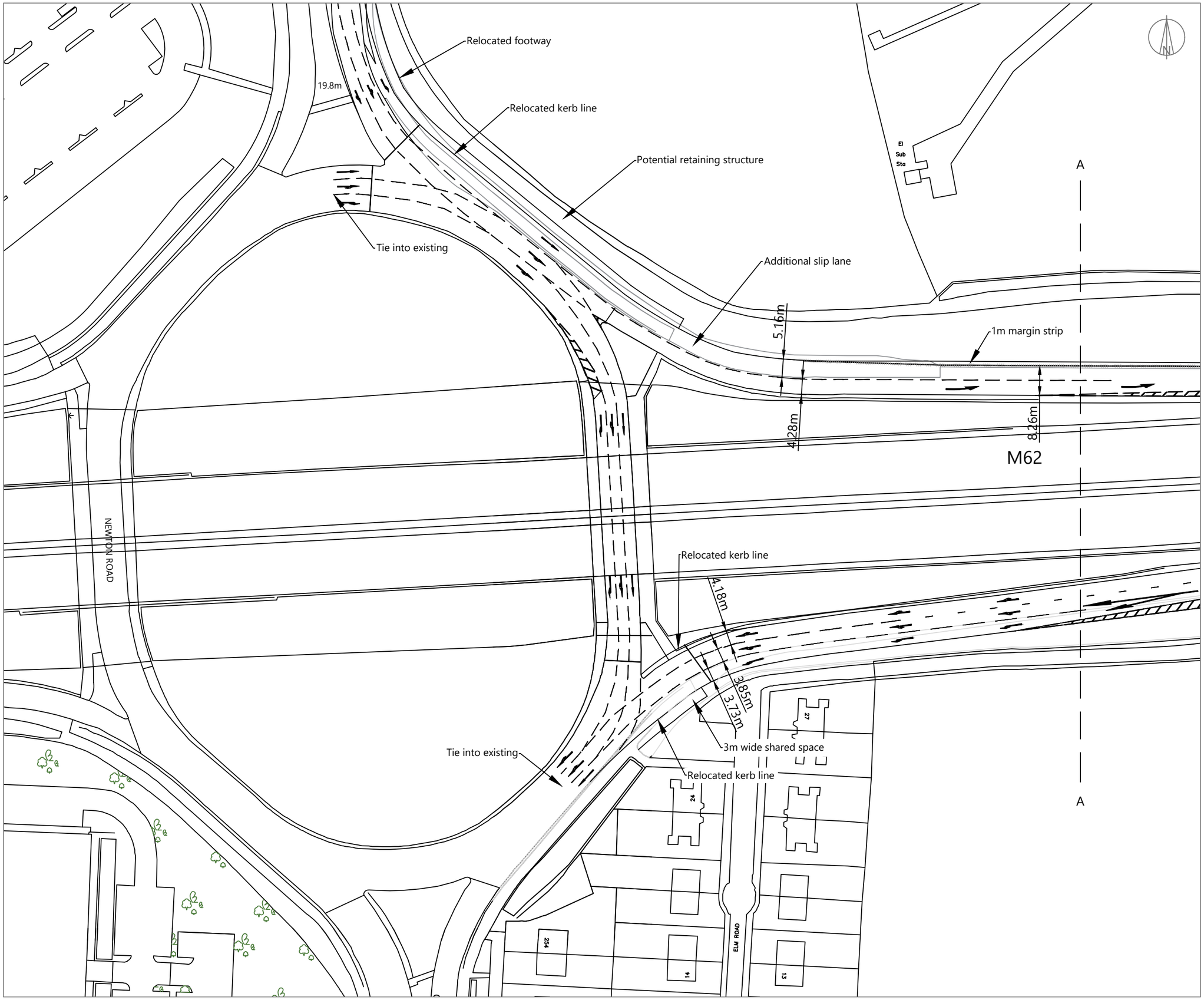

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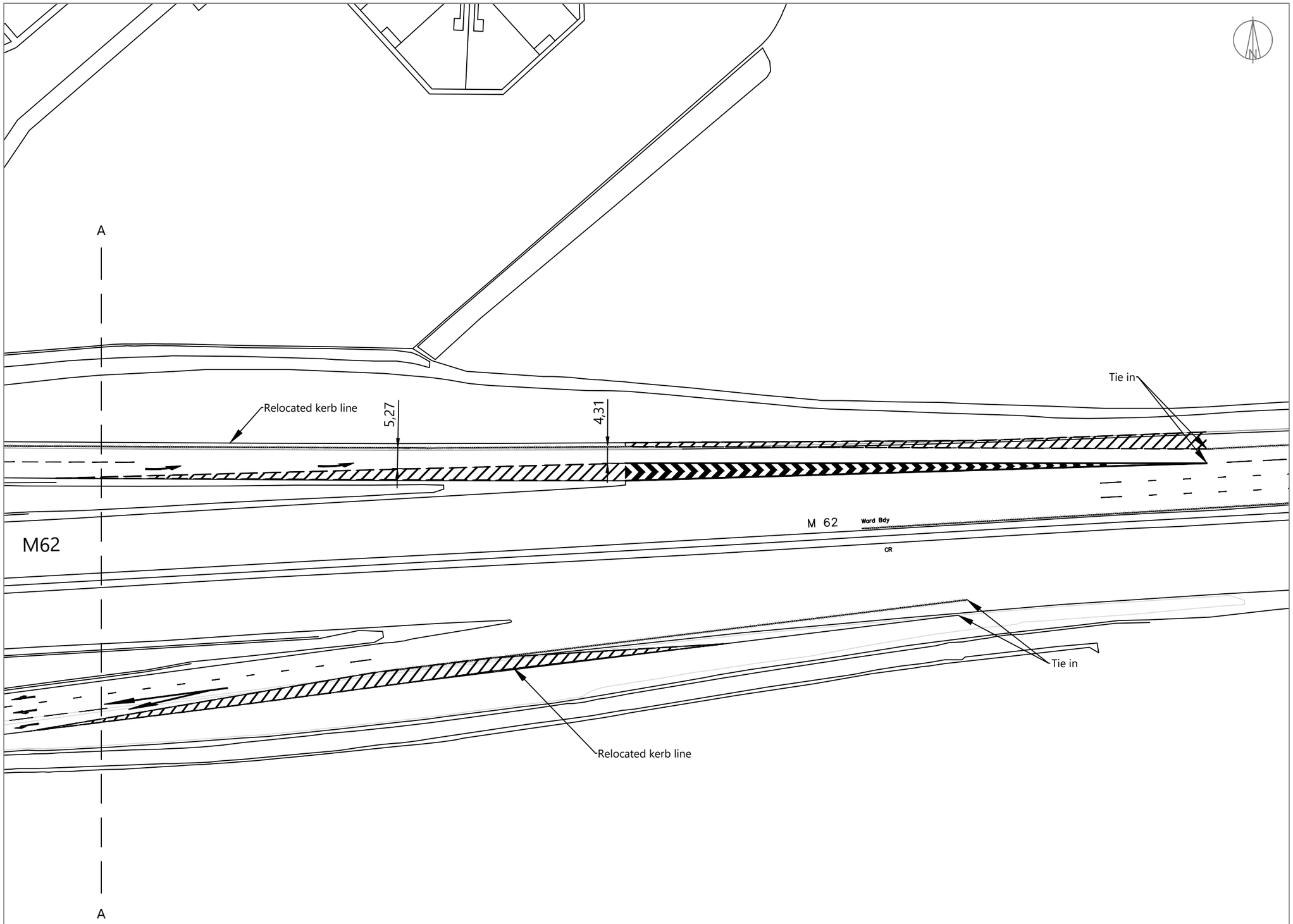
15/12/17	BL	FB



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1107	78	1:1,000 @ A3

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TITLE:

PEEL HALL - JUNCTION 9 M62 WITH POTENTIAL IMPROVEMENTS - EASTERN SECTION

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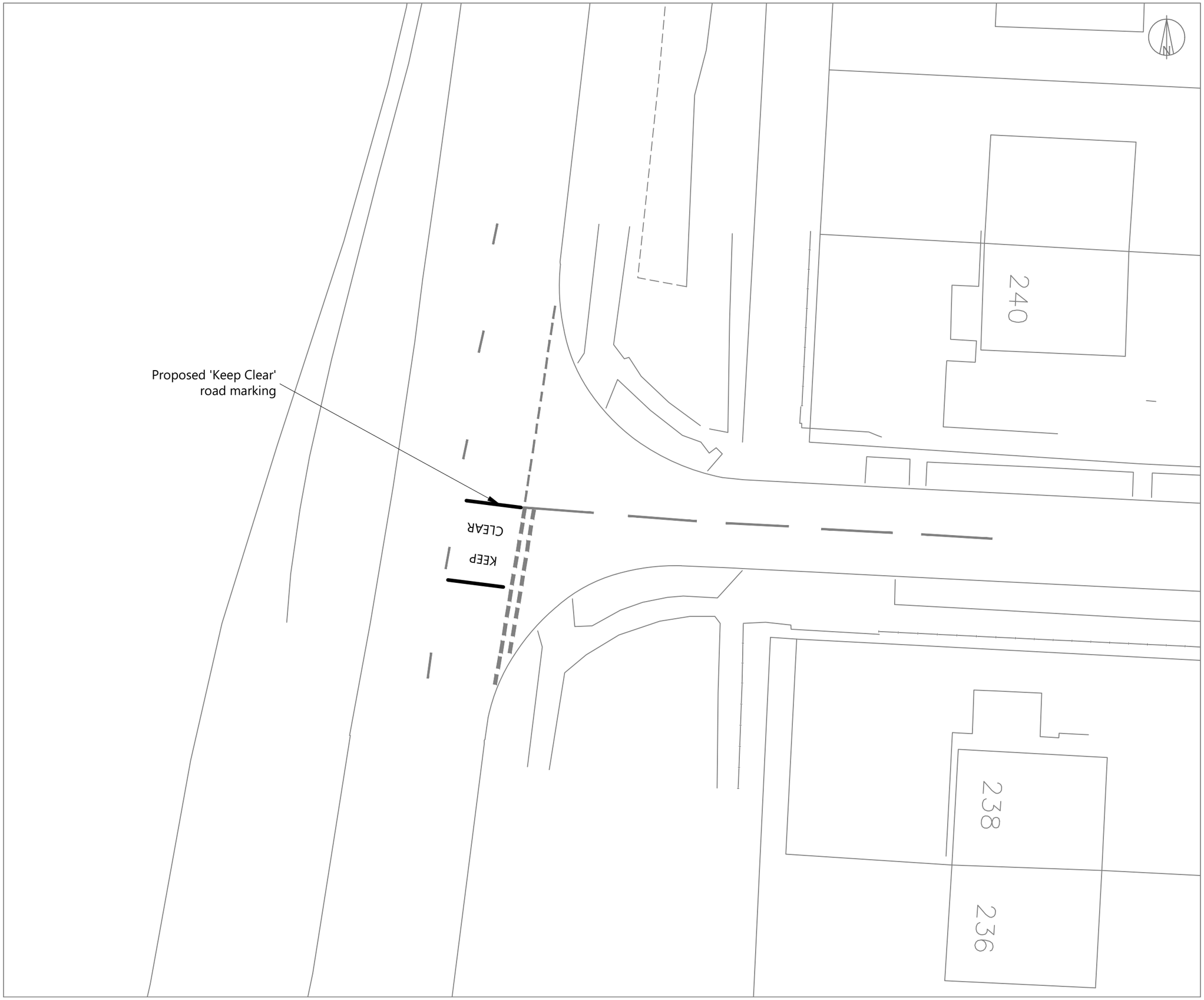
15/12/17	BL	FB



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1107	79	1:250 @ A3

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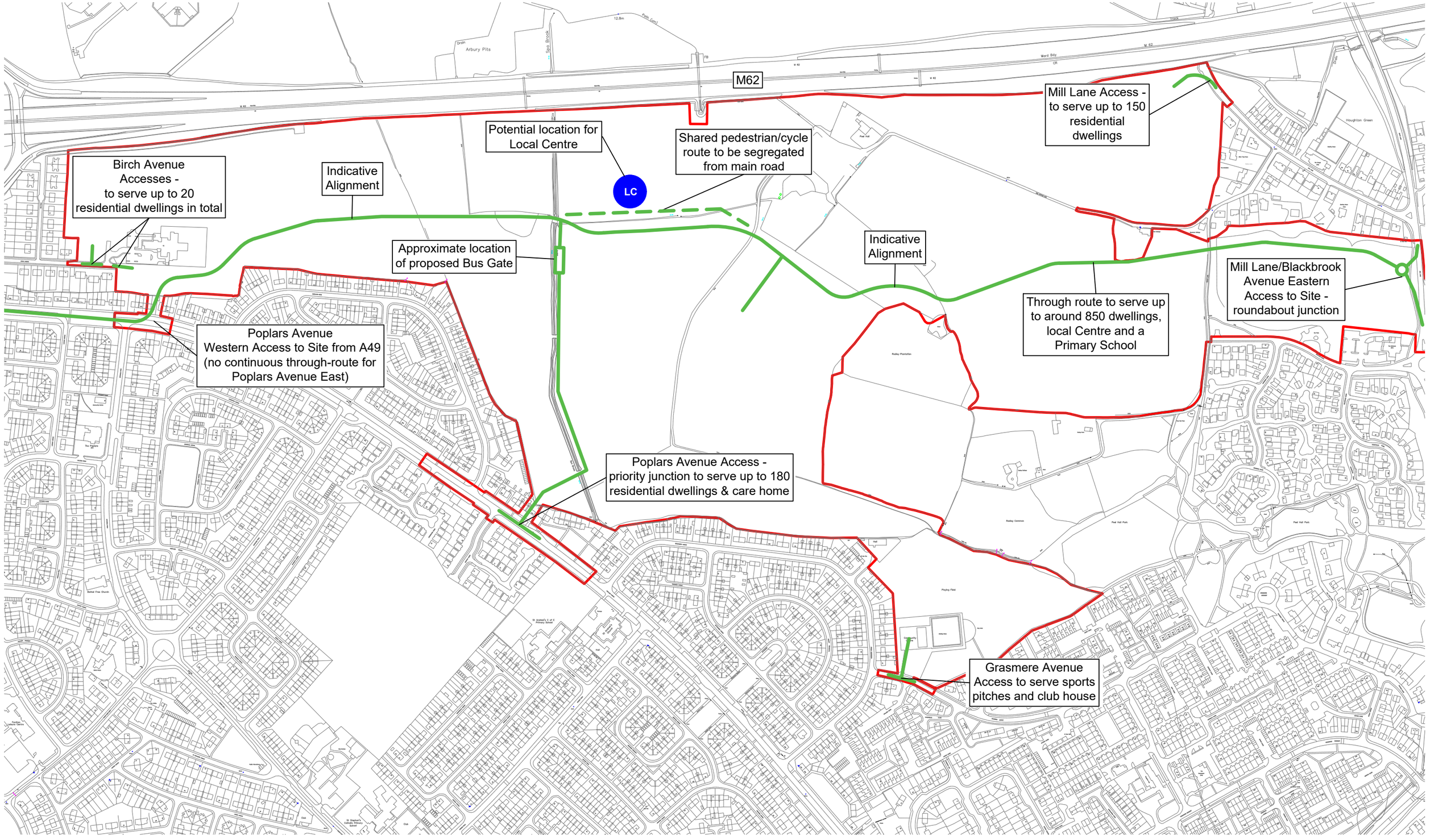
TITLE:

PEEL HALL POTENTIAL MITIGATION - A49 / BIRCH AVENUE

DATE:	DRAWN BY:	CHECKED:
22/12/17	BL	FB



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ISSUE	REASON FOR REVISION	DATE
A	Update to location of local centre	16/01/18

DATE: 01/07/17 | DRAWN BY: FB | CHECKED: DT

PROJECT: PEEL HALL, WARRINGTON

CLIENT: SATNAM MILLENNIUM LTD

TITLE: INDICATIVE THROUGH ROUTE AND ACCESS POINTS

PROJECT REFERENCE:	DRAWING NUMBER:	SCALE:
1107	43	Not to scale

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RESIDENTIAL-
PLOT A

RESIDENTIAL-
PLOT B

EMPLOYMENT
ACCESS

ELM ROAD

BIRCH AVENUE

SIGNED CYCLE ROUTE

PROPOSED
ON-STREET
PARKING BAYS

RE-OPENING AS
PART OF POPLARS
AVENUE
THROUGH ROUTE

POPLARS AVENUE

LANCING AVENUE

COTSWOLD ROAD

LEFT-TURN
OUT ONLY

SHORT SECTION
OF ONE-WAY
WORKING

SECTION OF
ONE-WAY
WORKING

POPLARS AVENUE

POPLARS AVENUE

El Sub Sta

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ISSUE	REASON FOR REVISION	DATE

DATE:	DRAWN BY:	CHECKED:
26/01/18	FB	DT

PROJECT:
PEEL HALL, WARRINGTON

CLIENT:
SATNAM MILLENNIUM LTD

TITLE:
WESTERN ACCESS AT POPLARS AVENUE - THROUGH ROUTE

PROJECT REFERENCE:	DRAWING NUMBER:	SCALE:
1107	46/B	1:1,000 @ A3

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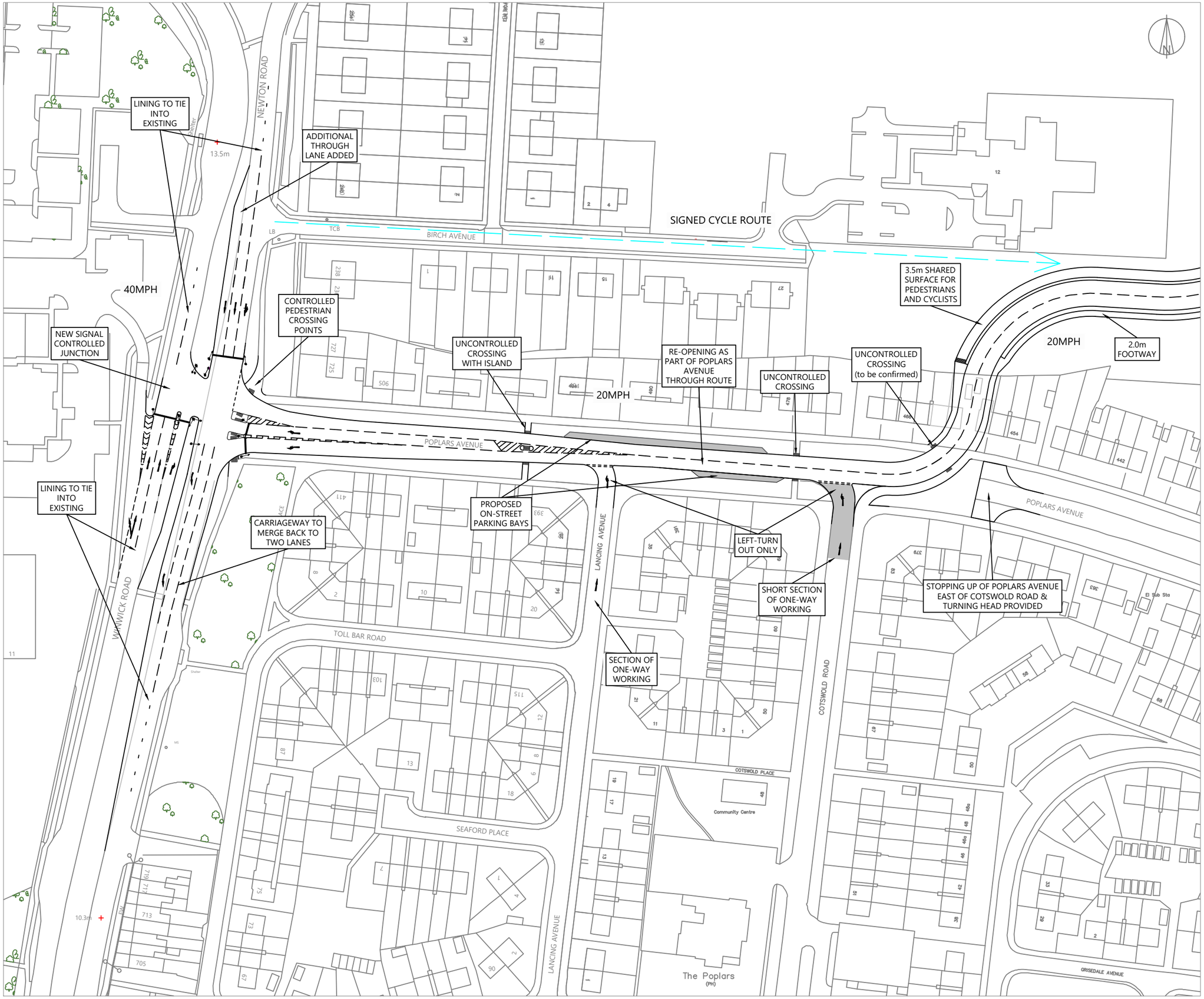

NOTES:

Drawing based on Appletons Opportunities & Constraints plan 1820_21 dated 21/10/14.

KEY

New on-street parking bays

ISSUE	REASON FOR REVISION	DATE

PROJECT:

PEEL HALL, WARRINGTON

CLIENT:

SATNAM MILLENNIUM LTD

PROJECT REFERENCE:	DRAWING NUMBER:	SCALE:
1107	52/F	1:1,250 @ A3

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TITLE:

PEEL HALL PROPOSED ALIGNMENT FOR THROUGH ROUTE TO A49

DATE:	DRAWN BY:	CHECKED:
26/01/18	BL	FB

NOTES:
Reproduced from Appletons Peel Hall Indicative Landscape Components Plan

KEY:

Existing PRoW

Proposed Pedestrian Links

Proposed Shared Footway/Cycleway

ISSUE	REASON FOR REVISION	DATE

PROJECT:
PEEL HALL, WARRINGTON

CLIENT:
SATNAM MILLENNIUM LTD

PROJECT REFERENCE:	DRAWING NUMBER:	SCALE:
1107	ES T8	NOT TO SCALE

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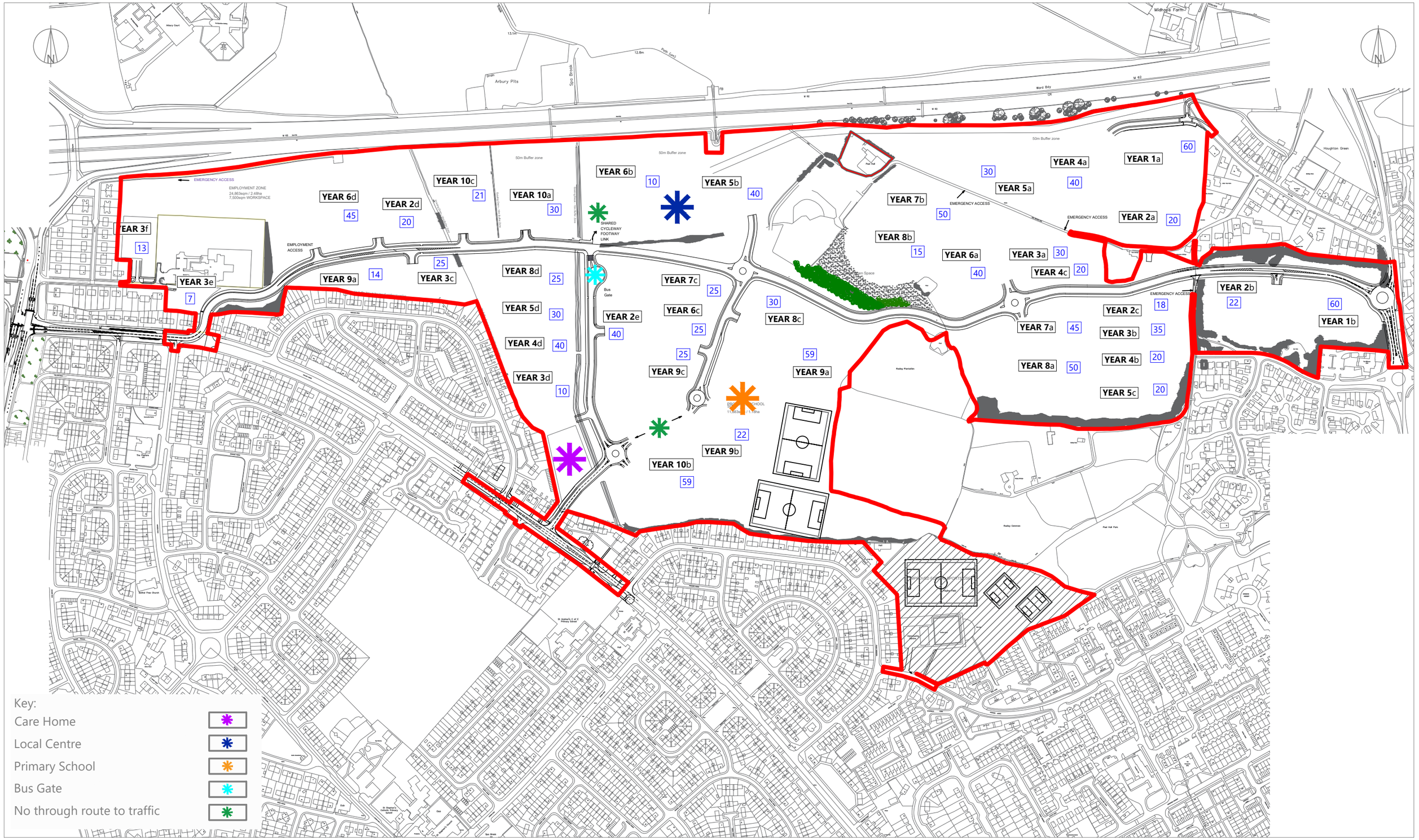
TITLE:
ILLUSTRATIVE PLAN SHOWING PROPOSED PEDESTRIAN AND CYCLE LINKAGES - OPTION B

DATE:	DRAWN BY:	CHECKED:
26/01/18	FB	DT



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KEY:
Indicative Year Numbering — YEAR 8b
Indicative Number of units Completed at Year End — 12

Phasing subject to detailed phasing plan to be submitted at Reserved Matters stage

ISSUE	REASON FOR REVISION	DATE

DATE:	DRAWN BY:	CHECKED:
20/10/17	FB	DT

PROJECT: PEEL HALL, WARRINGTON

CLIENT: SATNAM MILLENNIUM LTD

TITLE: INDICATIVE HIGHWAYS BUILD OUT PLAN - THROUGH ROUTE

PROJECT REFERENCE:	DRAWING NUMBER:	SCALE:
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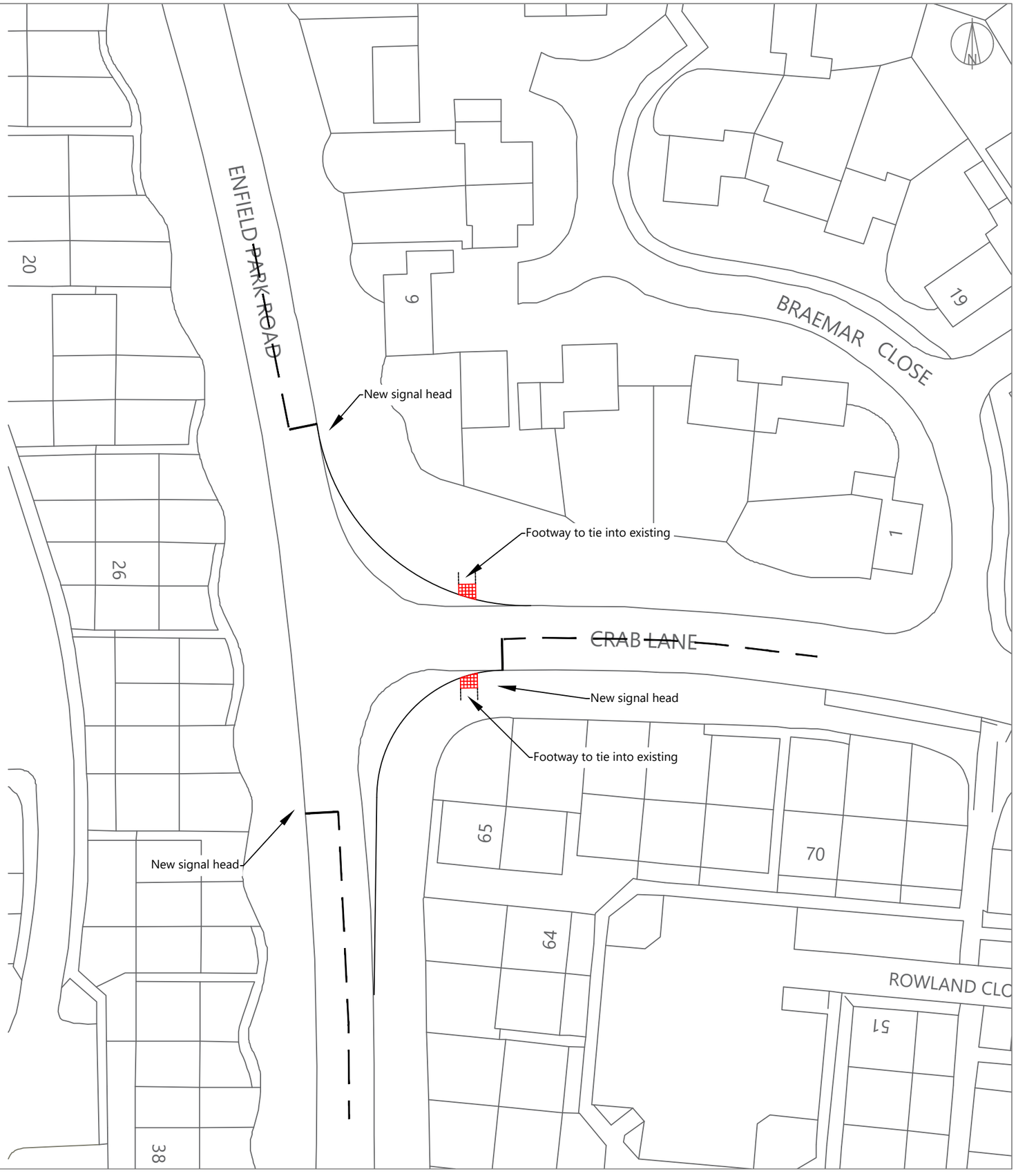

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1107	70	1:500 @ A3

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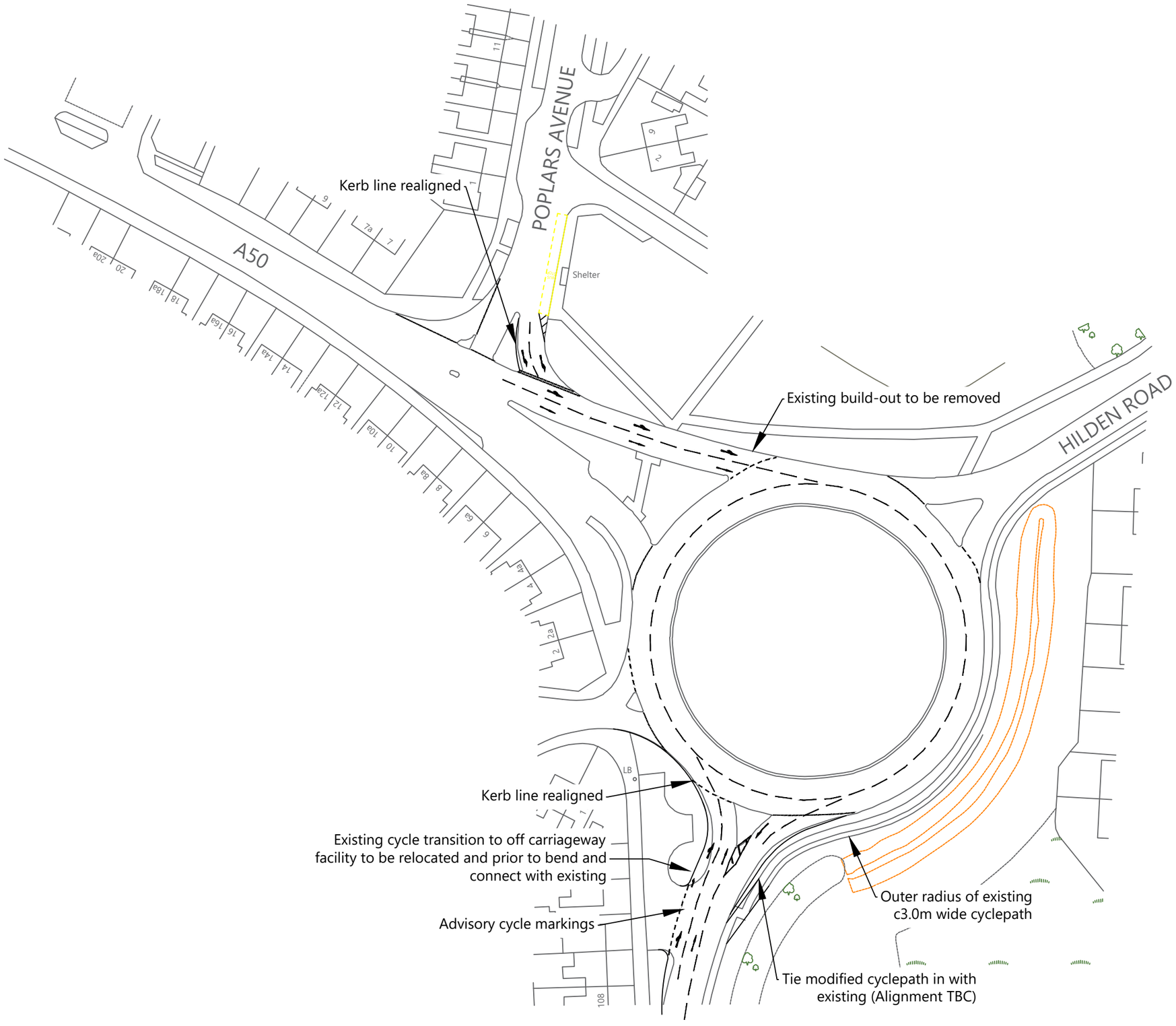
TITLE:
PEEL HALL POTENTIAL MITIGATION - CRAB LANE/ENFIELD PARK ROAD

DATE:	DRAWN BY:	CHECKED:
20/12/17	BL	FB



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CLIENT:
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PROJECT REFERENCE:	DRAWING NUMBER:	SCALE:
1107	72	1:1,000 @ A3

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TITLE:
PEEL HALL POTENTIAL MITIGATION - A50/HILDEN ROAD/POPLARS AVENUE WITH POTENTIAL IMPROVEMENTS

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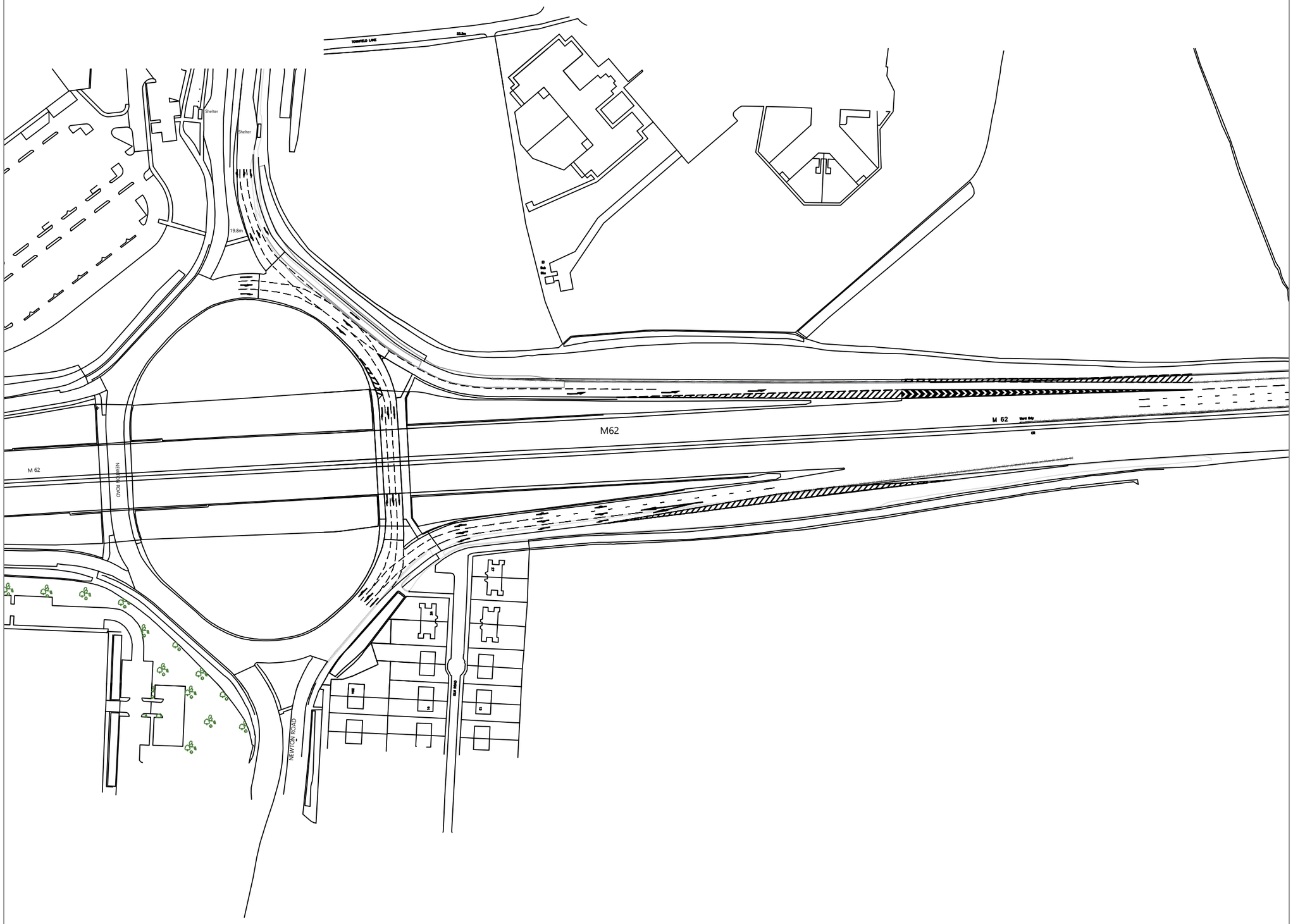
20/12/17	BL	FB



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PROJECT REFERENCE:	DRAWING NUMBER:	SCALE:
1107	75	1:2,000 @ A3

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TITLE:

PEEL HALL - JUNCTION 9 M62 WITH POTENTIAL IMPROVEMENTS OVERVIEW

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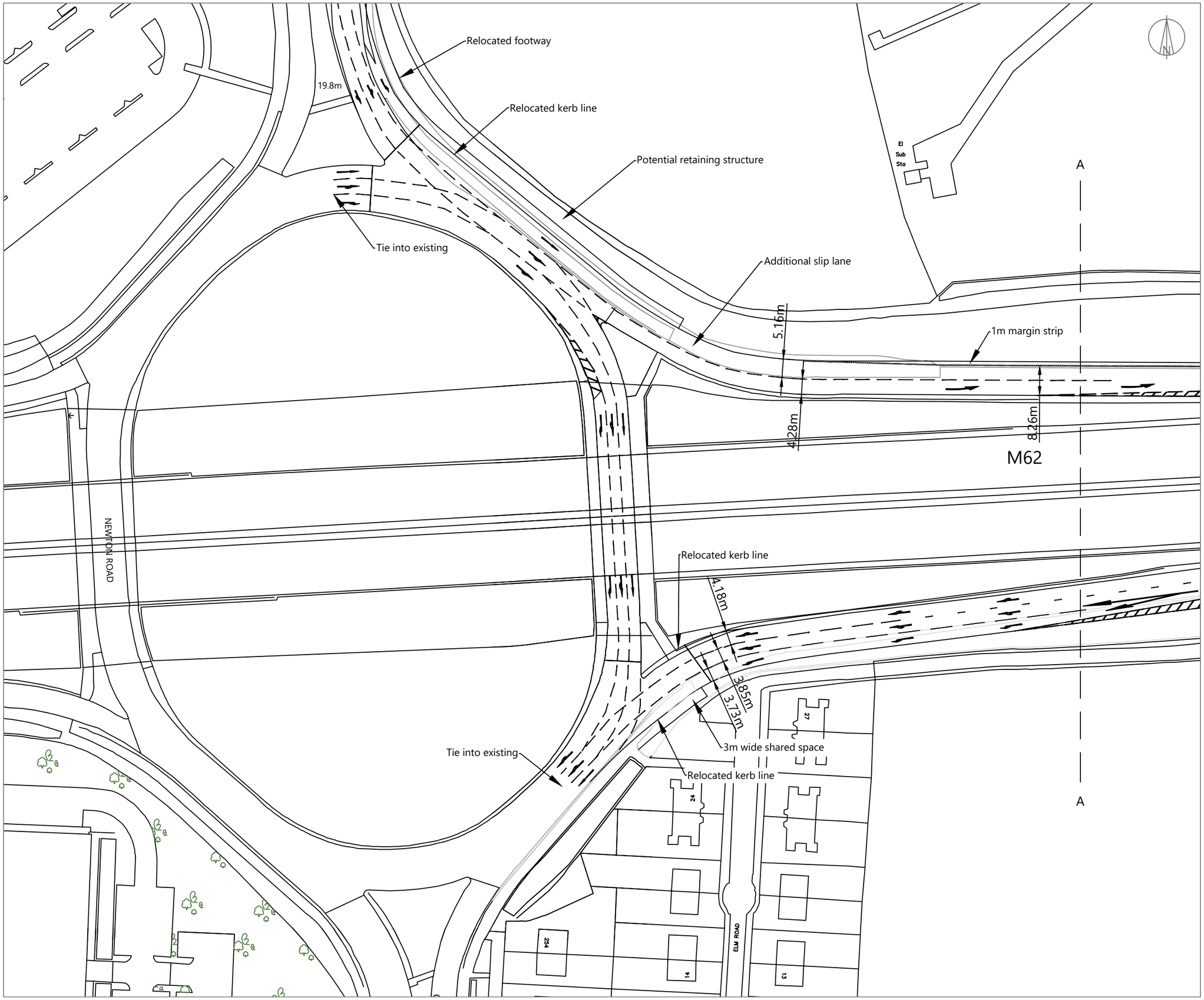

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1107	77	1:1,000 @ A3

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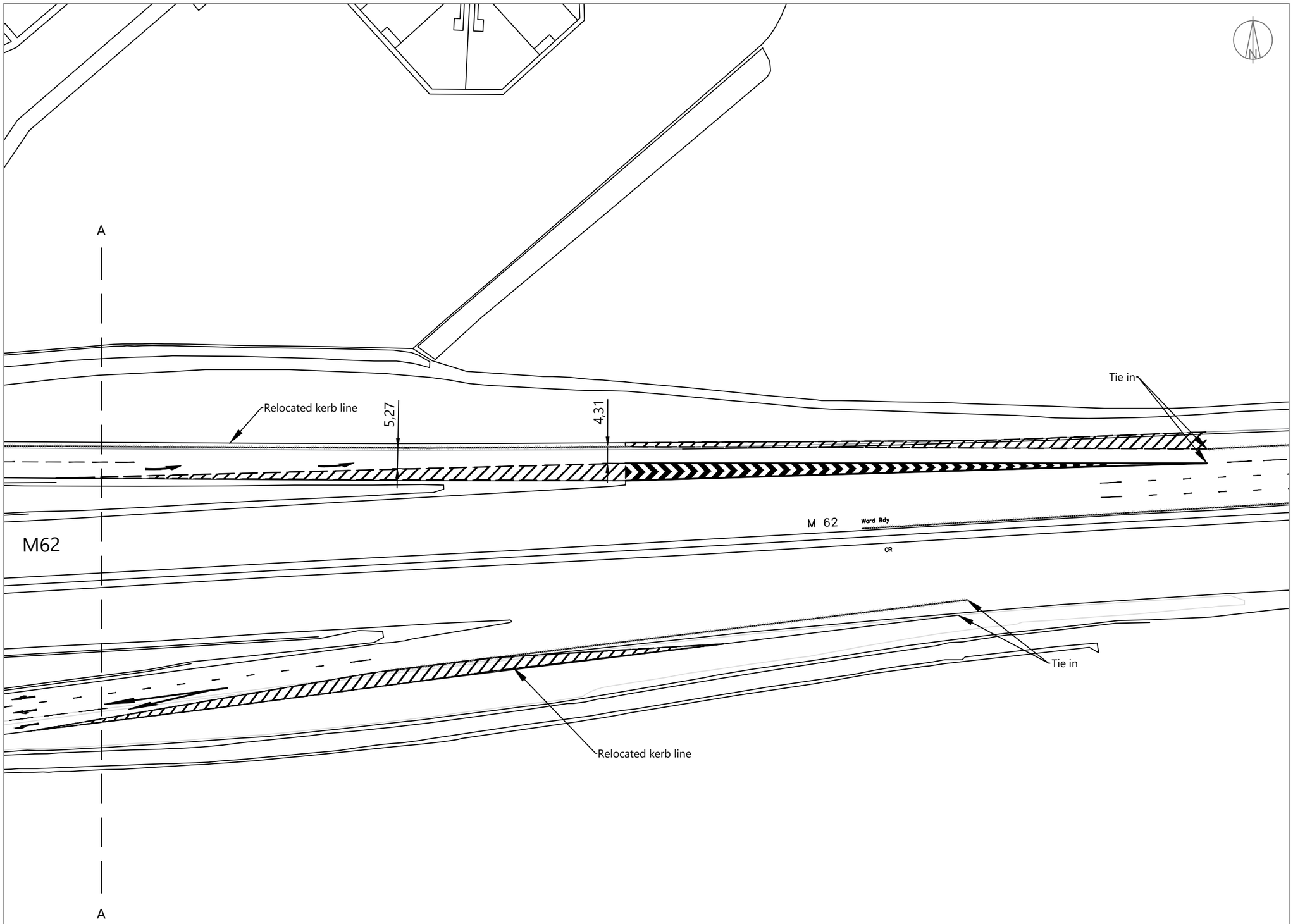
TITLE:
PEEL HALL - JUNCTION 9 M62 WITH POTENTIAL IMPROVEMENTS - WESTERN SECTION

DATE:	DRAWN BY:	CHECKED:
15/12/17	BL	FB



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PROJECT:

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1107	78	1:1,000 @ A3

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TITLE:

PEEL HALL - JUNCTION 9 M62 WITH POTENTIAL IMPROVEMENTS - EASTERN SECTION

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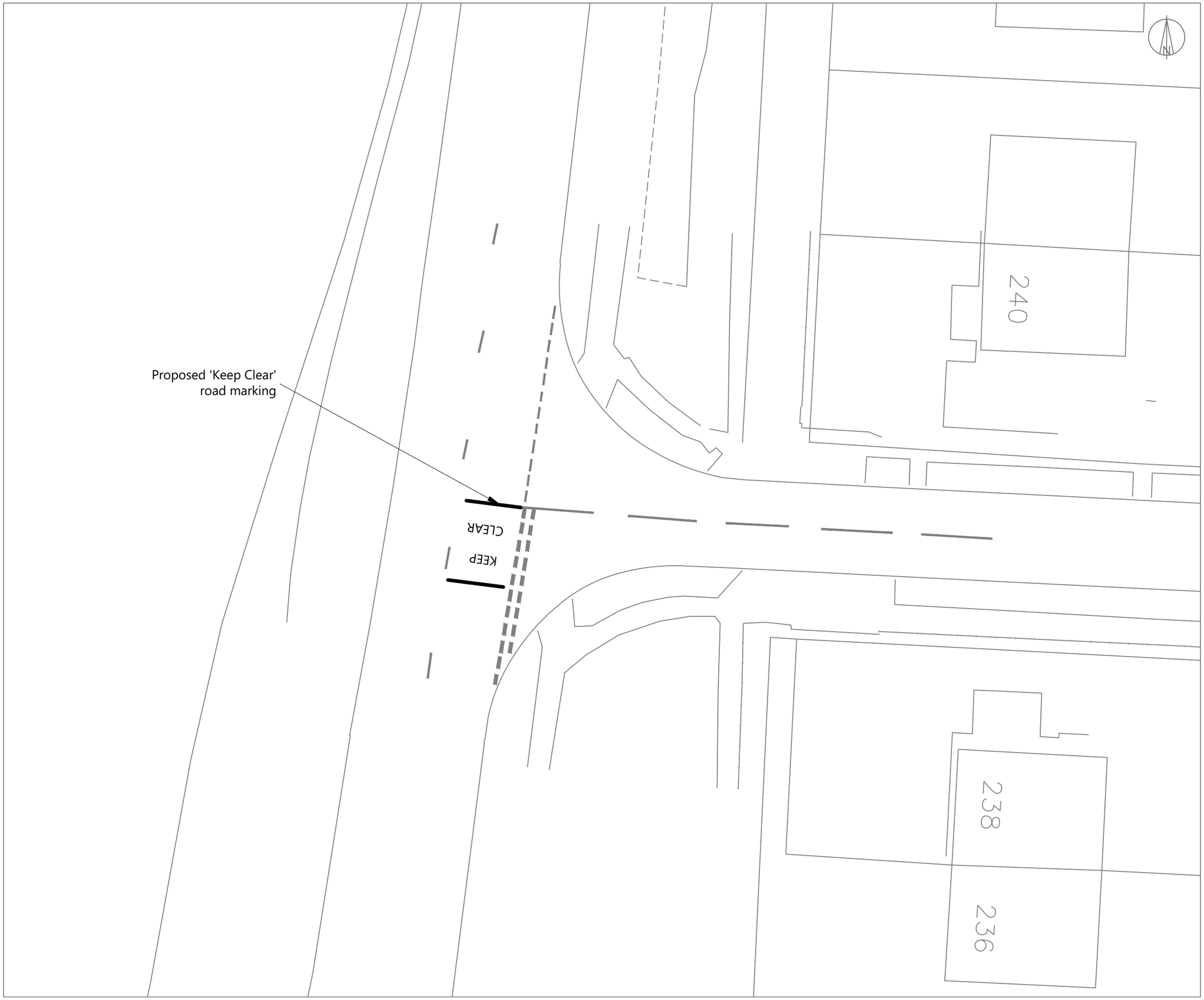

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TITLE:

PEEL HALL POTENTIAL MITIGATION - A49 / BIRCH AVENUE

DATE:	DRAWN BY:	CHECKED:
22/12/17	BL	FB

SOCIO-ECONOMIC

S2 Summary Tables

TableA1 Health Facilities within the Local Impact Area

Health Centre	Distance from site (km)	Number of Full Time Equivalent (FTE) GPs	Patients	Surplus / Deficit (versus typical provision of 1,800 patients per GP	Accepting New Patients?
Fearnhead Cross Medical Centre	1.9	8	14,211	189	Y
Park View Medical Practice	2.1	2	5,903	-2,303	Y
Padgate Medical Centre / Bewsey Street Branch	2.4	4	6,746	454	Y
Eric Moore Partnership - Orford Park Branch Medica / Woolston Surgery	2.4	5	9,777	-777	Y
4 Seasons Medical Centre	2.1	1	2,569	-769	Y
Longford St Surgery	2.1	9	14,211	1,989	Y
Greenbank Surgery	2.9	5	8,919	81	Y
Helsby Street Medical Centre	2.7	4	8,480	-1,280	Y
Manchester Road Surgery	3.1	3	3,007	2,393	Y
Fairfield Surgery	3	3	3,154	2,246	Y
Holes Lane Surgery (Dr Wadsworth M R & Partners)	3.2	6.5	10,459	1,241	Y
Dr Plumb E A & Partners (Folly Lane Medical Centre)	2.9	8	10,405	3,995	Y
Dallam Lane Medical Centre	3.4	2	2,754	846	Y
Dr Whitenburgh M (Cockhedge Medical Centre)	3.5	1	3,085	-1,285	Y
Guardian Street Med/Ctr (Dr M A Kerr & Partners)	3.9	6	10,164	636	Y
Springfields Medical Centre Dr Burke S L & Partners	3.9	3	6,946	-1,546	**N**
Dr Winter S M & Partners (Westbrook Medical Centre)	3.9	6	10,360	440	**N**
Birchwood Medical Centre	3.7	9	11,233	4,967	Y
Causeway Medical Centre & Great Sankey Health Centre / Hood Manor Surgery	4.7	3	8,241	-2,841	Y
Latchford Medical Centre	4.8	4	6,802	398	Y
TOTAL	**-**	**92.5**	**157,426**	**+9,074**	

Source: Lichfields Analysis / NHS Choices Website

TableA2 Dental Practices within the Local Impact Area

Dentist	Distance from site (km)	Number of Dentists	Accepting new patients?
Cotswold Dental Care	1.2	2	**N**
Fearnhead Dental Surgery	1.9	3	Y
Bupa Dental Care (Warrington)	2.6	7	**N**
Padgate (No 1) Limited	2.6	4	Y
Birchwood Dental Practice	3.5	6	Y
Victoria House Orthodontic Practice	3.5	2	**N**
The Smile Clinic	3.5	6	Y
IDH- Westbrook	3.7	4	Y
Warrington NHS Dental Clinic	3.9	N/A	N/A
Clayton & Scott	3.9	3	Y
mydentist, Dam Lane, Warrington	4	3	Y
Sankey Street Dental Practice	4	2	Y
Signature Smiles	4	2	Y
Museum Street Dental Surgery	4.2	9	**N**
Latchford Dental Practice	4.7	7	Y
TOTAL	**-**	**60**	**40**

Source: Lichfields Analysis / NHS Choices Website

TableA3 Public and Private Sports and Recreational Facilities within Warrington Borough and the North West Region

Facilities	Warrington	North West	
	Number	Number	Proportion of North West's Facilities in Warrington
Athletics Tracks	1	51	1.96%
Golf	8	349	2.29%
Grass Pitches	325	8,689	3.74%
Health & Fitness Suite	27	981	2.75%
Ice Rinks	0	5	0.00%
Indoor Bowls	0	10	0.00%
Indoor Tennis Centre	2	33	6.06%
Ski Slopes	0	20	0.00%
Sports Hall	43	1,358	3.17%
Squash Courts	18	472	3.81%
Swimming Pool	15	571	2.63%
Artificial Grass Pitch	29	1,006	2.88%
Tennis courts	39	1,329	2.93%
Total	**507**	**14,874**	**3.41%**
% of North West Population in Warrington			**2.90%**
% split between public / private facilities	**78% / 22%**	**71% / 29%**	

Source: Lichfields Analysis / Sport England's Active Places Power website