

**Appendix 2.1: Drainage System Summary Report**







## **M11 Junction 7A**

Ringway Jacobs / Essex County Council

### **Drainage System Summary Report**

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January 2017



## M11 Junction 7A

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## Appendix A. High Level Drainage Schematic Plans

## 1. Introduction

### 1.1 Drainage System Summary Report

This Drainage System Summary Report describes both the existing and proposed drainage systems within the M11 Junction 7A scheme, including the proposed drainage strategy for managing the quantity and quality of surface water runoff.

### 1.2 Scheme Overview

The primary objectives of the M11 Junction 7A scheme are as follows:

- To improve accessibility to and from Harlow;
- To reduce congestion primarily for the A414 corridor;
- To ensure the proposed infrastructure is of the appropriate scale for the future traffic demands of the stated growth;
- To facilitate future housing developments around Harlow and employment growth to the east of Harlow.

The proposed scheme is located in the west of Essex County, east of Harlow between the existing Junctions 7 and 8 of the M11. The proposed location of Junction 7A is centred at approximate National Grid Reference 549800, 212300.

The scheme extends westwards through rural land before joining the existing Sheering Road (B183) to the north of the Campions. The B183 continues westwards towards Harlow, becoming Gilden Way (North) prior to Churchgate Roundabout and Gilden Way (South) after the roundabout. The western limit of the scheme is the London Road Roundabout prior to the A414.

The proposed scheme comprises the following main elements:

- New grade separated junction consisting of an overbridge and roundabouts above the existing M11 motorway;
- New slip roads mostly on embankment to the north of the new junction;
- New slip roads mostly in cutting to the south of the new junction;
- Roundabouts connecting the motorway to the existing Sheering Road (B183) in the west. The new link comprises carriageways on separate embankments;
- Revised culverted sections of a rerouted unnamed ordinary watercourse discharging to Pincey Brook; and
- Approximately 2km of works along the Gilden Way (B183) from the general area of Mayfield Farm to its junction with London Road Roundabout in the west.

Works on Gilden Way comprise widening of the existing carriageway to create an additional lane, and road surface improvement works. There are no proposed works or modifications to the Gilden Way Bridge over the Harlowbury Brook.

In terms of the drainage design, the scheme can be considered as three distinct highway catchments, and are referred to as follows:

- Gilden Way (Highway Drainage Catchment A)
- Proposed Link Roads (Highway Drainage Catchment B)
- Proposed Junction 7A (Highway Drainage Catchment C)

Gilden Way (Highway Drainage Catchment A) can be further considered as two sub-catchments, referred to as Gilden Way (South) or Catchment A (South) and Gilden Way (North) or Catchment A (North).

See Appendix A for high level drainage schematic plans, prepared to support the planning application for the scheme, which illustrate the above highway drainage catchments.

## 2. Drainage Design

### 2.1 Drainage Objectives

An appropriate drainage strategy will mitigate the risk of surface water flooding as a result of the proposed increase in impermeable surfaces following development of the scheme.

The main objectives of the drainage strategy include:

- Remove water from the carriageway;
- Mitigate the impact of increased impermeable area on receiving watercourses;
- Mitigate any increase in surface water flood risk;
- Control road runoff prior to discharge; and
- Mitigate the impact of the scheme on the water quality of receiving watercourses.

### 2.2 Design Criteria and Modelling

The proposed drainage systems have been designed in accordance with the Highways England Design Manual for Roads and Bridges (DMRB), the CIRIA SuDS Manual 2015 and guidance from Essex County Council (ECC) as Lead Local Flood Authority (LLFA) (hereafter referred to as ECC), using the Micro Drainage Version 2016.1 drainage design software. At this stage in the design process, a range of assumptions regarding the existing drainage systems have been necessitated by limitations in the coverage of the available archive and survey data.

#### 2.2.1 Design Rainfall

There are currently two separate design rainfall approaches which are readily used for drainage design in the industry; the Flood Studies Report (FSR) (NERC, 1975) and the Flood Estimation Handbook (FEH) (CEH, 1999). In this instance the FEH approach was found to be slightly more conservative and has therefore been adopted.

#### 2.2.2 Allowance for Climate Change

At this stage in the design process, an allowance for climate change of 30% enhanced rainfall intensity has been made for the design of the proposed drainage systems. No climate change allowances have been applied during reviews of the existing drainage systems and consultation with ECC is ongoing regarding any refinements to the allowances for climate change that would be appropriate to this scheme.

#### 2.2.3 Return Period

Table 2.1 summarises the design return periods adopted at this stage. An initial design return period of 1 in 30 years has been adopted for no flooding from the drainage system, including for highway drainage catchment C (the proposed Junction 7A), based on guidance in the CIRIA SuDS Manual 2015. This approach will be reviewed following consultation with Highways England, and any revised approach agreed with ECC and the Environment Agency (EA).

Table 2.1 : Design Return Periods

Event	Return Period	Guidance
<b>Piped network</b>		
No surcharging of pipe	1 in 1 year (Highway Drainage Catchments B and C) 1 in 2 years (Highway Drainage Catchment A)	DMRB HD 33/16 ECC Development Construction Manual January 2012
No surcharging above formation of combined filter drains	1 in 5 years	DMRB HD 33/16
No flooding	1 in 30 years	CIRIA SuDS Manual 2015
<b>Attenuation structures</b>		
<b>Ponds / Tank</b>		
No flooding	1 in 100 years	CIRIA SuDS Manual 2015
<b>Oversized Pipes</b>		
No flooding	1 in 30 years	CIRIA SuDS Manual 2015
Management of exceedance flows	1 in 100 years	CIRIA SuDS Manual 2015

### 2.3 Discharge Hierarchy

It is best practice to apply the currently preferred discharge hierarchy when considering the discharge of surface water, which requires adopting infiltration based SuDS to the maximum extent possible before attenuating flows and discharging to surface waters. In general, attenuation based SuDS are proposed throughout the scheme to manage both the quantity and quality of runoff and provide amenity and biodiversity benefits. Based on geotechnical investigation works carried out to date, there are currently thought to be significant ground condition constraints to using infiltration based SuDS across the scheme, although this will be reviewed on a location by location basis during subsequent phases of the design.

## 3. Gilden Way (Highway Drainage Catchment A)

### 3.1 Existing Gilden Way Drainage System

The Gilden Way section of the scheme extends from the existing London Road Roundabout in northeast Harlow, in a north easterly direction past the Harlowbury Brook to the approximate location of Mayfield Farm, where the new section of Gilden Way deviates from the existing Gilden Way / Sheering Road and joins the new Sheering Road Roundabout. From a review of the limited surface water drainage asset information available, it is understood that the existing Gilden Way highway drainage catchment is currently served by kerbs and gullies and two independent carrier pipe drainage systems discharging to the Harlowbury Brook, one system to the southwest of Harlowbury Brook and another system to the northeast. It is understood that the outfalls on the west and east side of the Harlowbury Brook are approximately 375mm and 600mm in diameter respectively.

### 3.2 Proposed Drainage System

#### 3.2.1 Proposed Strategy

The existing systems are understood to currently discharge directly to Harlowbury Brook with no attenuation. It is proposed to attenuate flows in a combination of ponds, a storage tank and oversized pipes along the lengths of the systems before discharging to the Harlowbury Brook at the existing discharge locations, to achieve a discharge rate as agreed with ECC.

In general, the proposed highway works on Gilden Way are constrained to be within the existing highway corridor, and therefore the space readily available for drainage purposes is extremely limited. However, the space constraints have been eased in certain locations by the advice that use of Harlow District Council owned land may, with their agreement, be considered for this part of the project.

The preferred attenuation SuDS features are ponds where space permits. However, there are few large enough open areas adjacent to Gilden Way, particularly in close proximity to the outfalls at Harlowbury Brook. Therefore, it is proposed to attenuate flows in ponds and a storage tank located part way along each system, with the remaining storage being provided by oversized pipes either under the new verge, footpath or road.

Specifically, for the Gilden Way (South) system, it is proposed to locate a pond in a pocket of relatively clear land to the south of Gilden Way approximately 250m from the Harlowbury Brook. The pond will be sympathetically located and detailed to limit the impact of the existing trees in the area, although it is likely that some trees will need to be removed. For the Gilden Way (North) system, it is proposed to locate a pond in the playing fields to the southeast of the existing Churchgate Roundabout, adjacent to the existing sports pitches. Similarly, the pond will be sympathetically located and detailed to limit the impact on the existing sports pitches, although it is likely that a large proportion of the existing mature trees in the area will need to be removed. In addition, it is proposed to locate a storage tank in the area of land to the southwest of the existing Churchgate Roundabout, which is to be positioned in the clearing between trees to limit the need for tree removal. The position of this tank should be reviewed at the next design stage, with the merits of locating the tank in the centre of the Churchgate Roundabout explored further.

In general, it is proposed to drain Gilden Way with kerbs and gullies, with combined kerb drainage utilised where advantageous due to specific site constraints.

At present, the practicality of directly reusing or refurbishing significant proportions of the existing drainage infrastructure is considered unlikely. This is due to the positional relationship between the existing and proposed highway alignment combined with the increase in capacity requirements when accounting for road widening, allowance for climate change and the need for oversized pipes. Therefore, it is generally proposed to abandon the existing drainage and construct drainage specifically positioned and sized to suit the new road layout. However, directly reusing or refurbishing existing drainage infrastructure may be necessary in some locations, particularly in areas of high density existing utilities. This will be explored further at future stages of design.



It is understood that Essex Highways will maintain maintenance responsibilities for all drainage infrastructure within the Gilden Way highway drainage catchment.

### 3.2.2 Attenuation & Discharge Limit

Being located part way along each system, the ponds and the invert levels of their outlets will be located well outside of the Harlowbury Brook 1% AEP (plus climate change) floodplain and therefore no pond related compensatory storage will be required.

The ECC preference is to restrict the discharge from each of the two proposed Gilden Way systems to the Harlowbury Brook to 50% of the existing 1 in 1 year 'brownfield' (from existing contributing areas) discharge rates. Based on this approach, the required diameters of the oversized pipe system are a significant contributing factor to what is considered to be, in certain locations along Gilden Way, an extremely challenging scheme to construct due to the required coordination with existing utilities and environmental mitigations. Consultation with ECC is ongoing regarding a suitable approach to a refinement of the limiting discharge rate requirements for the Gilden Way highway drainage catchment.

### 3.2.3 Pollution Control

The Highways Agency Water Risk Assessment Tool (HAWRAT)<sup>1</sup> was used to assess the potential ecological impacts of routine surface water runoff and to determine the need for specific pollution mitigation measures. The following pollution mitigations measures are proposed for the Gilden Way systems:

- In addition to providing water quantity benefits, the inherent nature of the ponds will provide treatment of surface water runoff prior to discharge to the receiving watercourse. Ponds are to have a 500mm permanent pool depth which will act as the main treatment zone, and are to be planted which provides additional water quality benefits. Ponds are also to be lined to prevent contamination of groundwater and aquifers;
- A silt trap is required upstream of the storage tank to the southwest of Churchgate Roundabout;
- An oil interceptor and silt trap is required before discharging to the Harlowbury Brook, for both the Gilden Way systems (requirement for oil interceptors based on a worst case assumption regarding low flows in the Harlowbury Brook);
- Highway gullies are to be trapped gullies;

During recent consultation, ECC advised that for water quality mitigations, they would generally follow the CIRIA SuDS Manual 2015 advice as opposed to the HAWRAT approach. At the next stages of the design, a comparison between the water quality requirements indicated from HAWRAT and the CIRIA SuDS Manual 2015 will be undertaken, with a view to incorporating any appropriate refinements advised by the CIRIA SuDS Manual 2015.

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<sup>1</sup> Highways Agency was replaced by Highways England in April 2015. This Water Risk Assessment Tool is yet to be renamed.

## 4. Proposed Link Roads (Highway Drainage Catchment B)

### 4.1 Proposed Drainage System

#### 4.1.1 Proposed Strategy

The proposed link roads are to be constructed on 'greenfield' land. The highway catchment includes the Westbound Diverge Link, Eastbound Merge Link, Pincey Brook Roundabout, Sheering Road Roundabout, Sheering Road Dumbbell Link and the new section of Gilden Way to the approximate location of Mayfield Farm. The proposed link roads highway drainage catchment is to be drained by kerbs and gullies, or alternatively a combined kerbs and drainage system at the roundabouts, with the carrier pipe system converging at the Sheering Road Roundabout. Filter drains are to be adopted where the proposed highway is in cutting. It is proposed to attenuate flows in a pond to the north of Sheering Road Roundabout before discharging to the Pincey Brook at an existing outfall location approximately 40m east of the Ealing Bridge (the Sheering Road Bridge), to achieve a discharge rate in line with best practice and as agreed with ECC.

In general, within the vicinity of the proposed link roads, the land falls from south to north towards the Pincey Brook. New ditches and cut-off drains are to be provided along the link roads where required. Specifically, it is proposed to provide a ditch and cut-off drain where the link is on embankment and in cutting respectively south of the Westbound Diverge Link, Sheering Road Roundabout and Gilden Way. It is proposed that the ditch and a short length of the cut-off drain will drain to the realigned unnamed watercourse, which is discussed in section 4.2. It is proposed that the remaining length of the cut-off drain will fall towards a low point south of the Sheering Road Roundabout, before being piped around the proposed Sheering Road Roundabout drainage system and discharging to the existing drainage ditch to the east of the existing wooded areas adjacent to Sheering Road. It is also proposed to provide a new cut-off drain to the west of Sheering Road Roundabout and including a length along the northwest side of Gilden Way, which will be piped to the existing drainage ditch in the same way. From readily available LiDAR information, this would appear to be where the land being intercepted by the proposed link roads currently drains, and therefore the proposal is to mimic the current drainage path. In addition, it is proposed to provide new ditches at the toe of the embankments in the area enclosed by the proposed link roads, which will drain to the realigned unnamed watercourse.

It is understood that Essex Highways will have maintenance responsibilities for all drainage infrastructure within the proposed link roads highway drainage catchment.

#### 4.1.2 Attenuation & Discharge Limit

Both the pond and the invert level of its outlet will be placed outside of the Pincey Brook 1% AEP (plus climate change) floodplain, based on hydraulic modelling of the Pincey Brook undertaken by Jacobs, and therefore no compensatory storage will be required. This has been agreed in principle with ECC and the EA.

In line with best practice and as agreed in principle with ECC, discharge to the Pincey Brook from the proposed link roads highways drainage catchment will be restricted to the 1 in 1 year 'greenfield' runoff rate for the catchment or 1 l/s, whichever value is the larger.

#### 4.1.3 Pollution Control

The Highways Agency Water Risk Assessment Tool (HAWRAT) was used to assess the potential ecological impacts of routine surface water runoff and to determine the need for specific pollution mitigation measures. The following pollution mitigations measures are proposed for the proposed link roads system:

- In addition to providing water quantity benefits, the inherent nature of the pond will provide treatment of surface water runoff prior to discharge to the receiving watercourse. The pond is to have a 500mm permanent pool depth which will act as the main treatment zone, and is to be planted which provides

additional water quality benefits. The pond is also to be lined to prevent contamination of groundwater and aquifers;

- Highway gullies are to be trapped gullies;

During recent consultation, ECC advised that for water quality mitigations, they would generally follow the CIRIA SuDS Manual 2015 advice as opposed to the HAWRAT approach. At the next stages of the design, a comparison between the water quality requirements indicated from HAWRAT and the CIRIA SuDS Manual 2015 will be undertaken, with a view to incorporating any appropriate refinements advised by the CIRIA SuDS Manual 2015.

## 4.2 Unnamed Watercourse

The link road construction also requires the realignment of a small unnamed watercourse, which currently flows in a northerly direction from the wooded areas known as The Mores as an open channel, before discharging into the Pincey Brook via two parallel approximately 140m long, 300mm diameter pipes.

Two lengths of new 2m x 2m box culvert of approximate lengths 54m and 21m, excluding skew inlet and outlet structures, will accommodate the realigned watercourse as it passes through the new Westbound Diverge Link and Eastbound Merge Link highway embankments respectively. The size of the new box culverts have been determined by bat, otter and badger access considerations, rather than solely drainage related requirements. Bottom of embankment toe ditches will be used to convey run-off to the realigned watercourse as described elsewhere in the report.

There is an open channel section between the lengths of the two box culverts which is encompassed by the new link road construction. It is likely that the ground will need to be locally re-profiled in this area to achieve a minimum channel depth of 1m.

Downstream of the highway embankment works, the realigned watercourse reverts to an open channel and is appropriately positioned to avoid existing trees and to avoid works occurring in close proximity to the route of the existing gas main. The downstream length of open channel provides significant opportunity for ecological improvement when compared to the existing small diameter piped outlets to the Pincey Brook.

## 4.3 Sheering Road

There is an existing high point on Gilden Way/Sheering Road at the approximate location of Mayfield Farm. As discussed in Section 3, the existing Gilden Way drainage to the southwest of Mayfield Farm outfalls to the Harlowbury Brook and is considered as part of Highway Drainage Catchment A. To the north of Mayfield Farm, the new section of Gilden Way deviates from the existing road and joins the new Sheering Road Roundabout. The existing Sheering Road to the northeast of Mayfield farm is understood to drain via a combination of carrier pipes and ditches, and outfall to the Pincey Brook at the existing outfall location approximately 40m east of the existing Sheering Road Bridge (Ealing Bridge).

In the proposed scheme, the southern section of the existing Sheering Road becomes solely an access road for residential properties north of Gilden Way, with a new junction and link from the new section of Gilden Way. A new length of Sheering Road from the new Sheering Road Roundabout ties into the existing Sheering Road before the Ealing Bridge.

It is currently proposed that Sheering Road will continue to drain via the existing drainage system, with minor adaptation where necessary (e.g. piping existing ditches under the new access junction), and that the existing and proposed contributing areas served by the drainage system will be balanced. However, consultation is ongoing with ECC to determine practical measures that can optimise the level of discharge betterment.

## 5. Proposed Junction 7A (Highway Drainage Catchment C)

### 5.1 Existing M11 Drainage System

In the vicinity of the proposed Junction 7A, the existing M11 drains from south to north from a high point approximately 1.8km south of the Pincey Brook and discharging to the Pincey Brook immediately west of the M11. Each carriageway is served by a surface water channel and carrier pipe system in the verge. It is currently understood that the carrier pipe system serving the southbound carriageway outfalls into a ditch where the M11 transitions from in cutting to on embankment approximately 270m south of the Pincey Brook. The ditch is then understood to join the carrier pipe system serving the northbound carriageway at the toe of the M11 embankment via a pipe on the south side of and integral with the box culvert underpass approximately 100m south of the Pincey Brook. The northbound carriageway embankment is understood to be drained by a filter drain which joins the M11 drainage system at this location. The system then discharges to the Pincey Brook via an outfall, understood to be approximately 375mm in diameter.

To the north of the box culvert underpass, the existing M11 southbound carriageway is understood to currently discharge to the Pincey Brook via two separate outfalls and independent of the highway drainage catchment south of the box culvert underpass. The length between to box culvert underpass and the Pincey Brook is understood to drain via surface water channel and outlets into the toe of embankment ditch before discharging to Pincey Brook from the south. The length north of the Pincey Brook is understood to drain in the same way, before discharging to Pincey Brook from the north.

Archive material shows a piped system in the central reserve (the high point in cross section through the M11), which is assumed to provide sub surface drainage.

Based on the limited information available, for this particular location there is a risk that the existing M11 drainage system is in a relatively poor condition.

### 5.2 Proposed Drainage System

#### 5.2.1 Proposed Strategy

The proposed Junction 7A dumbbell roundabouts and link are to be drained by kerbs and gullies, or alternatively a combined kerbs and drainage system. The northbound diverge and southbound merge are to be predominantly drained by surface water channels which will tie into the existing surface water channel on the M11 mainline, with short lengths of kerbs and gullies utilised from the roundabouts. Due to the relatively steep nature of the northbound merge and southbound diverge, which would require the use of complex weir outlets if surface water channels were adopted, these slips will be drained by kerbs and gullies, with short lengths of filter drain where the slip roads are in cutting. The edge of carriageway drainage will transition back into surface water channel to tie into the existing at a location that longitudinal gradients dictate that the complex weir outlets are not required. This includes the length of the southbound diverge which extends over the box culvert underpass and to approximately 200m north of the Pincey Brook.

It is proposed to connect the new carrier drains from the proposed Junction 7A and slip roads to the existing M11 carrier drains, and upgrade / upsize the existing pipes impacted by the scheme to take the additional runoff and meet latest design criteria in terms of climate change. A new carrier pipe system serving the southbound diverge and adjacent southbound carriageway to the north of the box culvert underpass will join the proposed Junction 7A system in the vicinity of the box culvert underpass, and will benefit from the water quantity and quality advantages provided by the proposed pond. To the north of the extended southbound diverge, the existing M11 southbound drainage system is to continue to drain as is currently assumed, via surface water channel and outlets into the toe of embankment ditch.

The existing systems currently discharge directly to Pincey Brook with no attenuation. It is proposed to attenuate flows in a pond positioned immediately to the south of the Pincey Brook and to the west of the M11 before discharging to the Pincey Brook at the existing discharge location, to achieve a discharge rate as agreed with ECC.

The proposed works encompasses the existing ditch and filter drain east and west of the existing M11 respectively where the M11 is on an embankment. New ditches will be provided both east and west of the M11 from the Junction 7A dumbbell roundabouts to the box culvert underpass where the proposed M11 slip roads are predominantly on embankment. In addition, a new cut-off drain will be provided to the east of the M11 from the southern extent of the scheme to where the proposed ditch begins where the M11 slip road is in cutting. It is proposed that the new ditches will be connected by pipes to the existing ditches north of the box culvert underpass, which are understood to outfall directly to Pincey Brook. At a future design stage, the existing and required capacities of the existing ditches north of the box culvert underpass are to be reviewed and, if required, ditch capacities increased accordingly.

It is assumed that Highways England will have maintenance responsibilities for all drainage infrastructure within the proposed Junction 7A catchment, although this is subject to a wider approval of the drainage proposals by Highways England.

### 5.2.2 Attenuation & Discharge Limit

As with the proposed link road system, both the pond and the invert level of its outlet will be placed outside of the Pincey Brook 1% AEP (plus climate change) floodplain and therefore no compensatory storage will be required. This has been agreed in principle with ECC and the EA.

As agreed in principle with ECC, it is proposed to restrict the discharge to the Pincey Brook to a rate that is no greater than 50% of the existing 1 in 1 year 'brownfield' (from existing contributing areas) discharge rate, in addition to the 1 in 1 year 'greenfield' runoff rate for the proposed additional highway catchment area.

### 5.2.3 Pollution Control

The Highways Agency Water Risk Assessment Tool (HAWRAT) was used to assess the potential ecological impacts of routine surface water runoff and to determine the need for specific pollution mitigation measures. The following pollution mitigation measures are proposed for the proposed Junction 7A system:

- In addition to providing water quantity benefits, the inherent nature of the pond will provide treatment of surface water runoff prior to discharge to the receiving watercourse. The pond is to have a 500mm permanent pool depth which will act as the main treatment zone, and is to be planted which provides additional water quality benefits. The pond is also to be lined to prevent contamination of groundwater and aquifers;
- Highway gullies are to be trapped gullies;

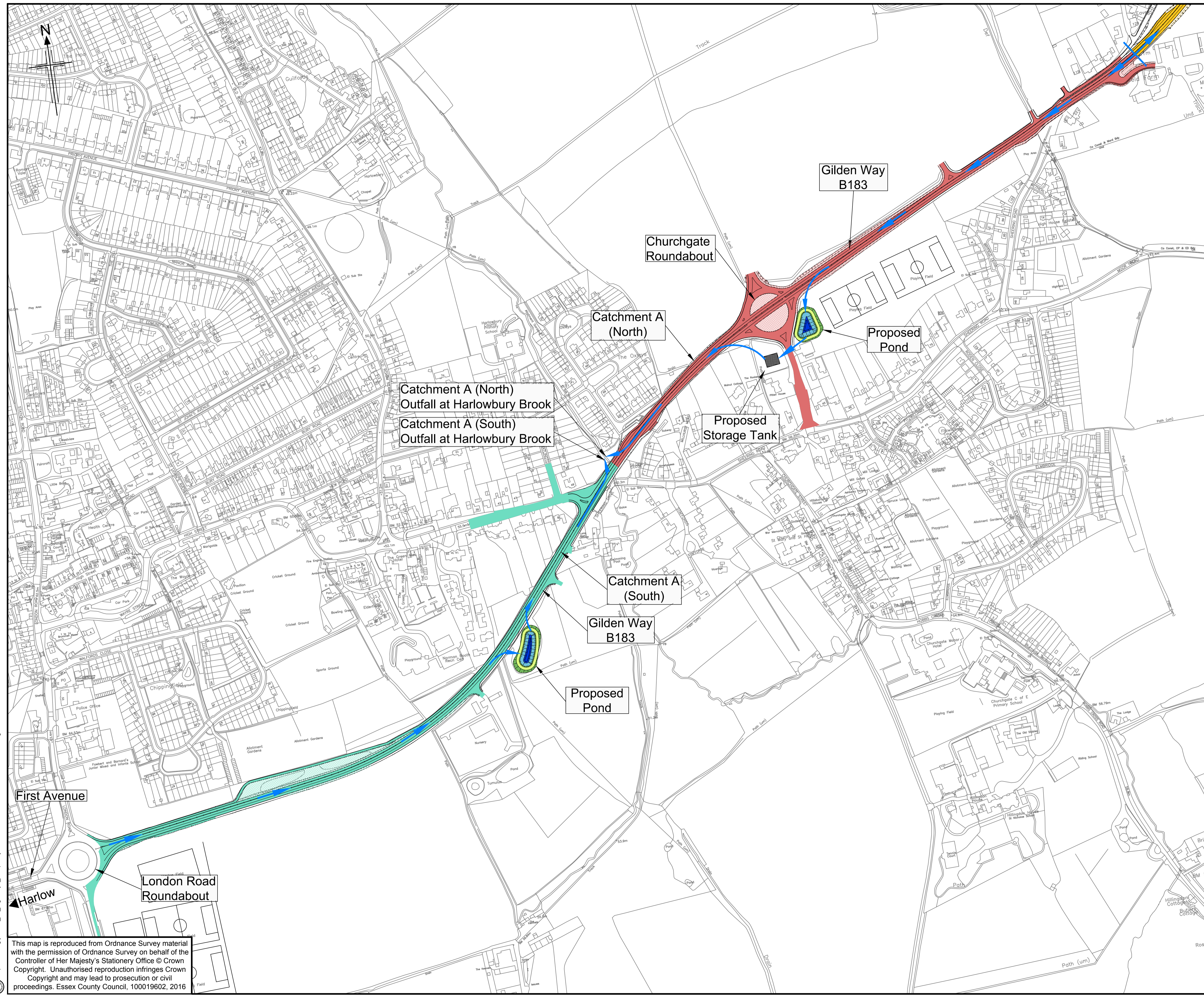
During recent consultation, ECC advised that for water quality mitigations, they would generally follow the CIRIA SuDS Manual 2015 advice as opposed to the HAWRAT approach. At the next stages of the design, a comparison between the water quality requirements indicated from HAWRAT and the CIRIA SuDS Manual 2015 will be undertaken, with a view to incorporating any appropriate refinements advised by the CIRIA SuDS Manual 2015.



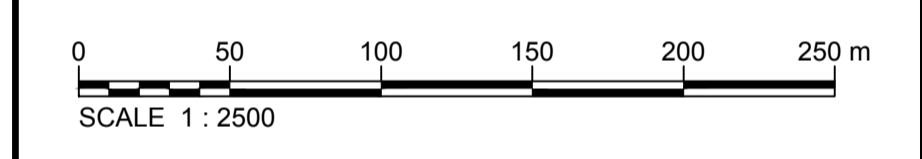
## Appendix A. High Level Drainage Schematic Plans







- Key:**
- Catchment A (South) Impermeable Area
  - Catchment A (South) Permeable Area
  - Catchment A (North) Impermeable Area
  - Catchment A (North) Permeable Area
  - Flow Direction
- Notes:**
1. Drawing is to be printed in colour.



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
PD	18/11/16	ORIGINAL	SR	MB	JP	PM

DRAWING STATUS: APPENDIX A



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Tel: 0345 6037631 © Essex County Council

SCHEME TITLE: M11 JUNCTION 7A

DRAWING TITLE: DRAINAGE CATCHMENT A

DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
SR	MB	JP	PM	
DATE	DATE	DATE	DATE	DATE
18/11/16	18/11/16	18/11/16	18/11/16	18/11/16

DRAWING UNITS U.N.O. DIMENSIONS AND LEVELS IN METRES SCALE AT A1 (841x594mm) 1:2500

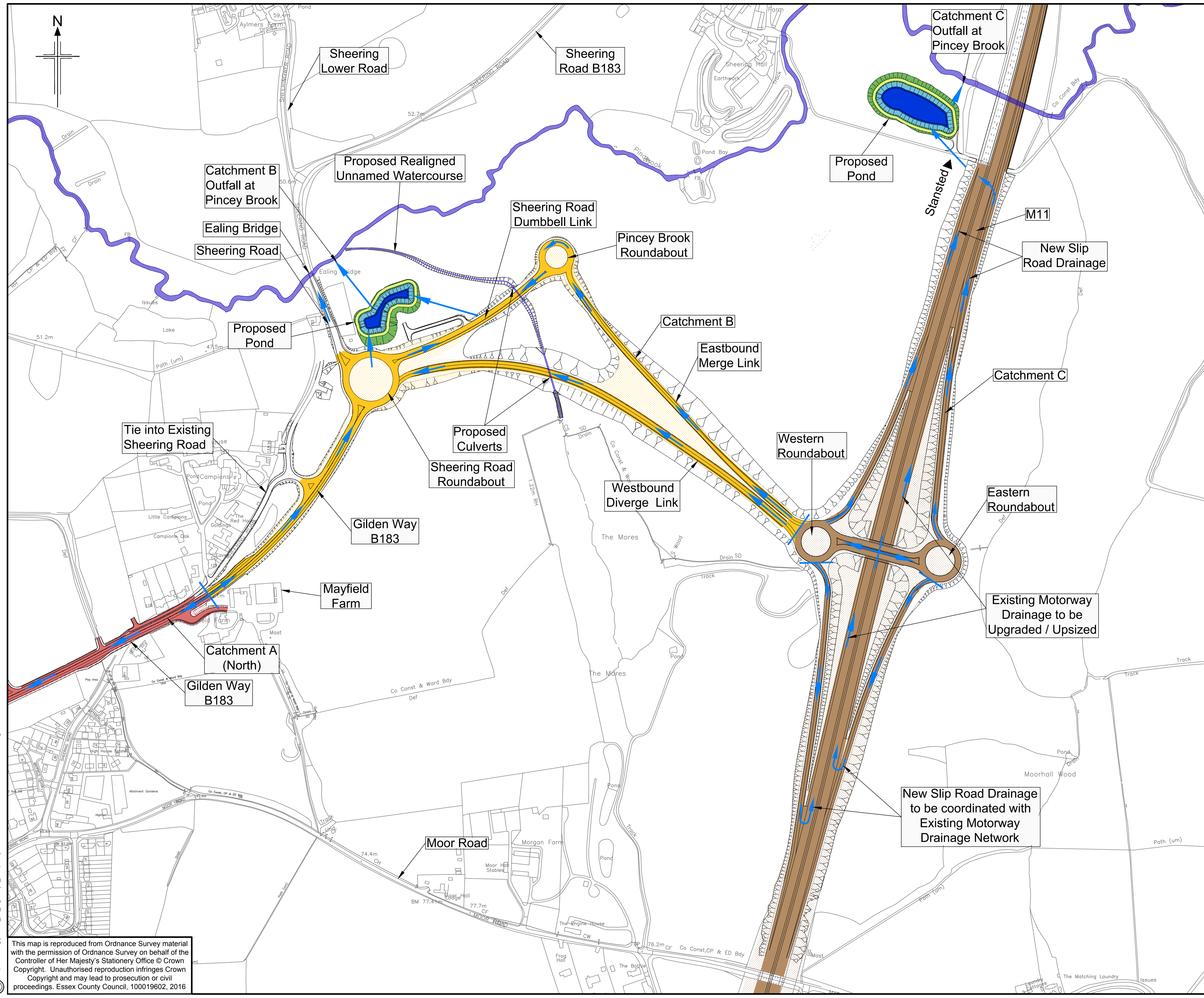
DRAWING No. B3553F05-0500-DR-0009	REV. P0
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**Key:**

- Catchment B Impermeable Area
- Catchment B Permeable Area
- Catchment C Impermeable Area
- Catchment C Permeable Area
- Flow Direction
- 1 In 100 Year + 70% Climate Change Flood Extent (Jacobs Hydraulic Modelling - Existing Scenario)
- Watercourse

**Notes:**

- Drawing is to be printed in colour.



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
PO	18/11/16	ORIGINAL	SR	MB	JP	PM

DRAWING STATUS: APPENDIX A



Mark Rowe, Service Director, Highways  
Seax House, Victoria Road South, Chelmsford, CM1 1QH.  
Tel: 0345 6037631 © Essex County Council

SCHEME TITLE: M11 JUNCTION 7A

DRAWING TITLE: DRAINAGE CATCHMENTS B & C

DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
	SR	MB	JP	PM
DATE	DATE	DATE	DATE	DATE
	18/11/16	18/11/16	18/11/16	18/11/16

DRAWING UNITS U.N.O. DIMENSIONS AND LEVELS IN METRES SCALE AT A1 (841x594mm) 1:2500

DRAWING No. B3553F05-0500-DR-0010 REV. P0

This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.

C:\pwworking\jacobs\_uk\_highways\_s4\pincey\dms 14942\B3553F05-0500-DR-0010.dwg - 11/18/2016 5:31:41 PM - RAWANS

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**Appendix 2.2: Construction Programme**

DRAFT

DRAFT

# M11 - Junction 7A Construction Programme

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	2017														
							Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov				
1		<b>Contract Mobilisation</b>	<b>65 days</b>	<b>Mon 17/12/18</b>	<b>Wed 20/03/19</b>																
2		Mobilise Contract following the award	65 days	Mon 17/12/18	Wed 20/03/19																
3		<b>Advanced Environmental Mitigation Works for Phase 1 - Section A (Phase A, B &amp; C)</b>	<b>202 days</b>	<b>Mon 17/12/18</b>	<b>Fri 04/10/19</b>																
4		Vegetation Clearance to 15cm (non bat roost) - Phase A [Ch:0 - Ch:830, north side]	50 days	Mon 17/12/18	Wed 27/02/19	2SS															
5		Vegetation Clearance - grub out - Phase A [Ch:0 - Ch:830, north side]	50 days	Mon 08/04/19	Thu 20/06/19	4FS+20 days,20															
6		Vegetation Clearance to 15cm (non bat roost) - Phase B [Ch:0 - Ch:1240, south side]	50 days	Mon 17/12/18	Wed 27/02/19	2SS															
7		Vegetation Clearance - grub out - Phase B [Ch:0 - Ch:1240, south side]	100 days	Mon 08/04/19	Fri 30/08/19	6FS+20 days,20															
8		Vegetation Clearance to 15cm (non bat roost) - Phase C [Ch:830 - Ch:1240, north side]	45 days	Mon 17/12/18	Wed 20/02/19	4SS															
9		Vegetation Clearance - grub out - Phase C [Ch:830 - Ch:1240, north side]	45 days	Mon 08/04/19	Thu 13/06/19	8FS+27 days,20															
10		Install Noise barriers for Phase A works on the north side between Ch:70 and Ch:220.	15 days	Fri 21/06/19	Thu 11/07/19	5															
11		Install Noise barriers for Phase B works on the south side between Ch:780 & Ch:1020.	25 days	Mon 02/09/19	Fri 04/10/19	7															
12		Install Noise barriers for Phase B works on the south side between Ch:1060 & Ch:1200.	15 days	Mon 02/09/19	Fri 20/09/19	7															
13		<b>Advanced Ecological Mitigation Works for Phase 1 - Section A (Phase A, B &amp; C)</b>	<b>321 days</b>	<b>Mon 03/09/18</b>	<b>Thu 05/12/19</b>																
14		GCN licence application	90 days	Mon 03/09/18	Wed 09/01/19																
15		Bat licence application	90 days	Mon 03/09/18	Wed 09/01/19	14SS															
16		Erection of bat boxes	5 days	Thu 10/01/19	Wed 16/01/19	15															
17		Construct amphibian and reptile refugia outside GCN exclusion area (using arisings from vegetation clearance work) as receptor for trapped animals	2 days	Thu 28/02/19	Fri 01/03/19	4,6,8															
18		Erect one-way exclusion fence for GCN	5 days	Mon 01/04/19	Fri 05/04/19	14FS+57 days															
19		Trapping GCN/reptiles and habitat manipulation within fence	60 days	Mon 08/04/19	Thu 04/07/19	18															
20		Remove bat roost trees under licence	5 days	Mon 01/04/19	Fri 05/04/19	15FS+57 days															
21		Collect seeds by mowing / portable leaf hoover prior to commencing Phase C Works	2 days	Wed 04/12/19	Thu 05/12/19	100															
22		<b>Advanced Utility Diversion Works for Phase 1 - Section A (Phase A, B &amp; C)</b>	<b>135 days</b>	<b>Mon 17/12/18</b>	<b>Tue 02/07/19</b>																
23		Divert Utilities	135 days	Mon 17/12/18	Tue 02/07/19	2SS															
24		<b>PHASE 1 Main Construction Works - Section A:- 'London Road' Roundabout to 'Churchgate' Roundabout [Ch:0 to Ch:1240]</b>	<b>351 days</b>	<b>Fri 05/07/19</b>	<b>Thu 19/11/20 19</b>																

Project: M11 Junction 7A Project  
Date: Mon 19/12/16

Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
Split		External Tasks		Inactive Summary		Manual Summary		Progress	
Milestone		External Milestone		Manual Task		Start-only			
Summary		Inactive Task		Duration-only		Finish-only			

## M11 - Junction 7A Construction Programme

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	2017														
							Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov				
25		<b>Traffic Management Set Up for Phase 1 - Section A - Phase A Works</b>	4 days	Fri 05/07/19	Wed 10/07/19																
26		Install Traffic Management and reduce lane width for the existing E/B & W/B traffic to 3.0m to create min 1.2m safe working distance from the edge of the live E/B traffic to allow widening on the north	3 days	Fri 05/07/19	Tue 09/07/19	19,23															
27		Set up Exclusion Zone on the edge of the existing E/B Carriageway from Ch: 0 to Ch:830.	1 day	Wed 10/07/19	Wed 10/07/19	26															
28		<b>Site Set-up and mobilisation</b>	45 days	Thu 11/07/19	Thu 12/09/19																
29		Set up Site Compound(s), Welfare facilities, Storage Areas etc.	45 days	Thu 11/07/19	Thu 12/09/19	27															
30		Import suitable fill material for Phase 1 -Section A Earthworks (All Phases)	5 days	Tue 03/09/19	Mon 09/09/19	35FS-10 days															
31		<b>Phase 1 - Section A - PHASE A Main Works :- From Ch:0 to Ch:830 (E/B Carriageway)</b>	25 days	Fri 13/09/19	Thu 17/10/19																
32		<b>Archaeological Mitigation Works</b>	19 days	Fri 13/09/19	Wed 09/10/19																
33		Undertake Archaeological Recording in the stretch between Ch:200 & Ch:500	19 days	Fri 13/09/19	Wed 09/10/19	35SS															
34		<b>Widening Works (E/B Carriageway)</b>	25 days	Fri 13/09/19	Thu 17/10/19																
35		Strip Top Soil	2 days	Fri 13/09/19	Mon 16/09/19	29															
36		Undertake Earthworks in Filling	2 days	Tue 17/09/19	Wed 18/09/19	35															
37		Capping Works	2 days	Thu 19/09/19	Fri 20/09/19	36															
38		Lay Kerbs on the north side of new E/B Carriageway from Ch:0 to Ch:900	6 days	Mon 23/09/19	Mon 30/09/19	37															
39		Prepare Sub-base	3 days	Mon 23/09/19	Wed 25/09/19	37															
40		Prepare Base Course	2 days	Wed 25/09/19	Thu 26/09/19	39SS+2 days															
41		Lay Black top Binder Course	1 day	Fri 27/09/19	Fri 27/09/19	40															
42		Construct footways & paved area on the north side between Ch:0 & Ch:830	16 days	Thu 26/09/19	Thu 17/10/19	38SS+3 days															
43		<b>Phase 1 - Section A - PHASE B Main Works:- From Ch:0 to Ch:1240 (W/B Carriageway)</b>	30 days	Fri 18/10/19	Thu 28/11/19																
44		<b>Traffic Management Set Up for Phase 1 - Section A - Phase B Works [Ch:0 to Ch:830 W/B]</b>	5 days	Fri 18/10/19	Thu 24/10/19																
45		Install Traffic Management and move the existing E/B traffic towards north side onto the newly built E/B lane between Ch:0 and Ch:830.	2 days	Fri 18/10/19	Mon 21/10/19	11,12,42															
46		Move the existing W/B traffic towards north to create minimum 1.2m safe distance from the edge of the live W/B traffic to allow widening /demolition of the existing W/B lane between	2 days	Tue 22/10/19	Wed 23/10/19	45															
47		Set up Exclusion Zone on the edge of existing W/B Carriageway from Ch: 0 to Ch:830.	1 day	Thu 24/10/19	Thu 24/10/19	46															
48		<b>Archaeological Mitigation Works</b>	10 days	Fri 25/10/19	Thu 07/11/19																

Project: M11 Junction 7A Project  
Date: Mon 19/12/16

Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
Split		External Tasks		Inactive Summary		Manual Summary		Progress	
Milestone		External Milestone		Manual Task		Start-only			
Summary		Inactive Task		Duration-only		Finish-only			

# M11 - Junction 7A Construction Programme

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	2017														
							Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov				
49		Undertake Archaeological Recording in the stretch between Ch:200-800.	10 days	Fri 25/10/19	Thu 07/11/19	52SS															
50		<b>Main Works -Phase B:- From Ch:0 to Ch:450 (W/B)</b>	<b>20 days</b>	<b>Fri 25/10/19</b>	<b>Thu 21/11/19</b>																
51		<b>Widening Works (W/B Carriageway)</b>	<b>20 days</b>	<b>Fri 25/10/19</b>	<b>Thu 21/11/19</b>																
52		Strip Top Soil	1 day	Fri 25/10/19	Fri 25/10/19	47															
53		Undertake Earthworks (in cutting)	1 day	Mon 28/10/19	Mon 28/10/19	52															
54		Undertake Earthworks (in filling)	1 day	Fri 01/11/19	Fri 01/11/19	53,68															
55		Install Drainage	9 days	Fri 01/11/19	Wed 13/11/19	54SS															
56		Capping Works	1 day	Thu 14/11/19	Thu 14/11/19	55															
57		Lay Kerbs on the south side of new W/B Carriageway from Ch:0 to Ch:450	3 days	Fri 15/11/19	Tue 19/11/19	56															
58		Prepare Sub-base	1 day	Fri 15/11/19	Fri 15/11/19	56															
59		Prepare Base Course	1 day	Mon 18/11/19	Mon 18/11/19	58															
60		Lay Black top Binder Course	1 day	Tue 19/11/19	Tue 19/11/19	59															
61		Construct footways & paved area on the south of London Road Roundabout at Ch:0	3 days	Tue 19/11/19	Thu 21/11/19	57SS+2 days															
62		<b>Main Works -Phase B:- From Ch:450 to Ch:600 (W/I)</b>	<b>5 days</b>	<b>Fri 25/10/19</b>	<b>Thu 31/10/19</b>																
63		<b>Demolition Works (W/B Carriageway)</b>	<b>5 days</b>	<b>Fri 25/10/19</b>	<b>Thu 31/10/19</b>																
64		Undertake demolition of the existing W/B lane	5 days	Fri 25/10/19	Thu 31/10/19	47															
65		<b>Main Works -Phase B:- From Ch:600 to Ch:830 (W/I)</b>	<b>16 days</b>	<b>Fri 25/10/19</b>	<b>Fri 15/11/19</b>																
66		<b>Widening Works (W/B)</b>	<b>16 days</b>	<b>Fri 25/10/19</b>	<b>Fri 15/11/19</b>																
67		Strip Top Soil and commence Earthworks (in cu	1 day	Fri 25/10/19	Fri 25/10/19	47															
68		Excavate Drainage Pond at Ch:650	5 days	Fri 25/10/19	Thu 31/10/19	67SS															
69		Undertake Earthworks (in filling)	1 day	Tue 29/10/19	Tue 29/10/19	68SS+2 days															
70		Install Drainage	10 days	Tue 29/10/19	Mon 11/11/19	69SS															
71		Capping Works	1 day	Tue 12/11/19	Tue 12/11/19	70															
72		Lay Kerbs on the south side of new W/B Carriageway from Ch:600 to Ch:830	1.5 days	Wed 13/11/19	Thu 14/11/19	71															
73		Prepare Sub-base	1 day	Wed 13/11/19	Wed 13/11/19	71															
74		Prepare Base Course	1 day	Thu 14/11/19	Thu 14/11/19	73															
75		Lay Black top Binder Course	1 day	Fri 15/11/19	Fri 15/11/19	74															
76		<b>Construction of Retaining Wall Structure (Ch:786 - Ch:820)</b>	<b>15 days</b>	<b>Fri 25/10/19</b>	<b>Thu 14/11/19</b>																
77		Construct 1no Retaining Wall Structure from Ch:786 to Ch:820.	15 days	Fri 25/10/19	Thu 14/11/19	47															
78		<b>Traffic Management Set Up for Phase 1 - Section A - Phase B Works [Ch:830 to Ch:1240 W/B]</b>	<b>4 days</b>	<b>Fri 18/10/19</b>	<b>Wed 23/10/19</b>																
79		Install Traffic Mgt and reduce lane width for the existing E/B & W/B traffic to 3.0m between Ch: 830 & Ch:1200 to create min 1.2m safe working distance from the edge of the live W/B traffic to allow widening on the south side from Ch:830 to	3 days	Fri 18/10/19	Tue 22/10/19	45SS															

Project: M11 Junction 7A Project  
Date: Mon 19/12/16

Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
Split		External Tasks		Inactive Summary		Manual Summary		Progress	
Milestone		External Milestone		Manual Task		Start-only			
Summary		Inactive Task		Duration-only		Finish-only			

# M11 - Junction 7A Construction Programme

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	2017												
							Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov		
80		Set up Exclusion Zone on the edge of the existing W/B Carriageway from Ch: 830 to Ch:1240.	1 day	Wed 23/10/19	Wed 23/10/19	79													
81		<b>Main Works -Phase B:- From Ch:830 to Ch:1240 (W/B Carriageway)</b>	<b>26 days</b>	<b>Thu 24/10/19</b>	<b>Thu 28/11/19</b>														
82		<b>Archaeological Mitigation Works</b>	<b>11 days</b>	<b>Thu 24/10/19</b>	<b>Thu 07/11/19</b>														
83		Undertake Archaeological Recording in the stretch between Ch:950 - Ch:1020 and	11 days	Thu 24/10/19	Thu 07/11/19	85SS													
84		<b>Widening Works (W/B)</b>	<b>26 days</b>	<b>Thu 24/10/19</b>	<b>Thu 28/11/19</b>														
85		Strip Top Soil	2 days	Thu 24/10/19	Fri 25/10/19	80													
86		Undertake Earthworks (in cutting)	1 day	Mon 28/10/19	Mon 28/10/19	85													
87		Undertake Earthworks (in filling)	2 days	Mon 28/10/19	Tue 29/10/19	86SS													
88		Install Drainage	18 days	Mon 28/10/19	Wed 20/11/19	87SS													
89		Capping Works	1 day	Thu 21/11/19	Thu 21/11/19	88													
90		Lay Kerbs on the south side of new W/B Carriageway from Ch:830 to Ch:1240.	3 days	Fri 22/11/19	Tue 26/11/19	89													
91		Prepare Sub-base	2 days	Fri 22/11/19	Mon 25/11/19	89													
92		Prepare Base Course	2 days	Tue 26/11/19	Wed 27/11/19	91													
93		Lay Black top Binder Course	1 day	Thu 28/11/19	Thu 28/11/19	92													
94		<b>Construction of Retaining Wall Structure (Ch:830 - Ch:870)</b>	<b>20 days</b>	<b>Mon 28/10/19</b>	<b>Fri 22/11/19</b>														
95		Construct 1no Retaining Wall Structure from Ch:830 to Ch:870.	20 days	Mon 28/10/19	Fri 22/11/19	86SS													
96		<b>Phase 1 - Section A - PHASE C Main Works:- From Ch:830 to Ch:1240 (E/B Carriageway)</b>	<b>14 days</b>	<b>Fri 29/11/19</b>	<b>Wed 18/12/19</b>														
97		<b>Traffic Management Set Up for Phase 1 -Section A - Phase C Works</b>	<b>4 days</b>	<b>Fri 29/11/19</b>	<b>Wed 04/12/19</b>														
98		Install Traffic Management and move the existing W/B traffic towards south onto the newly built W/B lane between Ch:830 and	2 days	Fri 29/11/19	Mon 02/12/19	93													
99		Move the existing E/B traffic towards South to create minimum 1.2m safe working distance from the edge of the live E/B traffic on the north side to allow demolition / widening of the	2 days	Tue 03/12/19	Wed 04/12/19	98													
100		Set up Exclusion Zone on the edge of existing E/B Carriageway in the stretch between Ch:830 &	1 day	Tue 03/12/19	Tue 03/12/19	99SS													
101		<b>Main Works -Phase C:- From Ch:830 to Ch:930 (E/B Carriageway)</b>	<b>6 days</b>	<b>Wed 04/12/19</b>	<b>Wed 11/12/19</b>														
102		<b>Demolition Works (E/B Carriageway)</b>	<b>6 days</b>	<b>Wed 04/12/19</b>	<b>Wed 11/12/19</b>														
103		Undertake demolition of the existing E/B Carriageway on the North side from Ch:830 to Ch:930.	6 days	Wed 04/12/19	Wed 11/12/19	100													
104		<b>Main Works -Phase C:- From Ch:930 to Ch:1040 (E/B Carriageway)</b>	<b>11 days</b>	<b>Wed 04/12/19</b>	<b>Wed 18/12/19</b>														
105		<b>Widening Works (E/B Carriageway)</b>	<b>11 days</b>	<b>Wed 04/12/19</b>	<b>Wed 18/12/19</b>														
106		Strip Top Soil	1 day	Wed 04/12/19	Wed 04/12/19	100													
107		Undertake Earthworks (in filling)	1 day	Thu 05/12/19	Thu 05/12/19	106													

Project: M11 Junction 7A Project  
Date: Mon 19/12/16

Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
Split		External Tasks		Inactive Summary		Manual Summary		Progress	
Milestone		External Milestone		Manual Task		Start-only			
Summary		Inactive Task		Duration-only		Finish-only			



# M11 - Junction 7A Construction Programme

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	2017											
							Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov	
108		Capping Works	1 day	Fri 06/12/19	Fri 06/12/19	107												
109		Lay Kerbs on the south side of new E/B Carriageway from Ch:830 to Ch:1040.	3 days	Mon 09/12/19	Wed 11/12/19	108												
110		Prepare Sub-base	1 day	Mon 09/12/19	Mon 09/12/19	108												
111		Prepare Base Course	1 day	Tue 10/12/19	Tue 10/12/19	110												
112		Lay Black top Binder Course	1 day	Wed 11/12/19	Wed 11/12/19	111												
113		Construct footways & paved area on the north side between Ch:830 to Ch:1040	5 days	Thu 12/12/19	Wed 18/12/19	109												
114		<b>Main Works -Phase C:- From Ch:1120 to Ch:1240 (E</b>	<b>9 days</b>	<b>Wed 04/12/19</b>	<b>Mon 16/12/19</b>													
115		<b>Archaeological Mitigation Works</b>	<b>5 days</b>	<b>Wed 04/12/19</b>	<b>Tue 10/12/19</b>													
116		Undertake Archaeological Recording in the stretch between Ch:1050 - Ch:1240	5 days	Wed 04/12/19	Tue 10/12/19	118SS												
117		<b>Widening Works (E/B Carriageway)</b>	<b>9 days</b>	<b>Wed 04/12/19</b>	<b>Mon 16/12/19</b>													
118		Strip Top Soil	1 day	Wed 04/12/19	Wed 04/12/19	100												
119		Undertake Earthworks (in filling)	1 day	Thu 05/12/19	Thu 05/12/19	118												
120		Capping Works	1 day	Fri 06/12/19	Fri 06/12/19	119												
121		Lay Kerbs on the south side of new E/B Carriageway from Ch:1040 to Ch:1240.	2 days	Mon 09/12/19	Tue 10/12/19	120												
122		Prepare Sub-base	1 day	Mon 09/12/19	Mon 09/12/19	120												
123		Prepare Base Course	1 day	Tue 10/12/19	Tue 10/12/19	122												
124		Lay Black top Binder Course	1 day	Wed 11/12/19	Wed 11/12/19	123												
125		Construct footways & paved area on the north side between Ch:1040 & Ch:1240	4 days	Wed 11/12/19	Mon 16/12/19	121												
126		<b>Phase 1 - Section A - PHASE D Main Works:- From Ch:0 to Ch:1240 Inlay Works (Central Strip)</b>	<b>30 days</b>	<b>Tue 17/12/19</b>	<b>Thu 30/01/20</b>													
127		<b>Traffic Management Set Up for Phase 1 - Section A - Phase D Works</b>	<b>12 days</b>	<b>Tue 17/12/19</b>	<b>Mon 06/01/20</b>													
128		Install Traffic Management and move the W/B traffic onto the newly widened W/B carriageway between Ch:0 & Ch:830. (To be noted that the W/B traffic flowing between Ch:830 & Ch:1240 already moved to the newly widened W/B	5 days	Tue 17/12/19	Mon 23/12/19	125												
129		Install Traffic Management and move the E/B traffic onto the newly widened E/B carriageway between Ch:830 & Ch:1240. (To be noted that E/B traffic flowing between Ch:0 & Ch:830 already moved to the newly widened E/B	3 days	Tue 17/12/19	Thu 19/12/19	128SS												
130		Set up 0.6m Exclusion Zone along the edge of E/B traffic from Ch:0 to Ch:1240.	7 days	Fri 20/12/19	Thu 02/01/20	129												
131		Set up 0.6m Exclusion Zone along the edge of W/B traffic from Ch:0 to Ch:1240.	7 days	Tue 24/12/19	Mon 06/01/20	128												
132		<b>Planing &amp; Inlay Works (Central Strip) -Ch:0 to Ch:12</b>	<b>18 days</b>	<b>Tue 07/01/20</b>	<b>Thu 30/01/20</b>													

Project: M11 Junction 7A Project  
Date: Mon 19/12/16

Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
Split		External Tasks		Inactive Summary		Manual Summary		Progress	
Milestone		External Milestone		Manual Task		Start-only			
Summary		Inactive Task		Duration-only		Finish-only			

# M11 - Junction 7A Construction Programme

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	2017														
							Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov				
133		Undertake Planing works in the 'Central Strip' of the existing carriageway from Ch:0 to Ch:1240.	13 days	Tue 07/01/20	Thu 23/01/20	131															
134		Repair Works to existing joints in the concrete sla	10 days	Thu 16/01/20	Wed 29/01/20	133SS+7 days															
135		Undertake Inlay works - Binder Course (only) in the 'Central Strip' of the existing carriageway from Ch:0 to Ch:1240.	5 days	Fri 24/01/20	Thu 30/01/20	134SS+6 days															
136		<b>Phase 1 - Section A - PHASE E Main Works:- From Ch:0 to Ch:1240 Inlay Works (Southern Strip - along W/B carriageway)</b>	<b>27 days</b>	<b>Fri 31/01/20</b>	<b>Mon 09/03/20</b>																
137		<b>Traffic Management Set Up for Phase 1 - Section A - Phase E Works</b>	<b>12 days</b>	<b>Fri 31/01/20</b>	<b>Mon 17/02/20</b>																
138		Install Traffic Management and move the W/B traffic onto the newly laid Central Strip.	5 days	Fri 31/01/20	Thu 06/02/20	135															
139		Set up 0.5m Exclusion Zone along the edge of W/B traffic from Ch:0 to Ch:1240.	7 days	Fri 07/02/20	Mon 17/02/20	138															
140		<b>Planing &amp; Inlay Works (Southern Strip along the edge of the W/B traffic) - Ch:0 to Ch:1240.</b>	<b>15 days</b>	<b>Tue 18/02/20</b>	<b>Mon 09/03/20</b>																
141		Undertake Planing works in the 'Southern Strip' from Ch:0 to Ch:1240.	9 days	Tue 18/02/20	Fri 28/02/20	139															
142		Repair Works to existing joints in the concrete sla	10 days	Mon 24/02/20	Fri 06/03/20	141SS+4 days															
143		Undertake Inlay works - Binder Course (only) in the 'Southern Strip' from Ch:0 to Ch:1240.	5 days	Tue 03/03/20	Mon 09/03/20	142SS+6 days															
144		<b>Phase 1 - Section A - PHASE F Main Works:- From Ch:0 to Ch:1240 Inlay Works (Northern Strip - along E/B carriageway)</b>	<b>28 days</b>	<b>Tue 10/03/20</b>	<b>Mon 20/04/20</b>																
145		<b>Traffic Management Set Up for Phase 1 - Section A - Phase F Works</b>	<b>12 days</b>	<b>Tue 10/03/20</b>	<b>Wed 25/03/20</b>																
146		Install Traffic Management and move the W/B traffic back onto the newly laid Southern Strip prepared in Phase E between Ch:0 & Ch:1240.	5 days	Tue 10/03/20	Mon 16/03/20	143															
147		Install Traffic Management and move the E/B traffic back on to the newly laid Central Strip prepared in Phase D between Ch:0 & Ch:1240.	5 days	Tue 10/03/20	Mon 16/03/20	146SS															
148		Set up 0.5m Exclusion Zone along the edge of E/B traffic from Ch:0 to Ch:1240.	7 days	Tue 17/03/20	Wed 25/03/20	147															
149		<b>Planing &amp; Inlay Works (Northern Strip along the edge of the E/B traffic) - Ch:0 to Ch:1240.</b>	<b>16 days</b>	<b>Thu 26/03/20</b>	<b>Mon 20/04/20</b>																
150		Undertake Planing works in the 'Northern Strip' from Ch:0 to Ch:1240.	11 days	Thu 26/03/20	Thu 09/04/20	148															
151		Repair Works to existing joints in the concrete sla	10 days	Fri 03/04/20	Mon 20/04/20	150SS+6 days															
152		Undertake Inlay works - Binder Course (only) in the 'Northern Strip' from Ch:0 to Ch:1240.	5 days	Tue 14/04/20	Mon 20/04/20	151SS+5 days															

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Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
Split		External Tasks		Inactive Summary		Manual Summary		Progress	
Milestone		External Milestone		Manual Task		Start-only			
Summary		Inactive Task		Duration-only		Finish-only			

# M11 - Junction 7A Construction Programme

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	2017															
							Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov					
153		<b>Phase 1 - Section A Surfacing Works - Ch:0 to Ch:1240 (NIGHT TIME WORKING ONLY)</b>	60 days	Tue 21/04/20	Wed 15/07/20																	
154		<b>Surfacing Works in Phase 1 -Section A - Northern side (NIGHT TIME WORKING ONLY, 620m Stretch between Ch:0 &amp; Ch:1240)</b>	15 days	Tue 21/04/20	Tue 12/05/20																	
155		Install Traffic Management using Traffic Light system in Section A for the 620m stretch	7 days	Tue 21/04/20	Wed 29/04/20	152																
156		Divert the E/B & W/B traffic through the southern part of the carriageway in 620m stretch	1 day	Thu 30/04/20	Thu 30/04/20	155																
157		Undertake Surfacing works on the northern part of the carriageway in 620m stretch between Ch:0	7 days	Fri 01/05/20	Tue 12/05/20	156																
158		<b>Surfacing Works in Phase 1 -Section A - Southern side (NIGHT TIME WORKING ONLY, 620m Stretch between Ch:0 &amp; Ch:1240)</b>	15 days	Wed 13/05/20	Wed 03/06/20																	
159		Install Traffic Management using Traffic Light system in Section A for the 620m stretch between Ch:0 & Ch:1240	7 days	Wed 13/05/20	Thu 21/05/20	157																
160		Divert the E/B & W/B traffic through the newly surfaced northern part of the carriageway in	1 day	Fri 22/05/20	Fri 22/05/20	159																
161		Undertake Surfacing works on the Southern part of the carriageway in 620m stretch between Ch:0	7 days	Tue 26/05/20	Wed 03/06/20	160																
162		<b>Surfacing Works in Phase 1 - Section A - Southern side (NIGHT TIME WORKING ONLY, Remainder 620m Stretch between Ch:0 &amp; Ch:1240)</b>	15 days	Thu 04/06/20	Wed 24/06/20																	
163		Install Traffic Management using Traffic Light system in Section A for the remainder 620m stretch between Ch:0 & Ch:1240	7 days	Thu 04/06/20	Fri 12/06/20	161																
164		Divert the E/B & W/B traffic through the northern part of the carriageway in the remainder 620m stretch between Ch:0 &	1 day	Mon 15/06/20	Mon 15/06/20	163																
165		Undertake Surfacing works on the southern part of the carriageway in the remainder 620m stretch between Ch:0 & Ch:1240	7 days	Tue 16/06/20	Wed 24/06/20	164																
166		<b>Surfacing Works in Phase 1 -Section A - Northern side (NIGHT TIME WORKING ONLY, Remainder 620m Stretch between Ch:0 &amp; Ch:1240)</b>	15 days	Thu 25/06/20	Wed 15/07/20																	
167		Install Traffic Management using Traffic Light system in Section A for the remainder 620m stretch between Ch:0 & Ch:1240	7 days	Thu 25/06/20	Fri 03/07/20	165																
168		Divert the E/B & W/B traffic through the newly surfaced southern part of the carriageway in	1 day	Mon 06/07/20	Mon 06/07/20	167																
169		Undertake Surfacing works on the Northern part of the carriageway in the remainder 620m stretch between Ch:0 & Ch:1240	7 days	Tue 07/07/20	Wed 15/07/20	168																

Project: M11 Junction 7A Project Date: Mon 19/12/16	Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
	Split		External Tasks		Inactive Summary		Manual Summary		Progress	
	Milestone		External Milestone		Manual Task		Start-only			
	Summary		Inactive Task		Duration-only		Finish-only			

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ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	2017												
							Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov		
170		<b>Completion of Phase 1 -Section A Widening, Inlay &amp; Resurfacing Works</b>	<b>0 days</b>	<b>Wed 15/07/20</b>	<b>Wed 15/07/20</b>	169													
171		<b>Landscape &amp; Planting Works - Phase 1 -Section A (Phase A, B &amp; C)</b>	<b>90 days</b>	<b>Thu 16/07/20</b>	<b>Thu 19/11/20</b>														
172		Plant Trees in Phase A	90 days	Thu 16/07/20	Thu 19/11/20	170													
173		Plant Trees in Phase B	90 days	Thu 16/07/20	Thu 19/11/20	172SS													
174		Plant Trees in Phase C	90 days	Thu 16/07/20	Thu 19/11/20	172SS													
175																			
176		<b>Advanced Environmental Mitigation Works for Phase 1 - Section B (Phase A &amp; B)</b>	<b>162 days</b>	<b>Mon 17/12/18</b>	<b>Thu 08/08/19</b>														
177		Vegetation Clearance to 15cm (non bat roost) - Phase A [Ch:1300 - Ch:1900, north side]	40 days	Thu 03/01/19	Wed 27/02/19	4SS+10 days													
178		Vegetation Clearance - grub out - Phase A [Ch:1300 - Ch:1900, north side]	40 days	Mon 01/04/19	Thu 30/05/19	177FS+22 days													
179		Vegetation Clearance to 15cm (non bat roost) - Phase B [Ch:1300 - Ch:1900, south side]	40 days	Thu 03/01/19	Wed 27/02/19	4SS+10 days													
180		Vegetation Clearance - grub out - Phase B [Ch:1300 - Ch:1900, south side]	40 days	Mon 01/04/19	Thu 30/05/19	179FS+20 days													
181		Install Noise barriers for Phase A works on the north side	50 days	Fri 31/05/19	Thu 08/08/19	177,178													
182		Install Noise barriers for Phase B works on the south side	50 days	Fri 31/05/19	Thu 08/08/19	179,180													
183		<b>Advanced Ecological Mitigation Works for Phase 1 - Section B (Phase A &amp; B)</b>	<b>82 days</b>	<b>Thu 28/02/19</b>	<b>Thu 27/06/19</b>														
184		Construct reptile refugia outside works area, so act as shelter for temporarily displaced individuals	2 days	Thu 28/02/19	Fri 01/03/19	177,179													
185		Habitat manipulation to render works area unsuitable for reptiles	60 days	Mon 01/04/19	Thu 27/06/19	184FS+20 days													
186		<b>Advanced Utility Diversion Works for Phase 1 - Section B (Phase A &amp; B)</b>	<b>120 days</b>	<b>Mon 17/12/18</b>	<b>Tue 11/06/19</b>														
187		Divert Utilities	120 days	Mon 17/12/18	Tue 11/06/19	2SS													
188		<b>PHASE 1 Main Construction Works - Section B:- Stretch between Churchgate Roundabout (Ch:1240) and Ch:1900 on the existing Sheering Road.</b>	<b>322 days?</b>	<b>Fri 13/09/19</b>	<b>Thu 17/12/20</b>														
189		<b>Phase 1 - Section B - PHASE A Main Works:- From Ch:1240 to Ch:1870 (E/B Carriageway)</b>	<b>23 days</b>	<b>Fri 13/09/19</b>	<b>Tue 15/10/19</b>														
190		<b>Main Works - Phase A:- From Ch:1240 to Ch:1650 (E/B Carriageway)</b>	<b>23 days</b>	<b>Fri 13/09/19</b>	<b>Tue 15/10/19</b>														
191		<b>Traffic Management Set Up for Phase 1 -Section B - Phase A Works</b>	<b>3 days</b>	<b>Fri 13/09/19</b>	<b>Tue 17/09/19</b>														
192		Install Traffic Management and reduce lane width of the existing E/B & W/B Carriageway to 3.0m to create min 1.2m safe working distance from the edge of the live E/B traffic to allow widening on the north side from	3 days	Fri 13/09/19	Tue 17/09/19	29													

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Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
Split		External Tasks		Inactive Summary		Manual Summary		Progress	
Milestone		External Milestone		Manual Task		Start-only			
Summary		Inactive Task		Duration-only		Finish-only			



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ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	2017														
							Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov				
193		Set up Exclusion Zone on the edge of the existing E/B Carriageway from Ch:1300 to	1 day	Fri 13/09/19	Fri 13/09/19	192SS															
194		<b>Archaeological Mitigation Works</b>	<b>9 days</b>	<b>Wed 18/09/19</b>	<b>Mon 30/09/19</b>																
195		Undertake Archaeological Recording in the stretch between Ch:1300 & Ch:1900	9 days	Wed 18/09/19	Mon 30/09/19	197SS															
196		<b>Widening Works (E/B Carriageway - Ch:1300 to Ch:1780)</b>	<b>20 days</b>	<b>Wed 18/09/19</b>	<b>Tue 15/10/19</b>																
197		Strip Top Soil	1 day	Wed 18/09/19	Wed 18/09/19	192															
198		Excavate Drainage Pond at Ch:0 (Actually located in Phase B of Section B)	5 days	Thu 19/09/19	Wed 25/09/19	197															
199		Undertake Earthworks (in cutting)	1 day	Thu 19/09/19	Thu 19/09/19	198SS															
200		Undertake Earthworks (in filling)	1 day	Tue 24/09/19	Tue 24/09/19	198SS+3 days															
201		Capping Works	1 day	Wed 25/09/19	Wed 25/09/19	200															
202		Lay Kerbs on the north side of new E/B Carriageway from Ch:1300 to Ch:1780.	4 days	Thu 26/09/19	Tue 01/10/19	201															
203		Prepare Sub-base	2 days	Thu 26/09/19	Fri 27/09/19	201															
204		Prepare Base Course	1 day	Mon 30/09/19	Mon 30/09/19	203															
205		Lay Black top Binder Course	1 day	Tue 01/10/19	Tue 01/10/19	204															
206		Construct footways & paved area on the north side between Ch:1300 to Ch:1780	10 days	Wed 02/10/19	Tue 15/10/19	202															
207		<b>Main Works - Phase A:- From Ch:1780 to Ch:1870 (Local Access Road -north of E/B Carriageway)</b>	<b>11 days</b>	<b>Fri 13/09/19</b>	<b>Fri 27/09/19</b>																
208		<b>Traffic Management Set Up</b>	<b>4 days</b>	<b>Fri 13/09/19</b>	<b>Wed 18/09/19</b>																
209		Install Traffic Management and reduce lane width for the existing E/B & W/B traffic to 3.0m to create min 1.2m safe working distance from the edge of the live E/B traffic to allow widening of Local Access Road between	3 days	Fri 13/09/19	Tue 17/09/19	192SS															
210		Set up Exclusion Zone on the edge of existing E/B Carriageway from Ch:1780 to Ch: 1870.	1 day	Wed 18/09/19	Wed 18/09/19	209															
211		<b>Local Access Road works - north of E/B Carriageway</b>	<b>7 days</b>	<b>Thu 19/09/19</b>	<b>Fri 27/09/19</b>																
212		Strip Top Soil	1 day	Thu 19/09/19	Thu 19/09/19	210															
213		Undertake Earthworks (in cutting)	1 day	Fri 20/09/19	Fri 20/09/19	212															
214		Undertake Earthworks (in filling)	1 day	Fri 20/09/19	Fri 20/09/19	198SS+1 day,213SS															
215		Capping Works	1 day	Mon 23/09/19	Mon 23/09/19	214															
216		Lay Kerbs on the north side of new E/B Carriageway from Ch:1780 to Ch:1900.	1 day	Tue 24/09/19	Tue 24/09/19	215															
217		Prepare Sub-base	1 day	Tue 24/09/19	Tue 24/09/19	215															
218		Prepare Base Course	1 day	Wed 25/09/19	Wed 25/09/19	217															
219		Lay Black top Binder Course	1 day	Thu 26/09/19	Thu 26/09/19	218															
220		Demolish the extent of existing E/B carriageway on the north side between	4 days	Mon 23/09/19	Thu 26/09/19	214															

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Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
Split		External Tasks		Inactive Summary		Manual Summary		Progress	
Milestone		External Milestone		Manual Task		Start-only			
Summary		Inactive Task		Duration-only		Finish-only			

## M11 - Junction 7A Construction Programme

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	2017														
							Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov				
221		Construct footways & paved area on the north side between Ch:1780 & Ch:1900	3 days	Wed 25/09/19	Fri 27/09/19	216															
222		<b>Phase 1 - Section B - PHASE B Main Works:- From Ch:0 to Ch:600 (W/B Carriageway)</b>	<b>48 days</b>	<b>Wed 16/10/19</b>	<b>Fri 20/12/19</b>																
223		<b>Traffic Management Set Up</b>	<b>5 days</b>	<b>Wed 16/10/19</b>	<b>Tue 22/10/19</b>																
224		Install Traffic Management and move the existing E/B traffic towards north side onto the newly built E/B lane between Ch:1300 and Ch:1650.	2 days	Wed 16/10/19	Thu 17/10/19	182,206,221															
225		Move the existing W/B traffic towards north to create minimum 1.2m safe distance from the edge of the live W/B traffic to allow widening of the existing W/B lane between Ch: 1300 &	1 day	Fri 18/10/19	Fri 18/10/19	224															
226		Set up Exclusion Zone on the edge of existing W/B Carriageway from Ch: 1300 to Ch:1650.	1 day	Mon 21/10/19	Mon 21/10/19	225															
227		Reduce lane widths for both existing E/B & W/B traffic to 3.0m from Ch:1650 to Ch:1900, to create min 1.2m safe working distance from the edge of the live W/B traffic to allow widening on the south side in the stretch from Ch:1650 to	1 day	Tue 22/10/19	Tue 22/10/19	226															
228		<b>Archaeological Mitigation Works</b>	<b>14 days</b>	<b>Wed 23/10/19</b>	<b>Mon 11/11/19</b>																
229		Undertake Archaeological Recording in the stretch between Ch:1300 & Ch:1900	14 days	Wed 23/10/19	Mon 11/11/19	231SS															
230		<b>Widening Works (W/B Carriageway - Ch:1300 to Ch:1900)</b>	<b>43 days</b>	<b>Wed 23/10/19</b>	<b>Fri 20/12/19</b>																
231		Strip Top Soil	2 days	Wed 23/10/19	Thu 24/10/19	227															
232		Undertake Earthworks (in cutting)	1 day	Fri 25/10/19	Fri 25/10/19	231															
233		Undertake Earthworks (in filling)	3 days	Fri 25/10/19	Tue 29/10/19	232SS															
234		Transport surplus fill material to Phase 2A	7 days	Wed 30/10/19	Thu 07/11/19	233															
235		Install Drainage	24 days	Fri 25/10/19	Wed 27/11/19	233SS															
236		Capping Works	1 day	Thu 28/11/19	Thu 28/11/19	235															
237		Lay Kerbs on the south side of new W/B Carriageway from Ch:1300 to Ch:1900.	4 days	Fri 29/11/19	Wed 04/12/19	236															
238		Prepare Sub-base	2 days	Fri 29/11/19	Mon 02/12/19	236															
239		Prepare Base Course	2 days	Tue 03/12/19	Wed 04/12/19	238															
240		Lay Black top Binder Course	1 day	Thu 05/12/19	Thu 05/12/19	239															
241		Construct footways & paved area on the south side between Ch:1300 & Ch:1900	12 days	Thu 05/12/19	Fri 20/12/19	237															
242		<b>Phase 1 - Section B - PHASE C Main Works:- From Ch:1300 to Ch:1900 Inlay Works (Central Strip)</b>	<b>15 days</b>	<b>Mon 23/12/19</b>	<b>Wed 15/01/20</b>																
243		<b>Traffic Management Set Up for Phase 1 - Section B - Phase C Works</b>	<b>7 days</b>	<b>Mon 23/12/19</b>	<b>Fri 03/01/20</b>																

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Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
Split		External Tasks		Inactive Summary		Manual Summary		Progress	
Milestone		External Milestone		Manual Task		Start-only			
Summary		Inactive Task		Duration-only		Finish-only			

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ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	2017														
							Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov				
244		Install Traffic Management and move the W/B traffic onto the newly widened W/B carriageway between Ch:1300 to Ch:1900.	3 days	Mon 23/12/19	Fri 27/12/19	241															
245		E/B traffic already moved to the newly widened E/B carriageway between Ch:0 & Ch:350 during Phase B. (To be noted that E/B traffic between Ch:1650 to Ch:1900 to move on the existing E/B	1 day	Mon 23/12/19	Mon 23/12/19	244SS															
246		Set up 0.6m Exclusion Zone along the edge of E/B traffic from Ch:1300 to Ch:1900.	4 days	Mon 30/12/19	Fri 03/01/20	244															
247		Set up 0.6m Exclusion Zone along the edge of W/B traffic from Ch:1300 to Ch:1900.	4 days	Mon 30/12/19	Fri 03/01/20	246SS															
248		<b>Planing &amp; Inlay Works (Central Strip) -Ch:1300 to Ch:1900.</b>	<b>8 days</b>	<b>Mon 06/01/20</b>	<b>Wed 15/01/20</b>																
249		Undertake Planing works in the 'Central Strip' of the existing carriageway from Ch:1300 to	6 days	Mon 06/01/20	Mon 13/01/20	247															
250		Repair Works to existing joints in the concrete sla	4 days	Fri 10/01/20	Wed 15/01/20	249SS+4 days															
251		Undertake Inlay works - Binder Course (only) in the 'Central Strip' of the existing carriageway from Ch:1300 to Ch:1900.	2 days	Tue 14/01/20	Wed 15/01/20	250SS+2 days															
252		<b>Phase 1 - Section B - PHASE D Main Works:- From Ch:1300 to Ch:1900 Inlay Works (Southern Strip - along W/B carriageway)</b>	<b>17 days</b>	<b>Thu 16/01/20</b>	<b>Fri 07/02/20</b>																
253		<b>Traffic Management Set Up for Phase 1 - Section B - Phase D Works</b>	<b>7 days</b>	<b>Thu 16/01/20</b>	<b>Fri 24/01/20</b>																
254		Install Traffic Management and move the W/B traffic onto the newly laid Central Strip.	3 days	Thu 16/01/20	Mon 20/01/20	251															
255		Set up 0.5m Exclusion Zone along the edge of W/B traffic from Ch:1300 to Ch:1900.	4 days	Tue 21/01/20	Fri 24/01/20	254															
256		<b>Planing &amp; Inlay Works (Southern Strip along the edge of the W/B traffic) - Ch:1300 to Ch:1900.</b>	<b>10 days</b>	<b>Mon 27/01/20</b>	<b>Fri 07/02/20</b>																
257		Undertake Planing works in the 'Southern Strip' from Ch:1300 to Ch:1900.	6 days	Mon 27/01/20	Mon 03/02/20	255															
258		Repair Works to existing joints in the concrete sla	4 days	Fri 31/01/20	Wed 05/02/20	257SS+4 days															
259		Undertake Inlay works - Binder Course (only) in the 'Southern Strip' from Ch:1300 to Ch:1900.	4 days	Tue 04/02/20	Fri 07/02/20	258SS+2 days															
260		<b>Phase 1 - Section B - PHASE E Main Works:- From Ch:1300 to Ch:1900 Inlay Works (Northern Strip - along E/B carriageway)</b>	<b>15 days</b>	<b>Mon 10/02/20</b>	<b>Fri 28/02/20</b>																
261		<b>Traffic Management Set Up for Phase 1 - Section B - Phase E Works</b>	<b>7 days</b>	<b>Mon 10/02/20</b>	<b>Tue 18/02/20</b>																
262		Install Traffic Management and move the W/B traffic back onto the newly laid Southern Strip prepared in Phase D between Ch:1300 to	3 days	Mon 10/02/20	Wed 12/02/20	259															

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Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
Split		External Tasks		Inactive Summary		Manual Summary		Progress	
Milestone		External Milestone		Manual Task		Start-only			
Summary		Inactive Task		Duration-only		Finish-only			

# M11 - Junction 7A Construction Programme

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	2017														
							Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov				
263		Install Traffic Management and move the E/B traffic back on to the newly laid Central Strip prepared in Phase C between Ch:1300 to	3 days	Mon 10/02/20	Wed 12/02/20	262SS															
264		Set up 0.5m Exclusion Zone along the edge of E/B traffic from Ch:1300 to Ch:1900	4 days	Thu 13/02/20	Tue 18/02/20	263															
265		<b>Planing &amp; Inlay Works (Northern Strip along the edge of the E/B traffic) - Ch:1300 to Ch:1900.</b>	<b>8 days</b>	<b>Wed 19/02/20</b>	<b>Fri 28/02/20</b>																
266		Undertake Planing works in the 'Northern Strip' from Ch:1300 to Ch:1900.	6 days	Wed 19/02/20	Wed 26/02/20	264															
267		Repair Works to existing joints in the concrete slab	4 days	Tue 25/02/20	Fri 28/02/20	266SS+4 days															
268		Undertake Inlay works - Binder Course (only) in the 'Northern Strip' from Ch:1300 to Ch:1900.	2 days	Thu 27/02/20	Fri 28/02/20	267SS+2 days															
269		<b>Phase 1 - Section B Surfacing Works - Ch:1300 to Ch:1900 (NIGHT TIME WORKING ONLY)</b>	<b>204 days?</b>	<b>Mon 02/03/20</b>	<b>Thu 17/12/20</b>																
270		<b>Surfacing Works in Phase 1 -Section B - Northern side (NIGHT TIME WORKING ONLY, 300m Stretch between Ch:1300 to Ch:1900)</b>	<b>8 days</b>	<b>Mon 02/03/20</b>	<b>Wed 11/03/20</b>																
271		Install Traffic Management using Traffic Light system in Section B for the 300m stretch between Ch:1300 to Ch:1900.	4 days	Mon 02/03/20	Thu 05/03/20	268															
272		Divert the E/B & W/B traffic through the southern part of the carriageway in 300m stretch	1 day	Fri 06/03/20	Fri 06/03/20	271															
273		Undertake Surfacing works on the northern part of the carriageway in 300m stretch between Ch:1300 to Ch:1900.	3 days	Mon 09/03/20	Wed 11/03/20	272															
274		<b>Surfacing Works in Phase 1 - Section B - Southern side (NIGHT TIME WORKING ONLY, 300m Stretch between Ch:1300 to Ch:1900)</b>	<b>8 days</b>	<b>Thu 12/03/20</b>	<b>Mon 23/03/20</b>																
275		Install Traffic Management using Traffic Light system in Section B for the 300m stretch between Ch:1300 to Ch:1900.	4 days	Thu 12/03/20	Tue 17/03/20	273															
276		Divert the E/B & W/B traffic through the newly surfaced northern part of the carriageway in	1 day	Wed 18/03/20	Wed 18/03/20	275															
277		Undertake Surfacing works on the Southern part of the carriageway in 300m stretch between Ch:1300 to Ch:1900.	3 days	Thu 19/03/20	Mon 23/03/20	276															
278		<b>Surfacing Works in Phase 1 - Section B - Southern side (NIGHT TIME WORKING ONLY, Remainder 300m Stretch between Ch:1300 to Ch:1900)</b>	<b>8 days</b>	<b>Tue 24/03/20</b>	<b>Thu 02/04/20</b>																
279		Install Traffic Management using Traffic Light system in Section B for the remainder 300m stretch between Ch:1300 to Ch:1900.	4 days	Tue 24/03/20	Fri 27/03/20	277															

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Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
Split		External Tasks		Inactive Summary		Manual Summary		Progress	
Milestone		External Milestone		Manual Task		Start-only			
Summary		Inactive Task		Duration-only		Finish-only			



# M11 - Junction 7A Construction Programme

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	2017														
							Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov				
280		Divert the E/B & W/B traffic through the northern part of the carriageway in the remainder 300m stretch between Ch:1300 to	1 day	Mon 30/03/20	Mon 30/03/20	279															
281		Undertake Surfacing works on the southern part of the carriageway in the remainder 300m stretch between Ch:1300 to Ch:1900.	3 days	Tue 31/03/20	Thu 02/04/20	280															
282		<b>Surfacing Works in Phase 1 - Section B - Northern side (NIGHT TIME WORKING ONLY, Remainder 300m Stretch between Ch:1300 to Ch:1900)</b>	<b>8 days</b>	<b>Fri 03/04/20</b>	<b>Thu 16/04/20</b>																
283		Install Traffic Management using Traffic Light system in Section B for the remainder 300m stretch between Ch:1300 to Ch:1900.	4 days	Fri 03/04/20	Wed 08/04/20	281															
284		Divert the E/B & W/B traffic through the newly surfaced southern part of the carriageway in	1 day	Thu 09/04/20	Thu 09/04/20	283															
285		Undertake Surfacing works on the Northern part of the carriageway in the remainder 300m stretch between Ch:1300 to Ch:1900.	3 days	Tue 14/04/20	Thu 16/04/20	284															
286		<b>Completion of Phase 1 -Section B Widening, Inlay &amp; Resurfacing Works</b>	<b>0 days</b>	<b>Thu 16/04/20</b>	<b>Thu 16/04/20</b>	<b>285</b>															
287		<b>Landscape &amp; Planting Works - Phase 1 - Section B (Phase A &amp; B)</b>	<b>60 days</b>	<b>Fri 17/04/20</b>	<b>Mon 13/07/20</b>																
288		Plant Trees in Phase A	60 days	Fri 17/04/20	Mon 13/07/20	286															
289		Plant Trees in Phase B	60 days	Fri 17/04/20	Mon 13/07/20	288SS															
290		Demobilisation Of Haul Routes, Soil Storage areas, Site Compound etc.	20 days	Fri 20/11/20	Thu 17/12/20	174,289															
291		Completion of Phase 1 Road Works (Section A & Sec	0 days	Thu 17/12/20	Thu 17/12/20	290															
292																					
293		Phase 2A Commencement of Work	1 day	Mon 03/06/19	Mon 03/06/19																
294		<b>PHASE 2A Main Construction Works - Section A:- Stretch between Ch:1900 on the existing Sheering Road up to the new Sheering Road Roundabout. [Including Tying-in with the existing Sheering Road at Ch:1900]</b>	<b>384 days</b>	<b>Mon 17/12/18</b>	<b>Thu 25/06/20</b>																
295		<b>Advanced Environmental Mitigation Works for Phase 2A - Section A (Phase A, B &amp; C)</b>	<b>137 days</b>	<b>Mon 17/12/18</b>	<b>Thu 04/07/19</b>																
296		Vegetation Clearance to 15cm (non bat roost) - Phase A- C [Ch:1900 to new Sheering Road round-about, north & south side]	50 days	Mon 17/12/18	Wed 27/02/19	4SS															
297		Vegetation Clearance - grub out avoid bat roost - Phase A- C [Ch:1900 to new Sheering Road round-about, north & south side]	50 days	Mon 01/04/19	Thu 13/06/19	296FS+22 days															
298		Plant landscape mounds to act as a screen for houses at Campions.	15 days	Fri 14/06/19	Thu 04/07/19	296,297															

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Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
Split		External Tasks		Inactive Summary		Manual Summary		Progress	
Milestone		External Milestone		Manual Task		Start-only			
Summary		Inactive Task		Duration-only		Finish-only			

# M11 - Junction 7A Construction Programme

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	2017														
							Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov				
299		<b>Advanced Ecological Mitigation Works for Phase 2A - Section A - Phase A, B &amp; C</b>	<b>120 days</b>	<b>Tue 04/06/19</b>	<b>Tue 19/11/19</b>																
300		Bat licence application	90 days	Tue 04/06/19	Tue 08/10/19	293															
301		Erection of bat boxes	5 days	Tue 04/06/19	Mon 10/06/19	300SS															
302		Construct reptile refugia outside works area, so act as shelter for temporarily displaced individuals	5 days	Tue 04/06/19	Mon 10/06/19	296															
303		Erection of acoustic fencing along Pincey Brook (otters - if required)	10 days	Tue 04/06/19	Mon 17/06/19	293															
304		Habitat manipulation to render works area unsuitable for reptiles	60 days	Tue 11/06/19	Tue 03/09/19	302															
305		Removal of bat roost trees under licence	10 days	Wed 09/10/19	Tue 22/10/19	300															
306		<b>Site Set-up and mobilisation for Phase 2A (Section A &amp; B) Works</b>	<b>60 days</b>	<b>Wed 04/09/19</b>	<b>Tue 26/11/19</b>																
307		Set up Site Compound(s), Welfare facilities, Storage Areas, Haul Routes etc. (To be used for Phase 2A - Section A & B works)	60 days	Wed 04/09/19	Tue 26/11/19	304															
308		<b>Advanced Utility Diversion Works for Phase 2A - Section A (Phase A, B &amp; C)</b>	<b>90 days</b>	<b>Tue 04/06/19</b>	<b>Tue 08/10/19</b>																
309		Divert Utilities	90 days	Tue 04/06/19	Tue 08/10/19	293															
310		<b>Phase 2A - Section A - Phase A Main Works:- From Ch:1900 to new Sheering Road Roundabout [Off-line Construction]</b>	<b>134 days</b>	<b>Wed 16/10/19</b>	<b>Mon 27/04/20</b>																
311		<b>Archaeological Mitigation Works</b>	<b>40 days</b>	<b>Wed 16/10/19</b>	<b>Tue 10/12/19</b>																
312		Undertake Trial Trenching Fieldwork	5 days	Wed 16/10/19	Tue 22/10/19	307SS+30 days															
313		Obtain post excavation archeological report	10 days	Wed 23/10/19	Tue 05/11/19	312															
314		Agree Scope & scale of further works with LPA Archeological Advisors	5 days	Wed 06/11/19	Tue 12/11/19	313															
315		Undertake Archaeological Excavation fieldwork	20 days	Wed 13/11/19	Tue 10/12/19	314															
316		<b>Construction of Drainage Pond to the north of new Sheering Road Roundabout</b>	<b>35 days</b>	<b>Wed 16/10/19</b>	<b>Tue 03/12/19</b>																
317		Excavate Drainage Pond No: 3 and transport excavated material to Soil Storage area	20 days	Wed 16/10/19	Tue 12/11/19	307SS+30 days															
318		Prepare Side Slopes / landscape etc	15 days	Wed 13/11/19	Tue 03/12/19	317															
319		<b>Construction of Sheet Pile Retaining Wall Structure (Ch:1890 - Ch:1960)</b>	<b>54 days</b>	<b>Wed 11/12/19</b>	<b>Thu 27/02/20</b>																
320		Construct Piling Platform	30 days	Wed 11/12/19	Fri 24/01/20	315															
321		Mobilise Sheet Piling Rig	2 days	Mon 27/01/20	Tue 28/01/20	320															
322		Install Sheet Piles from Ch:1890 - Ch:1960	10 days	Wed 29/01/20	Tue 11/02/20	321															
323		Brick Cladding Works	15 days	Fri 07/02/20	Thu 27/02/20	322SS+7 days															
324		<b>Construction of new E/B &amp; W/B Carriageway</b>	<b>94 days</b>	<b>Wed 11/12/19</b>	<b>Mon 27/04/20</b>																
325		Strip Top Soil	5 days	Wed 11/12/19	Tue 17/12/19	315															
326		Undertake Earthworks (in cutting)	25 days	Wed 12/02/20	Tue 17/03/20	322															
327		Undertake Earthworks (in filling)	4 days	Wed 04/03/20	Mon 09/03/20	326SS+15 days															

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Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
Split		External Tasks		Inactive Summary		Manual Summary		Progress	
Milestone		External Milestone		Manual Task		Start-only			
Summary		Inactive Task		Duration-only		Finish-only			

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ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	2017														
							Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov				
328		Install Drainage	12 days	Wed 04/03/20	Thu 19/03/20	327SS															
329		Capping Works	4 days	Fri 20/03/20	Wed 25/03/20	328															
330		Lay Kerbs to the north & south of the alignment from Ch:1900 upto the new Sheering Road Roundabout (including kerbs around new Sheering Road roundabout)	5 days	Thu 26/03/20	Wed 01/04/20	329															
331		Prepare Sub-base	6 days	Thu 26/03/20	Thu 02/04/20	329															
332		Prepare Base Course	5 days	Fri 03/04/20	Thu 09/04/20	331															
333		Lay Black top Binder Course	2 days	Tue 14/04/20	Wed 15/04/20	332															
334		Lay Surface Course	1 day	Mon 27/04/20	Mon 27/04/20	345															
335		Construct footways & paved area on the north side between Ch:1900 and new Sheering Road	4 days	Thu 02/04/20	Tue 07/04/20	330															
336		<b>Construction of new Sheering Road Roundabout</b>	<b>26 days</b>	<b>Wed 18/03/20</b>	<b>Fri 24/04/20</b>																
337		Strip Top Soil	3 days	Wed 18/03/20	Fri 20/03/20	326															
338		Undertake Earthworks (in cutting)	9 days	Mon 23/03/20	Thu 02/04/20	337															
339		Undertake Earthworks (in filling)	1 day	Tue 31/03/20	Tue 31/03/20	338SS+6 days															
340		Install Drainage	7 days	Tue 31/03/20	Wed 08/04/20	339SS															
341		Capping Works	2 days	Thu 09/04/20	Tue 14/04/20	340															
342		Prepare Sub-base	3 days	Wed 15/04/20	Fri 17/04/20	341															
343		Prepare Base Course	3 days	Mon 20/04/20	Wed 22/04/20	342															
344		Lay Black top Binder Course	1 day	Thu 23/04/20	Thu 23/04/20	343															
345		Lay Surface Course	1 day	Fri 24/04/20	Fri 24/04/20	344															
346		<b>Construction of the Northern Arm of new roundab</b>	<b>15 days</b>	<b>Wed 01/04/20</b>	<b>Thu 23/04/20</b>																
347		Strip Top Soil	1 day	Wed 01/04/20	Wed 01/04/20	339															
348		Undertake Earthworks (in filling)	3 days	Wed 01/04/20	Fri 03/04/20	347SS															
349		Install Drainage	10 days	Wed 01/04/20	Thu 16/04/20	348SS															
350		Capping Works	1 day	Fri 17/04/20	Fri 17/04/20	349															
351		Prepare Sub-base	1 day	Mon 20/04/20	Mon 20/04/20	350															
352		Prepare Base Course	1 day	Tue 21/04/20	Tue 21/04/20	351															
353		Lay Black top Binder Course	1 day	Wed 22/04/20	Wed 22/04/20	352															
354		Lay Surface Course	1 day	Thu 23/04/20	Thu 23/04/20	353															
355		<b>Construction of the new link at Ch:2100 to the existing Sheering Road</b>	<b>11 days</b>	<b>Mon 06/04/20</b>	<b>Wed 22/04/20</b>																
356		Strip Top Soil	1 day	Mon 06/04/20	Mon 06/04/20	348															
357		Undertake Earthworks (in cutting)	6 days	Mon 06/04/20	Wed 15/04/20	356SS															
358		Install Drainage	3 days	Thu 09/04/20	Wed 15/04/20	357SS+3 days															
359		Capping Works	1 day	Thu 16/04/20	Thu 16/04/20	358															
360		Prepare Sub-base	1 day	Fri 17/04/20	Fri 17/04/20	359															
361		Prepare Base Course	1 day	Mon 20/04/20	Mon 20/04/20	360															
362		Lay Black top Binder Course	1 day	Tue 21/04/20	Tue 21/04/20	361															
363		Lay Surface Course	1 day	Wed 22/04/20	Wed 22/04/20	362															

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Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
Split		External Tasks		Inactive Summary		Manual Summary		Progress	
Milestone		External Milestone		Manual Task		Start-only			
Summary		Inactive Task		Duration-only		Finish-only			

# M11 - Junction 7A Construction Programme

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	2017														
							Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov				
364		<b>Phase 2A - Section A - Phase B Main Works:- Tying-in of north &amp; south arms of new roundabout (NIGHT TIME WORKING REQUIRED)</b>	23 days	Tue 28/04/20	Mon 01/06/20																
365		Tie in the north & south arms of the new Sheering Road roundabout with the existing Sheering Road at Ch: 1880 & Ch:0 (north arm).	20 days	Tue 28/04/20	Wed 27/05/20	334,345,354,36															
366		Tie in new link road at Ch:2100 with the existing Sheering Road.	3 days	Thu 28/05/20	Mon 01/06/20	365															
367		<b>Phase 2A - Section A - Phase C Main Works:- on the existing Sheering Road</b>	18 days	Tue 02/06/20	Thu 25/06/20																
368		<b>Traffic Management Set Up</b>	3 days	Tue 02/06/20	Thu 04/06/20																
369		Install Traffic Management and Divert existing E/B & W/B traffic onto newly built alignment using the new Sheering Road Roundabout north & south arms. (Diversion req to carry out demolition / re-surfacing works on the old	3 days	Tue 02/06/20	Thu 04/06/20	366															
370		<b>Widening / Demolition / Resurfacing Works</b>	15 days	Fri 05/06/20	Thu 25/06/20																
371		Undertake widening, re-surfacing and demolition works (E/B & W/B) on the old	15 days	Fri 05/06/20	Thu 25/06/20	369															
372		<b>Completion of Phase 2A -Section A Road Works</b>	0 days	Thu 25/06/20	Thu 25/06/20	371															
373																					
374		<b>PHASE 2A Main Construction Works - Section B:- Stretch between East of new Sheering Road Roundabout and M11 Dumbbell Link (including tying in of ON/OFF Slips)</b>	511 days?	Mon 17/12/18	Tue 22/12/20																
375		<b>Advanced Environmental Mitigation Works for Phase 2A - Section B (Phase A, B &amp; C)</b>	511 days	Mon 17/12/18	Tue 22/12/20																
376		Vegetation Clearance to 15cm (non bat roost) in Phase 2A -Section B (All phases)	50 days	Mon 17/12/18	Wed 27/02/19	4SS															
377		Vegetation Clearance - grub out (avoid bat roost) - in Phase 2A -Section B (All phases)	50 days	Mon 11/03/19	Wed 22/05/19	376FS+7 days															
378		Plant trees in Phase B	20 days	Wed 25/11/20	Tue 22/12/20	545															
379		Plant trees in Phase A and at the centre if M11 Roundabout	20 days	Wed 25/11/20	Tue 22/12/20	554															
380		<b>Advanced Ecological Mitigation Works for Phase 2A - Section B - Phase A, B &amp; C)</b>	95 days	Tue 04/06/19	Tue 15/10/19																
381		Bat licence application	90 days	Tue 04/06/19	Tue 08/10/19	293															
382		Erection of bat boxes	5 days	Tue 04/06/19	Mon 10/06/19	381SS															
383		Landscaping works to replace lost flight lines	10 days	Tue 04/06/19	Mon 17/06/19	381SS															
384		Erect one-way exclusion fence for Reptiles - M11 embankments	5 days	Tue 04/06/19	Mon 10/06/19	381SS															
385		Trapping out reptiles and habitat manipulation within fenced area - M11 embankments	60 days	Tue 11/06/19	Tue 03/09/19	384															
386		Removal of bat roost trees under licence	5 days	Wed 09/10/19	Tue 15/10/19	381															

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Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
Split		External Tasks		Inactive Summary		Manual Summary		Progress	
Milestone		External Milestone		Manual Task		Start-only			
Summary		Inactive Task		Duration-only		Finish-only			



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ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	2017													
							Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov			
387		<b>Advanced Utility Diversion Works for Phase 2A - Section B (Phase A, B &amp; C)</b>	<b>90 days</b>	<b>Tue 04/06/19</b>	<b>Tue 08/10/19</b>															
388		Divert Utilities	90 days	Tue 04/06/19	Tue 08/10/19	293														
389		<b>Phase 2A - Section B - Phase A Main Works:- Construction of North bound Diverge &amp; Merge (SW Off-slip &amp; NW On-Slip) and South bound Diverge &amp;</b>	<b>124.5 days</b>	<b>Wed 27/11/19</b>	<b>Thu 28/05/20</b>															
390		<b>Traffic Management Set up on the existing M11 North &amp; South bound carriageways</b>	<b>30 days</b>	<b>Wed 27/11/19</b>	<b>Fri 10/01/20</b>															
391		Set up cones etc & create exclusion zone on the existing M11 N/B & S/B carriageways	30 days	Wed 27/11/19	Fri 10/01/20	307														
392		<b>Refurbishment works to the existing drainage on the existing M11 North &amp; South bound</b>	<b>60 days</b>	<b>Mon 13/01/20</b>	<b>Fri 03/04/20</b>															
393		Undertake modifications to the existing drainage on M11 north & south bound carriageways	60 days	Mon 13/01/20	Fri 03/04/20	391														
394		<b>Archaeological Mitigation Works</b>	<b>40 days</b>	<b>Wed 27/11/19</b>	<b>Fri 24/01/20</b>															
395		Undertake Trial Trenching Fieldwork	5 days	Wed 27/11/19	Tue 03/12/19	307														
396		Obtain post excavation archeological report	10 days	Wed 04/12/19	Tue 17/12/19	395														
397		Agree Scope & scale of further works with LPA Archeological Advisors	5 days	Wed 18/12/19	Tue 24/12/19	396														
398		Undertake Archaeological Excavation fieldwork	20 days	Fri 27/12/19	Fri 24/01/20	397														
399		<b>Construction of North bound Diverge - M11 South West off-slip (Ch:0-Ch:310)</b>	<b>52 days</b>	<b>Mon 27/01/20</b>	<b>Tue 07/04/20</b>															
400		Strip Top Soil	3 days	Mon 27/01/20	Wed 29/01/20	398														
401		Undertake Earthworks in Cutting and transport the surplus material to Soil storage area	42 days	Thu 30/01/20	Fri 27/03/20	400														
402		Install Drainage	7 days	Thu 12/03/20	Fri 20/03/20	401SS+30 days														
403		Capping Works	2 days	Mon 23/03/20	Tue 24/03/20	402														
404		Prepare Sub-base	4 days	Wed 25/03/20	Mon 30/03/20	403														
405		Prepare Base Course	3 days	Tue 31/03/20	Thu 02/04/20	404														
406		Lay Black top Binder Course	1 day	Fri 03/04/20	Fri 03/04/20	405														
407		Lay Surface Course	1 day	Mon 06/04/20	Mon 06/04/20	406														
408		Overlay & tie-in works	1 day	Tue 07/04/20	Tue 07/04/20	407														
409		<b>Construction of North bound Merge - M11 North West on-slip (Ch:0-Ch:90)</b>	<b>14 days</b>	<b>Mon 27/01/20</b>	<b>Thu 13/02/20</b>															
410		Strip Top Soil	1 day	Mon 27/01/20	Mon 27/01/20	398														
411		Undertake Earthworks in Filling	13 days	Tue 28/01/20	Thu 13/02/20	410														
412		Install Drainage	7 days	Tue 28/01/20	Wed 05/02/20	411SS														
413		Capping Works	1 day	Thu 06/02/20	Thu 06/02/20	412														
414		Prepare Sub-base	1 day	Fri 07/02/20	Fri 07/02/20	413														
415		Prepare Base Course	1 day	Mon 10/02/20	Mon 10/02/20	414														
416		Lay Black top Binder Course	0.5 days	Tue 11/02/20	Tue 11/02/20	415														
417		Lay Surface Course	0.5 days	Tue 11/02/20	Tue 11/02/20	416														

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Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
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Milestone		External Milestone		Manual Task		Start-only			
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ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	2017														
							Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov				
418		Overlay & tie-in works	1 day	Wed 12/02/20	Wed 12/02/20	417															
419		<b>Construction of South bound Diverge - M11 North East off-slip</b>	<b>73 days</b>	<b>Mon 27/01/20</b>	<b>Mon 11/05/20</b>																
420		<b>Construction of south bound diverge from Ch:0 to Ch:120</b>	<b>22 days</b>	<b>Mon 27/01/20</b>	<b>Tue 25/02/20</b>																
421		Strip Top Soil	1 day	Mon 27/01/20	Mon 27/01/20	398															
422		Undertake Earthworks in Cutting between Ch:0 - Ch:120	5 days	Tue 28/01/20	Mon 03/02/20	421															
423		Undertake Earthworks in filling between Ch:0 - Ch:120 [Section required for creating access from M11]	1 day	Thu 30/01/20	Thu 30/01/20	422SS+2 days															
424		Install Drainage (Including Cross Connections underneath existing Motorway)	14 days	Thu 30/01/20	Tue 18/02/20	423SS															
425		Capping Works	1 day	Wed 19/02/20	Wed 19/02/20	424															
426		Prepare Sub-base	1 day	Thu 20/02/20	Thu 20/02/20	425															
427		Prepare Base Course	1 day	Fri 21/02/20	Fri 21/02/20	426															
428		Lay Black top Binder Course	0.5 days	Mon 24/02/20	Mon 24/02/20	427															
429		Lay Surface Course	0.5 days	Mon 24/02/20	Mon 24/02/20	428															
430		Overlay & tie-in works	1 day	Tue 25/02/20	Tue 25/02/20	429															
431		<b>Extension of Sheerhall Subway</b>	<b>42 days</b>	<b>Mon 27/01/20</b>	<b>Tue 24/03/20</b>																
432		Construct Piling Platform for Sheet Piling works	2 days	Mon 27/01/20	Tue 28/01/20	398															
433		Mobilise Sheet Piling Rig (SP60-300 or similar)	2 days	Wed 29/01/20	Thu 30/01/20	432															
434		Undertake Sheet Piling installation	5 days	Fri 31/01/20	Thu 06/02/20	433															
435		Construct Concrete Box and reinforced concrete wing wall	20 days	Wed 26/02/20	Tue 24/03/20	430															
436		<b>Construction of south bound diverge from M11 Ch:37290 - Ch:37580</b>	<b>73 days</b>	<b>Mon 27/01/20</b>	<b>Mon 11/05/20</b>																
437		Excavate by preparing benches within the slope of the existing embankment to create space for the construction of Piling Platform	5 days	Mon 27/01/20	Fri 31/01/20	398															
438		Construct Piling platform	10 days	Mon 03/02/20	Fri 14/02/20	437															
439		Mobilise Sheet Piling Rig (SP60-300 or similar)	2 days	Mon 17/02/20	Tue 18/02/20	438															
440		Undertake Sheet Piling installation (including temporary drainage installation)	20 days	Wed 19/02/20	Tue 17/03/20	439															
441		Undertake Earthworks in Filling between M11 Ch:37290 - Ch:37580 [Required for widening the width of the existing embankment]	15 days	Wed 18/03/20	Tue 07/04/20	440															
442		Install Permanent Drainage and make connections to the south of Sheering Hall	10 days	Thu 09/04/20	Fri 24/04/20	441SS,453															
443		Capping Works	2 days	Mon 27/04/20	Tue 28/04/20	442															
444		Prepare Sub-base	3 days	Wed 29/04/20	Fri 01/05/20	443															
445		Prepare Base Course	2 days	Tue 05/05/20	Wed 06/05/20	444															
446		Lay Black top Binder Course	1 day	Thu 07/05/20	Thu 07/05/20	445															

Project: M11 Junction 7A Project  
Date: Mon 19/12/16

Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
Split		External Tasks		Inactive Summary		Manual Summary		Progress	
Milestone		External Milestone		Manual Task		Start-only			
Summary		Inactive Task		Duration-only		Finish-only			

# M11 - Junction 7A Construction Programme

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	2017														
							Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov				
447		Lay Surface Course	1 day	Fri 08/05/20	Fri 08/05/20	446															
448		Overlay works	1 day	Mon 11/05/20	Mon 11/05/20	447															
449		<b>Soil Nailing and construction of reinforced earth from M11 Ch:37380 - Ch:37390</b>	<b>16 days</b>	<b>Wed 18/03/20</b>	<b>Wed 08/04/20</b>																
450		Install Traffic Management and close outside lane for traffic in order to set up Nailing Rig [Night Time Working]	1 day	Wed 18/03/20	Wed 18/03/20	440															
451		Set up Nailing Rig and remove lane closure	1 day	Wed 18/03/20	Wed 18/03/20	450SS															
452		Insert 8m long nails into the existing embankment	5 days	Thu 19/03/20	Wed 25/03/20	451															
453		Undertake widening of the existing embankment using Reinforced Earth	10 days	Thu 26/03/20	Wed 08/04/20	452															
454		<b>Construction of South bound Merge - M11 South East on-slip (Ch:0-Ch:290)</b>	<b>84.5 days</b>	<b>Mon 27/01/20</b>	<b>Thu 28/05/20</b>																
455		Strip Top Soil	3 days	Mon 27/01/20	Wed 29/01/20	398															
456		Undertake Earthworks in Cutting	60 days	Thu 30/01/20	Fri 24/04/20	455															
457		Undertake Earthworks in Filling	0.5 days	Tue 21/04/20	Tue 21/04/20	456SS+56 days															
458		Transport Surplus soil to Soil Storage area SS4 on the western side that would be left after finishing all 'Cut' & 'Fill' operations on the eastern side.	25 days	Tue 21/04/20	Thu 28/05/20	457															
459		Install Drainage	6 days	Mon 27/04/20	Tue 05/05/20	456															
460		Capping Works	2 days	Wed 06/05/20	Thu 07/05/20	459															
461		Prepare Sub-base	3 days	Fri 08/05/20	Tue 12/05/20	460															
462		Prepare Base Course	3 days	Wed 13/05/20	Fri 15/05/20	461															
463		Lay Black top Binder Course	1 day	Mon 18/05/20	Mon 18/05/20	462															
464		Lay Surface Course	1 day	Tue 19/05/20	Tue 19/05/20	463															
465		Overlay & tie-in works	1 day	Wed 20/05/20	Wed 20/05/20	464															
466		<b>Phase 2A - Section B - Phase B Main Works:- Construction of Westbound Diverge link from new Sheering Road up to M11 Western Roundabout</b>	<b>252 days</b>	<b>Wed 27/11/19</b>	<b>Tue 24/11/20</b>																
467		<b>Construction of Reinforced Concrete Culvert at Ch:400</b>	<b>95 days</b>	<b>Wed 27/11/19</b>	<b>Tue 14/04/20</b>																
468		Construct RC Culvert at Ch:400	90 days	Wed 27/11/19	Fri 03/04/20	307															
469		Construct Ditch from the north side of the RC Culvert to Pincey Brook	30 days	Mon 03/02/20	Fri 13/03/20	468SS+45 days															
470		Divert the existing water course through newly built RC Culvert and temporary diversion to allow constructing Phase 2A -Section B Embankment	5 days	Mon 06/04/20	Tue 14/04/20	468,469															
471		<b>Construction of Drainage Pond to the north west of M11</b>	<b>55 days</b>	<b>Fri 08/05/20</b>	<b>Fri 24/07/20</b>																
472		Excavate Drainage Pond No 4 and transport the excavated material to Phase 2A - Section B - Phase B filling works	35 days	Fri 08/05/20	Fri 26/06/20	478SS															
473		Prepare Side Slopes / landscape etc	20 days	Mon 29/06/20	Fri 24/07/20	472															

Project: M11 Junction 7A Project Date: Mon 19/12/16	Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
	Split		External Tasks		Inactive Summary		Manual Summary		Progress	
	Milestone		External Milestone		Manual Task		Start-only			
	Summary		Inactive Task		Duration-only		Finish-only			

# M11 - Junction 7A Construction Programme

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	2017												
							Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov		
474		<b>Construction of new W/B diverge link from new Sheering Road Roundabout to M11 Western Roundabout (Ch:50 - Ch:630)</b>	<b>160 days</b>	<b>Wed 08/04/20</b>	<b>Tue 24/11/20</b>														
475		Import suitable Fill material for undertaking earthworks in Phase 2A - Section B - Phase B	100 days	Wed 08/04/20	Tue 01/09/20	408,468													
476		Strip Top Soil	7 days	Wed 08/04/20	Mon 20/04/20	408													
477		Undertake Earthworks in Cutting for the E/B & W,	18 days	Tue 21/04/20	Fri 15/05/20	476													
478		Undertake Earthworks in Filling for the E/B & W/E	83 days	Fri 08/05/20	Thu 03/09/20	477SS+12 days													
479		Capping Works	6 days	Fri 04/09/20	Fri 11/09/20	478													
480		Prepare Sub-base	9 days	Thu 10/09/20	Tue 22/09/20	479SS+4 days													
481		Prepare Base Course	7 days	Wed 16/09/20	Thu 24/09/20	480SS+4 days													
482		Lay Black top Binder Course	3 days	Fri 25/09/20	Tue 29/09/20	481													
483		Lay Surface Course	2 days	Mon 23/11/20	Tue 24/11/20	482FS+38 days													
484		<b>Phase 2A - Section B - Phase B Main Works:- Bridge Construction over existing M11</b>	<b>223 days?</b>	<b>Fri 10/01/20</b>	<b>Tue 24/11/20</b>														
485		<b>Construction of Bridge Abutments and Wing Walls</b>	<b>223 days?</b>	<b>Fri 10/01/20</b>	<b>Tue 24/11/20</b>														
486		<b>West Abutment &amp; Wing Wall Construction</b>	<b>79 days?</b>	<b>Wed 08/04/20</b>	<b>Fri 31/07/20</b>														
487		<b>Piling Works &amp; Pile Cap Construction</b>	<b>51 days</b>	<b>Wed 08/04/20</b>	<b>Tue 23/06/20</b>														
488		Prepare Piling platform for setting up Piling F	10 days	Wed 08/04/20	Thu 23/04/20	408													
489		Install LDA bored piles	20 days	Fri 24/04/20	Fri 22/05/20	488													
490		Breaking piles to the cut-off level	5 days	Tue 26/05/20	Mon 01/06/20	489													
491		Fix reinforcement to the Pile Cap	10 days	Tue 02/06/20	Mon 15/06/20	490													
492		Install Formwork	5 days	Thu 11/06/20	Wed 17/06/20	491SS+7 days													
493		Pour Concrete	2 days	Thu 18/06/20	Fri 19/06/20	492													
494		Strike Formwork and remove gear	2 days	Mon 22/06/20	Tue 23/06/20	493													
495		<b>RC Abutment &amp; Wing Wall construction</b>	<b>28 days?</b>	<b>Wed 24/06/20</b>	<b>Fri 31/07/20</b>														
496		Install Drainage	5 days	Wed 24/06/20	Tue 30/06/20	494													
497		Install Waterproofing	3 days	Mon 29/06/20	Wed 01/07/20	496SS+3 days													
498		Fix Reinforcement	15 days	Wed 01/07/20	Tue 21/07/20	497SS+2 days													
499		Install Formwork	10 days	Fri 10/07/20	Thu 23/07/20	498SS+7 days													
500		Pour Concrete	5 days	Fri 24/07/20	Thu 30/07/20	499													
501		Strike Formwork and remove gear	1 day?	Fri 31/07/20	Fri 31/07/20	500													
502		<b>East Abutment &amp; Wing Wall Construction</b>	<b>69 days?</b>	<b>Thu 21/05/20</b>	<b>Wed 26/08/20</b>														
503		<b>Piling Works &amp; Pile Cap Construction</b>	<b>41 days</b>	<b>Thu 21/05/20</b>	<b>Fri 17/07/20</b>														
504		Prepare Piling platform for setting up Piling F	10 days	Thu 21/05/20	Thu 04/06/20	465													
505		Install LDA bored piles	10 days	Fri 05/06/20	Thu 18/06/20	504													
506		Breaking piles to the cut-off level	5 days	Fri 19/06/20	Thu 25/06/20	505													
507		Fix reinforcement to the Pile Cap	10 days	Fri 26/06/20	Thu 09/07/20	506													
508		Install Formwork	5 days	Tue 07/07/20	Mon 13/07/20	507SS+7 days													
509		Pour Concrete	2 days	Tue 14/07/20	Wed 15/07/20	508													
510		Strike Formwork and remove gear	2 days	Thu 16/07/20	Fri 17/07/20	509													
511		<b>RC Abutment &amp; Wing Wall construction</b>	<b>28 days?</b>	<b>Mon 20/07/20</b>	<b>Wed 26/08/20</b>														

Project: M11 Junction 7A Project  
Date: Mon 19/12/16

Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
Split		External Tasks		Inactive Summary		Manual Summary		Progress	
Milestone		External Milestone		Manual Task		Start-only			
Summary		Inactive Task		Duration-only		Finish-only			



# M11 - Junction 7A Construction Programme

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	2017											
							Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov	
512		Install Drainage	5 days	Mon 20/07/20	Fri 24/07/20	510												
513		Install Waterproofing	3 days	Thu 23/07/20	Mon 27/07/20	512SS+3 days												
514		Fix Reinforcement	15 days	Mon 27/07/20	Fri 14/08/20	513SS+2 days												
515		Install Formwork	10 days	Wed 05/08/20	Tue 18/08/20	514SS+7 days												
516		Pour Concrete	5 days	Wed 19/08/20	Tue 25/08/20	515												
517		Strike Formwork and remove gear	1 day?	Wed 26/08/20	Wed 26/08/20	516												
518		<b>Fabrication of Steel Structure</b>	<b>155 days</b>	<b>Fri 10/01/20</b>	<b>Wed 19/08/20</b>													
519		Pre-fabrication	150 days	Fri 10/01/20	Wed 12/08/20	520SS-150 days												
520		Delivery to site	5 days	Thu 13/08/20	Wed 19/08/20	517FS-10 days												
521		<b>Installation of steel structure on the top of East &amp; West Abutments over existing M11 [NIGHT TIME WORKING UNDER FULL CLOSURE OF EXISTING M11 CARRIAGEWAY]</b>	<b>16 days</b>	<b>Thu 27/08/20</b>	<b>Fri 18/09/20</b>													
522		Set up Crane	1 day	Thu 27/08/20	Thu 27/08/20	517												
523		Set up Traffic Management over existing M11	7 days	Fri 28/08/20	Tue 08/09/20	522												
524		Lift & place the prefabricated steel girders on the top of abutments	5 days	Wed 09/09/20	Tue 15/09/20	523												
525		Grouting Works	3 days	Wed 16/09/20	Fri 18/09/20	524												
526		<b>Deck Construction</b>	<b>47 days</b>	<b>Mon 21/09/20</b>	<b>Tue 24/11/20</b>													
527		Install Soffit	3 days	Mon 21/09/20	Wed 23/09/20	525												
528		Install Drainage	5 days	Thu 24/09/20	Wed 30/09/20	527												
529		Fix Reinforcement	10 days	Thu 24/09/20	Wed 07/10/20	527												
530		Cast Concrete Deck (along with the central Kerl	3 days	Thu 08/10/20	Mon 12/10/20	529												
531		Install Waterproofing	5 days	Tue 13/10/20	Mon 19/10/20	530												
532		Lay Black top Binder Course on the top of the d	1 day	Fri 20/11/20	Fri 20/11/20	544												
533		Lay Surface Course on the top of the deck	1 day	Tue 24/11/20	Tue 24/11/20	532FS+1 day												
534		Install Parapet to the concrete deck	10 days	Tue 13/10/20	Mon 26/10/20	530												
535		<b>Phase 2A - Section B - Phase C Main Works:- Construction of M11 Eastern &amp; Western Roundabout and remainder of south bound and north bound</b>	<b>81 days</b>	<b>Mon 03/08/20</b>	<b>Tue 24/11/20</b>													
536		<b>Construction of M11 Western Roundabout, remainder of N/B diverge (Ch:310-Ch:410), remainder of N/B merge (Ch:90-Ch:292) and remainder of WB diverge link (Ch:0-Ch:50)</b>	<b>81 days</b>	<b>Mon 03/08/20</b>	<b>Tue 24/11/20</b>													
537		Import suitable fill material for undertaking earthworks in filling for M11 Western Roundabout, remainder of N/B diverge (Ch:310-Ch:410), remainder of N/B merge (Ch:90-Ch:292) and remainder of WB diverge link	40 days	Wed 02/09/20	Tue 27/10/20	475												
538		Strip Top Soil	4 days	Mon 03/08/20	Thu 06/08/20	501												
539		Undertake Earthworks in Cutting	0.5 days	Wed 28/10/20	Wed 28/10/20	537												
540		Undertake Earthworks in Filling	23 days	Thu 01/10/20	Mon 02/11/20	537SS+21 days												
541		Capping Works & Drainage Connections	7 days	Tue 03/11/20	Wed 11/11/20	540												

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Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
Split		External Tasks		Inactive Summary		Manual Summary		Progress	
Milestone		External Milestone		Manual Task		Start-only			
Summary		Inactive Task		Duration-only		Finish-only			

# M11 - Junction 7A Construction Programme

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	2017											
							Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov	
542		Prepare Sub-base	5 days	Fri 06/11/20	Thu 12/11/20	541SS+3 days												
543		Prepare Base Course	4 days	Thu 12/11/20	Tue 17/11/20	542SS+4 days												
544		Lay Black top Binder Course	2 days	Wed 18/11/20	Thu 19/11/20	543												
545		Lay Surface Course	1 day	Tue 24/11/20	Tue 24/11/20	544FS+2 days												
546		<b>Construction of M11 Eastern Roundabout, remainder of S/B diverge (Ch:120-Ch:360) and remainder of S/B merge (Ch:290-Ch:365)</b>	<b>63 days</b>	<b>Thu 27/08/20</b>	<b>Tue 24/11/20</b>													
547		Strip Top Soil	4 days	Thu 27/08/20	Wed 02/09/20	517												
548		Undertake Earthworks in Cutting	40 days	Thu 03/09/20	Wed 28/10/20	547												
549		Undertake Earthworks in Filling	40 days	Thu 10/09/20	Wed 04/11/20	548SS+5 days												
550		Capping Works & Drainage connections	7 days	Thu 05/11/20	Fri 13/11/20	549												
551		Prepare Sub-base	6 days	Tue 10/11/20	Tue 17/11/20	550SS+3 days												
552		Prepare Base Course	4 days	Tue 17/11/20	Fri 20/11/20	551SS+5 days												
553		Lay Black top Binder Course	1 day	Mon 23/11/20	Mon 23/11/20	532,552												
554		Lay Surface Course	1 day	Tue 24/11/20	Tue 24/11/20	553												
555		<b>Phase 2A - Section B Drainage Installation Works</b>	<b>20 days</b>	<b>Wed 25/11/20</b>	<b>Tue 22/12/20</b>													
556		Install Drainage ditches in Phase 2A - Section B.	20 days	Wed 25/11/20	Tue 22/12/20	554												
557		<b>Completion of Phase 2A - Section B Road Works</b>	<b>0 days</b>	<b>Tue 22/12/20</b>	<b>Tue 22/12/20</b>	378,379,556												
558		<b>Phase 2A Demobilisation</b>	<b>30 days</b>	<b>Wed 25/11/20</b>	<b>Fri 08/01/21</b>	556SS												
559		<b>Completion of Phase 2A Road Works - Section A &amp; Section B</b>	<b>0 days</b>	<b>Fri 08/01/21</b>	<b>Fri 08/01/21</b>	558												
560		<b>Completion of Phase 1 and Phase 2A Road Works - 'All Lanes Open to Traffic'</b>	<b>0 days</b>	<b>Fri 08/01/21</b>	<b>Fri 08/01/21</b>	291,559												
561																		
562		<b>PHASE 2B:- Stretch between Pincey Brook Roundabout and M11 Western Dumbbell - Construction of Eastbound Merger Link</b>	<b>681 days</b>	<b>Tue 04/06/19</b>	<b>Tue 08/02/22</b>													
563		Phase 2B Commencement of Work	1 day	Mon 11/01/21	Mon 11/01/21													
564		<b>Site Set-up and mobilisation</b>	<b>45 days</b>	<b>Tue 12/01/21</b>	<b>Mon 15/03/21</b>													
565		Set up Site Compounds, Storage Areas, Haul Routes	45 days	Tue 12/01/21	Mon 15/03/21	563												
566		<b>Advanced Environmental Mitigation Works for Phase 2B (Phase A &amp; B)</b>	<b>263 days</b>	<b>Tue 12/01/21</b>	<b>Tue 25/01/22</b>													
567		Vegetation Clearance to 15cm	20 days	Tue 12/01/21	Mon 08/02/21	563												
568		Plant Trees	20 days	Fri 24/12/21	Tue 25/01/22	603												
569		<b>Advanced Ecological Mitigation Works for Phase 2B (Phase A &amp; B)</b>	<b>661 days</b>	<b>Tue 04/06/19</b>	<b>Tue 11/01/22</b>													
570		Landscaping to replace lost bird habitat	10 days	Fri 24/12/21	Tue 11/01/22	568SS												
571		Landscaping works to replace lost flight lines -hedgerows, tree belts etc.	10 days	Fri 24/12/21	Tue 11/01/22	568SS												
572		Otter Mitigation - Erect Acoustic fencing	5 days	Tue 04/06/19	Mon 10/06/19	303SS												
573		<b>Archaeological Mitigation Works</b>	<b>40 days</b>	<b>Tue 16/03/21</b>	<b>Thu 13/05/21</b>													
574		Undertake Trial Trenching Fieldwork	5 days	Tue 16/03/21	Mon 22/03/21	565												
575		Obtain post excavation archeological report	10 days	Tue 23/03/21	Wed 07/04/21	574												

Project: M11 Junction 7A Project  
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Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
Split		External Tasks		Inactive Summary		Manual Summary		Progress	
Milestone		External Milestone		Manual Task		Start-only			
Summary		Inactive Task		Duration-only		Finish-only			

# M11 - Junction 7A Construction Programme

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	2017														
							Mar	May	Jul	Sep	Nov	Jan	Mar	May	Jul	Sep	Nov				
576		Agree Scope & scale of further works with LPA Archeological Advisors	5 days	Thu 08/04/21	Wed 14/04/21	575															
577		Undertake Archaeological Excavation fieldwork	20 days	Thu 15/04/21	Thu 13/05/21	576															
578		<b>Construction of Reinforced Concrete Culvert - South of Pincey Brook Roundabout</b>	<b>51 days</b>	<b>Tue 16/03/21</b>	<b>Fri 28/05/21</b>																
579		Temporary Diversion of Ditch at Ch:200 to allow construction of RC Culvert	5 days	Tue 16/03/21	Mon 22/03/21	565															
580		Construct RC Culvert	45 days	Tue 23/03/21	Thu 27/05/21	579															
581		Divert existing water course through new RC Culvert	1 day	Fri 28/05/21	Fri 28/05/21	580															
582		<b>Eastbound Link and Roundabout between Sheering Rd Roundabout and Western Dumbell</b>	<b>198 days</b>	<b>Tue 16/03/21</b>	<b>Thu 23/12/21</b>																
583		<b>Phase A Works - Construction of new Pincey Brook Roundabout</b>	<b>27 days</b>	<b>Fri 28/05/21</b>	<b>Tue 06/07/21</b>																
584		Strip Top Soil	2 days	Fri 28/05/21	Tue 01/06/21	580															
585		Undertake Earthworks in Cutting	15 days	Wed 02/06/21	Tue 22/06/21	584															
586		Undertake Earthworks in Filling	1 day	Wed 23/06/21	Wed 23/06/21	585															
587		Install Drainage	3 days	Wed 23/06/21	Fri 25/06/21	586SS															
588		Capping Works	1 day	Mon 28/06/21	Mon 28/06/21	587															
589		Prepare Sub-base	2 days	Tue 29/06/21	Wed 30/06/21	588															
590		Prepare Base Course	2 days	Thu 01/07/21	Fri 02/07/21	589															
591		Lay Black top Binder Course	1 day	Mon 05/07/21	Mon 05/07/21	590															
592		Lay Surface Course	1 day	Tue 06/07/21	Tue 06/07/21	591															
593		<b>Phase B Works - Construction of Eastbound Merger link connecting new Sheering Road Roundabout, Pincey Brook Roundabout and M11 Western</b>	<b>198 days</b>	<b>Tue 16/03/21</b>	<b>Thu 23/12/21</b>																
594		Import suitable fill material for undertaking Phase 2B - Phase B works.	160 days	Tue 16/03/21	Mon 01/11/21	565															
595		Strip Top Soil	7 days	Fri 14/05/21	Mon 24/05/21	577															
596		Undertake Earthworks in Cutting	23 days	Tue 25/05/21	Fri 25/06/21	595															
597		Undertake Earthworks in Filling	124 days	Tue 25/05/21	Tue 16/11/21	596SS															
598		Install Drainage	5 days	Tue 25/05/21	Tue 01/06/21	597SS															
599		Capping Works	6 days	Wed 17/11/21	Wed 24/11/21	597															
600		Prepare Sub-base	9 days	Thu 25/11/21	Tue 07/12/21	599															
601		Prepare Base Course	7 days	Wed 08/12/21	Thu 16/12/21	600															
602		Lay Black top Binder Course	3 days	Fri 17/12/21	Tue 21/12/21	601															
603		Lay Surface Course	2 days	Wed 22/12/21	Thu 23/12/21	602															
604		Construct Earthen Bunds around Ch:420 to divert run-off water to Pincey Brook.	10 days	Fri 24/12/21	Tue 11/01/22	603															
605		<b>Demobilisation Of Haul Routes, Soil Storage areas, Site Compound etc.</b>	<b>20 days</b>	<b>Wed 12/01/22</b>	<b>Tue 08/02/22</b>	604															
606		<b>Completion of Phase 2B Road works - Phase A &amp; B</b>	<b>0 days</b>	<b>Tue 08/02/22</b>	<b>Tue 08/02/22</b>	568,605															

Project: M11 Junction 7A Project Date: Mon 19/12/16	Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
	Split		External Tasks		Inactive Summary		Manual Summary		Progress	
	Milestone		External Milestone		Manual Task		Start-only			
	Summary		Inactive Task		Duration-only		Finish-only			



**Appendix 2.3: Construction Methodology Report**

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## **M11 J7A**

Essex Highways

### **Construction Methodology Report**

B3553F05-0000-REP-0076 | P0

November 2016

Client Reference

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**M11 J7A**

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## 1 Introduction

The M11 Junction 7A scheme begins at the London Road roundabout on Gilden Way (B183) and involves widening of the existing two-lane road to three lanes. When completed, two of the lanes would take traffic in a westerly direction into Harlow Town and the third lane would take the outbound traffic onto the M11.

The scheme involves construction of a new junction over the existing M11 motorway, including slip roads, located approximately 6km north of the existing Junction 7. The proposed location of the new junction is on the M11 north of the Moor Hall Road/Matching Road crossing and south of Sheering village. The Junction would be 'Grade -Separated' and would have both north and south 'on & off' slip roads giving full access to the Motorway network. The new proposed junction would comprise of two roundabouts in a dumbbell configuration (referred to as Dumbbell Roundabout) at either end of a four-lane overbridge that would be built over the existing M11 motorway as a part of the proposed scheme.

Improvements on Gilden Way would include re-configuration of the existing junctions, roundabouts and egress points to improve safety and flow efficiency for the increased traffic.

As Gilden Way becomes Sheering Road it passes Marsh Lane on the left and Mayfield Farm on the right. At Mayfield Farm, the widened carriageway would begin to veer offline to the right where a new carriageway would be built which would link the existing Sheering Road with a new roundabout known as Sheering Road roundabout. The existing Sheering Road would be converted into a local access road for the Campion residents and the new Sheering Road roundabout junction would link the Campions Residents with the realigned Sheering Road.

From the Sheering Road Roundabout, the outbound link continues to the Pincey Brook Roundabout before it connects to the grade separated junction at the western dumbbell roundabout.

A two-lane westbound link connects between the M11 Motorway and the Sheering Road Roundabout.

The layout between Sheering Road and the western dumbbell roundabouts has been future-proofed to accommodate the strategic intent for a future northern bypass.

The proposed scheme is split into three main phases based on the funding strategy, to facilitate construction and minimise the environmental and construction impacts. These main phases are known as 'Phase 1', 'Phase 2A' and 'Phase 2B'.

- Phase 1 includes the widening of the existing Gilden Way between London Road Roundabout and Mayfield Farm to address the existing capacity issues and to minimise the inconvenience to the residents by taking into account the new development of Harlowbury.

For the purpose of understanding the constructability of Phase 1, it is proposed to split this phase further into two sections named as Section A: London Road Roundabout to Churchgate Roundabout; and Section B: Churchgate Roundabout to Ch.1900 outside Mayfield Farm.

- Phase 2A includes the construction of a new carriageway between Mayfield farm and t Sheering Road Roundabout, construction of the westbound diverge link, and the installation of an overbridge above the existing M11 spanning between the eastern & western roundabouts and construction of the north & south bound merge and diverge M11 slipways in order to provide direct links to the existing Motorway. In addition this phase will also consist of the re-alignment of the existing Sheering Road.

For the purpose of understanding the constructability of Phase 2A, it is proposed to split this phase further into two sections named as Section A: Ch.1900 (Mayfield Farm) to Sheering Road Roundabout; and Section B: east of Sheering Road Roundabout to M11 Dumbbell Link.

- Phase 2B includes the construction of the Eastbound Merge Link from the M11 Western Dumbbell Roundabout to Pincey Brook Roundabout. This phase also includes construction of an additional link between Pincey Brook roundabout and Sheering Road Roundabout. This link would enable a future

Northern Bypass to access both the M11 and Harlow via the roundabout. When operational, traffic travelling from the M11 into Harlow would travel along the westbound diverge link and the traffic from Harlow would travel along the eastbound merge link to gain access onto the M11 motorway network.

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## 2 Report Overview

### 2.1 Overview

This report provides an overview of the construction methodology for the M11 Junction 7A scheme. This report has been written in-line with the construction programme which provides a list of activities attached to dates and timescales with linkages between interdependent activities. It is therefore highly advisable that this construction methodology report is read in conjunction with the construction programme.

M11 Junction 7A scheme has been broken down into three main phases titled as Phase 1, Phase 2A and Phase 2B. Each phase has been further split into multiple sub-phases to seek clear understanding of the sequence of construction within each main phase.

This Construction Methodology Report describes an outline methodology and sequence of works, including enabling works such as advanced environmental & archaeological mitigation works, utility diversion works and main construction activities that would be carried out within each main phase and sub-phases of the scheme.

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### 3 Abbreviations Table

Abbreviation	Meaning
CS	Compound Site
EB	East-bound carriageway
EB	East bound
HPGM	High pressure Gas mains
HS	Hard Shoulder
NB	North bound
PROW	Public Right of Way
Rbt	Roundabout
RC	Reinforced Concrete
SB	South bound
SS	Soil Storage
TM	Traffic Management
TS	Top Soil Storage
WB	West-bound carriageway
WB	West bound



## 4 General Construction Methodology

### 4.1 Method of Construction/Installation

This section captures the methodology for general items that would be built within each phase of the project. Construction methodologies for those elements that are specific to Phase 1, 2a or 2b are detailed in separate sections – Section 6 & 7 of this report.

General elements that be constructed within each phase (Phase 1, 2A & 2B) of the project are:

- Enabling Works including advanced ecological, environmental and archaeological mitigation works and Utility diversion works;
- Permanent Fencing;
- Topsoil removal works;
- Earthworks including Cutting & Filling operations;
- Drainage;
- Pavement Construction;
- Finishing works;
- Inlay works;
- Setting up of temporary traffic management;
- Spoil Management;
- Construction of temporary site compounds;
- Temporary fencing;
- Construction of temporary haul routes;
- Construction of specific construction zones.

#### 4.1.1 Enabling Works

There are three main enabling work activities featured in a number of sections required for this scheme. These include;

**Advanced Environmental Mitigation Works** – Advanced environmental mitigation works would include activities such as vegetation clearance and ecological mitigation for various species that would be required prior to the commencement of main construction activities.

Both vegetation clearance and ecological mitigation works are 'seasonal' due to which they would need to be carried out within a specific time period of the year to avoid causing any delays to the commencement of main construction activities.

**Advanced Archaeological Mitigation Works** – Advanced archaeological works could take the form of trial trenches, watching brief and several other techniques. These activities would require to be carried out prior to main construction works in the area or in some instances during the earthworks phase. The level of archaeological works required for a given area and thus the timing would be determined following the findings of the archaeological surveys.

**Utility Diversion Works** – Utility diversion works include diversion of existing utilities along the existing Gilden Way corridor (B183) in Phase 1 and diversion of the High-pressure Gas Main (HPGM) that exists in Phase 2A & 2B. In order to ensure that the diversion of utilities does not cause any delays to the main construction activities, it would be required to divert the utilities well in advance of the main construction works commencing. It is therefore highly advisable to engage the respective utility companies well in advance. This will ensure no delays are caused to the main construction activities as a result of the utility diversion works.

#### 4.1.2 Permanent Fencing

The land area occupied by the permanent works would be identified precisely on the ground, by surveying and installing suitable pegs and posts, prior to the works commencing. The area defined would be the area of land acquired through statutory orders and any other areas the contractor may acquire by agreement to facilitate construction of the works due to his own method of working.

The fencing required to denote the permanent highway boundary would generally be a 1.4m high timber post and four-rail fence. This would, however be complemented with additional measures suitable for the exclusion of ecological considerations (e.g. badgers, otters, great crested newts and other species).

#### 4.1.3 Topsoil Removal

Removal of topsoil is typically conducted once the enabling works in the area are complete and prior to the commencement of main construction activities such as earthworks in cutting or filling. Topsoil removal involves stripping the top layer of soil (which contains the most nutrients) typically 0.2m in depth and stockpiling. Topsoil would require to be removed from the areas mentioned below but are not limited to:

- Main alignment;
- Temporary construction site areas;
- Temporary haul routes and construction zones.

Typically, placement of topsoil and seeding of embankments & side slopes would be undertaken at the end of the construction phase following the completion of all main construction activities and prior to opening the new alignment to live traffic. This would enable the subsoil to be sealed preventing sediment run-off.

As described previously, topsoil would have been stripped and stored close to the works to allow getting the material transported easily to the desired location using 9t dumpers. In the case of certain temporary sites including compound and soil storage sites (not including Phase 1), topsoil would be stripped and temporarily banded on the perimeter to create a barrier (visual and noise). Grass seeding would be carried out either by hand or by machine spreading in the relevant areas in accordance with the landscape design.

#### 4.1.4 Earthworks

There are two main types of earthworks activities in this scheme which would be carried out following the stripping of the topsoil;

**Filling** – Construction of embankments by filling would involve sourcing and using fill material to construct an embankment and raising the profile of the ground to the road formation level enabling the construction of the road pavement, footpath etc. Construction of embankment involves transportation of suitable fill material using 20t road wagons / 9t dumpers, laying the fill material in layers of 200 to 250mm thickness (depending on the specification) using a dozer / grader and compacting each layer of fill material using a vibratory roller. A typical embankment slope ratio used for type 1 material would be 3:1 (horizontal: vertical). In some instances, this ratio could be altered by using a different fill material or by creating engineered slopes. Exact details of the earthworks will be covered in the geotechnical specification.

**Cutting** – Cutting operations would involve excavating the ground to the road formation level to enable construction of road pavement, footpath etc. This construction method involves excavating soil and shaping slopes using suitable sized excavators with hydraulic attachments. The slope would typically have a ratio of 3:1 but this is dependent on the ground conditions. Final details will be in the geotechnical specification.

#### 4.1.5 Drainage

Drainage could take several forms including pipes ditches and channels, all of which are typically constructed closely following the earthworks phase. Drainage works include the construction of drainage ponds, which for this scheme would be excavated prior to earthworks when possible for reuse as fill material.

Construction of carriageway drainage would typically involve laying filter drains, carrier drains and outfalls to transport surface water run-off from side slopes, carriageways and other paved areas. Drainage products will include pipes, gully pots, cover gratings, gravel filter material and other stone pieces for balancing ponds and open channels. Manholes and chambers would be built with in-situ concrete bases, a precast concrete ring or brickwork walls and will be covered by precast concrete caps coated with Iron. The construction materials required would be delivered to site by road.

Drainage activities also include the construction of culverts which would be carried out prior to earthworks. Culvert construction methods vary but would typically involve either in-situ construction or off-site pre-fabrication (and on-site installation) with the later usually favoured.

#### 4.1.6 Pavement

The road pavement is made up of several layers and each layer will need to be laid, compacted and in some cases allowed to set before laying the next layer. Pavement works would include activities such as laying capping material, preparation of the sub-base & base course and laying blacktop binder & surface course. Construction of pavement would involve plant such as graders, vibratory rollers (single & twin drum), milling machine, asphalt pavers and road wagons.

Table 1 shows indicative pavement depths in order of construction used for each layer in this scheme for both mainline works (new construction) and widening works to the existing carriageway.

Footpaths would also be laid following any earthwork activities required in the area.

Layer	Mainline Depth - New Construction (Phase 2A & 2B) (m)	Widening Depth – London Roundabout Up to Mayfield Farm (Phase 1) (m)
Capping	0.38	0.3
Sub-Base Course	0.2	0.2
Base Course	0.18	0.15
Binder Course	0.15	0.065
Surface Course	0.03	0.035

Table 1 - Indicative Pavement Depths

#### 4.1.7 Finishing Works

Following pavement construction, safety barriers, signs and cabling would be installed. Sign installation involves excavation for their concrete foundations and setting the posts. The sign faces are then fixed to the posts.

Some signs may be lit and would require cabling to be passed through the service ducts installed previously (lighting columns would also be installed and connected).

The road would then be cleaned of any debris and road markings would then be sprayed onto the road surface using specialist lorry mounted equipment. Following finishing works, the road would be ready for public use.

#### 4.1.8 Inlay Works

Inlay works would be carried out to upgrade the existing carriageway. For Gilden Way this involves stripping and removing the existing road surface; exposing the existing concrete slabs. At this stage, any repairs to the concrete (e.g. joint repairs) would be carried out. The new pavement would then be laid as per the phasing strategy (see B3553F05-0000-REP-0063[A1]) up to and including the binder course. Once the new binder course is laid over the entire stretch, the surface course would be laid in one/two parts to minimise the number of longitudinal joints.

This activity involves working on the existing live carriageway; therefore a strict traffic management regime will need to be put in place throughout the parts of the carriageway affected by construction prior to commencing any Inlay works.

#### 4.1.9 Temporary Traffic Management

Temporary traffic management refers to a temporary arrangement to manage the flow of traffic whilst works are occurring in the vicinity. It aims to minimise disruption by maintaining road capacity as far as possible whilst ensuring safety to road users and the workforce.

Traffic management in this scheme would be required throughout Phase 1 (refer to 'Construction Phasing / Sequencing Report' B3553F05-0000-REP-0063 for detailed phasing) and would be utilised during the day and in some instances during the night. This is addressed in more detail for each phase later in the report. Traffic management arrangements required would take the form of;

- Narrow Lanes - Typically 3m in width with speed restriction (typically 30mph)
- Exclusion Zone - A set distance to maintain between the live carriageway and the main works (varies between 0.5m - 1.2m)
- Lane/Road Closures – The use of traffic light system, manned stop/go sign or similar. Lane and road closures would be restricted to off-peak, usually night time hours as far as reasonably practicable.
- Night Time Working – Typically between 10pm-5am. Exact night time working hours would be set to coincide with periods in the night with lower traffic numbers or if the works have been pre-agreed and approved by the relevant authority (i.e. closure of M11 for the installation of Bridge beams would require pre-agreement with Highways England).

Further detail is provided in the sections below within each phase.

#### 4.1.10 Spoil Management

This scheme involves a significant amount of earthworks therefore the management of spoil is crucial to reduce the likelihood of delays and also to control the amount of traffic using the network at any given time.

Bearing in mind the quantity of earthworks (see tables Table 3, Table 4, Table 6, Table 7 and Table 9) and also considering the fact that the earthwork activities would appear on the critical path in the construction programme; in order to minimise programme delays and extra costs it is advised that the supply of fill material is always given a top priority. As such soil storage areas have been incorporated in the construction site layout (site layout drawings B3553F05-0100-DR-0813 to B3553F05-0100-DR-0818) to ensure spoil/fill supplies do not heavily rely on just-in-time delivery and therefore significantly reducing the likelihood of causing delays to the project.

This scheme requires a substantial amount of fill material, which shall be supplied from cuttings (assumed to be usable at this stage) and importation from external suppliers. Also it would be sensible to assume the additional spoil required (after using material from cuttings/ponds etc.) to meet the design's fill requirements would be transported using 20 tonne (9.2m<sup>3</sup>) road wagons from external suppliers. The exact location for sourcing the material would be determined by the principal contractor. At the present moment, it would be safe to assume that several suppliers would be required to deliver the quantities needed for this scheme.

As previously mentioned, the spoil management strategy currently assumes that any material excavated (from alignment cuttings, drainage ponds etc.) could be used as fill material. However once further geotechnical studies are conducted and the nature of the existing soil is established, it may appear that some material either cannot be used or would require treatment on site prior to using.

If the requirement to treat the excavated soil on-site prior to using it as a suitable fill material becomes necessary, then additional land (from what's been already shown on the proposed construction site lay out drawings) may be needed for storing this excavated spoil until it is treated. Additionally land space would be required to facilitate treatment plant, if required.

The source for the additional volume of suitable fill material that would be imported from outside is currently unknown. Once the principal contractor is mobilised, source for importing the fill material would be finalised by their supply chain management.

## 4.2 Construction of Temporary Sites

Refer to construction site layout drawings (B3553F05-0100-DR-0813 to B3553F05-0100-DR-0818) for plan views of the proposed construction site layout for the entire scheme.

It is to be noted that a number of disciplines have reviewed and fed into the site layout design, including the environmental team. Comments received from each discipline have been incorporated and the design has been refined to minimise the impact on trees, ecological mitigation and utility diversion whilst maintaining its main function.

### 4.2.1 Compound Sites

Compound sites would be required throughout the construction period to facilitate the works in a given area. These sites would be used as a base for the appointed contractor(s). They would contain some/all of the following:

- Welfare facilities – Toilets, kitchens etc.
- Office space – Desks, meeting rooms etc.
- Car Parks & Caravan Sites – Car parking facilities for staff and caravan sites if required.
- Plant/Equipment Storage – Storage for plant/equipment used for construction related work when not in use.
- Material Storage – Any material required, e.g. steel, drainage pipes, spare parts etc.
- Pre-Fab Area – A working area to assemble, pre-fabricate elements, e.g. steel cages etc.
- Lorry Holding Area – Area to check and control HGVs entering the site off the main road network.

Compound sites would first be cleared, stripped of topsoil and then constructed. Whilst the construction of the scheme is on-going, compound sites would remain lit (with lighting directed appropriately to minimise light pollution to nearby areas), fenced and secured at all times. Services to the site cabins and offices will include electrical, communications, water and sewerage amenities.

Temporary drainage would be installed where required to facilitate the use of welfare cabins during the construction phase. Visual and acoustic mitigation (e.g. earth bunds/fencing) would be installed where required. The compound sites have been kept as far away from watercourses as practicable to obviate the need for additional environmental mitigation. After demobilisation, the principal contractor will reinstate and hand back the sites to the respective landowners for areas outside the highway boundary.

#### 4.2.2 Soil Storage Area

Soil storage areas would be used to temporarily stockpile (at an advised height of 3m) the fill material. They would first be stripped of topsoil prior to being utilised for storage. . and The area would be bounded by appropriate fencing (e.g. silt fencing near watercourse) where and when required.

These areas would be created during site setup and be required up until the completion of the associated earthworks. The soil storage sites have been designed to:

- Have a capacity of 50% of the required volume for the associated works where possible (based on a stockpile height of 3m).
- Easy access to and from the road network/ haul routes.
- Close to the works to minimise travel distance.
- In line with the overall construction programme and phasing strategy (i.e. soil storage sites may be required for different durations at different periods in the construction programme).

The location of the soil storage sites shown on the site layout drawings (B3553F05-0100-DR-0813 to B3553F05-0100-DR-0818) have been reviewed by a number of disciplines including the environmental team and have been refined accordingly.

On completion, the areas would be reinstated and handed back to the respective land owner.

#### 4.2.3 Topsoil Storage Areas

Topsoil storage areas would be used to temporarily stockpile topsoil (see 4.1.3 for topsoil details). The topsoil would be stockpiled at an advised height of 2m. The site perimeter would have appropriate fencing (e.g. silt fencing near watercourse) when and where required.

These areas would be created during site setup. It is assumed that all topsoil would be re-used on the exposed side slopes of embankments and cuttings and also for additional landscaping purposes therefore the topsoil storage areas would be required until landscaping activities have been completed.

The soil storage sites have been designed to:

- Have a capacity of 100% of the required volume of stripped topsoil for the associated works (based on a depth of 0.2m).
- Easy access to and from the road network/ haul routes.
- Close to the works to minimise travel distance
- In line with overall construction programme and phasing strategy. Topsoil storage sites would generally be required at the start of the works and remain throughout the works. It is assumed that the material would then be used for landscaping activities.

Finally on completion of the related earthworks, the storage areas would be reinstated and handed back to the respective land owner.



#### 4.2.4 Temporary Fencing

Temporary fencing would include silt/sediment fences to prevent sediment reaching watercourses (generally used around soil and topsoil storage sites where required) and higher security fences typically used at compound sites to ensure access is only available to authorised personnel (refer to drawings B3553F05-0100-DR-0813 to B3553F05-0100-DR-0818 for proposed site layout for M11J7A scheme).

Environmental fencing (e.g. otter, badger fencing) may require to be extended below ground level which would require excavation. This would be carried out using a small excavator or by hand digging.

#### 4.2.5 Temporary Haul Routes

Haul routes would be used on a temporary basis to facilitate on-site movements of construction vehicles and shall be reinstated once they are no longer required.

Haul routes generally run at the toe of the alignment embankment to minimise construction footprint. They would also generally run 4-5m away from proposed cuttings dependent on the depth of cutting to ensure workforce safety and to avoid any soil stability issues.

Additionally they would vary in width dependent on the plant and equipment utilised on a project. For the M11J7A it is proposed that the maximum width for a single way haul route would be 3.5m (i.e. 7m for two-way haul routes).

Construction vehicles are generally larger than cars and therefore have a larger turning circle. As a result haul routes have been designed to have a free flow desirable minimum outer turning circle diameter of 22m. Where this is not possible the traffic flow would need to be controlled.

In order to construct the haul routes, the ground would first need to be stripped of topsoil and then dependent on the ground conditions it may be required to lay a layer of asphalt to support the weight of the construction vehicles. Finally once the haul routes are no longer required the asphalt would be removed and topsoil reinstated and for certain areas in the M11J7A they would act as drainage ditches.

#### 4.2.6 Construction Zone

The construction zone is an area used for specific construction activities and generally would be required for a set period of time and not the entire construction period. They differ from haul routes as they do not facilitate bulk construction movements but simply facilitate an activity or number of activities. The area of the zone varies depending on the activity and the type of plant/equipment required for it.

It is to be noted that the main alignment would also be used as a working area for construction (only construction zones that are required outside the main alignment are shown on the site layout drawings).

### 4.3 Typical list of Plant/Equipment and their usage

SI No	Anticipated Plant & Equipment List	Usage
1	Forklift	General across site. Would be used mainly to shift construction materials.
2	HIAB	Truck mounted crane. Would be used mainly in the construction site compounds for offloading construction materials from the back of the truck such as pallets, 1ton bags etc.



3	Site Transit Van for general movements	General across site for transporting staff, equipment etc.
4	5t Mini Excavator - Komatsu PC55MR or similar	<p>Would be mainly used to undertake either earthworks (cutting / filling) associated with the widening of the existing alignment in Phase 1 or excavation works associated with Utility diversion works in Phase 1 / 2A / 2B.</p> <p>There is also a potential of using mini excavators during the excavation of drainage ponds in Phase 1.</p>
5	35t - 45t Excavator - PC350 / 450 LC Komatsu or similar	<p>Would be used either for major cuttings / excavation works in Phase 2A &amp; Phase 2B or for loading 9t dumpers at the location of Soil storage areas or during the excavation of Pond 3 in Phase 2A and Pond 4 in Phase 2B.</p> <p>Potential of getting used in Phase 2A/2B during Utility Diversion works as well.</p>
6	Dozer - D6 Caterpillar or similar	Would be mainly used during the construction of embankments in Phase 2A -Section B and in Phase 2B where major quantities of 'filling' are involved.
7	Soil Compactor - Bomag Single Drum Vibratory Roller or similar	Would be used to compact the earthwork layers across Phase 1, 2A and 2B.
8	Soil Compactor - Bomag BW80 AD-5 Twin Drum Vibratory mini Roller or similar	Would be used to compact areas having extremely limited room; mainly across Phase 1.
9	20t Road Wagons (9.2m <sup>3</sup> heaped capacity)	<p>Offsite Movements - Would be used to import suitable fill material and other construction material such as capping, sub-base, base course, binder course and surface course material for pavement construction.</p> <p>Onsite Movements - Would be also used to shift / move mainly soil from the storage areas to the location of filling within Phase 1, 2A and 2B.</p>
10	9t Dumpers (4.6m <sup>3</sup> . heaped capacity)	Would be mainly used for shifting soil from soil storage areas to the location of filling within Phase 1, 2A and 2B.
11	12m <sup>3</sup> CAT AWD or similar Motor Grade	Would be mainly used to level the earthworks in 'filling' prior to commencing compacting each layer of fill material during the construction of embankments mainly in Phase 2A and Phase 2B.

12	100 - 500t (varying capacity) LTM Liebherr or similar Mobile Crane(s)	<p>Mobile Crane(s) would be used to lift construction materials such as bundles of reinforcement, formwork panels, scaffolding gear and other general construction equipment either at the location of Site compounds across the scheme or near the location where reinforced concrete structures are required to be built within the scheme.</p> <p>Suitable size mobile cranes (potentially 500t) would be also used to lift the prefabricated steel beam sections of the new M11 overbridge and place them on the top of the abutments over the NB &amp; SB carriageways.</p>
13	40ft flatbed Articulated Trailers (for bringing steel on site)	<p>40ft flatbed Articulated trailers would be used mainly to bring reinforcement bundles that would be required for the construction of reinforced concrete structures within the scheme.</p> <p>Articulated flatbed trailers could be also used to bring pre-fabricated formwork panels, steel bridge beams and precast concrete segments (if required any).</p>
14	RG21T or similar Telescopic Leader Rig for Piling Activities	Telescoping leader rigs would be used for piling activities.
15	Liebherr 833D or similar Diaphragm Wall Grab (for retaining wall construction)	Currently assumed that there wouldn't be any diaphragm wall construction required within the scheme due to which there shouldn't be a requirement of any diaphragm wall grabs. Following the finalisation of structures design, this may change.
16	Concrete Lorries (HGV)	Would be required during concreting operations at the location of reinforced concrete structures within the scheme; retaining walls & bridge abutments etc.
17	Putzmeister BSA1005 D Static Concrete Pump	<p>Static concrete pumps would be used for pouring concrete into the retaining walls –Ch. 786 to Ch.820 and Ch.830 – Ch.870 in Phase 1 and Ch.1890 – Ch.1960 in Phase 2A.</p> <p>Also there is a potential of using static pumps for pouring concrete into the M11 overbridge abutments.</p>
18	M34 or similar Concrete Boom Placer	<p>Boom placer would be mainly used for pouring the concrete deck on the M11 over bridge. Also they can be used for pouring concrete in the retaining walls and bridge abutments for the M11 overbridge.</p> <p>The use of this plant would be down to the principal contractor to decide depending on the amount of space available to set up the boom placer at the location of concrete structures.</p>
19	Asphalt Paver	Would be used for laying the binder course and surface course along the entire alignment of the scheme.

20	Twin Drum Vibratory Roller for Asphalt Works - Bomag BWA51 AD-5 or similar	Would be used for compacting the binder course and surface course along the entire alignment of the scheme.
21	Kerb Laying Machine	Would be used to lay concrete kerbs across the scheme. Please refer to 'Kerbs, footways and paved areas layout plans' for the exact location of kerbs in the scheme.
22	Milling Machine for Overlay works	Inlaying works i.e. along Gilden Way.
23	Permanent Road Marking Machine	General across site along the main alignment of the scheme.
24	Wheel Wash - Rhino Eco-wash Extra or similar	Exit points to compounds, haul routes entering road network. Phase 1 -1no, Phase 2A -3nos, Phase 2B -1no.
25	HILTI Power Tools	Mostly near structures. Variety of tools. (Use Hilti tools for the purpose of assessments).
26	Mobile Elevated Working platform (MEWP) - Nationwide Platform or similar	MEWP(s) would be used to gain access to high levels. There is potential of using MEWP(s) mainly at the location of structures such as retaining walls and bridge abutments of the M11 overbridge.
27	<b>PLAN B</b> – SP60-300 SLR Side Grip Piling Rig or similar	Would be used to install sheet piles in the slope of the existing road embankment on M11.

It is to be noted that the list drawn above is purely indicative. Ultimately, it would be down to the Principal Contractor to decide the type / specification of plant & equipment they would like to use on the project during the construction phase.

## 5 Proposed Phasing Breakdown

The main construction phases follow the overall scheme phasing (Phase 1, Phase 2A and Phase 2B) but are further broken down into construction sub-sections and further sub-phases.

See Table 2 and Figure 1 which shows the proposed construction phasing breakdown for the scheme.

For more information refer to 'Construction Phasing / Sequencing Report' (B3553F05-0000-REP-0063).

Main Phase	Sub-Section	Sub-Phase
<b>PHASE 1</b> (London Rd Rbt – Mayfield Farm)	Section A (London Rbt – Churchgate Rbt)	Phase A, B, C, D, E & F
	Section B (Churchgate Rbt – Mayfield Farm)	Phase A, B, C, D & E
<b>PHASE 2A</b> (Mayfield Farm – M11 excluding PHASE 2B works)	Section A (Mayfield Farm – Sheering Rd Rbt)	Phase A,B & C
	Section B (Sheering Rd Rbt – M11)	Phase A,B & C
<b>PHASE 2B</b> (Link between Sheering Rd Rbt and M11 Western Dumbbell Rbt via Pincey Brook Rbt)	N/A	Phase A & B

Table 2 - Proposed Construction Phasing Breakdown

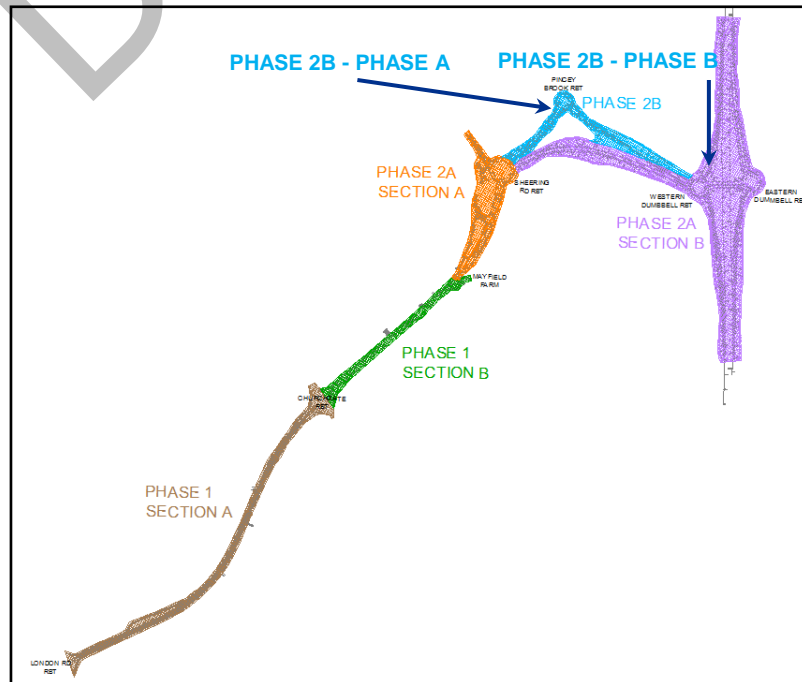


Figure 1 - Proposed Construction Phasing Breakdown (Main Phase & Sub-Sections)

Note that the phasing boundary between Phases 1 and 2A is indicative and may be adjusted to facilitate engagement with local residents and other stakeholders when the contractor comes on board.

## 6 Phase 1

### 6.1 Key Quantities

#### 6.1.1 Section A – London Rd Rbt to Churchgate Rbt

Type	Rounded Quantity	Bulk Quantity
Topsoil (Inc. Temp Areas)	830 m <sup>3</sup>	960 m <sup>3</sup>
Cut (Inc. 1 x Drainage Pond)	1640 m <sup>3</sup>	1880 m <sup>3</sup>
Fill	2990 m <sup>3</sup>	3440 m <sup>3</sup>
Pavement	2870 m <sup>3</sup>	3300 m <sup>3</sup>
Structures	2 x Retaining Walls (30 m <sup>3</sup> & 36 m <sup>3</sup> Concrete, 6000 kg & 7200 kg Steel)	N/A

Table 3 - Key Quantities for Phase 1 Section A

#### 6.1.2 Section B – Churchgate Rbt to Mayfield Farm

Type	Rounded Quantity	Bulk Quantity
Topsoil (Inc. Temp Areas)	2310 m <sup>3</sup>	2660 m <sup>3</sup>
Cut (Inc. 1 x Drainage Pond)	2410 m <sup>3</sup>	2770 m <sup>3</sup>
Fill	1950 m <sup>3</sup>	2240 m <sup>3</sup>
Pavement	1900 m <sup>3</sup>	2190 m <sup>3</sup>
Structures	N/A	N/A

Table 4 - Key Quantities for Phase 1 Section B

## 6.2 Site Layout

### 6.2.1 Compound Site

Phase 1 site layout proposes one site compound to facilitate Phase 1 Section A and Section B works.

The site compound (CS1 - 6340m<sup>2</sup>) located on the south side between London Rd Rbt and Churchgate Rbt (approximately Ch:500 - Ch:600). This compound is designed to accommodate between 25-30 staff and includes; pre-fab area & material storage, plant/equipment storage, lorry holding area, welfare facilities and a car park & caravan site (refer to section 4.2.1 for details). Additionally due to space constraints, the compound size has been minimised as far as practicable.



CS1 would be setup prior to main construction works and would only be required throughout the construction period for Phase 1. Existing basic welfare facilities currently exist at the proposed location so it is recommended these facilities are investigated and utilised for the compound site where possible.

Tree surveys have been carried out recently at the location of the proposed compound site (CS1) for Phase 1 works. It has been identified that the site is surrounded by 'Mature' trees whose root protection zones and canopies extend into the compound site.

Prior to setting up the site compound, certain ground protection measures such as 'CellWeb' would require to be installed by the principal contractor within the entire footprint of the proposed compound site to protect the tree roots and ensure that the root protection areas do not get disturbed either during the set-up of the site compound or during the construction phase.

It has also been identified during the tree surveys that some of the trees present within the boundary of the proposed site compound have low roof canopies. Although some pruning may be necessary, extra care would be required by the principal contractor's plant & machinery operators to ensure that the roof canopies are not damaged. As a result it is advisable to use smaller plant if working on the top of the soil heaps to ensure a minimum safe clear distance is maintained at all times.

In order to maintain the security and privacy of the compound site, a solid hoarding (metal / timber) is proposed to be erected along the perimeter of the compound site (CS1). Due to the presence of root protection zones within the perimeter of CS1, digging operations for the fencing foundation should be undertaken judiciously.

Two options have been identified for the installation of the hoarding around the perimeter of CS1 which would not require ground-digging. These options are:-

**Option 1:- Water-filled Hoarding System**



**Water-filled Hoarding System**

**Key features:-**

- Free standing system ideal for any construction site.
- Interlocking design forms a continuous wall.
- Compatible with pedestrian and vehicle gates.
- Easy to transport and install manually.
- No digging required on the ground due to the nature of free-standing design.

**Option 2:- Free-standing Timber Hoarding System**



**Free-standing Timber Hoarding System**

**Key features:-**

- No digging required.
- Site specific design would be required.
- Compatible with pedestrian and vehicle gates.
- Little or no remediation works required.

The compound site would be gated and secured appropriately and would not be accessible to the general public. For the purpose of security, compound site would be kept lit at all times during the entire phase of construction.

Following completion of the construction of phase 1, CS1 would be demobilised and the land reinstated and handed back to the respective land owner.

Refer to site layout drawing - B3553F05-0100-DR-0813 for plan view.

## 6.2.2 Soil Storage Areas

Phase 1 construction involves a small amount of earthworks; two new drainage ponds would require to be excavated in Phase 1, one at Ch 650 in Section A and the other one at the east of Churchgate Roundabout in Section B.

Assuming that the material obtained from the excavation of the two drainage ponds could be used for the purpose of filling while undertaking the widening works in Phase 1, a very small amount of soil storage area would be required for stockpiling the fill material for Phase 1 works. Assuming that it would be allowed to stockpile the fill material in the spoil storage area up to a height of max 3m, one single soil storage site - SS1 (620m<sup>2</sup>) would be sufficient. A small amount of soil would also require to be imported from outside to facilitate the filling operations in Phase 1.

Due to space constraints, SS1 would be located in the same area as the compound site with access to Gilden Way and through CS1. Once Phase 1 is complete the entire area (including compound site, soil storage site and topsoil site) would be reinstated and handed back to the respective landowner.

Refer to section 4.2.2 for general soil storage information.

## 6.2.3 Topsoil Storage Areas

One single topsoil site (TS1) would be required to temporarily stockpile 100% of the topsoil which would be stripped from the site as well as from CS1 and SS1.

It is assumed topsoil would remain in situ for the duration of the construction period until the landscaping activities start.

Any surplus topsoil not used for landscaping and other purposes would be exported offsite. Following this the land can be reinstated and returned to the landowner.

Refer to section 4.2.3 for general topsoil storage information.

## 6.2.4 Access & Construction Routes

The recommended construction route from the M11 would be via M11J7 and A414 (refer to site layout drawing B3553F05-0100-DR-0813 for details). As this section is online, construction traffic would share the existing road network with public users.

Due to space restrictions in this phase there would be no designated haul routes or similar. The widening area would be used as the working area and the haul route with access to these areas will only be available for construction vehicles from the main carriageway. This is only possible as the work involved is not significant therefore the plant/equipment and number of workforce required would also not be significant.

Local accesses to residential and public areas would be maintained in some form throughout the construction period. This may require construction of temporary access routes. As an example, Mayfield Farm will require a temporary access and the principal contractor would be responsible for maintaining all such accesses throughout the construction period whilst ensuring safety to all categories of users, including the workforce.

## 6.3 Construction Methodology

### 6.3.1 Enabling Works

Prior to main construction commencing, a number of pre-construction or enabling work activities would need to be carried out. These activities include the two described below but are not limited to them. Note that enabling works are subject to change following further surveys, etc.

**Advanced Environmental & Ecological Mitigation Works:**

- Following the surveys carried out by the environmental & ecological team to-date, listed below are the enabling activities that would require to be carried out as a part of 'Advanced Environmental & Ecological Mitigation' works prior to commencing main construction activities in Phase 1: Vegetation clearance within each sub-phase – A, B & C in Phase 1;
- Installation of noise barriers mainly in the neighbourhood sensitive areas. Noise barriers would require to be installed within few stretches only where the nearby local residents live in the close proximity of the construction works. Advanced installation of noise barriers in these sensitive areas would help to reduce noise levels to local residents during construction as well as in the permanent state and therefore, could be treated as a means of noise mitigation.
- Obtaining relevant licences (GCN & Bat).
- Construction of alternative habitats (such as bat boxes, amphibian and reptile habitat).
- Erection of GCN exclusion fences, trapping and transporting of GCN/reptiles. The fences cannot be erected whilst GCN are dormant (i.e. late autumn to early spring) due to being classed as Invasive works. Therefore, it is mandatory that the erection of fences must be timed so as to coincide with the active season. It should also be noted that the GCN licence must be in place prior to erecting the fence or undertaking any other intrusive works in the area. Therefore, it is an absolute key that the GCN & Bat licences are applied well in advance to avoid causing any delays to the main construction activities.
- Removal of bat roost trees.

Some of the activities mentioned above are seasonal, therefore would need to be carried out in a specific period of the year. For details regarding dates & durations for these activities, please refer to the Construction Programme.

Phase 1 also has a number of utilities running parallel to Gilden Way which would require diverting. It is highly recommended that the diversion works occur prior to main construction to avoid delays, disruptions and complications to the overall construction programme.

**Archaeological Works**

Archaeological work requirements have been provided by the archaeological team and are subject to change following further surveys/data etc. Based on the current information available archaeological works in Phase 1 would be required in a number of locations. These works would be in the form of archaeological recordings meaning they could be carried out within the main works and would not need to be carried out prior to the commencement of the main construction.

**6.3.2 Main Works**

Phase 1 involves widening works of Gilden Way from 2 lanes to 3 lanes between London Road Roundabout and the approximate location of Mayfield Farm. It also involves improvement works to the existing carriageway.

Due to space restrictions widening would be required on the EB and WB carriageway and is not symmetric, meaning it would vary in width in both directions.

Gilden Way currently has relatively high traffic counts (see Table 5 below) with undesirable diversion routes. As such, the main works methodology is designed to minimise user disruption by maintaining capacity and limiting closures as far as reasonably practical.

	EB Carriageway		WB Carriageway	
	AM	PM	AM	PM
<b>12:00</b>	26	453	14	453
<b>01:00</b>	14	436	9	432
<b>02:00</b>	11	527	5	448
<b>03:00</b>	5	689	11	567
<b>04:00</b>	14	824	27	565
<b>05:00</b>	50	944	122	597
<b>06:00</b>	133	685	335	437
<b>07:00</b>	427	422	796	279
<b>08:00</b>	709	247	1101	163
<b>09:00</b>	383	181	694	111
<b>10:00</b>	384	130	451	85
<b>11:00</b>	417	71	445	49

**Table 5 – Traffic Flow per Hour (Avg Weekday in March 2014)**

Due to the widening requirements on Gilden Way and the importance of maintaining 2 lanes running at all times, a number of sub phases would be required. These sub-phases are dictated by traffic management with the start of each sub phase introducing a new traffic management arrangement. For information on each sub-phase refer to 'Construction Phasing / Sequencing Report' (B3553F05-0000-REP-0063).

There would be disruption during the works to both the local residents and road users, however, this would be kept to a minimum. Local PROWs in the area are also likely to be disrupted during Phase 1 works where closures/ diversions or similar are required. The principal contractor would maintain PROWs where possible but may need to divert or close certain sections for certain periods due to safety issues. Any closure or diversion of the existing PROWs would need to be consulted and agreed with the local council in advance of implanting them in place. Where NMU usage is high, closures would be minimised and these areas would be manned during the construction phase to ensure safety to users and the workforce.

### 6.3.3 Widening Works

Widening works would require the use of traffic management by a competent traffic management company. The use of narrow lanes and an exclusion zone would be required during widening works (see section 4.1.9 for TM details).

The works would be carried out during normal daytime hours and would involve construction of a new pavement. As aforementioned, it is recommended that utilities are diverted prior to main construction to avoid any delays caused to the widening of the existing carriageway on Gilden Way.

Widening works would involve obtaining fill material and raising/lowering the ground to the designed height ready for new pavement. It is assumed fill material from drainage ponds (Pond 1 & 2) are usable and would be used for earthwork activities; therefore drainage ponds in Phase 1 would be excavated prior to earthwork activities. Importation of fill material would most likely not be required or be at a minimum as earthwork activities are not significant for Phase 1.

During earthwork activities it is also possible to install drainage. Based on the current information available on the drainage design, it is likely to require oversize piping. Drainage pipes would be installed during the widening earthworks and involve the cutting of a trench and lowering of pipes within the new carriageway verge.



Once earthworks are complete the pavement would be constructed in layers (refer to section 4.1.6 for details). It is to be noted that during the widening works, the pavement would only be laid up to and including the binder course.

Works to the footpath would also be carried out during the widening works. This would include installation of concrete kerbs along with the construction of a pavement in accordance with the specification for the construction of footways for cycles & pedestrians.

#### **6.3.4 Inlay & Surfacing Works**

Once widening works are complete, inlay works to upgrade the existing carriageway would commence (refer to section 4.1.8 for details). Inlay works would be carried out during normal daytime hours with a 2-narrow-lane running arrangement (single-lane running in each direction) at all times.

Inlay works would require multiple numbers of traffic switches for the traffic flowing on the existing E/B and W/B lanes on Gilden Way. Please refer to the Construction Phasing / Sequencing Report – B3553F05-0000-REP-0063 and Construction Phasing drawings for Phase 1 – B3553F05-0100-DR-0801 to 0804 and 0805 to 0808 for traffic management switches required for carrying out the Inlay works.

Inlay works would include activities such as setting up of traffic management to create a safe exclusion zone from the edge of the live traffic, undertaking planning works to rip the tarmac on the existing carriageway and exposing the concrete slab underneath, undertaking repair works to the joints in the concrete slab and finally, laying a binder course to the required design depth to the same level as carried out previously to the newly widened areas.

Due to the required number of traffic switches and subsequent sub-phases required for carrying out the Inlay works as described in the Construction Phasing / Sequencing Report and Construction Phasing drawings, there would be a number of road joints formed after the completion of the Inlay works.

Once the inlay works are complete, the surface course would be then laid under either a full night-time closure (desirable) or under a single lane closure. The surface course would be laid to ensure all longitudinal joints created due to the widening works and inlay works carried out on the existing carriageway are covered underneath the surfacing course.

Traffic numbers (refer to Table 5) overnight are not significant but as there is no convenient diversion route available it is deemed that this volume of traffic could be managed with a single lane closure during night time hours. Therefore the surface course would be conducted on half of the carriageway (5.1 m) with a traffic light system employed during night hours to manage the flow of traffic in both directions. Once the surface course is laid on one side (multiple nights) this can be repeated on the other side. The result would be a single joint running in the centre of the carriageway.

Once the surface course for the entire carriageway is complete, traffic management would be lifted-off and all lanes would be opened to traffic.

## 6.4 Construction Programme

### 6.4.1 Overview

Refer to the construction programme for having a clear understanding on the logic and sequence of construction for Phase 1 works.

### 6.4.2 Key Assumptions

Listed below are the key assumptions that have been assumed whilst writing the construction programme for Phase 1 (Section A&B) works.

- Construction Programme has been written based on the assumption that the contract mobilisation for Phase 1 works would commence in December 2018 with the main construction (site setup) commencing from July 2019. Current assumption is that the period between December 2018 and July 2019 would be used to undertake advanced environmental and ecological mitigation works.
- GCN and Bat licences would need to be in place as early as possible to minimise delays, therefore it is assumed the applications would be submitted in September 2018 prior to the contract mobilisation date.
- Vegetation Clearance works for Phase 1 (Section A & B – all sub-phases) would be allowed to run in parallel to the contract mobilisation period in order to avoid delays to the construction programme.
- It would be allowed to make licence applications for trapping & translocation of GCN, Bats and other protected species in parallel to the contract mobilisation period in order to avoid delays to the construction programme.
- It is assumed that the diversion of existing utilities on Gilden Way would be carried out in advance of the main construction works.
- Based on the archaeological survey findings available to-date, it is assumed that all of the archaeological works in Phase 1 (Section A&B) would only involve 'Archaeological Recording' that could be carried out in parallel to earthworks in that specific stretch. If at a later date it is found that archaeological digs would be required in any stretch in Phase 1, and then this could have a severe programme implication due to requiring longer time to undertake archaeological digs.
- It is assumed that during Surfacing works, it would be allowed to close lanes during the Night time for a certain period of time and install a 'Traffic Light' system to allow undertaking of the surfacing works.

### 6.4.3 Critical Path

Although the construction programme currently doesn't show any critical path for Phase 1 works, it is to be noted that should any of the items mentioned above under 'Key Assumptions' in Section 6.4.2 is delayed in its commencement, then Phase 1 works could become critical.

In the current construction programme, commencement of the main activities (i.e widening works) is linked with the setting up of traffic management which is further linked with the completion of environmental & ecological mitigation works and the completion of diversion of utilities. Any delay caused to the completion of advanced environmental & ecological mitigation works or to the utility diversion works would have a direct impact on the commencement of the main construction activities, i.e widening works which would then put the entire Phase 1 works on the Critical Path.

It is also to be noted that as per the current construction programme, Phase 1 works would take longer than Phase 2A works which means that it wouldn't be possible to open Phase 2A to traffic until Phase 1 is fully complete. Any delays caused in the construction of Phase 1 works would cause delays in opening the scheme to traffic.

## 7 Phase 2A

### 7.1 Quants

#### 7.1.1 Section A – Mayfield Farm to Sheering Road Roundabout

Type	Rounded Quantity	Bulk Quantity
Topsoil	3480 m <sup>3</sup>	4000 m <sup>3</sup>
Cut (Inc. 1 x Drainage Pond)	22020 m <sup>3</sup>	25320 m <sup>3</sup>
Fill	2650 m <sup>3</sup>	5350 m <sup>3</sup>
Pavement	5600 m <sup>3</sup>	6440 m <sup>3</sup>
Structures	1 x Retaining Walls (60 m <sup>3</sup> Concrete, 12600 kg Steel)	N/A

Table 6 - Key Quantities for Phase 2A Section A

#### 7.1.2 Section B – Sheering Road Roundabout to M11

Type	Rounded Quantity	Bulk Quantity
Topsoil	14700 m <sup>3</sup>	16900 m <sup>3</sup>
Cut (Including 1 x Drainage Pond)	47800 m <sup>3</sup>	54970 m <sup>3</sup>
Fill	150200 m <sup>3</sup>	172730 m <sup>3</sup>
Pavement	15210 m <sup>3</sup>	17490 m <sup>3</sup>
Structures	M11J7A Over Bridge (TBC)	N/A

Table 7 - Key Quantities for Phase 2A Section B

### 7.1.3 Section B – Sheering Road Roundabout to M11 – PLAN B

Type	Rounded Quantity	Bulk Quantity
Topsoil	15130 m <sup>3</sup>	17400 m <sup>3</sup>
Cut (Including 1 x Drainage Pond)	58760 m <sup>3</sup>	79650 m <sup>3</sup>
Fill	171870 m <sup>3</sup>	197660 m <sup>3</sup>
Pavement	15210 m <sup>3</sup>	17490 m <sup>3</sup>
Structures	M11J7A Over Bridge (TBC)	N/A

Table 8 - Key Quantities for Phase 2A Section B – Including PLAN B

## 7.2 Site Layout

### 7.2.1 Compound Site

Phase 2A site layout proposes two site compounds;

- One main site compound (CS2, 11400m<sup>2</sup>) would be located just underneath the westbound diverge link as it meets Sheering Road Roundabout. This would facilitate the majority of the work in Phase 2A including both Section A and Section B works.. This compound is designed to accommodate between 75-125 staff and provide for; a pre-fab area, material storage, plant/equipment storage, lorry holding area, welfare facilities and a car park & caravan site (refer to section 4.2.1 for details).
- One secondary site compound (CS3, 1600m<sup>2</sup>) would be located adjacent to the proposed SB diverge slipway on the eastern side. This would only facilitate Phase 2A Section B works (to the east of the M11). This compound is designed to accommodate between 20-40 staff and provide for; material storage, plant/equipment storage, welfare facilities and a car park (refer to section 4.2.1 for details).

CS2 & CS3 would be required to setup prior to commencing the main construction works and would only be required throughout the construction period for Phase 2A.

In order to maintain the security and privacy of the compound site, a solid hoarding (metal / timber) is proposed to be erected along the perimeter of the compound sites (CS2 & CS3). Refer to Section 6.2.1 for types of hoarding proposed for Phase 2A works.

The compound sites would be gated and secured appropriately and would not be accessible to the general public. On completion of Phase 2A, both compounds would no longer be required. As a result they would both be demobilised and the land reinstated and handed back to the respective land owner.

Refer to site layout drawings B3553F05-0100-DR-0816 & B3553F05-0100-DR-0817 for plan view.

### 7.2.2 Soil Storage Areas

Phase 2A construction involves a significant amount of fill material due to the designed road elevation. As such a number of soil storage sites have been proposed across this phase in order to allow a certain amount of material to be stockpiled prior to being used to create the road embankments.

It is recommended that **50%** of the total fill material required to construct Phase 2A is stockpiled in the proposed soil storage areas to ensure there is a sufficient supply of fill material at all times during the construction of the road embankments in this phase.

**West of M11:** Three soils storage sites (SS2, SS3 & SS4) have been designed to stockpile **50%** of the required fill material for Phase 2A (west of the M11) assuming an average bund height of 3m. These sites would be setup along with the compound site and would need to be ready to stockpile material prior to commencing the construction of the embankments required for Phase 2A works.

In order to meet the earthworks demand for Phase 2A – Section B works (west side of M11), importation of fill material would be required prior to the commencement of filling activities to ensure there is a sufficient supply of fill material, in order to minimise the delays caused to the earthworks activities.

It is also assumed that all cut material as well as material obtained from the excavation of the drainage pond located to the north of Sheering Road Roundabout would be utilised as suitable fill material. Finally once earthwork activities are complete the areas would be reinstated and the land acquired for setting up temporary soil storage sites would be returned to the respective land owner.

**East of M11:-** Two soil storage sites (SS5 & SS6) have been proposed on the east side of the M11 with the capacity to hold **100%** of the required fill for the east side of the M11. A 100% storage capacity is required as an earthworks balance would occur on this particular side (i.e. no importation is required on the east side, but the material obtained from cutting on the east side would supply the demand of fill material which would be stockpiled in the interim of the cut and fill activities, noting that this is based on the assumption that the cut material obtained would be 100% usable).

It is important to note that the position of the soil storage sites have been designed in-line with the construction requirements/ phasing etc. They have been assessed by the environmental team and refined accordingly. It is also to be noted that the proposed location of soil storage sites is indicative and haven't been proposed with any intention to constrain the principal contractor.

Should the principal contractor wish to use a different shape or location for these soil storage sites, it would be highly recommended to maintain the proposed capacity of the soil storage sites to avoid adding any risk to the construction programme due to the delays caused by the shortage of supply or insufficient storage of fill material on site.

Refer to section 4.2.2 for general soil storage information. Also refer to construction site layout drawing for Phase 2A (B3553F05-0100-DR-0816, 0817 and 0823) for details of soil storage areas capturing the name, plan area, capacity and facilitating purpose of each soil storage area required for Phase 2A works.

### 7.2.3 Topsoil Storage Areas

Phase 2A's designed land take is significant and therefore the amount of topsoil required to be stripped would also be significant and would require proper management for the storage of the stripped top soil.

As such, two topsoil sites (TS2 & TS3) are proposed to the west of the M11. TS2 is proposed to have a capacity to stockpile the entire volume of top soil stripped from Phase 2A Section A area and TS3 is proposed to have a capacity to stockpile the entire volume of top soil stripped from Phase 2A Section B (west side of M11) area.

Two smaller topsoil sites (TS4 & TS5) have also been proposed to the east of the M11 which is proposed to have a capacity to stockpile the entire volume of top soil stripped from the east side of the M11 - Phase 2A Section B area.

It is assumed topsoil would remain in situ for the duration of the construction period with a potential of using the material for landscaping activities after the completion of construction phase. Any surplus topsoil not used for landscaping or other purposes on site would need to be exported. Following this the land can be reinstated and returned to the land owner.



Refer to section 4.2.3 for general topsoil storage information.

#### 7.2.4 Access & Construction Routes

Due to the volume of construction traffic required to construct Phase 2A (Section A & B), access management 'to & from' site would be a critical activity to minimise disruption to the local residents as well as to minimise impact to the local & wider road network during the works.

Construction traffic required to use the existing road network would be largely significant due to the amount of material required to be imported for the construction of road embankments mainly in Phase 2A – Section B. (Refer to construction traffic numbers in section 9).

As Phase 2A involves largely offline construction, temporary haul routes are proposed across Phase 2A to facilitate construction movements across the site. The proposed haul routes for Phase 2A (refer to site layout drawings B3553F05-0100-DR-0816 & B3553F05-0100-DR-0817) have been designed to minimise land take with the use of a one way system where possible and also to avoid sensitive features such as Mores Woodland. Haul routes have been proposed in such a way that a minimum 15m clear distance is maintained from the edge of the nearest tree stems in the Mores Woodland area at all times.

In some instances, to ensure connectivity, haul routes would need to either cross or get on/off the existing road alignment. In order to allow construction to continue whilst live traffic is flowing on the existing alignment, it has been proposed to have the crossing points at certain locations in Phase 2A where the existing alignment is at the ground level. This would allow easy access to the construction traffic without causing any delays to the works on-going on the vicinity. After the completion of the main construction phase, the haul routes would become redundant and some minor work may be required to re-instate the haul route area prior to opening the new road to traffic.

Access for Phase 2A would be initially via Gilden Way during the setup of the compound site (CS2) required to facilitate Phase 2A works on the west side of the existing M11 and also during the part-construction of the M11 NB merge and diverge slipways..

In order to facilitate Phase 2A construction activities that exist to the east side of the existing M11, an additional compound site (CS3) would be required. Initial access to the east side of the M11 during the setup of the compound site (CS3) would be via the local road network including the M11 underpass (M11 approx. Ch.37280) and if required Matching Rd overbridge. This access would be required during the site setup and up until the part construction of the SB merge and diverge slipways..

Once part construction of the M11 slip roads is complete, construction vehicles would be able to access the site directly via the existing M11 network which would then avoid causing congestions in the local road network through Gilden Way.

To reduce the number of construction vehicles flowing through Gilden Way, it is proposed that the newly built M11 slips are used by the construction traffic while importing suitable fill material (which is significant in volume) for the construction of Phase 2A West-Bound Diverge Link embankment and also during importation of the fill material required for the construction of the Eastern and Western Dumbbell Roundabouts, as well as for the North & South Bound merges & diverges.

In order to manage the traffic during the construction phase, a suitable traffic management regime would require to be put in place on the M11 in the likely form of a closure of the HS on approach to the diverge slip roads. Access of the M11 would be restricted to construction related vehicles only.

Accesses to local residents are unlikely to be significantly affected as the works are largely offline. There would be short durations during Phase 2A Section A works where tie-in works and minor works to the existing road network would be required. During tying-in works, the principal contractor would be responsible for maintaining local access by putting a prior agreement in place agreed by the local council and local residents.

## 7.3 Construction Methodology

### 7.3.1 Enabling Works

Prior to main construction commencing, a number of pre-construction or enabling work activities would need to be carried out. These activities include but are not limited to the two described below; note enabling works are subject to change following further survey work etc.

#### **Advanced Environmental & Ecological Mitigation Works**

Following the surveys carried out by the environmental & ecological team to-date, below listed are the enabling activities that would require to be carried out as a part of 'Advanced Environmental & Ecological Mitigation' works prior to commencing main construction activities in Phase 2A:

- Vegetation clearance within Section A&B of Phase 2A – all sub-phases – A, B & C.
- Obtaining relevant licences (GCN, Bat & Badger).
- Construction of alternative habitats (such as bat boxes, artificial sett, amphibian and reptile habitat).
- Erection of GCN exclusion fence, trapping and transporting of GCN/reptiles.
- Landscape works for screening if required and also to replace lost flight lines.
- Removal of bat roost trees under licence.

Some of the activities mentioned above are seasonal, therefore would need to be carried out in a specific period of the year. For details regarding dates & durations for these activities, please refer to the Construction Programme.

Phase 2A has one main high-pressure gas pipe that runs perpendicular to the M11 (approx. Ch.36950) which would require diverting prior to commencing main construction activities, in order to avoid causing any delays to the construction of the M11 slip roads.

Any delays caused in building the M11 slip roads (North & South Bound on & off slips) would cause delays in importing the fill material required for Phase 2A works using the motorway network which means that the fill material would then have to be brought on site using Gilden Way leading to severe congestion issues on this road mainly due to the significant volume of material that is required to be imported from outside for undertaking earthworks in Phase 2A.

#### **Archaeological Works**

Archaeological work requirements have been provided by the archaeological team and are subject to change following further surveys/data etc. Based on the current information available archaeological works in Phase 2A would be required in a number of locations. These works would commence by undertaking trial trenching operations in certain locations within the entire stretch of Phase 2A. Following the completion of trial trenching operations, post excavation archaeological report would be produced, a scope & scale of further works would be agreed upon with the archaeological advisors and finally, archaeological digs would be carried out in accordance with the agreed scope.

Due to the fact that archaeological excavation works may require a lot longer to finish than currently anticipated in the construction programme, it is highly recommended to commence archaeological mitigation works in this phase well in advance of the main construction commencing to avoid causing any delays to the construction programme.

### 7.3.2 Main Works

Phase 2A involves significant amount of off-line works, largely consisting of new construction. Phase 2A is broken down into two sections, Section A and Section B (refer to 'Construction Phasing / Sequencing Report' B3553F05-0000-REP-0063 for detailed construction phasing breakdown).

#### 7.3.2.1 Phase 2A, Section A – Mayfield Farm to Sheering Road Roundabout

Once enabling works are complete, Phase 2A Section A main works can commence. In order to minimise disruptions to the traffic currently flowing on the existing Sheering Road, Section A would initially be constructed offline, as close as possible to the live carriageway by creating an exclusion zone from the edge of the live traffic.

After setup of temporary sites and haul routes (for having a better understanding on the location of temporary sites and haul routes for Phase 2A – Section A works, please refer to construction site layout drawings – B3553F05-0100-DR-0816 & 0817), the stretch of the new alignment in Section A between Mayfield Farm and new Sheering Road Roundabout would be stripped of topsoil. Section A is largely in cutting and therefore excavation works would be required in order to lower the profile to the designed height.

Excavation of pond 3 (north of Sheering Road Roundabout) would also be carried out early in the programme. Excavated soil would then be stockpiled at soil storage sites (SS3 & SS4) or when possible would be transported directly to the fill areas.

It is to be noted here that in order to construct embankments in Phase 2A, it would be required to lay and compact the soil in layers, therefore, it may not be possible to continuously transport excavated material to fill sites hence the need for soil storage sites in the interim periods.

A sheet pile retaining wall structure is also proposed at Mayfield Farm to support the earthworks in cutting for the construction of the new alignment between Ch.1890 & Ch.1960.

Refer to section 7.3.2.2 for the details regarding construction of the sheet pile retaining wall at Mayfield Farm.

During the tail end of the earthwork activities, installation of drainage pipes and certain cables could be installed (with sensitive cables required for communication & power to be installed at a later date during the pavement works).

Once the earthworks activities are finished and the existing ground has been taken to the designed level and slide slopes have been created to the road embankment, pavement works could commence. The pavement would be constructed in layers (refer to section 4.1.6 for details) with the whole carriageway width surfaced at once to avoid longitudinal joints.

Lane marking, installation of signs and all other finishing works would be carried out over the stretch after the completion of pavement construction works. The stretch between Mayfield Farm & Sheering Road Roundabout would be ready for use and require no further works prior to commencing tying-in works (Phase 2A, Section A, Phase B). The newly built northern arm of the Sheering Road Roundabout and the new link at Ch. 2100 would require to be tied-in to the existing Sheering Road.

Due to the significant usage of Gilden Way (refer to section 6.3.2 Table 5 for traffic flows), it is important to minimise disruption on the existing Gilden Way. By ensuring the stretch between Mayfield farm and Sheering Road Roundabout is complete, as soon as the tying-in works are complete, the traffic could then instantly be shifted from the existing Gilden Way through to the new alignment allowing minor works to the existing carriageway on Gilden Way to be carried out.

Tying-in works of the newly built carriageway at Mayfield Farm (approx. Ch.1880-Ch.1900), the new link road (approx. Ch.2100) and tying-in of the northern arm of the newly built Sheering Road Roundabout (approx. Ch.0-Ch.80) are not significant in terms of the volume of material.

However due to the length and location of tying-in works, it is advisable to undertake these works during night hours when the traffic flow would be manageable. It is strictly advised to carry out these works under the influence of traffic management set-up to ensure that the disruptions caused to the flowing traffic are minimal. Tie-in works at both ends (Mayfield Farm end and north of the new Sheering Road Roundabout) would need to be completed at the same time to allow the entire stretch to become available for the live traffic upon diversion.

In order to tie in the northern arm of Sheering Road Roundabout, considering the space constraints due to a live road and also nearby trees, it is proposed that smaller construction vehicles would be utilised to carry out these works. It is likely that this work would cause some disruption to road users however this would be for a relatively short duration.

Once tying-in works are complete, the traffic would be directed via the new alignment, removing the majority of traffic from the old Sheering Rd. It is to be noted that at this point the old Sheering Road would become local access road for Campions residents and would require some minor works to be carried out such as re-alignment and demolition works to the redundant sections of the old Sheering Road. The principal contractor would need to ensure that the access to local residents is maintained at all times whilst the realignment / demolition works are ongoing on the old Sheering Road.

Once works are complete to the old Sheering Rd, all works for Phase 2A - Section A would be deemed as complete and the stretch would run normally (refer to drawing B3553F05-0100-DR-0817 for site layout plan after Section A is live). It is to be noted that at this point, although the new Sheering Road Roundabout would be opened to live traffic, no access to the live traffic would be allowed towards the east of the roundabout and this would only be provided after the completion of Phase 2A – Section B works.

#### **7.3.2.2 Construction of sheet pile retaining wall at Mayfield farm between Ch.1890 – Ch.1960**

Prior to commencing earthworks in cutting in Phase 2A – Section A between Ch.1890 – Ch.1960, a retaining wall would require to be built using sheet piles to sustain the surcharge of the adjacent Gilden Way. Installation of sheet piled walls would typically involve the use of a telescopic leader rig with hydraulic hammer attachments to drive the sheet piles to the required depths. Installation of sheet piles would also minimise the extent of excavation during cutting operations.

Prior to mobilising a telescoping leader rig for installing the sheet piles, a piling platform would be constructed using suitable fill material. A suitable sized piling rig would be then mobilised to site. Once the sheet piles are driven using the piling rig, the top of the sheet piles would be covered with brick façade.

#### **7.3.2.3 Phase 2A, Section B – East of Sheering Road Roundabout to M11 Dumbbell Roundabout Junction**

Phase 2A – Section B involves construction of a new overbridge with a dumbbell roundabout junction over the existing M11 live carriageways. Scope of work also includes construction of a new west-bound diverge link connecting the new Sheering Road Roundabout to the M11 dumbbell roundabout junction.

##### **7.3.2.3.1 West of M11**

Phase 2A – Section A&B works would share the same compound site (CS2) that has been proposed to the south side of Sheering Road Roundabout (west of M11 western roundabout).

Haul routes on the west side of M11 have been designed as a 'one-way' system to reduce the land take and avoid clashing with sensitive areas such as Mores Woodland as far as practicable. Following the part construction of M11 NB merge and diverge slip ways on the west side of the existing M11, haul routes would be able to connect the site from both Gilden Way and the existing M11 motorway network which would then help reduce the congestion on Gilden Way during the construction phase of Phase 2A – Section B works. (For having a better understanding on the nature of the haul routes proposed for Phase 2A – Section B works, please refer to the Construction Site Layout Drawing – B3553F05-0100-DR-0816 & 0817).

Once the set-up of the compound site and haul route network have been established on the west side of the existing M11, main works for Phase 2A - Section B could commence.

Following site setup including the construction of the haul routes, topsoil would be stripped and stockpiled allowing part construction of the new M11 NB slips (merge and diverge) to commence. The slips require both cut and fill with the NB diverge largely in cutting and the NB merge largely in fill.

It is assumed that the excavated material could be re-used as a suitable fill material therefore no importation of fill material would be required at this stage with the surplus of fill material stockpiled (at soil storage SS4) for later use. At this stage, the slips would be partly constructed (NB merge Ch.0-Ch.90, NB diverge Ch.0-Ch.310) from the M11 up to a designed at-grade level to enable access to the construction traffic to site directly from the existing M11 motorway network. Traffic management would be required during tying-in works of the slips (proposed to be a narrow lane arrangement on the M11, refer to drawing B3553F05-0100-DR-0810 for cross section). Once part-construction of slips are complete, construction vehicles would access and leave the site using the North Bound on & off slips (North Bound merge & diverge).

Phase 2A - Section B on the west side of the M11 would require significant amount of importation of fill material for the construction of the West Bound Diverge Link. Importation of material is programmed to commence immediately following part construction of the NB slip roads (merge & diverge). This would allow transporting significant amount of fill material to site directly via M11 network. This approach would minimise disruptions to the local road network on Gilden Way, by minimising the construction traffic on Gilden Way as much as possible during Phase 2A – Section B works.

Once fill material begins to arrive on site, construction of embankments for the WB Diverge Link can commence between Ch.50-Ch.580. As this work is offline and covers a significant area, it is possible to have a higher rate of productivity by increasing resources (i.e. multiple gangs working on the same activity). This has been programmed for certain activities to ensure a well-timed construction programme.

During construction of the WB Diverge Link it is also possible to construct the western bridge abutment for the new M11 overbridge. Once complete this would facilitate construction of the overbridge, including landing pre-fabricated steel beams and deck construction as described in section 7.2.4.4

It is programmed that the stretch between Mayfield Farm and Sheering Road Roundabout (Phase 2A -Section A) would be completed prior to the completion of Phase 2A - Section B works and would therefore require to be opened to traffic to allow diverting the traffic from the existing Gilden Way through to the new alignment. Therefore, the access to site for Phase 2A – Section B works would require to be changed accordingly. Refer to B3553F05-0100-DR-0816 and B3553F05-0100-DR-0817 for Construction Site Layout drawings before and after Section A is live).

#### **7.3.2.3.2 East of M11**

Following enabling works site setup and the construction of temporary haul routes would be required prior to commencing main construction to the east of the existing M11. It is to be noted that the high pressure gas main (currently running perpendicular to the M11 at approx. Ch.36950) requires diversion and as previously mentioned, it is recommended that the diversion takes place prior to site set-up to avoid causing delays to the main construction activities. Temporary protection of the gas main may be required in the form of a 'Protection Slab' and would be installed during the diversion of the existing gas mains.

Following site setup, topsoil would be stripped and stockpiled allowing part construction of both SB slips (merge and diverge) to commence (Phase 2A - Section B - Phase A works). This involves excavation to lower the ground profile to the designed level. At this stage the slips would only be constructed from the M11 up to an at-grade level i.e. the existing M11 is currently in a cutting so the slips would be partly constructed from the M11 level to a position where the design is at-grade (SB diverge Ch.0-Ch.120, SB merge Ch.0-Ch.290). Traffic management would be required during tying-in works of the slips (proposed to be a narrow lane arrangement on the M11, refer to drawing B3553F05-0100-DR-0810 for cross section). Once the part slips are complete, construction vehicles would access and leave the site using these slips.



An earthworks balance occurs on the east side of the M11. As such, considering that part construction for both SB diverge and merge are in cutting, the soil would be excavated and stored at soil storage sites - SS5 & SS6 (with the assumption the material could be used for filling). SS5 has a maximum capacity of approx. 8400m<sup>3</sup> (3m bund height) which should not be exceeded as this material would be used for completing the SB slip roads at a later date. Material stored in SS5 would need to be exhausted as the area would need to be free for the construction of the Eastern Dumbbell Roundabout. The remaining excavated volume would be stockpiled at SS6 to be used for filling at a later date.

Following part construction of the SB slip roads, the eastern bridge abutment construction can commence. Brief methodology for the construction of the M11 overbridge is detailed below in Section 7.3.2.4.1.

Once both the eastern and western bridge abutments are complete, the pre-fabricated bridge beams (total 8 no.) would be lifted using a suitable size crane and placed on the top of the abutments and secured. Lifting of the bridge beams over the existing M11 carriageways would require a full closure of all lanes on the existing M11 for a minimum of one night. It is to be noted that additional night closures may be required subject to the principal contractor's methodology for the installation of the bridge beams and depending on the availability of resources and also in the case of adverse weather. As this activity would need to be pre-agreed with Highways England, the bridge abutments would need to be completed prior to the agreed date of installation of the bridge beams to avoid causing any delays to the construction programme.

Once the bridge beams have been landed on the top of the eastern & western abutments, the deck construction can continue on the top with traffic flowing on the existing M11 underneath. Refer to section 7.3.2.4.1 for a brief methodology for the M11 overbridge construction.

Following installation of the bridge beams, the remainder construction of the NB and SB slip roads can be completed. The previously stockpiled material at SS5 on the eastern side and SS4 on the western side would be used in its entirety to raise the profile to the road formation level for the remaining parts of the SB slips. At this stage it would be also possible to commence building the Eastern & Western Dumbbell Roundabouts by backfilling against the eastern & western bridge abutments.

Drainage and pavements would be installed as normal, all the works would be carried out offline with no additional traffic management required. It should be noted that pavement works would be carried out up to the binder course.

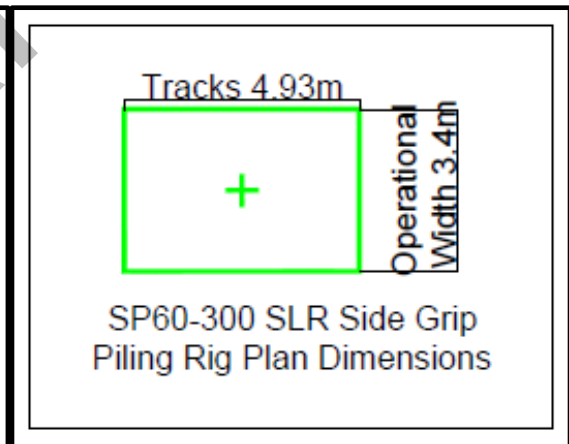
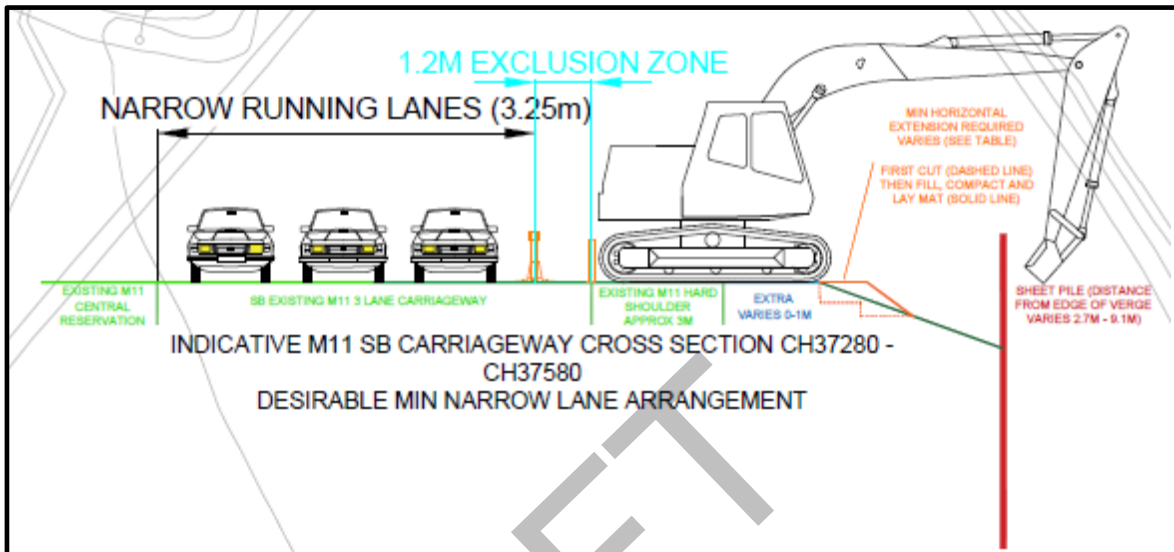
Once both Eastern and Western Dumbbell Roundabouts are connected, the surface course would be then laid on the top of the binder course for all slip roads, both dumbbell roundabouts and also the over bridge to minimise number of longitudinal joints. Finishing works in the form of installing lights, lane marking and other works can be carried out enabling the section to be open to traffic. Note Phase 2A - Section B would be complete with the use of temporary lane marking (the WB diverge would be a two-way arrangement up until Phase 2B is constructed).

As a part of constructing the South Bound off-slip (South Bound diverge) in Phase 2A – Section B, the scope of works also include extending the length of the South Bound off-slip (South Bound diverge) further towards north by 290m and forming a 'Ghost Island' between Ch.37050 & Ch.37400. Additional widening of the existing embankment would be required between Ch.37290 – Ch.37580 to cater sufficient width of the carriageway due to extending the length of the south bound off-slip (south bound diverge).

Prior to commencing any filling operation for widening the existing embankment between Ch. 37290 & Ch. 37580[A2], sheet piling would require to be installed in the middle of the slope of the existing embankment to retain the fill material (see drawing B3553F05-0100-DR-0823).

Due to restricted room issues at the toe of the embankment, it is advisable to mobilise the sheet piling rig on the top of the embankment and install the sheet piles from the top. In order to mobilise the sheet piling rig on the top of the existing embankment, running lanes on the existing M11 motorway would need to be narrowed down to 3.25m to create a minimum of 1.2m exclusion zone from the edge of the live carriageway. This would then allow safe operation of the piling rig during installation of the sheet piles. See below typical cross section of the carriageway in the stretch between Ch.37290 & Ch.37580 for clarity.

**Typical Cross-section taken from the stretch: Ch: 37290 – Ch: 37580**



**Proposed Sheet Piling Rig – SP60-300 SLR Side Grip**

Existing hard shoulder and verge on the M11 would have to be completely blocked to be used as a construction zone during sheet piling installation. It is proposed to use SP60-300SLR Side Grip or similar for the installation of the sheet piles. This proposed piling rig (shown in the figure above) is effectively a long reach excavator with a hydraulic hammer head attached at the front of the jib which could be easily used to reach up to 17m and able drive the sheet piles to the required depth in the slope of the existing embankment.

The entire stretch of the embankment between Ch.37290 – Ch.37580 where the sheet piles would need to be installed doesn't have sufficient room for setting up the piling rig - SP60-300SLR Side Grip. Therefore, the existing width of the embankment would need to be widened using suitable fill material normally used for the construction of piling mats. Below is the table that states that the existing embankment would need to be extended to min: 0.78m and max: 1.88m using suitable fill material used for building piling mats to allow the tracks of the piling rig to sit comfortably on the top of the hard shoulder and verge of the existing M11 carriageway.

[A3]

M11CH (Approx)	Existing 3 Lane Width	Total Rd Width (Inc HS) - Measured on OS Map	Avg HS	SB Verge/Extra Space	Distance from edge of verge to centre of sheet pile - Measured on OS Map	SP60-300 SLR Side Grip Length	Reduced Lane Width (Desired Min 3.25m) + 1.2m Exclusion Zone	Working Distance Available	Min Extension Required	Reduced Lane Width (Absolute Min 3m) + 1.2m Exclusion Zone	Working Distance Available	Min Extension Required
37280	10.95	14	3	0.05	9.1	4.930	10.95	3.05	1.880	10.2	3.8	1.130
37325	10.95	14.4	3	0.45	7.7	4.930	10.95	3.45	1.480	10.2	4.2	0.730
37350	10.95	14.5	3	0.55	7.2	4.930	10.95	3.55	1.380	10.2	4.3	0.630
37375	10.95	14.5	3	0.55	6.8	4.930	10.95	3.55	1.380	10.2	4.3	0.630
37400	10.95	14.5	3	0.55	6.3	4.930	10.95	3.55	1.380	10.2	4.3	0.630
37425	10.95	14.4	3	0.45	5.5	4.930	10.95	3.45	1.480	10.2	4.2	0.730
37450	10.95	14.4	3	0.45	5	4.930	10.95	3.45	1.480	10.2	4.2	0.730
37475	10.95	14.3	3	0.35	4.6	4.930	10.95	3.35	1.580	10.2	4.1	0.830
37500	10.95	14.8	3	0.85	3.9	4.930	10.95	3.85	1.080	10.2	4.6	0.330
37525	10.95	15.1	3	1.15	3	4.930	10.95	4.15	0.780	10.2	4.9	0.030
37550	10.95	14.9	3	0.95	2.7	4.930	10.95	3.95	0.980	10.2	4.7	0.230

Prior to commencing widening of the existing embankment using piling mat material, it is advised to form benches by cutting within the slope of the existing embankment and then undertake filling operation in layers. This would ensure that the layers of the piling mat material are compacted properly prior to mobilising the sheet piling rig on the top of the widened area.

Following the installation of the sheet piles, widening of the existing embankment would commence using suitable fill material.

In a stretch between Ch.37380 and Ch.37390, it wouldn't be possible to drive through the sheet piles on the eastern side of the existing embankment due to the presence of an existing culvert running in the east-west direction. Existing embankment at this location would be widened using reinforced soil. 8m long nails would be driven into the existing embankment to increase the bearing capacity of the existing embankment to cater for the loadings from the widened carriageway.

Prior to commencing soil nailing operations, traffic management would be set up on the east side of the existing M11 and the outside lane would be fully closed to traffic to create a safe working zone for setting up the nailing rig. Once the nailing rig is fully set up, the outside lane could be then opened to the traffic. Once the 8m long nails have been driven to the edge of the existing embankment, the latter would be widened using reinforced soil.

Once the earthworks are complete in Phase 2a Section B, drainage and pavement construction would be carried out in the same fashion as described above in Section 4.1.5 & 4.1.6.

Once Phase 2A – Section A & B is complete, demolition of the site on the eastern side would commence. This would include removing all temporary areas (Inc. haul routes), reinstating them and subsequently handing them back to the land owner.

### 7.3.2.4 Structures – Phase 2A:- Section A & B

#### 7.3.2.4.1 M11 Overbridge

The new over bridge over existing M11 carriageway would be a single span multi girder arrangement having a total of 8 steel girders/ bridge beams that would sit on the top of two reinforced concrete bridge abutments known as the 'Eastern Abutment' and the 'Western Abutment' located on either side of the M11. The bridge abutments on either ends would be backfilled with suitable fill material at a later date to allow building the Eastern & Western Dumbbell Roundabouts on the top of the fill that would eventually connect the over bridge structure from both sides. The clear span of the overbridge would be 38m and wouldn't require any pier in the middle.

The bridge abutments on either side of the existing M11 carriageway would be supported by piled foundations capped with a reinforced concrete capping beam. Abutments would be formed on the top of the pile cap to

support the ends of the bridge deck. The main bridge structure would typically involve installation of pre-fabricated steel bridge beams along with a cast-in-situ reinforced concrete deck on the top of the bridge beams.

In order to construct the bridge abutments on either ends, the abutment foundations would first need to be constructed.

Construction of abutment foundation would typically involve installation of augured secant piles topped up with a reinforced concrete pile cap. Once the foundation is set, the reinforced concrete abutment would be constructed on the top of the pile cap. It is envisaged that the abutment construction works would be carried out offline and therefore not require any additional traffic management. Refer below to section 7.3.2.4.2, 7.3.2.4.3 and 7.3.2.4.4 for an overview regarding the construction of the Bridge foundation, abutments and the Bridge deck.

#### 7.3.2.4.2 Bridge Foundation

Foundations are required for the abutments and piers. Foundations can be either concrete pad or piled. It is proposed to cast secant piled foundation for the construction of the bridge abutments for the M11 overbridge.

Installation of secant piled foundations would typically involve;

- Using a boring machine (piling rig) to create the void for the pile, placing a casing in the void followed by lowering steel reinforcement (usually assembled on site) and pouring concrete to form the pile. The casing would be removed following the pour whilst the concrete is still fluid.
- Trim projecting piles to required level using mechanical saws or cutting equipment.
- Construction of a reinforcement pile cap, by using formwork, placing a steel reinforcement cage and pouring concrete to form the pile cap (or flat slab). [A4]
- Bridge abutments could be then built on the top of the reinforced concrete pile caps.

#### 7.3.2.4.3 Bridge Abutments

Bridge abutments are typically concrete or brickwork upon which the bridge beams can be supported at each end. For M11 overbridge, it is proposed to construct a reinforced concrete bridge abutment. Construction of bridge abutments would generally involve the following activities:

- Erecting Scaffold working platform.
- Fixing reinforcement to the walls of the bridge abutments.
- Install drainage and cast-in items in the abutment walls.
- Erecting vertical formwork for casting the abutment walls.
- Pouring concrete within the formwork, compacting through the use of vibration and allowing to set.
- Removing formwork, treating surface and applying waterproofing to the concrete surface in accordance with the project specification.
- Following the completion of the bridge abutments, wing walls could be constructed on either side of the abutments.

#### 7.3.2.4.4 Bridge Deck

Bridge decks can take and be constructed using various methods. It is envisaged the following method would be employed for the proposed M11 overbridge;

- Once the pre-fabricated steel beams are lifted and placed on the top of the bridge abutments (night closure for lifts), deck construction can begin (under normal traffic).
- Erect permanent formwork system, between the beams & along the edges and install side forms.
- Installation of services, drainage etc.
- Place steel reinforcement and begin pouring concrete to create the deck (this may be done in stages).
- Install waterproofing on the bridge deck.
- Undertake finishing works (including parapet elements) and remove all temporary elements.

Once the concrete deck is cast, binder course and surface course would be laid on the top of the concrete deck.

#### **7.3.2.5 Other Structures in Phase 2A (Section B)**

Phase 2A – Section B has got two additional structures which include construction of a new reinforced concrete culvert at Ch.400 and extension of the existing Sheering Hall Subway.

##### **Reinforced Concrete Culvert at Ch.400 in Phase 2A Section B:**

Reinforced concrete culvert at Ch.400 exist underneath the new embankment that would be required for the construction of the West Bound Diverge Link in Phase 2A –Section B.

In order to ensure, no delays are caused to the construction of the West Bound Diverge Link, construction of the RC culvert would need to finish prior to commencing the earthworks for the embankment of the West Bound Diverge Link. It is therefore highly advisable that the construction of the RC culvert at Ch.400 commences as soon as the site setup is complete for Phase 2A works.

A ditch would require to be constructed from the north side of the newly built RC culvert at Ch.400 up to the existing Pincey Brook to allow diverting the water course through the newly built culvert. This would then allow to construct the West Bound Diverge Link embankment at the location of the existing water course.

Where haul routes would cut the proposed ditch, temporary piping would be used to extend the newly built RC culvert at Ch.400 and the pipe would be temporarily covered with a suitable backfill material to allow the construction traffic to run on the top of the compacted backfill. After the completion of the construction phase once the haul routes become redundant, the backfill material would be dugout and pipes removed.

##### **Extension of Sheering Hall Subway in Phase 2A Section B:-**

Due to the widening required to the South Bound diverge between Ch.37290 – Ch.37580, existing Sheering Hall subway that exist at approx. Ch.37280 would also need extension on the eastern side of the existing M11.

Prior to commencing any excavation required to cast the base slab for the extension of the existing Sheering Hall subway, sheet piles would require to be installed parallel to the length of the existing subway (perpendicular to the direction of traffic flow on the existing M11).

It is proposed to use SP60-300 SLR Side Grip or similar sheet piling rig to install the sheet piles required for the extension of the subway. Prior to mobilising the sheet piling rig, piling platform would be built using suitable piling platform material. Once the piling platform is built, the sheet piling rig would be mobilised and sheet piles would be driven to the required depth using hydraulic hammer attachment.

Following the installation of the sheet piles, excavation to the bottom of the base slab would commence. A reinforced concrete box along with reinforced concrete wing walls would be then cast which would allow to widen the existing embankment on the east side of existing M11.



## 7.4 Construction Programme

### 7.4.1 Overview

Refer to the construction programme for having a clear understanding on the logic and sequence of construction for Phase 2A – Section A & B works.

### 7.4.2 Key Assumptions

Listed below are the key assumptions that have been assumed whilst writing the construction programme for Phase 2A (Section A&B) works.

- Construction Programme has been written based on the assumption that the contract commencement for Phase 2A works would be in June 2019 with the site set-up required for Phase 2A works commencing in September 2019. Current assumption is period between June 2019 and September 2019 would be used to undertake advanced ecological mitigation works.
- In order to avoid causing delays to the main construction activities in Phase 2A works, environmental mitigation works such as vegetation clearance works in Phase 2A (Section A & B – all sub-phases) would need to commence as early as possible i.e. from December 2018 (contract award date). It is to be noted that vegetation clearance (two phases, first vegetation cut to 15cm followed by grubbing out) works are seasonal. Veg clearance to 15cm would need to take place in winter prior to bird nesting season with grubbing out works commencing April onwards.
- In order to ensure that no delays are caused in setting up the construction site compound for Phase 2A works (programmes to be commencing in in September 2019), the majority of the key advanced ecological mitigation works such as habitat manipulation must finish before the start of the site set up.
- It is assumed that the diversion and protection of high pressure gas mains which exist along the routes of Phase 2A would be carried out well in advance of main construction commencing in Phase 2A.
- Based on the archaeological survey findings available to-date, it is assumed that all of the archaeological works in Phase 2A – Section A&B would involve activities such as trial trenching and archaeological excavation field work based on the findings from the trial trenching operations. Currently it is assumed that it wouldn't take more than 20 days to undertake archaeological excavation fieldwork. If it is found at a later date that archaeological excavation would take a lot longer than what's currently anticipated, then this would have a direct impact on the main construction activities and could potentially delay the completion of Phase 2A works.
- It is assumed that Highways England would agree to completely close a stretch of the existing M11 during night time for a certain number of days to allow installing the bridge beams for the new overbridge over the existing M11 carriageways.
- Significant volume of earthworks would be required to be imported from outside for the construction of the West Bound Diverge Link. It is currently assumed that it would be possible to import up to 80 20t road wagons (total bulk volume = 736m<sup>3</sup>) per day for a period of 3 months[A5]. Any shortage in the supply of fill material from what's assumed would have an impact on the earthworks activity causing delays to the completion of Phase 2A Section B works.
- Significant volume of material would be obtained from the excavation of the drainage ponds in Phase 2A. It is currently assumed that 100% of the material obtained from the excavation of the drainage ponds in Phase 2A would be suitable for use and would be used for the purpose of filling operations during the construction of large embankments in Phase 2A. If at a later date it is found that the material is not suitable for use, then this would have a major impact on the volume of material that would be required to be imported from outside. If additional volume is required to be imported from outside then this would have an impact on the overall completion of Phase 2A works due to prolonged earthworks activity.

### 7.4.3 Critical Path

Although the construction programme currently doesn't show any critical path for Phase 2A works, it is to be noted that should any of the items mentioned above under 'Key Assumptions' in Section 7.4.2 is delayed in its commencement, then Phase 2A works could become critical.

In the current construction programme for Phase 2A works, commencement of main construction activities is linked with the setting up of construction site compound which is further linked with the completion of ecological mitigation works such as trapping out of reptiles and habitat manipulation within fenced areas. If any delays are caused to the completion of the ecological mitigation works due to being seasonal activities, commencement of main construction activities could get delayed bringing the entire Phase 2A works on the critical path.

Another major item which has got a potential of putting Phase 2A works onto the critical path would be the advanced diversion of high pressure gas mains. Any delays caused in diverting the existing HPGM would cause delays in setting up the construction site compounds for Phase 2A works which would eventually delay the overall completion of this phase.

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## 8 Phase 2B

### 8.1 Quants

Type	Rounded Quantity	Bulk Quantity
Topsoil (Inc. Temp Areas)	8260 m <sup>3</sup>	9500 m <sup>3</sup>
Cut	11870 m <sup>3</sup>	13650 m <sup>3</sup>
Fill	74400 m <sup>3</sup>	85560 m <sup>3</sup>
Pavement	5730 m <sup>3</sup>	6590 m <sup>3</sup>
Structures	N/A	N/A

Table 9 - Key Quantities for Phase 2B

### 8.2 Site Layout

#### 8.2.1 Compound Site

Phase 2B site layout proposes one site compound (CS4) which would be located just southeast of the new Pincey Brook Roundabout (between the EB and WB diverge links). Note that all previous site compounds at this stage would be demobilised.

The location of the site compound has been chosen to;

- Avoid additional land take outside the red line boundary.
- Allow the work to be conducted offline.
- Facilitate all Phase 2B activities.
- Allow movement from compound to Phase 2B site without need to travel via the live road network.

CS4 would be setup prior to Phase 2B main construction and would only be required during the construction period for Phase 2B. The compound site would be gated and secured appropriately and would not be accessible to the general public (no access to the site by public from Sheering Rd Roundabout with proposed manned booth and barrier). On completion of Phase 2B, CS4 would no longer be required and would be demobilised with the land reinstated.

Refer to site layout drawings B3553F05-0100-DR-0818 for plan view.

#### 8.2.2 Soil Storage Areas

Phase 2B construction involves a significant amount of fill material due to the designed road elevation. As such once large soil storage site (SS7) has been proposed in order to allow 50% of total material required to be stockpiled prior to being used to create the road embankments.

SS7 would be setup along with the compound site and would need to be ready to stockpile material prior to starting construction of the embankments.

In order to meet demand for Phase 2B, importation of fill material would be required and would commence prior to earthwork activities (refer to construction programme for details). It is also assumed that all cut material (which is not substantial relative to fill for Phase 2B, refer to Table 9) would be utilised as fill material.

The location of SS7 is to the north of Pincey Brook Rbt and is shaped to avoid the flood plain, diverted high pressure gas mains (indicative) as well as other sensitive areas. Additionally it has also been positioned to avoid land take close to the M11.

Once SS7 is no longer required the land would be reinstated by replacement of topsoil and handed back to the respective land owner following completion of Phase 2B.

Refer to section 4.2.2 for general soil storage information

### 8.2.3 Topsoil Storage Areas

Phase 2B designed land intake is significant and therefore the amount of topsoil required to be stripped would also be significant and would require proper management during the works.

As such, two topsoil sites (TS6 & TS7) are proposed. TS6 & TS7 are proposed to have a capacity to stockpile the entire volume of top soil stripped from Phase 2B.

It is assumed topsoil would remain in situ for the duration of the construction period with a potential of using the material for landscaping activities after the completion of construction phase. Any surplus topsoil not used for landscaping or other uses on site would need to be exported.

The topsoil storage sites have been designed to avoid the flood plain, high pressure gas main and other sensitive areas as well as to minimise land intake outside the permanent redline boundary.

Following completion of Phase 2B the land can be reinstated and returned back to the land owner.

Refer to section 4.2.3 for general topsoil storage information.

## 8.3 Construction Methodology

### 8.3.1 Enabling Works

Prior to main construction commencing, a number of pre-construction or enabling work activities would need to be carried out.

Following the surveys carried out by the environmental & ecological team to-date, listed below are the enabling activities that would require to be carried out as a part of 'Advanced Environmental & Ecological Mitigation' works prior to commencing main construction activities in Phase 2B (note enabling works are subject to change following further survey work etc.).

Some of the activities mentioned below are seasonal, therefore would need to be carried out in a specific period of the year. For details regarding dates & durations for these activities, please refer to the Construction Programme.

#### **Advanced Environmental & Ecological Mitigation Works:**

- Vegetation clearance within Phase 2B - sub-phases – A & B;
- Obtaining relevant licences (Badger);
- Construction of alternative habitats (such as artificial sett) as well as closure of badger sett;
- Erection of acoustic fencing (otter mitigation);

- Landscape works for screening if required and also to replace lost flight lines and bird habitat;

Phase 2B has one main high-pressure gas pipe that runs through the proposed location of Pincey Brook Roundabout which would require diverting prior to commencing main construction activities. It is highly recommended that the diversion works occur prior to commencing the main construction to avoid causing any delays.

### **Archaeological works:**

Archaeological work requirements have been provided by the archaeological team and are subject to change following further surveys/data etc. Based on the current information available archaeological works in Phase 2B would be required. These works would commence by undertaking trial trenching operations in certain locations within the entire stretch of Phase 2B. Following the completion of trial trenching operations, post excavation archaeological report would be produced, a scope & scale of further works would be agreed with the archaeological advisors and finally, archaeological excavation fieldworks would be carried out in accordance with the agreed scope.

Due to the fact that archaeological excavation works may require a lot longer to finish than currently anticipated in the construction programme, it is highly recommended to commence archaeological mitigation works in Phase 2B well in advance of the main construction activities to avoid causing any delays to the programme.

### **8.3.2 Main Works**

Phase 2B involves off-line works, consisting of new construction. Phase 2B is broken down into two phases, Phase A and Phase B (refer to 'Construction Phasing / Sequencing Report' B3553F05-0000-REP-0063 for detailed construction phasing breakdown).

#### **8.3.2.1 Phase 2B, Phase A – Pincey Brook Roundabout**

Once enabling works are complete including the gas main diversion, Phase 2B Phase A main works can commence.

After setup of temporary sites and haul routes (for having a better understanding on the location of temporary sites and haul routes for Phase 2B works, please refer to construction site layout drawing B3553F05-0100-DR-0818). Phase A, Pincey Brook Roundabout is largely in cutting and therefore excavation works would be required in order to lower the profile to the designed height.

During the tail end of the earthwork activities, installation of drainage pipes and certain cables could be installed (with sensitive cables required for communication & power to be installed at a later date during the pavement works).

Once the earthworks activities are finished and the existing ground has been taken to the designed level and slide slopes have been created, pavement works could commence. The pavement would be constructed in layers (refer to section 4.1.6 for details) with the whole carriageway width surfaced at once to avoid longitudinal joints.

Lane marking, installation of signs and all other finishing works would be carried out over the stretch after the completion of pavement construction works.

#### **8.3.2.2 Phase 2B, Phase B**

It is to be noted that Phase A and Phase B would be conducted in parallel.

Prior to commencing earthworks in Phase 2B – Phase B the ditch at approx. Ch.200 would need to be temporarily diverted to free up the immediate area for construction of a RC culvert. The ditch would be further excavated to create a square shaped cutting which would allow approximately half of the culvert to sit under the



existing ground level and half above. Once the RC culvert has been completed it would be possible to divert the water through the culvert and demolish the temporarily diverted ditch.

Phase 2B, Phase B includes significant fill volumes therefore importation of fill is required. Importation would commence early in the programme to allow a stockpile of material to be accessible when required. Earthworks would commence once sufficient fill material is available on site and then subsequently run in parallel with importation of fill. This would allow a mixture of just in time delivery as well as a secured supply of material already stockpiled on site. Earthwork activities would not impact existing traffic and can be conducted completely offline.

Drainage would be installed during earthwork activities. Following earthworks, construction of the road surface can begin including installation of any technology, cabling or similar. Finally, lane marking and finishing works would be conducted to complete the road and making it ready for traffic.

Haul routes and temporary site areas would be demobilised. Before opening the road to traffic a small earthen bund to the north of the road at approx. Ch.420 would be constructed. No drainage would be required to the north of the road due to the natural gradient of the existing ground. As such water would freely flow in a north-westerly direction from the embankments. In order to prevent run-off to the lowered Pincey Brook Roundabout a small earthen bund or similar to deflect the water towards Pincey Brook would be required following demobilisation of the haul routes at approx. Ch.420.

Following the construction of the earthen bund or similar as well as demobilisation of temporary site areas the road can be open to traffic. Note, at this point the WB diverge (Phase 2A, Section B) would require a lane marking change from the temporary arrangement which would be in place post phase 2A to the permanent configuration.

## 8.4 Construction Programme

### 8.4.1 Overview

Refer to the construction programme for having a clear understanding on the logic and sequence of construction for Phase 2B – Phase A & B works.

### 8.4.2 Key Assumptions

Listed below are the key assumptions that have been assumed whilst writing the construction programme for Phase 2B (Phase A&B) works.

- Construction programme has been written based on the assumption that the contract commencement for Phase 2B works would be in January 2021 with the site set-up required for Phase 2B works also commencing in January 2021. Current assumption is period between January 2021 and July 2021 would be used to undertake ecological mitigation works.
- High pressure gas mains exist in Phase 2B which would need to be diverted and protected prior to commencing main construction activities in Phase 2B. It is assumed that the diversion of the high pressure gas mains would be carried out well in advance of main construction commencing in Phase 2B.
- Based on the archaeological survey findings available to-date, it is assumed that all of the archaeological works in Phase 2B – Phase A&B would involve activities such as trial trenching and archaeological excavation field work based on the findings from the trial trenching operations. Currently it is assumed that it wouldn't take more than 20 days to undertake archaeological excavation fieldwork. If it is found at a later date that archaeological excavation would take a lot longer than what's currently anticipated, then this would have a direct impact on the main construction activities and would also have a potential in the delayed completion of Phase 2B works.

- Significant volume of earthworks would be required to be imported from outside for the construction of the East Bound Diverge Link. It is currently assumed that it would be possible to import up to 20t road wagons (total bulk volume = 736m<sup>3</sup>) per day for a period of 7 months. Any shortage in the supply of fill material from what's assumed would have an impact on the earthworks activity causing delays to the completion of Phase 2B Phase B works.

#### 8.4.3 Critical Path

Although the construction programme currently doesn't show any critical path for Phase 2B works, it is to be noted that should any of the items mentioned above under 'Key Assumptions' in Section 8.4.2 is delayed in its commencement, then Phase 2B works could become critical.

In the current construction programme for Phase 2B works, commencement of main construction activities, including importation of fill is linked with the setting up of construction site areas.

Another major item which has got a potential of putting Phase 2B works onto the critical path would be the advanced diversion of High Pressure Gas Mains. Any delays caused in diverting the existing HPGM would cause delays in setting up the construction site compounds and haul routes for Phase 2B works as well as delay Pincey Brook Roundabout works which would eventually have a negative impact on the overall completion of Phase 2B works.

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## 9 Construction Traffic

### 9.1.1 Overview

This section details the level of construction traffic which is likely to occur throughout the construction period. The numbers of traffic movements have been calculated based on material quantities, assumed rate of production and the proposed construction programme. [A7]

The construction traffic only details HGV or similar vehicles and does not include the movements of LGV[A8] or cars related to construction.

The construction traffic is comprised of off-site and on-site movements;

- On-site movements are those movements which occur on the construction site and do not use the live road network. These movements would be restricted to the use of temporary haul routes.
- Off-site movements are those movements which occur off-site. These movements use the live road network. It should be noted that off-site movements use the road network but also need to access the site and would also use the temporary haul routes. For example, importation of fill material would travel from a quarry, utilise the road network to get to the site, access and enter the site to deliver the material, and then exit the site and use the road network.

Each movement calculated as a round trip. To calculate single journeys the figure would need to be doubled. For example, if the calculated off-site traffic movement figure for a given month is 500, this would indicate 500 movements from location X to the site and back to location X. Therefore the total number of single journeys (from location X to site and then from site to location X) would be 1000 movements (500 from location X to site and 500 from site to location X).

### 9.1.2 Key Assumptions

Listed below are the key assumptions that have been assumed whilst calculating the traffic movements for scheme:

- Cut/Fill material comprises mainly of granular material
- Factor for calculating bulk material volumes is 1.15
- Capacity of road wagon (to transport material) is 9.2m<sup>3</sup>
- Capacity of concrete mixer (to transport wet concrete) is 8m<sup>3</sup>
- Reinforced concrete ratio equal to 200kg of steel per 1m<sup>3</sup> of concrete
- Current construction programme does not change (i.e. the construction programme is directly linked with construction traffic)

### 9.1.3 Traffic Movements

Below are graphs showing the construction traffic throughout the construction period. The graphs include PLAN B elements.

The X-axis is the date (month and year), the Y-axis is the quantity of HGV or similar movements in a given month[A9].

Figure 2 shows Phase 1 construction traffic movements and is split into earthworks, pavement and general movements (along with total movements which is the summation of all three). These movements are all off-site meaning they would utilise the live road network.

Figure 3 shows Phase 2A construction traffic movements and is also split into earthworks, pavement and general movements (along with total movements which is the summation of all). The earthworks movements are further broken down into off-site movements (uses the live road network) and on-site movements (does not use the live road network as movements are restricted to temporary haul routes). Pavement and general movements are all off-site.

Figure 4 shows Phase 2B construction traffic movements and is also split in the same way as Figure 3.

Figure 5 shows construction traffic movements for the whole scheme broken down into the following three phases; (Phase 1, Phase 2A, Phase 2B). It also breaks down the phases into off-site or on-site movements (noting Phase 1 only has off-site movements).

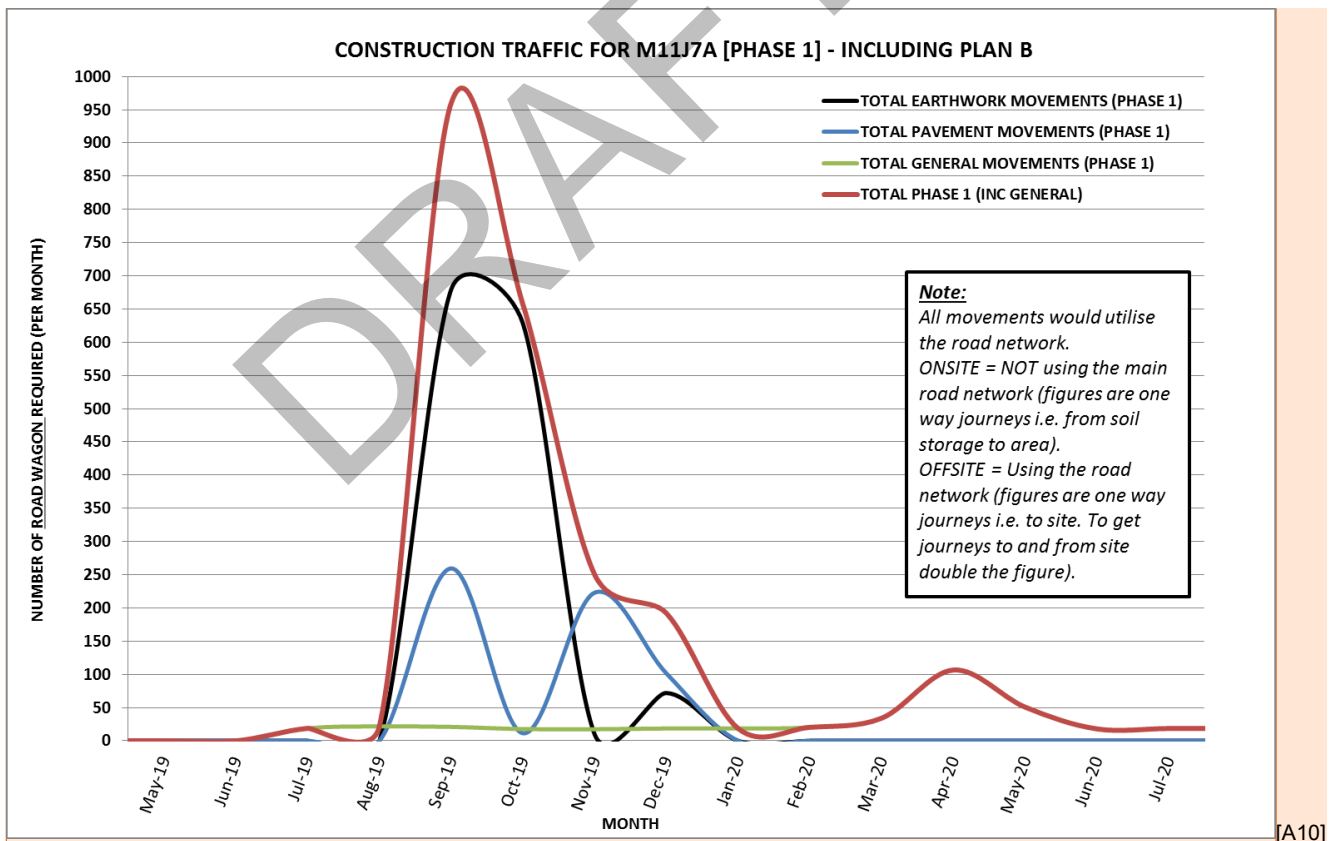


Figure 2 - Construction Traffic (Phase 1)

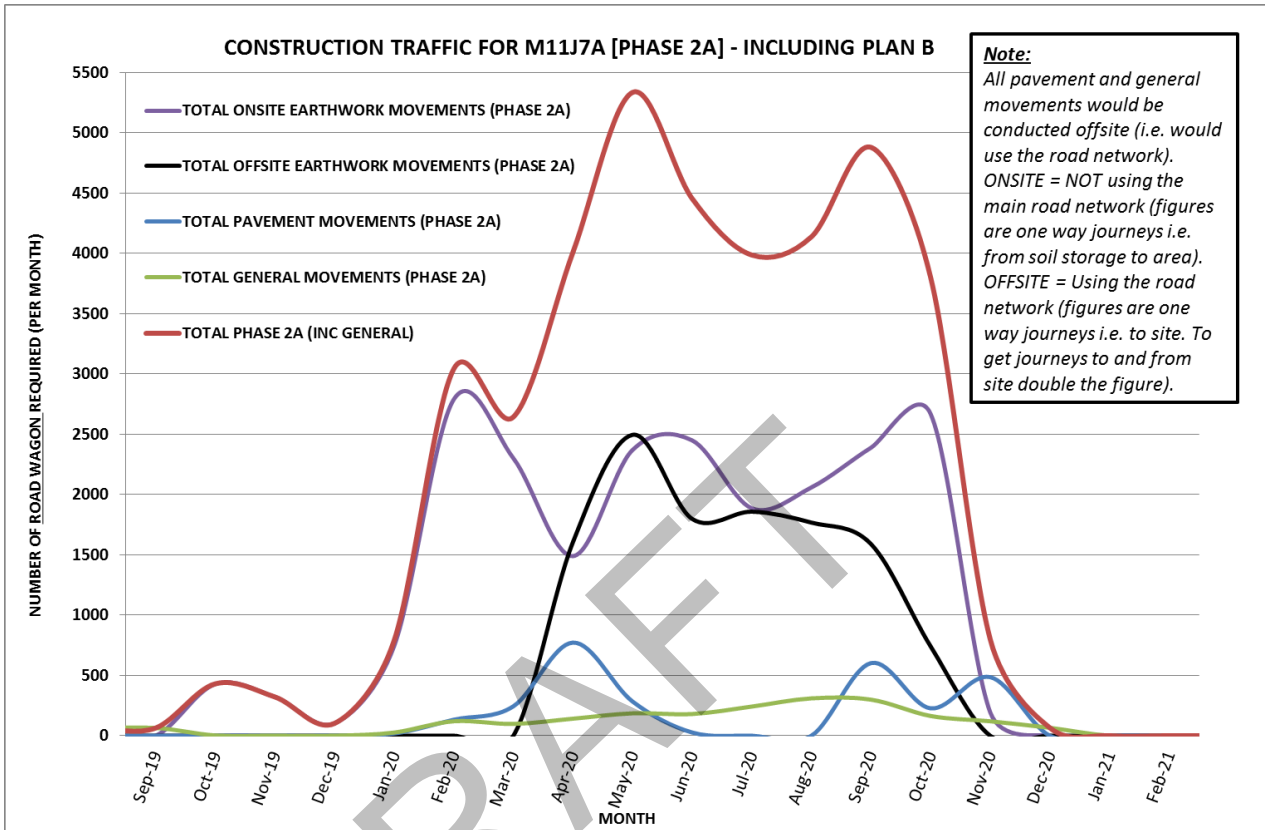


Figure 3 - Construction Traffic (Phase 2A)

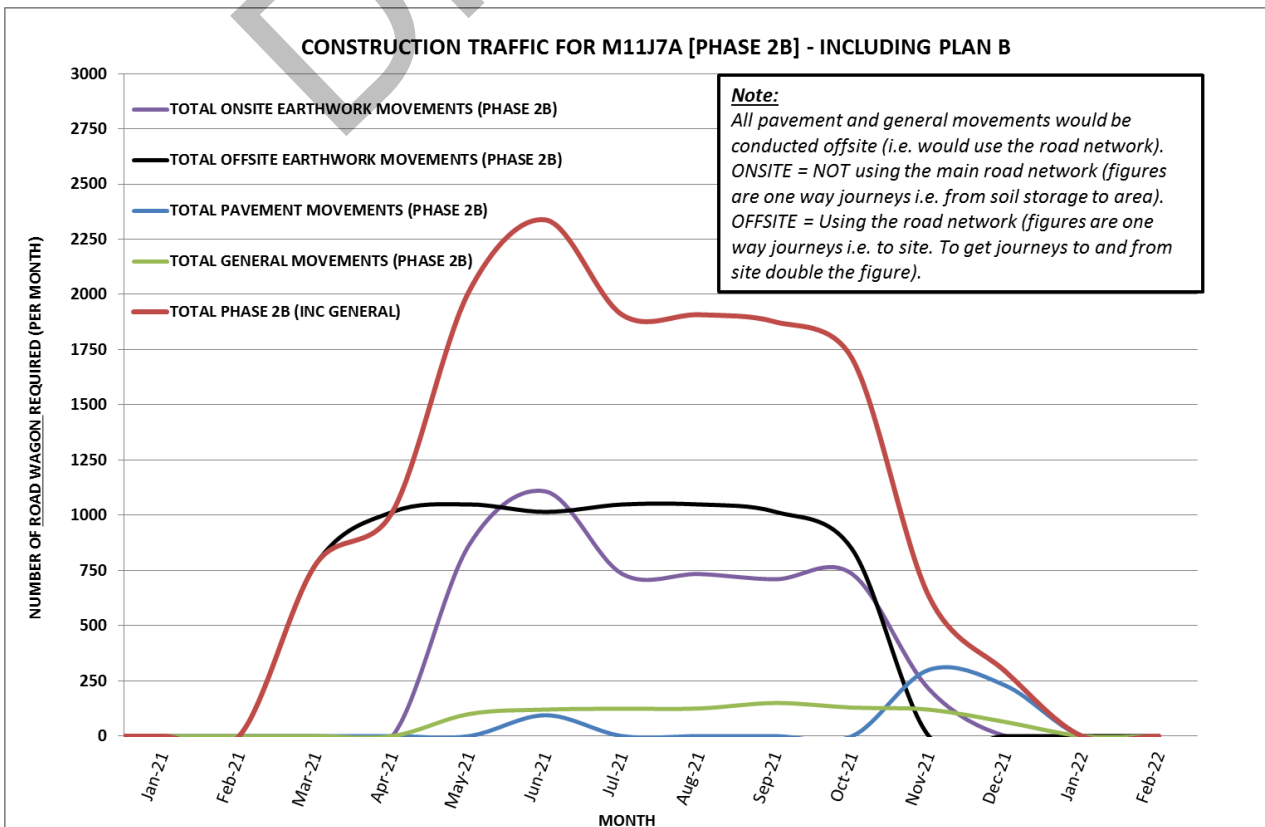


Figure 4 - Construction Traffic (Phase 2B)



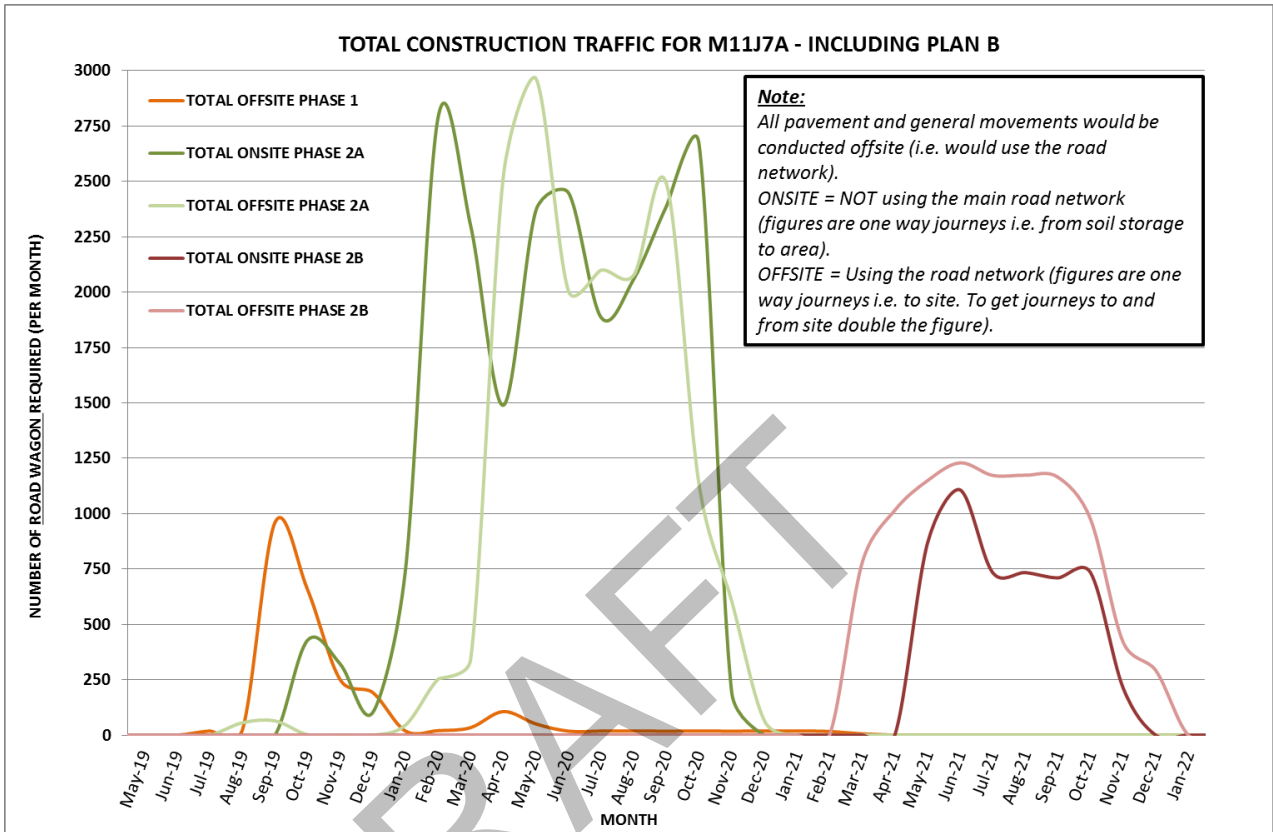


Figure 5 - Construction Traffic (Entire Scheme)

## 10 Recommended Actions Going Forward

- Environmental and archaeological works to be further detailed (including any survey work). In order to further optimize construction programme, accurate details of environmental and archaeological works (in terms of exact areas) are required. Currently the construction programme shows main works following the completion of enabling works whereas overlap may occur if areas are known. For example, if archaeological works are required at Chainage 100-200 then main works may be able to commence simultaneously at other locations except between Ch.100-200.
- Ensure critical enabling works (such as utilities diversions) are completed prior to main construction to avoid delays. This includes contacting relevant parties and agreeing plans as well as ensuring land access to carry out works is available when required.
- Further geotechnical investigation to ascertain whether cut material (and percentage) can or cannot be used as fill material and also whether it needs treatment prior to use. Currently it is assumed that 100% of excavated material could be used as fill (if this is not the case, importation and exportation of material is likely to increase to the levels mentioned in this report or even beyond them).
- Drainage design to be finalised and revised quantities and strategy to be incorporated in construction programme. Currently, the drainage team have provided approximate quantities and draft designs.
- Supply of construction material to be determined (likely to be multiple suppliers). Currently it is assumed the majority of material would be imported from within a 50 mile radius from the site.
- Develop post main construction landscaping plan and determine how much topsoil material would be required for landscaping activities. Currently it is assumed stripped topsoil would be stockpiled on site and used for landscaping activities. Any surplus topsoil not used on site would need to be exported.



## **Appendix 4.1: Scoping Opinion**





## SCOPING OPINION

**PROPOSAL:** Creation of a new motorway junction for Harlow between Junction 7 and 8, with new link road and junction

**LOCATION:** Between Junction 7 and 8 on the M11 motorway,

**APPLICATION REFERENCE: ESS/13/16/EPF/SPO**

### Documentation

The planning application supporting documentation should include a detailed description of the proposal and the detail of the proposal should be considered when undertaking the Environmental Impact Assessment. Any mitigation recommended within the Environmental Statement should be included and described in the proposals within the planning application documentation. The planning application and supporting statement should be a separate document to the Environmental Statement. The planning application and planning supporting statement should be able to be understood alone without reference to the Environmental Statement except to understand the assessment that lead to proposed mitigation within the application.

Please refer to ECC Supplementary Guidance for Submission of Planning Applications for further information, available at:

<http://www.essex.gov.uk/Environment%20Planning/Planning/Minerals-Waste-Planning-Team/Planning-Applications/Application-Forms-Guidance-Documents/Pages/Application-Forms-Guidance-Documents.aspx>

### Application Details

Essex County Council (Major Programmes and Infrastructure) is developing a proposal for improving access to and from the M11 in the Harlow area. Harlow has only one connection to the Strategic Road Network (SRN) on the M11 via Junction 7 (J7), which is located to the south and east of the town. High levels of traffic access this one junction onto the M11 and much of this traffic passes through Harlow on the A414.

The project is for the provision of a new motorway Junction 7A on the M11 between Junctions 7 and 8 and is supported by the proposed widening of Gilden Way.

The proposed Junction 7A has the following objectives:

- to improve accessibility to and from Harlow;
- to reduce congestion primarily for the A414 corridor;
- to ensure the proposed infrastructure is the appropriate scale for future traffic demands; and
- to provide an opportunity for future housing developments and employment to the east of Harlow.

## Consultations

The following bodies responded to the consultation undertaken by ECC as part of the scoping process, and below is a summary of the comments received. Only comments which relate to the Scoping Request have been summarised and appraised as part of the issue of this Opinion. The applicant is advised to view the consultation responses received in full to read in context and contact key consultees during preparation of the Environment Statement, including those responsible for the management of utilities such as gas, water, electricity (not consulted as part of this Scoping Opinion) to ensure clarity and completeness.

### Environment Agency – Comments as follows:

Ecology Protected species surveys: We support the full range of species and habitat surveys and desktop study undertaken to date. Pincey Brook was noted for surveys, and we are happy that the Harlowbury Brook – also Main River, will be surveyed in 2016.

Riparian mammals: We would request the inclusion of surveys for any watercourse and ditch within both study areas (where they may support water vole) that occur within 100m of any proposed structure or construction (i.e. disturbance) pathways. This will include the ditch that runs parallel to Harlowbury Brook. We note and welcome the acknowledgement that the unnamed watercourses require further study; it is therefore expected that appropriate ecology surveys are to be undertaken. This data will also be required for Flood Risk Activity Permit applications (see below). Where each crossing occurs, we request that surveys lengths include at least 100m upstream and downstream of the structure (whether new or modified). This is to ensure that surveys will sufficiently cover equal lengths that could be affected by the works and operations, and may therefore impacts beyond the arbitrary boundary line.

Great Crested Newts (GCN) survey results and efforts: We approve of the combination of baseline data of desktop research and HSI tool to achieve a good standard in describing the general distribution and breeding foci for GCN. We would wish to ensure that the assessment for ecological receptor – ‘GCN and breeding habitat’ will include information on whether the proposal will potentially fragment and isolate any GCN populations using the network of ponds, ditches and migration corridors within the combined study areas. The desk study and limited survey results may indicate a sparsely distributed GCN population, and a long term increase in traffic and disturbance to the pond and habitat network within the study areas, present a significant risk to a sustainable population. To address this concern and establish the likely relationship and use of the landscape features by GCN, we would wish to see data from all suitable ponds and ditches that exist either side of the proposed road leading east-west (in both study areas). Surveying the linked migration routes (a 500m buffer limit can be

applied) may need to go beyond the boundary line where reasonable, for example to link to a suitable habitat or confirmed presence. All ponds and corridors surveyed should be mapped out clearly. If GCN are found to be present, any negative impacts identified should lead to compensation or mitigation measures proportionate to the loss of future population expansion and connectivity. Consideration of additional receptor - 8 metre buffer zone: The proposal contains several bridges and crossings, which has the potential to result in a loss of natural bank within 8 metres of the Main River. This may have impacts upon the local morphology and connectivity of the river in the long term. Wherever possible, this buffer zone should be regarded as a natural wildlife corridor, free from amenity grassland and any building. The area presents opportunities for enhancement and any planting should be native. We ask for this feature to be identified within the development layout, and protected throughout the development and operational scheme.

#### Road Drainage and Water Environment

Opportunity to de-culvert: We support the adoption of design principles within the Government's Design Manual for Roads and Bridges (DMRB) in terms of guideline principles for road design that minimises environmental impact. The proposal will be, in places, over a watercourse in culvert. Although the watercourse is not Main River; we would like to take the opportunity to promote good practice of seeking the removal of existing culverts to restore morphological, ecological and landscape value to all watercourses. Building over a culvert precludes it from being opened up in future. This could be identified as a missed opportunity for environmental improvement. If there is the opportunity to open up a watercourse as part of the proposal, this would be supported. If not feasible, then we recommend the developer to provide appropriate compensation to match the loss of long term opportunity.

Water Framework Directive (WFD) assessment guidance: The quality elements mentioned within the report for consideration in terms of WFD compliance are comprehensive, and we are glad to see inclusion of morphological impacts. Please note, this should include impacts on changes to bed substrate as well as bed-bank profile and sustaining the natural low flow levels. We also welcome the inclusion of ordinary watercourses which support the wider waterbody that they are hydrologically connected to. In essence, wherever a proposed structure or temporary works/pathways/discharges may interact within the 8 metre buffer zone or affect the bed and banks of any Main River, then we may require a WFD assessment. An assessment will be required when a risk to cause deterioration at either a local and wider waterbody level scale cannot be avoided or mitigated. It must be ensured that the most up to date information is used to support any assessment.

Design notes and WFD: Bridge design: All watercourse crossings (temporary or permanent) should be constructed to span both banks with the abutments set back from the watercourse on the bank tops and allow for a margin of bank

underneath. This ensures free movement of wildlife and facilitates high flows when the structure is operational. Our policy is to seek alternatives to culverting any part of any watercourse, unless there is an overriding need to do so. If new culverts are drawn in, then designs will need to ensure they minimise the hindered connectivity in terms of hydraulics and wildlife migration, this would be a loss of natural corridor and so compensation to match the loss should be sought. Designs need particular focus on ensuring otters can use them at all times. Designs for otter friendly features are provided in the Design Manual for Roads and Bridges and also CIRIA.

Invasive non-native plants: Several species of invasive non-native species were noted within the reports and our local records also confirm this, some of which are listed under legislation. It is advised that a targeted survey be carried out in order to assess the potential pathways of spread (during all stages of development and operations) and the associated long term impact of their presence. A method statement for removal or long-term management plan (including biosecurity) should be drawn up and submitted for approval before any works commence.

#### Flood Risk:

Although it has been stated that a Flood Risk Assessment (FRA) for the proposed new junction and link road will be carried out in accordance with the NPPF, no further details have been provided to date. Therefore, for the avoidance of doubt, it is worth mentioning that we will expect our latest climate change allowances to be used to assess the risk of flooding to and from the proposed development. Further detail can be found at: <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances> We will also expect any loss in flood storage to be calculated and compensated for on a level for level and volume for volume basis. We are aware that modelling is being undertaken to demonstrate the impact of the proposed junction and link road on flood risk, and have so far received a draft model design input statement to comment on. However, the applicant should be made aware that when they make their final submission for planning permission, they will be required to submit the final model report, along with all model files (including inputs & outputs) in order for us to conduct a detailed review of the modelling.

We would also take this opportunity to advise that on the 6th April 2016, flood defence consents moved into the Environmental Permitting (England and Wales) Regulations 2010 system (EPR). A Flood Risk Activity Permit may be required for any works in, on, under, over or within 8 metres of a designated Main River. Further information can be found at: <https://www.gov.uk/guidance/flood-risk-activities-environmental-permits> or email: [floodriskactivity@environment-agency.gov.uk](mailto:floodriskactivity@environment-agency.gov.uk)

Water quality: As the scheme progresses, further detail will be required in respect of the proposed structures and form of the drainage system, as well as

information on water quality inputs. Opportunities for an appropriate SUDs scheme are welcomed. It must be demonstrated that this development would not adversely impact the WFD status of the surface waterbodies and groundwater bodies in this area both during construction and operation.

Natural England – Comments as follows:

General comments -\_Natural England notes that the proposed scope of the Environmental Statement, as set out in the Pre-application Environmental and Planning Statement, follows the methodology detailed in the Design Manual for Roads and Bridges. As such, we are satisfied that, with the exception of the specific points detailed below, the proposed scope of the EIA should adequately cover all of the topics which fall within Natural England's remit.

Chapter 4 'Air Quality':

Table 4.1 gives the annual mean AQO for NO<sub>2</sub> as 40µg/m<sup>3</sup>, which is the AQO for human health. However, if it becomes necessary to consider potential air quality impacts on the Epping Forest SAC and SSSI (as explained in more detail in our comments on Chapter 7 below), then the relevant standard would be the critical level for the protection of vegetation, which is 30µg/m<sup>3</sup> as an annual mean.

Chapter 7 'Ecology and Nature Conservation':

Paragraph 7.1.1 'Development Footprints and Proposed Study Area' defines the study area for Natura 2000 sites (except those designated specifically for bats) as a 2km buffer from the scheme. Paragraph 7.2.2 'Designated Sites' states that "There are no Natura 2000 Sites, National Nature Reserves, Local Nature Reserves or SSSIs within 2km of the Scheme"; implying that the scheme will therefore not affect any Natura 2000 Sites or SSSIs.

Natural England is of the opinion that, in addition to the 2km buffer, the study area should also include any Natura 2000 sites or SSSIs which lie within 200m either side of any road links which may experience changes to their traffic flows in excess of the thresholds detailed in paragraph 4.1.1 of the Air Quality chapter. Dependent upon the results of the traffic and air quality modelling, this could potentially include the Epping Forest SAC and the Epping Forest SSSI, which are immediately adjacent to a number of roads including the B1393, A104 and A121. Natural England is therefore of the opinion that a Habitats Regulations Assessment (HRA) should be carried out in respect of the Epping Forest SAC. If the traffic modelling were to show an increase in traffic on the roads through Epping Forest, then we would expect to see air quality modelling results detailing the associated increased process contributions to NO<sub>x</sub> and to the deposition of nitrogen and acidity; and an assessment of the effect these increases would be likely to have upon the interest features for which the SAC is designated. We recognise that the scheme is probably more likely to reduce, rather than increase, traffic flows on the roads through Epping Forest; in which case the HRA could be completed at an early stage with a conclusion of 'no likely significant



effect', without the need to proceed to the Appropriate Assessment stage. However, it is not possible to exclude the possibility of adverse effects upon this Natura 2000 site until such time as the modelling results have produced the evidence on which to base such a conclusion. As already pointed out by Emma Simmonds in the response from Place Services, paragraph 7.2.8 'Dormice' is actually a copy of the preceding paragraph 7.2.7 'Bats'. Similarly, paragraph 7.2.11 'Reptiles' is a copy of paragraph 7.2.10 'Great Crested Newts'.

ECC's Ecology, Historic Building, Historic Environment, Arboriculture and Landscape Consultants (Place Services)

Ecology (Emma Simmonds)

The Essex Biodiversity Validation Checklist should be submitted as part of the planning application. This includes use of the Defra Biodiversity Offsetting Metric as part of the ecological impact assessment to calculate habitat losses and gains. The Metric provides a straightforward calculator to assess impacts upon habitats which have some biodiversity value (including arable land) to be measured in units or credits. The Metric is a stand-alone tool; its use does not require Biodiversity Offsetting to be used. The use of the Metric allows impacts to be established in a more transparent fashion and will ensure proposed mitigation measures are more readily understood and more efficiently delivered.

Statutory sites Pincey Brook which feeds into the River Stort and a number of Statutory sites are situated downstream including the Lee Valley SPA and Ramsar Site and a number of SSSIs (including Hundson Mead SSSI, Rye Meads SSSI, Turnford and Cheshunt Pits SSSI). Impacts can potentially be carried a lot further by streams and rivers than would otherwise be the case and the 2km distance is not always an adequate buffer distance. Therefore, the ecological report should demonstrate that there would be no adverse effects on the statutory wildlife sites.

Species

Birds - Adequate information should be provided to assist the local authority in ensuring that they abide by Reg 9A(8) of the Conservation of Habitats and Species Regulations 2010 which states that, "A competent authority in exercising any function in the UK must use all reasonable endeavours to avoid any pollution or deterioration of habitats of wild birds". This covers all wild birds, not just those that are nesting, uncommon, or important.

Missing information - 7.2.8 This heading is for dormice but this section discusses bats. This error occurs again in 7.2.11 (reptiles and GCNs). The correct details should be provided.

Highways England– No response received

CPRE- No response received

Epping Forest District Council – No response received  
 ECC Highways Strategic Development – No response received

**Checklists:**

As the competent authority undertaking the scoping opinion the County Planning Authority must answer 3 key questions:

- What effects could this project have on the environment?
- Which of these effects are likely to be significant and therefore need particular attention in the environmental studies?
- Which alternatives and mitigating measures ought to be considered in developing the proposals for the project?

The checklist which has been adapted from European Commission Guidance on EIA, June 2001 attempts to consider these questions:

No.	Questions to be considered in Scoping	Yes/No/?	Which Characteristics of the Project Environment could be affected and how?	Is the effect likely to be significant? Why?
<b>1. Will construction, operation or decommissioning (restoration) of the Project involve actions which will cause physical changes in the locality (topography, land use, changes in waterbodies, etc)?</b>				
1.1	Permanent or temporary change in land use, landcover or topography including increases in intensity of land use?	Yes	Construction of new permanent motorway junction. Temporary construction compound.	The impact on the locality from the construction of the new structure and ongoing operation and new traffic flows needs to be assessed. Visual Impact and landscape impact needs to be assessed. Without sufficient demonstration of no undue impact and/or mitigation to reduce impact projects of this size can cause significant impacts. Impact on openness of green belt needs to be considered.
1.2	Clearance of existing land, vegetation and buildings?	Yes	To ensure sufficient working areas and to create/maintain access it is considered likely that some vegetation clearance would be necessary.	An assessment of the impact of such removal would need to be submitted together with a plan to reinstate or restore that loss.
1.3	Creation of new land uses?	Yes	Proposed use as public highway on land currently used mainly for agriculture.	An assessment of any proposed activities would need to be considered and appraised in context of the locality and potential impacts.
1.4	Pre-construction investigations e.g. boreholes, soil testing?	Yes	Impact on agriculture.	
1.5	Construction (extraction) works?	Yes	Soil / overburden movement	Assessment of likely noise, visual, landscape and potential impacts on water quality and quality.
1.6	Demolition works?	No	n/a	n/a

1.7	Temporary sites used for construction works or housing of construction workers?	Yes	Temporary staff welfare accommodation is likely to be required during construction phase. Temporary compound for storage of fill material also likely to be required.	Impacts likely to be temporary but could be significant during construction phase and needs to be assessed.
1.8	Above ground buildings, structures or earthworks including linear structures, cut and fill or excavations?	Yes	The new motorway junction is proposed as an elevated structure.	Visual impact on surrounding landscape and impact on nearby residential properties needs to be assessed. Visual impact likely to be significant.
1.9	Underground works including mining or tunnelling?	No	n/a	n/a
1.10	Reclamation works?	No	n/a	n/a
1.11	Dredging?	No		
1.12	Coastal structures e.g. seawalls, piers?	No	n/a	n/a
1.13	Offshore structures?	No	n/a	n/a
1.14	Production and manufacturing processes?	No	n/a	n/a
1.15	Facilities for storage of goods or materials?	NO	n/a	n/a
1.16	Facilities for treatment or disposal of solid wastes or liquid effluents?	No	n/a	n/a
1.17	Facilities for long term housing of operational workers?	No	n/a	n/a
1.18	New road, rail or sea traffic during construction or operation?	Yes	The proposal is for a new motorway junction and road.	A Transport Assessment will be required to assess the existing local infrastructure and the suitability of this for handling the additional vehicle movements. Impacts on the highway network and the safety of existing or new junctions have the potential to be significant.
1.19	New road, rail, air, waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc?	Yes	As above (1.18).	Transport Assessment will be required to assess impact which has potential to be significant.
1.20	Closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements?	Yes	The proposed new motorway junction will lead to changes in traffic routes around Harlow and on M11.	Potential for significant impact which needs to be assessed.
1.21	New or diverted transmission lines or pipelines?	Yes	Gas pipe to the north.	Impact needs to be assessed.
1.22	Impoundment, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	?	unknown	Need to be assessed.
1.23	Stream crossings?	No	n/a	n/a
1.24	Abstraction or transfers of water from ground or surface waters?	No	n/a	n/a

1.25	Changes in water bodies or the land surface affecting drainage or run-off?	Yes	Additional surface area of new road and junction.	Flood risk to be assessed.
1.26	Transport of personnel or materials for construction, operation or decommissioning?	Yes	Staff and materials during construction period.	Impact to be assessed.
1.27	Long term dismantling or decommissioning or restoration works?	No	n/a	n/a
1.28	Ongoing activity during decommissioning (restoration) which could have an impact on the environment?	No	n/a	n/a
1.29	Influx of people to an area in either temporarily or permanently?	No	n/a	n/a
1.30	Introduction of alien species?	No	n/a	n/a
1.31	Loss of native species or genetic diversity?	No	n/a	n/a
1.32	Any other actions?	No	n/a	n/a

**2. Will construction or operation of the Project use natural resources such as land, water, materials or energy, especially any resources which are non-renewable or in short supply?**

2.1	Land especially undeveloped or agricultural land?	Yes	At present the site is in arable farming. The project is likely to affect the workability and agricultural classification of the land.	Baseline information on the physical characteristics, existing use/crop rotation, soil and ALC is required in context of the likely impact the proposal will have.
2.2	Water	Yes	Limited use through construction	No
2.3	Minerals	Yes	Limited use expected through construction.	No
2.4	Aggregates	Yes	Limited use through construction.	No
2.5	Forests and timber	No	n/a	n/a
2.6	Energy including electricity and fuels?	Yes	Limited use through construction.	No
2.7	Any other resources?	No	n/a	n/a

**3. Will the Project involve use, storage, transport, handling or production of substances or materials which could be harmful to human health or the environment or raise concerns about actual or perceived risks to human health?**

3.1	Will the project involve use of substances or materials which are hazardous or toxic to human health or the environment (flora, fauna, water supplies)?	No	n/a	n/a
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3.2	Will the project result in changes in occurrence of disease or affect disease vectors (e.g. insect or water borne diseases)?	No		
3.3	Will the project affect the welfare of people e.g. by changing living conditions?	No		
3.4	Are there especially vulnerable groups of people who could be affected by the project e.g. hospital patients, the elderly?	No		
3.5	Any other causes?	No		

<b>4. Will the Project produce solid wastes during construction or operation or decommissioning (restoration)?</b>				
4.1	Spoil, overburden or mine wastes?	Yes	Limited amount during excavation, likely to be reused on site for constructed of raised junction.	No
4.2	Municipal waste (household and or commercial wastes)?	No		
4.3	Hazardous or toxic wastes (including radioactive wastes)?	No		
4.4	Other industrial process wastes?	No		
4.5	Surplus product	No		
4.6	Sewage sludge or other sludges from effluent treatment?	Yes	Limited during construction	No
4.7	Construction or demolition wastes?	Yes	Limited from construction.	No
4.8	Redundant machinery or equipment?	No		No
4.9	Contaminated soils or other material?	?	Unknown	No
4.10	Agricultural wastes?	No		
4.11	Any other solid wastes?	No		

<b>5. Will the Project release pollutants or any hazardous, toxic or noxious substances to air?</b>				
5.1	Emissions from combustion of fossil fuels from stationary or mobile sources?	No		
5.2	Emissions from production processes?	No		
5.3	Emissions from materials handling including storage or transport?	Yes	Fumes and emissions associated with vehicle movements.	Need to identify existing baseline data in context of activities likely to cause emissions.
5.4	Emissions from construction activities including plant and equipment?	Yes	Temporary plant and machinery during construction.	Unlikely to be significant.



5.5	Dust or odours from handling of materials including construction materials, sewage and waste?	Yes	Dust during construction	Should be assessed.
5.6	Emissions from incineration of waste?	No		
5.7	Emissions from burning of waste in open air (e.g. slash material, construction debris)?	No		
5.8	Emissions from any other sources?	No		

<b>6. Will the Project cause noise and vibration or release of light, heat energy or electromagnetic radiation?</b>				
6.1	From operation of equipment e.g. engines, ventilation plant, crushers?	Yes	Noise and light from vehicles using new motorway.	Noise will need to be considered.
6.2	From industrial or similar processes?	No		
6.3	From construction or demolition?	Yes	Limited noise and vibration during construction.	Should be assessed.
6.4	From blasting or piling?	No		
6.5	From construction or operational traffic	Yes	During construction period and from vehicles using new motorway.	Yes - an assessment of potential noise and vibration impacts on receptors on the local road network, together within the immediate vicinity of the site would be required to assess the full significance of any impact.
6.6	From lighting or cooling systems?	No		
6.7	From sources of electromagnetic radiation (consider effects on nearby sensitive equipment as well as people)?	No		
6.8	From any other sources?	No		

<b>7. Will the Project lead to risks of contamination of land or water from releases of pollutants onto the ground or into sewers, surface waters, groundwater, coastal waters or the sea?</b>				
7.1	From handling, storage, use or spillage of hazardous or toxic materials?	No	Day to day equipment, fuel storage.	
7.2	From discharge of sewage or other effluents (whether treated or untreated) to water or the land?	No		
7.3	By deposition of pollutants emitted to air, onto the land or into water?	No	Vehicle oil/fuel spill.	No scheme will include interceptors to remove oils and fuels.
7.4	From any other sources?	No		
7.5	Is there a risk of long term build up of pollutants in the environment from these sources?	No	Only in the event of accident/spillage.	

<b>8. Will there be any risk of accidents during construction or operation of the Project which could affect human health or the environment?</b>				
8.1	From explosions, spillages, fires etc from storage, handling, use or production of hazardous or toxic substances?	No	Day to day equipment, fuel storage – Risk very low.	
8.2	From events beyond the limits of normal environmental protection e.g. failure of pollution control systems?	No		
8.3	From any other causes?	No		
8.4	Could the project be affected by natural disasters causing environmental damage (e.g. floods, earthquakes, landslip, etc)?	?	unknown	

<b>9. Will the Project result in social changes, for example, in demography, traditional lifestyles, employment?</b>				
9.1	Changes in population size, age, structure, social groups etc?	No		
9.2	By resettlement of people or demolition of homes or communities or community facilities e.g. schools, hospitals, social facilities?	No		
9.3	Through in-migration of new residents or creation of new communities?	No		
9.4	By placing increased demands on local facilities or services e.g. housing, education, health?	Yes	Local infrastructure.	No – any such impact is not likely to result in impacts sufficient to warrant wider scale social change.
9.5	By creating jobs during construction or operation or causing the loss of jobs with effects on unemployment and the economy?	Yes	During construction	No – employment opportunities created are not considered significant
9.6	Any other causes?	No		

<b>10. Are there any other factors which should be considered such as consequential development which could lead to environmental effects or the potential for cumulative impacts with other existing or planned activities in the locality?</b>				
10.1	Will the project lead to pressure for consequential development which could have significant impact on the environment e.g. more housing, new roads, new supporting industries or utilities, etc?	No		

10.2	<p>Will the project lead to development of supporting facilities, ancillary development or development stimulated by the project which could have impact on the environment e.g.:</p> <ul style="list-style-type: none"> <li>• supporting infrastructure (roads, power supply, waste or waste water treatment, etc)</li> <li>• housing development</li> <li>• extractive industries</li> <li>• supply industries</li> <li>• other?</li> </ul>	No		
10.3	<p>Will the project lead to after-use of the site which could have an impact on the environment?</p>	No		
10.4	<p>Will the project set a precedent for later developments?</p>	No		
10.5	<p>Will the project have cumulative effects due to proximity to other existing or planned projects with similar effects?</p>	?		To be assessed.

## CHARACTERISTICS OF THE PROJECT ENVIRONMENT

<p><b>Are there features of the local environment on or around the Project location which could be affected by the Project?</b></p> <p>Listed buildings and Conservation Area (Old Harlow and Harlow-church-gate street) Ancient Woodland (Marsh Lane Wood)</p>
<p><b>Is the Project in a location where it is likely to be highly visible to many people?</b></p> <p>The site is likely to be highly visible from Gilden Way and the M11 and nearby properties.</p>
<p><b>Is the Project located in a previously undeveloped area where there will be loss of greenfield land?</b></p> <p>The application area does represent previously undeveloped land. The site is located within the Green Belt.</p>
<p><b>Are there existing land uses on or around the Project location which could be affected by the Project?</b></p> <p>Yes – adjoining residential properties and agricultural land. The M11 is to the east.</p>
<p><b>Are there any plans for future land uses on or around the location which could be affected by the Project?</b></p> <p>No</p>
<p><b>Are there any areas on or around the location which are densely populated or built-up, which could be affected by the Project?</b></p> <p>The location of proposed motorway junction is on green belt land and the road improvements along Gilden way extend into the built up urban area of Harlow.</p>
<p><b>Are there any areas on or around the location which contain important, high quality or scarce resources which could be affected by the Project?</b></p> <p>No.</p>
<p><b>Are there any areas on or around the location of the Project which are already subject to pollution or environmental damage e.g. where existing legal environmental standards are exceeded, which could be affected by the project?</b></p> <p>Unaware of any in the immediate vicinity.</p>
<p><b>Is the Project likely to affect the physical condition of any environmental media?</b></p> <p>Landscape – Visual screening/mitigation will be necessary and appropriate restoration to ensure that the physical condition is not unduly damaged.</p>
<p><b>Are releases from the Project likely to have effects on the quality of any environmental media?</b></p> <p>Air Quality – The operations and activities undertaken from the site have the potential to adversely affect the air quality in the vicinity. Suitable mitigation, management procedures will have to be put in place to ensure the air quality in the area doesn't decline to a level detrimental to any natural ecosystem and human health.</p> <p>Noise/vibration – Excessively noisy activities could affect the suitability of nearby habitat.</p> <p>Light Pollution – As above excessively bright lighting could affect the suitability of nearby habitat.</p>
<p><b>Is the Project likely to affect the availability or scarcity of any resources either locally or globally?</b></p> <p>No</p>

**Is the Project likely to affect human or community health or welfare?**

Living conditions in the vicinity of the site could potentially be affected by traffic movements.

**It is considered that the following issues are of such significance that they should be addressed within the Environmental Statement**

Landscape and Visual Impact

A Landscape and Visual impact assessment is required; please refer to comments from ECC Place Services Landscape above.

Air Quality

Please refer to comments from Natural England above

Noise

Assessment of noise impact required during the construction and operation phase.

Ecology

Refer to comments from Environment Agency and ECC Place Services above.

Archaeological and Architectural Heritage

Assessment of impact on listed building and conservations areas which area in close proximity along Gilden Way as well as wider visual impact due to elevated nature of junction.

Economic and Social Factors

In context of the Framework and the three dimensions to planning it is considered that an assessment of economic and social factors should also be included within the ES. Include impact on agricultural viability.

Cumulative Impacts and Consideration of Alternatives

The ES should include an impact assessment to identify, describe and evaluate the effects that are likely to result from the project in combination with other projects and activities that are being, have been or will be carried out.

Signed:.....

Planning Manager/ Principal Planner/Senior Planner

Date:.....





## **Appendix 4.2: Scoping Opinion Response**



Scoping Opinion Comment

Specialists Response

Documentation

The planning application supporting documentation should include a detailed description of the proposal and the detail of the proposal should be considered when undertaking the Environmental Impact Assessment. Any mitigation recommended within the Environmental Statement should be included and described in the proposals within the planning application documentation. The planning application and supporting statement should be a separate document to the Environmental Statement. The planning application and planning supporting statement should be able to be understood alone without reference to the Environmental Statement except to understand the assessment that lead to proposed mitigation within the application.

Please refer to ECC Supplementary Guidance for Submission of Planning Applications for further information, available at:

<http://www.essex.gov.uk/Environment%20Planning/Planning/Minerals-Waste-Planning-Team/Planning-Applications/Application-Forms-Guidance-Documents/Pages/Application-Forms-Guidance-Documents.aspx>

Consultations

The following bodies responded to the consultation undertaken by ECC as part of the scoping process, and below is a summary of the comments received. Only comments which relate to the Scoping Request have been summarised and appraised as part of the issue of this Opinion. The applicant is advised to view the consultation responses received in full to read in context and contact key consultees during preparation of the Environmental Statement, including those responsible for the management of utilities such as gas, water, electricity (not consulted as part of this Scoping Opinion) to ensure clarity and completeness.

Detailed description of the scheme is given at front of ES. The description of possible construction methodologies is also given. These are based on assumptions and any final methodology would be proposed by the contractor. Mitigation proposals are contained in detail within the specialists sections of the ES. In addition they are presented in the Environmental Management Plan. The planning statement is designed to be read as a stand alone document.

A Round Table meeting was convened with ECC planning authority. Natural England, Environment Agency and Historic England were invited but declined. Outstanding is to view the consultation responses in full and consult with gas water and electricity.

Environment Agency – Comments as follows:

Ecology Protected species surveys: We support the full range of species and habitat surveys and desktop study undertaken to date. Pincey Brook was noted for surveys, and we are happy that the Harlowbury Brook – also Main River, will be surveyed in 2016.

Riparian mammal surveys were carried out for the Harlowbury Brook (a tributary to the River Stort) which passes beneath Gilden Way in 2016; Harlowbury Brook and the parallel surface water channel was assessed for their suitability for riparian mammals but subsequently scoped out.

Riparian mammals: We would request the inclusion of surveys for any watercourse and ditch within both study areas (where they may support water vole) that occur within 100m of any proposed structure or construction (i.e. disturbance) pathways. This will include the ditch that runs parallel to Harlowbury Brook. We note and welcome the acknowledgement that the unnamed watercourses require further study; it is therefore expected that appropriate ecology surveys are to be undertaken. This data will also be required for Flood Risk Activity Permit applications (see below). Where each crossing occurs, we request that surveys lengths include at least 100m upstream and downstream of the structure (whether new or modified). This is to ensure that surveys will sufficiently cover equal lengths that could be affected by the works and operations, and may therefore impacts beyond the arbitrary boundary line.

Survey undertaken in April 2016 of ditch running parallel to Harlowbury Brook. Scoped out due to low water flows and a lack of bank or in-stream vegetation.

Great Crested Newts (GCN) survey results and efforts: We approve of the combination of baseline data of desktop research and HSI tool to achieve a good standard in describing the general distribution and breeding foci for GCN. We would wish to ensure that the assessment for ecological receptor – ‘GCN and breeding habitat’ will include information on whether the proposal will potentially fragment and isolate any GCN populations using the network of ponds, ditches and migration corridors within the combined study areas. The desk study and limited survey results may indicate a sparsely distributed GCN population, and a long term increase in traffic and disturbance to the pond and habitat network within the study areas, present a significant risk to a sustainable population. To address this concern and establish the likely relationship and use of the landscape features by GCN, we would wish to see data from all suitable ponds and ditches that exist either side of the proposed road leading east-west (in both study areas). Surveying the linked migration routes (a 500m buffer limit can be

GCN population found in Gilden Way Meadow Local Wildlife Site only. Other GCN populations outside the study area are located to the south and west of this site. It is therefore considered that there would be no fragmentation of populations due to the Proposed Scheme. A 500m buffer was used. 27 ponds were considered and eDNA testing on 5 suitable ponds of which 1 tested positive. GCN impacts and mitigation are covered in the report.

applied) may need to go beyond the boundary line where reasonable, for example to link to a suitable habitat or confirmed presence. All ponds and corridors surveyed should be mapped out clearly. If GCN are found to be present, any negative impacts identified should lead to compensation or mitigation measures proportionate to the loss of future population expansion and connectivity. Consideration of additional receptor - 8 metre buffer zone: The proposal contains several bridges and crossings, which has the potential to result in a loss of natural bank within 8 metres of the Main River. This may have impacts upon the local morphology and connectivity of the river in the long term. Wherever possible, this buffer zone should be regarded as a natural wildlife corridor, free from amenity grassland and any building. The area presents opportunities for enhancement and any planting should be native. We ask for this feature to be identified within the development layout, and protected throughout the development and operational scheme.

The Proposed Scheme crosses the Harlowbury Brook at an existing location along the Gilden Way. There is also an existing crossing over the Pincey Brook where it flows underneath the M11. The Proposed Scheme extends to the southern bank of the Pincey Brook along Sheering Road. The implications and mitigations of these crossing points are covered in the ES. There would be new outfalls from two attenuation ponds and the realigned unnamed watercourse into the Pincey Brook. Implications of this are covered in the water quality and drainage chapter of the ES. Planting has been specified to be native within the landscaping section and drawings

Road Drainage and Water Environment

Opportunity to de-culvert: We support the adoption of design principles within the Government’s Design Manual for Roads and Bridges (DMRB) in terms of guideline principles for road design that minimises environmental impact. The proposal will be, in places, over a watercourse in culvert. Although the watercourse is not Main River; we would like to take the opportunity to promote good practice of seeking the removal of existing culverts to restore morphological, ecological and landscape value to all watercourses. Building over a culvert precludes it from being opened up in future. This could be identified as a missed opportunity for environmental improvement. If there is the opportunity to open up a watercourse as part of the proposal, this would be supported. If not feasible, then we recommend the developer to provide appropriate compensation to match the loss of long term opportunity.

The scheme only has two permanent crossings over the existing unnamed watercourse. We are providing betterment on the unnamed watercourse by opening up the existing culvert. In addition there are some changes to current structures along Gilden Way and discharges into the Pincey Brook. Water quality has been assessed for operation and we have stipulated that standard good practices are implemented for the construction processes to ensure this is covered.

Water Framework Directive (WFD) assessment guidance: The quality elements mentioned within the report for consideration in terms of WFD compliance are comprehensive, and we are glad to see inclusion of morphological impacts. Please note, this should include impacts on changes to bed substrate as well as bed-bank profile and sustaining the natural low flow levels. We also welcome the inclusion of ordinary watercourses which support the wider waterbody that they are hydrologically connected to. In essence, wherever a proposed structure or temporary works/pathways/discharges may interact within the 8 metre buffer zone or affect the bed and banks of any Main River, then we may require a WFD assessment. An assessment will be required when a risk to cause deterioration at either a local and wider waterbody level scale cannot be avoided or mitigated. It must be ensured that the most up to date information is used to support any assessment.

A full WFD compliance assessment has been provided as an appendix to the ES. This addresses changes to all quality elements including bed substrate and include the entire channel cross-section and lateral connectivity. The ordinary watercourses are also considered as part of each of the WFD water body catchments. No significant impacts are anticipated and the Proposed Scheme is compliant with the WFD.

Design notes and WFD: Bridge design: All watercourse crossings (temporary or permanent) should be constructed to span both banks with the abutments set back from the watercourse on the bank tops and allow for a margin of bank

The only crossing required during construction and operation is that of an unnamed watercourse feeding into the Pincey Brook. Due to the size and nature of the channel, a culvert has been designed for all crossings. This has accounted for flood risk implications and has been tied in with the upstream and downstream channel.

underneath. This ensures free movement of wildlife and facilitates high flows when the structure is operational. Our policy is to seek alternatives to culverting any part of any watercourse, unless there is an overriding need to do so. If new culverts are drawn in, then designs will need to ensure they minimise the hindered connectivity in terms of hydraulics and wildlife migration, this would be a loss of natural corridor and so compensation to match the loss should be sought. Designs need particular focus on ensuring otters can use them at all times. Designs for otter friendly features are provided in the Design Manual for Roads and Bridges and also CIRIA.

Two culverts are being proposed which replace one long culvert from the unnamed brook to Pincey Brook. These have been kept to a minimum length and widened and heightened. The culverts are 2x2m cross section in order to allow free movement of badgers, otters and bats. Planting and sensitive lighting has been specified to guide the mammals towards the culvert.

Invasive non-native plants: Several species of invasive non-native species were noted within the reports and our local records also confirm this, some of which are listed under legislation. It is advised that a targeted survey be carried out in order to assess the potential pathways of spread (during all stages of development and operations) and the associated long term impact of their presence. A method statement for removal or long-term management plan (including biosecurity) should be drawn up and submitted for approval before any works commence.

A method statement for the control of invasive species would be produced within the Construction Environmental Management Plan by the contractor.

#### Flood Risk:

Although it has been stated that a Flood Risk Assessment (FRA) for the proposed new junction and link road will be carried out in accordance with the NPPF, no further details have been provided to date. Therefore, for the avoidance of doubt, it is worth mentioning that we will expect our latest climate change allowances to be used to assess the risk of flooding to and from the proposed development. Further detail can be found at: <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances> We will also expect any loss in flood storage to be calculated and compensated for on a level for level and volume for volume basis. We are aware that modelling is being undertaken to demonstrate the impact of the proposed junction and link road on flood risk, and have so far received a draft model design input statement to comment on. However, the applicant should be made aware that when they make their final submission for planning permission, they will be required to submit the final model report, along with all model files (including

A Flood Risk Assessment has been calculated following the NPPF guidance and taking into account the appropriate climate change allowances following the latest published guidance. All methodologies are provided within the FRA Report which is appended to the report.

inputs & outputs) in order for us to conduct a detailed review of the modelling.

Our modelling of Pincey Brook has shown no difference between "existing" and "with scheme" modelling so there should be no need for any compensatory storage. The Proposed Scheme has been located by using climate change modelling in accordance with latest guidance (i.e. 1 in 100 year + 35% and 1 in 100 year + 70%) to avoid the flood zone.

We would also take this opportunity to advise that on the 6th April 2016, flood defence consents moved into the Environmental Permitting (England and Wales) Regulations 2010 system (EPR). A Flood Risk Activity Permit may be required for any works in, on, under, over or within 8 metres of a designated Main River.

This is noted and has been taken into consideration through the Proposed Scheme and would be applied during the consenting process

Further information can be found at: <https://www.gov.uk/guidance/flood-risk-activities-environmental-permits> or email: [floodriskactivity@environment-agency.gov.uk](mailto:floodriskactivity@environment-agency.gov.uk)

Water quality: As the scheme progresses, further detail will be required in respect of the proposed structures and form of the drainage system, as well as

The report fully documents the potential water quality impacts and mitigation proposed. HAWRAT has been applied and subsequent additional SuDS techniques included to allow for the treatment of runoff prior to discharge.

information on water quality inputs. Opportunities for an appropriate SUDs scheme are welcomed. It must be demonstrated that this development would not adversely impact the WFD status of the surface waterbodies and groundwater bodies in this area both during construction and operation.

A WFD assessment has also been produced further covering the potential impacts on the three quality elements and overall status. This is provided as an appendix to the final reporting.

#### Natural England – Comments as follows:

General comments - Natural England notes that the proposed scope of the Environmental Statement, as set out in the Pre-application Environmental and Planning Statement, follows the methodology detailed in the Design Manual for Roads and Bridges. As such, we are satisfied that, with the exception of the specific points detailed below, the proposed scope of the EIA should adequately cover all of the topics which fall within Natural England's remit.

#### Chapter 4 'Air Quality':

Table 4.1 gives the annual mean AQO for NO<sub>2</sub> as 40µg/m<sup>3</sup>, which is the AQO for human health. However, if it becomes necessary to consider potential air quality impacts on the Epping Forest SAC and SSSI (as explained in more detail in our comments on Chapter 7 below), then the relevant standard would be the critical level for the protection of vegetation, which is 30µg/m<sup>3</sup> as an annual mean.

The Test of Likely Significant Effect is presented within the Air Quality chapter. It was not considered necessary to undertake an Appropriate Assessment.

Chapter 7 'Ecology and Nature Conservation':

Paragraph 7.1.1 'Development Footprints and Proposed Study Area' defines the study area for Natura 2000 sites (except those designated specifically for bats) as a 2km buffer from the scheme. Paragraph 7.2.2 'Designated Sites' states that "There are no Natura 2000 Sites, National Nature Reserves, Local Nature Reserves or SSSIs within 2km of the Scheme"; implying that the scheme will therefore not affect any Natura 2000 Sites or SSSIs.

Natural England is of the opinion that, in addition to the 2km buffer, the study area should also include any Natura 2000 sites or SSSIs which lie within 200m either side of any road links which may experience changes to their traffic flows in excess of the thresholds detailed in paragraph 4.1.1 of the Air Quality chapter. Dependent upon the results of the traffic and air quality modelling, this could potentially include the Epping Forest SAC and the Epping Forest SSSI, which are immediately adjacent to a number of roads including the B1393, A104 and A121. Natural England is therefore of the opinion that a Habitats Regulations Assessment (HRA) should be carried out in respect of the Epping Forest SAC.

There were no Natura 2000 sites within 200m for any links affected by a decrease in air quality. (see comment below)

If the traffic modelling were to show an increase in traffic on the roads through Epping Forest, then we would expect to see air quality modelling results detailing the associated increased process contributions to NOx and to the deposition of nitrogen and acidity; and an assessment of the effect these increases would be likely to have upon the interest features for which the SAC is designated.

Epping Forest SSSI to the west of M11, lies within 200m of the affected links. Please note, the EU limit value for the protection of vegetation (annual mean 30 µg/m<sup>3</sup>), applies only to locations more than 20km from towns with more than 250,000 inhabitants or more than 5km from other built-up areas, industrial installations or motorway (DMRB HA207/07 Annex F1.2). Therefore this statutory limit value is not applicable for this designated site. However, for completeness an HRA has been completed for SACs in the surrounding area including Epping Forest. Consideration is given to the Epping Forest SSSI in the ES.

We recognise that the scheme is probably more likely to reduce, rather than increase, traffic flows on the roads through Epping Forest; in which case the HRA could be completed at an early stage with a conclusion of 'no likely significant

effect', without the need to proceed to the Appropriate Assessment stage. However, it is not possible to exclude the possibility of adverse effects upon this Natura 2000 site until such time as the modelling results have produced the evidence on which to base such a conclusion. As already pointed out by Emma Simmonds in the response from Place Services, paragraph 7.2.8 'Dormice' is actually a copy of the preceding paragraph 7.2.7 'Bats'. Similarly, paragraph 7.2.11 'Reptiles' is a copy of paragraph 7.2.10 'Great Crested Newts'.

ECC's Ecology, Historic Building, Historic Environment, Arboriculture and Landscape Consultants (Place Services)  
Ecology (Emma Simmonds)

The Essex Biodiversity Validation Checklist should be submitted as part of the planning application. This includes use of the Defra Biodiversity Offsetting Metric as part of the ecological impact assessment to calculate habitat losses and gains. The Metric provides a straightforward calculator to assess impacts upon habitats which have some biodiversity value (including arable land) to be measured in units or credits. The Metric is a stand-alone tool; its use does not require Biodiversity Offsetting to be used. The use of the Metric allows impacts to be established in a more transparent fashion and will ensure proposed mitigation measures are more readily understood and more efficiently delivered.

The Checklist is presented with the planning documents

Statutory sites Pincey Brook which feeds into the River Stort and a number of Statutory sites are situated downstream including the Lee Valley SPA and Ramsar Site and a number of SSSIs (including Hundson Mead SSSI, Rye Meads SSSI, Turnford and Cheshunt Pits SSSI). Impacts can potentially be carried a lot further by streams and rivers than would otherwise be the case and the 2km distance is not always an adequate buffer distance. Therefore, the ecological report should demonstrate that there would be no adverse effects on the statutory wildlife sites.

Jacobs screened out effects on downstream receptors more than 2km from the Scheme boundary, as it was considered that best practice construction practices and appropriate standard mitigations, especially with regards to sediment and water quality treatment, would be sufficient to prevent impacts on any such receptors. Given the confidence in no significant effect from the operational scheme, and distances involved between road and snails there is no pathway to impact on the DWS. There would be sufficient buffering by the receiving watercourses to reduce a slight negative to neutral water quality effect further, given the distance between road and the nearest statutory wildlife sites.

Species

Birds - Adequate information should be provided to assist the local authority in ensuring that they abide by Reg 9A(8) of the Conservation of Habitats and Species Regulations 2010 which states that, "A competent authority in exercising any function in the UK must use all reasonable endeavours to avoid any pollution or deterioration of habitats of wild birds". This covers all wild birds, not just those that are nesting, uncommon, or important.

This is covered within the Ecology chapter

Missing information - 7.2.8 This heading is for dormice but this section discusses bats. This error occurs again in 7.2.11 (reptiles and GCNs). The correct details should be provided.

Highways England- No response received

CPRE- No response received

Epping Forest District Council - No response received

ECC Highways Strategic Development - No response received





## **Appendix 5.1: Designated Sites Assessment Detailed Results**



The detailed results of annual mean NO<sub>x</sub> and N-deposition at the designated sites are presented in table C.1 and C.2 with the evaluation of exceedance of critical load in table C.3

Receptor ID	X	Y	2014 Base	2021 DM	2021 DS	Change (DS – DM)
Sawbridgeworth Marsh 0	549318.1	215766.2	34.0	30.0	26.4	-3.7
Epping Forest 0	548239.1	202632.4	154.5	153.1	156.3	3.2
Epping Forest 10	548229.8	202636	109.6	107.5	109.5	2.0
Epping Forest 20	548220.4	202639.7	88.4	86.0	87.5	1.5
Epping Forest 30	548211.1	202643.3	75.7	73.1	74.3	1.2
Epping Forest 40	548201.8	202647	67.3	64.6	65.5	0.9
Epping Forest 50	548192.5	202650.6	61.2	58.4	59.2	0.8
Epping Forest 60	548183.3	202654.3	56.6	53.8	54.5	0.7
Epping Forest 70	548173.9	202657.9	53.0	50.1	50.7	0.6
Epping Forest 80	548164.6	202661.6	50.1	47.2	47.7	0.5
Epping Forest 90	548155.3	202665.2	47.7	44.8	45.3	0.5
Epping Forest 100	548146	202668.9	45.7	42.7	43.2	0.5
Epping Forest 110	548136.7	202672.5	43.9	40.9	41.4	0.5
Epping Forest 120	548127.4	202676.2	42.5	39.5	39.9	0.4
Epping Forest 130	548118.1	202679.8	41.2	38.2	38.6	0.4
Epping Forest 140	548108.8	202683.5	40.1	37.1	37.4	0.3
Epping Forest 150	548099.4	202687.1	39.1	36.1	36.4	0.3
Epping Forest 160	548090.1	202690.8	38.2	35.2	35.5	0.3
Epping Forest 170	548080.8	202694.4	37.4	34.4	34.7	0.3
Epping Forest 180	548071.5	202698.1	36.6	33.6	33.9	0.3
Epping Forest 190	548062.2	202701.7	36.0	33.0	33.2	0.2

Table C.1: NO<sub>x</sub> Concentration (µg/m<sup>3</sup>)

Receptor ID	X	Y	2014 Base	2021 DM	2021 DS	Change (DS – DM)
Sawbridgeworth Marsh 0	549318.1	215766.2	21.2	20.5	18.5	-0.2
Epping Forest 0	548239.1	202632.4	67.5	63.7	64.7	0.1
Epping Forest 10	548229.8	202636	52.8	47.3	48.0	0.1
Epping Forest 20	548220.4	202639.7	45.1	38.8	39.3	0.1
Epping Forest 30	548211.1	202643.3	40.2	33.4	33.8	0.0
Epping Forest 40	548201.8	202647	36.7	29.7	30.0	0.0
Epping Forest 50	548192.5	202650.6	34.1	26.9	27.2	0.0

Receptor ID	X	Y	2014 Base	2021 DM	2021 DS	Change (DS – DM)
Epping Forest 60	548183.3	202654.3	32.1	24.8	25.1	0.0
Epping Forest 70	548173.9	202657.9	30.5	23.2	23.4	0.0
Epping Forest 80	548164.6	202661.6	29.2	21.8	22.0	0.0
Epping Forest 90	548155.3	202665.2	28.1	20.7	20.9	0.0
Epping Forest 100	548146	202668.9	27.2	19.7	19.9	0.0
Epping Forest 110	548136.7	202672.5	26.4	18.9	19.1	0.0
Epping Forest 120	548127.4	202676.2	25.7	18.2	18.4	0.0
Epping Forest 130	548118.1	202679.8	25.1	17.6	17.8	0.0
Epping Forest 140	548108.8	202683.5	24.6	17.1	17.2	0.0
Epping Forest 150	548099.4	202687.1	24.1	16.6	16.8	0.0
Epping Forest 160	548090.1	202690.8	23.6	16.2	16.3	0.0
Epping Forest 170	548080.8	202694.4	23.3	15.8	15.9	0.0
Epping Forest 180	548071.5	202698.1	22.9	15.5	15.6	0.0
Epping Forest 190	548062.2	202701.7	22.6	15.2	15.3	0.0

Table C.2: N-deposition (kg N ha<sup>-1</sup> yr<sup>-1</sup>)

Receptor ID	X	Y	Change (DS- DM)	Critical Load	Greater than 1% of the lower threshold of Critical Load
Sawbridgeworth Marsh 0	549318.1	215766.2	-0.2	10 – 15	Yes

Table C.3: Exceedance of critical load

## **Appendix 5.2: Verification and Model Adjustment**





The comparison of modelled concentrations with local monitored concentrations is a process termed 'verification'. Model verification investigates the discrepancies between modelled and measured concentrations, which can arise due to the presence of inaccuracies and/or uncertainties in model input data, modelling and monitoring data assumptions. The following are examples of potential causes of such discrepancy:

- Estimates of background pollutant concentrations
- Meteorological data uncertainties
- Traffic data uncertainties
- Model input parameters such as 'roughness length'
- Overall limitations of the dispersion model

### 1.1.1 Model precision

Residual uncertainty may remain after systematic error or 'model accuracy' has been accounted for in the final predictions. Residual uncertainty may be considered synonymous with the 'precision' of the model predictions (i.e. how wide the scatter or residual variability of the predicted values compare with the monitored true value, once systematic error has been allowed for). The quantification of model precision provides an estimate of how the final predictions may deviate from true (monitored) values at the same location over the same period.

Suitable local monitoring data for the purpose of verification is available for concentrations of NO<sub>2</sub> at the locations shown in the Figure 5-1. This monitoring data have been used to validate the dispersion model prediction and obtain adjustment factors, which can be applied to predictions of pollutant concentrations in the base and future years.

### 1.1.2 Model performance

An evaluation of model performance has been undertaken to establish confidence in model results. LAQM.TG(09) identifies a number of statistical procedures that are appropriate to evaluate model performance and assess the uncertainty. The statistical parameters used in this assessment are:

- Root mean square error (RMSE)
- Fractional bias (FB)
- Correlation coefficient (CC)

A brief for explanation of each statistic is provided in Table B.1

Statistical parameter	Comments	Ideal value
RMSE	<p>RMSE is used to define the average error or uncertainty of the model. The units of RMSE are the same as the quantities compared.</p> <p>If the RMSE values are higher than 25% of the objective being assessed, it is recommended that the model inputs and verification should be revisited in order to make improvements.</p> <p>For example, if the model predictions are for the annual mean NO<sub>2</sub> objective of 40µg/m<sup>3</sup>, if an RMSE of 10µg/m<sup>3</sup> or above is determined for a model it is advised to revisit the model parameters and model verification.</p>	0.01

Statistical parameter	Comments	Ideal value
	Ideally an RMSE within 10% of the air quality objective would be derived, which equates to $4\mu\text{g}/\text{m}^3$ for the annual mean $\text{NO}_2$ objective.	
FB	It is used to identify if the model shows a systematic tendency to over or under predict.  FB values vary between +2 and -2 and has an ideal value of zero. Negative values suggest a model over-prediction and positive values suggest a model under-prediction.	0.00
CC	It is used to measure the linear relationship between predicted and observed data. A value of zero means no relationship and a value of 1 means absolute relationship.  This statistic can be particularly useful when comparing a large number of model and observed data points.	1.00

**Table B.1: Model performance statistics**

These parameters estimate how the model results agree or diverge from the observations.

These calculations have been carried out prior to, and after, adjustment and provide information on the improvement of the model predictions as a result of the application of the verification adjustment factors.

### 1.1.3 Assessment verification

The verification process involves a review of the modelled pollutant concentrations against corresponding monitoring data to determine how well the air quality model has performed. Depending on the outcome it may be considered that the model has performed adequately and that there is no need to adjust any of the modelled results (LAQM.TG(16)).

Alternatively the model may perform poorly against the monitoring data. There is then a need to check all the input data to ensure that it is reasonable and accurately represented in the air quality modelling process.

Where all input data, such as traffic data, emissions rates and background concentrations, have been checked and considered as reasonable, then the modelled results require adjustment to best align with the monitoring data. This may either be a single verification adjustment factor to be applied to the modelled concentrations across the study area, or a range of different adjustment factors to account for different zones in the study area (e.g. motorways, local roads).

The model verification review identified a range of adjustment factors to be applied to the modelled concentrations to achieve a realistic representation of the monitored  $\text{NO}_2$  concentrations. These 5 Verification zones can be found in table B.2.

Zone Number	Location
1 north	Sawbridgeworth AQMA north of Station Road
1 middle	Sawbridgeworth AQMA between Station Road and Bell Street
1 south	Sawbridgeworth AQMA south of Bell Street
2	All receptors within the Bishops Stortford AQMA but also extending as far west as the A1250 roundabout, south as far as Grange Road, east as far as Manor Road.
3	The rest of the study area

Table B.2: Verification Adjustment Zones

## 1.1.4 Zone 1 north

The non-adjusted modelled versus monitored NO<sub>2</sub> concentrations are presented in Table B.3.

Monitor ID	X (m)	Y (m)	Monitored annual mean NO <sub>2</sub> (µg/m <sup>3</sup> )	Non-adjusted modelled annual mean NO <sub>2</sub> (µg/m <sup>3</sup> )	Monitored versus modelled (% difference)
EH59/EH60/EH61	548222	215395	33.0	23.3	-29.5
East Herts Roadside	548221	215395	33.0	24.1	-27.1

Table B.3: Non-adjusted modelled vs monitored NO<sub>2</sub>

The initial comparison between the predicted concentrations and monitoring data illustrates that the model tends to over-predict NO<sub>2</sub> concentrations over the modelled area.

Model adjustment was, therefore, undertaken in accordance with LAQM.TG(16). Data was collected from a number of suitable diffusion tube monitoring sites in the vicinity of the Proposed Scheme.

The results suggested that the model was under-predicting road NO<sub>x</sub> concentrations. The ratio between monitored and modelled road NO<sub>x</sub> was 1.97. Adjusted modelled versus monitored total NO<sub>2</sub> concentrations are presented in Table B.4. Modelled Road NO<sub>x</sub> concentrations predicted at sensitive receptors in the base and opening year scenarios were multiplied by the adjustment factor 1.97 to account for the over-prediction of road NO<sub>x</sub> by the model.

Monitor ID	X (m)	Y (m)	Monitored annual mean NO <sub>2</sub> (µg/m <sup>3</sup> )	Adjusted modelled annual mean NO <sub>2</sub> (µg/m <sup>3</sup> )	Monitored versus modelled (% difference)
EH59/EH60/EH61	548222	215395	33.0	32.31	-2.1
East Herts Roadside	548221	215395	33.0	33.72	2.2

Table B.4: Adjusted modelled vs monitored NO<sub>2</sub>

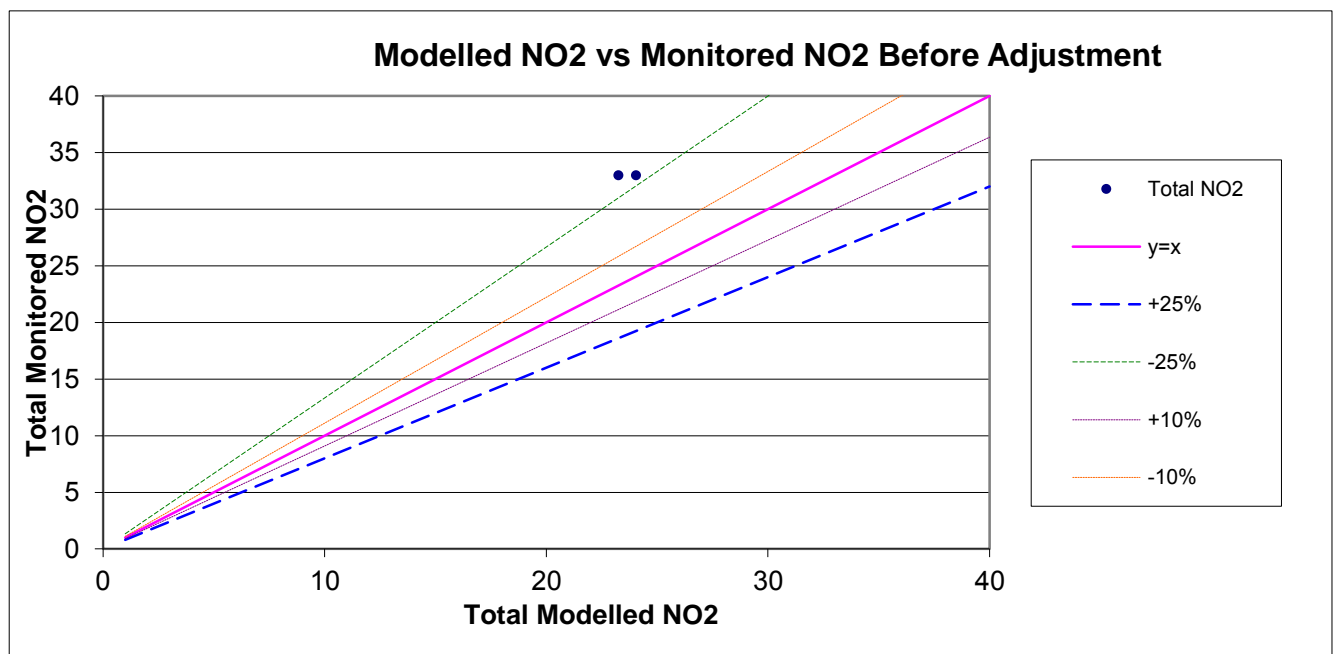
The summary results and model performance statistics defined in LAQM.TG(16) are provided in Table B.5.

Summary table	No adjustment	NO <sub>x</sub> roads adjustment
Within +10%	0	1
Within -10%	0	1
Within +/-10%	0	2
Within +10 to 25%	0	0
Within -10 to 25%	0	0
Within +/-10 to 25%	0	0
Over +25%	0	0
Under -25%	2	0
Greater +/-25%	2	0
Within +/-25%	0	2

Total	2	2
Adjustment factors		
NOx roads adjustment	n/a	1.97
Uncertainties assessment		
Correlation	N/A	N/A
RMSE ( $\mu\text{g}/\text{m}^3$ )	9.3	0.7
Fractional bias	-2.0	0.0

**Table B.5: Model performance statistics**

Figure B.1 provides a comparison of the modelled total NO<sub>2</sub> versus monitored total NO<sub>2</sub> for no adjustment of the dataset. Figure B.2 provides a comparison of the adjusted modelled total NO<sub>2</sub> versus monitored total NO<sub>2</sub>.



**Figure B.1: Comparison of modelled and monitored NO<sub>2</sub> (no adjustment)**

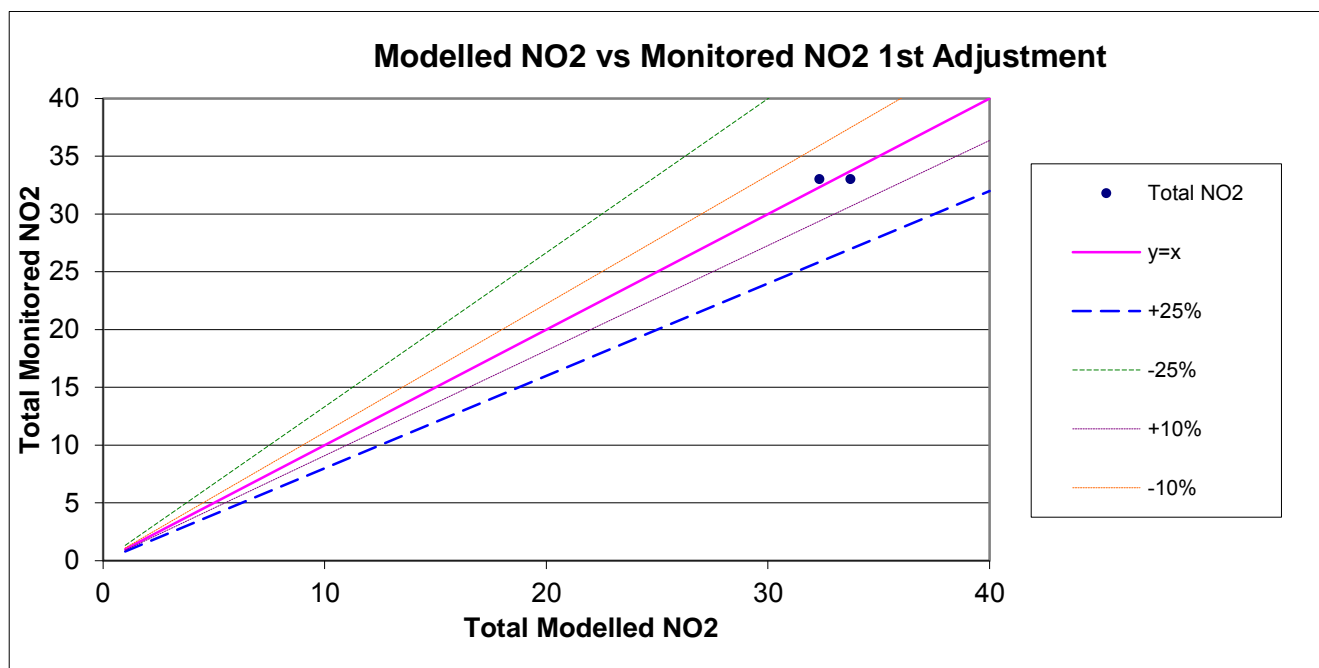


Figure B.2: Comparison of adjusted modelled total NO<sub>2</sub> versus monitored total NO<sub>2</sub> (after adjustment of road NO<sub>x</sub>)

A comparison of the performance of the modelled concentrations from the air quality model against the monitoring data was undertaken. The results show that two verification results deviate by less than +/-10% between the modelled and monitored concentrations. The model performance statistics show that the uncertainty in the predictions of adjusted total NO<sub>2</sub> was acceptable as the RMSE is less than 10µg/m<sup>3</sup> and less than 4µg/m<sup>3</sup> for the study area.

### 1.1.5 Zone 1 middle

The non-adjusted modelled versus monitored NO<sub>2</sub> concentrations are presented in Table B.6.

Monitor ID	X (m)	Y (m)	Monitored annual mean NO <sub>2</sub> (µg/m <sup>3</sup> )	Non-adjusted modelled annual mean NO <sub>2</sub> (µg/m <sup>3</sup> )	Monitored versus modelled (% difference)
EH14/EH55/EH56	548065	214712	51.0	20.5	-59.8
East Herts Roadside	548221	215395	33.0	23.0	-30.3
EH59/EH60/EH61	548222	215395	33.0	22.3	-32.5

Table B.6: Non-adjusted modelled vs monitored NO<sub>2</sub>

The initial comparison between the predicted concentrations and monitoring data illustrates that the model tends to over-predict NO<sub>2</sub> concentrations over the modelled area.

Model adjustment was, therefore, undertaken in accordance with LAQM.TG(16). Data was collected from a number of suitable diffusion tube monitoring sites in the vicinity of the Proposed Scheme.

The results suggested that the model was under-predicting road NO<sub>x</sub> concentrations. The ratio between monitored and modelled road NO<sub>x</sub> was 2.71. Adjusted modelled versus monitored total NO<sub>2</sub> concentrations are presented in Table B.7. Modelled Road NO<sub>x</sub> concentrations predicted at sensitive receptors in the base and opening year scenarios were multiplied by the adjustment factor 2.71 to account for the over-prediction of road NO<sub>x</sub> by the model.

Monitor ID	X (m)	Y (m)	Monitored annual mean NO <sub>2</sub> (µg/m <sup>3</sup> )	Adjusted modelled annual mean NO <sub>2</sub> (µg/m <sup>3</sup> )	Monitored versus modelled (% difference)
EH14/EH55/EH56	548065	214712	51.0	34.9	-31.6
East Herts Roadside	548221	215395	33.0	40.9	24.0
EH59/EH60/EH61	548222	215395	33.0	39.1	18.5

**Table B.7: Adjusted modelled vs monitored NO<sub>2</sub>**

The summary results and model performance statistics defined in LAQM.TG(16) are provided in Table B.8.

Summary table	No adjustment	NO <sub>x</sub> roads adjustment
Within +10%	0	0
Within -10%	0	0
Within +/-10%	<b>0</b>	<b>0</b>
Within +10 to 25%	0	2
Within -10 to 25%	0	0
Within +/-10 to 25%	<b>0</b>	<b>2</b>
Over +25%	0	0
Under -25%	3	1
Greater +/-25%	3	1
Within +/-25%	0	2
Total	3	3
Adjustment factors		
NO <sub>x</sub> roads adjustment	n/a	2.71
Uncertainties assessment		
Correlation	1.0	1.0
RMSE (µg/m <sup>3</sup> )	19.5	11.0
Fractional bias	-2.0	0.0

**Table B.8: Model performance statistics**

Figure B.3 provides a comparison of the modelled total NO<sub>2</sub> versus monitored total NO<sub>2</sub> for no adjustment of the dataset. Figure B.4 provides a comparison of the adjusted modelled total NO<sub>2</sub> versus monitored total NO<sub>2</sub>.



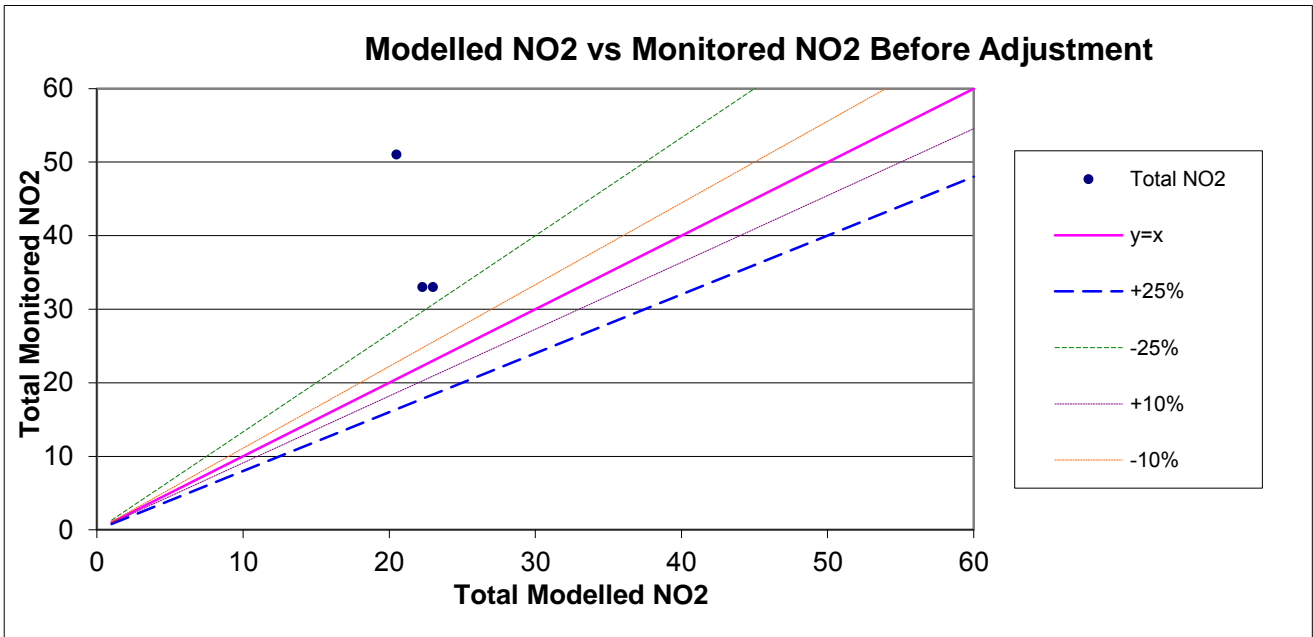


Figure B.3: Comparison of modelled and monitored NO<sub>2</sub> (no adjustment)

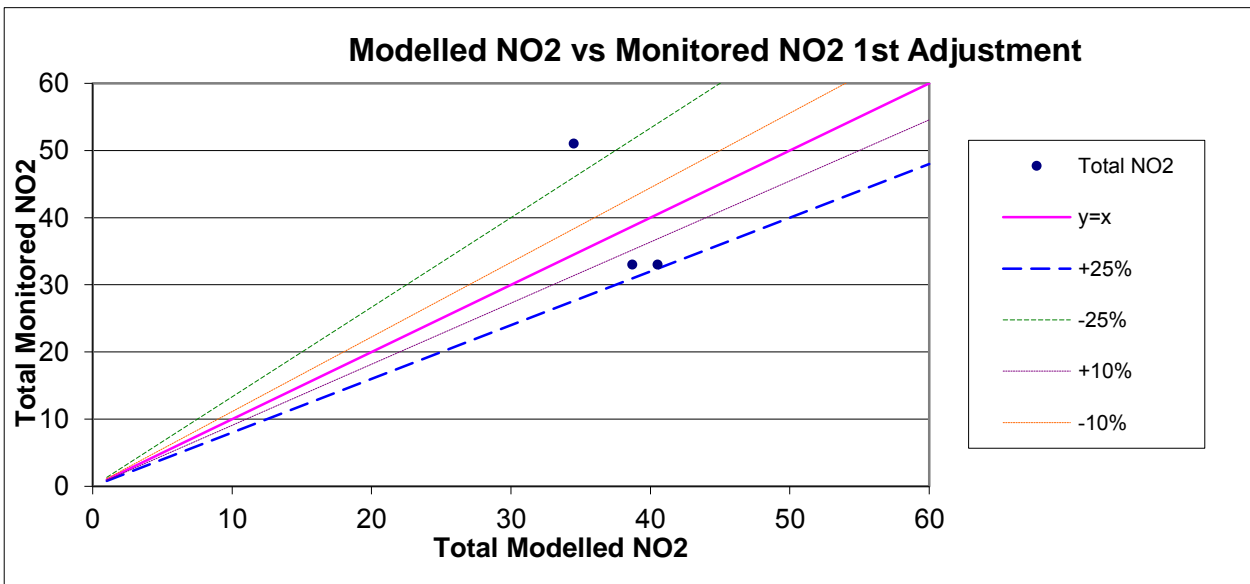


Figure B.4: Comparison of adjusted modelled total NO<sub>2</sub> versus monitored total NO<sub>2</sub> (after adjustment of road NO<sub>x</sub>)

A comparison of the performance of the modelled concentrations from the air quality model against the monitoring data was undertaken. The results show that one verification result deviates by greater than +/-25% between the modelled and monitored concentrations. The model performance statistics show that the uncertainty in the predictions of adjusted total NO<sub>2</sub> was acceptable as the RMSE is greater than 10µg/m<sup>3</sup>.

### 1.1.6 Zone 1 south

The non-adjusted modelled versus monitored NO<sub>2</sub> concentrations are presented in Table B.9.

Monitor ID	X (m)	Y (m)	Monitored annual mean NO <sub>2</sub> (µg/m <sup>3</sup> )	Non-adjusted modelled annual mean NO <sub>2</sub> (µg/m <sup>3</sup> )	Monitored versus modelled (% difference)
EH14/EH55/EH56	548065	214712	51.0	21.9	-57.0

**Table B.9: Non-adjusted modelled vs monitored NO<sub>2</sub>**

The initial comparison between the predicted concentrations and monitoring data illustrates that the model tends to over-predict NO<sub>2</sub> concentrations over the modelled area.

Model adjustment was, therefore, undertaken in accordance with LAQM.TG(16). Data was collected from a number of suitable diffusion tube monitoring sites in the vicinity of the Proposed Scheme.

The results suggested that the model was under-predicting road NO<sub>x</sub> concentrations. The ratio between monitored and modelled road NO<sub>x</sub> was 5.35. Adjusted modelled versus monitored total NO<sub>2</sub> concentrations are presented in Table B.10. Modelled Road NO<sub>x</sub> concentrations predicted at sensitive receptors in the base and opening year scenarios were multiplied by the adjustment factor 5.35 to account for the over-prediction of road NO<sub>x</sub> by the model.

Monitor ID	X (m)	Y (m)	Monitored annual mean NO <sub>2</sub> (µg/m <sup>3</sup> )	Adjusted modelled annual mean NO <sub>2</sub> (µg/m <sup>3</sup> )	Monitored versus modelled (% difference)
EH14/EH55/EH56	548065	214712	51.0	51.00	0.0

**Table B.10: Adjusted modelled vs monitored NO<sub>2</sub>**

The summary results and model performance statistics defined in LAQM.TG(16) are provided in Table B.11.

Summary table	No adjustment	NO <sub>x</sub> roads adjustment
Within +10%	0	0
Within -10%	0	1
Within +/-10%	0	1
Within +10 to 25%	0	0
Within -10 to 25%	0	0
Within +/-10 to 25%	0	0
Over +25%	0	0
Under -25%	1	0
Greater +/-25%	1	0
Within +/-25%	0	1
Total	1	1
Adjustment factors		
NO <sub>x</sub> roads adjustment	N/A	5.35
Uncertainties assessment		

Summary table	No adjustment	NO <sub>x</sub> roads adjustment
Correlation	N/A	N/A
RMSE (µg/m <sup>3</sup> )	29.1	0.0
Fractional bias	-2.0	0.0

Table B.11: Model performance statistics

Figure B.5 provides a comparison of the modelled total NO<sub>2</sub> versus monitored total NO<sub>2</sub> for no adjustment of the dataset. Figure B.6 provides a comparison of the adjusted modelled total NO<sub>2</sub> versus monitored total NO<sub>2</sub>.

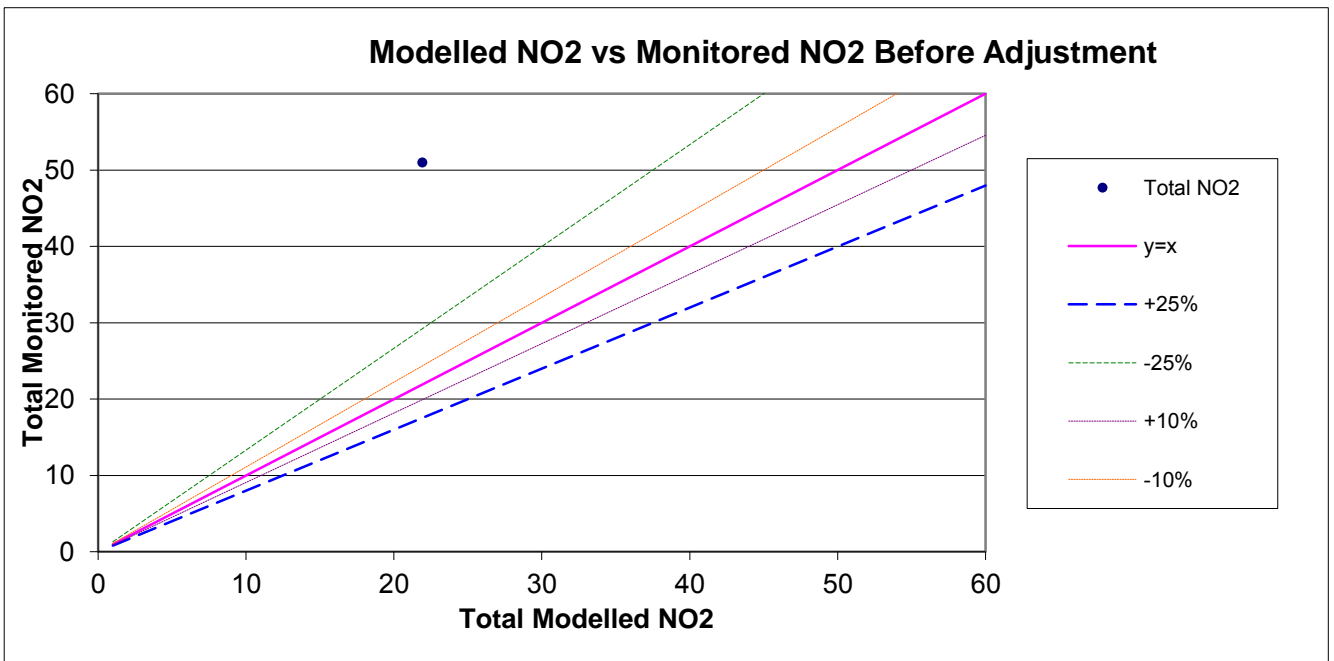
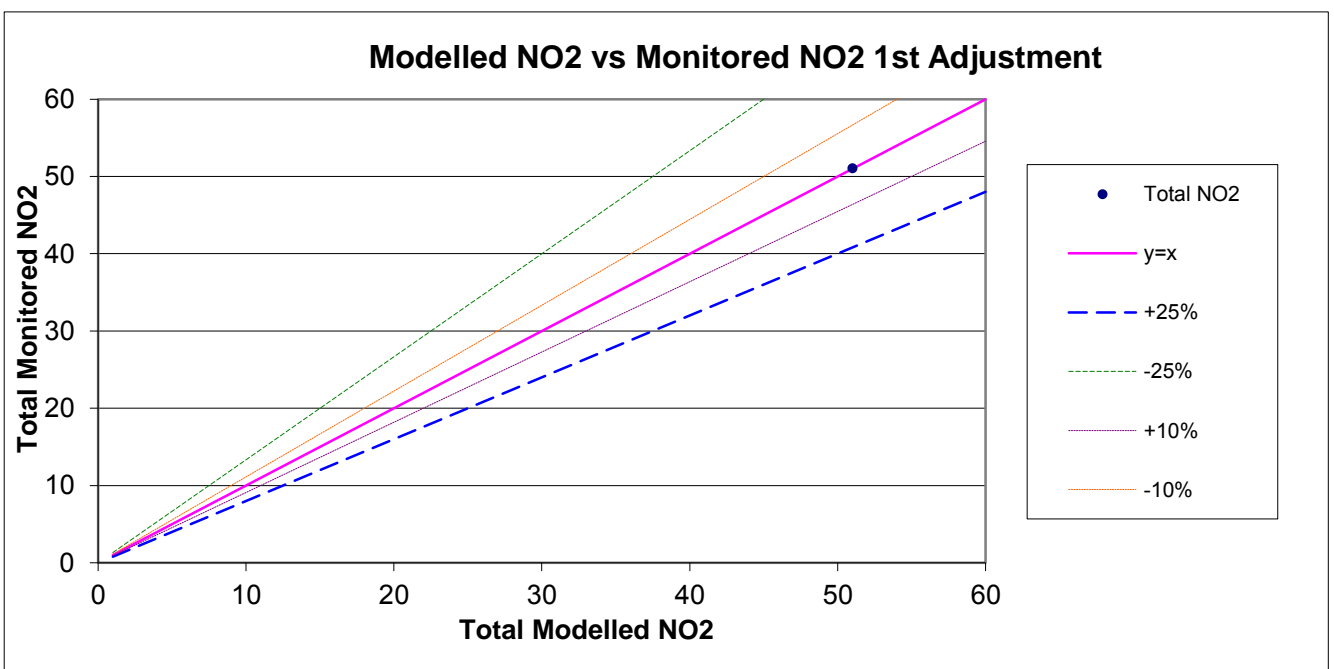


Figure B.5: Comparison of modelled and monitored NO<sub>2</sub> (no adjustment)



**Figure B.6: Comparison of adjusted modelled total NO<sub>2</sub> versus monitored total NO<sub>2</sub> (after adjustment of road NO<sub>x</sub>)**

A comparison of the performance of the modelled concentrations from the air quality model against the monitoring data was undertaken. The results show that no verification results deviate by greater than +/-25% between the modelled and monitored concentrations. The model performance statistics show that the uncertainty in the predictions of adjusted total NO<sub>2</sub> was acceptable as the RMSE is below than 10µg/m<sup>3</sup>.

### 1.1.7 Zone 2

The non-adjusted modelled versus monitored NO<sub>2</sub> concentrations are presented in Table B.12.

Monitor ID	X (m)	Y (m)	Monitored annual mean NO <sub>2</sub> (µg/m <sup>3</sup> )	Non-adjusted modelled annual mean NO <sub>2</sub> (µg/m <sup>3</sup> )	Monitored versus modelled (% difference)
EH12/EH31/EH32	549158	221242	48.0	18.9	-60.7
EH18/EH37/EH38	549300	221312	41.0	17.3	-57.8

**Table B.12: Non-adjusted modelled vs monitored NO<sub>2</sub>**

The initial comparison between the predicted concentrations and monitoring data illustrates that the model tends to over-predict NO<sub>2</sub> concentrations over the modelled area.

Model adjustment was, therefore, undertaken in accordance with LAQM.TG(16). Data was collected from a number of suitable diffusion tube monitoring sites in the vicinity of the Proposed Scheme.

The results suggested that the model was under-predicting road NO<sub>x</sub> concentrations. The ratio between monitored and modelled road NO<sub>x</sub> was 10.62. Adjusted modelled versus monitored total NO<sub>2</sub> concentrations are presented in Table B.13. Modelled Road NO<sub>x</sub> concentrations predicted at sensitive receptors in the base and opening year scenarios were multiplied by the adjustment factor 10.62 to account for the over-prediction of road NO<sub>x</sub> by the model.

Monitor ID	X (m)	Y (m)	Monitored annual mean NO <sub>2</sub> (µg/m <sup>3</sup> )	Adjusted modelled annual mean NO <sub>2</sub> (µg/m <sup>3</sup> )	Monitored versus modelled (% difference)
EH12/EH31/EH32	549158	221242	48.0	51.24	6.7
EH18/EH37/EH38	549300	221312	41.0	38.56	-5.9

**Table B.13: Adjusted modelled vs monitored NO<sub>2</sub>**

The summary results and model performance statistics defined in LAQM.TG(16) are provided in Table B.14.

Summary table	No adjustment	NO <sub>x</sub> roads adjustment
Within +10%	0	1
Within -10%	0	1
Within +/-10%	0	2
Within +10 to 25%	0	0
Within -10 to 25%	0	0
Within +/-10 to 25%	0	0
Over +25%	0	0

Summary table	No adjustment	NO <sub>x</sub> roads adjustment
Under -25%	2	0
Greater +25%	2	0
Within +25%	0	2
Total	2	2
Adjustment factors		
NO <sub>x</sub> roads adjustment	n/a	10.62
Uncertainties assessment		
Correlation	0.1	1.0
RMSE (µg/m <sup>3</sup> )	26.6	2.9
Fractional bias	-2.0	0.0

Table B.14: Model performance statistics

Figure B.7 provides a comparison of the modelled total NO<sub>2</sub> versus monitored total NO<sub>2</sub> for no adjustment of the dataset. Figure B.8 provides a comparison of the adjusted modelled total NO<sub>2</sub> versus monitored total NO<sub>2</sub>.

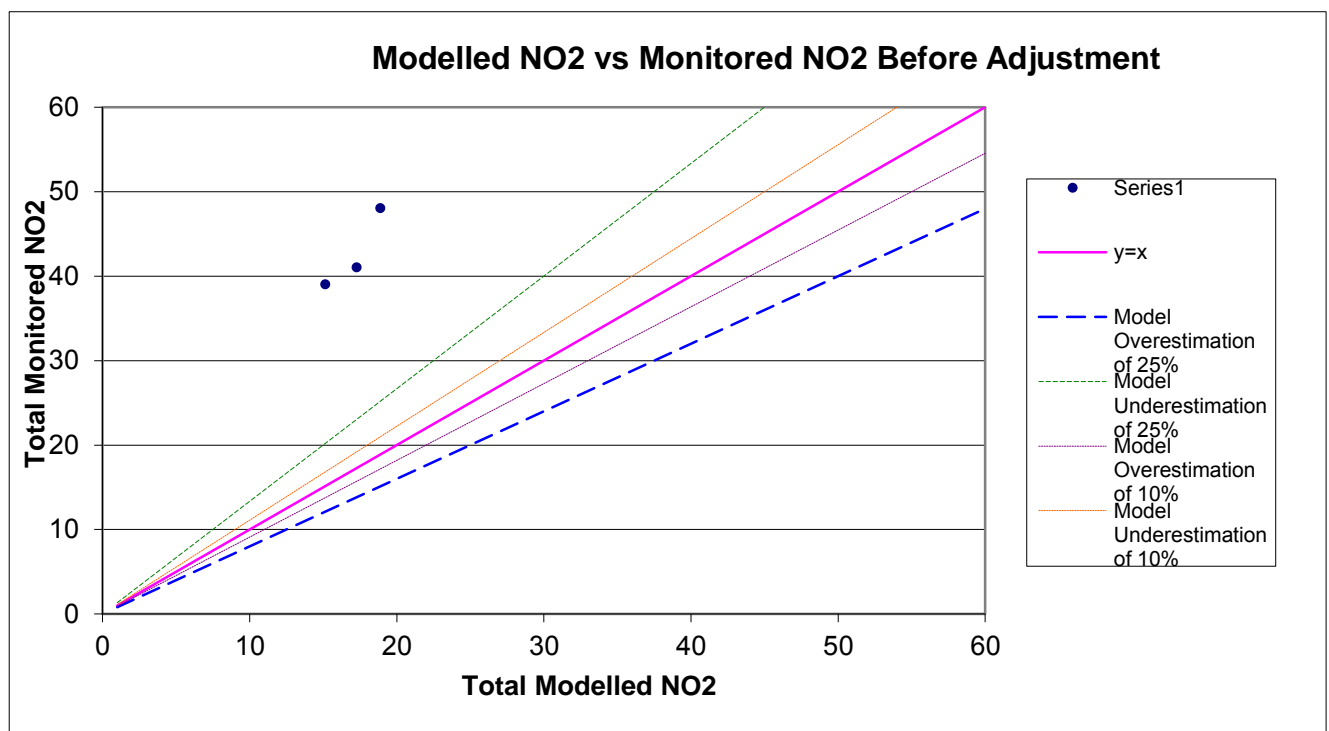


Figure B.7: Comparison of adjusted modelled total NO<sub>2</sub> versus monitored total NO<sub>2</sub> (after adjustment of road NO<sub>x</sub>)

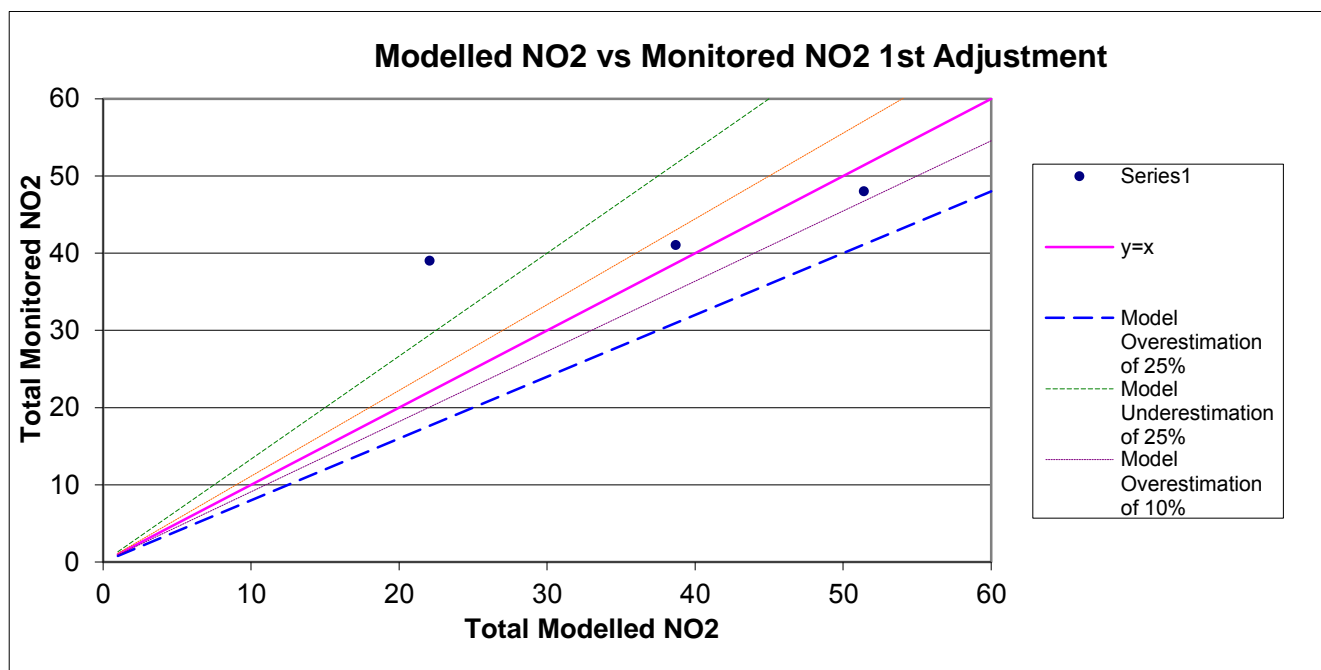


Figure B.8: Comparison of modelled and monitored NO<sub>2</sub> (no adjustment)

A comparison of the performance of the modelled concentrations from the air quality model against the monitoring data was undertaken. The results show that no verification results deviate by greater than +/-25% between the modelled and monitored concentrations. The model performance statistics show that the uncertainty in the predictions of adjusted total NO<sub>2</sub> was acceptable as the RMSE is less than 10µg/m<sup>3</sup>.

### 1.1.8 Zone 3

The non-adjusted modelled versus monitored NO<sub>2</sub> concentrations are presented in Table B.14.

Monitor ID	X (m)	Y (m)	Monitored annual mean NO <sub>2</sub> (µg/m <sup>3</sup> )	Non-adjusted modelled annual mean NO <sub>2</sub> (µg/m <sup>3</sup> )	Monitored versus modelled (% difference)
HAR 8	546944	211186	28.2	22.3	-20.8
HAR 9	546884	209430	29.8	18.5	-37.8
HAR10	544423	209670	29.1	20.3	-30.4
EFD 6	547840	206820	26.0	19.7	-24.1
UT002	552706	221403	20.7	18.2	-11.9
EH64/EH65	548740	222109	39.0	15.1	-61.2
UT034	556101	221241	27.4	15.9	-42.1
Birchanger	551496	222208	15.3	16.0	4.4

Table B.14: Non-adjusted modelled vs monitored NO<sub>2</sub>

The initial comparison between the predicted concentrations and monitoring data illustrates that the model tends to over-predict NO<sub>2</sub> concentrations over the modelled area.

Model adjustment was, therefore, undertaken in accordance with LAQM.TG(16). Data was collected from a number of suitable diffusion tube monitoring sites in the vicinity of the Proposed Scheme.



The results suggested that the model was under-predicting road NO<sub>x</sub> concentrations. The ratio between monitored and modelled road NO<sub>x</sub> was 3.56. Adjusted modelled versus monitored total NO<sub>2</sub> concentrations are presented in Table B.15. Modelled Road NO<sub>x</sub> concentrations predicted at sensitive receptors in the base and opening year scenarios were multiplied by the adjustment factor 3.56 to account for the over-prediction of road NO<sub>x</sub> by the model.

Monitor ID	X (m)	Y (m)	Monitored annual mean NO <sub>2</sub> (µg/m <sup>3</sup> )	Adjusted modelled annual mean NO <sub>2</sub> (µg/m <sup>3</sup> )	Monitored versus modelled (% difference)
HAR 8	546944	211186	28.2	30.91	9.6
HAR 9	546884	209430	29.8	26.99	-9.4
HAR10	544423	209670	29.1	30.41	4.5
EFD 6	547840	206820	26.0	32.29	24.2
UT002	552706	221403	20.7	25.82	24.7
EH64/EH65	548740	222109	39.0	22.13	-43.3
UT034	556101	221241	27.4	23.06	-15.8
Birchanger	551496	222208	15.3	20.98	37.1

**Table B.15: Adjusted modelled vs monitored NO<sub>2</sub>**

The summary results and model performance statistics defined in LAQM.TG(16) are provided in Table B.16.

Summary table	No adjustment	NO <sub>x</sub> roads adjustment
Within +10%	1	3
Within -10%	0	1
Within +/-10%	1	3
Within +10 to 25%	0	1
Within -10 to 25%	3	2
Within +/-10 to 25%	3	3
Over +25%	0	1
Under -25%	4	1
Greater +/-25%	4	1
Within +/-25%	4	6
Total	8	8
Adjustment factors		
NO <sub>x</sub> roads adjustment	n/a	3.56
Uncertainties assessment		
Correlation	0.0	0.2
RMSE (µg/m <sup>3</sup> )	11.1	6.5
Fractional bias	-2.0	0.1

**Table B.16: Model performance statistics**

Figure B.9 provides a comparison of the modelled total NO<sub>2</sub> versus monitored total NO<sub>2</sub> for no adjustment of the dataset. Figure B.10 provides a comparison of the adjusted modelled total NO<sub>2</sub> versus monitored total NO<sub>2</sub>.

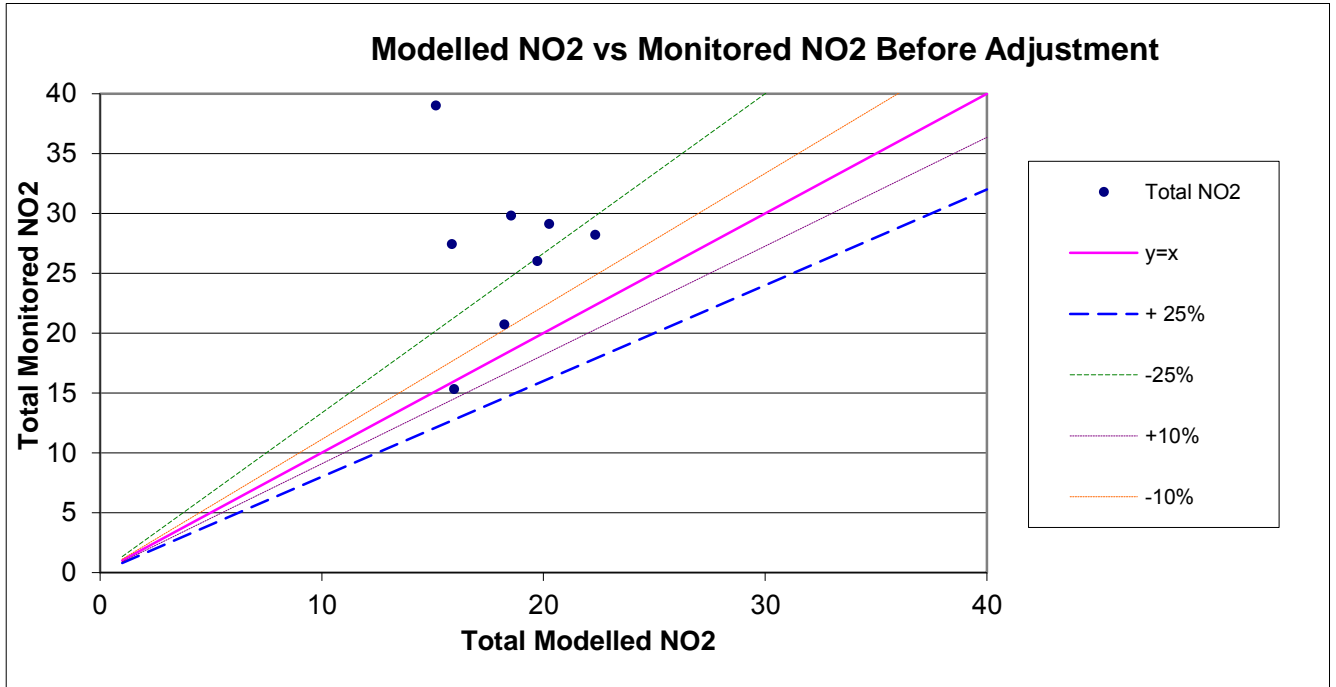


Figure B.9: Comparison of adjusted modelled total NO<sub>2</sub> versus monitored total NO<sub>2</sub> (after adjustment of road NO<sub>x</sub>)

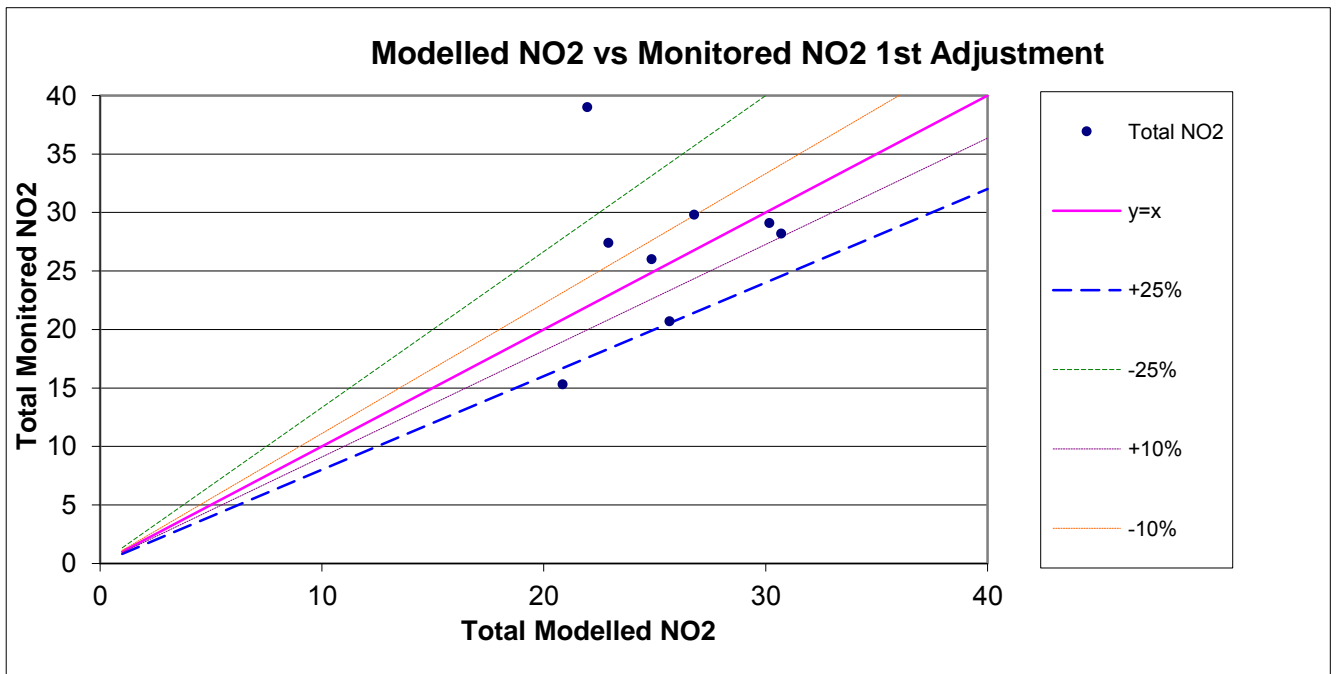


Figure B.10: Comparison of modelled and monitored NO<sub>2</sub> (no adjustment)

A comparison of the performance of the modelled concentrations from the air quality model against the monitoring data was undertaken. The results show that two verification results deviate by greater than +/-25% between the modelled and monitored concentrations. The model performance statistics show that the uncertainty in the predictions of adjusted total NO<sub>2</sub> was acceptable as the RMSE is less than 10µg/m<sup>3</sup> and close to 4µg/m<sup>3</sup> for the study area.

## **Appendix 5.3: Local Air Quality Monitoring**



Below is the Local Authority Monitoring within the study area.

Local Authority	Reference	Location	2014 Annual Mean ( $\mu\text{g}/\text{m}^3$ )
HDC	HAR 8	East Park	28.2
HDC	HAR 9	Gardiners	29.8
HDC	HAR10	Dads Wood	29.1
HDC	HAR11	Town Centre	33.6
HDC	HAR12	Allende Avenue	28.4
HDC	HAR 13	Guilfords	19.7
HDC	HAR 14	Old Road	23.1
EFDC	6	Hastingwood: Canes Cottages	26.0
EFDC	12	North Weald: Pike Way	19.0
EFDC	13	North Weald: Tempest Mead	20.0
EFDC	15	Roydon: High Street	25.0
EHDC	EH12/EH31/EH32	Hockerill Street, Bishops Stortford	48.0
EHDC	EH14/EH55/EH56	London Road, Sawbridgeworth	51.0
EHDC	EH17/EH35/EH36	Dunmow Road, Bishops Stortford	68.0
EHDC	EH18/EH37/EH38	Stansted Road, Bishops Stortford	41.0
EHDC	EH19/EH39/EH40	London Road, Bishops Stortford	76.0
EHDC	EH57/EH58	Junction between Bell Street and London Road Sawbridgeworth	68.0
EHDC	EH59/EH60/EH61	Cutforth Road Sawbridgeworth	33.0
EHDC	EH62/EH63	Northgate End Bishops Stortford	36.0
EHDC	EH64/EH65	79 Rye Street Bishops Stortford	39.0
EHDC	EH66/EH67	221 Rye Street Bishops Stortford	22.0
EHDC	EH68/EH69	9 Hadham Road Bishops Stortford	38.0

<b>Local Authority</b>	<b>Reference</b>	<b>Location</b>	<b>2014 Annual Mean (<math>\mu\text{g}/\text{m}^3</math>)</b>
EHDC	East Herts Roadside	East Herts Roadside	33.0
UDC	UT002	Airport 1 Thatched Cottage	20.7
UDC	UT007	Airport 2 Rose Cottage	20.0
UDC	UT008	Hallingbury	26.2
UDC	UT009	Burton End	33.6
UDC	UT010	Newport	23.8
UDC	UT034	Four Ashes	27.4
UDC	UT035	Takeley Street	21.2
UDC	Birchanger	Birchanger	15.3

## **Appendix 5.4: Air Quality Modelling Results**





Modelled Receptor Name	X	Y	Annual mean NO <sub>2</sub> concentration (µg/m <sup>3</sup> ) (to 1 decimal place)			
			2014 Base	2021 DM	2021 DS	Change (DS-DM)
205250	549258	221205	80.5	83.4	74.3	-9.1
206654	549254	221183	73.5	76.3	67.8	-8.5
206658	549252	221170	67.3	69.9	62.2	-7.7
207536	549244	221113	59.3	61.7	54.8	-6.9
212848	549248	221141	60.2	62.7	55.8	-6.9
212849	549248	221138	60.1	62.6	55.7	-6.9
212854	549244	221117	59.1	61.5	54.6	-6.9
212850	549247	221133	59.7	62.0	55.2	-6.8
212851	549246	221129	59.6	61.9	55.1	-6.8
212852	549245	221125	59.4	61.6	54.9	-6.7
212853	549245	221121	59.3	61.5	54.8	-6.7
212846	549245	221187	60.6	62.8	56.2	-6.6
206640	549244	221075	57.2	59.5	53.0	-6.5
205481	549243	221179	59.3	61.4	55.0	-6.4
205482	549244	221182	59.4	61.5	55.1	-6.4
212845	549248	221195	61.4	63.4	57.0	-6.4
212861	549244	221085	56.7	58.9	52.5	-6.4
212866	549244	221090	56.3	58.5	52.1	-6.4
212867	549244	221059	55.7	58.0	51.7	-6.3
207714	549246	221102	54.0	56.1	50.1	-6.0
212859	549245	221097	54.4	56.6	50.6	-6.0
215314	549275	221244	55.9	54.4	49.9	-4.5
206662	549270	221194	49.2	50.6	46.2	-4.4
207500	549304	221210	60.4	63.1	58.9	-4.2
206771	549280	221252	51.1	49.4	45.3	-4.1
210892	549318	221220	58.6	61.3	57.4	-3.9
210895	549322	221219	58.0	60.7	56.8	-3.9
179581	548119	214870	64.0	61.4	57.5	-3.9
210902	549336	221207	58.6	61.4	57.6	-3.8
206666	549272	221182	43.9	45.0	41.3	-3.7
210897	549326	221219	57.5	60.2	56.5	-3.7
210899	549334	221219	57.4	60.1	56.4	-3.7
210901	549338	221219	57.0	59.8	56.1	-3.7
212228	549259	221239	57.7	56.7	53.0	-3.7
210903	549342	221218	56.6	59.2	55.6	-3.6
210905	549346	221218	56.3	59.1	55.5	-3.6
210907	549350	221218	55.9	58.7	55.1	-3.6
179744	548123	214830	59.7	57.9	54.3	-3.6
185335	548120	214821	59.6	57.9	54.3	-3.6
172675	546991	208411	39.2	40.9	37.4	-3.5
206670	549270	221171	42.6	43.7	40.2	-3.5
210909	549353	221218	55.6	58.4	54.9	-3.5
210911	549357	221218	55.3	58.0	54.5	-3.5
210913	549362	221218	55.0	57.7	54.2	-3.5
185334	548122	214826	59.3	57.5	54.1	-3.4
208394	549379	221205	54.4	57.0	53.7	-3.3
179542	548120	214887	56.5	53.0	49.8	-3.2

Modelled Receptor Name	X	Y	Annual mean NO <sub>2</sub> concentration (µg/m <sup>3</sup> ) (to 1 decimal place)			
			2014 Base	2021 DM	2021 DS	Change (DS-DM)
179586	548096	214797	54.3	53.1	49.9	-3.2
210893	549310	221204	48.8	50.6	47.5	-3.1
210932	549351	221204	50.7	53.0	49.9	-3.1
210933	549354	221203	50.2	52.5	49.4	-3.1
210934	549359	221203	49.5	51.8	48.7	-3.1
196115	548015	214574	53.9	52.7	49.6	-3.1
210896	549314	221202	46.8	48.6	45.6	-3.0
210898	549317	221202	46.5	48.3	45.3	-3.0
179535	548014	214571	53.4	52.2	49.2	-3.0
206581	549412	221203	50.3	52.7	49.8	-2.9
179750	548083	214757	54.3	53.1	50.2	-2.9
181955	548063	214709	53.3	52.0	49.1	-2.9
210900	549321	221201	46.1	47.9	45.1	-2.8
210904	549336	221201	46.7	48.5	45.7	-2.8
210915	549371	221222	47.8	49.9	47.1	-2.8
179534	548011	214566	52.4	51.3	48.5	-2.8
179536	548045	214628	50.5	49.3	46.5	-2.8
179537	548051	214640	50.4	49.2	46.4	-2.8
185329	548085	214763	55.3	54.1	51.3	-2.8
210917	549379	221223	46.6	48.7	46.0	-2.7
210921	549394	221223	46.0	48.1	45.4	-2.7
210923	549400	221223	45.8	47.9	45.2	-2.7
179506	547980	214515	48.1	47.0	44.4	-2.6
179507	547981	214519	48.9	47.9	45.3	-2.6
179532	548075	214741	50.0	48.7	46.1	-2.6
160107	548357	208657	38.8	42.3	39.8	-2.5
210919	549385	221223	46.2	48.1	45.6	-2.5
210925	549407	221223	45.3	47.3	44.8	-2.5
210929	549423	221224	44.8	46.8	44.3	-2.5
180494	547837	214355	49.2	48.5	46.0	-2.5
180643	547957	214521	46.3	45.3	42.8	-2.5
179566	548068	214728	47.9	46.7	44.2	-2.5
210906	549335	221197	42.1	43.5	41.1	-2.4
210927	549414	221224	45.0	47.0	44.6	-2.4
210931	549432	221224	44.4	46.4	44.0	-2.4
212225	549248	221239	54.2	52.8	50.4	-2.4
179745	547878	214372	46.9	46.2	43.8	-2.4
213034	549450	221225	43.4	45.8	43.5	-2.3
179559	548014	214562	45.1	44.0	41.7	-2.3
180622	548121	214787	44.5	43.3	41.0	-2.3
172856	546837	209286	43.6	42.2	40.0	-2.2
172857	546835	209294	45.0	43.8	41.6	-2.2
172858	546837	209306	43.6	43.2	41.0	-2.2
172860	546838	209314	43.5	43.7	41.5	-2.2
172861	546839	209318	42.7	43.1	40.9	-2.2
208021	549239	221226	54.2	52.6	50.4	-2.2
179509	547913	214417	45.0	44.2	42.0	-2.2
180292	547936	214451	46.1	45.6	43.4	-2.2
179663	548040	214607	43.7	42.7	40.5	-2.2
180245	548051	214693	43.6	42.6	40.4	-2.2

Modelled Receptor Name	X	Y	Annual mean NO <sub>2</sub> concentration (µg/m <sup>3</sup> ) (to 1 decimal place)			
			2014 Base	2021 DM	2021 DS	Change (DS-DM)
172859	546838	209310	42.5	42.3	40.2	-2.1
195035	547919	214473	41.0	40.3	38.2	-2.1
180496	547901	214446	41.6	40.9	38.9	-2.0
179592	548003	214539	41.1	40.2	38.2	-2.0
172862	546843	209327	41.7	42.3	40.4	-1.9
195037	547905	214451	40.8	40.1	38.2	-1.9
206166	549230	221229	52.6	50.7	49.0	-1.7
212222	549238	221242	52.5	50.6	48.9	-1.7
212230	549225	221232	56.6	54.1	52.5	-1.6
212226	549218	221233	54.7	52.3	51.0	-1.3
203742	549084	221248	55.4	51.1	49.9	-1.2
206586	549144	221243	52.2	49.1	47.9	-1.2
206597	549166	221240	52.3	49.2	48.0	-1.2
203425	549118	221256	58.2	54.3	53.2	-1.1
203985	549218	221245	52.7	50.2	49.1	-1.1
206583	549116	221247	55.5	51.9	50.8	-1.1
206584	549168	221251	54.8	51.4	50.3	-1.1
207758	549198	221236	54.6	51.6	50.5	-1.1
208001	549210	221246	55.2	52.3	51.2	-1.1
208069	549190	221238	54.3	51.2	50.1	-1.1
212221	549185	221236	48.9	46.3	45.2	-1.1
142369	544393	211014	40.9	42.6	41.6	-1.0
203745	549156	221241	51.9	48.8	47.8	-1.0
206596	549162	221241	52.1	49.0	48.0	-1.0
207071	549125	221255	57.2	53.4	52.4	-1.0
212220	549173	221238	48.9	46.2	45.2	-1.0
206587	549148	221243	52.4	49.2	48.3	-0.9
151280	548079	204937	41.4	43.6	44.1	0.5
146738	544661	211114	42.5	41.6	42.9	1.3
222753	550185	213741	44.0	46.5	48.8	2.3
222015	550195	214111	41.5	44.4	48.0	3.6
222014	550187	214079	43.8	46.9	50.6	3.7
223106	550184	214019	44.1	47.2	51.0	3.8
222326	550184	214053	44.5	47.7	51.7	4.0
222768	550183	214035	44.9	48.1	52.1	4.0

Table A.1: Modelled Receptors exceeding the Air Quality Objective with a significant change.



## **Appendix 5.5: Recommended Construction Mitigation Measures**





IAQM's guidance, Guidance on the assessment of dust from demolition and construction (2014), provides a set of mitigation measures required for high, medium and low risk sites.

For the proposed scheme, the following mitigation measures are required for High Risk sites, associated with the earthworks activities.

Key to tables:

- H – Minimum Commitment
- D – Enhanced Commitment
- N – Not Required
- Communications

### 1.1.1 Communications

Mitigation Measure	Low Risk	Medium Risk	High Risk
Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.	N	H	H
Display the name and contact details of person(s) accountable for air quality and dust issue on the site boundary. This may be the environment manager/engineer or the site manager.	H	H	H
Display the head or regional office contact information.	H	H	H
Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site. In London additional measures may be required to ensure compliance with the Mayor of London's guidance. The DMP may include monitoring of dust deposition, dust flux, real-time PM <sub>10</sub> continuous monitoring and/or visual inspections.	D	H	H

### 1.1.2 Site Management

Mitigation Measure	Low Risk	Medium Risk	High Risk
Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.	H	H	H
Make the complaints log available to the local authority when asked.	H	H	H
Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.	H	H	H
Hold regular liaison meetings with other high risk construction sites within 500m of the site boundary, to ensure plans are co-	N	N	H

ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/ deliveries which might be using the same strategic road network routes.			
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### 1.1.3 Monitoring

Mitigation Measure	Low Risk	Medium Risk	High Risk
Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of site boundary, with cleaning to be provided if necessary.	D	D	H
Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.	H	H	H
Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.	H	H	H
Agree dust deposition, dust flux, or real-time PM <sub>10</sub> continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.	N	H	H

### 1.1.4 Preparing and maintaining the site

Mitigation Measure	Low Risk	Medium Risk	High Risk
Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.	H	H	H
Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.	H	H	H
Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.	D	H	H
Avoid site runoff of water or mud.	H	H	H
Keep site fencing, barriers and scaffolding clean using wet methods.	D	H	H
Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.	D	H	H
Cover, seed or fence stockpiles to prevent wind whipping.	D	H	H

**1.1.5 Operating vehicle/machinery and sustainable travel**

Mitigation Measure	Low Risk	Medium Risk	High Risk
Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London NRMM standards, where applicable.	H	H	H
Ensure all vehicles switch off engines when stationary - no idling vehicles.	H	H	H
Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.	H	H	H
Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).	D	D	H
Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.	N	H	H
Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).	N	D	H

**1.1.6 Operations**

Mitigation Measure	Low Risk	Medium Risk	High Risk
Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.	H	H	H
Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.	H	H	H
Use enclosed chutes and conveyors and covered skips.	H	H	H
Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	H	H	H
Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.	D	H	H

**1.1.7 Waste management**

Mitigation Measure	Low Risk	Medium Risk	High Risk
Avoid bonfires and burning of waste materials.	H	H	H

**1.1.8 Measures specific to earthworks**

Mitigation Measure	Low Risk	Medium Risk	High Risk
Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.	N	D	H
Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.	N	D	H
Only remove the cover in small areas during work and not all at once.	N	D	D

**1.1.9 Measures specific to construction**

Mitigation Measure	Low Risk	Medium Risk	High Risk
Avoid scabbling (roughening of concrete surfaces) if possible.	D	D	H
Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.	D	H	H
Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overflowing during delivery.	N	D	H
For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.	N	D	D

**1.1.10 Measures specific to trackout**

Mitigation Measure	Low Risk	Medium Risk	High Risk
Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.	D	H	H
Avoid dry sweeping of large areas.	D	H	H
Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.	D	H	H
Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.	N	H	H
Record all inspections of haul routes and any subsequent action in a site log book.	D	H	H
Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.	N	H	H
Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).	D	H	H
Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.	N	H	H

## **Appendix 6.1: Gazetteer of Cultural Heritage Assets**



<b>Site Number</b>	3	<b>Site Name</b>	Cropmark East of Sheering Hall and West of M11
<b>Legal Status</b>	None	<b>NGR</b>	TL4988912980
<b>Value</b>	Medium	<b>Condition</b>	Unknown
<b>Site Type</b>	Linear feature, Ring ditch Cropmark	<b>Period</b>	Prehistoric Uncertain
<b>NMR ref</b>	N/A	<b>HER ref</b>	3326 MEX13264
<b>Description</b>			
Cropmark of pennanular ring ditch and possible associated linear features, included in a plot supplied by the HER. [1] [2] The modern landscape surroundings of this asset do not contribute to our understanding of it. [3]			
<b>Sources</b>			
[1] Essex Historic Environment record [2] Aerial Photograph: Ordnance Survey/71/173/86-87, Ordnance Survey, 1971, 04/05/1971 [3] Walkover survey, August 2014			

<b>Site Number</b>	5	<b>Site Name</b>	Sheering Hall Ringwork
<b>Legal Status</b>	None	<b>NGR</b>	TL4959412864
<b>Value</b>	High	<b>Condition</b>	Fair
<b>Site Type</b>	Ringwork Castle	<b>Period</b>	Early Medieval 11th Century
<b>NMR ref</b>	N/A	<b>HER ref</b>	11009; 13990 MEX13081
<b>Description</b>			
<p>Ringwork within the grounds of Sheering Hall, the north east arc is overlaid by Sheering Hall and obliterated by landscape gardening. The west and south west arcs survive as a strong rampart c1m maximum height above the interior with an outer ditch 4.5m deep from the top of the rampart. The ditch around the west side was and still is dry but on the south and east arcs there was a wet moat formed by diverting the Pincey Brook around the base of the rampart and retained by a bank 2m high on the south of the ringwork. This bay has been breached and the moat is dry. The interior of the work which must have measured c70m in diameter contains no evidence on the surface of interior buildings (the slopes shown on OS 1:25,000 are the result of levelling to accommodate a tennis court. [1])</p> <p>The setting of the ringwork is defined by its relationships with Pincey Brook (the source of water for the 'wet' sections of the moat) and Sheering Hall as the building (or a later incarnation of it) being enclosed. It is not a prominent features in the surrounding landscape due to the dense, mature trees which serve to conceal it from all but the closest viewpoints. Traffic noise from the M11 motorway approximately 300m east of the asset is a constant presence in the modern setting of the asset. [2] [3]</p>			
<b>Sources</b>			
[1] Essex Historic Environment record [2] Walkover survey, August 2014 [3] Essex County Council, 2014, M11 Junction 7A Built Heritage Assessment			



<b>Site Number</b>	6	<b>Site Name</b>	Barn Approximately 10m north of Sheering Hall
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4959312929
<b>Value</b>	High	<b>Condition</b>	Good
<b>Site Type</b>	Aisled barn Agricultural Building	<b>Period</b>	medieval Post-medieval 17th Century
<b>NMR ref</b>	1146975 118250	<b>HER ref</b>	7192 MEX1009272
<b>Description</b>			
<p>Timber framed, weatherboarded, roofed with corrugated plastics material. 6 bays aligned approx. N-S, one midstrey to W in third bay from S. C19 and C20 lean-to extensions to E. Half-hipped at both ends. The 3 N bays are older in material and design than the remainder. The N arcade posts have large jowls, shores to the wallposts, arched braces to the tiebeams with struts in the spandrels, arched braces to the arcade plates. The roof trusses have heavy queen struts, and high collars with collar-braces (soulaces). There are 2 butt-purlins in each mainspan roof pitch, with curved wind-bracing to the upper purlins only. The arcade plates and wallplates have face-halved and bladed scarfs. A section of original wall at the NE has curved braces trenched to the inside of the studs, but most of the walls have been rebuilt with primary straight bracing. Immediately S of the central truss the arcade plates are extended with simple scarfs, and all the structure to the S is simpler and lighter. The arcade posts have slender jowls, there are no spandrel struts, the braces to the arcade plates are straight, the queen struts, high collars and collar braces are relatively thin, and there is one clasped through- purlin in each mainspan roof pitch, without wind-bracing. It seems that the 3 northern bays were themselves a reconstruction c.1600 of a medieval aisled barn, with lesser resources of timber and workmanship. [1] [2]</p> <p>During the walkover survey it was observed that this barn had been converted for residential use. [3]</p> <p>The setting of the barn is defined by its relationship with Sheering Hall (asset 8) and the other associated agricultural buildings (Asset 7), all of which are contained within the medieval ringwork (Asset 5). The group was carefully positioned to be close to but concealed from the nearest road, and close enough to Pincey Brook to use it as a source of water for the wet parts of the moat, but outside the flood zone. The asset is largely concealed (and screened) by a belt of tall mixed plantation woodland at the southern edge of the ringwork and following the northern bank of Pincey Brook. Traffic noise from the M11 motorway approximately 300m east of the asset is a constant presence in the modern setting of the asset. [3] [4]</p>			
<b>Sources</b>			
<p>[1] English Heritage National Heritage List  [2] Essex Historic Environment record  [3] Walkover survey, May 2016  [4] Essex County Council, 2014, M11 Junction 7A Built Heritage Assessment</p>			

<b>Site Number</b>	7	<b>Site Name</b>	<b>Barn Approximately 30m north-west of Sheering Hall</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4962312918
<b>Value</b>	High	<b>Condition</b>	Good
<b>Site Type</b>	Aisled barn Agricultural Building	<b>Period</b>	Post Medieval 17th Century
<b>NMR ref</b>	1111360 118251	<b>HER ref</b>	7193 MEX1009273
<b>Description</b>			
<p>Timber framed, weatherboarded, roofed with corrugated plastics material. 7 bays aligned NE-SW, no midstrey, wooden doors to SE in third bay from SW, corrugated iron doors in NE end. Jowled posts, some exhibiting bark. Tiebeams straight or of irregular natural curvature. Arched braces to tiebeams and arcade plates, some of irregular curvature. Queen post roof. Birdmouthed collars between side purlins at mid-points between trusses. Walls mainly rebuilt, with primary straight bracing. [1] [2]</p> <p>The setting of the barn is defined by its relationship with Sheering Hall (asset 8) and the other associated agricultural buildings (Asset 6), all of which are contained within the medieval ringwork (Asset 5). The group was carefully positioned to be close to but concealed from the nearest road, and close enough to Pincey Brook to use it as a source of water for the wet parts of the moat, but outside the flood zone. The asset is largely concealed (and screened) by a belt of tall mixed plantation woodland at the southern edge of the ringwork and following the northern bank of Pincey Brook. Traffic noise from the M11 motorway approximately 300m east of the asset is a constant presence in the modern setting of the asset. [3] [4]</p>			
<b>Sources</b>			
<p>[1] English Heritage National Heritage List  [2] Essex Historic Environment record  [3] Walkover survey, May 2016  [4] Essex County Council, 2014, M11 Junction 7A Built Heritage Assessment</p>			

<b>Site Number</b>	8	<b>Site Name</b>	<b>Sheering Hall</b>
<b>Legal Status</b>	Grade II* Listed Building	<b>NGR</b>	TL4962012882
<b>Value</b>	High	<b>Condition</b>	Good
<b>Site Type</b>	Hall House, Wealden House House	<b>Period</b>	Medieval Post Medieval 15th & 16th Century
<b>NMR ref</b>	1337229 118249	<b>HER ref</b>	7191 MEX1009271
<b>Description</b>			
<p>Pair of hall houses, late C15 and early C16, comprising a 'Unit System' group of manorial status, combined to form one house and extended in C19 and C20. Timber framed, roughcast rendered, roofed with handmade red clay tiles. (1) Wealden house, late C15, aligned approx. NW-SE, with storeyed end to SE jettied on both sides, 2 bay hall ending in a hip, with no original storeyed accommodation to the NW. (2) Abutting on the NW end aligned approx. NE-SW, hall house, early C16, with integral storeyed SW end, 2 bay hall, storeyed crosswing to NE. Cellar under NE bay of hall. Inserted axial chimney stack in SW bay of hall, late C16. Stair tower in E angle. External chimney stack at NE side of crosswing (3) C19 extension to NW of (2) forming an approx. Z-plan (4) Extension c.1900, to SE of (1) with axial chimney stack at the junction (5) Miscellaneous small extensions, C19 and C20, on all sides. Two storeys. SW elevation, ground floor, 3 bay windows, c.1900, double glazed doors in tiled gabled porch. First floor, 4 C20 casement windows with facade gables above. Jetty in middle section. Roof hipped at SE end only. (1) Some framing exposed internally, mainly on ground floor. Transverse joists of horizontal section, unchamfered, forming the NE jetty over the angle staircase. Crownpost roof, with original hip rafter at NW end, smoke-blackened to end, now enclosed in later extension. Plain crownpost with arch braces. Roof mainly complete, including original wattle and daub partition between hall and storeyed SW end. Ground floor hearth at junction of the 2 houses has stone surround with bolection moulding. Ground floor room at SE end has fire surround of grey marble with carved wooden surround, egg-and-dart at sides, acorn and oak leaf design above, and ceiling has floral band, all c.1900. (2) Axial beam of inserted floor in hall plain chamfered with lamb's tongue stops. Cambered central tiebeam of hall, originally with deep arched braces of which one is severed for a closet door, the other removed. Crownpost of octagonal section with step stops and 4 arched braces of thin section. Roof mainly complete, smoke-blackened over hall. C18 window in SE end of crosswing at first floor level, one fixed light with 2 vertical iron bars, one wrought iron casement, with rectangular panes including some early glass and original leading, all in hardwood frame, a rare feature to survive in this condition. This pair of houses is of exceptional interest. (1) It is the only Wealden house known in Essex at this date which is jettied on both sides, although this occurs in the Weald itself. The roof structure, indicating original hips at both ends is unusually complete, although the lower part of the house is much altered. The 'Unit System' group is rare at manorial level; a parallel exists at Leaden Roding Hall, but with many differences. The 'Unit System' enabled 2 generations of the same family to live in close proximity but with separate household arrangements, working the</p>			

same land. Where identified elsewhere the smaller house is the later in date, but here the reverse seems to apply. It seems unlikely that house (1) comprised a manor house originally, with only one storeyed end, so an earlier manor house on the site of (2) can be presumed, replaced in a phased renewal programme in which the Wealden house was built before the main manor house was rebuilt. [1]

More recently, Sheering Hall has been owned and enhanced by a series of celebrity residents, the last of which was Steve Harris of Iron Maiden, who's legacy includes an indoor swimming pool with spectacular Viking themed mosaics.. [3]

The setting of Sheering Hall is defined by its relationship with the two later barns (assets 6 and 7) and the medieval ringwork within which it sits (Asset 5). The group was carefully positioned to be close to but concealed from the nearest road, and close enough to Pincey Brook to use it as a source of water for the wet parts of the moat, but outside the flood zone. The asset is largely concealed (and screened) by a belt of tall mixed plantation woodland at the southern edge of the ringwork and following the northern bank of Pincey Brook. Traffic noise from the M11 motorway approximately 300m east of the asset is a constant presence in the modern setting of the asset. [4] [5]

#### Sources

- [1] English Heritage National Heritage List
- [2] Essex Historic Environment record
- [3] Hamptons, 2014, Sheering Hall, Estate agent particulars
- [4] Walkover survey, May 2016
- [5] Essex County Council, 2014, M11 Junction 7A Built Heritage Assessment

<b>Site Number</b>	9	<b>Site Name</b>	Potter's Croft Field Name
<b>Legal Status</b>	None	<b>NGR</b>	TL4915312379
<b>Value</b>	Negligible	<b>Condition</b>	Unknown
<b>Site Type</b>	Pottery works Placename Evidence	<b>Period</b>	Medieval Post Medieval
<b>NMR ref</b>	N/A	<b>HER ref</b>	4685 MEX13088

#### Description

Potter's Croft is recorded as a field name east of Campions. [1] This land is now under intensive arable production, and no surface evidence for historic pottery production was observed during the walkover survey. [2]

The modern landscape setting of this asset does not contribute to our understanding of it. [2]

#### Sources

- [1] Essex Historic Environment record
- [2] Walkover survey, August 2014

<b>Site Number</b>	10	<b>Site Name</b>	Neolithic Polished Axe
<b>Legal Status</b>	None	<b>NGR</b>	TL4925012320
<b>Value</b>	Low	<b>Condition</b>	Destroyed
<b>Site Type</b>	Findspot Artefact Scatter	<b>Period</b>	Prehistoric Neolithic
<b>NMR ref</b>	N/A	<b>HER ref</b>	28124 MEX40975

#### Description

Casual find of a Neolithic polished axe in 1995. Taken to Harlow Museum for recording. [1]

The setting of surface finds are not considered to contribute to our understanding of them. [2]

#### Sources

- [1] Essex Historic Environment record
- [2] Walkover survey, August 2014

<b>Site Number</b>	11	<b>Site Name</b>	Harlowbury Brickworks (site of)
<b>Legal Status</b>	None	<b>NGR</b>	TL4874712309
<b>Value</b>	Negligible	<b>Condition</b>	Unknown
<b>Site Type</b>	Brickworks Brick and Tilemaking Site	<b>Period</b>	Post Medieval 19th Century
<b>NMR ref</b>	N/A	<b>HER ref</b>	3184 MEX1037231
<b>Description</b>			
<p>Harlowbury brickworks (operating 1830's to 1870's or later), located east of Marsh Lane, north west of Campions and south of Pincey Brook. [1]</p> <p>Operators: Richard Prior, early 1830's, and Henry Prior, late 1830s. Richard Prior was also a brickmaker at Bishops Stortford, Hertfordshire. [1] Although no buildings associated with brickmaking are indicated on early OS maps, a number of ponds and the field name "Brick Field" are noted on the first edition 1:10,560 map of 1881. [2] The majority of this asset is now agricultural land, and no surface trace was noted during the walkover survey. [3]</p> <p>The modern landscape setting of this asset does not contribute to our understanding of it.</p>			
<b>Sources</b>			
<p>[1] Essex Historic Environment record</p> <p>[2] Ordnance Survey, 1881, 1st Edition 1:10,560, Essex, Sheet XLII</p> <p>[3] Walkover survey, August 2014</p>			

<b>Site Number</b>	12	<b>Site Name</b>	Gilden Way Cropmarks
<b>Legal Status</b>	None	<b>NGR</b>	TL4843712032
<b>Value</b>	Medium	<b>Condition</b>	Unknown
<b>Site Type</b>	Ring ditch, Linear feature, Pit Cropmark	<b>Period</b>	Prehistoric Uncertain
<b>NMR ref</b>	N/A	<b>HER ref</b>	4177 MEX1038592
<b>Description</b>			
<p>Cropmarks of a ring-ditch with a central pit, linear features and associated maculae which could be pits. No pits are recorded on the NMP plot. [1] [2]</p> <p>The modern landscape setting of this asset does not contribute to our understanding of it. [3]</p>			
<b>Sources</b>			
<p>[1] Essex Historic Environment record</p> <p>[2] Aerial Photograph: 58/30/PTII/3295-3297, RAF, 1948</p> <p>[3] Walkover survey, August 2014</p>			

<b>Site Number</b>	<b>13</b>	<b>Site Name</b>	<b>Tudor Cottage</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4864611926
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Timber framed house Dwelling	<b>Period</b>	Post Medieval 17th Century
<b>NMR ref</b>	1337094 119600	<b>HER ref</b>	6163 MEX1007149
<b>Description</b>			
<p>Early C17 with later C17 alterations. Pargetted render over timber frame; gabled old plain tile roof; early C19 brick ridge stack with 2 diagonally-set flues . Two-unit lobby-entry plan 2 storeys; 2-window range. Blocked central door- way and C20 casements. C20 door in right gable end of early C19 parallel range to rear; small kitchen extension to rear left(of 1987). [1]</p> <p>Interior: room to left has joists of heavy scantling, firebeam with pegholes for missing stud for jamb of front doorway. Room to right has chamfered bressumer over open fireplace and later C17 ogee-stopped beam and narrow joists. First floor has exposed jowled posts, chamfered wall plates, A-frame truss to left and tie beams of 2 closely-spaced trusses flanking stack; inspection of roof not possible. [1]</p> <p>The grid reference given in the National Heritage List is incorrect, and this entry has been amended to reflect the walkover survey results. This indicated that the building described in the National Heritage List (NHL) is c 100m north of the given grid reference. [3]</p> <p>Tudor Cottage is surrounded by modern development, which defines its modern setting. This does not contribute to our understanding of it. [3] [4]</p>			
<b>Sources</b>			
<p>[1] Historic England National Heritage List  [2] Essex Historic Environment Record  [3] Walkover survey, August 2014  [4] Essex County Council, 2014, M11 Junction 7A Built Heritage Assessment</p>			

<b>Site Number</b>	<b>14</b>	<b>Site Name</b>	<b>Medieval Pottery Scatter</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4870011930
<b>Value</b>	Low	<b>Condition</b>	Destroyed
<b>Site Type</b>	Findspot Artefact Scatter	<b>Period</b>	Medieval
<b>NMR ref</b>	N/A	<b>HER ref</b>	28087; 3414 MEX40873
<b>Description</b>			
<p>A watching brief found evidence of medieval pottery lying on the surface of a stripped area. A total of 3 sherds were recovered. The stripping of the site had only removed some of the topsoil with natural visible in places. No features were easily identifiable. [1] This area is shown as farmland until the mid 20th century when it is labelled as "allotment gardens" by the OS. [2] [3] Now the site of a small modern housing estate. [4]</p> <p>The modern landscape setting of this asset does not contribute to our understanding of it. [4]</p>			
<b>Sources</b>			
<p>[1] Essex Historic Environment record  [2] Ordnance Survey, 1947, 1:10,560, Essex, Sheet 23  [3] Medlycott, M., 2004, Matching: Historic settlement assessment, Essex CC  [4] Walkover survey, August 2014</p>			

<b>Site Number</b>	15	<b>Site Name</b>	Pump 20m south-west of Mayfield Farmhouse
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4885012044
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Pump Water Supply Site	<b>Period</b>	Post Medieval 19th Century
<b>NMR ref</b>	1111367 118267	<b>HER ref</b>	7209 MEX1009289
<b>Description</b>			
<p>Cast iron pump, late C19, against N wall of lean-to extension at E end of barn, approx. 20 metres SSW of Mayfield Farmhouse. Cap with fluted dome and fluted spike finial. Fluted upper barrel. On lower barrel, raised device, corroded, possibly a lion, and raised lettering, corroded, possibly E.J. Linton. Handle ending in knop. [1] [2] Observed to be in good condition during walkover survey. [3]</p> <p>The setting of the pump is defined by its relationship with Mayfield Farm (Asset 31), and in particular the adjacent weatherboarded barn. [3] [4]</p>			
<b>Sources</b>			
<p>[1] English Heritage National Heritage List  [2] Essex Historic Environment record  [3] Walkover Survey, August 2014  [4] Essex County Council, 2014, M11 Junction 7A Built Heritage Assessment</p>			

<b>Site Number</b>	17	<b>Site Name</b>	Moor Hall (site of)
<b>Legal Status</b>	None	<b>NGR</b>	TL4951311960
<b>Value</b>	Medium	<b>Condition</b>	Poor
<b>Site Type</b>	Manor house House	<b>Period</b>	Medieval Post Medieval
<b>NMR ref</b>	N/A	<b>HER ref</b>	9796 MEX1037407
<b>Description</b>			
<p>The manor of Moor Hall appears to have been formed partly from a ½ hide of land held in 1086 by Eustace of Boulogne and partly from lands held by the Abbey of Bury St Edmunds. It is sited within what was Harlow parish before 1955. The first reference to the name as Le Mourhall is in an Inquisition of 1324. However, by the mid-12th century the demesne tenancy is known to have been held by a Gilbert of Harlow who also held the demesnes of Brent Hall (New Hall) and Hubbard's Hall to the west of Moor hall. It passed in to the hands of the Bugge family in 1443, along with Brent Hall and Hubbards Hall. Moor Hall was rebuilt between 1805 and 1810 as a three-storey mansion in the classical style with 5-bays and a Doric portico. The grounds were extensively landscaped and planted and a chain of natural small lakes were reshaped. In 1849 the estate included Harlow Tye, Jackells, Feltimore and Roffey Hall Farm. A cricket club complete with pitch was founded in 1855. The Matching road was diverted further from the house at the suggestion of Humphrey Repton. [2] The house was further enlarged later in the 19th century. It was occupied by the army in World War II, after which a cycle of decay and vandalism began, culminating in a devastating fire and its final demolition in 1960. [1]</p> <p>Part of the stable block and one of the lodges survive, but are outside the study area. Portions of the planned landscape also still survive. [3]</p>			
<b>Sources</b>			
<p>[1] Essex Historic Environment record  [2] Repton, H., 1881, Report concerning Moor Hall in Harlow Essex a seat of [blank] Perry Esqr. (D/Des T6/2)  [3] Walkover survey, August 2014</p>			

<b>Site Number</b>	20	<b>Site Name</b>	Iron Age pottery findspot
<b>Legal Status</b>	None	<b>NGR</b>	TL4970012000
<b>Value</b>	Low	<b>Condition</b>	Destroyed
<b>Site Type</b>	Findspot Artefact Scatter	<b>Period</b>	Prehistoric Iron Age
<b>NMR ref</b>	N/A	<b>HER ref</b>	18674 MEX13195
<b>Description</b>			
Flint gritted pottery revealed by construction work for M11. [1] The modern landscape setting of this asset does not contribute to our understanding of it.			
<b>Sources</b>			
[1] Essex Historic Environment record			

<b>Site Number</b>	21	<b>Site Name</b>	Gilden Way Archaeological Evaluation
<b>Legal Status</b>	None	<b>NGR</b>	TL4819312237
<b>Value</b>	Low	<b>Condition</b>	Poor
<b>Site Type</b>	Ditch, Post hole	<b>Period</b>	Late Bronze Age Early Iron Age Roman
<b>NMR ref</b>	N/A	<b>HER ref</b>	8357 MEX1039898
<b>Description</b>			
Oxford Archaeology carried out trial-trenching on behalf of CgMs Consulting as part of a staged programme of archaeological investigation ahead of a proposed housing development. This phase of evaluation revealed areas of activity within the site relating to the Bronze Age/early Iron Age, Iron Age, early to late Romano-British and post-medieval periods. Evidence for Saxon activity is light. All features revealed during the evaluation have been truncated by ploughing and are concentrated to the north and north-east of the site. The archaeological evaluation generally confirms the results of the geophysical survey. [1] [2] No surface trace of this asset was visible during the walkover survey. [3] The modern landscape setting of this asset does not contribute to our understanding of it. However, it is one of a number of assets that indicate the archaeological potential of undeveloped land within the study area.			
<b>Sources</b>			
[1] Essex Historic Environment record [2] Oxford Archaeology, 2006, Gilden Way, Harlow, Essex: Archaeological Evaluation Report [3] Walkover survey, August 2014			



<b>Site Number</b>	<b>23</b>	<b>Site Name</b>	<b>High House</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4863411784
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	House Dwelling	<b>Period</b>	Post Medieval 17th Century
<b>NMR ref</b>	1111685 119501	<b>HER ref</b>	
<b>Description</b>			
<p>Externally a thorough renovation of a 17th century house, with rainwater heads dated 1876. Rectangular plan with a T-plan to the roof-ridges owing to a gabled wing above a rear lean-to of full length. Peg-tiled, and with a central red brick chimney-stack of the 17th century 'concertina' type. Timber frame exposed with plaster infill, and casement windows. Storey posts visible in the end-walls have jowls. [1]</p> <p>High House was historically detached from the villages that now form the outer suburbs of Harlow, and its modern setting is defined and limited by its relationship with Matching Road and the many later buildings surrounding it. [2] [3]</p>			
<b>Sources</b>			
<p>[1] English Heritage National Heritage List  [2] Walkover survey, August 2014  [3] Essex County Council, 2014, M11 Junction 7A Built Heritage Assessment</p>			

<b>Site Number</b>	<b>24</b>	<b>Site Name</b>	<b>House 20m north-west of St Stephen's Cottages</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4947611503
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	House	<b>Period</b>	Post Medieval 17th Century
<b>NMR ref</b>	1337570 118141	<b>HER ref</b>	N/A
<b>Description</b>			
<p>Lobby-entrance house, early C17, altered in C19, disused when inspected in March 1983. Timber framed, partly plastered, partly tile-hung, partly bricked, roofed with handmade red clay tiles. 3 bays aligned approx. NW-SW, aspect NE with axial chimney stack of 4 grouped diagonal shafts in middle bay, forming a lobby entrance. Bakehouse to SE with chimney stack at end. 2 storeys. Plain door under tiled gabled hood supported on elaborately carved scrolled brackets, late C19. 2 windows on ground floor, 3 on first floor, boarded over when inspected. Front elevation plastered, with label mouldings over ground floor windows, forming a symmetrical composition. Gable ends hung with handmade red clay tiles, mostly plain, banded with fishtail tiles. Elaborately scrolled bargeboards, C19. Ground floor of rear wall bricked. NW ground floor room, axial beam plain-chamfered with bar stops, plain-chamfered joists of vertical section. Remainder of interior not seen, but reported to be open to roof on first floor. This is a symmetrical lobby-entrance house of high quality, C17 in basic structure, treated with some architectural distinction in the late c19, and unaffected by modernisation since. An estate map of 1807 shows the present building as the farmhouse of Feltimores Farm, with 3 other buildings on the site. It was bought by the Perry-Watlington. Estate in 1831, and sometime after 1849 a new farm complex was built approx. 350 metres to the SW, the present Feltimores Farm. [1]</p> <p>At the time of the walkover survey it was noted that this asset had recently been extensively renovated and was in god condition. [2]</p>			
<b>Sources</b>			
<p>[1] English Heritage National Heritage List  [2] Walkover survey, August 2014</p>			

<b>Site Number</b>	25	<b>Site Name</b>	Flint Blades and Core (Pincey Brook)
<b>Legal Status</b>	None	<b>NGR</b>	TL5008813017
<b>Value</b>	Medium	<b>Condition</b>	Destroyed
<b>Site Type</b>	Findspot Artefact Scatter	<b>Period</b>	Prehistoric Mesolithic
<b>NMR ref</b>	N/A	<b>HER ref</b>	6591 MEX15842
<b>Description</b>			
<p>Two Mesolithic blades and a core found while field walking north of Pincey Brook in 1973. [1]</p> <p>A number of prehistoric finds have been discovered on the slopes of Pincey Brook, which appears to have been an important route along which prehistoric settlement could penetrate the boulder clay plateau. A late Bronze Age tanged chisel/leatherworking knife was given to ECC for identification. [1]</p> <p>The modern landscape setting of this asset does not contribute to our understanding of it. However, it is one of a number of assets that indicate the archaeological potential of undeveloped land within the study area.</p>			
<b>Sources</b>			
[1] Essex Historic Environment record			

<b>Site Number</b>	26	<b>Site Name</b>	95 Sheering Road / Medway
<b>Legal Status</b>	Locally Listed Building	<b>NGR</b>	TL4862911876
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	House Building	<b>Period</b>	Post Medieval 18th Century
<b>NMR ref</b>	N/A	<b>HER ref</b>	N/A
<b>Description</b>			
<p>Detached house shown on Chapman Andre map of Essex (1771) and 1st edition OS 1:10,560 (1881). [1] [2] Two storey house with steeply pitched, tiled roof and end chimney stacks, with a rendered exterior. [3] Now named 'Medway'. [4]</p> <p>95 Sheering Road was historically detached from the villages that now form the outer suburbs of Harlow, and its modern setting is defined and limited by its relationship with Matching Road and the later residential development surrounding it. [2] [3] [5]</p>			
<b>Sources</b>			
<p>[1] Chapman, J and Andre, P., 1777, Map of Essex (E912.267)</p> <p>[2] Ordnance Survey, 1881, 1st edition, 1:10,560, Essex, Sheet 23</p> <p>[3] Walkover survey, August 2014</p> <p>[4] Harlow Council, 2011, Schedule of Locally Listed Buildings</p> <p>[5] Essex County Council, 2014, M11 Junction 7A Built Heritage Assessment</p>			

<b>Site Number</b>	27	<b>Site Name</b>	Former gravel pit 1
<b>Legal Status</b>	None	<b>NGR</b>	TL4860012100
<b>Value</b>	Negligible	<b>Condition</b>	Destroyed
<b>Site Type</b>	Quarry Extraction site	<b>Period</b>	Post Medieval Modern
<b>NMR ref</b>	N/A	<b>HER ref</b>	N/A
<b>Description</b>			
Gravel pit indicated at this location on the 1923 edition Ordnance Survey 1:10,560 map. [1] No trace of this site is visible on the surface. [2] The modern landscape setting of this asset does not contribute to our understanding of it.			
<b>Sources</b>			
[1] Ordnance Survey, 1923, 3rd edition, 1:10,560, Essex, Sheet [2] Walkover survey, August 2014			

<b>Site Number</b>	29	<b>Site Name</b>	129 Sheering Road
<b>Legal Status</b>	None	<b>NGR</b>	TL4885112151
<b>Value</b>	Low	<b>Condition</b>	Good
<b>Site Type</b>	House Dwelling	<b>Period</b>	Post Medieval 19th Century
<b>NMR ref</b>	N/A	<b>HER ref</b>	N/A
<b>Description</b>			
A house is indicated at this location on the 1881 Ordnance Survey 1:10,560 map. [1] A dwelling consisting of a complex group of single storey structures of rendered brick was observed here during the walkover survey. It was unclear if this is the same building shown in 1881, although it may be incorporated into the current house. [2] (see following paragraphs: Eaves now identified as a modern dwelling, but former lodge to Campions (Asset 32) is still extant as 129 Sheering Road. [3]) This asset and its surroundings was investigated in more detail during a second walkover survey in 2016, when it was established that 129 Sheering Road was originally a gatelodge to Campions (Asset 32). It is a single-storey structure; square in plan with later extensions added to the north and east elevations. It is located within a tall garden wall of handmade red brick which originally formed the boundary between Campions and Sheering Road. [3] The value of this asset is derived from its modest architectural value; and its group value with surviving elements of the Campions group (Asset 32) such as the garden wall. Its roadside location contributes to our understanding of its historic function as a gatelodge to a larger house.			
<b>Sources</b>			
[1] Ordnance Survey, 1881, 1st edition, 1:10,560, Essex, Sheet LXII [2] Walkover survey, August 2014 [3] Walkover survey, May 2016			

<b>Site Number</b>	<b>30</b>	<b>Site Name</b>	<b>Boat house (site of)</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4885612470
<b>Value</b>	Negligible	<b>Condition</b>	Destroyed
<b>Site Type</b>	Boathouse Building	<b>Period</b>	Post Medieval 19th Century
<b>NMR ref</b>	N/A	<b>HER ref</b>	N/A
<b>Description</b>			
<p>The site of a boathouse is indicated at this location on a 1:2500 map published by the Ordnance Survey in 1923. [1] No trace of this asset was visible during the walkover survey. [2]</p> <p>The historic setting of this asset was defined by its relationship with the lake to the west, and despite the absence of a standing structure this relationship still continues through any buried archaeological remains.</p>			
<b>Sources</b>			
<p>[1] Ordnance Survey, 1923, 1:10,560, Essex, Sheet XLII</p> <p>[2] Walkover survey, August 2014</p>			

<b>Site Number</b>	<b>31</b>	<b>Site Name</b>	<b>Mayfield Farm</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4886912076
<b>Value</b>	Low	<b>Condition</b>	Good
<b>Site Type</b>	Farm Agricultural Building	<b>Period</b>	Post Medieval 19th Century 20th Century
<b>NMR ref</b>	N/A	<b>HER ref</b>	N/A
<b>Description</b>			
<p>A farm is first indicated at this location on an Ordnance Survey map published in 1923. The land occupied by Mayfield Farm is recorded as farmland belonging to the Moor Hall estate on the Harlow Tithe map, but to have been sold to Samuel Porter Matthews, owner of Campions west of Sheering Road in sale particulars dated 1899. This appears to corroborate a very early 20th century date for its construction. [1] [2] [3]</p> <p>The buildings were arranged in a courtyard plan with a detached farmhouse and barn, both located to the south-west. The farmhouse is shown by the Ordnance Survey as a pair of semi-detached cottages, which appear to have been turned into a single dwelling at a later date. [1] [4]</p> <p>The courtyard buildings are all of a single storey and built from stock bricks in Flemish bond with modern pantile pitched roofs. They are likely to have originally been cow houses and storage, and have been converted for use as retail premises, a bakery and café. [4] [5]</p> <p>A single building to the south of the courtyard depicted on contemporary maps may have originally been a small detached dairy. It is a single-storey, one room structure of rendered brick with a steeply pitched hipped roof with an overhanging porch to the north gable and entrance. The porch is supported by rustic columns formed from tree trunks, which may not be original although they are supported by carved stone bases. [4] [5]</p> <p>Although of 20th century date the detached barn is constructed in a traditional Essex weatherboarded style, with a steeply pitched tiled roof and a pedimented central bay. [4] [5]</p>			
<b>Sources</b>			
<p>[1] Ordnance Survey, 1923, 1:10,560, Essex, Sheet XLII</p> <p>[2] Harlow Tithe Map and Apportionment 1848</p> <p>[3] Moor Hall Sale Particulars 1899</p> <p>[4] Walkover survey, August 2014</p> <p>[5] Walkover survey, May 2016</p>			

<b>Site Number</b>	<b>32</b>	<b>Site Name</b>	<b>Campions</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4887512258
<b>Value</b>	Low	<b>Condition</b>	Fair
<b>Site Type</b>	House Dwelling	<b>Period</b>	Post Medieval Modern
<b>NMR ref</b>	N/A	<b>HER ref</b>	N/A
<b>Description</b>			
<p>Campions is a much altered country house and grounds indicated on the 1st edition Ordnance Survey 1:10,560 map of 1881, and that takes its name from the family that held the land during the 14th century. [1] [2] The house was extensively renovated and extended during the 1920s following a fire, and was converted into a number of flats during the 1950s. [2] It was not possible to investigate Campions itself or the outbuildings to the north during the walkover surveys. [3] [4]</p> <p>A number of associated outbuildings including a coach house survive to the north-west of the main house, and a number of modern dwellings have been constructed within the former walled garden and orchard to the south. [3] A hand-made brick incorporated in the garden wall is inscribed with the initials SPM and year 1830, which ties in with ownership of Campions by Samuel Porter Matthews as recorded in the Harlow Tithe Map. [5]</p> <p>Campions is largely concealed from view by its tall garden wall which flanks the north side of Sheering Road, and by dense mature trees. Although the presence of Sheering Road is felt through traffic noise, Campions retains a secluded setting, which is even more pronounced at the range of outbuildings to the north-west which are set further back from the existing road.</p>			
<b>Sources</b>			
<p>[1] Ordnance Survey, 1881, 1st edition, 1:10,560, Essex, Sheet XLII  [2] Powell, W.R., (Ed.), 1983, A History of the County of Essex, Vol. 8, Victoria County History  [3] Walkover survey, August 2014  [4] Walkover survey, May 2016  [5] Harlow Tithe Map and Apportionment 1848</p>			

<b>Site Number</b>	<b>33</b>	<b>Site Name</b>	<b>Ealing Bridge</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4899212560
<b>Value</b>	Low	<b>Condition</b>	Fair
<b>Site Type</b>	Bridge Road Transport Site	<b>Period</b>	Post Medieval Modern
<b>NMR ref</b>	N/A	<b>HER ref</b>	N/A
<b>Description</b>			
<p>Bridge carrying Sheering Road over Pincey Brook is indicated at this location on the Chapman Andre map of Essex (1771) and 1st edition OS 1:10,560 (1881). [1] [2] The present bridge is of modern concrete construction with a parapet comprising concrete uprights and two rails of steel tubes. [3]</p> <p>The setting of Ealing Bridge is defined by its function as a crossing point of Pincey Brook on the road linking Harlow with Sheering and beyond.</p>			
<b>Sources</b>			
<p>[1] Chapman, J and Andre, P., 1777, Map of Essex (E912.267)  [2] Ordnance Survey, 1881, 1st edition, 1:10,560, Essex, Sheet 23  [3] Walkover survey, August 2014</p>			

<b>Site Number</b>	35	<b>Site Name</b>	The Bothy
<b>Legal Status</b>	None	<b>NGR</b>	TL4944911571
<b>Value</b>	Low	<b>Condition</b>	Good
<b>Site Type</b>	House	<b>Period</b>	Modern; 20 <sup>th</sup> Century
<b>NMR ref</b>	N/A	<b>HER ref</b>	N/A
<b>Description</b>			
<p>A building is first shown at this location on the 1923 edition Ordnance Survey 1:10,560 map. [1]  This asset was observed from the highway to be a timber-clad bungalow with a central chimney stack of red brick, and a pitched roof of red tiles. It is surrounded by mature trees, and hedges which limit its visibility and define its setting. [2]</p>			
<b>Sources</b>			
<p>[1] Ordnance Survey, 1923, 1st edition, 1:10,560, Essex, Sheet 42  [2] Walkover survey, August 2014</p>			

<b>Site Number</b>	36	<b>Site Name</b>	St Stephen's Cottages
<b>Legal Status</b>	None	<b>NGR</b>	TL4948511473
<b>Value</b>	Low	<b>Condition</b>	Good
<b>Site Type</b>	House	<b>Period</b>	Modern; 20 <sup>th</sup> Century
<b>NMR ref</b>	N/A	<b>HER ref</b>	N/A
<b>Description</b>			
<p>A pair of brick cottages first shown on the 1923 edition Ordnance Survey 1:10,560 map. [1]  This asset was observed from the highway. It consists of a pair of two storey cottages each of a T-plan arrangement. Each is of two bays facing Chalk Lane to the east, with a projecting bay with a gable forming a valley roof in the centre. The main roof is pitched, and comes down to the first floor windows on the outer bays, where it forms a porch over the front doors of both cottages. It has red brick end stacks, and the roof is of red tiles. All windows have been replaced with modern timber casements. Most of the rainwater goods have been replaced with UPVC, although a cast iron downpipe and hopper is retained at the centre bay valley gutter. [2]</p>			
<b>Sources</b>			
<p>[1] Ordnance Survey, 1923, 1st edition, 1:10,560, Essex, Sheet 42  [2] Walkover survey, August 2014</p>			

<b>Site Number</b>	37	<b>Site Name</b>	Guide Post
<b>Legal Status</b>	None	<b>NGR</b>	TL4945511607
<b>Value</b>	Negligible	<b>Condition</b>	Good
<b>Site Type</b>	Sign Post; Street Furniture	<b>Period</b>	Modern; 20th Century
<b>NMR ref</b>	N/A	<b>HER ref</b>	N/A
<b>Description</b>			
<p>A "Guide Post" is indicated at this location on the first edition OS 1:10,560, and the walkover survey confirmed that what appeared to be a modern facsimile of a traditional sign post is still located here. [1] [2] The sign has three wooden leaves with directions indicated in raised letters to: Epping, Harlow, Chalk Lane, Matching Tye and Matching Green. The post is wooden, square in cross-section with a chamfered top. [2]  The setting of the guide post is defined by its relationship with Matching Road, and particularly its position adjacent to the junction with Chalk Lane.</p>			
<b>Sources</b>			
<p>[1] Ordnance Survey, 1881, 1st Edition, 1:10,560, Essex. Sheet XLII  [2] Walkover survey, August 2014</p>			

<b>Site Number</b>	<b>38</b>	<b>Site Name</b>	<b>Post Box</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4945711607
<b>Value</b>	Negligible	<b>Condition</b>	Fair
<b>Site Type</b>	Post Box Street Furniture	<b>Period</b>	Modern 20th Century
<b>NMR ref</b>	N/A	<b>HER ref</b>	N/A
<b>Description</b>			
<p>A 'lamp box' type post box with an Elizabeth II cypher was observed at this location during the walkover survey. [1] It is attached to a wooden post, and is not shown on any of the Ordnance Survey maps consulted.</p> <p>The setting of the guide post is defined by its relationship with Matching Road, where it was positioned to service a historically larger rural community when the primary means of long-distance communication was still by letter.</p>			
<b>Sources</b>			
[1] Walkover survey, August 2014			

<b>Site Number</b>	<b>39</b>	<b>Site Name</b>	<b>Former gravel pit 3</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4975012890
<b>Value</b>	Negligible	<b>Condition</b>	Destroyed
<b>Site Type</b>	Quarry Extraction Site	<b>Period</b>	Post Medieval 19th Century
<b>NMR ref</b>	N/A	<b>HER ref</b>	N/A
<b>Description</b>			
<p>A former gravel pit is noted at this location on the 1st edition 1:2,500 Ordnance Survey map. [1] No surface trace of this asset was observed during the walkover survey, although its outline is visible on some aerial photographs. [2] [3]</p> <p>The modern landscape setting of this asset does not contribute to our understanding of it.</p>			
<b>Sources</b>			
<p>[1] Ordnance Survey, 1890, 1:2,500, Essex, Sheet XLII</p> <p>[1] Walkover survey, August 2014</p> <p>[3] Google Earth, Imagery dated 31/12/2009</p>			



<b>Site Number</b>	42	<b>Site Name</b>	Prehistoric ditches Mark Hall School
<b>Legal Status</b>	None	<b>NGR</b>	TL4709010836
<b>Value</b>	Low	<b>Condition</b>	Destroyed
<b>Site Type</b>	Enclosure Enclosure	<b>Period</b>	Prehistoric Bronze Age
<b>NMR ref</b>	N/A	<b>HER ref</b>	MEX1038885 46337
<b>Description</b>			
<p>An archaeological excavation was carried out by ECC Field Archaeology Unit on the area of a new sports facility at Mark Hall School, Harlow. An evaluation by trial trenching in the Spring of 2004 had indicated the presence of archaeological features. Although the site had been partly levelled, probably during the construction of the school playing fields, a range of archaeological remains were identified dating from the Late Bronze Age/ early Iron Age, Roman and post-medieval periods.</p> <p>The late Bronze Age / early iron Age activity is marked by a sinuous field boundary ditch running north-south and part of a subcircular enclosure, measuring c. 50m in diameter. The lack of artefacts collected from the enclosure gullies suggests that it was agricultural in nature, perhaps a cattle pen or corral. Associated with the enclosure were two small pits containing 'placed deposits' of animal remains. Both comprised the jaws and partially articulated lower legs of cattle. In the boundary ditch was the skeleton of a new-born lamb [1]. The modern landscape setting of this asset does not contribute to our understanding of it.</p>			
<b>Sources</b>			
[1] Essex Historic Environment Record			

<b>Site Number</b>	45	<b>Site Name</b>	Gate Lodge (115 East Park)
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4717911374
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Lodge Dwelling	<b>Period</b>	Post-medieval 19th Century
<b>NMR ref</b>	1169204	<b>HER ref</b>	MEX1007032 31643
<b>Description</b>			
<p>Formerly pertaining to Marks Hall. One storey, of stock brick in Flemish bond on square plan with ridged gabled and slated roof. Verges dentilled, and transom soffit. South front gable supported on 4 round and slender Doric columns, over stone paved walkway. Central door with 6 fielded panels, with a pair of hornless and small-paned sashes each side of it, under straight gauged arches. Two matching sashes in each side wall, and a modern extension at the rear to the west. Matching columns and pediment on north end elevation. [1] [2]</p> <p>Historically, the Lodge was located at the end of one of the eastern approaches to the Mark Hall estate. [3] Although traces of its parkland surroundings can still be discerned in the form of mature plantation trees retained within the modern residential developments, its setting is dominated by the proximity of modern housing on East Park. [4]</p>			
<b>Sources</b>			
<p>[1] National Heritage List  [2] Essex Historic Environment Record  [3] Ordnance Survey, 1880-84, 1:2,500, Essex, Sheet XLI  [4] Walkover survey, May 2016</p>			

<b>Site Number</b>	46	<b>Site Name</b>	<b>Garden Wall to Fawbert and Barnards School</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4720311327
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Garden Wall Garden Building	<b>Period</b>	Post-medieval 19th Century
<b>NMR ref</b>	1111678	<b>HER ref</b>	MEX1007068 31679
<b>Description</b>			
Dwarf wall, stock brick, with C19 spear-rails, round arched central gateway, and straight arched gateways at each end. All with good contemporary iron gates. [1] [2] This asset as observed to be in good condition during the walkover survey. [3] The setting of the garden wall is defined by its association with Fawbert and Barnards School (Asset 46), and its outward-facing aspect to London Road to the west.			
<b>Sources</b>			
[1] National Heritage List [2] Essex Historic Environment Record [3] Walkover survey, May 2016			

<b>Site Number</b>	47	<b>Site Name</b>	<b>Fawbert and Barnards School</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4722811335
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	School School	<b>Period</b>	Post-medieval 19th Century
<b>NMR ref</b>	1337074	<b>HER ref</b>	MEX1007067 31678
<b>Description</b>			
Former British School 1836. Of stock brick in Flemish bond, with single storeyed range flanked by 2 storeyed ends. Roof slated and hipped with parapet coped in moulded stone, and having 2 stock brick chimneys evenly spaced. Plan forming a U. Centre range with central stuccoed portico, 2 Doric columns and 2 pilasters, flat entablature and 2 fielded panel door leaves - rectangular fanlight. First floor band with margin barred sashes each side of door under straight gauged arches. A range of 3 square, small-paned sashes on first storey with straight gauged arches. Two tall round headed sashes each side of central elevation. The 2 end units have pilasters at their centres and returns with stock brick capitals, moulded: and 2 tall round-headed sashes each. Three matching sashes on end elevations. [1] [2] The site is still in use as a primary school. [3] When originally built in the mid-19th century, the school was located in open countryside south of Harlow, adjacent to the main north-south London Road and with the designed landscape of Mark Hall estate to the west. The creation of the new town beginning in the 1950s resulted in the school being surrounded on three sides by residential development and service buildings, with the newly created Gilden Way a short distance to the south. [4] [5] The retained original wall, gates and railings (Asset 46) to the west and extensive mature trees and hedgerows serve to largely isolate the school from visual intrusion from its modern surroundings.			
<b>Sources</b>			
[1] National Heritage List [2] Essex Historic Environment Record [3] Walkover survey, May 2016 [4] Ordnance Survey, 1880-84, 1:2,500, Essex, Sheet XLI			

<b>Site Number</b>	48	<b>Site Name</b>	<b>Harlow medieval and post-medieval town (Old Harlow)</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4740911553
<b>Value</b>	Medium	<b>Condition</b>	Unknown
<b>Site Type</b>	Medieval Town Settlement	<b>Period</b>	Early medieval medieval post-medieval
<b>NMR ref</b>	N/A	<b>HER ref</b>	MEX13199 3625
<b>Description</b>			
<p>Harlow was a polyfocal settlement, the dominant landowner was the Abbey of St Edmunds in Bury, Suffolk. The oldest part is Harlowbury (TL47761198), which was the manorial centre and there may also have been an early medieval village on this site. The second focus, Churchgate Street (TL48331149) appears to have developed before the end of the 11th century, possibly as a result of the deliberate movement of the village at Harlowbury to Churchgate Street. The Parish Church of St Mary the Virgin is sited here, the earliest portions of this date to the 12th century. The third focus of settlement is Old Harlow (TL47091150), on the Hertford-Dunmow road, and it appears to have been deliberately planted by the Abbots of Bury St Edmunds, following the granting of a market and annual fair in 1218 (there may also have been an earlier market on the site). The original plan, comprised a row of properties, essentially rural in appearance on the southern side of Fore Street/High Street. In front of these was the market-place. The market area was gradually infilled, first by the building on 'Midil Rowe', on the northern side of the market-place, and then the block of buildings between Back Street and Fore Street.</p> <p>With the Dissolution of the Monasteries Bury St Edmunds Abbey ceased to be the major landholder, and there was a decline in the market-function at Harlow, partially also due to the collapse of the wool-trade. However the Harlow pottery industry flourished to the south of the main built up area, at Potter Street, Latton Street and Harlow Common. In 1947 an area of approximately two and a half thousand hectares was designated as the site of Harlow New Town, with Frederick Gibberd as the planner-architect for the project. The New Town was characterised by urban building-types in a rural setting.</p> <p>Additional information from Mike Jury (Harlow) based on watching-briefs and documentary research suggests that the medieval and post-medieval occupation extended to the west of the present Market Street as far as the 18th century Bromleys House. [1]</p>			
<b>Sources</b>			
[1] Essex Historic Environment Record			

<b>Site Number</b>	49	<b>Site Name</b>	<b>Old Harlow Conservation Area</b>
<b>Legal Status</b>	Conservation Area	<b>NGR</b>	TL4750711627
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Conservation Area Conservation Area	<b>Period</b>	Post-medieval 19th Century
<b>NMR ref</b>	N/A	<b>HER ref</b>	DEX22815
<b>Description</b>			
<p>The Old Harlow Conservation Area encompasses the surviving historic core of Harlow and Mulberry Green, which formed part of a polyfocal settlement in combination with Churchgate Street to the south-east. [1] Among the justifications for its designation as a Conservation area were: The late medieval market town character and street pattern present on Market Street, Fore Street and the High Street - evidence of the organic growth of the village; The rich variety of listed buildings of different ages ranging from 15th, 17th, 18th, 19th century of significant historic and architectural interest; The enclosed and intimate character of the High street; The presence of traditional building materials and historic local building methods such as timber frames, tiled roofs and pargetting, and the presence of well preserved shop fronts, coaching inns and pre-New Town houses. [2]</p> <p>The significant features of the Conservation Area; namely the well preserved traditional buildings, focal point around the Green Man public house, and mature trees and roadside verges, create an attractive but inward-looking scene which defines its setting.</p>			
<b>Sources</b>			
[1] Essex Historic Environment Record			
[2] Harlow Council, 2013, Old Harlow Conservation Area Appraisal			

<b>Site Number</b>	50	<b>Site Name</b>	New Hall Archaeological Evaluation
<b>Legal Status</b>	None	<b>NGR</b>	TL4762911159
<b>Value</b>	Negligible	<b>Condition</b>	Fair
<b>Site Type</b>	Archaeological Remains; Cropmark	<b>Period</b>	Bronze Age; Romano-British; Early medieval
<b>NMR ref</b>	N/A	<b>HER ref</b>	MEX23745 7268
<b>Description</b>			
<p>Soilmarks of two parallel linear features which run diagonally across a field and abut onto its boundaries; one end appears to exhibit a slight incurving of the ditch before it meets the field boundary; possible cursus cut at both ends by field boundaries.</p> <p>Site de-scheduled October 2008 as no longer regarded as a cursus.</p> <p>Field survey and trial trenching was completed in order to evaluate the impact of unauthorised re-contouring groundworks upon it. This archaeological work was undertaken by the Essex County Council Field Archaeology Unit at the request of English Heritage (now Historic England). It consisted of a site walk-over inspection, collection of spot height data and the excavation of trenches across the plotted position of the cropmark and the area to its immediate west. The principal objectives of the work were to establish the presence of the cursus monument and to assess the extent of any damage which may have been caused to it.</p> <p>The archaeological fieldwork identified the presence of prehistoric and Early Saxon remains, but no trace of the putative cursus. It also established that there had been relatively little deep and extensive truncation of archaeological remains across the majority of the scheduled area, and that the groundworks had largely comprised the removal and the stockpiling of topsoil. However, general compaction, disturbance and rutting caused by the movement of heavy plant were observed on the exposed surface that is likely to have had an adverse impact upon below-ground remains present. It is concluded that the cursus had never been present and that the linear 'cropmark' features evident on aerial photographs, from which it was identified, are more likely to have been modern-day tracks, footpaths or other wear marks on the field surface. [1]</p> <p>During the walkover survey it was noted that much of this area had been stripped ahead of residential development. [2]</p> <p>Archaeological investigations conducted between 2013 and 2016 ahead of residential development have revealed an extensive multi-period site including a ring ditch believed to be part of a levelled Bronze Age round barrow, and an urnfield cremation cemetery from the same period; a substantial Romano-British rectilinear enclosure containing a kiln; and traces of Anglo Saxon settlement dating to the 5th century AD. [3]</p> <p>The modern landscape setting of this asset does not contribute to our understanding of it.</p>			
<b>Sources</b>			
<p>[1] Essex Historic Environment Record</p> <p>[2] Walkover survey, May 2016</p> <p>[3] Archaeological Solutions, 2016, New Hall, Harlow Essex, Archaeological Investigations June 2013-September 2016: Interim Report</p>			

<b>Site Number</b>	52	<b>Site Name</b>	The Green Man Public House and Hotel
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4771411541
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Public House Eating and Drinking Establishment	<b>Period</b>	Post-medieval 17th Century
<b>NMR ref</b>	1337038	<b>HER ref</b>	MEX1007082 31693
<b>Description</b>			
<p>Seventeenth century, two-storeyed range with break in ridge height and rear access arch near centre. Rendered right of archway exposed framing left of it. Windows: sashes in exposed boxes, a venetian sash above the archway and 2 bay windows of different patterns - all small-paned. Simple doorway, and ridged peg-tiled roof with eaves. East of archway mixed exposed framing of the C17 and C18. Windows mixed sashes and casements, with one semi-hexagonal small-paned bay window on right, at first storey. [1] [2]</p> <p>The Green Man acts as a focal point at the centre of the Mulberry Green Conservation Area (Asset 49). Its roadside location close to the junction between High Street and Old Road, surrounded by traditional buildings defines its setting. [3] [4]</p>			
<b>Sources</b>			
<p>[1] National Heritage List</p> <p>[2] Essex Historic Environment Record</p> <p>[3] Harlow Council, 2013, Old Harlow Conservation Area Appraisal</p> <p>[4] Walkover survey, May 2016</p>			

<b>Site Number</b>	<b>55</b>	<b>Site Name</b>	<b>The Old Forge</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4773711545
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Timber Framed House Dwelling	<b>Period</b>	Post-medieval 16th Century
<b>NMR ref</b>	1169455	<b>HER ref</b>	MEX1007083 31694
<b>Description</b>			
<p>Sixteenth century. Timber-framed and plastered with ridge, gables and eaves roof - peg-tiled and hipped at west. First storey has 2 small-paned sashes on left and 2 small-paned casements right. Door in plain case with small-paned sashes each side. A wing projects on right clad in painted weatherboards with a semi-hexagonal bay window of full width, small-paned glazing. Roofed with ridged and gabled peg-tiles. [1] [2]</p> <p>The Old Forge's roadside location close to the junction between High Street and Old Road, surrounded by traditional buildings defines its setting. [3] [4]</p>			
<b>Sources</b>			
<p>[1] National Heritage List  [2] Essex Historic Environment Record  [3] Harlow Council, 2013, Old Harlow Conservation Area Appraisal  [4] Walkover survey, May 2016</p>			

<b>Site Number</b>	<b>56</b>	<b>Site Name</b>	<b>3, 5, 7 and 9 Mulberry Green</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4774211587
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Tenement Dwelling	<b>Period</b>	Post-medieval 19th Century
<b>NMR ref</b>	1111687	<b>HER ref</b>	MEX1007079 31690
<b>Description</b>			
<p>Approximately AD 1800 range of tenements. Red brick, Flemish bond, painted. Of 2 storeys with dentilled eaves, and a first floor band, ridged and gabled roof - slated. Three red brick chimney stacks. Range of 7 windows on first storey one of which blocked (2, west) with sashes of circa 1900. Four doors, and 5 matching sashes on ground storey under segmental arches in exposed boxes. Two of the doors original, in good cases, at the east end of the range. [1] [2]</p> <p>3, 5, 7 and 9 Mulberry Green and their neighbours (Assets 57 and 58) contribute to the character of the Conservation Area through their well preserved traditional structures and facades facing the high Street. [3] [4] They form part of an inward looking scene bounded by elements of the New Town of Harlow to the north, and the recreation ground, mature trees and Gilden way to the south.</p>			
<b>Sources</b>			
<p>[1] National Heritage List  [2] Essex Historic Environment Record  [3] Harlow Council, 2013, Old Harlow Conservation Area Appraisal  [4] Walkover survey, May 2016</p>			

<b>Site Number</b>	<b>57</b>	<b>Site Name</b>	<b>Cotswold / 11 to 23 Mulberry Green</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4775711588
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	House Dwelling	<b>Period</b>	Post-medieval 18th Century
<b>NMR ref</b>	1111688	<b>HER ref</b>	MEX1007080 31691
<b>Description</b>			
<p>Mid eighteenth century house. Three bays and 3 storeys, in painted brick with parapetted front and parapetted gables left and right. Three part sashes left and right on second and first floors, with semi-hexagonal bay windows under them on the ground-storey. Central, 6 panel door with rectangular light over, bay windows, leaded flat tops with dentilled cornices. Blocked window central on first storey and a small-paned window central to second storey. [1] [2]</p> <p>Cotswold contributes to the traditional character of the Conservation Area and High Street. [3] [4] They form part of an inward looking scene bounded by elements of the New Town of Harlow to the north, and the recreation ground, mature trees and Gildea Way to the south.</p>			
<b>Sources</b>			
<p>[1] National Heritage List  [2] Essex Historic Environment Record  [3] Harlow Council, 2013, Old Harlow Conservation Area Appraisal  [4] Walkover survey, May 2016</p>			

<b>Site Number</b>	<b>58</b>	<b>Site Name</b>	<b>The Dormer Cottage / 31 Mulberry Green</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4776711588
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Timber Framed House Dwelling	<b>Period</b>	Post-medieval 17th Century
<b>NMR ref</b>	1169451	<b>HER ref</b>	MEX1007081 31692
<b>Description</b>			
<p>Seventeenth century house. Double range framed in timber and now roughcast, and painted. Front roof hipped and peg-tiled with lead bonnets and covered eaves; rear range ridged and gabled with 2 red brick chimney stacks in the intervening valley. Three pedimented dormers with small-paned casements and 3 small-paned sashes in exposed boxes on the first-storey. Two semi-hexagonal bay windows with flat tops and Edwardian glazing bars, with a fielded panel door-leaf in wooden case beneath a pediment and consoles. [1] [2]</p> <p>Dormer Cottage contributes to the traditional character of the Conservation Area and High Street. [3] [4] It forms part of an inward looking scene bounded by elements of the New Town of Harlow to the north, and the recreation ground, mature trees and Gildea Way to the south.</p>			
<b>Sources</b>			
<p>[1] National Heritage List  [2] Essex Historic Environment Record  [3] Harlow Council, 2013, Old Harlow Conservation Area Appraisal  [4] Walkover survey, May 2016</p>			

<b>Site Number</b>	59	<b>Site Name</b>	Bowl Barrow / Harlow Mound
<b>Legal Status</b>	Scheduled Monument	<b>NGR</b>	TL4778411205
<b>Value</b>	High	<b>Condition</b>	Good
<b>Site Type</b>	Bowl Barrow Funerary Site	<b>Period</b>	Bronze Age
<b>NMR ref</b>	1017474 29392	<b>HER ref</b>	MEX264 DEX2998
<b>Description</b>			
<p>Bowl barrows, the most numerous form of round barrow, are funerary monuments dating from the Late Neolithic period to the Late Bronze Age, with most examples belonging to the period 2400-1500 BC. They were constructed as earthen or rubble mounds, sometimes ditched, which covered single or multiple burials. They occur either in isolation or grouped as cemeteries and often acted as a focus for burials in later periods. Often superficially similar, although differing widely in size, they exhibit regional variations in form and a diversity of burial practices. There are over 10,000 surviving bowl barrows recorded nationally (many more have already been destroyed), occurring across most of lowland Britain. Often occupying prominent locations, they are a major historic element in the modern landscape and their considerable variation of form and longevity as a monument type provide important information on the diversity of beliefs and social organisations amongst early prehistoric communities. They are particularly representative of their period and a substantial proportion of surviving examples are considered worthy of protection.</p> <p>The bowl barrow 240m north of The Kennels is well preserved and will retain valuable archaeological remains and environmental evidence related to its construction and to the appearance of the landscape in which it was set. The monument may also retain some evidence of later use, particularly during the Anglo-Saxon period when it may have served as a communal meeting place within the tribal territory or hundred.</p> <p>The monument includes a Bronze Age bowl barrow located to the south of Gilden Way on the southern outskirts of Old Harlow. It stands on the edge of a slight plateau overlooking a broad valley to the south west. The barrow mound is circular in plan and domed in profile, measuring approximately 25m in diameter and 1.5m in height. The summit, which is slightly flattened, measures approximately 8m across. The locations of two minor, unrecorded excavations are marked by a narrow depression ascending the southern slope and by a small declivity on the summit. The encircling ditch, from which material would have been quarried for the mound, has long since been infilled and is no longer visible above ground although it will survive as a buried feature. The barrow is reputed to have also served as an Anglo-Saxon moot, or meeting place, and it is possible that it is the 'mound' or 'hill' (old English 'hlaew') after which the town of Harlow may be named. [1] [2]</p> <p>During the walkover survey it was noted that the mound appears to be in good condition, although very overgrown with woodland undergrowth, and it is well screened from the wider landscape by its location within a well established woodland plantation. It is also screened from Gilden Way by buildings associated with a plant nursery immediately to the north. Ongoing residential development will sever any visual link with the landscape to the west. It's setting is better understood in terms of its topographic position overlooking a broad shallow valley to the south-west. [3]</p>			
<b>Sources</b>			
<p>[1] National Heritage List  [2] Essex Historic Environment Record  [3] Walkover survey, May 2016</p>			



<b>Site Number</b>	<b>60</b>	<b>Site Name</b>	<b>Mulberry Green House and Stables</b>
<b>Legal Status</b>	Grade II* Listed Building	<b>NGR</b>	TL4779811535
<b>Value</b>	High	<b>Condition</b>	Good
<b>Site Type</b>	House Dwelling	<b>Period</b>	Post-medieval 18th Century
<b>NMR ref</b>	1111689	<b>HER ref</b>	MEX1007084 31695
<b>Description</b>			
<p>Late C18 house. Two storeys and 3 bays with 2 full-height semi-circular bow windows, all of red brick in Flemish bond. First floor bonds parapet. Roofs hipped and peg-tiled. Hornless small-paned sashes in the bows form semi-hexagons, being flats, and their exposed boles have roundels curved at their top returns. Central doorway with open pediment on columns that are reeded on their top halves with composite capitals. Leaf of 6 fielded panels. Central Diocletian sash on first storey. Contemporary stables at side, with original features. [1] [2]</p> <p>Mulberry Green House was gutted by fire in 2000 and was renovated and converted into six apartments. A number of sensitively designed new-build properties were built in the gardens behind the house as part of the same scheme. [2] [3]</p> <p>Mulberry Green House contributes to the traditional character of the Conservation Area and High Street, within which it occupies a prominent position. [4] [5] It forms part of an inward looking scene bounded by elements of the New Town of Harlow to the north, and the recreation ground, mature trees and Gilden Way to the south.</p>			
<b>Sources</b>			
<p>[1] National Heritage List  [1] Essex Historic Environment Record  [3] Bermac Properties, 2009, The Mulberry Green Collection, Old Harlow Essex (Development description)  [4] Harlow Council, 2013, Old Harlow Conservation Area Appraisal  [5] Walkover survey, May 2016</p>			

<b>Site Number</b>	<b>61</b>	<b>Site Name</b>	<b>Former Depot Site, Mulberry Green</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4781111408
<b>Value</b>	None	<b>Condition</b>	Destroyed
<b>Site Type</b>	Archaeological Features Archaeological Features	<b>Period</b>	Modern
<b>NMR ref</b>	N/A	<b>HER ref</b>	MEX1040142 47265
<b>Description</b>			
<p>A development site (former depot) located to the rear of Mulberry Green House revealed only modern features including a drainage run and a late 20th century feature containing plastic bags.</p> <p>Monitoring of a development site comprising a former depot located to the rear of Mulberry Green House revealed only modern features comprising a drainage run and a feature containing plastic bags. An earlier trial-trench evaluation on land immediately to the north of the site revealed post-medieval garden features. [1]</p> <p>This asset is of no archaeological interest.</p>			
<b>Sources</b>			
<p>[1] Essex Historic Environment Record</p>			

<b>Site Number</b>	<b>63</b>	<b>Site Name</b>	<b>Gateway to Hill House</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4782011566
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Gateway Barrier	<b>Period</b>	Post-medieval 18th Century
<b>NMR ref</b>	1306487	<b>HER ref</b>	MEX1007086 31697
<b>Description</b>			
<p>Late 18th century wooden gateway with 2 Tuscan columns and square opening, formerly giving access to a covered front entrance. [1] [2]            In combination with Hill House (Asset 64) and Mulberry Green House (Asset 60), the Gateway contributes to the traditional character of the Conservation Area and High Street, within which it occupies a prominent position facing the High Street. [3] [4]</p>			
<b>Sources</b>			
<p>[1] National Heritage List            [2] Essex Historic Environment Record            [3] Harlow Council, 2013, Old Harlow Conservation Area Appraisal            [4] Walkover survey, May 2016</p>			

<b>Site Number</b>	<b>64</b>	<b>Site Name</b>	<b>Hill House</b>
<b>Legal Status</b>	Grade II* Listed Building	<b>NGR</b>	TL4782411557
<b>Value</b>	High	<b>Condition</b>	Good
<b>Site Type</b>	Timber Framed House House	<b>Period</b>	Post-medieval 16th Century
<b>NMR ref</b>	1337039	<b>HER ref</b>	MEX1007085 31696
<b>Description</b>			
<p>Probably late 16th century with an 18th century re-styling. House, framed in timber with 2 stairs towers, one at each return of the front elevation (west). Both towers have pyramidal peg-tiled roofs, and 2 small-paned windows of which the top 2 are blocked and painted. Central range has a hipped peg-tiled roof with a coved plastered eaves and 2 flat dormers with small paned sashes. First storey with 3 hornless small paned sashes in plaster architraves and key stones. Central stuccoed doorcase, round-headed with leaded fanlight and with a blank date-panel above. Three pane side lights to door leaf, which is of 6 fielded panels, with wreath knocker. Three part small-paned sashes, hornless, either side of the door. Plan complex. Inside: late C18 stairs and handrail. [1] [2]            Although partially concealed behind mature hedgerows and low rail-topped walls, Hill House contributes to the traditional character of the Conservation Area and High Street, within which it occupies a prominent position. [3] [4] It forms part of an inward looking scene bounded by elements of the New Town of Harlow to the north, and the recreation ground, mature trees and Gilden Way to the south.</p>			
<b>Sources</b>			
<p>[1] National Heritage List            [2] Essex Historic Environment Record            [3] Harlow Council, 2013, Old Harlow Conservation Area Appraisal            [4] Walkover survey, May 2016</p>			

<b>Site Number</b>	65	<b>Site Name</b>	<b>Mulberry Green House (post medieval features)</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4783011670
<b>Value</b>	Negligible	<b>Condition</b>	Destroyed
<b>Site Type</b>	Pit Archaeological Feature	<b>Period</b>	Post Medieval 17th Century
<b>NMR ref</b>	N/A	<b>HER ref</b>	MEX1038884 46336
<b>Description</b>			
<p>An archaeological evaluation by trial trenching, carried out to the rear of Mulberry Green House, Mulberry Green, Old Harlow. Two features probably Victorian in date were revealed.</p> <p>An archaeological evaluation, consisting of four trenches, was carried out to the rear of Mulberry Green House, Mulberry Green, Old Harlow. Only two archaeological features were identified, both probably Victorian in date. A deep pit, in Trench 1, containing a loamy fill with post-medieval brick and pottery at its base, was likely created as a planting hole, with the finds placed to aid drainage. The second feature, in Trench 2, was part of a planting bed; the fill of which contained a high humic content. Both were probably features belonging to the garden of Mulberry Green House itself (18th century). [1]</p> <p>This asset contributes to our understanding of the history and function of Mulberry Green House and its gardens. Its modern landscape setting does not contribute to our understanding of it.</p>			
<b>Sources</b>			
[1] Essex Historic Environment Record			

<b>Site Number</b>	66	<b>Site Name</b>	<b>Granary Cottage (post medieval features)</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4785011550
<b>Value</b>	Negligible	<b>Condition</b>	Destroyed
<b>Site Type</b>	Garden Feature Plant Beds	<b>Period</b>	Post-medieval 17th Century
<b>NMR ref</b>	N/A	<b>HER ref</b>	MEX1040139 47262
<b>Description</b>			
<p>An archaeological trial-trench evaluation was conducted at Granary Cottage (Asset 67) in advance of the construction of a new residential dwelling. The site is located to the east of Harlow Old Town, on the south side of Mulberry Green. A grade II listed c. 18th-century barn is located along the northern edge of the property (Listed building no. 119511).</p> <p>The trench was excavated to a maximum depth of 1.07m, at which level the orange silty clay drift geology of the area was exposed. The topsoil, 0.52m thick, overlay a silty clay levelling layer, 0.45m thick, containing late 18th- to early 19th-century pottery and tile as well as late 16th- to 17th-century brick.</p> <p>Three shallow linear horticultural features were aligned north-west to south-east and cut into the natural silty clay. The very shallow nature of each feature indicates severe truncation. Each of them contained a light grey silt fill and yielded no finds. The northern end of the trench was severely root-disturbed.</p> <p>The residual 16th- to 17th-century brick suggests post-medieval activity on the site but only evidence of horticultural practice was revealed within the trench. [1]</p> <p>This asset contributes to our understanding of the history and function of Granary Cottage. Its modern landscape setting does not contribute to our understanding of it.</p>			
<b>Sources</b>			
[1] Essex Historic Environment Record			

<b>Site Number</b>	<b>67</b>	<b>Site Name</b>	<b>Granary Cottage / 30 Mulberry Green</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4786011569
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Timber Framed Barn Agricultural Building	<b>Period</b>	Post-medieval 18th Century
<b>NMR ref</b>	1111690	<b>HER ref</b>	MEX1007087 31698
<b>Description</b>			
<p>Late C18 barn-like building. Timber-framed and black weatherboarded with ridged and gabled roof, peg-tiled and fly-hipped. Modern square access opening at west end. [1] [2]</p> <p>The building described in the Listing description appears to be an ancillary building originally associated with the service range of Hill House (Asset 64) to the west. Although it occupies a similar footprint at a noticeable angle to other buildings at this location recorded on the first edition Ordnance Survey 1:10,560 map, Granary Cottage itself (south of the Listed Building described above) appears to be a large cottage of early 20th century construction. [4] [5]</p> <p>Granary Cottage forms part of an inward looking scene bounded by elements of the New Town of Harlow to the north, and the recreation ground, mature trees and Gilden Way to the south.</p>			
<b>Sources</b>			
<p>[1] National Heritage List  [2] Essex Historic Environment Record  [3] Walkover survey, May 2016  [4] Ordnance Survey, 1880-84, 1:2,500, Essex, Sheet XLI</p>			

<b>Site Number</b>	<b>68</b>	<b>Site Name</b>	<b>Wall extending for 11 bays, east of Number 30</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4789311577
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Garden Wall Barrier	<b>Period</b>	Post-medieval 18th Century
<b>NMR ref</b>	1169507	<b>HER ref</b>	MEX1007088 31699
<b>Description</b>			
<p>Wall, extending for 11 bays, east of No 30. Red brick wall in Flemish-bond, having 12 pilasters, coped with tile-courses, and headers. [1] [2]</p> <p>Observed to be in good condition during the walkover survey. [3] Its roadside setting and relationship with Granary Cottage (Asset 67) which it screens define its setting. It also contributes to the traditional character of the Mulberry Green Conservation Area (Asset 49). [4]</p>			
<b>Sources</b>			
<p>[1] National Heritage List  [2] Essex Historic Environment Record  [3] Walkover survey, May 2016  [4] Harlow Council, 2013, Old Harlow Conservation Area Appraisal</p>			

<b>Site Number</b>	69	<b>Site Name</b>	Gilden Way Pumping Station (archaeological investigation)
<b>Legal Status</b>	None	<b>NGR</b>	TL4795611437
<b>Value</b>	Negligible	<b>Condition</b>	Destroyed
<b>Site Type</b>	Ditch and Pit Archaeological Feature	<b>Period</b>	Modern
<b>NMR ref</b>	N/A	<b>HER ref</b>	MEX1042289 48547
<b>Description</b>			
<p>Archaeological monitoring was carried out in association with the construction of a new pumping station on land to the south of off Gilden Way, Harlow.</p> <p>Two cut features were found during the topsoil strip. A long gully or plough scar was investigated on the western side of the site, which may in fact be the remains of a field boundary, perhaps associated with an existing field boundary to the east. A small oval pit was excavated in the main part of the site, which may be a geological feature. Despite the remains of multiperiod activity in the vicinity of the site and more specifically Bronze Age and Saxon activity nearby, no significant features were identified or finds recovered. [1]</p> <p>This asset is of no archaeological interest.</p>			
<b>Sources</b>			
[1] Essex Historic Environment Record			

<b>Site Number</b>	71	<b>Site Name</b>	Long Barn / 8 to 10 Sheering Drive
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4799811530
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Timber Framed Barn Agricultural Building	<b>Period</b>	Post-medieval 17th Century
<b>NMR ref</b>	1337070	<b>HER ref</b>	MEX1007145 31756
<b>Description</b>			
<p>Seventeenth century barn, timber framed and black weatherboarded, with ridged, gabled and tiled roof; converted into two residences. Inside: heavy oak frame with queen-post roof, bladed scarfs, and an integral first floor having haunched tenons; suggesting original use as a granary. [1] [2] Originally part of a group of buildings related to the neighbouring 15th century moated Newhall (Asset 74).</p> <p>A stone-built range of buildings north of and perpendicular to Long Barn appears to have been added in the late 19th century and is first depicted on the 3rd edition Ordnance Survey 1:10,560 map. [3]</p> <p>Long Barn is only a short distance south of Gilden Way but is well screened visually by dense roadside trees and hedgerows, although traffic noise is noticeable. The asset is also screened from all other directions by a combination of mature trees and other properties including Newhall (Asset 74). Its historical relationship with Newhall to which it was once part of a farm complex contributes more to our understanding of it than its modern landscape setting which is largely the product of 20th century development associated with Harlow New Town to the north and west, and residential infill between Churchgate Street and Newhall to the east. [4]</p>			
<b>Sources</b>			
<p>[1] National Heritage List</p> <p>[2] Essex Historic Environment Record</p> <p>[3] Ordnance Survey, 1923, 1:2,500, Essex, Sheet XLI</p> <p>[4] Walkover survey, May 2016</p>			

<b>Site Number</b>	74	<b>Site Name</b>	Newhall
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4802911517
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Timber Framed House Dwelling	<b>Period</b>	Medieval Post-medieval 15th/16th Century
<b>NMR ref</b>	1169810	<b>HER ref</b>	MEX1007144 31755
<b>Description</b>			
<p>Fifteenth or sixteenth century house on a complex plan. Timber-framed and plastered, of 2 storeys. Ridged, gabled and peg-tiled roof with a circa 1590 red brick chimney stack against the west end, with crowsteps and one octagonal, shaft beside one hexagonally sectioned shaft. Various casement windows and one two-storey semi-hexagonal bay window at north-east. Modern porch at north. [1] [2] Possibly built on the site of a medieval predecessor given its location inside the remains of a medieval moat (Asset 71), and the proximity of the near contemporary Long Barn (Asset 71).</p> <p>Newhall is approached from the north along a private driveway (Sheering Drive), and is in a secluded location set back from both the historic route of Sheering Road and the modern Gilden Way. It is further screened by mature tree and shrub planting, and a tall garden wall to the west. [3] Newhall's historical relationship with Long Barn (Asset 71) contributes more to our understanding of it than its modern landscape setting which is largely the product of 20th century development associated with Harlow New Town to the north and west, and residential infill between Churchgate Street and Newhall to the east.</p>			
<b>Sources</b>			
<p>[1] National Heritage List  [2] Essex Historic Environment Record  [3] Walkover survey, May 2016</p>			

<b>Site Number</b>	75	<b>Site Name</b>	Newhall Moat
<b>Legal Status</b>	None	<b>NGR</b>	TL4803011509
<b>Value</b>	Low	<b>Condition</b>	Poor
<b>Site Type</b>	Moated Site Earthwork	<b>Period</b>	Medieval
<b>NMR ref</b>	N/A	<b>HER ref</b>	MEX13162 3612
<b>Description</b>			
<p>Newhall Moat, manorial, formerly known as Brenthall. Remains of moat can be traced to the south of the present house. Only the south east angle survives as a pool and sunken garden, the south arm survives as a depression 8m wide and 0.5m deep in the lawn. The east arm was filled in 12 years ago. Modern buildings cover the rest. Probably rectangular originally, although it appears to have had a narrow plan oriented from north to south with an unnamed stream providing a water source, entering at the south-east corner and exiting the north-east towards Harlowbury. [1] [2]</p> <p>The setting of the moat is best understood through its historical relationship with Newhall (asset 74) and Long Barn (Asset 71) which it originally enclosed.</p>			
<b>Sources</b>			
<p>[1] Essex Historic Environment Record  [2] Walkover survey, May 2016</p>			

<b>Site Number</b>	76	<b>Site Name</b>	Almshouses / 13 and 15 Sheering Road
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4810611605
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Almshouse Residential Building	<b>Period</b>	Post-medieval 18th Century
<b>NMR ref</b>	1306358	<b>HER ref</b>	MEX1007146 31757
<b>Description</b>			
<p>Dated 1716. A long range of one storey built in Flemish bonded red brick with ridged and gabled peg-tile roof. Three red brick plain chimneys one at the centre and one at each gable end. Two front doors in later gabled porches and a range of 7 pairs of double 6 pane wooden casements. At the centre-front a blind dormer with gable bears the inscription with date and name of benefactor. Three course projecting eaves band. Inscribed: 'Thefe houfefe were builded for ye habitation of fower poore widdowes with monies left by ye will of Mr Francis Reeve formerly of Huberts Hall'. These words on the front of a blind central dormer with a gable. [1] [2]</p> <p>The almshouses face south onto Sheering Road, and their setting is defined by their relationship with it. The mature tree and shrub planting south of Sheering Road and adjacent to Gilden Way sever more distant views and restrict its visual setting. [3]</p> <p>The value of this asset is derived from its architectural value as recognised by its designation as a Grade II Listed Building; and its group value the other well preserved designated and undesignated buildings within the Churchgate Street Conservation Area (Asset 85).</p>			
<b>Sources</b>			
<p>[1] National Heritage List  [2] Essex Historic Environment Record  [3] Walkover survey, May 2016</p>			

<b>Site Number</b>	77	<b>Site Name</b>	23 Sheering Road / 1 and 2 Millhurst Mews
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4815911662
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	House House	<b>Period</b>	Post-medieval 19th Century
<b>NMR ref</b>	1111684	<b>HER ref</b>	MEX1007076 31687
<b>Description</b>			
<p>Mid 19th century residential range, rectangular plan, ground storey rendered first storey white weatherboarded. Roof slated with eaves, hips and 2 stock brick chimney stacks of decorative brickwork near south end. A row of 5 small-paned casements on first-storey, and 3 plain doors with 5 matching casements along the ground storey. [1] [2]</p> <p>This asset is set back to the north of Sheering Road and approached by a narrow driveway between 19 Sheering Road (Asset 112) and Mill Hurst (Asset 78). [3] Its size and orientation suggested that it may have originally been associated with the site of Piper's Mill, marked on the Harlow Tithe map and first edition Ordnance Survey 1:2,500 map. [4] [5]</p> <p>The value of this asset is derived from its architectural value as recognised by its designation as a Grade II Listed Building; and its group value the other well preserved designated and undesignated buildings within the Churchgate Street Conservation Area (Asset 85). [3]</p>			
<b>Sources</b>			
<p>[1] National Heritage List  [2] Essex Historic Environment Record  [3] Walkover survey, May 2016  [4] Ordnance Survey, 1880-84, 1:2,500, Essex, Sheet XLI  [5] Harlow Tithe Map and Apportionment 1848</p>			



<b>Site Number</b>	78	<b>Site Name</b>	Mill Hurst / 25 Sheering Road
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4820411641
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	House House	<b>Period</b>	Post-medieval 18th/19th Century
<b>NMR ref</b>	1111672	<b>HER ref</b>	MEX1007147 31758
<b>Description</b>			
<p>Late 18th century, early 19th century. House of 3 storeys and 5 window range, with slated hipped roof having a wide eaves soffit. Stucco cornices on brackets to the sashes, which are in exposed boxes. Top centre a Diocletian sash, above a tri-partite sash on the first floor, above a porch with Corinthian columns. [1] [2]</p> <p>The value of this asset is derived from its architectural value as recognised by its designation as a Grade II Listed Building; and its group value with the associated garden wall and gate piers (Asset 79) and the other well preserved designated and undesignated buildings within the Churchgate Street Conservation Area (Asset 85). [3]</p>			
<b>Sources</b>			
<p>[1] National Heritage List  [2] Essex Historic Environment Record  [3] Walkover survey, May 2016</p>			

<b>Site Number</b>	79	<b>Site Name</b>	Mill Hurst Garden Wall and Gate Piers
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4821611618
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Garden Wall Barrier	<b>Period</b>	Post-medieval 18th/19th Century
<b>NMR ref</b>	1337071	<b>HER ref</b>	MEX1007148 31759
<b>Description</b>			
<p>Sheering Road Garden Wall of 70 feet (TL 4811 NW 7/3) and gate piers immediately south-east of Mill Street fronting road. Late 18th century, early 19th century red brick garden wall with rusticated brick central gate piers topped with stone pineapples. [1] [2]</p> <p>The value of this asset is derived from its architectural value as recognised by its designation as a Grade II Listed Building; and its group value with the associated house (Mill Hurst; Asset 78) and the other well preserved designated and undesignated buildings within the Churchgate Street Conservation Area (Asset 85). [3]</p>			
<b>Sources</b>			
<p>[1] National Heritage List  [2] Essex Historic Environment Record  [3] Walkover survey, May 2016</p>			

<b>Site Number</b>	80	<b>Site Name</b>	Post-medieval finds from Churchgate, Sheering Road
<b>Legal Status</b>	None	<b>NGR</b>	TL4825011650
<b>Value</b>	Negligible	<b>Condition</b>	Destroyed
<b>Site Type</b>	Findspot Artefact Scatter	<b>Period</b>	Post-medieval
<b>NMR ref</b>	N/A	<b>HER ref</b>	MEX40938 16195
<b>Description</b>			
<p>A watching brief on a development site only recovered post medieval material. [1] Although this asset can contribute to our understanding of the development of settlement at Churchgate Street, there is no surviving archaeological interest.</p>			
<b>Sources</b>			
[1] Essex Historic Environment Record			

<b>Site Number</b>	81	<b>Site Name</b>	2, 4 and 6 Churchgate Street
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4825711595
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Timber Framed House House	<b>Period</b>	Post-medieval 19th Century
<b>NMR ref</b>	1337026	<b>HER ref</b>	MEX1007013 31624
<b>Description</b>			
<p>Early 19th century house. Timber framed and weatherboarded of rectangular plan. Two stock brick chimney stacks, one each end, roof ridged and gabled with eaves - peg-tiled. Small paned sashes on first storey in exposed boxes, one matching sash on ground storey at south. Door of 6 fielded panels with broken pediment on reeded half columns with no fanlight. A matching door north of last one, and a large square former shop window with small panes; and a name board above it. A 2 storey extension to the north with slated roof and central red brick chimney stack. Four leaded casements, 2 over 2 and a plain door at the south in a case. Walls of painted weatherboards. [1] The value of this asset is derived from its architectural value as recognised by its designation as a Grade II Listed Building; and its group value with Meadhams opposite (Asset 81) and the other well preserved designated and undesignated buildings within the Conservation Area (Asset 85). [2] [3]</p>			
<b>Sources</b>			
<p>[1] National Heritage List [2] Essex Historic Environment Record [3] Walkover survey, May 2016</p>			

<b>Site Number</b>	<b>83</b>	<b>Site Name</b>	<b>Meadhams / 1 Churchgate Street</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4827511614
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	House House	<b>Period</b>	Post-medieval 16th Century
<b>NMR ref</b>	1111703	<b>HER ref</b>	MEX1007024 31635
<b>Description</b>			
<p>Sixteenth century house. West front of 2 storeys with attics, with 5 window range. Roof peg-tiled and hipped with red brick chimney stacks at north and south. Coved eaves plastered. Porch in third place to south with curved leaded top and fluted pilasters left and right with triglyphs. Six panelled door. One pair of small paned sashes to south, a Serliana window left of porch with external shutters; then a pair of small paned sashes. All sashes in exposed boxes. [1]</p> <p>The value of this asset is derived from its architectural value as recognised by its designation as a Grade II Listed Building; and its group value with 2, 4 and 6 Churchgate Street opposite (Asset 81) and the other well preserved designated and undesignated buildings within the Conservation Area (Asset 85). [2] [3]</p>			
<b>Sources</b>			
<p>[1] National Heritage List [2] Essex Historic Environment Record</p>			

<b>Site Number</b>	<b>85</b>	<b>Site Name</b>	<b>Churchgate Street Conservation Area</b>
<b>Legal Status</b>	Conservation Area	<b>NGR</b>	TL4829311509
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Conservation Area Conservation Area	<b>Period</b>	Post-medieval
<b>NMR ref</b>	N/A	<b>HER ref</b>	DEX22811
<b>Description</b>			
<p>The Churchgate Street Conservation Area encompasses the surviving historic core of the village, which historically formed part of a polyfocal settlement in combination with Old Harlow and Mulberry Green to the south-west. [1]</p> <p>The rich variety of listed buildings of different ages are of significant historic and architectural interest; The enclosed and intimate character of Churchgate Street; The presence of traditional building materials and historic local building methods such as timber frames, tiled roofs and pargetting, and the presence of the prominently positioned parish church of St Mary and St Hugh (Grade II Listed; 1111740). [2]</p> <p>The significant features of the Conservation Area; namely the well preserved traditional buildings, create an attractive but inward-looking scene which defines its setting. [3]</p>			
<b>Sources</b>			
<p>[1] Essex Historic Environment Record [2] National Heritage List [3] Walkover survey, May 2016</p>			

<b>Site Number</b>	90	<b>Site Name</b>	Harlow medieval and post-medieval town (Churchgate Street)
<b>Legal Status</b>	None	<b>NGR</b>	TL4831411481
<b>Value</b>	Medium	<b>Condition</b>	Unknown
<b>Site Type</b>	Medieval Town Settlement	<b>Period</b>	early-medieval medieval post-medieval
<b>NMR ref</b>	N/A	<b>HER ref</b>	MEX13199 3625
<b>Description</b>			
<p>Grant of burgage tenure to the tenants of Harlow market in 1213 and 1229.</p> <p>Harlow was a polyfocal settlement, the dominant landowner was the Abbey of St Edmunds in Bury, Suffolk. The oldest part is Harlowbury (TL47761198), which was the manorial centre and there may also have been an early medieval village on this site. The second focus, Churchgate Street (TL48331149) appears to have developed before the end of the 11th century, possibly as a result of the deliberate movement of the village at Harlowbury to Churchgate Street. The Parish Church of St Mary the Virgin is sited here, the earliest portions of this date to the 12th century. The third focus of settlement is Old Harlow (TL47091150), on the Hertford-Dunmow road, and it appears to have been deliberately planted by the Abbots of Bury St Edmunds, following the granting of a market and annual fair in 1218 (there may also have been an earlier market on the site). The original plan, comprised a row of properties, essentially rural in appearance on the southern side of Fore Street/High Street. In front of these was the market-place. The market area was gradually infilled, first by the building on 'Midil Rowe', on the northern side of the market-place, and then the block of buildings between Back Street and Fore Street.</p> <p>With the Dissolution of the Monasteries Bury St Edmunds Abbey ceased to be the major landholder, and there was a decline in the market-function at Harlow, partially also due to the collapse of the wool-trade. However the Harlow pottery industry flourished to the south of the main built up area, at Potter Street, Lutton Street and Harlow Common. In 1947 an area of approximately two and a half thousand hectares was designated as the site of Harlow New Town, with Frederick Gibberd as the planner-architect for the project. The New Town was characterised by urban building-types in a rural setting.</p> <p>Additional information from Mike Jury (Harlow) based on watching-briefs and documentary research suggests that the medieval and post-medieval occupation extended to the west of the present Market Street as far as the 18th century Bromleys House. [1]</p>			
<b>Sources</b>			
[1] Essex Historic Environment Record			

<b>Site Number</b>	98	<b>Site Name</b>	Geophysical anomalies west of M11
<b>Legal Status</b>	None	<b>NGR</b>	TL4947512391
<b>Value</b>	Medium	<b>Condition</b>	Uncertain
<b>Site Type</b>	Geophysical Anomalies Archaeological Feature	<b>Period</b>	Prehistoric Uncertain
<b>NMR ref</b>	N/A	<b>HER ref</b>	N/A
<b>Description</b>			
<p>Geophysical anomalies identified during survey commissioned to inform the forthcoming Environmental Statement. Provisional results appear to show two circular anomalies and a number of linear anomalies on high ground between the M11 and Sheering Road. It appears likely that these anomalies represent the trace of buried archaeological remains of probable prehistoric date. The two circular anomalies in particular have been interpreted as representing plough-levelled prehistoric barrows or burial mounds. [1] [2]</p> <p>Archaeological investigation conducted ahead of residential development north of Gilden Way (Asset 21) identified archaeological remains of a similar date; cropmarks indicative of similar features have been identified 700m north-east (Asset 3); and prehistoric finds have been recovered from the ploughsoil close to Pincey Brook (Asset 25), near Moor Hall (Asset 10) and during construction of the M11 (Asset 20). [3]</p> <p>The value of this asset is derived from its archaeological potential and its ability to contribute to our understanding of prehistoric settlement and funerary practice at a local and regional level. The modern landscape setting of this asset does not contribute to our understanding of it.</p>			
<b>Sources</b>			
<p>[1] Headland Archaeology, 2016a, M11 Junction 7A, Essex: Geophysical Survey</p> <p>[2] Headland Archaeology, 2016b, M11 Junction 7A, Essex: Additional Geophysical Survey</p> <p>[3] Oxford Archaeology, 2006, Gilden Way, Harlow, Essex: Archaeological Evaluation Report</p>			

<b>Site Number</b>	99	<b>Site Name</b>	163 Sheering Road
<b>Legal Status</b>	None	<b>NGR</b>	TL4899812489
<b>Value</b>	Low	<b>Condition</b>	Good
<b>Site Type</b>	House House	<b>Period</b>	Post medieval 19th Century
<b>NMR ref</b>	N/A	<b>HER ref</b>	N/A
<b>Description</b>			
<p>Pair of cottages south of Ealing Bridge and depicted on a 1st edition Ordnance Survey 1:10560 map. [1] Recorded as part of the Campions estate belonging to Samuel Porter Matthews in the apportionment to the Harlow Tithe map. [2] Square in plan and of rendered brick construction, with a hipped roof in slate and a central chimney stack. The house has sliding sash windows and a projecting porch over an asymmetrically positioned door in the east elevation. [3]</p> <p>The house is set back slightly from Sheering Road, within a garden defined by tall modern larch lap fencing to the east, and mature hedgerows to the south and west. At ground level, views are constrained to the garden and glimpses of the road; first floor windows in the north elevation have filtered views towards Pincey Brook and sloping farmland beyond. [3]</p>			
<b>Sources</b>			
<p>[1] Ordnance Survey, 1880, 1:10,560 1st edition, Hertfordshire, Sheet XXXI  [2] Harlow Tithe apportionment 1848, 91  [3] Walkover survey 2016</p>			

<b>Site Number</b>	100	<b>Site Name</b>	35 Mulberry Green
<b>Legal Status</b>	Locally Listed Building	<b>NGR</b>	TL4779811590
<b>Value</b>	Low	<b>Condition</b>	Good
<b>Site Type</b>	House House	<b>Period</b>	Post-medieval 18th Century
<b>NMR ref</b>	N/A	<b>HER ref</b>	N/A
<b>Description</b>			
<p>Recorded as Little Mulberry Cottage in the Local List. [1] Two-storey semi-detached house (the western of two properties with Asset 101) of rendered brick with a hipped roof of red tile. Sliding sash windows of 12 panes throughout. Set back from the north side of High Street. [2]</p> <p>The value of this asset is derived from its architectural value as recognised by its Local Listing; and its group value with 37 and 39 Mulberry Green (Assets 101 and 102) and the other well preserved designated and undesignated buildings within the Conservation Area (Asset 49). [1]</p>			
<b>Sources</b>			
<p>[1] Harlow Council, 2011, Schedule of Locally Listed Buildings  [2] Walkover survey, May 2016</p>			

<b>Site Number</b>	<b>101</b>	<b>Site Name</b>	<b>37 Mulberry Green</b>
<b>Legal Status</b>	Locally Listed Building	<b>NGR</b>	TL4780911591
<b>Value</b>	Low	<b>Condition</b>	Good
<b>Site Type</b>	House House	<b>Period</b>	Post-medieval 19th Century
<b>NMR ref</b>	N/A	<b>HER ref</b>	N/A
<b>Description</b>			
<p>Two-storey semi-detached house (the eastern of two properties with Asset 100) of rendered brick with a hipped roof of red tile. Sliding sash windows of 12 panes throughout. Set back from the north side of High Street. Attached to 39 Mulberry Green (Asset 102) at the east. [1]</p> <p>The value of this asset is derived from its architectural value as recognised by its Local Listing; and its group value with 37 and 39 Mulberry Green (Assets 100 and 102) and the other well preserved designated and undesignated buildings within the Conservation Area (Asset 49). [2]</p>			
<b>Sources</b>			
<p>[1] Walkover survey, May 2016</p> <p>[2] Harlow Council, 2011, Schedule of Locally Listed Buildings</p>			

<b>Site Number</b>	<b>102</b>	<b>Site Name</b>	<b>39 Mulberry Green</b>
<b>Legal Status</b>	Locally Listed Building	<b>NGR</b>	TL4783711594
<b>Value</b>	Low	<b>Condition</b>	Good
<b>Site Type</b>	House House	<b>Period</b>	Post-medieval 19th Century
<b>NMR ref</b>	N/A	<b>HER ref</b>	N/A
<b>Description</b>			
<p>A double-fronted house on the north side of Mulberry Green. Rendered symmetrical exterior with full height canted bay windows either side of a central front door with a protruding doorcase and porch and a central first floor window. All windows facing Mulberry Green are sliding sashed with four panes. The roof including the bays are of slate. [1] Designated as a Locally Listed building by Harlow Council. [2]</p> <p>The value of this asset is derived from its architectural value as recognised by its Local Listing; and its group value with 35 and 37 Mulberry Green (Assets 100 and 101) and the other well preserved designated and undesignated buildings within the Conservation Area (Asset 49). [2]</p>			
<b>Sources</b>			
<p>[1] Walkover survey, May 2016</p> <p>[2] Harlow Council, 2011, Schedule of Locally Listed Buildings</p>			

<b>Site Number</b>	<b>103</b>	<b>Site Name</b>	<b>49 Mulberry Green / Former Police Station</b>
<b>Legal Status</b>	Locally Listed Building	<b>NGR</b>	TL4797411611
<b>Value</b>	Low	<b>Condition</b>	Good
<b>Site Type</b>	House House	<b>Period</b>	Post-medieval 19th Century
<b>NMR ref</b>	N/A	<b>HER ref</b>	N/A
<b>Description</b>			
<p>Two storey building of red brick in Flemish bond with stock brick quoins, door and window heads, and carved stone capping to the gables. Complex plan. Dated 1853 by a recessed stone plaque on the south-facing gable. All windows replaced by UPVC double glazing in a modern casement style. [1] Described as the former Magistrates Court in the Local List, but labelled as a Police Station by the Ordnance Survey from the its first depiction on the first edition 1:10,560. [2] [3]</p> <p>The value of this asset is derived from its architectural value as recognised by its Local Listing. [2]</p> <p>49 Mulberry Green is located on the north side of what was originally the main east to west road through Old Harlow and Churchgate Street. This location is typical of early police stations, where a prominent loction was seen as an important way to advertise the presence of the police to the public.</p>			
<b>Sources</b>			
<p>[1] Harlow Council, 2011, Schedule of Locally Listed Buildings  [2] Harlow Council, 2011, Schedule of Locally Listed Buildings  [3] ] Ordnance Survey, 1881, 1st edition 1:10,560, Essex, Sheet XLI</p>			

<b>Site Number</b>	<b>104</b>	<b>Site Name</b>	<b>Sheering Road Bridge</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4803811602
<b>Value</b>	Low	<b>Condition</b>	Good
<b>Site Type</b>	Bridge Road Transport Site	<b>Period</b>	Modern 20th Century
<b>NMR ref</b>	N/A	<b>HER ref</b>	N/A
<b>Description</b>			
<p>Road bridge with cast iron railings in the form of pierced lancets between two brick pillars, and a large Essex crest with the date 1904 on a central circular plaque. The pillars have rectangular inset panels in the brickwork with chamfered edges, and are topped with substantial cast concrete copings with shallow pyramidal tops and inset panels. [1]</p> <p>The bridge spans an unnamed stream and replaced a ford and footbridge on the old line of Sheering Road marked on a 1st edition Ordnance Survey 1:10,560 map. [2] Only the southern parapet survives, and the stream is presumably culverted beneath Gilden Way and a grassed area to the north of the asset. [1]</p> <p>The setting of the bridge is defined by its relationship with Sheering Road. Although the road has been severed by Gilden Way, the relationship can still clearly discernible and this contributes to our understanding of the bridge.</p>			
<b>Sources</b>			
<p>[1] Walkover survey May 2016  [2] Ordnance Survey, 1881, 1st edition 1:10,560, Essex, Sheet XLI</p>			



<b>Site Number</b>	<b>105</b>	<b>Site Name</b>	<b>Aylmers</b>
<b>Legal Status</b>	Grade II* Listed Building	<b>NGR</b>	TL4892112927
<b>Value</b>	High	<b>Condition</b>	Good
<b>Site Type</b>	Timber-framed House House	<b>Period</b>	17th Century
<b>NMR ref</b>	1147128 118265	<b>HER ref</b>	33887
<b>Description</b>			
<p>Lobby entrance manor house, early C17, restored and extended in C20. Timber framed, plastered with exposed studding, roofed with handmade red clay tiles. Three bays aligned approx. N-S, with chimney stack in middle bay, forming a lobby entrance to E, with original 3 storey porch. Stair tower to W of middle bay, and 2 bay service wing in NW angle. Extension to N of W end of service wing, forming a Z plan, converted to separate dwelling c.1980. Single-storey flat- roofed extension to W of S bay of house, C20. Small lean-to porch against N side of existing porch, C20. Main house and porch of 2 storeys with attics, service wing and N extension of one storey with attics. To each side of porch an oriel of 2 storeys with attics, C20, with large gabled dormers, forming a symmetrical composition. All windows C20 casements, in early C17 style. Original ground floor oriel on N elevation, with moulded brick base, 4 ovolo moulded mullions, intermediate diamond stiffening bars of iron, transom carved inside and outside with guilloche design, more guilloche carving on outside of corner posts, of which the W is original, the E accurately restored. Some early coal-fired glass with C20 leading. C20 wooden casement in place of original wrought iron casement, otherwise historically authentic, a rare survival. Some framing exposed internally, heavy studding closely spaced. Straight braces across upper corners of walls, inside studs but not trenced. Axial beams, plain chamfered with lamb's tongue stops. Joists exposed in ground floor S room, but unchamfered and intended to be lathed and plastered to the soffits, as the other ceilings are. Storey posts with small jowls at first floor as well as large jowls at top. Hearth of ground floor N room has 2 recessed panels above mantel beam, plastered, one having the date 1615, which appears authentic and consistent with other evidence, but which was not reported by RCHM c.1920. Hearth of first floor N room has brick arch of depressed curvature with stop-chamfered lintels. Stair tower has original newel post and some original treads. Roof of butt-purlin construction, with original apertures for the 3 dormers to E. Service wing has no central tiebeam, trussed originally with straight braces to collar. The E oriels are wholly or largely C20 work, but may be based on original features. The house was reported by the RCHM to be in poor condition c.1920, and has been extensively restored since then. [1] [2]</p> <p>The value of this asset is derived from its architectural value as recognised by its designation as a Grade II* Listed Building; and also its evidential and historical value for occupation and farming at the same site since at least the 17th century. The presence of a medieval moated site at this location (Asset 107) implies that Aylmers reflects an even longer period of occupation.</p>			
<b>Sources</b>			
<p>[1] Historic England National Heritage List [2] Essex Historic Environment Record</p>			

<b>Site Number</b>	106	<b>Site Name</b>	Aylmers Barn
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4890012954
<b>Value</b>	High	<b>Condition</b>	Good
<b>Site Type</b>	Barn Agricultural Building	<b>Period</b>	17th Century
<b>NMR ref</b>	1111365 118264	<b>HER ref</b>	33886
<b>Description</b>			
<p>Barn, early C17. Timber framed, weatherboarded, roofed with handmade red clay tiles. Four bays aligned approx. NE-SW, with aisle on NW side only, midstrey to SE in second bay from NE. Lean-to extensions on both sides of midstrey and at SW end. Four windows in SE elevation, C20. Roof hipped at SW, half-hipped at NE. Jowled posts, straight tiebeams, arched braces to tiebeams and arcade plate. Heavy studding with straight braces inside, not trenched, across upper angles of walls. Queen strut roof with clasped purlins. Curved wind bracing to purling in one bay only, that containing the midstrey. Contemporary with house and exhibiting similar constructional features, in particular the unusual wall bracing. Reported by the RCHM to be in poor condition c.1920, but wholly reclad since then, frame unaltered. [1] [2]</p> <p>The value of this asset is derived from its architectural value as recognised by its designation as a Grade II Listed Building; and also its evidential and historical value for occupation and farming at the same site since at least the 17th century. The presence of a medieval moated site at this location (Asset 107) implies that Aylmers reflects an even longer period of occupation.</p> <p>Under the DMRB methodology this asset would be considered of Medium value. However, taking its evident group value with Aylmers (asset 105) as part of a 17th century farm into account, its value has been assessed to be High.</p>			
<b>Sources</b>			
<p>[1] Historic England National Heritage List [2] Essex Historic Environment Record</p>			

<b>Site Number</b>	107	<b>Site Name</b>	Durrington Hall
<b>Legal Status</b>	Grade II* Listed Building	<b>NGR</b>	TL4898013061
<b>Value</b>	High	<b>Condition</b>	Good
<b>Site Type</b>	Country House House	<b>Period</b>	Post-medieval 18th Century
<b>NMR ref</b>	1111363 118260	<b>HER ref</b>	33883 46290
<b>Description</b>			
<p>Country house, mid-C18, extended in late C19. Plastered brickwork (exposed on NW elevation), slate roof. Square plan, aspect approx. SW, with internal chimney stacks near W corner and middle of SE side. Late C19 extension to NE with chimney stacks near N and S corners. Two storeys with attics. Main elevation, ground floor, porch with modillioned pediment, 2 fluted Corinthian columns on plinths and 2 fluted Corinthian pilasters, semi-circular niche to each side, 2 original bays each of 3 double-hung sash windows of 24 and 18 lights. First floor, 1:3:1 arrangement of Venetian windows and double-hung sash windows, the latter of 12 lights each, with a detached segmental head over the middle one. Oblong recesses at outside, on both floors. Modillioned cornice and pediment with circular light and floral design. Pedimented dormer to each side, the N of 6 lights, the S dummy. Hipped roof. The whole forms a symmetrical composition, except the chimney stacks, of which the S has diagonally grouped shafts. Garden (SE) elevation, ground floor, 7 windows, various, all with cornices. First floor, 7 double-hung sash windows of 12 lights, 5 in the original building with pedimented heads, those in the C19 extension larger and with cornices. Modillioned cornice across both parts. Three dormers in original building, the middle one with segmental pediment, the others triangular. The interior is complete with all doors and doorcases, panelling, all fireplaces except in the S first floor room, blocked. Oak staircase with 3 turned balusters to each tread, and scrolled ends, asymmetrical. In the entrance hall, 2 inserted Ionic columns and beam with Greek key design on soffit, early C19.</p> <p>Muilman stated in 1771 'A capital mansion, called Durrington-House, has lately been built about a mile south-west from the church, upon the estate belonging to Sheering Hall manor' (A History of Essex, IV, 106). He named the owner as Samuel Feake, who had built the house after inheriting the estate from his father of the same name, who had bought it at the collapse of the South Sea Company, i.e. 1720. This information and the architectural style, tend to date the construction a decade or two earlier than the date of his publication. The architect is not known. An engraving opposite depicts the house in all essentials as now, including the bays, although shown with fewer glazing bars. A coach house is depicted to the north-west with square clock tower and cupola. This building is missing, but the same clock tower and cupola seem to have been transferred to a C19 coach house approx. 60 metres to the north. [1] [2]</p>			
<b>Location, area, boundaries, landform and setting</b>			
<p>The site is about 2 km west-southwest of Sheering Parish church and is about 30 hectares in area. It is bound to the south and east by the Harlow to Sheering road, to the west by Lower Road, a minor road to Lower Sheering, and to the north by farmland. The gardens are level but the parkland falls gently to the south.</p>			

### Entrances and approaches

From Lower Road near Old Harlow, the entrance is by a short drive that branches at its eastern end, which corresponds to that shown on the first edition 25' OS map. There are two panelled c18/19 stone piers (Grade II), topped by stone balls on low plinths, adjoining the road and a wooden park gate. New railings line the fairly straight section of the drive, running almost west to east, has a hard surface and leads to the service area, stable yard and three cottages at the back end (north) of the principal building and this corresponds to the position of the drive shown on the Chapman and Andre map of 1777. Approximately two thirds of the way along, the drive divides and a section, with a loose gravel surface, leads off the south. It is protected by newly installed electric gates and ends in a turning area in front of the principal building. There is no lodge. On the eastern extremity, at the point where the original road meets the diverted road of 1845, there is a second entrance, not suitable for vehicles, between stock brick pier and dwarf walls, both capped with Portland stone copings, those on the walls bearing scars of removed railings.

### Principal Buildings

The Grade II listed two-storey house, with attics, is covered in stucco and, from the west, it closely resembles the Chapman engraving (illustrated in Muilman). The house was extended during C19th. Recent repair work revealed a timber framed structure with brick infill beneath, indicating an earlier building within this shell. Cottages and a stable block (all listed Grade II) with clock turret to the north are mainly in stock brick and of early mid C19 appearance.

### Gardens and Pleasure Grounds

The house and its surrounding garden lie on the north side of the park. To the west, between the house and the Lower Road is a lawn with specimen trees (beech, horse chestnut, fastigiate chesnut and a tulip tree, *Liriodendron tulipifera*) and an oval pond as shown on earlier maps. Abutting the southwest corner of the house is an area densely planted with yew, laurel and syringa, with the possible remains of a serpentine path running through it. This may be the path shown on the first edition 25' OS map meandering through mixed conifer and deciduous planting, between the front lawn and the park which ended at Lower Road opposite the entrance to Aylmers (the neighbouring property which was formerly part of the estate). To the south of the house is a lawn, separated from the park by a ha-ha, with in-situ cast concrete retaining wall. The ha-ha seemed to follow views, across the former park, south down the valley and up toward the Moor Hall site. The imprint of a former tennis court is visible in the southwest corner. Slight irregularities of the lawn are due to the loss of several substantial trees including two cedars, *Cedrus libani*, due to age, as well as the 1987 gale. A striking feature of the garden is a very straight 400 metre path running east from the southeast corner of the house to the north corner of Chapel Field. It isn't discernable as on the Chapman and André map of 1777 unless it is the actual road, which is depicted as running beside the house; but a long straight path is clearly shown on the first edition 25' OS map of the 1870s. In places this is slightly raised above the surrounding ground level, and is very well consolidated. The first part of straight path runs across the lawn. The second part, running between yew hedges planted by the present owner, passes through a grasses area planted with clipped Irish yew and various specimen trees, including a tormented willow, *Salix babylonica* 'Tortuosa'; a fine fern leaved beech, *Fagus sylvatica* 'Asplenifolia'; and a copper beech. A curved beech hedge (predating the present family ownership in 1960 to the north cuts off a triangular area, planted as a rose garden by the present owner, through some old fruit trees suggest it may have been an orchard. The third part of the straight path enters an orchard and nuttury through a wrought iron gate between red brick pier of C20 date. Lime trees, many showing signs of poor health and a few horse chestnuts are planted along the north boundary of this area and some may be survivors of those shown line in the boundary on the first edition 25' OS map. The straight path ends where it joins the curved line of the old road to Sheering, which is lined each side with a ditch and a hedge of hawthorn and field maple. The line of this old road can be traced along much of the south edge of the orchard and nuttury.

### Park

This lies to the south of the gardens and slopes gently down towards the Sheering Road. The southern and north eastern section is fenced off and in agricultural use with no free-standing timber, although the roadside tree belts (containing mature Scots pine and horse chestnut) and a large roundel at the north edge (Scots pine C19 park) is under permanent grass and contains some specimen trees including a large white poplar, *Populus alba*; London plane, *Platanus x hispanica*; and an unidentified grafted ash with most unusual bark. A narrow pond, which may be that shown on the first on the first edition 25' OS map, protrudes into the northwest corner, forming one side of an enclosed area planted with horse chestnut.

### Kitchen Garden

This is in two separate compartments. The east compartment is enclosed by a red brick wall about 4 metres high (south wall: c340mm thick, with opening between piers containing railings on dwarf wall and wrought iron gate, Flemish bond to outside but almost no headers on inner face, probably reconstructed or using second hand material. East wall: English bond. North and west walls: Flemish bond). The southernmost part of this compartment contains a deeply rectangular pond (corresponding to that shown on the Tithe and first edition 25' OS maps) with a narrow turfed terrace between the wall and the steeply cut pond bank. A brick wall with stone capping lines the east end of the pond and continues up the steps on either side to the north and south, giving a crenellated effect. Another set of steps from the east leads down to the pond, dissecting the wall halfway along its length. The northern part is productive vegetable garden. Wall scars in the southwest corner show the position of a boiler house. Adjoining is a timber built fruit store. In addition to the main ornamental metal gate, which has a crown on top, on the south side there is also a narrower ornamental gate approximately 6 metres to the east of the same wall (at the top of the steps beside the pond). Other entrances to this compartment comprise single wooden gates to the east and west at each end of the central path and narrow double wooden doors in the northwest corner. The size and extent on this formal pond is most unusual within its walled garden setting and may hint at an earlier derivation. Perhaps from a formal water feature in connection with a pre- or early C18 phase? The west compartment is enclosed to the north by the coach house, and to the west by a range of cottages. The south wall is stock brick was built in the 1960s from material salvaged from the demolished servants wing. There is a large modern central glasshouse running north to south on the site of an earlier slightly smaller structure. A vine from the earlier glasshouse survives at the south end. The worn red quarry tile floor dates from the earlier structure. In the northeast corner is a lean-to potting shed with pantile roof, recently carefully repaired. There is another utilitarian lean-to in the southeast corner. Although there have been various C20 improvements and alterations to the gardens and grounds of Durrington House, much evidence still remains of the layout as shown on the first edition 25' OS map. The only extant features from the C18 layout as shown on Chapman and André's map of 1777, are the pond on the front (west) lawn and the drive leading to the north of the house. The wider landscape contains features named after two significant former owners of the site: Feakes Lock (north-west of site on Stort Navigations) and Glyn's spring, an almost rectangular wooded area surrounded by farmland between Sheering Church and the M11. [2]

The house remained in the Feake family and its descendants before being sold by Clayton L Glyn, husband of influential early 20th century novelist and screenwriter Elinor Glyn. [5]

Originally called Durrington House, and is labelled as such on early Ordnance Survey maps. The name Durrington Hall has been adopted by this study because it is the title used by Historic England in the statutory List. [3]

The value of this asset is derived from its architectural value as recognised by its designation as a Grade II\* Listed Building; its group value

with its well preserved estate buildings (Assets 108, 109 and 110) which have also been recognised through designation; and the survival of the main elements of its gardens and wider landscaped grounds. [4]

Although positioned on a prominent raised location from which its grounds and surrounding landscape could be enjoyed, views of the wider landscape to the south and south-west are variable depending on the viewer's location within the house. At ground floor level views are limited to the immediate gardens, and the artificial horizon south-west of the house obscures views in this direction. Views from bedrooms at first floor level are partially obscured by landscape planting, some of which may relate to improvements to the house in the 18th Century. Views from these rooms offer glimpses of The Mores (a prominent plantation forming part of the site of Moor Hall (Asset 17)) filtered through tree canopies in the near and medium ground. Views from attic rooms on the second floor are slightly more open, but still filtered and partially screened by foliage. From this position Mayfield Farm (Asset 31) and The Mores plantation (part of Asset 17) are more clearly visible. [4]

#### Sources

[1] Historic England National Heritage List

[2] Essex Historic Environment Record

[3] Ordnance Survey, 1880-84, 1:10,560, Essex. Sheet XLI

[4] Walkover survey, May 2016

[5] Victoria County History, 1983, A History of the County of Essex, Volume VIII, 242

<b>Site Number</b>	<b>108</b>	<b>Site Name</b>	<b>Durrington Hall Gate Piers</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4885813064
<b>Value</b>	High	<b>Condition</b>	Good
<b>Site Type</b>	Gate Piers Gateway	<b>Period</b>	Post-medieval 18th Century
<b>NMR ref</b>	1147102 118261	<b>HER ref</b>	33884

#### Description

Pair of gate piers approx. 100 metres west of Durrington Hall, C18/19. Stone. Square, with recessed panels, square copings and ball finials. Listed for Group Value. [1] [2]

During the walkover survey it was observed that low flanking walls and a second set of taller inner piers have been added in a similar style to the originals, with tall decorative wrought iron railings and gates. [3]

The value of this asset is derived from its architectural value as recognised by its designation as a Grade II Listed Building; and its group value with Durrington Hall (Asset 108) and the other well preserved estate buildings (Assets 110 and 111) which have also been recognised through designation.

#### Sources

[1] Historic England National Heritage List

[2] Essex Historic Environment Record

[3] Walkover survey, May 2016

<b>Site Number</b>	<b>109</b>	<b>Site Name</b>	<b>Durrington Hall Domestic Quarters</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4898213098
<b>Value</b>	High	<b>Condition</b>	Good
<b>Site Type</b>	Servants Quarters House	<b>Period</b>	Post-medieval 17th Century 18th Century
<b>NMR ref</b>	1147117 118263	<b>HER ref</b>	38211
<b>Description</b>			
<p>C17 house altered and extended in C19 and C20 to form domestic quarters of Durrington Hall. Timber framed, plastered, slate roof, extended in brickwork with slate roofs. Four bays aligned approx. NW-SE, with chimney stack at each end. Extended to SE with red brickwork, Flemish bond, C19. Lean-to extension at SE end, C20. Wooden garage to front of SE end, wooden shed to rear. Two storeys. Ground floor, glazed door with flat roofed porch, 4 panel door with shallow hood, 4 C20 casement windows. First floor, 5 C20 casement windows. In red brick extension to SE, 4-panel door and 2 double-hung sash windows, C19, string course. Roof of shallow pitch, hipped at both ends. Timber framed building divided into 2 dwellings. Two bay ground floor room at NW end has transverse and axial chamfered beams with lamb's tongue stops. Beams in SE end boxed in. Originally this building was of one storey with attics. Roof raised by approximately one metre in C18, and converted to low pitch for slate in early C19, with continuous roof over red brick extension. [1] [2]</p> <p>The value of this asset is derived from its architectural value as recognised by its designation as a Grade II Listed Building; and its group value with Durrington Hall (Asset 108) and the other well preserved estate buildings (Assets 109 and 111) which have also been recognised through designation.</p>			
<b>Sources</b>			
<p>[1] Historic England National Heritage List [2] Essex Historic Environment Record</p>			

<b>Site Number</b>	<b>110</b>	<b>Site Name</b>	<b>Durrington Hall Coach House and Stable Block</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4897813139
<b>Value</b>	High	<b>Condition</b>	Good
<b>Site Type</b>	Coach House Road Transport Site	<b>Period</b>	Post-medieval 19th Century
<b>NMR ref</b>	1111364 118262	<b>HER ref</b>	33885
<b>Description</b>			
<p>Coach house and stables, c.1800, one end converted to cottage, C20. Brickwork partly rendered, slate roofs. Aligned approx. NE-SW, with central vehicle entrance to SE with triangular open pediment over. Shallow pitched hipped roof. SW end converted to 2 storey cottage with internal chimney stack in SW wall, pyramidal roof of shallow pitch. Original brickwork of SE elevation is of gault bricks, Flemish bond. NW and NE elevations of red bricks, English bond, with 10 plain pilasters on the former and 3 on the latter. SW and SE elevations of cottage cased with later brickwork, smooth plaster to first floor level, roughcast render above. To NE of vehicle entrance, plain boarded door with louvre above, 2 C20 cross windows of 4 fixed lights with flat brick arches over. Central square clock tower, originally with cupola but dismantled when inspected in March 1983. Cottage, glazed door and 2 casement windows on each floor, all C20. [1] [2]</p> <p>The value of this asset is derived from its architectural value as recognised by its designation as a Grade II Listed Building; and its group value with Durrington Hall (Asset 108) and the other well preserved estate buildings (Assets 109 and 110) which have also been recognised through designation.</p>			
<b>Sources</b>			
<p>[1] Historic England National Heritage List [2] Essex Historic Environment Record</p>			

<b>Site Number</b>	111	<b>Site Name</b>	17 and 19 Sheering Road
<b>Legal Status</b>	None	<b>NGR</b>	TL4813311605
<b>Value</b>	Low	<b>Condition</b>	Fair
<b>Site Type</b>	House House	<b>Period</b>	Post medieval 19th Century
<b>NMR ref</b>	N/A	<b>HER ref</b>	N/A
<b>Description</b>			
<p>A large late 19th century house located on the north side of Sheering Road and depicted on the 1st edition Ordnance Survey 1:10,560 map. [1] Built from stock brick in Flemish bond, with segmental window and door heads also in the same brick. Two storeys plus attic. Pitched slate roof with a central stack also in stock brick and with 14 pots. Windows are a mixture of six and four-pane sliding sashes and UPVC. A carved brick plaque on the south-facing gable dates the building to AD 1854. [2]</p> <p>The value of this asset is derived from its group value with several other well preserved designated and undesignated buildings within the Churchgate Street Conservation Area (Asset 85).</p>			
<b>Sources</b>			
<p>[1] Ordnance Survey, 1880-84, 1st edition 1:10560, Essex, Sheet XLI  [2] Walkover survey, May 2016</p>			

<b>Site Number</b>	112	<b>Site Name</b>	Housham Hall
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL5038811890
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	House Timber-framed building	<b>Period</b>	Post-medieval 16th Century 17th Century
<b>NMR ref</b>	1165954	<b>HER ref</b>	4387 33764
<b>Description</b>			
<p>Farmhouse, mid-C16 and C17, altered in C18, C19 and C20. Timber framed, cased with brickwork and rough-cast rendered, roofed with handmade red clay tiles. Two storey crosswing aligned NE-SW, mid-C16. Internal chimney stack in middle of SE wall, C17/18. Three bay block of 2 storeys with attics extending to SE, with external chimney stack at end. Single storeyed extension to NW, C20. SW elevation, glazed door, one casement window, 2 tripartite double-hung sash windows, all c20. 6 panel door, top panels glazed, in flat roofed porch. First floor, one C20 casement window, 2 tripartite double-hung sash windows, early C19, one double-hung sash window, early C19. Main roof hipped at both ends behind parapet. Roof of crosswing rebuilt on NW-SE alignment, half-hipped at NW. Framing partly exposed internally. Jowled posts. Evidence of former unglazed windows with sliding shutters in crosswing. The crosswing and the main block are structurally distinct and of different periods, indicating a phased renewal of the building. The first phase was probably an open hall, aligned NW-SE, with a crosswing at the NW end. The second phase was the insertion of a chimney stack in the NW bay of the hall. This is well illustrated in the Walker map of 1609 (Essex Record Office D/DU 25) which shows the building in elevation. The third phase was the demolition of the hall block and chimney, and its replacement by the present NW-SE block, leaving the crosswing standing to the present day. The fourth phase was the casing in brickwork of the whole building, and the reconstruction of the crosswing roof on a NW-SE alignment, characteristic of the C18. The present chimney stack in the crosswing cannot be the one illustrated by Walker. Alterations were made to the windows in the early C19, of which some survive, and in the C20. [1] Described by the HER as 'not outstanding'. [2]</p> <p>The value of this asset is derived from its architectural value as recognised by its designation as a Grade II Listed Building; its group value with its well preserved barns (Assets 113 and 114) which have also been recognised through designation. The presence of a medieval moated site (HER Ref. 4386) at this location (Asset 107) implies that Housham Hall reflects an even longer period of occupation, possibly encompassing a deserted medieval village. Our understanding of this asset is also informed by its association with the two barns as a post medieval farmstead, and with the moat as the later incarnation of a mediaeval manorial farm. Its farming origins can be traced in the modern landscape, where it is located within 20th century agricultural fields (HLT 2).</p>			
<b>Sources</b>			
<p>[1] National Heritage List  [2] Walkover survey, May 2016</p>			



<b>Site Number</b>	113	<b>Site Name</b>	Barn approximately 25m north of Housham Hall
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL5037811933
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Barn Agricultural Building	<b>Period</b>	Post-medieval 17th Century
<b>NMR ref</b>	1337549	<b>HER ref</b>	33765
<b>Description</b>			
<p>Barn, C17. Timber framed, weatherboarded, roofed with handmade red clay tiles. Five bays aligned NE-SW, midstrey to SE, doors blocked. Lean-to extensions both sides of midstrey. Main roof half-hipped both ends, midstrey also half-hipped, catslide roofs over lean-to extensions. Jowled posts, arched braces to straight tiebeams, queen strut roof, clasped purlins without wind braces. Primary straight braces in walls. [1]</p> <p>The value of this asset is derived from its architectural value as recognised by its designation as a Grade II Listed Building; its group value with the post medieval farmhouse and another barn (Assets 112 and 114) which have also been recognised through designation. This relationship defines its modern setting.</p>			
<b>Sources</b>			
<p>[1] National Heritage List [2] Walkover survey, May 2016</p>			

<b>Site Number</b>	114	<b>Site Name</b>	Barn approximately 75m south of Housham Hall
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL5038711812
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Barn Agricultural Building	<b>Period</b>	Post-medieval 16th Century
<b>NMR ref</b>	1165980	<b>HER ref</b>	33766
<b>Description</b>			
<p>Aisled barn, c.1600 altered in C19 and C20. Timber framed, walls originally of timber framing but rebuilt in brick with roughcast rendering, roofed with corrugated iron. Six bays aligned approx. NE-SE with double doors in SE side in second bay from SW. Lean-to extension at SW end known as 'the quin-hus'. Half-hipped at both ends. Jowled arcade braces from them to tiebeams and arcade plates, queen strut roof. No aisle shores. Face-halved and bladed scarfs in arcade plates. This barn corresponds in position with one depicted in elevation in the Walker map of Matching, 1609 (Essex Record Office, D/DU 25), and may be the same. The only apparent difference is in the position of the doors which in the Walker map are placed centrally in the SE side. [1]</p> <p>The value of this asset is derived from its architectural value as recognised by its designation as a Grade II Listed Building; its group value with the post medieval farmhouse and another barn (Assets 112 and 113) which have also been recognised through designation. This relationship defines its modern setting.</p>			
<b>Sources</b>			
<p>[1] National Heritage List [2] Walkover survey, May 2016</p>			



<b>Site Number</b>	115	<b>Site Name</b>	Geophysical anomalies east of M11
<b>Legal Status</b>	None	<b>NGR</b>	TL4986512037
<b>Value</b>	Medium	<b>Condition</b>	Uncertain
<b>Site Type</b>	Geophysical Anomalies Archaeological Feature	<b>Period</b>	Prehistoric Uncertain
<b>NMR ref</b>	N/A	<b>HER ref</b>	N/A
<b>Description</b>			
<p>Geophysical anomalies identified during surveys commissioned to inform the forthcoming Environmental Statement. Provisional results appear to show a number of linear and discrete anomalies on high ground east of the M11 and north of Matching Road. It appears likely that these anomalies represent the trace of buried archaeological remains of probable prehistoric date and associated with similar anomalies identified west of the M11 (Asset 98). [1]</p> <p>Archaeological investigation conducted ahead of residential development north of Gilden Way (Asset 21) identified archaeological remains of a similar date; cropmarks indicative of similar features have been identified 700m north-east (Asset 3); and prehistoric finds have been recovered from the ploughsoil close to Pincey Brook (Asset 25), near Moor Hall (Asset 10) and during construction of the M11 (Asset 20). [2]</p> <p>The value of this asset is derived from its archaeological potential and its ability to contribute to our understanding of prehistoric settlement and funerary practice at a local and regional level. The modern landscape setting of this asset does not contribute to our understanding of it.</p>			
<b>Sources</b>			
<p>[1] Headland Archaeology, 2016b, M11 Junction 7A, Essex: Additional Geophysical Survey</p> <p>[2] Oxford Archaeology, 2006, Gilden Way, Harlow, Essex: Archaeological Evaluation Report</p>			

## **Appendix 6.2: Heritage Statement**





**M11 Junction 7A**

**Heritage Statement**

**Revision 1**

**January 2016**

<b>Project:</b>	M11 Junction 7A		
<b>Client:</b>	Essex County Council	<b>Project Number:</b>	B3553F05
<b>Document Title:</b>	Heritage Statement		
<b>Ref. No:</b>	TBC		

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DATE	<b>6/11/2014</b>	<b>Document status Final for Approval</b>		

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		<b>Rob McNaught</b>	<b>Rebecca Thompson-Lawrence</b>	<b>Jonathan Mullis</b>
<b>Approved by</b>	NAME	As Project Manager I confirm that the above document(s) have been subjected to Jacobs' Check and Review procedure and that I <b>approve them for issue</b>		INITIALS
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# 1 Introduction

Essex Highways has commissioned Jacobs UK Ltd (hereafter 'Jacobs') to design a new junction on the M11 motorway north-east of Harlow. The Scheme design also included improvements to the Gilden Way (the B183) between Sheering Road and First Avenue, to improve links between the town of Harlow and the strategic road network (central NGR TL 4930 1220; Figure 1).

The National Planning Policy Framework (NPPF; DCLG<sup>1</sup> 2012) requires that, where development could affect heritage assets, a description of the significance of affected heritage assets and the contribution of their setting to that significance is provided, along with assessment of the impact of the proposal. The impact of a development on the significance of heritage assets is a material consideration for the local planning authority in determining any planning application. Although elements of the assessment methodology presented in the Design Manual for Roads and Bridges (DMRB), Volume 11, Section 3 Part 2 'Cultural Heritage' (HA 208/07) have been used in the preparation of this report; because the proposed development is not a trunk road scheme, a heritage statement to address the requirements of the NPPF was considered the appropriate format for this report.

This option appraisal has been prepared by Jacobs in response to the scoping report recommendations (Jacobs 2013) and following consultation with Essex County Council (ECC). This report provides an assessment of the significance of heritage assets potentially affected by each of the scheme options; an assessment of the magnitude and significance of impact of each option; and a preferred route option in terms of the overall heritage effects.

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<sup>1</sup> Department for Communities and Local Government.



## 2 Development Proposals

At present, the only access to the strategic road network into Harlow is via the existing Junction 7 of the M11 motorway, currently considered to be ‘at capacity’ for traffic use. There is also significant traffic congestion at peak times on the current local road network, in particular along the A414 corridor.

Harlow is projected to grow in the next 15 years through existing committed developments. Hence traffic congestion at Junction 7 and throughout the town would be expected to increase significantly. Traffic queues currently are frequent. The proposed Junction 7A to the east of Harlow would help alleviate these problems with the following objectives:

- *to improve accessibility to and from Harlow;*
- *to reduce congestion primarily for the A414 corridor;*
- *to ensure the proposed infrastructure is the appropriate scale for future traffic demands; and*
- *to provide an opportunity for future housing developments and employment to the east of Harlow.*

At this stage a ‘preferred option’ for the Scheme has not been chosen. This will be announced after the formal public consultations have ended. At present there are four options under consideration, but all with a similar corridor / footprint, namely:

- *Option 1;*
- *Option 1A;*
- *Option 1B; and*
- *Option 2.*

Options 1, 1A and 1B follow approximately the same footprint (see Figures 3 and 4). The difference between these three Options involves the access to Gilden Way / Sheering Road (B183) and the Campions residential area from the proposed western roundabout.

For Option 2 the majority of the features to the east of Sheering Road are also common to Options 1 and 1A. However, Option 2 is different in that it extends over Sheering Road via a bridge and around the Campions residential area, before connecting to the north of Gilden Way (B183) (Figure 5).

The design of the proposed grade-separated junction will consist of a pair of dumb-bell roundabouts with slip roads connecting to the M11 motorway in all four directions is common to all four options. The proposals for the improvement to Gilden Way (the B183) between Sheering Road and First Avenue will comprise the widening of the existing road footprint to a dual carriageway within the grass verges which are positioned either side of the existing road..

## 3 Planning Policy Context

Scheduled Monuments are, by definition, of National Importance and are protected by law under the Ancient Monuments and Archaeological Areas Act 1979. Consequently it is a criminal offence to damage a Scheduled Monument, and Scheduled Monument Consent (SMC) is required for any works affecting a Scheduled Monument and is obtained from the Secretary of State for Culture, Media and Sport (DCMS)<sup>2</sup> before any works affecting a Scheduled Monument may take place.

Listed buildings are protected under the Planning (Listed Buildings and Conservation Areas) Act 1990, and are recognised to be of ‘special architectural or historic interest’. Under this Act, planning authorities are required to have special regard to the desirability of preserving a Listed Building, its setting, or any features of special architectural or historic interest which it may possess. Designation as a Listed Building provides planning authorities with additional controls over the demolition and alteration of historic buildings through the process of Listed Building Consent (LBC) to be gained before undertaking works of alteration or demolition. The setting of a Listed Building is a material consideration in determining of planning permission by local authorities.

Under Section 69 of the Planning (Listed Buildings and Conservation Areas) Act 1990, planning authorities have a duty to designate Conservation Areas which are defined as ‘areas of special architectural or historic interest the character or appearance of which it is desirable to preserve or enhance’. Conservation Area designation provides controls over the demolition of unlisted buildings and the removal of trees. In addition it also limits permitted development rights within the area, and provides the basis for local authority planning policies to further preserve and enhance the area’s special character.

### 3.1 National Planning Policy Framework

National planning policies for the conservation of the historic environment are set out in section 12 of the National Planning Policy Framework (NPPF) (DCLG 2012).

The NPPF recognises that heritage assets are an irreplaceable resource which should be conserved in a manner appropriate to their significance. Significance is defined by the NPPF as ‘the value of a heritage asset to this and future generations because of its heritage interest’. This significance may be related to archaeological, architectural and artistic or historic elements, and may also derive from the setting of the site (DCLG 2012, para 56).

Under paragraph 128, applicants for planning permission are required to provide a description of the significance of any affected heritage assets and the contribution of their setting to this, in sufficient detail to understand the potential impact of the proposal on them. The level of detail should be proportionate to the importance of the heritage asset. This information together with an assessment of the impact of the proposal should be set out in the planning application.

In determining planning applications, local planning authorities are instructed to take into account:

<sup>2</sup> The administration and handling of the SMC application is undertaken by English Heritage.

- *the desirability of sustaining and enhancing the significance of heritage assets and putting them to viable uses consistent with their conservation;*
- *the positive contribution that conservation of heritage assets can make to sustainable communities including their economic vitality; and*
- *the desirability of new development making a positive contribution to local character and distinctiveness. (DCLG 2012, para 131).*

Under paragraph 134, where development will lead to less than substantial harm to the significance of a designated<sup>3</sup> asset, this harm should be weighed against the public benefits of the proposal, including securing its optimum use.

Under paragraph 135, the impact of a scheme on the significance of undesignated heritage assets<sup>4</sup> is to be taken into account in determining planning applications, with a balanced judgement to be made with regards to the scale of any harm/loss, and the significance of the asset. Where a heritage asset will be wholly or partially lost, local planning authorities are instructed to require developers to record and advance the understanding of the significance of the heritage assets in a manner proportionate to their importance and the impact. This evidence should then be made publicly accessible through deposition with the relevant Historic Environment Record (DCLG 2012, para 141).

Paragraph 137 recommends that local planning authorities should look for opportunities for new development within Conservation Areas and within the setting of heritage assets to enhance or better reveal their significance. Planning authorities are instructed to treat applications favourably which preserve elements of the setting which make a positive contribution to, or better reveal the significance of an asset. A recent Court of Appeal judgement<sup>5</sup> has reiterated that significant weight should be given to the preservation of the setting of designated heritage assets.

### **3.2 Local Planning Policy**

Local policy on heritage matters is set out in the Epping Forest District Local Plan (adopted 1998) and Local Plan Alterations (adopted 2006), and the Adopted Replacement Harlow Local Plan (2006).

The following policies are relevant to the Scheme.

Policy HC1 sets out Epping Forest District Council's (EFDC) approach to development affecting Scheduled Monuments and other archaeological remains, and states:

*“On sites of known or potential archaeological interest, planning permission will only be granted for development which would not adversely affect nationally important remains, whether scheduled or not, or their settings. The Council will also require:*

- the results of an archaeological evaluation to be submitted as part of any application;*
- the preservation in situ, and provision for appropriate management, of those remains and their settings considered to be of particular importance;*

<sup>3</sup> Designated assets: World Heritage Sites, Scheduled Monuments, Listed Buildings, Conservation Areas, Registered Parks and Gardens and Registered Battlefields.

<sup>4</sup> Undesignated assets: locally Listed Buildings and locally recorded assets.

<sup>5</sup> Barnwell Manor Wind Energy Ltd. V East Northamptonshire District Council and Others (2014) EWCA Civ. 137

- iii. *provision for recording and/or excavation by a competent archaeological organisation prior to the commencement of development, where in situ preservation is not justified”.*

Harlow Council sets out its approach to development that may affect archaeological remains in Policies BE12, 13 and 14. Policy BE12 covers Scheduled Monuments and states:

*“Planning permission will not be granted for development proposals that would adversely affect the site or setting of a Scheduled Monument listed below or other archaeological site of national or particular local importance.”*

Policy BE 12 also goes on to list the Scheduled Monuments covered by the plan including Harlowbury Deserted Medieval Village (BE12/6; NHL Ref. 1002151), and a Roman villa 500m north east of Harlowbury (BE12/9; NHL Ref. 1014738), which are both a short distance outside the study area.

The approach of EFDC to ancient landscapes is set out in Policy HC2, which states:

*“The Council will not grant planning permission for development which could adversely affect the nature and physical appearance of ancient landscapes (identified as such on the Proposals Map)”.*

Policy HC12 covers EFDC’s approach to development affecting the setting of Listed Buildings, and states:

*“The Council will not grant planning permission for development which could adversely affect the setting of a Listed Building”.*

Harlow Council’s approach to development affecting Listed Buildings is set out in Policy BE6 of the Adopted Local Plan (2006), which states:

*“Proposals for the extension or alteration of any Listed Building, alteration of its setting, conversion or change of use should not adversely affect or harm any of the following:*

1. *The character that forms its value as being of special architectural or historic interest;*
2. *The particular physical features that justify its statutory protection;*
3. *Its setting in relation to its grounds, the surrounding area, other buildings and wider views and vistas.”*

Policy BE11 sets out Harlow Council’s approach to development affecting Registered Historic Parks and Gardens:

*“Development proposals that would adversely affect the character, appearance, setting or views into and outward of a registered historic park or garden will not be permitted.”*

**4.1 Study Area**

In line with the guidance for scoping stage assessment presented in *The Design Manual for Roads and Bridges* (DMRB) Volume 11, Section 3, Part 2 (HA208/07) ‘Cultural Heritage’, a study area comprising the footprint of the proposed options, and a 300m radius extending in every direction from each option was defined (see Figure 1). Because of the similarity of the proposed options, the study area used for this assessment was defined as extending 300m in all directions from the combined options.

**4.2 Data Sources**

This report drew information from the previously prepared Preliminary Environmental Assessment (PEA) (Jacobs 2013), and in particular Appendix H which included information on heritage assets. It also drew on results of a Pre-Application Environmental Scoping Report (Jacobs 2014).

Additional data was gathered from the following sources:

- *The National Heritage List for information on statutorily and other nationally designated assets (World Heritage Sites, Scheduled Monuments, Listed Buildings, Registered Historic Parks and Gardens, Registered Battlefields);*
- *Essex Historic Environment Record (EHER) for information on designated and undesignated assets, and historic landscape characterisation data;*
- *Essex County Council website for information on Conservation Areas;*
- *Essex Record Office for documents, historic mapping and local history publications (for Harlow, Matching and Sheering) (visited on 7<sup>th</sup> August 2014);*
- *An Envirocheck report for historic Ordnance Survey mapping (August 2014); and*
- *A site inspection undertaken on 8<sup>th</sup> August 2014.*

A geophysical survey of all suitable areas of the scheme footprint was also commissioned. The fieldwork was not complete at the time of writing although interim plots of the unprocessed survey data were available.

Documents from the sources listed above used in the preparation of this report are referenced in the text, and listed in the References section below.

**4.3 Value of Heritage Receptors**

The NPPF defines significance as ‘the value of a heritage asset to this and future generations because of its heritage interest’. This significance may be related to archaeological, architectural and artistic or historic elements, and may also derive from the setting of the site (DCLG 2012, 56).

HA208/07 provides a methodology for the assessment of the value of heritage assets, including historic buildings and conservation areas, and use of this methodology therefore aligns with the guidance provided by the NPPF. For the purposes of this report, the term ‘value’ is used in order to avoid confusion with the terminology for impact assessment, and particularly ‘significance of impact’ as commonly used in Environmental Impact Assessment.

Based on the guidance provided by HA 208/07, a preliminary assessment of the ‘value’ of each heritage receptor (or asset) identified from the above sources was made according to the criteria outlined in Table 4.1, Table 4.2, and Table 4.3 on a six-point scale of ‘Very High’, ‘High’, ‘Medium’, ‘Low’, ‘Negligible’ and ‘Unknown’. It should be noted that the Unknown category only applies to archaeological assets and historic buildings, not historic landscapes.

**Table 4.1 Criteria to Assess the Value of Archaeological Remains**

Value	Criteria
Very High	<ul style="list-style-type: none"> <li>World Heritage Sites (including nominated sites).</li> <li>Assets of acknowledged international importance.</li> <li>Assets that can contribute significantly to acknowledged international research objectives.</li> </ul>
High	<ul style="list-style-type: none"> <li>Scheduled Monuments (including proposed sites).</li> <li>Undesignated assets of schedulable quality and importance.</li> <li>Assets that can contribute significantly to acknowledged national research objectives.</li> </ul>
Medium	<ul style="list-style-type: none"> <li>Designated or undesignated assets that contribute to regional research objectives.</li> </ul>
Low	<ul style="list-style-type: none"> <li>Designated and undesignated assets of local importance.</li> <li>Assets compromised by poor preservation and/or poor survival of contextual associations.</li> <li>Assets of limited value, but with potential to contribute to local research objectives.</li> </ul>
Negligible	<ul style="list-style-type: none"> <li>Assets with very little or no surviving archaeological interest.</li> </ul>
Unknown	<ul style="list-style-type: none"> <li>The sensitivity of the site has not been ascertained.</li> </ul>

**Table 4.2 Criteria to Assess the Value of Historic Buildings**

Value	Criteria
Very High	<ul style="list-style-type: none"> <li>Structures inscribed as of universal importance as World Heritage Sites.</li> <li>Other buildings of recognised international importance.</li> </ul>
High	<ul style="list-style-type: none"> <li>Scheduled Monuments with standing remains.</li> <li>Grade I and Grade II* Listed Buildings.</li> <li>Other Listed Buildings that can be shown to have exceptional qualities in their fabric or historical associations not adequately reflected in the listing grade.</li> <li>Conservation Areas containing very important buildings.</li> <li>Undesignated structures of clear national importance.</li> </ul>
Medium	<ul style="list-style-type: none"> <li>Grade II Listed Buildings.</li> <li>Historic (unlisted) buildings that can be shown to have exceptional qualities in their fabric or historical associations.</li> <li>Conservation Areas containing buildings that contribute significantly to its historic character.</li> <li>Historic Townscape or built-up areas with important historic integrity in their buildings, or built settings (e.g. including street furniture and other structures).</li> </ul>
Low	<ul style="list-style-type: none"> <li>‘Locally Listed’ buildings.</li> <li>Historic (unlisted) buildings of modest quality in their fabric or historical association.</li> <li>Historic Townscape or built-up areas of limited historic integrity in their buildings, or built settings (e.g. including street furniture and other structures).</li> </ul>
Negligible	<ul style="list-style-type: none"> <li>Buildings of no architectural or historical note; buildings of an intrusive character.</li> </ul>
Unknown	<ul style="list-style-type: none"> <li>Buildings with some hidden (i.e. inaccessible) potential for historic</li> </ul>



	significance.
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**Table 4.3 Criteria to Assess the Value of Historic Landscape Types**

Value	Criteria
Very High	<ul style="list-style-type: none"> <li>World Heritage Sites inscribed for their historic landscape qualities.</li> <li>Historic landscapes of international value, whether designated or not.</li> <li>Extremely well preserved historic landscapes with exceptional coherence, time-depth, or other critical factor(s).</li> </ul>
High	<ul style="list-style-type: none"> <li>Designated historic landscapes of outstanding interest.</li> <li>Undesignated landscapes of outstanding interest.</li> <li>Undesignated landscapes of high quality and importance, and of demonstrable national value.</li> <li>Well preserved historic landscapes, exhibiting considerable coherence, time-depth or other critical factor(s).</li> </ul>
Medium	<ul style="list-style-type: none"> <li>Designated special historic landscapes.</li> <li>Undesignated historic landscapes that would justify special historic landscape designation, landscapes of regional value.</li> <li>Averagely well-preserved historic landscapes with reasonable coherence, time-depth or other critical factor(s).</li> </ul>
Low	<ul style="list-style-type: none"> <li>Robust undesignated historic landscapes.</li> <li>Historic landscapes with importance to local interest groups.</li> <li>Historic landscapes whose value is limited by poor preservation and/or poor survival of contextual associations.</li> </ul>
Negligible	<ul style="list-style-type: none"> <li>Landscapes with little or no significant historical interest.</li> </ul>

#### 4.4 Assessment of Magnitude and Significance of Effects

The assessment of magnitude and significance of impact was assessed using professional judgement guided by the methodology provided in HA 208/07, as this method provides a robust method of assessing the magnitude and significance of impact.

Magnitude of impact is defined as the degree of change that would be experienced by an asset and its setting if the Scheme and recommended mitigation measures were completed, as compared with a ‘do nothing’ situation. The magnitude of impact is assessed without reference to the significance of the receptor, and may include physical impacts upon the asset, or impacts upon setting or amenity value. The criteria for the assessment of the magnitude of impact on archaeological assets are set out in Table 4.4 whilst the magnitude of impact on historic buildings and landscapes is presented in Tables 4.5 and 4.6 respectively.

**Table 4.4 Criteria to Assess the Magnitude of Impact on Archaeological Remains**

Magnitude	Criteria
Major	<ul style="list-style-type: none"> <li>Change to most or all key archaeological materials, such that the resource is totally altered.</li> <li>Comprehensive changes to setting.</li> </ul>
Moderate	<ul style="list-style-type: none"> <li>Changes to many key archaeological materials, such that the resource is clearly modified.</li> <li>Considerable changes to setting that affect the character of the asset.</li> </ul>
Minor	<ul style="list-style-type: none"> <li>Changes to key archaeological materials, such that the asset is slightly altered.</li> <li>Slight changes to setting.</li> </ul>
Negligible	<ul style="list-style-type: none"> <li>Very minor changes to archaeological materials, or setting.</li> </ul>



Magnitude	Criteria
No Change	<ul style="list-style-type: none"> <li>No change.</li> </ul>

**Table 4.5 Criteria to Assess the Magnitude of Impact on Historic Buildings**

Magnitude	Criteria
Major	<ul style="list-style-type: none"> <li>Change to key historic building elements, such that the resource is totally altered.</li> <li>Comprehensive changes to the setting.</li> </ul>
Moderate	<ul style="list-style-type: none"> <li>Change to many key historic building elements, such that the resource is significantly modified.</li> <li>Changes to the setting of an historic building, such that it is significantly modified.</li> </ul>
Minor	<ul style="list-style-type: none"> <li>Change to key historic building elements, such that the asset is slightly different.</li> <li>Change to the setting of an historic building, such that it is noticeably changed.</li> </ul>
Negligible	<ul style="list-style-type: none"> <li>Slight changes to historic building elements or setting that hardly affect it.</li> </ul>
No Change	<ul style="list-style-type: none"> <li>No Change</li> <li>No change to fabric or setting</li> </ul>

**Table 4.6 Criteria to Assess the Magnitude of Impact on Historic Landscape Types**

Magnitude	Criteria
Major	<ul style="list-style-type: none"> <li>Change to most or all key historic landscape elements, parcels or components; extreme visual effects; gross change of noise or change to sound quality; fundamental changes to use or access; resulting in total change to historic landscape character unit.</li> </ul>
Moderate	<ul style="list-style-type: none"> <li>Changes to many key historic landscape elements, parcels or components, visual change to many key aspects of the historic landscape, noticeable differences in noise or sound quality, considerable changes to use or access; resulting in moderate changes to historic landscape character.</li> </ul>
Minor	<ul style="list-style-type: none"> <li>Changes to few key historic landscape elements, parcels or components, slight visual changes to few key aspects of historic landscape, limited changes to noise levels or sound quality; slight changes to use or access: resulting in limited changes to historic landscape character.</li> </ul>
Negligible	<ul style="list-style-type: none"> <li>Very minor changes to key historic landscape elements, parcels or components, virtually unchanged visual effects, very slight changes in noise levels or sound quality; very slight changes to use or access; resulting in a very small change to historic landscape character.</li> </ul>
No Change	<ul style="list-style-type: none"> <li>No change to elements, parcels or components; no visual or audible changes; no changes arising from amenity or community factors.</li> </ul>

For all three sub-topics, the significance of impact was determined using professional judgement, informed by the combination of the value of the asset and the magnitude of impact. This assessment was guided by the matrix illustrated in Table 4.7. Five levels of significance of impact were defined which apply equally to ‘Adverse’ and ‘Beneficial’ impacts.

**Table 4.7 Matrix to Assess the Significance of Impacts on Heritage assets**

Value of Asset	Magnitude of Impact				
	No Change	Negligible	Minor	Moderate	Major
Very High	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
High	Neutral	Slight	Moderate or Slight	Moderate or Large	Large or Very Large
Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

## 5 Baseline Conditions

### 5.1 Introduction

A total of 101 cultural heritage assets have been identified within the study area, comprising: 39 archaeological remains, 53 historic buildings, and nine historic landscape types. A further three Listed Buildings located outside the study area have also been included for assessment due to their proximity to the proposed M11 junction. These cultural heritage assets are summarised in Table 4.8 and shown on Figures 1 and 2. The value of all the assets identified in this report comprises:

- *High:* 6;
- *Medium:* 49;
- *Low:* 23, and
- *Negligible:* 26.

No World Heritage Sites or Registered Battlefields have been identified in the study area.

The asset numbering used in this assessment continues the sequence used in previous reports, namely the PEA (Jacobs 2013), and Pre-Application Environmental Scoping Report (Jacobs 2014). However, due to changes in the study area resulting from the option designs, three assets from those reports are no longer within the study area and are omitted from this report. They are Assets 1, 18 and 19.

### 5.2 Archaeological Remains

#### 5.2.1 Assets of High Value

Harlow Mound (Asset 59) is a bowl barrow, believed to date from the Bronze Age (2,500 – 700 BC). It is located within woodland south of Gilden Way, and is designated as a Scheduled Monument. Taking its Scheduled status into account, the value of Asset 59 has been assessed as High.

#### 5.2.2 Assets of Medium Value

The earliest activity is believed to date to the Lower Palaeolithic period (500,000 to 70,000 BC) and is in the form of a worked flint tool (Asset 72) found north of Gilden Way (B183). Although of limited value in isolation, as part of a wider group of similar finds, Asset 72 could contribute to the understanding of the distribution of sites of this period at a regional level (Medleycott 2011, 7). Taking the group value of this asset into account, the value of Asset 72 has been assessed as Medium.

Evidence for flint working in the form of a core and blades dated to the Mesolithic period (7000-4000 BC) was identified during fieldwalking north of Pincey Brook (Asset 25). The Late Bronze Age (1000-700 BC) period is represented by a series of uncontained cremations, pits and a boundary ditch discovered during gravel extraction at Moor Hall Gravel Pit (Asset 16). These sites have been excavated and no longer exist, however, they have the potential to contribute to regional research objectives (Medlycott 2011, 29). As a result, these two sites have been assessed to be of Medium value.

Archaeological evaluations undertaken in the west of the study area ahead of proposed housing development on Gilden Way (Asset 21) revealed finds and archaeological remains dating from the Late Neolithic (3000-2200 BC) or early Bronze Age (2500-1500 BC), Iron Age (800 BC - AD 43), Romano British and Early Medieval periods (Oxford Archaeology 2007; Dicks and Chadwick 2010). Although the remains were heavily truncated by the effects of Post Medieval ploughing, taking their potential as an indicator of lengthy prehistoric occupation into account, the value of Asset 21 has been assessed as Medium.

Asset 98 was a group of circular, curvilinear and linear geophysical anomalies identified west of the M11, between the motorway and Sheering Road and close to the north end of the proposed scheme. The ring ditch has been provisionally interpreted as the trace of a prehistoric barrow similar to Asset 59. The value of Asset 98 has been assessed as Medium.

Activity within the study area during the Roman (AD 43-410) period is also represented by a stone coffin with associated pottery (Asset 4) was found in 1855 north of Pincey Brook (Powell 1983, 142), which again contributes to regional research objectives on ritual and religion in the Roman period (Medlycott 2011, 48). Taking this into account, the value of Asset 4 has been assessed as Medium.

A ringwork (Asset 5) is located in the north of the study area and still partially survives as an extant earthwork (bank and ditch) adjacent to Sheering Hall (Asset 8). The ringwork is undated, but this type of feature was typically constructed during the late Anglo-Saxon period to the later 12<sup>th</sup> century. In scheduling notes for other ringworks, English Heritage notes ringworks are rare nationally with only 200 surviving examples in England. Due to its rarity and its potential to contribute to regional research objectives on rural settlement, but taking into consideration the fact it has not been Scheduled, the value of this asset has been assessed to be Medium.

Harlow is believed to have evolved from an early-medieval (AD 410-1066) or medieval (AD 1066-1540) polyfocal<sup>6</sup> settlement, parts of which are preserved within the study area in Old Harlow (Asset 48), and Churchgate Street (Asset 90). As these archaeological remains contribute to the understanding of the development of Harlow during this period, and medieval towns at a regional level (Medlycott 2011, 70), the value of Assets 48 and 90 has been assessed as Medium.

### **5.2.3 Assets of Low Value**

Potential later prehistoric or early Roman archaeological remains identified as cropmarks include: a possible rectilinear enclosure (Asset 2); a ring ditch and associated linear features (Asset 3); and a ring ditch and associated linear features and possible pits (Asset 12). The date of these features is uncertain, but ring ditches predominantly date to the late prehistoric period (Bronze Age and Iron Age periods), and the rectilinear enclosures often date to the Iron Age (800 BC – AD 43) and Roman (AD43 - 410) periods. Given their potential to contribute to regional research objectives on prehistoric and Roman rural settlement (Medlycott 2011, 31 and 47), the value of these assets has been assessed as Low.

The Neolithic period (4000-2200 BC) is represented by the findspot of a polished stone axe (Asset 10). Evidence from later prehistoric periods includes cropmarks identified from aerial photographs (such as Assets 2, 3, 12 and 95) and findspots of

<sup>6</sup> Where adjacent nucleated villages have expanded and merged to form a cohesive overall community.

pottery and flint tools (such as Assets 20 and 70). Post prehistoric activity includes archaeological pits and ditches from the Roman period (AD 43-410) (including Assets 43 and 87) and a findspot concerning three sherds of pottery (Asset 14) , whilst the medieval period (AD 1066-1540) is represented by the presence of a moated site (Asset 75) at Newhall south of Gilden Way. These heritage assets are assessed to be of Low value as they indicate that the area was being used during these periods, but as isolated finds offer little information on the context, type or extent of the activity.

#### **5.2.4 Assets of Negligible Value**

The EHER notes the field name ‘Potters croft’ (Asset 9), which is interpreted as ‘*land used or occupied by a potter, the use being normally the provision of clay for pottery*’ (Field 1972, 21). The date of any pottery here is unknown, but the EHER suggests it is likely to be post medieval (1540-1901) (EHER Asset Ref. MEX13088). Harlowbury Brickworks (Asset 11) lies a short distance west of Potters croft (Asset 9) on the opposite side of Shearing Road, and was likely to have been located here to utilise the clay deposits in the area. Asset 11 operated during the 19<sup>th</sup> century, but has now been reinstated and is occupied by residential properties. The associated removal of topsoil and clay deposits for the manufacture of bricks is likely to have removed any archaeological evidence in their footprint. However, elements of structures associated with the operation of the brickworks (Asset 11) may still survive below ground. Taking their possible condition and value as an indicator of historic land use into account, the value of Assets 9 and 11 has been assessed as Negligible.

Evidence for the widespread extraction of aggregates in Essex is provided within the study area by the locations of three former gravel pits; two west of Shearing Road (Assets 27 and 28) and one west of the M11 in the north-east of the study area (Asset 39). Asset 39 is the earliest in date, being marked on a 1:2,500 Ordnance Survey map published in 1890 (Essex, Sheet 42.14). Assets 27 and 28 are both first indicated on a 1:10,560 third edition Ordnance Survey map published in 1923 (Essex, Sheet 23). All three sites have been filled in, and no trace is visible on the modern ground surface. It is considered unlikely that archaeological remains relating to their operation as gravel quarries will survive. Taking their possible condition and their relatively frequency in the landscape of this part of Essex into account, the value of all these three assets has been assessed as Negligible.

Findspots of artefacts such as pottery (Asset 80) and cutlery (Asset 78), and archaeological features recorded during modern development (e.g. Assets 44, 65, 66, 73 and 97) and are common finds within the study area.

At the eastern end of a lake west of Ealing Bridge (Asset 30), a boathouse (Asset 30) is marked on a 1:2,500 Ordnance Survey map published in 1921 (Essex, Sheet 42.14) No trace of this asset is visible on the surface today. Taking its modern date into account, the value of Asset 30 has been assessed as Negligible.

A guidepost (Asset 37) is indicated on the north side of Moor Hall Lane, close to the junction with Chalk Lane on a first edition 1:10,560 Ordnance Survey map published in 1881 (Essex, Sheet 31). During the walkover survey, it was noted that an early 20<sup>th</sup> century sign post with a wooden post and three wooden ‘fingers’ indicates the directions to Epping and Harlow, Matching Tye and Matching Green, and Chalk Lane. Although not marked on any of the maps examined for this study, a post mounted Post Box with the cipher of Elizabeth II (Asset 38) is co-located with Asset 37. Both are in good condition, and taking their status as undesignated assets into account the value of both has been assessed as Negligible.

## 5.3 Historic Buildings

### 5.3.1 Assets of High Value

The value of five historic buildings has been assessed as High. Sheering Hall (Asset 8) is of medieval date and is a Grade II\* Listed Building, and its two associated 17<sup>th</sup> century barns (Asset 6, Asset 7) are both Grade II Listed Buildings. The three form a group of structures (Assets 6, 7 and 8) adjacent to the site of an earlier medieval moat or ringwork (Asset 5). Although they are located between 30m and 70m outside the study area, they have been included for assessment, as they form part of a group with Asset 5 (which is within the study area) and are situated very close to the proposed M11 junction. Thus the potential for impacts on the setting of these three assets has been addressed in this report. Sheering Hall (Asset 8) incorporates a pair of hall houses dating to the late 15<sup>th</sup> and early 16<sup>th</sup> centuries. Assets 6, 7 and 8 form a group of buildings of manorial status that was combined to form one house, and was extended in the 19<sup>th</sup> and 20<sup>th</sup> centuries. Asset 6 and Asset 7 are both aisled barns dating to the early 17<sup>th</sup> century (*ibid.*). Because the three buildings are demonstrably a group they have been assessed as such and, taking this into account and the designated status of these historic buildings, the value of all three assets has been assessed as High.

Mulberry Green House and Stables (Asset 60) and Hill House (Asset 64) are both Grade II\* Listed Buildings located in Old Harlow. Asset 60 is of late 18<sup>th</sup> century date and is a two storey building of red brick with a three bay façade and full-height semi-circular bays in the outer bays. Asset 64 dates to the 16<sup>th</sup> century, and was substantially remodelled in the 18<sup>th</sup> century. Its west-facing façade has two stair towers at each end with pyramidal roofs. It is constructed of rendered brick with a pitched peg-tiled roof. Assets 60 and 64 are adjacent to each other on the south side of Mulberry Green, where they form part of a multi-period streetscape within the Old Harlow Conservation Area (Asset 49). Their setting is defined by their location within the traditional village street, and their principal views take in the surrounding traditional houses on what has become a minor road, since the construction of Gilden Way (B183) in the late 20<sup>th</sup> century. Taking their designation as Grade II\* Listed Buildings into account, their group value and association with the Conservation Area, the value of Assets 60 and 64 has been assessed as High.

### 5.3.2 Assets of Medium Value

There are 37 Grade II Listed Buildings within the study area (Assets 13, 15, 23, 24, 40, 41, 45, 46, 47, 52, 53, 54, 55, 56, 57, 58, 63, 67, 68, 71, 74, 76, 77, 78, 79, 81, 82, 83, 84, 86, 88, 89, 91, 92, 93, 94 and 96). Those of particular note include: a timber framed Tudor Cottage (Asset 13) in Churchgate Street, an elaborately decorated cast iron water pump (Asset 15) adjacent to Mayfield Farm; three gates or gate lodges (Assets 45, 63 and 79); a K6 telephone kiosk (Asset 79), and two almshouses (Assets 76 and 88) in Churchgate Street. Taking their designation into account all of these assets have been assessed to be of Medium Value.

Two Conservation Areas are located partly within the study area: Old Harlow (Asset 49), and Churchgate Street (Asset 85). Old Harlow was designated to protect the relatively unspoiled market town character of the medieval and post medieval precursor to the 20<sup>th</sup> century Harlow New Town to the west (Harlow Council 2013, 1). Churchgate Street has been defined for similar reasons, although it has more of a village character, with a higher proportion of vernacular buildings including a number of timber-framed houses, and the Parish Church of St Mary and St Hugh (Asset 84) in



a prominent hill top position. Both Conservation Areas contain a number of Grade II Listed Buildings. These assets were designated as Conservation Areas because they were considered to exhibit special architectural or historic interest, and taking this and their designation into account, the value of Assets 49 and 85 has been assessed as Medium.

The manor of Moor Hall was created in AD 1086; the actual date of the manor house (Asset 17) that would have stood here is uncertain. The most recent incarnation of Moor Hall was rebuilt between 1805 and 1810 as a three-storey mansion in the classical style with 5-bays and a Doric portico. The grounds were extensively landscaped at this time; of note here is the route of Matching Road, which was diverted to the south and straightened at the suggestion of Humphrey Repton (ERO D/DES/T6). Repton wrote to the then owner, that the grounds had already been so well improved that there was little remaining for him to suggest, and *“that it may appear fastidious to point out those only which might have been done better”* (ibid.). The house was used by the army during World War II, but fell into disrepair before being demolished in 1960. During construction works for a manège in 2006 on the site of the former manor house, a cache of rifle ammunition was discovered which is believed to have been concealed during World War II (Germany 2006). Given its historical association with a famous English landscape designer (Humphrey Repton); the surviving remnants of the landscape; and the fact that the history of the site has the potential to contribute to regional research objectives regarding parks and gardens, Asset 17 has been assessed to be of Medium value.

The House, also known as the Gibberd Garden (Asset 22) is a private garden established in the mid-20<sup>th</sup> century by Sir Frederick Gibberd, the town planner responsible for the establishment of the post war new town at Harlow. It is designated as a Grade II Registered Park and Garden. The garden was created to accompany a simple modern house, and to house Gibberd’s collection of sculpture (Register of Historic Parks and Gardens). Taking its designation and connection to nearby Harlow New Town into account, the value of Asset 22 has been assessed to be Medium.

### **5.3.3 Assets of Low Value**

95 Sheering Road (Asset 26) is a detached house with a steeply-pitched tiled roof and end chimney stacks, which appears to be shown on the Chapman and Andre Map of Essex (1777) (ERO E912-267). Campions (Asset 32) is a much altered house of 17<sup>th</sup> century date that is believed to occupy the site of an earlier residence of William de Campion who held land in Harlow during the 14<sup>th</sup> century (Powell 1983, 140; Roaney 1935, 38). The house was stuccoed in the 19<sup>th</sup> century, and restored and extended in the 1930s following a fire (Powell 1983, 140). 129 Sheering Road and The Bothy (Assets 29 and 35) are both detached houses constructed in the late 19<sup>th</sup> or early 20<sup>th</sup> century, as are St Stephen’s Cottages (Asset 36) which are a pair of semi-detached red brick houses on Chalk Lane close to the south of the study area. Taking their status as undesignated historic buildings into account, the value of all these five assets has been assessed as Low.

Engine House (Asset 34) is a two storey agricultural building of 19<sup>th</sup> century date, first depicted on a first edition 1:10,560 Ordnance Survey map of 1881 (Essex, Sheet 23). It is likely that Asset 34 derived its name from the presence of a steam engine used to power threshing or other agricultural equipment (Lake and Edwards 2006, 44). The building is one of the last surviving components of Moor Hall (Asset 17), and has been recently converted to residential use. Mayfield Farm (Asset 31) was built in the late 19<sup>th</sup> century and first depicted on a 1:2,500 Ordnance Survey map published in



1921. Taking their status as undesignated historic buildings into account, the value of both assets has been assessed as Low.

A bridge over Pincey Brook has been recorded at the location now occupied by Ealing Bridge (Asset 33) since the 11<sup>th</sup> century (Powell 1983, 138). The current bridge is of modern brick and steel construction. Taking its significance as the indicator of a historic crossing point into account, the value of Asset 33 has been assessed to be Low.

#### **5.3.4 Assets of Negligible Value**

No historic buildings of Negligible value have been identified in the study area.

### **5.4 Historic Landscape**

Information on the historic landscape of the study area was derived from GIS data supplied by the EHER and the published Historic Landscape characterisation Report for Essex (Bennett 2011), supplemented with observations made during the walkover survey.

#### **5.4.1 Assets of High Value**

No historic landscape types of High value have been identified in the study area.

#### **5.4.2 Assets of Medium Value**

Based on the evidence from *The Enclosure Maps of England and Wales, 1595-1918* (Kain Chapman and Oliver 2004), Acts of Enclosure in Essex took place predominantly in the 19<sup>th</sup> century. Historic Landscape Character Type HL5: Pre-18th Century Enclosure is therefore of significance because it represents an early form of informal enclosure, which is not common in the landscape of the study area. As a result it has the potential to contribute to regional research objectives regarding the development of landscape. As a result, Historic Landscape Character Type HLT5 is assessed to be of Medium value.

The Historic earthworks type (HLT9) is represented by a single element within the study area, which conforms to the location of Harlow Mound (Asset 59), a Scheduled Monument. The type is defined as representing large scale monuments large enough to be defined at a landscape scale. HLT9 is considered rare at a county level, and taking this and its association with the Scheduled Harlow Mound into account, its value has been assessed as Medium.

#### **5.4.3 Assets of Low Value**

No historic landscape types of Low value have been identified in the study area.

#### **5.4.4 Assets of Negligible Value**

The seven Historic Landscape Character Types assessed to be of Negligible value comprise 20<sup>th</sup> Century Agriculture (HLT1) represented in the study area by large fields created by amalgamating earlier small fields to accommodate modern mechanised farming; 19<sup>th</sup> and 20<sup>th</sup> Century Woodland Plantation (HLT2); Built-up Areas (HLT3); Enclosed Meadow Pasture (HLT4), in this case represented by the low lying pasture land on the banks of Pincey Brook west of Ealing Bridge (Asset 33); Informal Parkland (HLT6), such as that associated with Durrington Hall in the north-west of the

study area; and 20th Century Communications represented by the M11 motorway (HLT7). HLT8 represents evidence for modern horticulture, in this case a nursery with glasshouses south of Gilden Way (B183). These are common historic landscape character types in the area and have little significant historical interest. As a result they are assessed to be of Negligible value.

**Table 4.8 Heritage Assets within the Study Area**

Asset No	Asset Name	EHER no.	Designation	Value
2	Cropmarks South of Woodlands Farm	MEX15840	None	Medium
3	Cropmark East of Sheering Hall and West of M11	MEX13264	None	Medium
4	Stone Coffin and pottery	MEX13087	None	Medium
5	Sheering Hall Ringwork	MEX13081	None	Medium
6	Barn Approximately 10m north of Sheering Hall	MEX1009272	Grade II Listed Building	High
7	Barn Approximately 30m north-west of Sheering Hall	MEX1009273	Grade II Listed Building	High
8	Sheering Hall	MEX1009271	Grade II* Listed Building	High
9	Potter's Croft Field Name	MEX13088	None	Negligible
10	Neolithic Polished Axe	MEX40975	None	Low
11	Harlowbury Brickworks (site of)	MEX1037231	None	Negligible
12	Gilden Way Cropmarks	MEX1038592	None	Medium
13	Tudor Cottage	MEX1007149	Grade II Listed Building	Medium
14	Medieval Pottery Scatter	MEX40873	None	Low
15	Pump 20m south-west of Mayfield Farmhouse	MEX1009289	Grade II Listed Building	Medium
16	Moor Hall gravel pit (site of)	MEX13230	None	Medium
17	Moor Hall (site of)	MEX1037407	None	Medium
20	Iron Age arrowhead and core findspot	MEX13195	None	Low
21	Gilden Way Archaeological Evaluation	MEX1039898	None	Medium
22	The House (Gibberd Garden)	1001299	Grade II Registered Park or Garden	Medium
23	High House	1111685	Grade II Listed Building	Medium
24	House 20m north-west of St Stephen's Cottages	1337570	Grade II Listed Building	Medium
25	Flint Blades and Core (Pincey Brook)	MEX15842	None	Medium
26	95 Sheering Road	None	None	Low
27	Former gravel pit 1	None	None	Negligible
28	Former gravel pit 2	None	None	Negligible
29	129 Sheering Road	None	None	Low
30	Boat house (site of)	None	None	Negligible
31	Mayfield Farm	None	None	Low
32	Campions	None	None	Low

Asset No	Asset Name	EHER no.	Designation	Value
33	Ealing Bridge	None	None	Low
34	Engine House	None	None	Low
35	The Bothy	None	None	Low
36	St Stephens Cottages	None	None	Low
37	Guide Post	None	None	Negligible
38	Post Box	None	None	Negligible
39	Former gravel pit 3	MEX15840	None	Negligible
40	1 Park Hill	MEX1031904	Grade II Listed Building	Medium
41	Harlow Baptist Church	MEX1007043	Grade II Listed Building	Medium
42	Prehistoric ditches Mark Hall School	MEX1038885	None	Low
43	Roman pits Mark Hall School	MEX1038886	None	Low
44	Post medieval features Mark Hall School	MEX1038887	None	Negligible
45	Gate Lodge (115 East Park)	MEX1007032	Grade II Listed Building	Medium
46	Garden Wall to Fawbert and Barnards School	MEX1007068	Grade II Listed Building	Medium
47	Fawbert and Barnards School	MEX1007067	Grade II Listed Building	Medium
48	Harlow medieval and post medieval town (Old Harlow)	MEX13199	None	Medium
49	Old Harlow Conservation Area	DEX22815	Conservation Area	Medium
50	Linear features south of Gilden Way	MEX23745	None	Negligible
51	Signpost at Mulberry Green	MEX1038456	None	Negligible
52	The Green Man Public House and Hotel	MEX1007082	Grade II Listed Building	Medium
53	4 Old Road	MEX1007102	Grade II Listed Building	Medium
54	2 Old Road	MEX1007101	Grade II Listed Building	Medium
55	The Old Forge	MEX1007083	Grade II Listed Building	Medium
56	3, 5, 7 and 9 Mulberry Green	MEX1007079	Grade II Listed Building	Medium
57	Cotswold	MEX1007080	Grade II Listed Building	Medium
58	The Dormer Cottage (31 Mulberry Green)	MEX1007081	Grade II Listed Building	Medium
59	(Harlow Mound) Bowl Barrow, 240m North of The Kennels	MEX264; DEX2998	Scheduled Monument	High
60	Mulberry Green House and Stables	MEX1007084	Grade II* Listed Building	High
61	Former Depot Site, Mulberry Green	MEX1040142	None	Negligible
62	Multi-period site New Hall	MEX1038998	None	Low
63	Gateway to Hill House	MEX1007086	Grade II Listed Building	Medium

Asset No	Asset Name	EHER no.	Designation	Value
64	Hill House	MEX1007085	Grade II* Listed Building	High
65	Post medieval features at Mulberry Green House	MEX1038884	None	Negligible
66	Post medieval features at Granary Cottage	MEX1040139	None	Negligible
67	Granary Cottage	MEX1007087	Grade II Listed Building	Medium
68	Wall extending for 11 bays, east of Number 30	MEX1007088	Grade II Listed Building	Medium
69	Features at New Pumping Station	MEX1042289	None	Negligible
70	Gilden Way Fieldwalking Finds	MEX40741	None	Low
71	Long Barn	MEX1007145	Grade II Listed Building	Medium
72	Findspot of chisel/knife	MEX1032164	None	Low
73	Findspot of post medieval spoon	MEX1045632	None	Negligible
74	14 Newhall	MEX1007144	Grade II Listed Building	Medium
75	Newhall Moat	MEX13162	None	Low
76	Almshouses (13 and 15 Sheering Road)	MEX1007146	Grade II Listed Building	Medium
77	23 Sheering Road	MEX1007076	Grade II Listed Building	Medium
78	Millhurst	MEX1007147	Grade II Listed Building	Medium
79	Garden Wall of 70 feet and Gatepiers immediately south-east of Mill Hurst Fronting Road	MEX1007148	Grade II Listed Building	Medium
80	Post medieval finds from Churchgate, Sheering Road	MEX40938	None	Negligible
81	2, 4 and 6 Churchgate Street	MEX1007013	Grade II Listed Building	Medium
82	The School	MEX1007014	Grade II Listed Building	Medium
83	Meadhams	MEX1007024	Grade II Listed Building	Medium
84	Parish Church of St Mary and St Hugh	MEX1007017; MEX13196	Grade II Listed Building	Medium
85	Churchgate Street Conservation Area	DEX22811	Conservation Area	Medium
86	Godsafe	MEX1007016	Grade II Listed Building	Medium
87	Roman and post medieval features at 1 Churchgate Street	MEX1041074	None	Low
88	Stafford Almshouses	MEX1007019	Grade II Listed Building	Medium
89	Lychgate to Church of St Mary and St Hugh	MEX1007018	Grade II Listed Building	Medium
90	Harlow medieval and post medieval town (Churchgate	MEX13199	None	Medium

Asset No	Asset Name	EHER no.	Designation	Value
	Street)			
91	K6 Telephone Kiosk on Churchgate Street	MEX1007015	Grade II Listed Building	Medium
92	13 Churchgate Street	MEX1007025	Grade II Listed Building	Medium
93	15 Churchgate Street	MEX1007026	Grade II Listed Building	Medium
94	Post Office on Churchgate Street	MEX1007027	Grade II Listed Building	Medium
95	Cropmarks west of Hillingdon House	MEX13262	None	Low
96	21, 23 and 25 Churchgate Street	MEX1007028	Grade II Listed Building	Medium
97	Post medieval features at Mill Lane	MEX42095	None	Negligible
98	Geophysical anomalies west of M11	N/A	None	Medium
HLT1	20th Century Agriculture	TEF-bl; TEF-br; TEF-te	None	Negligible
HLT2	19th and 20th Century Woodland Plantation	WDS-wp	None	Negligible
HLT3	Built-up Areas	BUM; BUH	None	Negligible
HLT4	Enclosed Meadow Pasture	IMW-mp	None	Negligible
HLT5	Pre 18th Century Enclosure	AEF	None	Medium
HLT6	Informal Parkland	PGR	None	Negligible
HLT7	20th Century Communications	COM-mr	None	Negligible
HLT8	Modern Horticulture	HOR-ng	None	Negligible
HLT9	Historic Earthworks	EAR-he	None	Medium

#### 5.4.5 Potential for Unknown Archaeological Remains

The nearby presence of late prehistoric and Roman archaeological remains in the form of cropmarks and surface finds (Assets 2, 3 and 25), or as proven by archaeological fieldwork (Assets 12, 21, 50, 69 and 98), indicates that there is the potential for unknown archaeological remains to be present in the scheme footprint. The EHER data indicates the presence of archaeological activity across the study area; the identification of archaeological remains during the construction of the M11 motorway indicates the potential for archaeological remains in the area. Taking this into account, the potential for the presence of unknown archaeological remains within the study area has been assessed as Medium.

## 6 Impact Assessment

### 6.1 Archaeological Remains

#### 6.1.1 Option 1

Construction of the proposed development will not have a physical impact on Sheering Hall Ringwork (Asset 5). However, construction of the junction with the M11 and the route between the M11 and Sheering Road it will result in an impact on its predominantly rural setting. Although Asset 5 is largely screened from the proposed option by a belt of existing mature trees that form a screen to the east and south, a temporary visual impact from construction plant and activity during construction will be replaced during operation by the presence of a prominently located section of modern infrastructure in the predominantly rural setting of Asset 5. Taking the prominent location of this section of proposed highway, and the distance from Asset 5 into account, the magnitude of this impact has been assessed to be Minor. Following the methodology described above, the significance of this impact on the setting of Asset 5 has been assessed as Slight for both construction and operation.

Construction of the proposed access road to the Campions residential area west of the B183 Sheering Road may result in removal of archaeological remains associated with the periphery of the site of Harlowbury Brick Works (Asset 11), the value of which was assessed as Negligible. As the Scheme will only have an impact on a very small area of Asset 11, and the fact that remains associated with this asset may have already been removed/disturbed by the groundworks associated with the existing road, the magnitude of the impact has been assessed as Negligible. In accordance with the methodology described in Section 4.4 above, the significance of the impact of the Scheme on this heritage asset has been assessed as Neutral.

Construction of the western roundabout and part of the road linking it to the proposed junction with the M11 motorway will affect c. 13.5% of the total area (6.6ha) of Potter's Croft Feld Name (Asset 9), the value of which has been assessed as Negligible. Given that the Scheme will only have an impact on a small area of this asset and any archaeological remains outside the scheme footprint will be left *in situ*, the magnitude of this impact has been assessed as Minor. Following the methodology described in section 4.4 above, the significance of the impact of the Scheme on this heritage asset has been assessed as Slight.

Construction of the western and eastern northbound slip roads would result in a physical impact on a small portion of the site of Moor Hall (Asset 17), amounting to c.0.5% of a total of c.42 hectares. The affected areas are narrow strips adjacent to the existing M11, and it is likely that this area has already been disturbed during construction of the motorway. The value of Asset 17 has been assessed as Low. Given the likelihood that this area has been previously disturbed and thus the potential for archaeological remains is low, the magnitude of the impact has been assessed as Negligible. In accordance with the methodology described in Section 4.4 above, the significance of the impact of the Scheme on this heritage asset has been assessed as Slight.

Construction of the road linking Gilden Way with the proposed western roundabout would result in the removal of a small area of the north-western corner of the farmyard at Mayfield Farm (Asset 31), the value of which has been assessed as low. This may result in the removal of archaeological remains associated with the late 19<sup>th</sup>



century farm. The magnitude of this impact has been assessed as Negligible. Following the methodology set out in Section 4.4 above, the significance of the impact of the Scheme on this heritage asset has been assessed as Slight.

### **6.1.2 Options 1A and 1B**

Apart from minor variation of the proposed access road linking Gilden Way and the Campions residential area, Options 1A and 1B are identical to Option 1 and their impacts on heritage assets are considered as such. The predicted impacts of the Scheme and their magnitude on heritage assets within the study area are therefore the same as those described in Section 6.1.1 above.

### **6.1.3 Option 2**

Construction of the proposed link road and roundabouts west of Shearing Road may result in the removal of archaeological remains associated with the site of the Harlowbury Brickworks (Asset 11), the value of which was assessed as Negligible. This impact would affect c. 17.6% of the total area (14.8ha) of Asset 11. Given that that remains associated with this asset are anticipated to have been extensively eroded by modern ploughing, the magnitude of this impact has been assessed as Minor. In accordance with the methodology described in Section 4.3 above, the significance of the impact of the Scheme on this heritage asset has been assessed as Slight.

Construction of the western and eastern northbound slip roads would result in a physical impact on a small portion at the north-eastern boundary of the site of Moor Hall (Asset 17), amounting to c.0.5% of a total of c.42 hectares. The value of Asset 17 was assessed as Low. The affected areas are narrow strips adjacent to the existing M11, and it is likely that this area has already been disturbed during construction of the motorway. Given the likelihood that this area has been previously disturbed, the magnitude of the impact has been assessed as Negligible. Following the methodology set out in Section 4.4 above, the significance of the impact of the Scheme on this heritage asset has been assessed as Slight.

Construction of the western roundabout would affect an area of less than 0.5% of the total area (0.25ha) of the site of a former gravel quarry (Asset 28), the value of which was assessed as Negligible. Given that the Scheme will only have an impact on a small area of Asset 28 and it has been infilled, the magnitude of the impact has been assessed as Negligible. In accordance with the methodology set out in Section 4.4 above, the significance of the impact of the Scheme on this heritage asset has been assessed as Neutral.

With the exception of Sheering Hall Ringwork (Asset 5) described above, the setting of the remaining archaeological remains within the study area is not considered to contribute to their understanding or assessment of value. Consequently, following implementation of agreed mitigation measures the magnitude of impacts on the remains archaeological remains assets is considered to be No Change, and the significance of these impacts as Neutral.

### **6.1.4 Gilden Way Improvements**

The proposed widening of Gilden Way would result in the removal of archaeological remains associated with Assets 12, 21, 50 and 69. All four assets are archaeological remains associated with prehistoric activity identified in association with other recent development projects. Given that the proposed improvements will be predominantly



contained within the existing highway boundary, and will only affect a very small proportion of each asset the magnitude of impact has been assessed as Minor for all four assets. Following the methodology set out in Section 4.4 above, the significance of the impact of the Scheme on Assets 12 and 21 has been assessed as Slight Adverse, whilst on Assets 50 and 69 it has been assessed as Neutral.

## **6.2 Historic Buildings**

No physical impacts resulting from construction or operation of any of the options have been identified on any of the historic buildings assets within the study area.

### **6.2.1 Options 1, 1A and 1B**

The group of assets comprising the Grade II\* Listed Sheering Hall (Asset 8) and its two associated Grade II Listed barns (Assets 6 and 7 respectively) has been assessed to be of High value.

Assets 6, 7 and 8 are largely screened from these Options by a belt of existing mature trees that form a screen to the east and south.

The exception to this will be the section of road linking the M11 in the east to Sheering Road in the west, which will run across the south-facing slope in an elevated position c. 50m south and 15m higher relative to the Ordnance datum than Assets 6, 7 and 8. A temporary visual impact from construction plant and activity during construction will be replaced by the visual impact of a prominently located section of modern infrastructure in the predominantly rural setting of Assets 6, 7 and 8. Taking the prominent location of this section of highway for all three options, and the distance from Assets 6, 7 and 8 into account, the magnitude of this impact has been assessed to be Minor. Following the methodology described above, the significance of this impact on the setting of Assets 6, 7 and 8 has been assessed as Slight.

Construction of the proposed link road between Gildea Road and Sheering Road would have an impact on the setting of the Grade II Listed water pump south-west of Mayfield Farmhouse (Asset 15). Taking the condition and the designation of this asset into account, the value of Asset 15 has been assessed to be Medium. The construction phase of these three options has the potential to have an impact on the setting of this heritage asset. The magnitude of this impact has been assessed as Minor. In accordance with the methodology set out in Section 4.3 above, the significance of the impact of these three Options has been assessed as Slight.

129 Sheering Road and Campions (Assets 29 and 32) are undesignated historic buildings located on the west side of Sheering Road, the value of both of which was assessed as Low. Construction of the proposed road, western roundabout and slip roads linking them with Gildea Way and Sheering Road may result in an impact on the setting of both assets during construction and operation. A dense belt of mature trees west of Sheering road should screen both assets from the more substantial parts of the scheme. Taking this into account, the magnitude of this impact has been assessed as Negligible. Following the methodology described in Section above into account, the significance of this impact of the three options has been assessed as Slight for both assets.

### 6.2.2 Option 2

The group of assets formed by the Grade II\* Listed Sheering Hall (Asset 8) and its two neighbouring Grade II Listed barns (Assets 6 and 7) has been assessed to be of High value. All three buildings are largely screened from these Options visual effects on their setting by a belt of existing mature trees that form a screen to the east and south.

The section of the scheme linking the M11 in the east to Sheering Road in the west will run across the south-facing slope in an elevated position c. 50m south and 15m higher relative to the Ordnance datum than Assets 6, 7 and 8. A temporary visual impact from construction plant and activity during construction will be replaced during operation by the visual impact of a prominently located section of modern infrastructure in the predominantly rural setting of Assets 6, 7 and 8. Taking the prominent location of this section of highway for Option 2, and the distance from Assets 6, 7 and 8 into account, the magnitude of this impact has been assessed to be Minor. Following the methodology described above, the significance of this impact on the setting of Assets 6, 7 and 8 has been assessed as Slight.

Construction of the south-western roundabout would have an impact on the setting of the Grade II Listed water pump south-west of Mayfield Farmhouse (Asset 15). Taking the condition and its designation into account, the value of Asset 15 has been assessed to be Medium. The construction phase of Option 2 has the potential to have an impact on the setting of this heritage asset as a result of construction traffic and other activity. The magnitude of this impact has been assessed as Minor. In accordance with the methodology set out in Section 4.3 above into account, the significance of the impact of Option 2 on Asset 15 has been assessed as Slight..

Construction of the proposed bridge carrying Option 2 over Sheering Road would have a visual impact on the setting of Ealing Bridge (Asset 33). It would introduce a substantial piece of modern highway infrastructure into the predominantly rural setting of Asset 33. Taking this into account, the magnitude of this impact has been assessed as Minor. Following the methodology described in Section 4.3 above into account, the significance of the impact of Option 2 on Asset 33 has been assessed as Slight.

Construction of Option 2 west of Sheering Road including the western roundabout may have an impact on the setting of The House (Gibberd Garden) (Asset 22), a Grade II Registered Park or Garden, the value of which has been assessed to be Medium. This impact is predicted due to the proximity of the western roundabout to Asset 22 as it would be c. 180m south of its closest point. Although existing mature trees would provide an element of screening from Option 2, the presence of construction traffic and other construction phase activity may result in a visual impact. The magnitude of this impact has been assessed as Minor, and the significance as Slight for both construction and operation.

### 6.2.3 Gilden Way Improvements

No physical impacts are predicted for historic buildings during the construction or operational phases of the proposed Gilden Way improvements.

Temporary visual impacts are predicted to occur on the setting of the four Grade II Listed Buildings. These comprise: Long Barn (Asset 71), 14 Newhall (Asset 74), Almshouses (13 and 15 Sheering Road) (Asset 76), 23 Sheering Road (Asset 77). The Gilden Way improvements will also have an impact on the setting of the western

edge of the Churchgate Street Conservation Area (Asset 85). This would be as a result of the general effects of construction activity, including the operation of construction plant, the presence of materials stockpiles. The magnitude of this temporary impact has been assessed to be Minor, and the significance has been assessed as Slight Adverse for all five cultural heritage assets.

## **6.3 Historic Landscape**

### **6.3.1 Options 1, 1A and 1B**

The value of the 20<sup>th</sup> Century Agriculture type (HLT1) has been assessed to be Negligible. Construction of Option 1, 1A or 1B would introduce a new linear element of modern infrastructure into HLT1 west of the existing M11 motorway (HLT7) as a result of construction of the link road and western roundabout. They will cut across the grain of the existing field boundaries, resulting in a change in the field layout, with the potential to affect the land use as well changing the character of the type. Taking this into account, the magnitude of this impact on HLT1 has been assessed as Minor for all four options. Following the methodology described in Section 4.4 above, the significance of this impact has been assessed as Slight for all four options.

### **6.3.2 Option 2**

West of Shearing Road, construction of Option 2 would have the same effect on HLT1, west of the M11, as options 1, 1A and 1B (see 6.3.1 above). However, construction of the link road west of Shearing Road would also remove sections of several field boundaries within a relatively narrow corridor where HLT1 is flanked to the north by HLT4 and to the south by HLT3. Taking into account the modern character of HLT1, due to the removal of elements of earlier land divisions, the magnitude of this impact has been assessed as Minor, and the significance has been assessed as Slight.

### **6.3.3 Gilden Way Improvements**

The proposed Gilden Way improvements are entirely within the existing highway boundary, and therefore no historic landscape assets would be affected. Consequently, the magnitude of impact on the historic landscape has been assessed as No Change, and the significance has been assessed as Neutral.

**Table 4.9 Comparison of Options**

<b>Topic</b>	<b>Option 1</b>	<b>Option 1A and 1B</b>	<b>Option 2</b>	<b>Gilden Way</b>
<b>Archaeological Remains</b>	<p><u>Construction</u></p> <p>Removal of archaeological remains resulting in impacts of Slight significance on three assets (Assets 9, 17 and 31), and Neutral significance on one asset (Asset 11).</p> <p>Effects on setting resulting in an impact of Slight significance on one asset (Asset 5).</p>	<p><u>Construction</u></p> <p>Removal of archaeological remains resulting in impacts of Slight significance on three assets (Assets 9, 17 and 31), and Neutral significance on one asset (Asset 11).</p> <p>Effects on setting resulting in an impact of Slight significance on one asset (Asset 5).</p>	<p><u>Construction</u></p> <p>Removal of archaeological remains resulting in impacts of Slight significance on four assets (Assets 9, 11, 17 and 31), and Neutral significance on one asset (Asset 28).</p> <p>Effects on setting resulting in an impact of Slight significance on one asset (Asset 5).</p>	<p><u>Construction</u></p> <p>Removal of archaeological remains resulting in impacts of Slight significance on two assets (Assets 12 and 21), and Neutral significance on two assets (Assets 50 and 69).</p> <p><u>Operation</u></p> <p>No impacts on archaeological remains assets have been identified during operation of the proposed Gilden Way improvements.</p>
	<p><u>Operation</u></p> <p>Effects on setting resulting in an impact of Slight significance on one asset (Asset 5).</p>	<p><u>Operation</u></p> <p>Effects on setting resulting in an impact of Slight significance on one asset (Asset 5).</p>	<p><u>Operation</u></p> <p>Effects on setting resulting in an impact of Slight significance on one asset (Asset 5).</p>	
<b>Historic Buildings</b>	<p><u>Construction</u></p> <p>Visual impacts on setting resulting in impacts of Slight significance on six assets (Assets 6, 7, 8, 15, 29 and 32).</p>	<p><u>Construction</u></p> <p>Visual impacts on setting resulting in impacts of Slight significance on five assets (Assets 6, 7, 8, 15, and 33).</p>	<p><u>Construction</u></p> <p>Visual impacts on setting resulting in impacts of Slight significance on six assets (Assets 6, 7, 8, 15, 22 and 33).</p>	<p><u>Construction</u></p> <p>Visual impacts on setting resulting in impacts of Slight significance on five assets (Assets 71, 74, 76, 77 and 85).</p>
	<p><u>Operation</u></p> <p>Visual impacts on setting of resulting in impacts of Slight significance on six assets (Assets 6, 7, 8, 15, 29 and 32).</p>	<p><u>Operation</u></p> <p>Visual impacts on setting of resulting in impacts of Slight significance on five assets (Assets 6, 7, 8, 15, and 33).</p>	<p><u>Operation</u></p> <p>Visual impacts on setting of resulting in impacts of Slight significance on six assets (Assets 6, 7, 8, 15, 22 and 33).</p>	<p><u>Operation</u></p> <p>Visual impacts on setting resulting in impacts of Slight significance on five assets (Assets 71, 74, 76, 77 and 85).</p>
<b>Historic Landscape</b>	<p><u>Construction</u></p> <p>Removal of elements resulting in an impact of Slight significance on one historic landscape type (HLT1).</p>	<p><u>Construction</u></p> <p>Removal of elements resulting in an impact of Slight significance on one historic landscape type (HLT1).</p>	<p><u>Construction</u></p> <p>Removal of elements resulting in an impact of Slight significance on one historic landscape type (HLT1).</p>	<p><u>Construction and Operation</u></p> <p>No impacts on archaeological remains assets have been identified during operation of the proposed Gilden Way improvements..</p>



## 7 Recommendations

### 7.1 Evaluation

After consultation with the relevant local authority planning archaeologists, it is recommended that a staged programme of archaeological evaluation is initiated, in order to establish the presence of archaeological remains within the footprint of the Preferred Option. In the first instance, a geophysical survey should be used to identify the presence or absence of anomalies indicative of archaeological remains. If necessary, this would be followed by trial trenching to confirm the nature, scale and date of any archaeological remains identified by the survey.

The results of any evaluation would be used to inform any future detailed assessment of the impacts of the preferred option on the cultural heritage resource.

### 7.2 Mitigation

Although it is not possible to identify specific measures at this stage, the following are commonly used to mitigate or reduce potential impacts of development on heritage assets:

- *Preservation in situ;*
- *Sensitive scheme design, including that of signage and lighting to minimise effects on the setting of heritage assets;*
- *Detailed archaeological excavation - the full excavation of an archaeological site within the boundary of the proposed scheme;*
- *Strip, map and sample excavation - stripping of an area within the proposed scheme boundary where archaeological remains are suspected, followed by mapping of any remains exposed, and targeted excavation;*
- *Archaeological monitoring during construction (“watching brief”) - the observation of construction works to identify archaeological remains that might otherwise be destroyed without record;*
- *Historic building recording - making a record of the current, state of a structure and its surroundings before construction of the proposed scheme, and*
- *Landscape planting to reduce impacts on the setting of heritage assets.*

A total of 101 heritage assets have been identified in the study area, plus , one Grade II\* Listed Buildings (Asset 8) and two Grade II Listed Buildings (Assets 6 and 7) located outside the study area were included in this assessment because of their proximity to the to the proposed M11 junction. The value of the assets identified comprises:

- *High:* 6
- *Medium:* 49
- *Low:* 23
- *Negligible:* 26

Heritage assets identified comprise:

- *Scheduled Monuments:* 1
- *Grade II\* Listed Buildings:* 3
- *Grade II Listed Buildings:* 39
- *Conservation Areas:* 2
- *Grade II Registered Parks and Gardens:* 1
- *Undesignated assets:* 58

No World Heritage Sites or Registered Battlefields were identified in the study area. No physical impacts on designated assets are predicted for any of the options under consideration.

Based on the assessment carried out for this report, Junction Options 1A and 1B would be preferred on the grounds that they would result in one fewer visual impact on undesignated historic buildings than Option 1. Option 2 would be least preferred because it would result in one more physical impact on undesignated archaeological remains, and an impact on the setting of the Grade II Registered Gibberd Garden (Asset 22). Impacts predicted for the proposed Gilden Way improvements would be common to all the junction options assessed.



- Department for Communities and Local Government, 2012, *National Planning Policy Framework*
- Dicks, S., and Chadwick, P., 2010, *Land Off Gilden Way, Harlow, Essex: Heritage Assessment*, CgMs
- English Heritage, 2008, *Conservation Principles*
- English Heritage, 2011, *The Setting of Heritage Assets*
- Epping Forest District Council, 2006, *Combined Policies of Epping Forest District Local Plan (2008) and Alterations (2006)*
- Field, J., 1972, *English Field Names: A Dictionary*
- Germany, M., 2006, *Moor Hall Stables, Old Harlow: Archaeological Watching Brief*, Unpublished fieldwork record, Essex County Council Field Archaeology Unit
- Hamptons, 2014, *Sheering Hall*, Estate agent particulars
- Harlow District Council, 2006, *Adopted Replacement Harlow Local Plan*
- Harlow District Council, 2013, *Old Harlow Conservation Area Character Appraisal*, Adopted December 2013
- Highways Agency, 2007, *Design Manual for Roads and Bridges*, Volume 11, Section 3, Part 2 'Cultural Heritage' (HA 208/07)
- Institute for Archaeologists, 2012, *Standard and Guidance for historic environment desk-based assessment*
- Jacobs, 2013, *Preliminary Environmental Assessment Report, Appendix H: Cultural Heritage Preliminary Environmental Assessment Report*
- Jacobs, 2014, *M11 Junction 7A, Pre-application environmental scoping report*
- Kain, R, Chapman, J and Oliver T, 2004, *The Enclosure Maps of England and Wales 1595–1918: A Cartographic Analysis and Electronic Catalogue*
- Medlycott, M (ed.), 2011, *Research and Archaeology Revisited: A Revised Framework for the East of England*
- Oxford Archaeology, 2007, *Gilden Way, Harlow, Essex: Archaeological Evaluation Report*, Ref. 3333, Issue 2
- Powell, W.R., (Ed.) 1983, *Victoria County History of the County of Essex*, Volume VIII
- Repton, H., 1881, *Report concerning Moor Hall in Harlow Essex a seat of [blank] Perry Esqr.* ERO Ref. D/DEs T6/2
- Roaney, P.H., 1935, *The Place Names of Essex*

**Cartographic Sources**

Chapman, J. and Andre, P., 1777, *Map of Essex*, ERO Ref. E912-267

*Plan of the Parish of Harlow in the County of Essex* [Harlow Tithe Map], 1848, ERO Ref. D/CT 164

*Plan of the Parish of Matching in the County of Essex* [Matching Tithe Map], 1843, ERO Ref. D/CT 236

*Plan of the Parish of Sheering in the County of Essex* [Sheering Tithe Map], 1840, ERO Ref. D/CT 313

Ordnance Survey, 1881, 1<sup>st</sup> Edition 1:10,560, Essex, Sheets 23 and 31

Ordnance Survey, 1890, 1<sup>st</sup> Edition 1:2,500 Essex, Sheet XLII.14

Ordnance Survey, 1921, 3<sup>rd</sup> Edition, Essex, Sheet 42.14

Ordnance Survey, 1923, 3<sup>rd</sup> Edition 1:10,560, Essex, Sheet 23

**Aerial Photographs**

58/30/PTII/3295-3297, RAF, 1948

OS/71/173/86-87, Ordnance Survey, 1971, 04/05/1971

(AP Plot supplied by EHER)

## Appendix A Gazetteer

<b>Site Number</b>	<b>2</b>	<b>Site Name</b>	<b>Cropmarks South of Woodlands Farm</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL5008813017
<b>Value</b>	Medium	<b>Condition</b>	Unknown
<b>Site Type</b>	Rectilinear enclosure	<b>Period</b>	Prehistoric
<b>NMR ref</b>		<b>HER ref</b>	MEX15840
<b>Description</b>			
Cropmarks indicating part of a rectilinear enclosure, included in a plot supplied by the HER. [1]			
<b>Sources</b>			
[1] Essex Historic Environment record			

<b>Site Number</b>	<b>3</b>	<b>Site Name</b>	<b>Cropmark East of Sheering Hall and West of M11</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4988912980
<b>Value</b>	Medium	<b>Condition</b>	Unknown
<b>Site Type</b>	Linear feature, Ring ditch	<b>Period</b>	Prehistoric
<b>NMR ref</b>		<b>HER ref</b>	MEX13264
<b>Description</b>			
Cropmark of pennanular ring ditch and possible associated linear features, included in a plot supplied by the HER. [1]			
<b>Sources</b>			
[1] Essex Historic Environment record			
[2] Aerial Photograph: OS/71/173/86-87, Ordnance Survey, 1971, 04/05/1971			

<b>Site Number</b>	<b>4</b>	<b>Site Name</b>	<b>Stone Coffin</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4990013100
<b>Value</b>	Medium	<b>Condition</b>	Destroyed
<b>Site Type</b>	Coffin	<b>Period</b>	Roman
<b>NMR ref</b>	TL 41 SE 12	<b>HER ref</b>	MEX13087
<b>Description</b>			
Stone coffin and fragments of bronze paterae found in 1855. [1] The coffin is in Chelmsford Museum. [2]			
<b>Sources</b>			
[1] Essex Historic Environment record			
[2] English Heritage Pastscape			

<b>Site Number</b>	5	<b>Site Name</b>	Sheering Hall Ringwork
<b>Legal Status</b>	None	<b>NGR</b>	TL4959412864
<b>Value</b>	Medium	<b>Condition</b>	Fair
<b>Site Type</b>	Ringwork	<b>Period</b>	Early Medieval
<b>NMR ref</b>		<b>HER ref</b>	MEX13081
<b>Description</b>			
<p>Ringwork within the grounds of Sheering Hall, the north east arc is overlaid by Sheering Hall and obliterated by landscape gardening. The west and south west arcs survive as a strong rampart c1m maximum height above the interior with an outer ditch 4.5m deep from the top of the rampart. The ditch around the west side was and still is dry but on the south and east arcs there was a wet moat formed by diverting the Pincey Brook around the base of the rampart and retained by a bank 2m high on the south of the ringwork. This bay has been breached and the moat is dry. The interior of the work which must have measured c70m in diameter contains no evidence on the surface of interior buildings (the slopes shown on OS 1:25000 are the result of levelling to accommodate a tennis court. [1]</p>			
<b>Sources</b>			
[1] Essex Historic Environment record			

<b>Site Number</b>	6	<b>Site Name</b>	Barn Approximately 10m north of Sheering Hall
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4959312929
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Aisled barn	<b>Period</b>	
<b>NMR ref</b>	1146975 118250	<b>HER ref</b>	MEX1009272
<b>Description</b>			
<p>Timber framed, weatherboarded, roofed with corrugated plastics material. 6 bays aligned approx. N-S, one midstrey to W in third bay from S. C19 and C20 lean-to extensions to E. Half-hipped at both ends. The 3 N bays are older in material and design than the remainder. The N arcade posts have large jowls, shores to the wallposts, arched braces to the tiebeams with struts in the spandrels, arched braces to the arcade plates. The roof trusses have heavy queen struts, and high collars with collar-braces (soulaces). There are 2 butt-purlins in each mainspan roof pitch, with curved wind-bracing to the upper purlins only. The arcade plates and wallplates have face-halved and bladed scarfs. A section of original wall at the NE has curved braces trenched to the inside of the studs, but most of the walls have been rebuilt with primary straight bracing. Immediately S of the central truss the arcade plates are extended with simple scarfs, and all the structure to the S is simpler and lighter. The arcade posts have slender jowls, there are no spandrel struts, the braces to the arcade plates are straight, the queen struts, high collars and collar braces are relatively thin, and there is one clasped through- purlin in each mainspan roof pitch, without wind-bracing. It seems that the 3 northern bays were themselves a reconstruction c.1600 of a medieval aisled barn, with lesser resources of timber and workmanship. [1]</p>			
<b>Sources</b>			
[1] English Heritage National Heritage List			
[2] Essex Historic Environment record			

<b>Site Number</b>	7	<b>Site Name</b>	<b>Barn Approximately 30m north-west of Sheering Hall</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4962312918
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Aisled barn	<b>Period</b>	Post Medieval
<b>NMR ref</b>	1111360 118251	<b>HER ref</b>	MEX1009273
<b>Description</b>			
<p>Timber framed, weatherboarded, roofed with corrugated plastics material. 7 bays aligned NE-SW, no midstrey, wooden doors to SE in third bay from SW, corrugated iron doors in NE end. Jowled posts, some exhibiting bark. Tiebeams straight or of irregular natural curvature. Arched braces to tiebeams and arcade plates, some of irregular curvature. Queen post roof. Birdmouthed collars between side purlins at mid-points between trusses. Walls mainly rebuilt, with primary straight bracing. [1]</p>			
<b>Sources</b>			
<p>[1] English Heritage National Heritage List                  [2] Essex Historic Environment record</p>			

<b>Site Number</b>	8	<b>Site Name</b>	Sheering Hall
<b>Legal Status</b>	Grade II* Listed Building	<b>NGR</b>	TL4962012882
<b>Value</b>	High	<b>Condition</b>	Good
<b>Site Type</b>	Hall House, Wealden House	<b>Period</b>	Medieval
<b>NMR ref</b>	1337229 118249	<b>HER ref</b>	MEX1009271
<b>Description</b>			
<p>Pair of hall houses, late C15 and early C16, comprising a 'Unit System' group of manorial status, combined to form one house and extended in C19 and C20. Timber framed, roughcast rendered, roofed with handmade red clay tiles. (1) Wealden house, late C15, aligned approx. NW-SE, with storeyed end to SE jettied on both sides, 2 bay hall ending in a hip, with no original storeyed accommodation to the NW. (2) Abutting on the NW end aligned approx. NE-SW, hall house, early C16, with integral storeyed SW end, 2 bay hall, storeyed crosswing to NE. Cellar under NE bay of hall. Inserted axial chimney stack in SW bay of hall, late C16. Stair tower in E angle. External chimney stack at NE side of crosswing (3) C19 extension to NW of (2) forming an approx. Z-plan (4) Extension c.1900, to SE of (1) with axial chimney stack at the junction (5) Miscellaneous small extensions, C19 and C20, on all sides. 2 storeys. SW elevation, ground floor, 3 bay windows, c.1900, double glazed doors in tiled gabled porch. First floor, 4 C20 casement windows with facade gables above. Jetty in middle section. Roof hipped at SE end only. (1) Some framing exposed internally, mainly on ground floor. Transverse joists of horizontal section, unchamfered, forming the NE jetty over the angle staircase. Crownpost roof, with original hip rafter at NW end, smoke-blackened to end, now enclosed in later extension. Plain crownpost with arch braces. Roof mainly complete, including original wattle and daub partition between hall and storeyed SW end. Ground floor hearth at junction of the 2 houses has stone surround with bolection moulding. Ground floor room at SE end has fire surround of grey marble with carved wooden surround, egg-and-dart at sides, acorn and oak leaf design above, and ceiling has floral band, all c.1900. (2) Axial beam of inserted floor in hall plain chamfered with lamb's tongue stops. Cambered central tiebeam of hall, originally with deep arched braces of which one is severed for a closet door, the other removed. Crownpost of octagonal section with step stops and 4 arched braces of thin section. Roof mainly complete, smoke-blackened over hall. C18 window in SE end of crosswing at first floor level, one fixed light with 2 vertical iron bars, one wrought iron casement, with rectangular panes including some early glass and original leading, all in hardwood frame, a rare feature to survive in this condition. This pair of houses is of exceptional interest. (1) is the only Wealden house known in Essex at this date which is jettied on both sides, although this occurs in the Weald itself. The roof structure, indicating original hips at both ends is unusually complete, although the lower part of the house is much altered. The 'Unit System' group is rare at manorial level; a parallel exists at Leaden Roding Hall, but with many differences. The 'Unit System' enabled 2 generations of the same family to live in close proximity but with separate household arrangements, working the same land. Where identified elsewhere the smaller house is the later in date, but here the reverse seems to apply. It seems unlikely that house (1) comprised a manor house originally, with only one storeyed end, so an earlier manor house on the site of (2) can be presumed, replaced in a phased renewal programme in which the Wealden house was built before the main manor house was rebuilt. [1]</p> <p>More recently, Sheering Hall has been owned and enhanced by a series of celebrity residents, the last of which was Nicko McBrain of Iron Maiden, who's legacy includes an indoor swimming pool with spectacular Viking themed mosaics. [3]</p>			
<b>Sources</b>			
<p>[1] English Heritage National Heritage List          [2] Essex Historic Environment record          [3] Hamptons, 2014, Sheering Hall, Estate agent particulars</p>			

<b>Site Number</b>	<b>9</b>	<b>Site Name</b>	<b>Potter's Croft Field Name</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4915312379
<b>Value</b>	Negligible	<b>Condition</b>	Unknown
<b>Site Type</b>	Pottery works	<b>Period</b>	Medieval
<b>NMR ref</b>		<b>HER ref</b>	MEX13088

**Description**

Potter's Croft is recorded as a field name east of Campions. [1] This land is now under intensive arable production, and no surface trace of this asset was observed during the walkover survey. [2]

**Sources**

- [1] Essex Historic Environment record
- [2] Walkover survey, August 2014

<b>Site Number</b>	<b>10</b>	<b>Site Name</b>	<b>Neolithic Polished Axe</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4925012320
<b>Value</b>	Low	<b>Condition</b>	Destroyed
<b>Site Type</b>	Findspot	<b>Period</b>	Prehistoric
<b>NMR ref</b>		<b>HER ref</b>	MEX40975

**Description**

Casual find of a neolithic polished axe in 1995. Taken to Harlow Museum for recording. [1]

**Sources**

- [1] Essex Historic Environment record

<b>Site Number</b>	<b>11</b>	<b>Site Name</b>	<b>Harlowbury Brickworks (site of)</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4874712309
<b>Value</b>	Negligible	<b>Condition</b>	Unknown
<b>Site Type</b>	Brickworks	<b>Period</b>	Post Medieval
<b>NMR ref</b>		<b>HER ref</b>	MEX1037231

**Description**

Harlowbury brickworks (operating 1830's to 1870's or later), located east of Marsh Lane, north north west of Campions and south of Pincey Brook. [1]  
 Operators: Richard Prior, early 1830's, and Henry Prior, late 1830s. Richard Prior was also a brickmaker at Bishops Stortford, Hertfordshire. [1] Although no buldings associated with brickmaking are indicated on early OS maps, a number of ponds and the field name "Brick Field" are noted on the first edition 1:10,560 map of 1881. [2] The majority of this asset is now agricultural land, and no surface trace was noted during the walkover survey. [3]

**Sources**

- [1] Essex Historic Environment record
- [2] Ordnance Survey, 1881, 1st Edition 1:10,560, Essex, Sheet 23
- [3] Walkover survey, August 2014



<b>Site Number</b>	12	<b>Site Name</b>	Gilden Way Cropmarks
<b>Legal Status</b>	None	<b>NGR</b>	TL4843712032
<b>Value</b>	Medium	<b>Condition</b>	Unknown
<b>Site Type</b>	Ring ditch, Linear feature, Pit	<b>Period</b>	Prehistoric
<b>NMR ref</b>		<b>HER ref</b>	MEX1038592

**Description**

Cropmarks of a ring-ditch with a central pit, linear features and associated maculae which could be pits. No pits are recorded on the NMP plot. [1] [2]

**Sources**

- [1] Essex Historic Environment record
- [2] Aerial Photograph: 58/30/PTII/3295-3297, RAF, 1948

<b>Site Number</b>	13	<b>Site Name</b>	Tudor Cottage
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4864611926
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Timber framed house	<b>Period</b>	Post Medieval
<b>NMR ref</b>	1337094 119600	<b>HER ref</b>	MEX1007149

**Description**

Early C17 with later C17 alterations. Pargetted render over timber frame; gabled old plain tile roof; early C19 brick ridge stack with 2 diagonally-set flues . 2-unit lobby-entry plan 2 storeys; 2-window range. Blocked central door- way and C20 casements. C20 door in right gable end of early C19 parallel range to rear; small kitchen extension to rear left(of 1987). [1]

Interior: room to left has joists of heavy scantling, firebeam with pegholes for missing stud for jamb of front doorway. Room to right has chamfered bressumer over open fireplace and later C17 ogee-stopped beam and narrow joists. First floor has exposed jowled posts, chamfered wall plates, A-frame truss to left and tie beams of 2 closely-spaced trusses flanking stack; inspection of roof not possible. [1]

The grid reference given in the National Heritage List is incorrect, and this entry has been amended to reflect the walkover survey results. This indicated that the building described in the NHL is c 100m north of the given grid reference. [3]

**Sources**

- [1] English Heritage National Heritage List
- [2] Essex Historic Environment Record
- [3] Walkover survey, 8/8/2014

<b>Site Number</b>	14	<b>Site Name</b>	Medieval Pottery Scatter
<b>Legal Status</b>	None	<b>NGR</b>	TL4870011930
<b>Value</b>	Low	<b>Condition</b>	Destroyed
<b>Site Type</b>	Findspot	<b>Period</b>	Medieval
<b>NMR ref</b>		<b>HER ref</b>	MEX40873

**Description**

A watching brief found evidence of medieval pottery lying on the surface of a stripped area. A total of 3 sherds were recovered. The stripping of the site had only removed some of the topsoil with natural visible in places. No features were easily identifiable. [1] This area is shown as farmland until the mid 20th century when it is labelled as "allotment gardens" by the OS. [2]

Sources	
[1] Essex Historic Environment record	
[2] Ordnance Survey, 1947, 1:10,560, Essex, Sheet 23	
[3] Medlycott, M., 2004, Matching: Historic settlement assessment, Essex CC	

<b>Site Number</b>	15	<b>Site Name</b>	<b>Pump 20m south-west of Mayfield Farmhouse</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4885012044
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Pump	<b>Period</b>	Post Medieval
<b>NMR ref</b>	1111367 118267	<b>HER ref</b>	MEX1009289

**Description**

Cast iron pump, late C19, against N wall of lean-to extension at E end of barn, approx. 20 metres SSW of Mayfield Farmhouse. Cap with fluted dome and fluted spike finial. Fluted upper barrel. On lower barrel, raised device, corroded, possibly a lion, and raised lettering, corroded, possibly E.J. Lindon. Handle ending in knop. [1] Observed to be in good condition during walkover survey. [3]

**Sources**

[1] English Heritage National Heritage List  
 [2] Essex Historic Environment record  
 [3] Walkover Survey, August 2014

<b>Site Number</b>	16	<b>Site Name</b>	<b>Moor Hall gravel pit (site of)</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4888211700
<b>Value</b>	Negligible	<b>Condition</b>	
<b>Site Type</b>	Ditch, Pit, Cremation, Boundary marker	<b>Period</b>	Prehistoric
<b>NMR ref</b>		<b>HER ref</b>	MEX13230

**Description**

Several shallow pits, a boundary ditch and unpotted cremations. Pottery included heavily flint-gritted jars, some with shoulder decoration with finger-tipping and nail impressions. Some jars of situlate form, fine carinated bowls in a burnished black fabric also recovered. Occupation covered 0.80 hectares. [1]

**Sources**

[1] Essex Historic Environment record

<b>Site Number</b>	17	<b>Site Name</b>	Moor Hall (site of)
<b>Legal Status</b>	None	<b>NGR</b>	TL4951311960
<b>Value</b>	Medium	<b>Condition</b>	Poor
<b>Site Type</b>	Manor house	<b>Period</b>	Medieval
<b>NMR ref</b>		<b>HER ref</b>	MEX1037407
<b>Description</b>			
<p>The manor of Moor Hall appears to have been formed partly from a ½ hide of land held in 1086 by Eustace of Bolougne and partly from lands held by the Abbey of Bury St Edmunds. It is sited within what was Harlow parish before 1955. The first reference to the name as Le Mourhall is in an Inquisition of 1324. However by the mid-12th century the demesne tenancy is known to have been held by a Gilbert of Harlow who also held the demesnes of Brent Hall (New Hall) and Hubbard's Hall to the west of Moor hall. It passed in to the hands of the Bugge family in 1443, along with Brent Hall and Hubbards Hall. Moor Hall was rebuilt between 1805 and 1810 as a three-storey mansion in the classical style with 5-bays and a Doric portico. The grounds were extensively landscaped and planted and a chain of natural small lakes were reshaped. In 1849 the estate included Harlow Tye, Jackells, Feltimore and Roffey Hall Farm. A cricket club complete with pitch was founded in 1855. The Matching road was diverted further from the house at the suggestion of Humphrey Repton. [2] The house was further enlarged later in the 19th century. It was occupied by the army in World War II and a cycle of decay and vandalism began, culminating in its burning and final demolition in 1960. [1]</p> <p>Part of the stable block, one of the lodges survive, but are outside the study area. Portions of the planned landscape also still survive. [3]</p>			
<b>Sources</b>			
<p>[1] Essex Historic Environment record                  [2] Repton, H., 1881, Report concerning Moor Hall in Harlow Essex a seat of [blank] Perry Esqr. (D/DEs T6/2)                  [3] Walkover survey, August 2014</p>			

<b>Site Number</b>	20	<b>Site Name</b>	Iron Age pottery findspot
<b>Legal Status</b>	None	<b>NGR</b>	TL4970012000
<b>Value</b>	Low	<b>Condition</b>	Destroyed
<b>Site Type</b>	Findspot	<b>Period</b>	Prehistoric
<b>NMR ref</b>		<b>HER ref</b>	MEX13195
<b>Description</b>			
<p>Flint gritted pottery revealed by construction work for M11. [1]</p>			
<b>Sources</b>			
<p>[1] Essex Historic Environment record</p>			

<b>Site Number</b>	21	<b>Site Name</b>	Gilden Way Archaeological Evaluation
<b>Legal Status</b>	None	<b>NGR</b>	TL4819312237
<b>Value</b>	Low	<b>Condition</b>	Poor
<b>Site Type</b>	Ditch, Post hole	<b>Period</b>	Late Bronze Age
<b>NMR ref</b>		<b>HER ref</b>	MEX1039898
<b>Description</b>			
<p>Oxford Archaeology carried out trial-trenching on behalf of CgMs Consulting. This phase of evaluation revealed areas of activity within the site relating to the Bronze Age/early Iron Age, Iron Age, early to late Romano-British and post medieval periods. Evidence for Saxon activity is light.</p> <p>All features revealed during the evaluation have been truncated by ploughing and are concentrated to the north and north-east of the site. The archaeological evaluation generally confirms the results of the geophysical survey. [1] [2]</p>			
<b>Sources</b>			
<p>[1] Essex Historic Environment record                  [2] Oxford Archaeology, 2006, Gilden Way, Harlow, Essex: Archaeological Evaluation Report</p>			

<b>Site Number</b>	22	<b>Site Name</b>	The House (Gibberd Garden)
<b>Legal Status</b>	Grade II Registered Park or Garden	<b>NGR</b>	TL4834712673
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Landscape Garden	<b>Period</b>	20th Century
<b>NMR ref</b>	1001299 2328	<b>HER ref</b>	
<b>Description</b>			
<p>Gardens laid out by Frederick Gibberd from 1956 to 1984 as the setting for his own house.</p> <p><b>HISTORICAL BACKGROUND</b></p> <p>In 1956 Frederick Gibberd (later Sir Frederick), the architect/planner of Harlow New Town, purchased c 8ha of land on the edge of the town. On it sat an early C20 building, now known as 'The House', surrounded by a minimal and fragmentary garden scheme including a gazebo, formal pool, and lime avenue. Over the next twenty-eight years he developed extensive gardens which became home to a large collection of sculptures. On his death in 1984, The House, together with the gardens and art collection were willed to Harlow District Council for the recreation and education of the people of Harlow. However, the will was contested, making the estate a debtor through litigation. This forced the sale of the site, which was purchased as a short-term measure by an anonymous benefactor, allowing time for the Gibberd Garden Trust to be established and to raise funds for its permanent preservation. The site remains (2000) in the hands of the trustees.</p> <p><b>DESCRIPTION</b></p> <p><b>LOCATION, AREA, BOUNDARIES, LANDFORM, SETTING</b> The House, Marsh Lane, which stands in c 2ha of garden, is set in farmland in the Stort valley, on the east side of Harlow, separated from Old Harlow by two fields. To the north the land falls to the Pincey Brook, which forms the northern boundary of the site, while a track to the south of The House forms the southern boundary.</p> <p><b>ENTRANCES AND APPROACHES</b> Access to The House is off Marsh Lane which runs to the east of the gardens. The entrance is at the south-east corner of the site, where gate piers surmounted by a pair of cast concrete eagles lead to the forecourt beside The Bungalow. From here, a straight walk leads to the south side of The House, the surface treatment of the path, like all the hard landscaping, being carefully detailed, here with small precast concrete slabs infilled with cobbles, flints and tiles.</p>			

**PRINCIPAL BUILDING** The House stands in the south-east corner of the site. It is essentially a small early C20 building which forms part of the landscape scheme.

**GARDENS AND PLEASURE GROUNDS** The House stands on high ground to the south of the garden. Surrounding it are formal gardens, linked integrally with views from the main windows, the windows being designed to frame contrasting views of the valley, walled garden, and conservatory. To the east of The House is a paved court, to the west of which is a small canal. To the north of The House is a terrace, the focus of which is a rectangular pool. At its northern end stands a concrete gazebo, below which is the Grotto; both the gazebo and the pool predate Gibberd's involvement although the pool was much changed by him.

The terrace lies to the west of the lawn sloping down from The House to the Lime Walk, a closely planted avenue of limes, predating Gibberd's ownership of the site. At the northern end of the vista stands Mary Gorarra's Swan and Cygnet (concrete). The main lawn slopes up towards the eastern boundary, to the site of a planned Labyrinth on the former tennis court.

West of the main terrace is an informal area of lawns divided by shrub planting. This leads north from the round pool at the west end of the conservatory, past Antanas Brazdys' stainless steel fountain, to Gerda Rubinstein's statue Lucinda (fibreglass cast), to the west of the Lime Walk. At the western corner of the site is The Temple, formed of a set of Corinthian columns saved from the old Coutts Bank in The Strand, London.

Beyond a line of pools, an informal area of rockwork and winding paths leads down to the Pincey Brook. The latter is widened to form a pool on the banks of which are boulders from the site of Llyn Celyn Reservoir, for which Gibberd was the landscape architect. Further downstream is a waterfall.

A vital element of the garden is the collection of sculpture, each piece having been carefully selected and positioned so as to enhance the surrounding garden, while the setting in turn compliments the work. The garden has been highly praised: writing in the Concrete Quarterly (1979) for example, George Perkin referred to it as 'about the most fascinating garden I had yet visited, representing as it does a fertile imagination and a special eye for what used to be called 'a pleasing prospect'. Gibberd himself wrote about the garden and lectured on its laying out, 'a selfish, intense and completely absorbing pleasure' (CQ 1979). He emphasised that garden design, like architecture, is the art of space, and explained that the garden was intended to form a series of informal rooms with an alternating sense of enclosure and space. The site was developed gradually, working from The House downwards. The improvements made use of the existing landform to provide a series of rooms, each with its own character, from small intimate spaces to large enclosed prospects interconnecting spaces loosely divided up by screens of planting or walls.

There are sequences of spaces in all directions. A focal point on one area draws you on into the next. The design is a cellular one to be explored ... While all the rooms have their own character they are not self-contained like a rock garden or a white garden. The plants that enclose the space contribute to those adjoining, and the spaces lead imperceptibly into each other (Lees-Milne and Verey 1982). [1]

The garden was not accessible at the time of the walkover survey. [3]

#### Sources

- [1] English Heritage National Heritage List
- [2] [www.thegibberdgarden.co.uk](http://www.thegibberdgarden.co.uk), 29/7/2014
- [3] Walkover survey, August 2014

<b>Site Number</b>	23	<b>Site Name</b>	High House
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4863411784
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	House	<b>Period</b>	Post Medieval
<b>NMR ref</b>	1111685 119501	<b>HER ref</b>	
<b>Description</b>			
Externally a thorough renovation of a 17th century house, with rainwater heads dated 1876. Rectangular plan with a T-plan to the roof-ridges owing to a gabled wing above a rear lean-to of full length. Peg-tiled, and with a central red brick chimney-stack of the 17th century 'concertina' type. Timber frame exposed with plaster infill, and casement windows. Storey posts visible in the end-walls have jowls. [1]			
<b>Sources</b>			
[1] English Heritage National Heritage List [2] Walkover survey, August 2014			

<b>Site Number</b>	24	<b>Site Name</b>	House 20m north-west of St Stephen's Cottages
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4947611503
<b>Value</b>	Medium	<b>Condition</b>	Fair
<b>Site Type</b>	House	<b>Period</b>	Post Medieval
<b>NMR ref</b>	1337570 118141	<b>HER ref</b>	
<b>Description</b>			
Lobby-entrance house, early C17, altered in C19, disused when inspected in March 1983. Timber framed, partly plastered, partly tile-hung, partly bricked, roofed with handmade red clay tiles. 3 bays aligned approx. NW-SW, aspect NE with axial chimney stack of 4 grouped diagonal shafts in middle bay, forming a lobby entrance. Bakehouse to SE with chimney stack at end. 2 storeys. Plain door under tiled gabled hood supported on elaborately carved scrolled brackets, late C19. 2 windows on ground floor, 3 on first floor, boarded over when inspected. Front elevation plastered, with label mouldings over ground floor windows, forming a symmetrical composition. Gable ends hung with handmade red clay tiles, mostly plain, banded with fishtail tiles. Elaborately scrolled bargeboards, C19. Ground floor of rear wall bricked. NW ground floor room, axial beam plain-chamfered with bar stops, plain-chamfered joists of vertical section. Remainder of interior not seen, but reported to be open to roof on first floor. This is a symmetrical lobby-entrance house of high quality, C17 in basic structure, treated with some architectural distinction in the late c19, and unaffected by modernisation since. An estate map of 1807 shows the present building as the farmhouse of Feltimores Farm, with 3 other buildings on the site. It was bought by the Perry-Watlington. Estate in 1831, and some time after 1849 a new farm complex was built approx. 350 metres to the SW, the present Feltimores Farm. [1]			
<b>Sources</b>			
[1] English Heritage National Heritage List [2] Walkover survey, August 2014			

<b>Site Number</b>	25	<b>Site Name</b>	<b>Flint Blades and Core (Pincey Brook)</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL5008813017
<b>Value</b>	Medium	<b>Condition</b>	Destroyed
<b>Site Type</b>	Findspot	<b>Period</b>	Prehistoric
<b>NMR ref</b>		<b>HER ref</b>	MEX15842
<b>Description</b>			
Two Mesolithic blades and a core found while field walking north of Pincey Brook in 1973. [1]			
A number of prehistoric finds have been discovered on the slopes of Pincey Brook, which appears to have been an important route along which prehistoric settlement could penetrate the boulder clay plateau. A late Bronze Age tanged chisel/leatherworking knife was given to ECC for identification. [1]			
<b>Sources</b>			
[1] Essex Historic Environment record			

<b>Site Number</b>	26	<b>Site Name</b>	<b>95 Sheering Road</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4862911876
<b>Value</b>	Low	<b>Condition</b>	Good
<b>Site Type</b>	House	<b>Period</b>	Post Medieval
<b>NMR ref</b>		<b>HER ref</b>	
<b>Description</b>			
Detached house shown on Chapman Andre map of Essex (1771) and 1st edition OS 1:10,560 (1881). [1] [2] Two storey house with steeply pitched, tiled roof and end chimney stacks, with a rendered exterior. [3]			
<b>Sources</b>			
[1] Chapman, J and Andre, P., 1777, Map of Essex (E912.267)			
[2] Ordnance Survey, 1881, 1st edition, 1:10,560, Essex, Sheet 23			
[3] Walkover survey, August 2014			

<b>Site Number</b>	27	<b>Site Name</b>	<b>Former gravel pit 1</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4860012100
<b>Value</b>	Negligible	<b>Condition</b>	Destroyed
<b>Site Type</b>	Quarry	<b>Period</b>	Post Medieval
<b>NMR ref</b>		<b>HER ref</b>	
<b>Description</b>			
Gravel pit indicated at this location on the 1923 edition Ordnance Survey 1:10,560 map. [1] No trace of this site is visible on the surface. [2]			
<b>Sources</b>			
[1] Ordnance Survey, 1923, 3rd edition, 1:10,560, Essex, Sheet 23			
[2] Walkover survey, August 2014			



<b>Site Number</b>	28	<b>Site Name</b>	Former gravel pit 2
<b>Legal Status</b>	None	<b>NGR</b>	TL4861512420
<b>Value</b>	Negligible	<b>Condition</b>	Destroyed
<b>Site Type</b>	Quarry	<b>Period</b>	Post Medieval
<b>NMR ref</b>		<b>HER ref</b>	

**Description**

Gravel pit indicated at this location on the 1923 edition Ordnance Survey 1:10,560 map. [1] No trace of this site is visible on the surface. [2]

**Sources**

[1] Ordnance Survey, 1923, 3rd edition, 1:10,560, Essex, Sheet 23

[2] Walkover survey, August 2014

<b>Site Number</b>	29	<b>Site Name</b>	129 Sheering Road
<b>Legal Status</b>	None	<b>NGR</b>	TL4885112151
<b>Value</b>	Low	<b>Condition</b>	Fair
<b>Site Type</b>	House	<b>Period</b>	Post Medieval
<b>NMR ref</b>		<b>HER ref</b>	

**Description**

A house is indicated at this location on the 1881 Ordnance Survey 1:10,560 map. [1] A dwelling consisting of a complex group of single storey structures of rendered brick was observed here during the walkover survey. It was unclear if this is the same building shown in 1881, although it may be incorporated into the current house. [2]

**Sources**

[1] Ordnance Survey, 1881, 1st edition, 1:10,560, Essex, Sheet 23

[2] Walkover survey, August 2014

<b>Site Number</b>	30	<b>Site Name</b>	Boat house (site of)
<b>Legal Status</b>	None	<b>NGR</b>	TL4885612470
<b>Value</b>	Negligible	<b>Condition</b>	Destroyed
<b>Site Type</b>	Boathouse	<b>Period</b>	Post Medieval
<b>NMR ref</b>		<b>HER ref</b>	

**Description**

The site of a boathouse is indicated at this location on a 1:2500 map published by the Ordnance Survey in 1921. [1] No trace of this asset was visible during the walkover survey. [2]

**Sources**

[1] Ordnance Survey, 1921, 1:2,500, Essex, Sheet 42.14

[2] Walkover survey, August 2014

<b>Site Number</b>	31	<b>Site Name</b>	Mayfield Farm
<b>Legal Status</b>	None	<b>NGR</b>	TL4886912076
<b>Value</b>	Low	<b>Condition</b>	Fair
<b>Site Type</b>	Farm	<b>Period</b>	Post Medieval
<b>NMR ref</b>		<b>HER ref</b>	

**Description**

A farm is first indicated at this location on an Ordnance Survey map published in 1921. [1] The farmhouse and outbuildings were observed to be extant and in good condition during the walkover survey. [2]

Sources	
[1] Ordnance Survey, 1921, 1:2,500, Essex, Sheet 42.14	
[2] Walkover survey, August 2014	

<b>Site Number</b>	<b>32</b>	<b>Site Name</b>	<b>Campions</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4887512258
<b>Value</b>	Low	<b>Condition</b>	Fair
<b>Site Type</b>	House	<b>Period</b>	Post Medieval
<b>NMR ref</b>		<b>HER ref</b>	

Description	
Campions is a much altered country house, indicated on the 1st edition Ordnance Survey 1:10,560 map of 1881. [1] the modern house takes its name from the family that held the land during the 14th century. [2] The current house was extensively renovated and extended during the 1920s following a fire, and was converted into a number of flats during the 1950s. [2]	

Sources	
[1] Ordnance Survey, 1881, 1st edition, 1:10,560, Essex, Sheet 23	
[2] Powell, W.R., (Ed.), 1983, A History of the County of Essex, Vol. 8, Victoria County History	

<b>Site Number</b>	<b>33</b>	<b>Site Name</b>	<b>Ealing Bridge</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4899212560
<b>Value</b>	Low	<b>Condition</b>	Fair
<b>Site Type</b>	Bridge	<b>Period</b>	Post Medieval
<b>NMR ref</b>		<b>HER ref</b>	

Description	
Bridge carrying Sheering Road over Pincey Brook is indicated at this location on the Chapman Andre map of Essex (1771) and 1st edition OS 1:10,560 (1881). [1] [2] The present bridge is of modern concrete construction. [3]	

Sources	
[1] Chapman, J and Andre, P., 1777, Map of Essex (E912.267)	
[2] Ordnance Survey, 1881, 1st edition, 1:10,560, Essex, Sheet 23	
[3] Walkover survey, August 2014	

<b>Site Number</b>	<b>34</b>	<b>Site Name</b>	<b>Engine House</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4936211631
<b>Value</b>	Low	<b>Condition</b>	Fair
<b>Site Type</b>	Building	<b>Period</b>	Post Medieval
<b>NMR ref</b>		<b>HER ref</b>	

Description	
An outbuilding connected with the now demolished Moor Hall (Asset 17). [1] It consists of a two and a half storey central bay, with symmetrical single two storey wings, constructed from red brick with a slate roof. It has recently been converted to residential use. [2]	

Sources	
[1] Ordnance Survey, 1881, 1st edition, 1:10,560, Essex, Sheet 23	
[2] Walkover survey, August 2014	

<b>Site Number</b>	<b>35</b>	<b>Site Name</b>	<b>The Bothy</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4944911571
<b>Value</b>	Low	<b>Condition</b>	Good
<b>Site Type</b>	House	<b>Period</b>	Modern
<b>NMR ref</b>		<b>HER ref</b>	

**Description**

A building is first shown at this location on the 1923 edition Ordnance Survey 1:10,560 map. [1] This asset was not accessible during the walkover survey. [2]

**Sources**

- [1] Ordnance Survey, 1923, 1st edition, 1:10,560, Essex, Sheet 42
- [2] Walkover survey, August 2014

<b>Site Number</b>	<b>36</b>	<b>Site Name</b>	<b>St Stephens Cottages</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4948511473
<b>Value</b>	Low	<b>Condition</b>	Good
<b>Site Type</b>	House	<b>Period</b>	Modern
<b>NMR ref</b>		<b>HER ref</b>	

**Description**

A pair of brick cottages first shown on the 1923 edition Ordnance Survey 1:10,560 map. [1]

**Sources**

- [1] Ordnance Survey, 1923, 1st edition, 1:10,560, Essex, Sheet 42
- [2] Walkover survey, August 2014

<b>Site Number</b>	<b>37</b>	<b>Site Name</b>	<b>Guide Post</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4945511607
<b>Value</b>	Negligible	<b>Condition</b>	Good
<b>Site Type</b>	Sign Post	<b>Period</b>	Modern
<b>NMR ref</b>		<b>HER ref</b>	

**Description**

A "Guide Post" is indicated at this location on the first edition OS 1:10,560, and the walkover survey confirmed that what appeared to be a modern facsimile of a traditional sign post is still located here. The sign has three wooden leaves with directions indicated in raised letters to: Epping, Harlow, Chalk Lane, Matching Tye and Matching Green. The post is wooden, square in cross-section with a chamfered top.

**Sources**

- [1] Ordnance Survey, 1880-84, 1st Edition, 1:10,560, Essex. Sheet XLA
- [2] Walkover survey, August 2014

<b>Site Number</b>	<b>38</b>	<b>Site Name</b>	<b>Post Box</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4945711607
<b>Value</b>	Negligible	<b>Condition</b>	Good
<b>Site Type</b>	Post Box	<b>Period</b>	Modern
<b>NMR ref</b>		<b>HER ref</b>	

**Description**

A post box attached to a concrete pillar was observed at this location during the walkover survey. [1] It is not shown on any of the the Ordnance Survey maps consulted.

Sources	
[1]	
[2] Walkover survey, August 2014	

<b>Site Number</b>	39	<b>Site Name</b>	Former gravel pit 3
<b>Legal Status</b>	None	<b>NGR</b>	TL4975012890
<b>Value</b>	Negligible	<b>Condition</b>	Destroyed
<b>Site Type</b>	Quarry	<b>Period</b>	Post Medieval
<b>NMR ref</b>		<b>HER ref</b>	

Description	
A former garvel pit is noted at this location on the 1st edition 1:2,500 Ordnance Survey map. [1] No trace was observed during the walkover survey. [2]	

Sources	
[1] Ordnance Survey, 1890, 1:2,500, Essex, Sheet 42.14	
[2] Walkover survey, August 2014	

<b>Site Number</b>	40	<b>Site Name</b>	1 Park Hill
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4700011000
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Timber Framed Building	<b>Period</b>	Post medieval
<b>NMR ref</b>	1259612	<b>HER ref</b>	MEX1031904; 39293

Description	
House. Early C17 or earlier, refronted in mid C19 and refitted in late C19. Timber framed building covered in roughcast with tiled roof and brick chimneystacks. Two storeys and attics with gabled and jet tied crosswing to right of one bay and two further bays. Mid C19 sashes with verticals only in moulded architraves and doorcase with open pediment on brackets. Jet tied crosswing has wooden brackets and Tuscan columns. Rear elevation shows concealed original gable with later extended gable, C19 infilling of L-shaped building and one 12-pane sash. Interior has most beams boxed in but there is a chamfered beam with triangular stop. Attic retains some plank and muntin panelling which may have been the original panelling replaced in the C19 and a utility room on the ground floor retains hand applied chevron pargetting. Staggered purlin roof to crosswing. The other roof appears to have been renovated in the C19. Ground floor has two late C19 panelled rooms with fireplaces and china cupboard, built-in late C19 kitchen cupboards, late C19 well staircase with balusters, several cast iron fireplaces, C19 panelled doors and winder attic staircase. [1] [2]	

Sources	
[1] National Heritage List	
[2] Essex Historic Environment Record	

<b>Site Number</b>	<b>41</b>	<b>Site Name</b>	<b>Harlow Baptist Church</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4708711439
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Baptist Chapel	<b>Period</b>	Post medieval; 19th Century
<b>NMR ref</b>	1111713	<b>HER ref</b>	MEX1007043; 31654
<b>Description</b>			
<p>Mid-19th century church in Romanesque style, of stock brick with buff freestone dressings. Roof hipped and slated. Front of 3 bays with bold eaves band and a tympanum above it at centre, with pediment and stone finial. Rusticated pilasters at returns, and balustrades each side of central tympanum above eaves band. Porch central and square with rusticated returns and round arched doorway having a vermiculated keystone. Round quatrefoil window in pediment. Tall round headed windows each side of porch with mullion and roundels in heads. Window above porch round headed of 2 lights, each with mullion and roundel over. Sill band of freestone. Side walls with 7 tall matching windows and intervening pilasters. Whole unaltered and in good condition. [1] [2]</p>			
<b>Sources</b>			
<p>[1] National Heritage List                  [2] Essex Historic Environment Record</p>			

<b>Site Number</b>	<b>42</b>	<b>Site Name</b>	<b>Prehistoric ditches Mark Hall School</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4709010836
<b>Value</b>	Low	<b>Condition</b>	Destroyed
<b>Site Type</b>	Enclosure	<b>Period</b>	Prehistoric; Bronze Age
<b>NMR ref</b>	N/A	<b>HER ref</b>	MEX1038885; 46337
<b>Description</b>			
<p>An archaeological excavation was carried out by ECC Field Archaeology Unit on the area of a new sports facility at Mark Hall School, Harlow. An evaluation by trial trenching in the Spring of 2004 had indicated the presence of archaeological features.</p> <p>Although the site had been partly levelled, probably during the construction of the school playing fields, a range of archaeological remains were identified dating from the Late Bronze Age/ early Iron Age, Roman and post medieval periods.</p> <p>The late Bronze Age / early iron Age activity is marked by a sinuous field boundary ditch running north-south and part of a sub circular enclosure, measuring c 50m in diameter. The lack of artefacts collected from the enclosure gullies suggests that it was agricultural in nature, perhaps a cattle pen or corral. Associated with the enclosure were two small pits containing 'placed deposits' of animal remains. Both comprised the jaws and partially articulated lower legs of cattle. In the boundary ditch was the skeleton of a new-born lamb. [1]</p>			
<b>Sources</b>			
<p>[1] Essex Historic Environment Record</p>			

<b>Site Number</b>	43	<b>Site Name</b>	Roman pits Mark Hall School
<b>Legal Status</b>	None	<b>NGR</b>	TL4710010900
<b>Value</b>	Low	<b>Condition</b>	Destroyed
<b>Site Type</b>	Pits	<b>Period</b>	Roman
<b>NMR ref</b>	N/A	<b>HER ref</b>	MEX1038886; 46338
<b>Description</b>			
<p>An archaeological excavation at Mark Hall School, Harlow revealed Roman pits, situated towards the north of the site.</p> <p>Although these were inside a prehistoric enclosure (PRN 46337) they are not likely to be associated. Some Roman features may have been destroyed by the levelling of the playing fields. The artefacts recovered from the pits do not suggest domestic occupation in or immediately around the site. Most of the brick and tile recovered from the site is of Roman date. [1]</p>			
<b>Sources</b>			
[1] Essex Historic Environment Record			

<b>Site Number</b>	44	<b>Site Name</b>	Post medieval features Mark Hall School
<b>Legal Status</b>	None	<b>NGR</b>	TL4710010900
<b>Value</b>	Negligible	<b>Condition</b>	Destroyed
<b>Site Type</b>	Ridge and Furrow	<b>Period</b>	Post medieval; 19th Century
<b>NMR ref</b>	N/A	<b>HER ref</b>	MEX1038887; 46339
<b>Description</b>			
<p>A combination of the archaeological evidence and historical sources has allowed a cleared picture of the site during the post medieval period, and specifically the late 18th and early 19th centuries. Running east-west through the centre of the site was a gravelled trackway, shown on a map of Mark Hall estate dated 1819. Originally the track ran through four fields, which seem to have been part of a short lived plan to design the landscape of Mark Hall estate during the 1770s. Perpendicular to the trackway was a series of north-south gullies which seem to be the remains of Napoleonic period ridge-and-furrow, possibly instigated by Montague Burgoyne, the owner of Mark Hall during the early 19th century. [1]</p>			
<b>Sources</b>			
[1] Essex Historic Environment Record			

<b>Site Number</b>	45	<b>Site Name</b>	Gate Lodge (115 East Park)
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4717911374
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Lodge	<b>Period</b>	Post medieval; 19th Century
<b>NMR ref</b>	1169204	<b>HER ref</b>	MEX1007032; 31643
<b>Description</b>			
<p>(Formerly pertaining to Marks Hall). One storey, of stock brick in Flemish bond on square plan with ridged gabled and slated roof. Verges dentilled, and transom soffit. South front gable supported on 4 round and slender Doric columns, over stone paved walkway. Central door with six fielded panels, with a pair of hornless and small-paned sashes each side of it, under straight gauged arches. Two matching sashes in each side wall, and a modern extension at the rear to the west. Matching columns and pediment on north end elevation. [1] [2]</p>			
<b>Sources</b>			
[1] National Heritage List			
[2] Essex Historic Environment Record			

<b>Site Number</b>	46	<b>Site Name</b>	<b>Garden Wall to Fawbert and Barnards School</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4720311327
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Garden Wall	<b>Period</b>	Post medieval; 19th Century
<b>NMR ref</b>	1111678	<b>HER ref</b>	MEX1007068; 31679
<b>Description</b>			
Dwarf wall, stock brick, with C19 spear-rails, round arched central gateway, and straight arched gateways at each end. All with good contemporary iron gates. [1] [2]			
<b>Sources</b>			
[1] National Heritage List [2] Essex Historic Environment Record			

<b>Site Number</b>	47	<b>Site Name</b>	<b>Fawbert and Barnards School</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4722811335
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	School	<b>Period</b>	Post medieval; 19th Century
<b>NMR ref</b>	1337074	<b>HER ref</b>	MEX1007067; 31678
<b>Description</b>			
Former British School 1836. Of stock brick in Flemish bond, with single storeyed range flanked by 2 storeyed ends. Roof slated and hipped with parapet coped in moulded stone, and having 2 stock brick chimneys evenly spaced. Plan forming a U. Centre range with central stuccoed portico, 2 Doric columns and 2 pilasters, flat entablature and 2 fielded panel door leaves - rectangular fanlight. First floor band with margin barred sashes each side of door under straight gauged arches. A range of 3 square, small-paned sashes on first storey with straight gauged arches. Two tall round headed sashes each side of central elevation. The 2 end units have pilasters at their centres and returns with stock brick capitals, moulded: and 2 tall round-headed sashes each. Three matching sashes on end elevations. [1] [2]			
<b>Sources</b>			
[1] National Heritage List [2] Essex Historic Environment Record			



<b>Site Number</b>	48	<b>Site Name</b>	Harlow medieval and post medieval town (Old Harlow)
<b>Legal Status</b>	None	<b>NGR</b>	TL4740911553
<b>Value</b>	Medium	<b>Condition</b>	Unknown
<b>Site Type</b>	Medieval Town	<b>Period</b>	Early medieval; medieval; post medieval
<b>NMR ref</b>	N/A	<b>HER ref</b>	MEX13199; 3625

**Description**

Harlow was a polyfocal settlement, the dominant landowner was the Abbey of St Edmunds in Bury, Suffolk. The oldest part is Harlowbury (TL47761198), which was the manorial centre and there may also have been an early medieval village on this site. The second focus, Churchgate Street (TL48331149) appears to have developed before the end of the 11th century, possibly as a result of the deliberate movement of the village at Harlowbury to Churchgate Street. The Parish Church of St Mary the Virgin is sited here, the earliest portions of this date to the 12th century. The third focus of settlement is Old Harlow (TL47091150), on the Hertford-Dunmow road, and it appears to have been deliberately planted by the Abbots of Bury St Edmunds, following the granting of a market and annual fair in 1218 (there may also have been an earlier market on the site). The original plan, comprised a row of properties, essentially rural in appearance on the southern side of Fore Street/High Street. In front of these was the market-place. The market area was gradually infilled, first by the building on 'Midil Rowe', on the northern side of the market-place, and then the block of buildings between Back Street and Fore Street.

With the Dissolution of the Monasteries Bury St Edmunds Abbey ceased to be the major landholder, and there was a decline in the market-function at Harlow, partially also due to the collapse of the wool-trade. However the Harlow pottery industry flourished to the south of the main built up area, at Potter Street, Latton Street and Harlow Common. In 1947 an area of approximately two and a half thousand hectares was designated as the site of Harlow New Town, with Frederick Gibberd as the planner-architect for the project. The New Town was characterised by urban building-types in a rural setting.

Additional information from Mike Jury (Harlow) based on watching-briefs and documentary research suggests that the medieval and post medieval occupation extended to the west of the present Market Street as far as the 18th century Bromleys House. [1]

**Sources**

[1] Essex Historic Environment Record

<b>Site Number</b>	49	<b>Site Name</b>	Old Harlow Conservation Area
<b>Legal Status</b>	Conservation Area	<b>NGR</b>	TL4750711627
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Conservation Area	<b>Period</b>	Post medieval
<b>NMR ref</b>	N/A	<b>HER ref</b>	DEX22815

**Description**

No description available. [1]

**Sources**

[1] Essex Historic Environment Record

<b>Site Number</b>	50	<b>Site Name</b>	<b>Linear Features (not a Cursus) South of Gilden Way</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4762911159
<b>Value</b>	Negligible	<b>Condition</b>	Fair
<b>Site Type</b>	Linear Features	<b>Period</b>	Early medieval
<b>NMR ref</b>	N/A	<b>HER ref</b>	MEX23745; 7268

**Description**

Soilmarks of two parallel linear features which run diagonally across a field and abut onto its boundaries; one end appears to exhibit a slight incurving of the ditch before it meets the field boundary; possible cursus cut at both ends by field boundaries.

Site de-scheduled October 2008 as no longer regarded as a cursus.

Field survey and trial trenching was completed in order to evaluate the impact of unauthorised re-contouring groundworks upon it. This archaeological work was undertaken by the Essex County Council Field Archaeology Unit at the request of English Heritage (now Historic England). It consisted of a site walk-over inspection, collection of spot height data and the excavation of trenches across the plotted position of the cropmark and the area to its immediate west. The principal objectives of the work were to establish the presence of the cursus monument and to assess the extent of any damage which may have been caused to it.

The archaeological fieldwork identified the presence of prehistoric and Early Saxon remains, but no trace of the putative cursus. It also established that there had been relatively little deep and extensive truncation of archaeological remains across the majority of the scheduled area, and that the groundworks had largely comprised the removal and the stockpiling of topsoil. However, general compaction, disturbance and rutting caused by the movement of heavy plant were observed on the exposed surface that is likely to have had an adverse impact upon below-ground remains present. It is concluded that the cursus had never been present and that the linear 'cropmark' features evident on aerial photographs, from which it was identified, are more likely to have been modern-day tracks, footpaths or other wear marks on the field surface. [1]

**Sources**

[1] Essex Historic Environment Record

<b>Site Number</b>	51	<b>Site Name</b>	<b>Signpost at Mulberry Green, Old Harlow</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4770211569
<b>Value</b>	Negligible	<b>Condition</b>	Fair
<b>Site Type</b>	Signpost	<b>Period</b>	Modern; 20th Century
<b>NMR ref</b>	N/A	<b>HER ref</b>	MEX1038456; 40681

**Description**

Signpost. 1920s/1930s. Cast iron. Manufactured by Maldon Iron Works. A circular section tapered post with flat semicircular parish plate finial reading PARISH OF HARLOW. Two 10½-inch arms remain of three (?) reading: (1) HATFIELD HEATH 4 / CHELMSFORD 18 B183; (2) BISHOP'S STORTFORD 7 / CAMBRIDGE 33. Two modern reflective arms attached below surviving originals. [1]

**Sources**

[1] Essex Historic Environment Record

<b>Site Number</b>	52	<b>Site Name</b>	The Green Man Public House and Hotel
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4771411541
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Public House	<b>Period</b>	Post medieval; 17th Century
<b>NMR ref</b>	1337038	<b>HER ref</b>	MEX1007082; 31693

**Description**

Seventeenth century, two-storeyed range with break in ridge height and rear access arch near centre. Rendered right of archway exposed framing left of it. Windows: sashes in exposed boxes, a venetian sash above the archway and 2 bay windows of different patterns - all small-paned. Simple doorway, and ridged peg-tiled roof with eaves. East of archway mixed exposed framing of the C17 and C18. Windows mixed sashes and casements, with one semi-hexagonal small-paned bay window on right, at first storey. [1] [2]

**Sources**

- [1] National Heritage List
- [2] Essex Historic Environment Record

<b>Site Number</b>	53	<b>Site Name</b>	4 Old Road
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4771711621
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	House	<b>Period</b>	Post medieval; 19th Century
<b>NMR ref</b>	1337042	<b>HER ref</b>	MEX1007102; 31713

**Description**

Mid C19 house. Two storeys and 3 bays of painted brick laid in Flemish bond. Roof ridged, slated with eaves, and 3 end chimney stacks with decorative ceramic pots: octagonal. A range of 3 hornless small paned sashes on first storey with modern shutters outside. Central front door with leaf of 6 fielded panels under a flat hood on bold brackets, leaded - matching sashes each side of doorway, all under straight gauged arches. [1] [2]

**Sources**

- [1] National Heritage List
- [2] Essex Historic Environment Record

<b>Site Number</b>	54	<b>Site Name</b>	2 Old Road
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4772011612
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Timber Framed House	<b>Period</b>	Post medieval; 17th Century
<b>NMR ref</b>	1169599	<b>HER ref</b>	MEX1007101; 31712

**Description**

Seventeenth century house. T-plan, with 2 storey cross-wing and single storey hall, ridges at the same level. Roofs peg-tiled. Chimney-stack flanks the south wall of the crosswing, which timber framed and plastered. Hall range with painted brick walls. Front elevation has 2 pairs of small-paned casements, one over one, on the wing; and a pair of Edwardian sashes to the hall. [1] [2]

**Sources**

- [1] National Heritage List
- [2] Essex Historic Environment Record

<b>Site Number</b>	<b>55</b>	<b>Site Name</b>	<b>The Old Forge</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4773711545
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Timber Framed House	<b>Period</b>	Post medieval; 16th Century
<b>NMR ref</b>	1169455	<b>HER ref</b>	MEX1007083; 31694
<b>Description</b>			
<p>Sixteenth century. Timber-framed and plastered with ridge, gables and eaves roof - peg-tiled and hipped at west. First storey has 2 small-paned sashes on left and 2 small-paned casements right. Door in plain case with small-paned sashes each side. A wing projects on right clad in painted weatherboards with a semi-hexagonal bay window of full width, small-paned glazing. Roofed with ridged and gabled peg-tiles. [1] [2]</p>			
<b>Sources</b>			
<p>[1] National Heritage List                  [2] Essex Historic Environment Record</p>			

<b>Site Number</b>	<b>56</b>	<b>Site Name</b>	<b>3, 5, 7 and 9 Mulberry Green</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4774211587
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Tenement	<b>Period</b>	Post medieval; 19th Century
<b>NMR ref</b>	1111687	<b>HER ref</b>	MEX1007079; 31690
<b>Description</b>			
<p>Approximately AD 1800 range of tenements. Red brick, Flemish bond, painted. Of 2 storeys with dentilled eaves, and a first floor band, ridged and gabled roof - slated. Three red brick chimney stacks. Range of 7 windows on first storey one of which blocked (2, west) with sashes of circa 1900. Four doors, and 5 matching sashes on ground storey under segmental arches in exposed boxes. Two of the doors original, in good cases, at the east end of the range. [1] [2]</p>			
<b>Sources</b>			
<p>[1] National Heritage List                  [2] Essex Historic Environment Record</p>			

<b>Site Number</b>	<b>57</b>	<b>Site Name</b>	<b>Cotswold</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4775711588
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	House	<b>Period</b>	Post medieval; 18th Century
<b>NMR ref</b>	1111688	<b>HER ref</b>	MEX1007080; 31691
<b>Description</b>			
<p>Mid eighteenth century house. Three bays and 3 storeys, in painted brick with parapetted front and parapetted gables left and right. Three part sashes left and right on second and first floors, with semi-hexagonal bay windows under them on the ground-storey. Central, 6 panel door with rectangular light over, bay windows, leaded flat tops with dentilled cornices. Blocked window central on first storey and a small-paned window central to second storey. [1] [2]</p>			
<b>Sources</b>			
<p>[1] National Heritage List                  [2] Essex Historic Environment Record</p>			

<b>Site Number</b>	58	<b>Site Name</b>	<b>The Dormer Cottage (31 Mulberry Green)</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4776711588
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Timber Framed House	<b>Period</b>	Post medieval; 17th Century
<b>NMR ref</b>	1169451	<b>HER ref</b>	MEX1007081; 31692
<b>Description</b>			
<p>Seventeenth century house. Double range framed in timber and now roughcast, and painted. Front roof hipped and peg-tiled with lead bonnets and coved eaves; rear range ridged and gabled with 2 red brick chimney stacks in the intervening valley. Three pedimented dormers with small-paned casements and 3 small-paned sashes in exposed boxes on the first-storey. Two semi-hexagonal bay windows with flat tops and Edwardian glazing bars, with a fielded panel door-leaf in wooden case beneath a pediment and consoles. [1] [2]</p>			
<b>Sources</b>			
<p>[1] National Heritage List                  [2] Essex Historic Environment Record</p>			

<b>Site Number</b>	59	<b>Site Name</b>	<b>Bowl Barrow, 240m North of The Kennels (Harlow Mound)</b>
<b>Legal Status</b>	Scheduled Monument	<b>NGR</b>	TL4778411205
<b>Value</b>	High	<b>Condition</b>	Good
<b>Site Type</b>	Bowl Barrow	<b>Period</b>	Bronze Age
<b>NMR ref</b>	1017474; 29392	<b>HER ref</b>	MEX264; DEX2998
<b>Description</b>			
<p>The bowl barrow 240m north of The Kennels is well preserved and will retain valuable archaeological remains and environmental evidence related to its construction and to the appearance of the landscape in which it was set. The monument may also retain some evidence of later use, particularly during the Anglo-Saxon period when it may have served as a communal meeting place within the tribal territory or hundred.</p> <p>The monument includes a Bronze Age bowl barrow located to the south of Gilden Way on the southern outskirts of Old Harlow. It stands on the edge of a slight plateau overlooking a broad valley to the south west. The barrow mound is circular in plan and domed in profile, measuring approximately 25m in diameter and 1.5m in height. The summit, which is slightly flattened, measures approximately 8m across. The locations of two minor, unrecorded excavations are marked by a narrow depression ascending the southern slope and by a small declivity on the summit. The encircling ditch, from which material would have been quarried for the mound, has long since been infilled and is no longer visible above ground although it will survive as a buried feature. The barrow is reputed to have also served as an Anglo-Saxon moot, or meeting place, and it is possible that it is the 'mound' or 'hill' (old English 'hlaew') after which the town of Harlow may be named. [1] [2]</p>			
<b>Sources</b>			
<p>[1] National Heritage List                  [2] Essex Historic Environment Record</p>			

<b>Site Number</b>	60	<b>Site Name</b>	<b>Mulberry Green House and Stables</b>
<b>Legal Status</b>	Grade II* Listed Building	<b>NGR</b>	TL4779811535
<b>Value</b>	High	<b>Condition</b>	Good
<b>Site Type</b>	House	<b>Period</b>	Post medieval; 18th Century
<b>NMR ref</b>	1111689	<b>HER ref</b>	MEX1007084; 31695
<b>Description</b>			
<p>Late C18 house. Two storeys and 3 bays with 2 full-height semi-circular bow windows, all of red brick in Flemish bond. First floor bonds parapet. Roofs hipped and peg-tiled. Hornless small-paned sashes in the bows form semi-hexagons, being flats, and their exposed boles have roundels curved at their top returns. Central doorway with open pediment on columns that are reeded on their top halves with composite capitals. Leaf of 6 fielded panels. Central Diocletian sash on first storey. Contemporary stables at side, with original features. [1] [2]</p>			
<b>Sources</b>			
<p>[1] National Heritage List                  [2] Essex Historic Environment Record</p>			

<b>Site Number</b>	61	<b>Site Name</b>	<b>Former Depot Site, Mulberry Green</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4781111408
<b>Value</b>	None	<b>Condition</b>	Destroyed
<b>Site Type</b>	Archaeological Features	<b>Period</b>	Modern
<b>NMR ref</b>	N/A	<b>HER ref</b>	MEX1040142; 47265
<b>Description</b>			
<p>A development site (former depot) located to the rear of Mulberry Green House revealed only modern features including a drainage run and a late 20th century feature containing plastic bags. Monitoring of a development site comprising a former depot located to the rear of Mulberry Green House revealed only modern features comprising a drainage run and a feature containing plastic bags. An earlier trial-trench evaluation on land immediately to the north of the site revealed post medieval garden features. [1]</p>			
<b>Sources</b>			
<p>[1] Essex Historic Environment Record</p>			

<b>Site Number</b>	62	<b>Site Name</b>	Multi-period site New Hall
<b>Legal Status</b>	None	<b>NGR</b>	TL4781510486
<b>Value</b>	Low	<b>Condition</b>	Destroyed
<b>Site Type</b>	Settlement	<b>Period</b>	Early Bronze Age; Roman
<b>NMR ref</b>	N/A	<b>HER ref</b>	MEX1038998; 46442
<b>Description</b>			
<p>Between January and April 2004, Archaeological Solutions Ltd undertook an archaeological evaluation on land at New Hall, Harlow. The evaluation revealed prehistoric and Roman remains and post medieval boundary ditches.</p> <p>Prehistoric activity on the site is represented by five areas of archaeological features:</p> <p>a) On the east side of the site, to the north of Hubbard' s Hall, ditches , gullies and a large pit were excavated . Finds from these features comprise burnt flint, struck flint and pottery (Trenches 287,288 and 292).</p> <p>b) Following the crest, westwards to Roundhouse and New Hall Farm, prehistoric activity is centred around crop marks, a possible ring ditch. The latter was revealed in Trench 182 where two parallel ditches some 15m apart were identified. Additional machining revealed a central pit, some 1.5m+ in diameter. Due to the possible importance of the remains, the trench was backfilled to protect the features. Close by in Trenches 174 and 183 additional ditches were excavated and they contained struck flint. A hearth was revealed to the south of the ring ditch in Trench 190.</p> <p>c) Due north of the ring ditch, east of Newpond Spring, prehistoric features cut by Roman features were recorded . In Trench 134 two post holes and a pit were excavated . All three features contained struck flint.</p> <p>d) West of Hubbard' s Hall, Trench 298 contained two postholes , one of which contained prehistoric pottery.</p> <p>e) On the south side of the site, Trench 328 revealed three postholes and two pits. The features contained Mid to Late Iron Age pottery and struck flint. Romano-British (RB)-activity on the site is represented by three concentrations of features.</p> <p>a) In the far south of the site, Trench 329, contained two Roman ditches. Trench 327 contained several inter-cutting features, with associated Roman finds.</p> <p>b) The remains of a possible RB field system was tentatively identified in Trenches 234, 313 and 314. Few finds were recovered but, one ditch in Trench 314, contained a well preserved coin (depicting Julia Domna, mother of joint Emperors Caracalla and Geta, dated to the first half of the 3d century A.D.</p> <p>c) On the north side of the site, east of Newpond springs, the most substantial concentration Roman features was recorded. Situated on some of the lowest lying ground on the site and naturally sheltered , the possible remains of two Roman structures were identified. Trenches 133 and 134 revealed spreads of demolition rubble with Roman finds. The demolition material overlay ditches, post holes and foundations. Trench 140 &amp; 141 and Trenches A, B and C revealed a concentration of Roman features including wall footings, postholes , ditches and possible occupation floors. The finds include Roman pottery, a lead loom weight and copper alloy artefacts such as brooches, a dress pin, a possible ring fragment and coins.</p> <p>In 2014 large-scale excavations of the northern half of this area took place (New Hall Phase II, Bellway Homes site and the Triangle Site). The ring-ditch contained a large central beaker burial, the site also contained part of a Roman fieldscape and the corner of the Roman farmstead, as well as a number of Saxon sunken-floored buildings.</p> <p>Excavation on the new sewer revealed Roman finds, whilst work on the Triangle site revealed one, possibly two, Saxon sunken-floored buildings. [1]</p>			
<b>Sources</b>			
[1] Essex Historic Environment Record			



<b>Site Number</b>	<b>63</b>	<b>Site Name</b>	<b>Gateway to Hill House</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4782011566
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Gateway	<b>Period</b>	Post medieval; 18th Century
<b>NMR ref</b>	1306487	<b>HER ref</b>	MEX1007086; 31697

**Description**

Late 18th century wooden gateway with 2 Tuscan columns and square opening, formerly giving access to a covered front entrance. [1] [2]

**Sources**

- [1] National Heritage List
- [2] Essex Historic Environment Record

<b>Site Number</b>	<b>64</b>	<b>Site Name</b>	<b>Hill House</b>
<b>Legal Status</b>	Grade II* Listed Building	<b>NGR</b>	TL4782411557
<b>Value</b>	High	<b>Condition</b>	Good
<b>Site Type</b>	Timber Framed House	<b>Period</b>	Post medieval; 16th Century;
<b>NMR ref</b>	1337039;	<b>HER ref</b>	MEX1007085; 31696

**Description**

Probably late 16th century with an 18th century re-styling. House, framed in timber with 2 stairs towers, one at each return of the front elevation (west). Both towers have pyramidal peg-tiled roofs, and 2 small-paned windows of which the top 2 are blocked and painted. Central range has a hipped peg-tiled roof with a coved plastered eaves and 2 flat dormers with small paned sashes. First storey with 3 hornless small paned sashes in plaster architraves and key stones. Central stuccoed doorcase, round-headed with leaded fanlight and with a blank date-panel above. Three pane side lights to door leaf, which is of 6 fielded panels, with wreath knocker. Three part small-paned sashes, hornless, either side of the door. Plan complex. Inside: late C18 stairs and handrail. [1] [2]

**Sources**

- [1] National Heritage List
- [2] Essex Historic Environment Record

<b>Site Number</b>	<b>65</b>	<b>Site Name</b>	<b>Evaluation by trial trenching Mulberry Green House, post medieval features</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4783011670
<b>Value</b>	Negligible	<b>Condition</b>	Destroyed
<b>Site Type</b>	Pit	<b>Period</b>	Post Medieval; 17th Century
<b>NMR ref</b>	N/A	<b>HER ref</b>	MEX1038884; 46336

**Description**

An archaeological evaluation by trial trenching, carried out to the rear of Mulberry Green House, Mulberry Green, Old Harlow. Two features probably Victorian in date were revealed.

An archaeological evaluation, consisting of four trenches, was carried out to the rear of Mulberry Green House, Mulberry Green, Old Harlow. Only two archaeological features were identified, both probably Victorian in date. A deep pit, In Trench 1, containing a loamy fill with post medieval brick and pottery at its base, was likely created as a planting hole, with the finds placed to aid drainage. The second feature, in Trench 2, was part of a planting bed; the fill of which contained a high humic content. Both were probably features belonging to the garden of Mulberry House itself (18th century). [1]

**Sources**

- [1] Essex Historic Environment Record

<b>Site Number</b>	66	<b>Site Name</b>	Post medieval features at Granary Cottage, 30 Mulberry Green
<b>Legal Status</b>	None	<b>NGR</b>	TL4785011550
<b>Value</b>	Negligible	<b>Condition</b>	Destroyed
<b>Site Type</b>	Garden Feature	<b>Period</b>	Post medieval; 17th Century
<b>NMR ref</b>	N/A	<b>HER ref</b>	MEX1040139; 47262

**Description**

The residual 16th to 17th-century brick suggests post medieval activity on the site but only evidence of horticultural practice was revealed within the trench.

An archaeological trial-trench evaluation was conducted at Granary Cottage in advance of the construction of a new residential dwelling. The site is located to the east of Harlow Old Town, on the south side of Mulberry Green. A grade II listed c. 18th-century barn is located along the northern edge of the property (Listed building no. 119511).

The trench was excavated to a maximum depth of 1.07m, at which level the orange silty clay drift geology of the area was exposed. The topsoil, 0.52m thick, overlay a silty clay levelling layer, 0.45m thick, containing late 18th to early 19th-century pottery and tile as well as late 16th to 17th-century brick.

Three shallow linear horticultural features were aligned north-west to south-east and cut into the natural silty clay. The very shallow nature of each feature indicates severe truncation. Each of them contained a light grey silt fill and yielded no finds. The northern end of the trench was severely root-disturbed.

The residual 16th to 17th-century brick suggests post medieval activity on the site but only evidence of horticultural practice was revealed within the trench. [1]

**Sources**

[1] Essex Historic Environment Record

<b>Site Number</b>	67	<b>Site Name</b>	Granary Cottage
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4786011569
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Timber Framed Barn	<b>Period</b>	Post medieval; 18th Century
<b>NMR ref</b>	1111690	<b>HER ref</b>	MEX1007087; 31698

**Description**

Late C18 barn-like building. Timber-framed and black weatherboarded with ridged and gabled roof, peg-tiled and fly-hipped. Modern square access opening at west end. [1] [2]

**Sources**

[1] National Heritage List

[2] Essex Historic Environment Record

<b>Site Number</b>	68	<b>Site Name</b>	Wall extending for 11 bays, east of Number 30
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4789311577
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Garden Wall	<b>Period</b>	Post medieval; 18th Century
<b>NMR ref</b>	1169507	<b>HER ref</b>	MEX1007088; 31699

**Description**

Wall, extending for 11 bays, east of No 30. Red brick wall in Flemish-bond, having 12 pilasters, coped with tile-courses, and headers. [1] [2]

Sources	
[1] National Heritage List	
[2] Essex Historic Environment Record	

<b>Site Number</b>	69	<b>Site Name</b>	<b>New Pumping Station, Gilden Way, Harlow</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4795611437
<b>Value</b>	Negligible	<b>Condition</b>	Destroyed
<b>Site Type</b>	Ditch and Pit	<b>Period</b>	Uncertain
<b>NMR ref</b>	N/A	<b>HER ref</b>	MEX1042289; 48547

Description	
Archaeological monitoring was carried out in association with the construction of a new pumping station on land to the south of off Gilden Way, Harlow.	
Two cut features were found during the topsoil strip. A long gully or plough scar was investigated on the western side of the site, which may in fact be the remains of a field boundary, perhaps associated with an existing field boundary to the east. A small oval pit was excavated in the main part of the site, which may be a geological feature. Despite the remains of multiperiod activity in the vicinity of the site and more specifically Bronze Age and Saxon activity nearby, no significant features were identified or finds recovered. [1]	

Sources	
[1] Essex Historic Environment Record	

<b>Site Number</b>	70	<b>Site Name</b>	<b>Gilden Way Fieldwalking Survey</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4798011970
<b>Value</b>	Low	<b>Condition</b>	Destroyed
<b>Site Type</b>	Findspot	<b>Period</b>	Roman
<b>NMR ref</b>	N/A	<b>HER ref</b>	MEX40741; 16078

Description	
A fieldwalking survey undertaken during Sep-Nov 1990 revealed large concentrations of Roman tile at the above location. These may be from outbuildings associated with the large Roman complex at ESMR 3600. [1]	

Sources	
[1] Essex Historic Environment Record	

<b>Site Number</b>	71	<b>Site Name</b>	<b>Long Barn</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4799811530
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Timber Framed Barn	<b>Period</b>	Post medieval; 17th Century
<b>NMR ref</b>	1337070	<b>HER ref</b>	MEX1007145; 31756

Description	
Seventeenth century barn, timber framed and black weatherboarded, with ridged, gabled and tiled roof - converted into 2 residences. Inside: heavy oak frame with queen-post roof, bladed scarfs, and an integral first floor having haunched tenons; suggesting original use as a granary. [1] [2]	

Sources	
[1] National Heritage List	
[2] Essex Historic Environment Record	

<b>Site Number</b>	<b>72</b>	<b>Site Name</b>	<b>Findspot of chisel/knife</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4800012000
<b>Value</b>	Medium	<b>Condition</b>	Destroyed
<b>Site Type</b>	Flint Chisel or Knife	<b>Period</b>	Prehistoric; Lower Palaeolithic; Bronze Age
<b>NMR ref</b>	N/A	<b>HER ref</b>	MEX1032164; 9129
<b>Description</b>			
Findspot of tanged chisel/leather working knife recorded by the Portable Antiquities Scheme. [1]			
<b>Sources</b>			
[1] Essex Historic Environment Record			

<b>Site Number</b>	<b>73</b>	<b>Site Name</b>	<b>Findspot of Post Medieval Spoon</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4800012000
<b>Value</b>	Negligible	<b>Condition</b>	Destroyed
<b>Site Type</b>	Spoon	<b>Period</b>	Post Medieval
<b>NMR ref</b>	N/A	<b>HER ref</b>	MEX1045632; 53941
<b>Description</b>			
Findspot of a post medieval spoon recorded by the Portable Antiquities Scheme. [1]			
<b>Sources</b>			
[1] Essex Historic Environment Record			

<b>Site Number</b>	<b>74</b>	<b>Site Name</b>	<b>14 Newhall</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4802911517
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Timber Framed House	<b>Period</b>	Medieval; Post medieval; 15th/16th Century
<b>NMR ref</b>	1169810	<b>HER ref</b>	MEX1007144; 31755
<b>Description</b>			
Fifteenth or sixteenth century house on a complex plan. Timber-framed and plastered, of 2 storeys. Ridged, gabled and peg-tiled roof with a circa 1590 red brick chimney stack against the west end, with crowsteps and one octagonal, shaft beside one hexagonally sectioned shaft. Various casement windows and one 2-storey semi-hexagonal bay window at north-east. Modern porch at north. [1] [2]			
<b>Sources</b>			
[1] National Heritage List [2] Essex Historic Environment Record			

<b>Site Number</b>	75	<b>Site Name</b>	<b>Newhall Moat, manorial, formerly known as Brenthall.</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4803011509
<b>Value</b>	Low	<b>Condition</b>	Poor
<b>Site Type</b>	Moated Site	<b>Period</b>	Medieval
<b>NMR ref</b>	N/A	<b>HER ref</b>	MEX13162; 3612

**Description**

Newhall Moat, manorial, formerly known as Brenthall. Remains of moat can be traced to the south of the present house.

Only the south east angle survives as a pool and sunken garden, the south arm survives as a depression 8m wide and 0.5m deep in the lawn. The east arm was filled in 12 years ago. Modern buildings cover the rest. Probably rectangular originally. [1]

**Sources**

[1] Essex Historic Environment Record

<b>Site Number</b>	76	<b>Site Name</b>	<b>Almshouses (13 and 15 Sheering Road)</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4810611605
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Almshouse	<b>Period</b>	Post medieval; 18th Century
<b>NMR ref</b>	1306358	<b>HER ref</b>	MEX1007146; 31757

**Description**

Dated 1716. A long range of one storey built in Flemish bonded red brick with ridged and gabled peg-tile roof. Three red brick plain chimneys one at the centre and one at each gable end. Two front doors in later gabled porches and a range of 7 pairs of double 6 pane wooden casements. At the centre-front a blind dormer with gable bears the inscription with date and name of benefactor. Three course projecting eaves band. Inscribed: 'Thefe houfey were builded for ye habitation of fower poore widdowes with monies left by ye will of Mr Francis Reeve formerly of Huberts Hall'. These words on the front of a blind central dormer with a gable. [1] [2]

**Sources**

[1] National Heritage List

[2] Essex Historic Environment Record

<b>Site Number</b>	77	<b>Site Name</b>	<b>23 Sheering Road</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4815911662
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	House	<b>Period</b>	Post medieval; 19th Century
<b>NMR ref</b>	1111684	<b>HER ref</b>	MEX1007076; 31687

**Description**

Mid-19th century residential range, rectangular plan, ground storey rendered first storey white weatherboarded. Roof slated with eaves, hips and 2 stock brick chimney stacks of decorative brickwork near south end. A row of 5 small-paned casements on first-storey, and 3 plain doors with 5 matching casements along the ground storey. [1] [2]

**Sources**

[1] National Heritage List

[2] Essex Historic Environment Record

<b>Site Number</b>	<b>78</b>	<b>Site Name</b>	<b>Millhurst</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4820411641
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	House	<b>Period</b>	Post medieval; 18th/19th Century
<b>NMR ref</b>	1111672	<b>HER ref</b>	MEX1007147; 31758
<b>Description</b>			
Late 18th century, early 19th century. House of 3 storeys and 5 window range, with slated hipped roof having a wide eaves soffit. Stucco cornices on brackets to the sashes, which are in exposed boxes. Top centre a Diocletian sash, above a tri-partite sash on the first floor, above a porch with Corinthian columns. [1] [2]			
<b>Sources</b>			
[1] National Heritage List [2] Essex Historic Environment Record			

<b>Site Number</b>	<b>79</b>	<b>Site Name</b>	<b>Garden Wall of 70 feet and Gatepiers immediately south-east of Mill Hurst Fronting Road</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4821611618
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Garden Wall	<b>Period</b>	Post medieval; 18th/19th Century
<b>NMR ref</b>	1337071	<b>HER ref</b>	MEX1007148; 31759
<b>Description</b>			
5216 Sheering Road Garden Wall of 70 feet (TL 4811 NW 7/3) and gatepiers immediately south east of Mill Street fronting road. Late 18th century, early 19th century red brick garden wall with rusticated brick central gate piers - topped with stone pineapples. [1] [2]			
<b>Sources</b>			
[1] National Heritage List [2] Essex Historic Environment Record			

<b>Site Number</b>	<b>80</b>	<b>Site Name</b>	<b>Post medieval finds from Churchgate, Sheering Road</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4825011650
<b>Value</b>	Negligible	<b>Condition</b>	Destroyed
<b>Site Type</b>	Findspot	<b>Period</b>	Post medieval
<b>NMR ref</b>	N/A	<b>HER ref</b>	MEX40938; 16195
<b>Description</b>			
A watching brief on a development site only recovered post medieval material. [1]			
<b>Sources</b>			
[1] Essex Historic Environment Record			

<b>Site Number</b>	<b>81</b>	<b>Site Name</b>	<b>2, 4 and 6 Churchgate Street</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4825711595
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Timber Framed House	<b>Period</b>	Post medieval; 19th Century;
<b>NMR ref</b>	1337026;	<b>HER ref</b>	MEX1007013; 31624

**Description**

Early 19th century house. Timber framed and weatherboarded, of rectangular plan. Two stock brick chimney stacks, one each end, roof ridged and gabled with eaves - peg-tiled. Small paned sashes on first storey in exposed boxes, one matching sash on ground storey at south. Door of 6 fielded panels with broken pediment on reeded half columns with no fanlight. A matching door north of last one, and a large square former shop window with small panes; and a name board above it. A 2 storey extension to the north with slated roof and central red brick chimney stack. Four leaded casements, 2 over 2 and a plain door at the south in a case. Walls of painted weatherboards. [1] [2]

**Sources**

- [1] National Heritage List
- [2] Essex Historic Environment Record

<b>Site Number</b>	<b>82</b>	<b>Site Name</b>	<b>The School</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4826211545
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	School	<b>Period</b>	Post medieval; 19th Century
<b>NMR ref</b>	1111739	<b>HER ref</b>	MEX1007014; 31625

**Description**

Mid-19th century former school, a complex based on a T-plan of one tall storey built of coursed and squared rag-stone with ashlar quoins and dressings. Roofs ridged and gabled clad with peg-tile with verge boards of Victorian Gothic style hollow moulded and cusped - octagonal pendants at the apexes. Windows tall rectangular voids with hollow chamfered mullions and no transoms. The street frontage (east) has a gabled porch with 4 centred door head with datestone over: AD. 1850. Four buttresses each with 3 off-sets interspersed with 2 single and 2 pairs of double rectangular lancet windows complete this elevation. At the centre of the roof a lantern part tile hung, saltire traceried, with pyramidal roof on bold bracketted eaves. [1] [2]

**Sources**

- [1] National Heritage List
- [2] Essex Historic Environment Record

<b>Site Number</b>	<b>83</b>	<b>Site Name</b>	<b>Meadhams</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4827511614
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	House	<b>Period</b>	Post medieval; 16th Century
<b>NMR ref</b>	1111703	<b>HER ref</b>	MEX1007024; 31635

**Description**

Sixteenth century house. West front of 2 storeys with attics, with 5 window range. Roof peg-tiled and hipped with red brick chimney stacks at north and south. Coved eaves plastered. Porch in third place to south with curved leaded top and fluted pilasters left and right with triglyphs. Six panelled door. One pair of small paned sashes to south, a Serliana window left of porch with external shutters; then a pair of small paned sashes. All sashes in exposed boxes. [1] [2]

**Sources**

- [1] National Heritage List
- [2] Essex Historic Environment Record



<b>Site Number</b>	<b>84</b>	<b>Site Name</b>	<b>Parish Church of St Mary and St Hugh</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4827611470
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Church	<b>Period</b>	Medieval; 12th Century; 19th Century
<b>NMR ref</b>	1111740	<b>HER ref</b>	MEX1007017; MEX13196
<b>Description</b>			
<p>Church of mediaeval origin without aisles, cruciform plan and tower at the crossing with tall broach spire, shingled. Completely restored: 1878/80, few old features. Carcase of large flints, some Roman brick and indurated conglomerate - stone dressings. One Norman window in north-west bay of nave-wall. Eleven brasses inside. [1]</p> <p>Church with walls of flint rubble interspersed with Roman brick in the south wall. Ordnance Survey record card reports tile in south wall of nave and chancel, and south transept, but mostly in the west wall, and the north nave wall. The earliest part is the nave which is 12th century in origin, the central tower may have also belonged to that period. North and south transepts were added in the 13th century, and the chancel and north-east vestry in the late 14th century. The cruciform plan and central tower are unusual in Essex. In the 19th century the organ-chamber, vestry and south porch were added, the central tower rebuilt and a west tower of brick is said to have been removed.</p> <p>Heritage Network undertook archaeological monitoring during the groundworks for a new floor and boiler house at St. Mary's and St. Hugh's Church. The monitoring programme inside the church revealed five brick built barrel vaults of varying sizes. Also revealed were partial stone foundations at the west end of the nave, a brick floor surface and brick steps. Monitoring of the external service trenches and the ground reduction for the new boiler house, to the west of the north transept, revealed evidence for 19th structures and drains. Disarticulated human bone fragments, including a skull, were also encountered. [2]</p>			
<b>Sources</b>			
<p>[1] National Heritage List</p> <p>[2] Essex Historic Environment Record</p>			

<b>Site Number</b>	<b>85</b>	<b>Site Name</b>	<b>Churchgate Street Conservation Area</b>
<b>Legal Status</b>	Conservation Area	<b>NGR</b>	TL4829311509
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Conservation Area	<b>Period</b>	Post medieval
<b>NMR ref</b>	N/A	<b>HER ref</b>	DEX22811
<b>Description</b>			
No description available. [1]			
<b>Sources</b>			
[1] Essex Historic Environment Record			

<b>Site Number</b>	<b>86</b>	<b>Site Name</b>	<b>Godsafe</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4829311523
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Timber Framed House	<b>Period</b>	Post medieval; 17th Century
<b>NMR ref</b>	1337027	<b>HER ref</b>	MEX1007016; 31627
<b>Description</b>			
Mid-sixteenth century range on T-plan with cross-wing at south, jettied. Two storeyed with exposed timber frame, ridged, hipped and gabled roof peg-tiled. Red brick chimney stack at south with 4 shafts. The cross-wing has a C19 oriel on first storey and 4 matching casements on the ground-storey. Corner posts jowled, walls side-girt, no wind bracing on outer faces. [1] [2]			
<b>Sources</b>			
[1] National Heritage List [2] Essex Historic Environment Record			

<b>Site Number</b>	<b>87</b>	<b>Site Name</b>	<b>Roman and post medieval features at 1 Churchgate Street</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4830411574
<b>Value</b>	Low	<b>Condition</b>	Destroyed
<b>Site Type</b>	Ditches and Pits	<b>Period</b>	Roman; medieval; post medieval
<b>NMR ref</b>	N/A	<b>HER ref</b>	MEX1041074; 48169
<b>Description</b>			
Archaeological evaluation in January 2011 in the garden of 1 Churchgate Street. One undated probable ditch, one medieval ditch and a ditch and two pits containing pottery and ceramic building material of Roman, medieval and post medieval date were revealed in two of the three trenches. [1]			
<b>Sources</b>			
[1] Essex Historic Environment Record			

<b>Site Number</b>	<b>88</b>	<b>Site Name</b>	<b>Stafford Almshouses</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4831411465
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Timber Framed House	<b>Period</b>	Post medieval; c.1600; 17th Century
<b>NMR ref</b>	133704	<b>HER ref</b>	MEX1007019; 31630
<b>Description</b>			
Circa 1600 house, of U-plan, timber framed, of 2 storeys, with the framing exposed on the street frontage with black weatherboards on rear elevation. Curved wind-braces on first storey. Four leaded casements, 2 over 2. Roofs peg-tiled and gabled with front eaves formerly bracketted, the brackets survive in-situ. Plaque above central front door with inscription and date: 1630. [1] [2]			
<b>Sources</b>			
[1] National Heritage List [2] Essex Historic Environment Record			

<b>Site Number</b>	89	<b>Site Name</b>	Lychgate to Church of St Mary and St Hugh
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4831411473
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Lych Gate	<b>Period</b>	Post medieval; 19th Century
<b>NMR ref</b>	1111699	<b>HER ref</b>	MEX1007018; 31629
<b>Description</b>			
<p>Circa 1880. Lychgate, of tarred softwood. On 2 posts of the German 'man-figure' style, end crown-posts and a ridged, gabled and peg-tiled roof. The ridge mounts 3 iron finials of which the central one is a decorative cross, all have conoid lead flashings. Original pair of gates with iron crockets on top rails. [1] [2]</p>			
<b>Sources</b>			
<p>[1] National Heritage List                  [2] Essex Historic Environment Record</p>			

<b>Site Number</b>	90	<b>Site Name</b>	Harlow medieval and post medieval town (Churchgate Street)
<b>Legal Status</b>	None	<b>NGR</b>	TL4831411481
<b>Value</b>	Medium	<b>Condition</b>	Unknown
<b>Site Type</b>	Medieval Town	<b>Period</b>	early-medieval; medieval; post medieval
<b>NMR ref</b>	N/A	<b>HER ref</b>	MEX13199; 3625
<b>Description</b>			
<p>Grant of burgage tenure to the tenants of Harlow market in 1213 and 1229. Harlow was a polyfocal settlement, the dominant landowner was the Abbey of St Edmunds in Bury, Suffolk. The oldest part is Harlowbury (TL47761198), which was the manorial centre and there may also have been an early medieval village on this site. The second focus, Churchgate Street (TL48331149) appears to have developed before the end of the 11th century, possibly as a result of the deliberate movement of the village at Harlowbury to Churchgate Street. The Parish Church of St Mary the Virgin is sited here, the earliest portions of this date to the 12th century. The third focus of settlement is Old Harlow (TL47091150), on the Hertford-Dunmow road, and it appears to have been deliberately planted by the Abbots of Bury St Edmunds, following the granting of a market and annual fair in 1218 (there may also have been an earlier market on the site). The original plan, comprised a row of properties, essentially rural in appearance on the southern side of Fore Street/High Street. In front of these was the market-place. The market area was gradually infilled, first by the building on 'Midil Rowe', on the northern side of the market-place, and then the block of buildings between Back Street and Fore Street.</p> <p>With the Dissolution of the Monasteries Bury St Edmunds Abbey ceased to be the major landholder, and there was a decline in the market-function at Harlow, partially also due to the collapse of the wool-trade. However the Harlow pottery industry flourished to the south of the main built up area, at Potter Street, Latton Street and Harlow Common. In 1947 an area of approximately two and a half thousand hectares was designated as the site of Harlow New Town, with Frederick Gibberd as the planner-architect for the project. The New Town was characterised by urban building-types in a rural setting.</p> <p>Additional information from Mike Jury (Harlow) based on watching-briefs and documentary research suggests that the medieval and post medieval occupation extended to the west of the present Market Street as far as the 18th century Bromleys House. [1]</p>			
<b>Sources</b>			
<p>[1] Essex Historic Environment Record</p>			

<b>Site Number</b>	<b>91</b>	<b>Site Name</b>	<b>K6 Telephone Kiosk, Churchgate Street</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4832211494
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Telephone Box	<b>Period</b>	Modern; 20th Century
<b>NMR ref</b>	1111639	<b>HER ref</b>	MEX1007015; 31626
<b>Description</b>			
Telephone kiosk. Type K6. Designed 1935 by Sir Giles Gilbert Scott. Made by various contractors. Cast iron. Square kiosk with domed roof. Unperforated crowns to top panels and margin glazing to windows and door. [1] [2]			
<b>Sources</b>			
[1] National Heritage List [2] Essex Historic Environment Record			

<b>Site Number</b>	<b>92</b>	<b>Site Name</b>	<b>13 Churchgate Street</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4832411524
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Timber Framed House	<b>Period</b>	Post medieval; Built c.1600; 17th Century
<b>NMR ref</b>	1111704	<b>HER ref</b>	MEX1007025; 31636
<b>Description</b>			
Circa 1600 house. Timber framed and plastered with parapet, ridged, hipped peg-tiled roof; with a red brick chimney-stack on the return at south-west. A semi-hexagonal bay window of 2 storeys height, with 3 small paned sashes on each storey in exposed bosed. A tripartite sash on first storey at north over a door on ground storey - the case of which combines 2 windows of the width of the window above. [1] [2]			
<b>Sources</b>			
[1] National Heritage List [2] Essex Historic Environment Record			

<b>Site Number</b>	<b>93</b>	<b>Site Name</b>	<b>15 Churchgate Street</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4832511508
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Shop	<b>Period</b>	Post medieval; 17th Century
<b>NMR ref</b>	1111705	<b>HER ref</b>	MEX1007026; 31637
<b>Description</b>			
Number 15 (formerly listed as premises occupied by F Perring Ltd.). Circa 1600 house. Exposed timber frame at north in Mill Lane with side-girt. Of 2 storeys with steep pitched peg tiled roof hipped at north. Red brick chimney stack on return at north. Semi hexagonal bay window of 2 storeys height at south, of frontage with 3 small paned sashes on both storeys. First storey has a range of 4 small paned sashes beneath the eaves. A modern projecting shop unit obscures the north ground storey. [1] [2]			
<b>Sources</b>			
[1] National Heritage List [2] Essex Historic Environment Record			

<b>Site Number</b>	<b>94</b>	<b>Site Name</b>	<b>Post Office, Churchgate Street</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4832811496
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Post Office (Timber Framed House)	<b>Period</b>	Post medieval
<b>NMR ref</b>	1111706	<b>HER ref</b>	MEX1007027; 31638
<b>Description</b>			
Deeds from 1664. Double range with cross-wing at north end. Roofs ridges gabled and hipped, clad with peg tiles. A red brick chimney stack central to front range. A set of 3 leaded casements in the first storey of the cross wing, other fenestration partly modern includes shop windows of ground storey. [1] [2]			
<b>Sources</b>			
[1] National Heritage List [2] Essex Historic Environment Record			

<b>Site Number</b>	<b>95</b>	<b>Site Name</b>	<b>Cropmarks west of Hillingdon House</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4833011070
<b>Value</b>	Low	<b>Condition</b>	Fair
<b>Site Type</b>	Ring-Ditches	<b>Period</b>	Prehistoric
<b>NMR ref</b>	N/A	<b>HER ref</b>	MEX13262; 3647
<b>Description</b>			
Two adjacent ring ditches with central pits. Cropmarks of a ring ditch and linear ditch. Possible Barrow. [1]			
<b>Sources</b>			
[1] Essex Historic Environment Record			

<b>Site Number</b>	<b>96</b>	<b>Site Name</b>	<b>21, 23 and 25 Churchgate Street</b>
<b>Legal Status</b>	Grade II Listed Building	<b>NGR</b>	TL4833511476
<b>Value</b>	Medium	<b>Condition</b>	Good
<b>Site Type</b>	Timber Framed House	<b>Period</b>	Post medieval; 19th Century
<b>NMR ref</b>	1111707	<b>HER ref</b>	MEX1007028; 31639
<b>Description</b>			
Late 19th century range of tenements. Timber framed and rendered, of 2 storeys, with black weatherboards underground-storey windows. Ridged and gabled peg-tiled roof with 4 plain red brick chimneys. Ten casements, various, on first storey and 9 casements on ground-storey. Three modern doors and a rear access. [1] [2]			
<b>Sources</b>			
[1] National Heritage List [2] Essex Historic Environment Record			

<b>Site Number</b>	<b>97</b>	<b>Site Name</b>	<b>St. Nicholas School (site of)</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4838011510
<b>Value</b>	Negligible	<b>Condition</b>	Destroyed
<b>Site Type</b>	Archaeological Features	<b>Period</b>	Post medieval
<b>NMR ref</b>	N/A	<b>HER ref</b>	MEX42095; 16760
<b>Description</b>			
<p>The site of the former St. Nicholas School, Churchgate Street, was evaluated by trial trenching. A number of archaeological features were recorded, including pits, ditches and gullies. The majority of the features contained artefacts dating to 19th and 20th centuries, but a ditch and gully produced no dating evidence and are possibly earlier. Finds included pottery, iron objects including horse-shoes and nails, a single residual fragment of Roman roof-tile and two immature pig burials. [1]</p>			
<b>Sources</b>			
[1] Essex Historic Environment Record			

<b>Site Number</b>	<b>98</b>	<b>Site Name</b>	<b>Geophysical anomalies west of the M11</b>
<b>Legal Status</b>	None	<b>NGR</b>	TL4947512391
<b>Value</b>	Medium	<b>Condition</b>	Uncertain
<b>Site Type</b>	Geophysical Anomalies	<b>Period</b>	Prehistoric
<b>NMR ref</b>	N/A	<b>HER ref</b>	N/A
<b>Description</b>			
<p>Geophysical anomalies identified during survey commissioned to inform the forthcoming Environmental Statement. Provisional results appear to show a circular anomaly and a number of linear anomalies on high ground between The M11 and Sheering Road. It appears likely that these anomalies represent the trace of buried archaeological remains of probable prehistoric date. [1]</p>			
<b>Sources</b>			
[1] Headland Archaeology 2016, Interim data plot			

<b>Site Number</b>	<b>HLT1</b>	<b>Site Name</b>	<b>20th Century Agriculture</b>
<b>Legal Status</b>	None	<b>Value</b>	Negligible
<b>Description</b>			
<p>These represent field boundary loss since the 1950's due to mechanisation and changes in agricultural practices. This may range from the loss of a single boundary merging two fields into one, or many field boundaries being removed to form a single field (over 36 fields merged into one have been recorded). The resultant field is a hybrid and palimpsest, with edges that may have several periods of origin. The surviving edges of these fields are of historic importance. [1]</p>			
<b>Sources</b>			
[1] Essex Historic Environment Record			

<b>Site Number</b>	HLT2	<b>Site Name</b>	19th & 20th Century Woodland Plantation
<b>Legal Status</b>	None	<b>Value</b>	Negligible

**Description**

This includes all managed and planted woodland which post-date Ancient Woodland. These may be planted as commercial concerns or as ornamental woodland in association with informal parkland. These woodlands can be replanting of cleared woodland, inter-planting within existing woodland, or new planting within former fields. Some plantations may have been planted and felled between the OS 1st Edition mapping and modern mapping. Many plantations are comprised of a single or couple of species of deciduous or coniferous tree, though some may have been designed with a mixed composition to imitate traditional woodland, such as plantations encouraged as part of Thames Chase or under Agri-environmental schemes. [1]

**Sources**

[1] Essex Historic Environment Record

<b>Site Number</b>	HLT3	<b>Site Name</b>	Built Up Areas
<b>Legal Status</b>	None	<b>Value</b>	Negligible

**Description**

This type has been applied to the relict layers of modern built up or urban areas which have an historic core, and ranges from cities, towns, villages, and hamlets to large farms. All examples pre-date the 1st edition Ordnance Survey maps. These areas were not mapped as the urban area was not part of this project. This and further information is available in the Essex Historic Settlement survey reports.

This type has also been applied to modern and historic built up or urban areas, and ranges from cities, towns, villages, and hamlets to large farms. [1]

**Sources**

[1] Essex Historic Environment Record

<b>Site Number</b>	HLT4	<b>Site Name</b>	Enclosed Meadow Pasture
<b>Legal Status</b>	None	<b>Value</b>	Negligible

**Description**

These are sinuous fields that border rivers, often forming part of the flood plain/regime of the river, where the river floods naturally. They may be marked as areas of rough pasture. The traditional use from medieval times up to the 1950's was to produce a hay crop for winter fodder and for grazing. Some have been subsequently wooded or alternate with wooded areas along the river's course. [1]

**Sources**

[1] Essex Historic Environment Record

<b>Site Number</b>	HLT5	<b>Site Name</b>	Pre 18th Century Enclosure
<b>Legal Status</b>	None	<b>Value</b>	Medium

**Description**

Irregular enclosures vary considerably in size and shape, forming both arable and pasture, and are widespread though more common to the north and west of the county. They are probably the result of piecemeal enclosure and may originate from the medieval period or earlier. Morphologically they tend to have sinuous edges and offset corners. [1]

**Sources**

[1] Essex Historic Environment Record



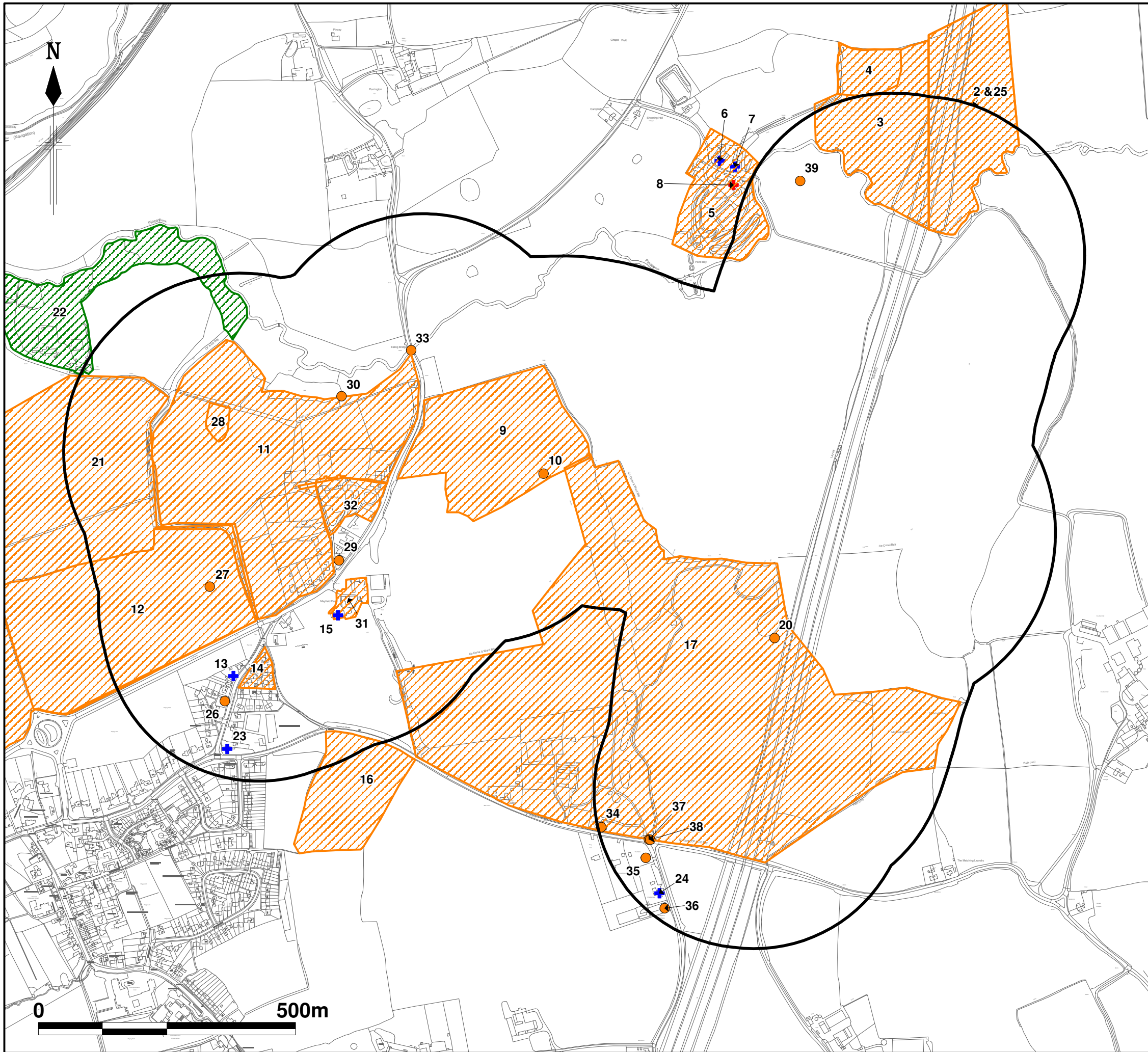
<b>Site Number</b>	<b>HLT6</b>	<b>Site Name</b>	<b>Informal Parkland</b>
<b>Legal Status</b>	None	<b>Value</b>	Negligible
<b>Description</b>			
Designed ornamental landscapes laid out around the 'great' or 'grand' house in the post medieval period, many by designers of national repute, such as Lancelot 'Capability' Brown at Audley End and Thorndon, Brentwood; and Humphry Repton at Hylands Park, Chelmsford and Gosfield Place, Halstead. The parks may include a formal garden, lakes, woodland, avenues, rides, vistas, and architectural features such as a ha-ha, terrace, folly or grotto. There may be remains of greenhouses and ice-houses. [1]			
<b>Sources</b>			
[1] Essex Historic Environment Record			

<b>Site Number</b>	<b>HLT7</b>	<b>Site Name</b>	<b>20th Century Communications (M11)</b>
<b>Legal Status</b>	None	<b>Value</b>	Negligible
<b>Description</b>			
This HLC type covers major roads and railways lines, road interchanges, and railway sidings, which have had a significant impact on the landscape. Although roads have a long history, this type is concerned with the modern infrastructure of the 20th/21st centuries. The railway network developed in 19th century but suffered cuts in the mid-20 <sup>th</sup> century. [1]			
<b>Sources</b>			
[1] Essex Historic Environment Record			







<b>Site Number</b>	<b>HLT8</b>	<b>Site Name</b>	<b>Modern Horticulture</b>
<b>Legal Status</b>	None	<b>Value</b>	Negligible
<b>Description</b>			
This HLC type covers nurseries and greenhouses for market gardening. The main distribution of this type is in the Lea Valley in the west of the county. Greenhouses used to be constructed of glass but have mostly been replaced with other materials or polytunnels. They may sit within an earlier field boundary pattern, or may have replaced it. These date from the late 19 <sup>th</sup> / early 20 <sup>th</sup> centuries. [1]			
<b>Sources</b>			
[1] Essex Historic Environment Record			

<b>Site Number</b>	<b>HLT9</b>	<b>Site Name</b>	<b>Historic Earthworks</b>
<b>Legal Status</b>	None	<b>Value</b>	Medium
<b>Description</b>			
This type covers large scale historic monuments which are definable on a landscape scale. They date from any archaeological or historic period. They may be designated as Scheduled monuments, and managed to preserve them for the future. [1]			
<b>Sources</b>			
[1] Essex Historic Environment Record			





**Legend**

-  300m Study area
-  Grade II\* Listed Buildings
-  Grade II Listed Buildings
-  Grade II Registered Parks and Gardens
-  Undesignated Assets (Point or Area)
-  Undesignated Assets (Point or Area)

0	28/10/2014		RM	RT-L	JM	PM
Rev	Revision Date	Purpose of revision	Drawn	Checked	Reviewed	Approved

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 www.jacobsbatle.com

Client **Essex Highways**

Project **M11 Junction 7A**

Drawing title **Figure 1  
Heritage Assets**

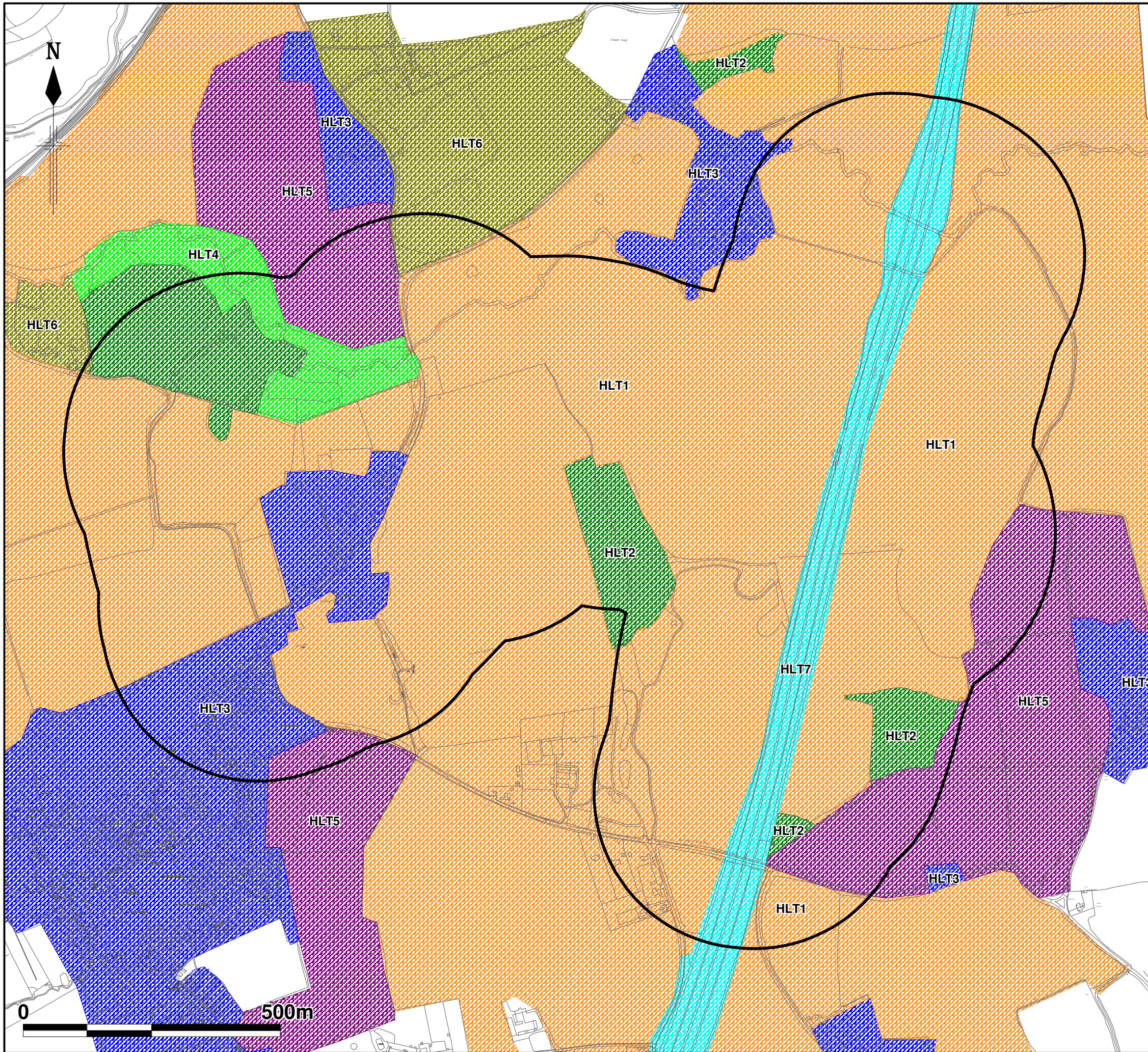
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Client no.	26994	

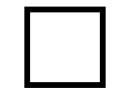
Drawing number	B3553F05/Heritage/01	Rev	0
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**Legend**



300m Study area

**Historic Landscape Types**

- HLT1 - 20th Century Agriculture
- HLT2 - 19th & 20th Century Woodland Plantation
- HLT3 - Built Up Areas
- HLT4 - Enclosed Meadow Pasture
- HLT6 - Informal Parkland
- HLT5 - Pre 18th Century Enclosure
- HLT7 - 20th Century Communications (M11)

0	27/10/2014		RM	RT-L	JM	PM
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Client  
**Essex Highways**

Project  
 M11 Junction 7A

Drawing title  
**Figure 2  
 Historic Landscape Types**

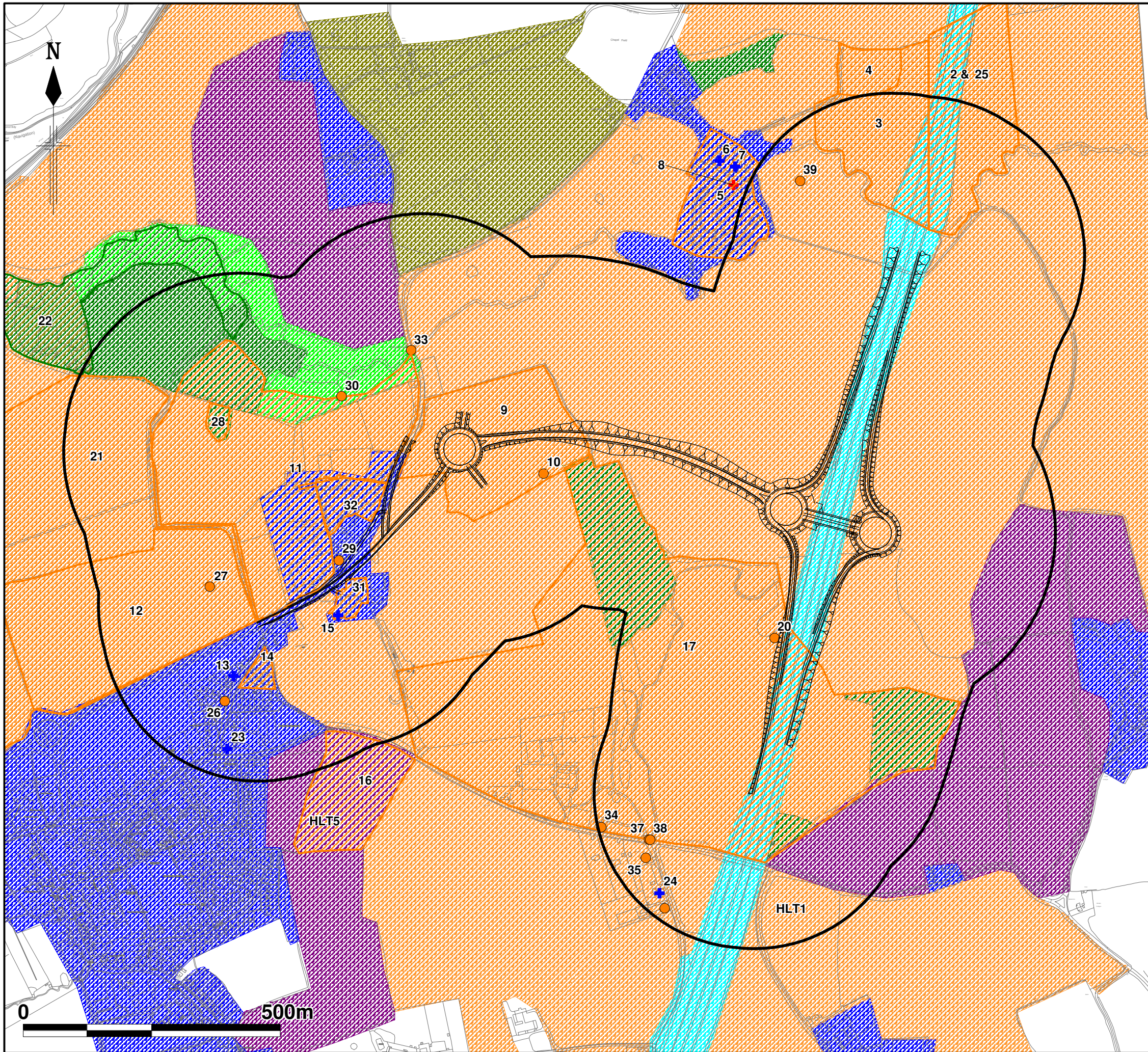
Drawing status  
**DRAFT**

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JB no.	B3553F05	
Client no.	26994	

Drawing number	B3553F05/Heritage/02	Rev	0
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**Legend**

300m Study area

**Historic Landscape Types**

- HLT1 - 20th Century Agriculture
- HLT2 - 19th & 20th Century Woodland Plantation
- HLT3 - Built Up Areas
- HLT4 - Enclosed Meadow Pasture
- HLT6 - Informal Parkland
- HLT5 - Pre 18th Century Enclosure
- HLT7 - 20th Century Communications (M11)

**Heritage Assets**

- Grade II\* Listed Buildings
- Grade II Listed Buildings
- Grade II Registered Parks and Gardens
- Undesignated Assets

0	27/10/2014		RM	RT-L	JM	PM
Rev	Revision Date	Purpose of revision	Drawn	Checked	Reviewed	Approved

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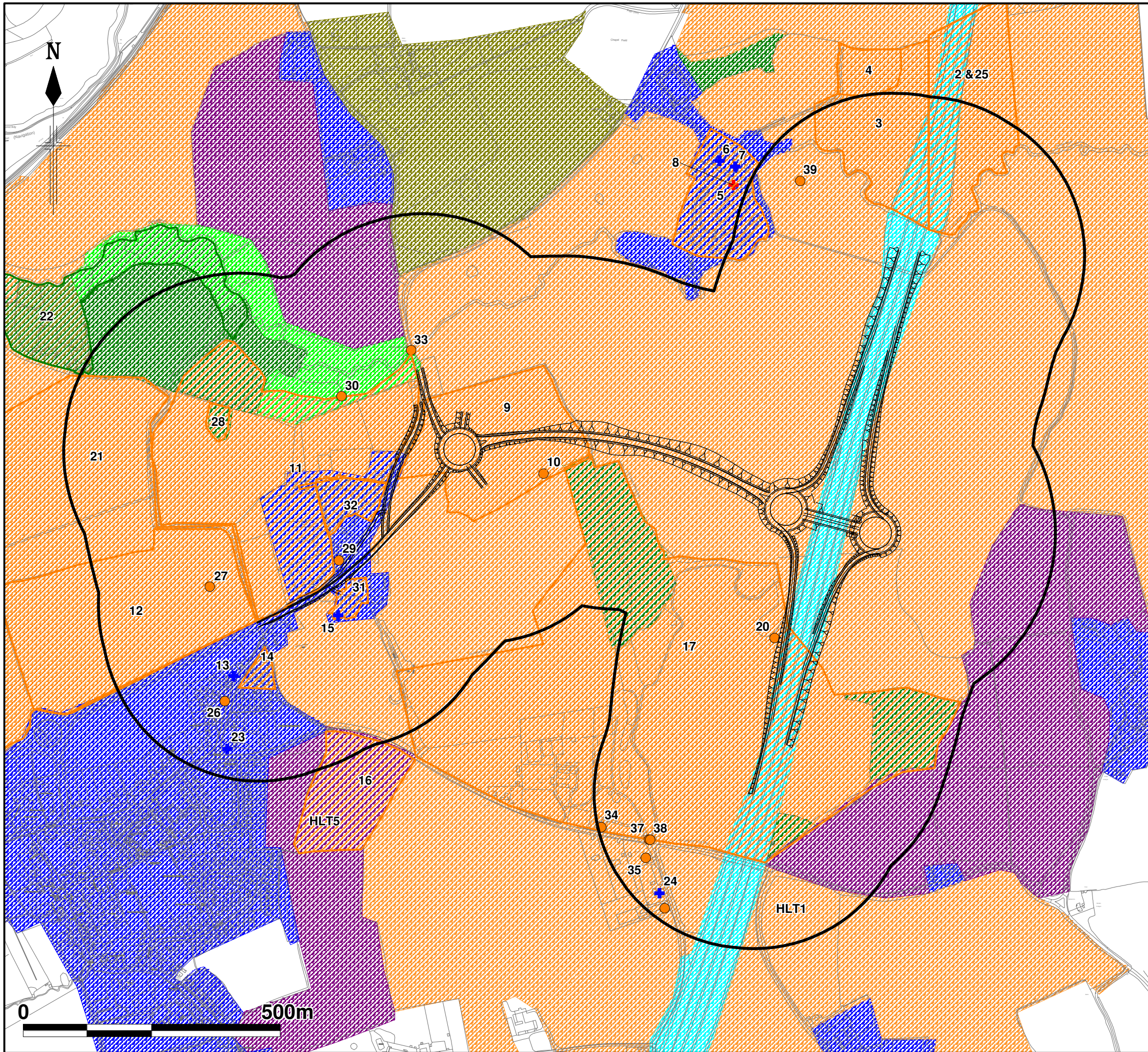
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Location of Heritage Assets - Option 1**

Drawing status **DRAFT**

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Client no.	26994	
Drawing number	B3553F05/Heritage/03	Rev 0

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**Legend**

300m Study area

**Historic Landscape Types**

- HLT1 - 20th Century Agriculture
- HLT2 - 19th & 20th Century Woodland Plantation
- HLT3 - Built Up Areas
- HLT4 - Enclosed Meadow Pasture
- HLT6 - Informal Parkland
- HLT5 - Pre 18th Century Enclosure
- HLT7 - 20th Century Communications (M11)

**Heritage Assets**

- Grade II\* Listed Buildings
- Grade II Listed Buildings
- Grade II Registered Parks and Gardens
- Undesignated Assets

0	27/10/2014		RM	RT-L	JM	PM
Rev	Revision Date	Purpose of revision	Drawn	Checked	Reviewed	Approved

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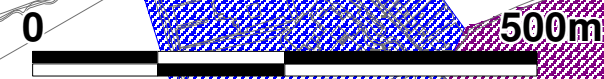
Drawing title **Figure 4  
Location of Heritage Assets -  
Options 1A and 1B**

Drawing status **DRAFT**

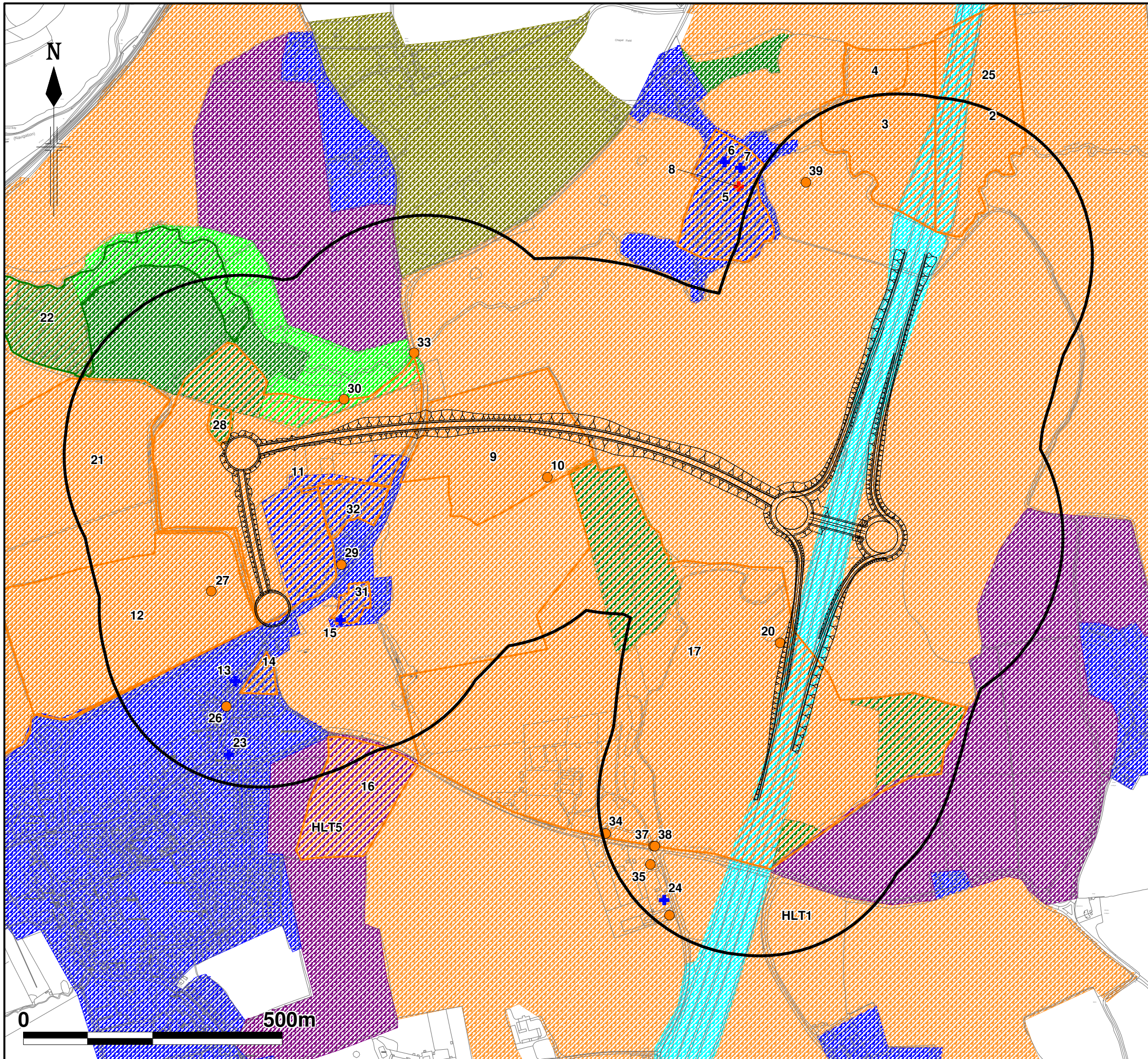
Scale	1:25,000 @ A3	Do not scale
JB no.	B3553F05	
Client no.	26994	

Drawing number	B3553F05/Heritage/04	Rev	0
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**Legend**

300m Study area

**Historic Landscape Types**

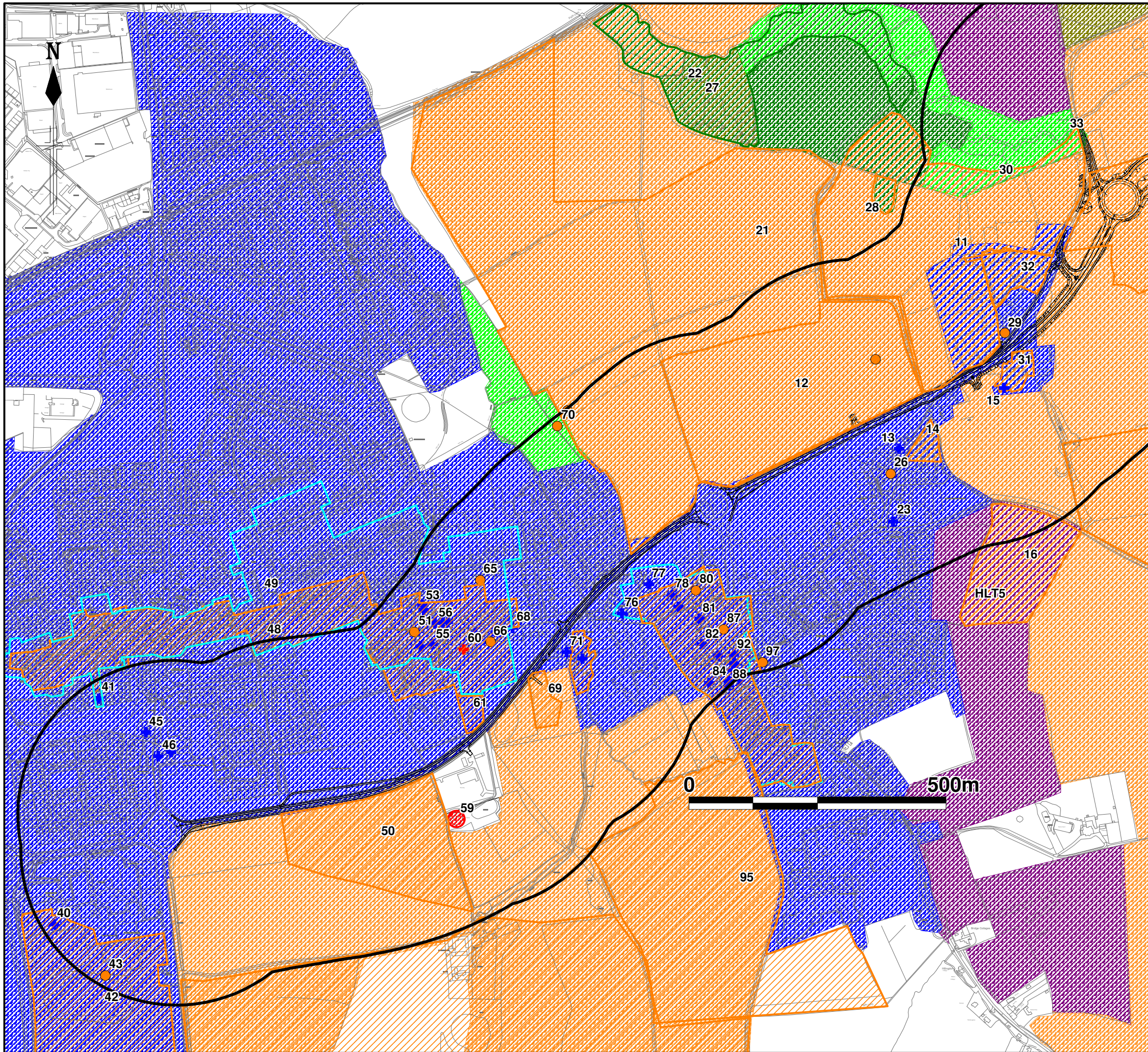
- HLT1 - 20th Century Agriculture
- HLT2 - 19th & 20th Century Woodland Plantation
- HLT3 - Built Up Areas
- HLT4 - Enclosed Meadow Pasture
- HLT6 - Informal Parkland
- HLT5 - Pre 18th Century Enclosure
- HLT7 - 20th Century Communications (M11)

**Heritage Assets**

- Grade II\* Listed Buildings
- Grade II Listed Buildings
- Grade II Registered Parks and Gardens
- Undesignated Assets

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Client						
Project	M11 Junction 7A					
Drawing title	Figure 5 Option 2 and Heritage Assets					
Drawing status	<b>DRAFT</b>					
Scale	1:25,000 @ A3		Do not scale			
JB no.	B3553F05					
Client no.	26994					
Drawing number	B3553F05/Heritage/01					Rev
						0
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**Legend**

300m Study area

**Historic Landscape Types**

- HLT1 - 20th Century Agriculture
- HLT2 - 19th & 20th Century Woodland Plantation
- HLT3 - Built Up Areas
- HLT4 - Enclosed Meadow Pasture
- HLT6 - Informal Parkland
- HLT5 - Pre 18th Century Enclosure
- HLT7 - 20th Century Communications (M11)

**Heritage Assets**

- Grade II\* Listed Buildings
- Grade II Listed Buildings
- Grade II Registered Parks and Gardens
- Undesignated Assets
- Undesignated Assets

0	12/01/2016		RM	RT-L	JM	PM
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Client **Essex Highways**

Project **M11 Junction 7A**

Drawing title **Figure 6  
Gilden Way Improvements  
and Heritage Assets**

Drawing status **DRAFT**

Scale 1:25,000 @ A3 Do not scale

JB no. B3553F05

Client no. 26994

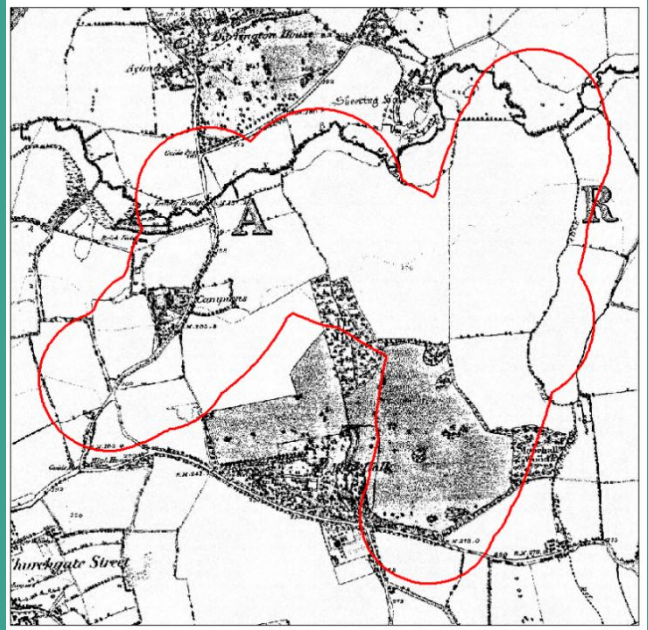
Drawing number **B3553F05/Heritage/01** Rev **0**

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## **Appendix 6.3: Cartographic Analysis**





# Assessment of the historic cartographic evidence for the M11 Junction 7a area

May 2015



Essex County Council



**place  
services**

# **Assessment of the historic cartographic evidence for the M11 Junction 7a area**

**May 2015**



**Essex County Council**

# Assessment of the historic cartographic evidence for the M11 Junction 7a area

Prepared for Essex Highways

by  
Place Services  
Essex County Council  
County Hall  
Chelmsford  
Essex  
CM1 1QH

May 2015

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3	Cartographic evidence .....	6
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# Assessment of the historic cartographic evidence for the M11 Junction 7a area

## 1 Introduction

This assessment considers the historic cartographic evidence of an area of land (the Study Area), situated on the north-east edge of Harlow with a center point at TL4946212417. The area is largely under agricultural use, it is bisected by the M11 motorway.

This assessment has been carried out in line with the Chartered Institute for Archaeologists *Standard and Guidance for historic environment desk-based assessment* (ClfA 2014), and to follow the requirements of Paragraph 128 of the *National Planning Policy Framework* to identify known heritage assets on the site, and consider the potential for additional, as yet unknown, remains to be present, in order to consider their significance and the likely impacts which may arise from the proposed development.

This document comprises an assessment of the historic cartographic sources for the Study Area. The Study Area is the same as that used in the Heritage Statement (Jacobs, November 2014) and is derived using an indicative location for the route of the road plus 300m extending in all directions from it (Fig. 1). It is intended to act as an appendix to the Heritage Statement. The Asset numbers used in the Heritage Statement are referenced in **bold** and bracketed – e.g. **(1)**.

## 2 Location, topography and geology

The Study Area is largely within Epping Forest District, with two small areas on the southern edge within the Harlow District boundary. The area is roughly bounded by Moor Hall Road to the south; a strip of land directly to the east of the M11 motorway; a line approximately 200m to the north of Pincey Brook; and a line approximately 250m to the west of the Campions residential area.

The M11 is sited on the higher ground within the Study Area, with the land sloping to the north and west to the Pincey Brook and the Stort Valley. The geology consists of Boulder Clay, with head deposits and alluvium in the valley sides and floor of the Pincey Brook.

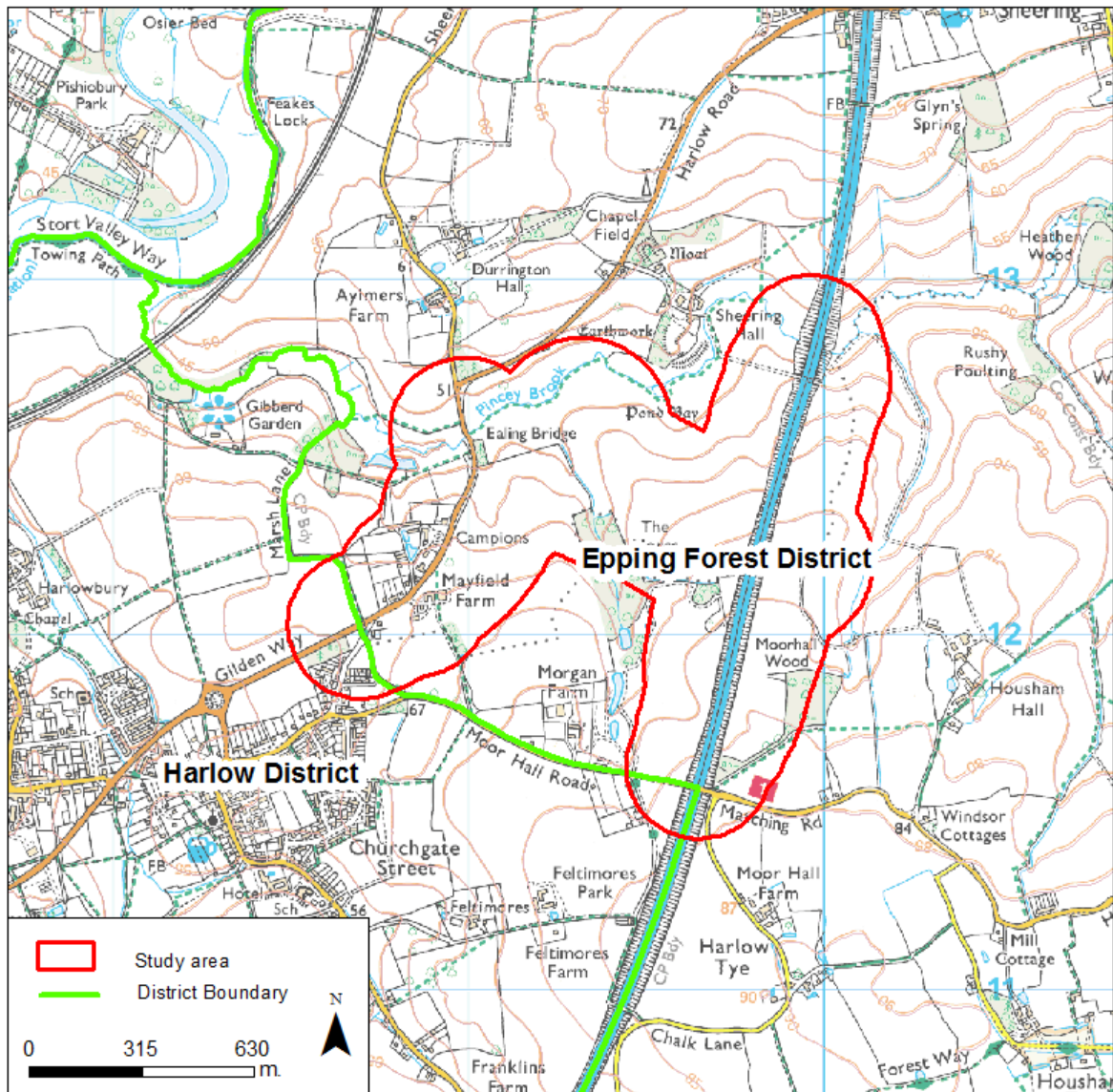


Fig. 1 Location map of study area

### 3 Cartographic evidence

#### Late 18<sup>th</sup> century

The earliest map to show the study area is the Chapman and André map of 1777 (Fig. 2). Although no detail is shown of the proposed development area, it does show its topographical position and surrounding features. The five principal holdings in the area are all depicted, Durrington House, Sheering Hall (8), Househam Hall, Moor Hall (17) and Campions, which is not named on the map (32). The Matching Road layout originally comprised a series of dog-legs around the southern boundary of Moor Hall.

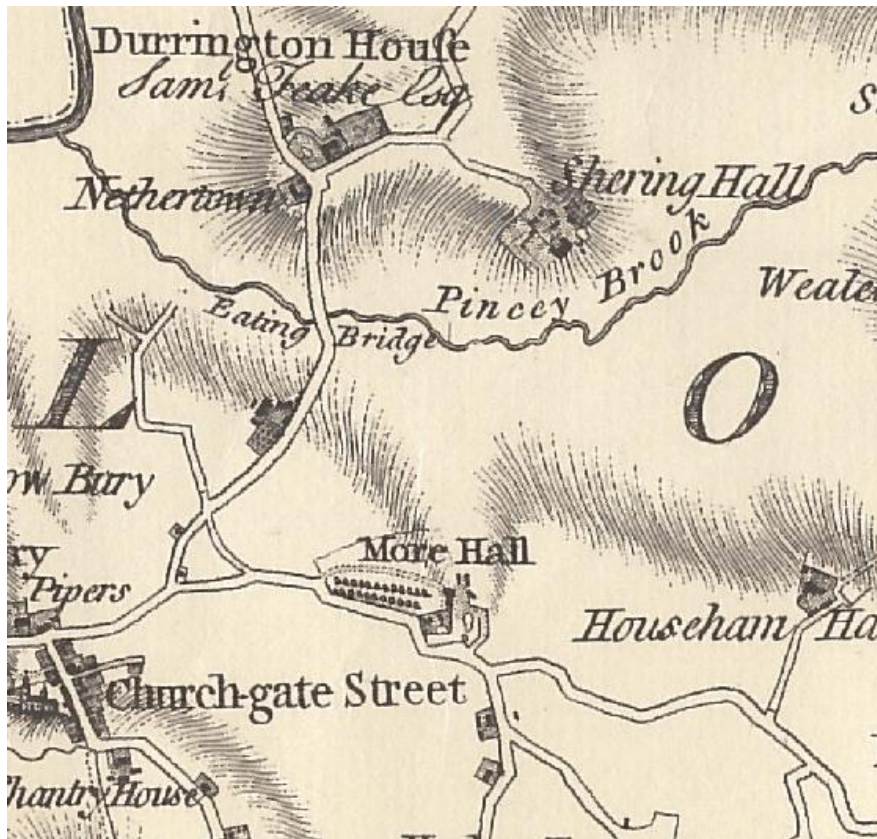


Fig. 2 Extract from Chapman and Andre Map of 1777 centred on the study area

The 1795 estate map of Moor Hall Farm (17) (ERO D/DEs P3) shows some detail of the southern edge of the study area, although the map itself is quite faint. The Matching Road is still a series of dog-legs at that date. The fields and the two areas of woodland, The Mores and Moorhall Wood, are depicted. The Mores woodland however appears to have been limited to the topmost corner of the long narrow field to the north of the house.

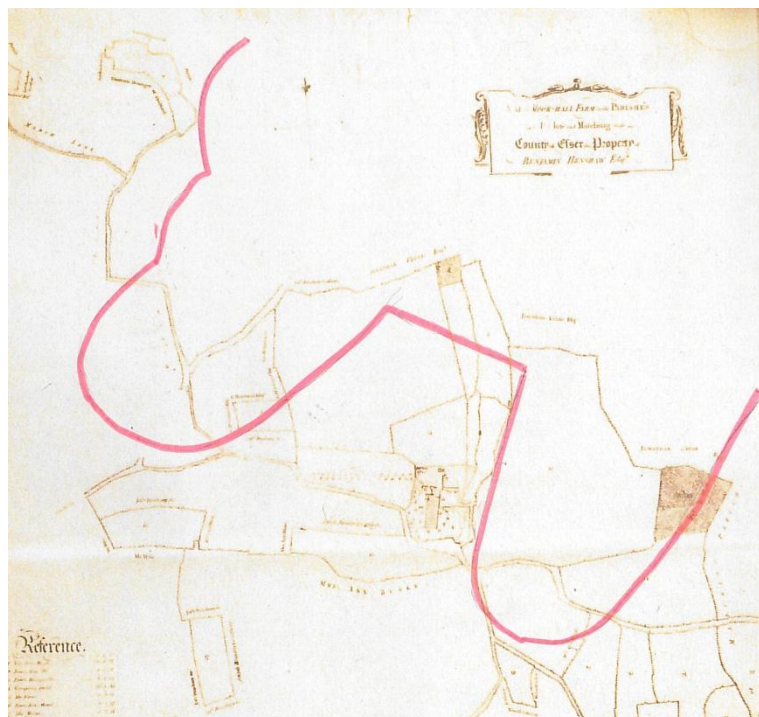
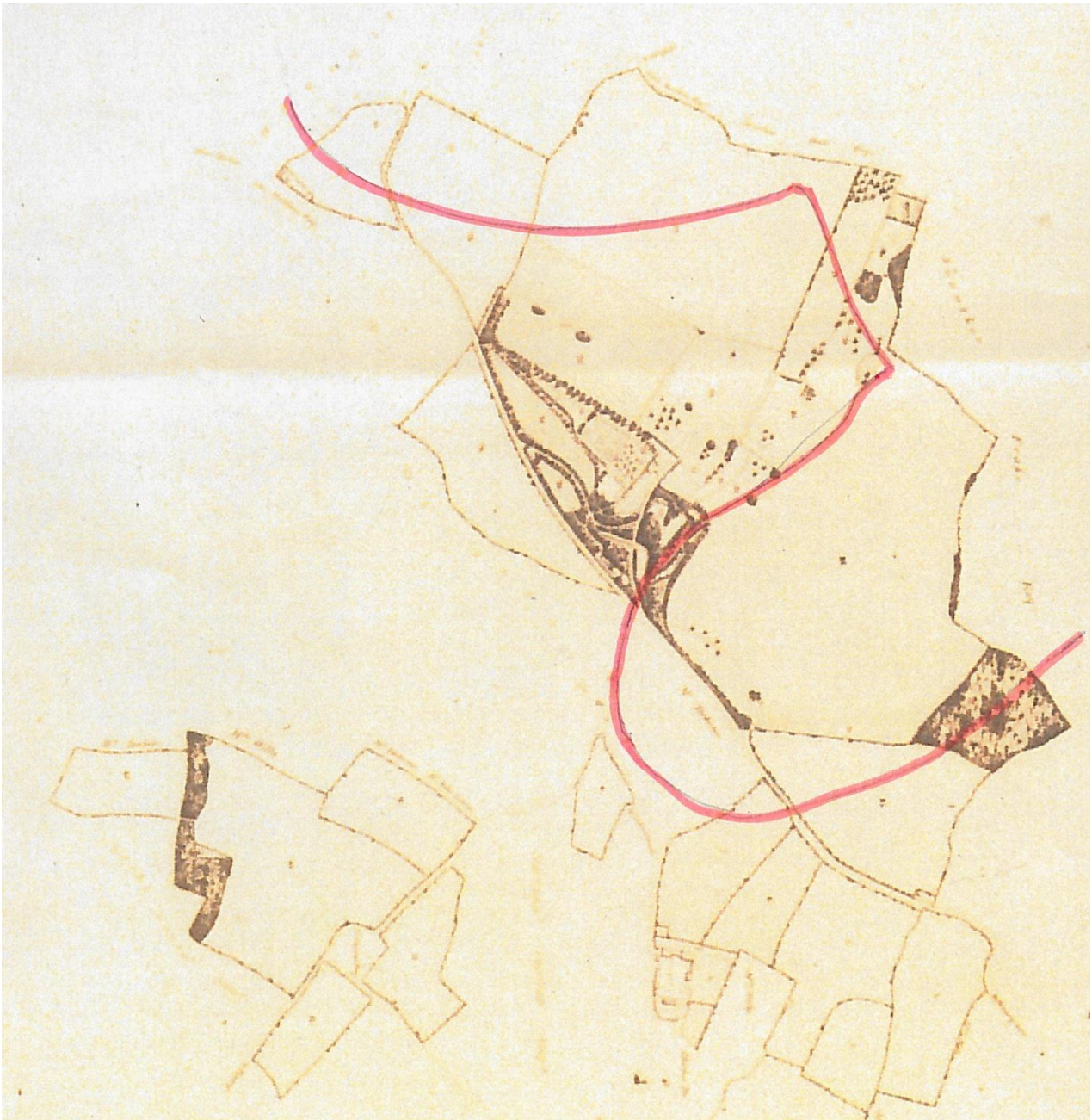


Fig. 3 Extract from the 1795 Estate Map of Moor Hall (D/Des P3). The approximate boundary of the study area has been added in pink



### Early 19<sup>th</sup> century

Moor Hall (17) was rebuilt between 1805 and 1810 as a three-storey mansion in the classical style with 5-bays and a Doric portico. The grounds were also extensively landscaped and Matching Road straightened at this time on the advice of Humphrey Repton. The report by Repton, dated 11 May 1808, includes a pencil and ink plan with coloured washes, and carries calculations in ink and pencil of the lengths of the 'present crooked road' and 'proposed new road'. The new route is depicted on the 1814 map of 'Moor Hall and Roffey, the property of John and Philip Perry Esqrs' (D/DU 44/1).



*Fig. 4 Extract from the 1814 Estate Map of Moor Hall (D/DU 44/1). The approximate boundary of the study area has been added in pink.*



## Mid 19<sup>th</sup> century

The earliest maps of the entire Study Area with any detail on are the Tithe maps for Harlow, Sheering and Matching parishes (Figs 5-8). These show roads, buildings, fields, parkland etc., as well as recording land-use and ownership details in the accompanying Tithe Awards. The Sheering map is the earliest of the three maps, dating to c. 1840, with Matching drawn in 1843 and Harlow in 1849.

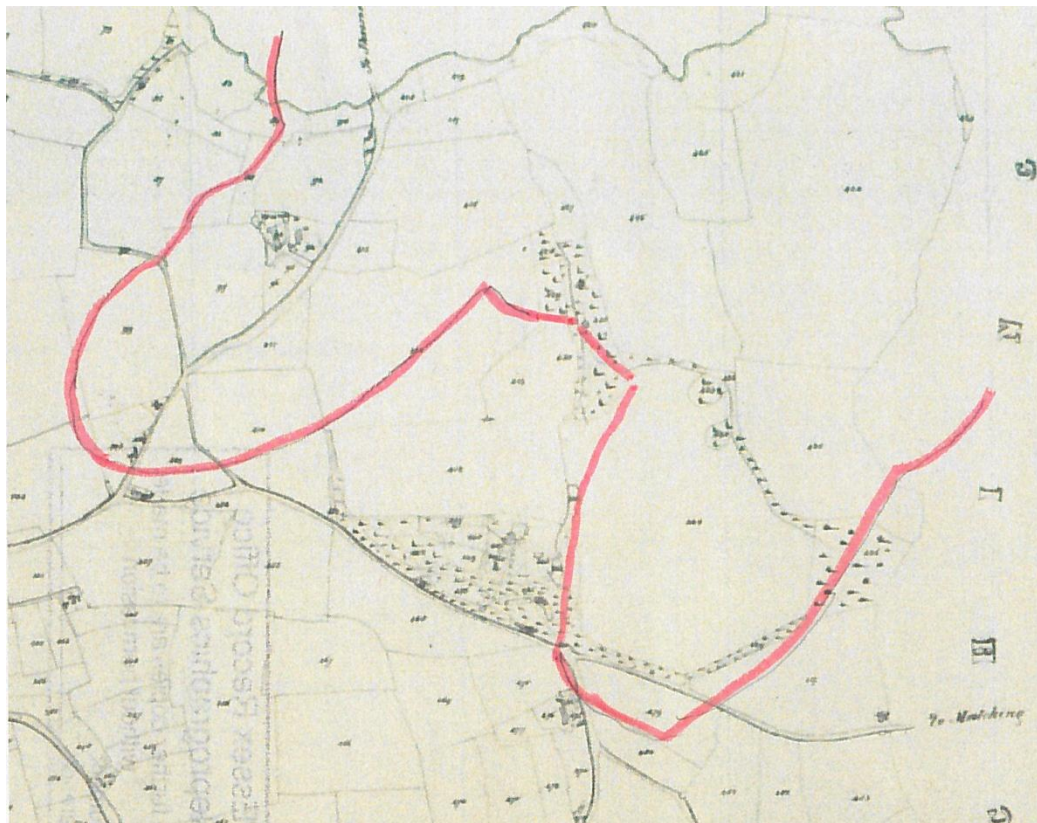


Fig. 5 Extract from Harlow Parish Tithe map, 1849 (D/CT164). The approximate boundary of the study area has been added in pink, north is at the top of the map

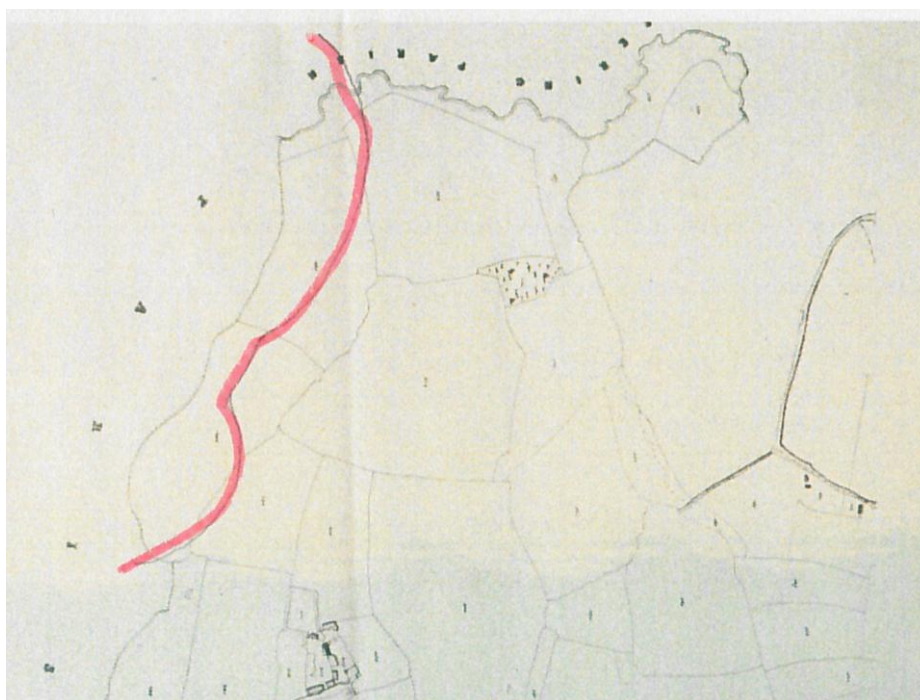


Fig. 6 Extract from Matching Parish Tithe map, 1843 (D/CT 236B). The approximate boundary of the study area has been added in pink, north is at the top of the map



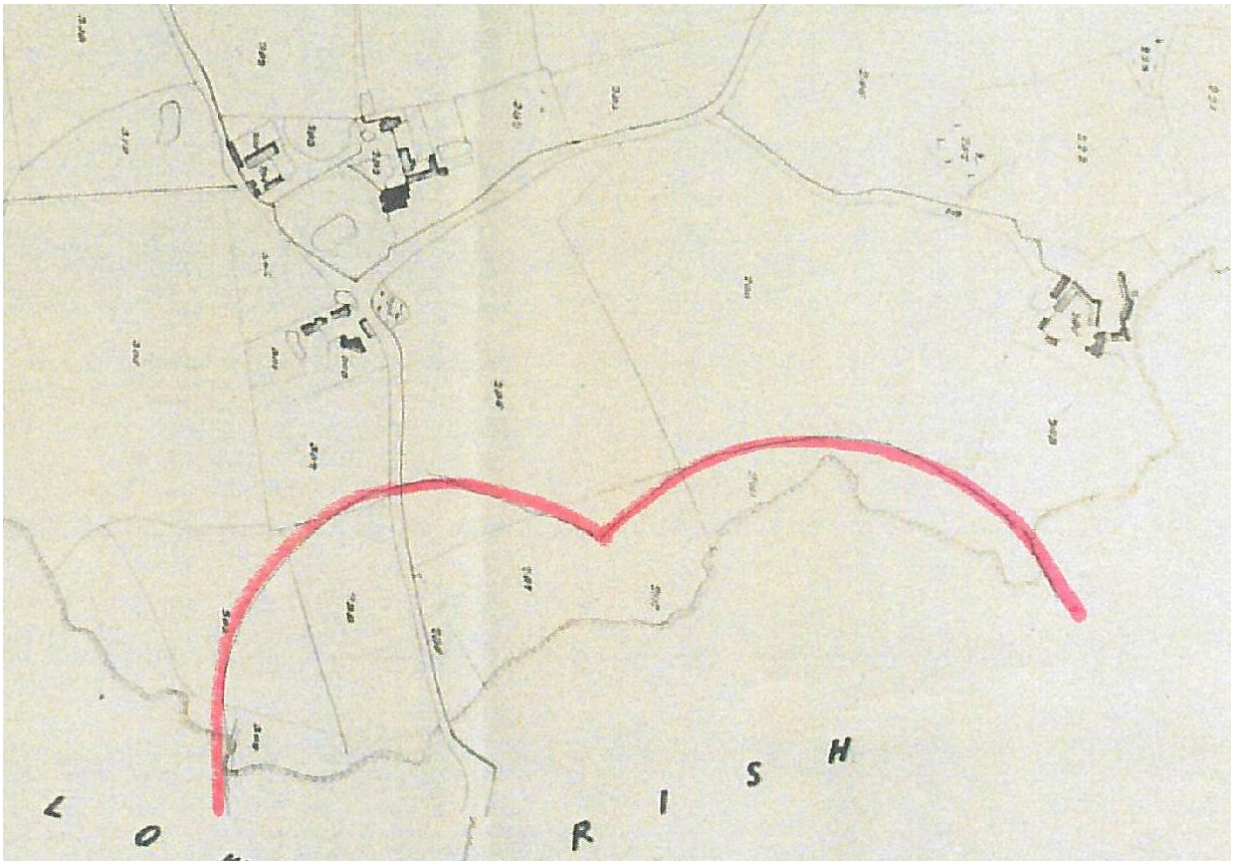


Fig. 7 Extract from Sheering Parish Tithe map, c. 1840 (D/CT 313B, 1 of 2). The approximate boundary of the study area has been added in pink, north is at the top of the map

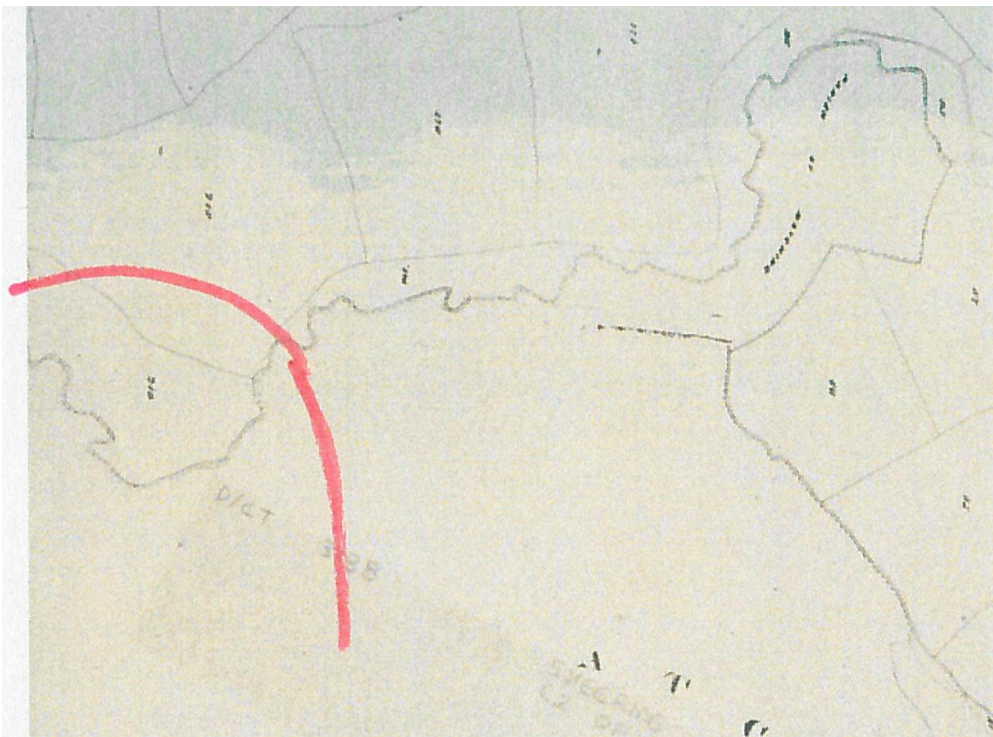


Fig. 8 Extract from Sheering Parish Tithe map, c. 1840 (D/CT 313B, 2 of 2). The approximate boundary of the study area has been added in pink, north is at the top of the map

<b>Field No.</b>	<b>Field-name</b>
<b>HARLOW</b>	
84	Brickground
87	Great Wick
88	Brickground
90	Bridge Mead
91	2 New Cottages and Gardens
92	Granary Field
93	Barn, yards and stables
94	Campions
95	Kitchen garden
96	Orchard
97	Little Wick
98	Harlow Marsh Lane
99	Little Hempshall
102	Cottage, shed and garden
103	Cottage Field
180	Cottage Allotments
409	High House Field
410	Gravel Pit Field
411	Three-Cornered Field
412	The Walk Mead
413	Campion's Field
414	Campion's Field
415	Front Mead
416	Potter's Croft
417	Part Lower Aley Field
418	Bridge Mead
419	3 Acre Mead
420	Further 5 Acres
421	Nearest 5 Acres
422	Harlow Mead
423	Bushes
424	Great Aley Field
425	Rookery Mead
426	Middle Aley Field
427	Grove Mead
428	Wood



429	Young Plantation
431	Plantation and pleasure grounds
433	Plantation and pleasure grounds
434	Plantation and pleasure grounds
435	Upper Aley Field
436	Park Wood
437	Perry Field
SHEERING	
218	Wood Field
219	Wood Field Mead
220	Church Hall Mead
289	The Warren
290	Plashets
296	Plashets
297	The Ley
298	Bridge Mead
299	-
300	Crankley Mead
302	Home Field
MATCHING	
427	Meadow
493	Great Whitwells
494	Little Whitwells

*Table 1 Field names for the study area from the Harlow, Sheering and Matching Tithe Awards*

The Tithe maps reflect the earlier changes to the road layout associated with Moor Hall (**17**). There appears to have been additional woodland planting around the parkland, forming long narrow springs or shaws (narrow strips of woodland around a field boundary) and spinneys (clumps of trees), these would have had a dual function, both enhancing the aesthetics of the park and in providing cover for game-birds. The five principal holdings in the area are all depicted, Durrington House, Sheering Hall (**8**), Househam Hall, Moor Hall (**17**) and Campions (**32**). Campions (**32**) is the only one of these residences which lies wholly within the Study Area, although the eastern half of Moor Park is within the Study Area, as is a small portion of Durrington House park and the area known as The Warren to the south of Sheering Hall. The place name The Warren is of significance, in that it may record the location of a medieval rabbit warren associated with Sheering Hall, the creation of artificial Warrens to house imported rabbits was a feature of high status sites in the centuries after the Norman Conquest (Leach 2010).

Two new groups of cottages are depicted, these comprised a small triangular area of land labelled '2 new cottages and gardens' immediately to the south of Ealing Bridge (**33**), and another couple of cottages and cottage allotments (**13 and 26**) at the southern end of Sheering Road. Both of these sites are still extant and occupied. There are a number of areas of industrial interest are depicted. On the western edge of the Study Area, behind Campions (**32**) were two small fields

called 'brick grounds' (11). To the south of Mayfield Farm (31) is Gravel Pit Field, and again an extraction pit is depicted on the map. Experience from elsewhere in Harlow suggests that the extraction on both these sites is likely to be of a haphazard and sporadic nature, with individual extraction pits being dug and then back-filled with the residue from the next pit. The field name Potters Croft (9) opposite to Campions is also of interest. Harlow was an important location for pottery manufacture from the 13<sup>th</sup> to 18<sup>th</sup> centuries, reaching its peak in the 17<sup>th</sup> century when Metropolitan slipware was produced and widely traded (Davey and Walker 2009). What is not known is whether pottery was produced on the site, or whether it was used for clay extraction for the Harlow pottery industry (no extraction pits are depicted on the map) or whether a potter or a person by the name of Potter owned Potters Croft. The remainder of the area was under agriculture, the majority being in arable cultivation, but with meadow concentrated along the Pincey Brook, which is prone to flooding. The parish boundary between Matching and Harlow ran up the eastern side of the Study Area, whilst the Pincey Brook was the Harlow and Sheering parish boundary.

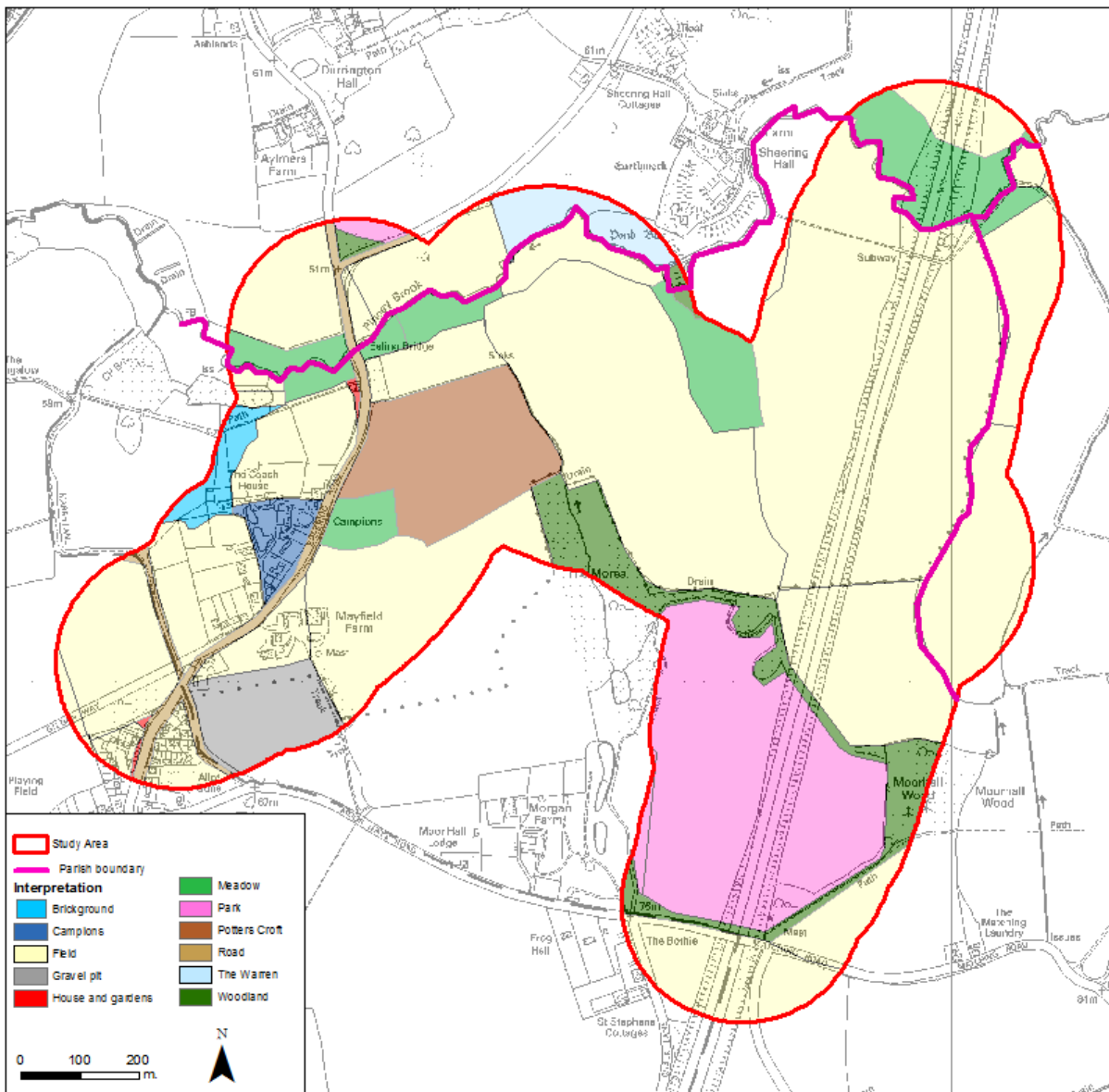


Fig. 9 Interpretative map of the Tithe Award, showing land use and other significant features

### Late 19<sup>th</sup> century

The 25<sup>th</sup> 1st edition OS map (1875) shows the Study Area largely unchanged, except for Fields 271 and 272 which originally comprised 3 fields, the field boundary has also been straightened

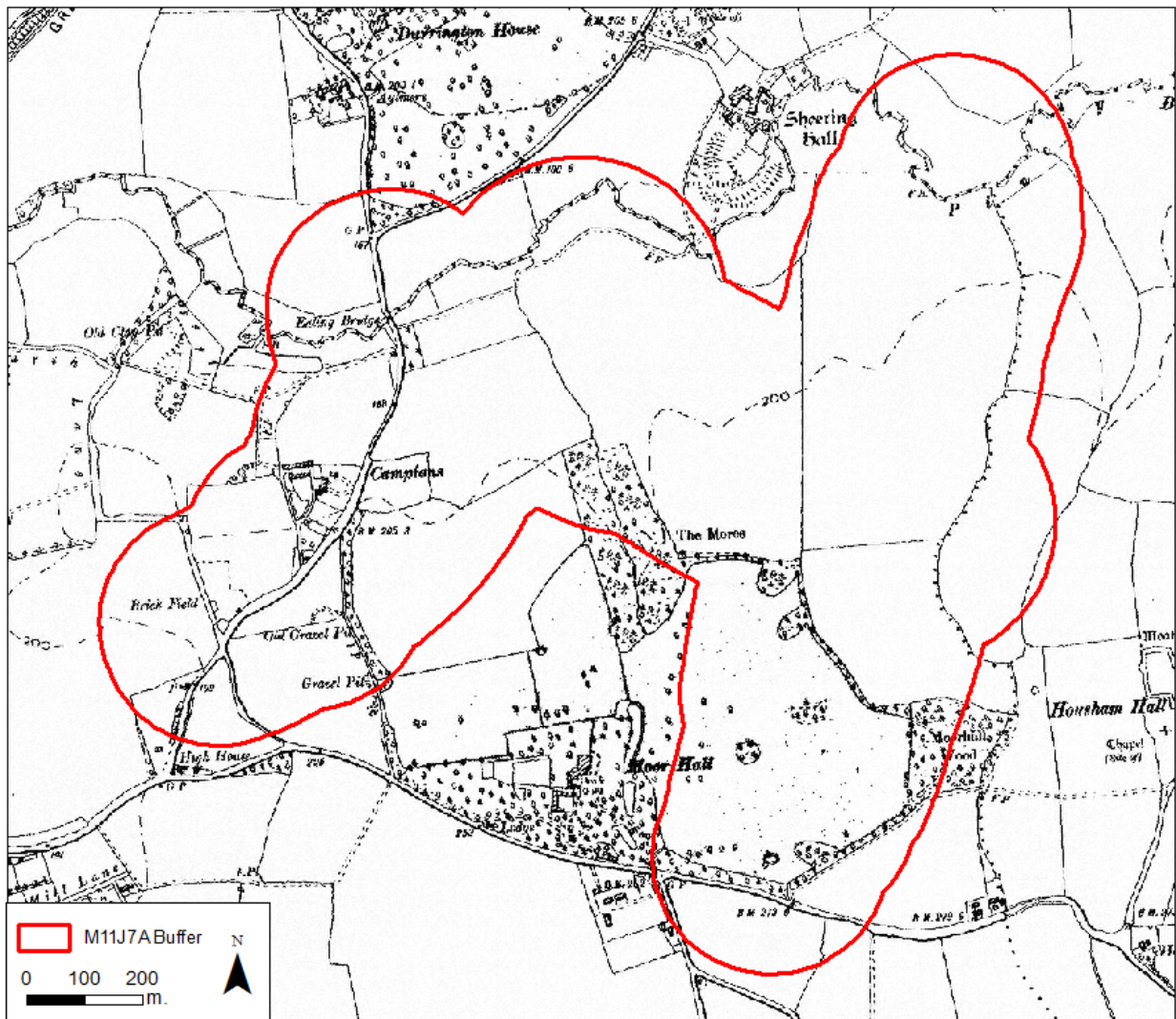
between 271 and 272. The brick field (11) is still depicted, with the addition of at least two structures and a number of clay pits. The gravel pit in Gravel Pit Field is also depicted, as is a smaller gravel pit at the junction of Sheering Road and Moor Hall Lane. A small gravel pit to the immediate east of Sheering Hall, extends just into the Study Area. The cottages at the southern end of Sheering Road has expanded to form a row of 8 or 9 buildings, and a further cottage (possibly a gatelodge) has been built at the entrance to Campions (32). A guide-post (37) is recorded at the junction of Chalk Lane and Matching Road.



Fig 10 Extract from the OS 1st edition 25" map (1875)

The 2nd edition OS map (1897) shows only one significant change from the 1<sup>st</sup> edition, in that the focus of the brickfield to the west of Campions (32) seems to have shifted into the field to the south-west. A small piece of plantation woodland has been planted to the south of Ealing Bridge, and a belt of woodland planted along the western boundary of the Gravel Pit Field. There is also some limited boundary loss in the fields adjoining the Pincey Brook.



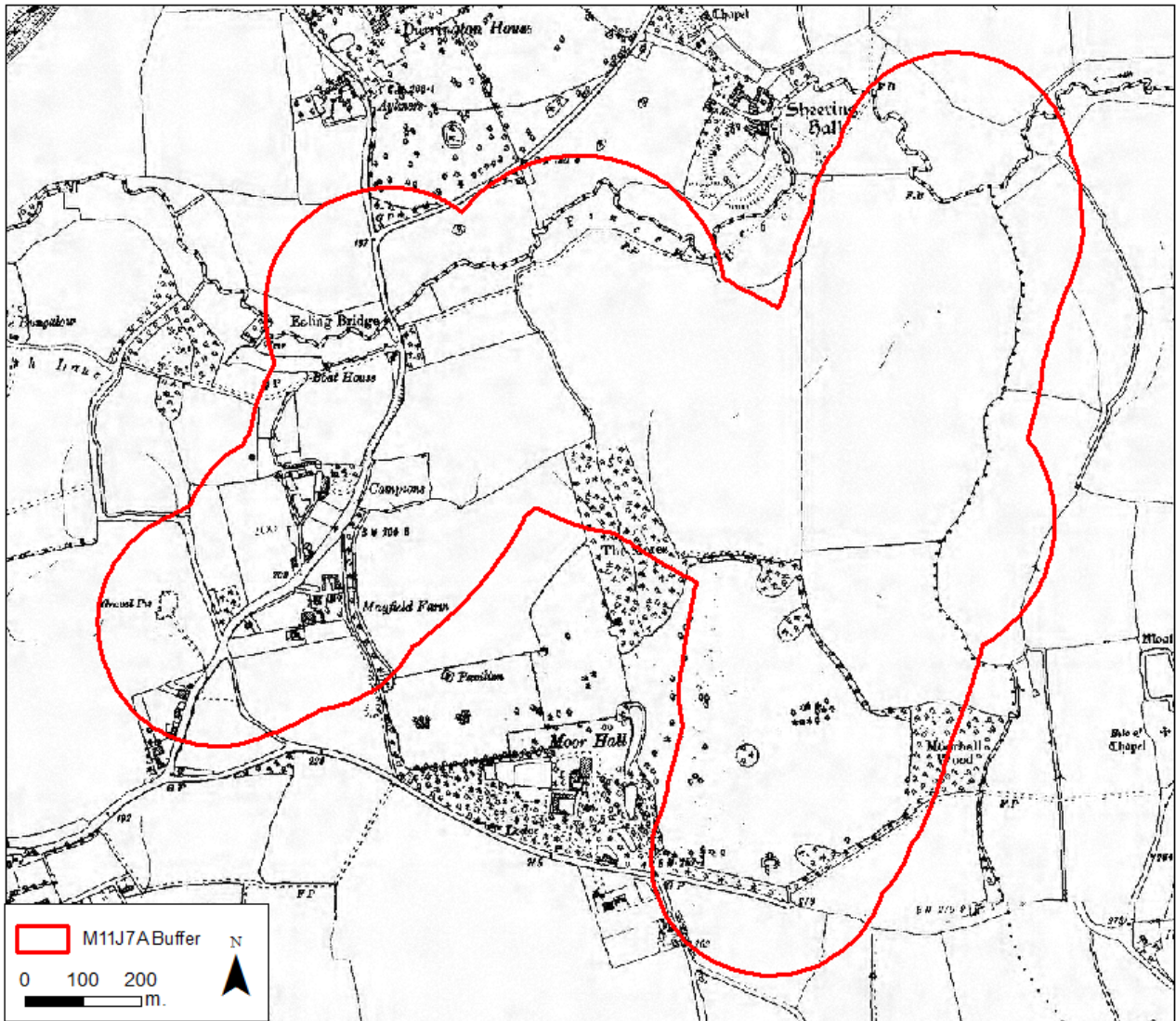


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Fig 11 Extract from the OS 2nd edition 6" map (1897)

### Early 20<sup>th</sup> century

The 3rd edition OS map (1923) shows the construction of a new farm, Mayfield Farm (31) on the site of the Gravel Pit, this comprised a farmhouse and associated barns and sheds. A new gravel-pit (27) is depicted in the south-west corner of the Study Area, and the gardens of some of the buildings facing on to Sheering Road have been extended. A new conifer plantation has been planted at the junction of Moor Hall Lane and Sheering Road which overlies the former gravel pit on the site. Two small cottages have been constructed opposite the plantation. A new house has been built to the west of the entrance to Campions (32). A boat house (30) is depicted at Campions (32), on the edge of the Pincey Brook flood plain. A small structure, possibly a cottage, is depicted on the edge of Durrington House Park, behind a small triangular piece of woodland.



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Fig 12 Extract from the OS 3rd edition 6" map (1923)

The 4th edition OS map (1938) shows the construction of High House Estate at the south-western corner of the Study Area. A row of four buildings have also been built on the western side of the Sheering Road. In the woodland belt along the southern edge of Moor Hall park are depicted a scatter of small rectangular structures, it is not sure whether these are actually buildings or whether they represent structures such as pheasant pens.



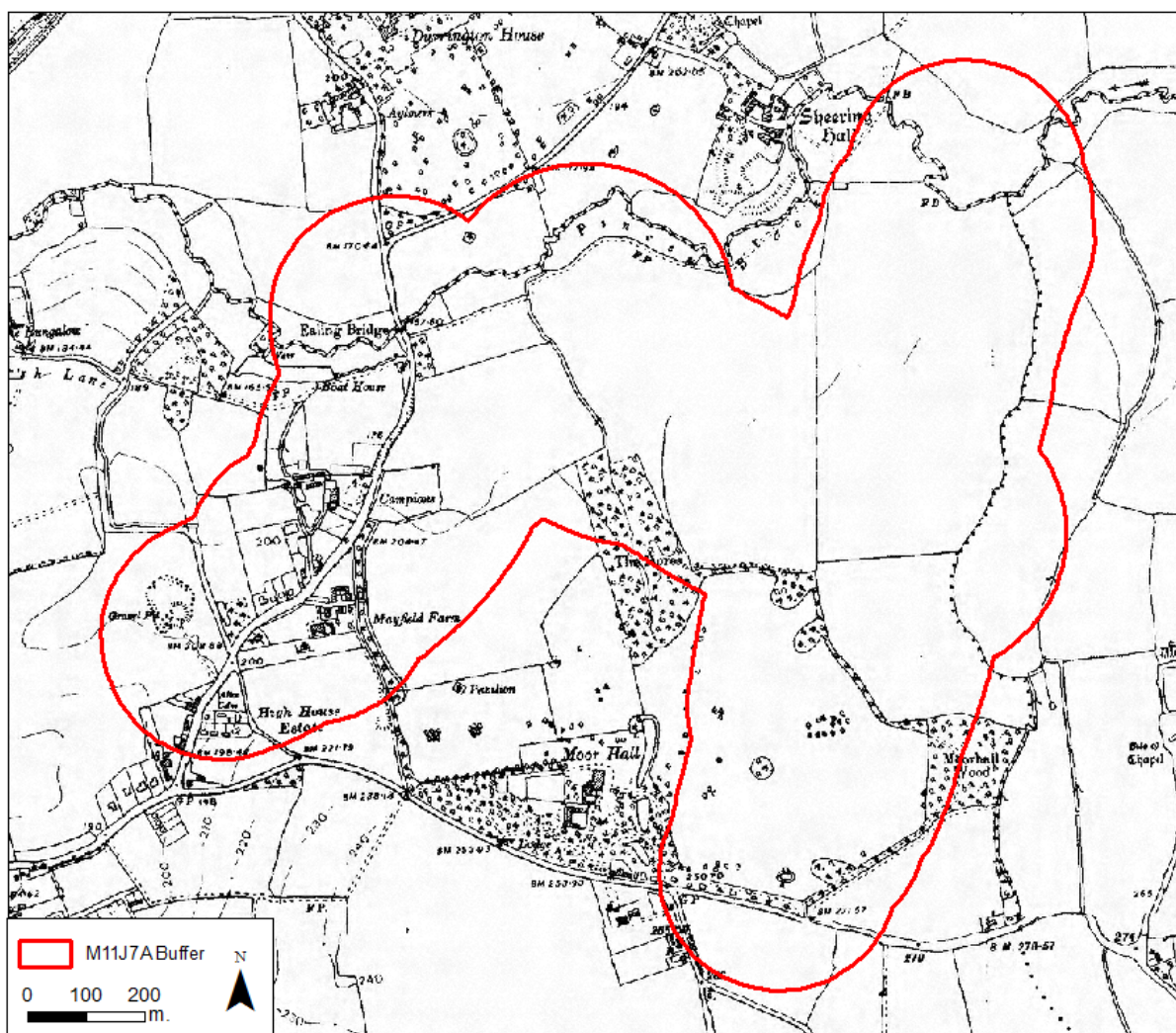
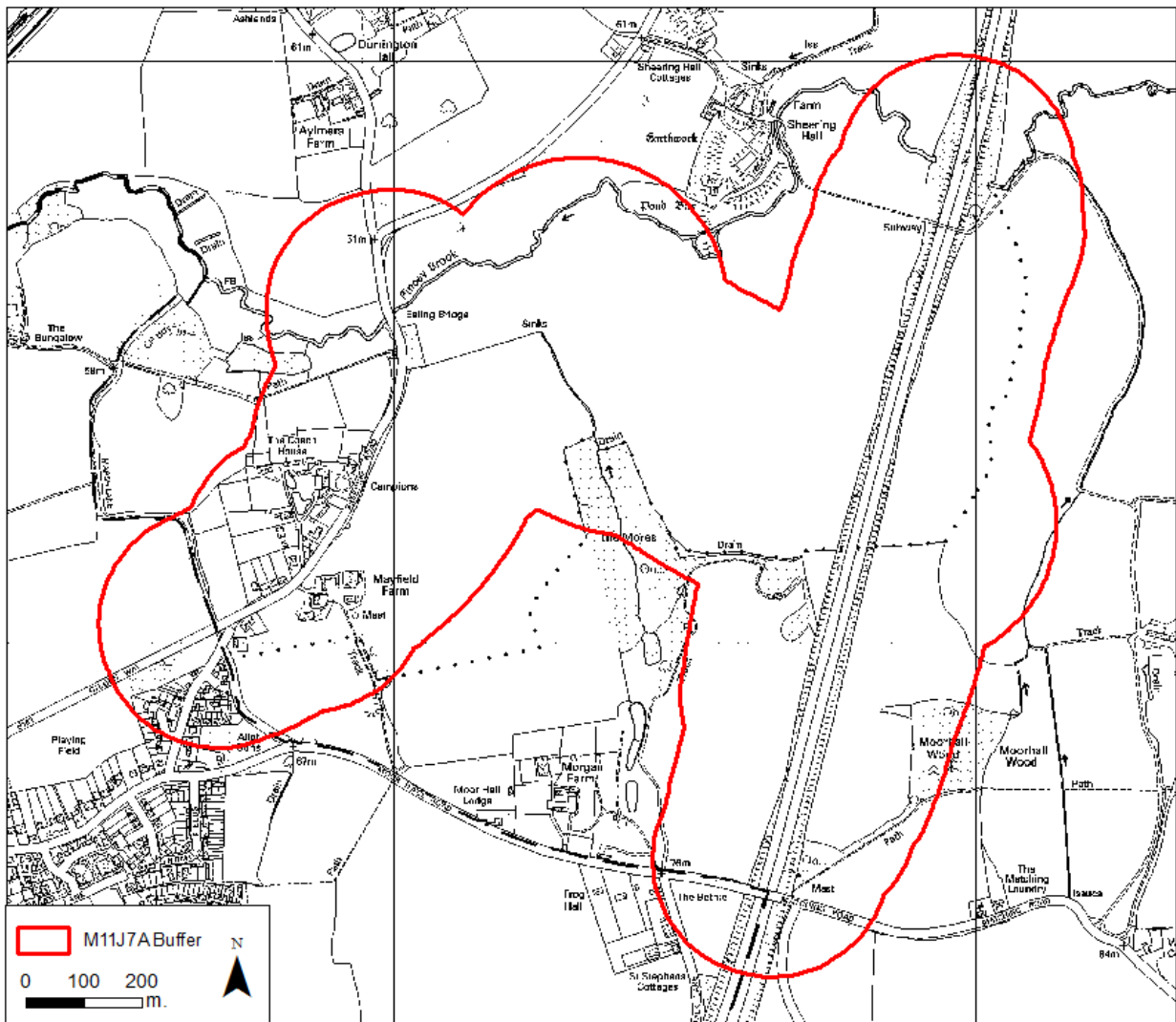


Fig 13 Extract from the OS 4th edition 6" map (1938)

### Late 20<sup>th</sup> century

Harlow new town was built after World War II in response to the urgent need for housing to accommodate those made homeless during the Blitz and to ease overcrowding. The Phase 1 New Towns were designated following the New Towns Act of 1946, with the master plan for Harlow drawn up in 1947 by Sir Frederick Gibberd. However the principal change to the Study Area was the construction of the M11 between 1975–80. The motorway was opened in stages, with the first stage (between Junctions 7 and 8) opening in June 1975, and the completed motorway becoming fully operational in February 1980.



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Fig 13 Extract from the modern OS 1:10000 map (2012)

Other changes including the construction of additional housing, both at the junction of Matching Road and Sheering Road and at Campions. Moor Hall (17) had been requisitioned by the army, but fell into disrepair, the house was demolished in 1960 with the site becoming Morgan Farm and the parkland reverting to agriculture. There has been a considerable degree of late 20<sup>th</sup> century boundary loss over much of the study area, with the removal of field boundaries to form a series of large open fields. By contrast the area around Campions (32) has seen further land sub-division to form paddocks.





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Fig 14 Aerial view taken from the Essex high level vertical cover (2000)

## 4 Bibliography

- |   |      |  |
|---|------|--|
| Chartered Institute for Archaeologists (CIfA),  | 2014 | 'Standard and Guidance for historic environment desk-based assessment', December 2014  |
| Davey, W. and Walker, H.                        | 2009 | <i>The Harlow pottery industries</i> , Medieval Pottery Research Group Occasional Paper 3  |
| Department for Communities and Local Government | 2012 | <i>National Planning Policy Framework</i> , HMSO   |
| Jacobs UK Ltd.                                  | 2014 | <i>M11 Junction 7A: Heritage Statement</i> , November 2014   |
| Leach, M.                                       | 2010 | 'Fine Rich Conies or Pernicious Beasts: Rabbits in the Landscape', in Twigs, W. (ed.) <i>The Living Landscape: Animals in Parks and Gardens of Essex</i> , Essex Gardens Trust, pp 30-38 |

## **Cartographic Sources**

Chapman, J. and Andre, P., 1777, *Map of Essex*, ERO Ref. E912-267

Map of Moor-Hall Farm, the property of Benjamin Henshaw Esqr. Martin Nockolds Junr, surveyor, 1795, ERO Ref. D/DES p3

Map of Moor Hall and Roffey, the property of John and Philip Perry esqrs, by Robt Burton, Hatfield Broad Oak, 1814, ERO Ref. D/DU 44/1

*Plan of the Parish of Harlow in the County of Essex* [Harlow Tithe Map], 1848, ERO Ref. D/CT 164

*Plan of the Parish of Matching in the County of Essex* [Matching Tithe Map], 1843, ERO Ref. D/CT 236

*Plan of the Parish of Sheering in the County of Essex* [Sheering Tithe Map], 1840, ERO Ref. D/CT 313

Ordnance Survey, 1881, 1st Edition 25" Essex, Sheets 23 and 31

Ordnance Survey, 1897, 1st Edition 6" Essex

Ordnance Survey, 1923, 3rd Edition, 6" Essex

Ordnance Survey, 1937, 4<sup>th</sup> Edition, 6" Essex

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## **Appendix 6.4: Built Heritage Assessment**





# 1. Built Heritage

## 1.1 Introduction

The objective of this assessment is to identify the significance of the assessed historic buildings, Conservation Areas and Registered Parks and Gardens (hitherto referred to collectively as heritage assets) which are likely to be affected by the construction and operation of the proposed new M11 Junction 7a in accordance with the policies set out in the National Planning Policy Framework.

## 1.2 Assessment Methodology

### 1.2.1 Legislation and Guidance

The legislative framework for conservation and enhancement of buildings and areas of special architectural or historic is set out in the Planning (Listed Buildings and Conservation Areas) Act 1990 (HMSO 1990). National planning policy in relation to the conservation and enhancement of heritage assets is outlined in chapter 12 of the Government's National Planning Policy Framework (DCLG 2012). These documents have been used as a foundation for preparing this report.

The objective of this assessment is to consider the significance of the heritage assets which are likely to be affected by the proposed development, and to consider the location, type and magnitude of any potential constraints. This assessment has been carried out in accordance with guidance as set out by Historic England, with particular reference to:

- *Conservation Principles Policy and Guidance* (2008) which sets out Historic England's (formerly English Heritage) best practice in relation to the conservation of heritage assets, and is intended to give a 'clear, over-arching philosophical framework of what conservation means at the beginning of the 21st century';
- *Historic Environment Good Practice Advice in Planning Note 2: Managing Significance in Decision-Taking in the Historic Environment* (2015), which sets out the criteria and guidance as to understanding and applying significance, and how to best implement historic environment policy as set out in the National Planning Policy Framework (NPPF) and the related guidance given in the Planning Practice Guidance (PPG); and
- *Historic Environment Good Practice Advice in Planning Note 3: The Setting of Heritage Assets* (2015), which sets out Historic

England's guidance as to the assessment and preservation of the setting of heritage assets.

The proposed development is located on the boundary between two local authorities, Epping Forest District Council and Harlow District Council. Local planning policy is set out in the Epping Forest District Council Local Plan (2006) and Harlow District Local Plan (2006). Saved policies which are relevant to heritage assets include:

Epping Forest:

- HC6- *Within or adjacent to Conservation Areas, the council will not grant planning permission for any development, or give listed building consent or consent for works to trees, which could be to the detrimental to the character, appearance and setting of the Conservation Area.*
- HC12- *The Council will not grant planning permission for development which could adversely affect the setting of a listed building.*
- HC13A- *The Council will prepare a list of buildings of local architectural or historic importance (the 'Local List'). Maintenance of these buildings will be encouraged and they will receive special consideration in the exercise of the development control process.*

Harlow:

- BE7- *Planning permission which would necessitate the demolition of a listed building, or buildings, or compromise its/their character or setting, will not be granted.*
- BE10- *New development in Conservation Areas or development that affects the setting, surrounding areas, or inward and outward views will be granted planning permission providing: It does not harm the character and appearance of the Conservation area; The scale, height, form, massing, elevation, detailed design, materials and layout respect the character of the Conservation Area; The proposed land use is compatible with the functions and activities of the Conservation Area.*
- BE11- *Development proposals that would adversely affect the character, appearance, setting or views into or outward of a registered historic park and garden will not be permitted.*

### 1.2.2 Study Area

The study area for this development has been defined through consideration of the site conditions and development design. All heritage assets which fall within the criteria set out in the introduction to this chapter which are located

within 300m of the proposed site boundary have been considered, along with all further heritage assets up to 1km from the centre of the proposed development where it was identified that there may be an impact on their significance. The 300m study area is represented by the red line boundary in Figure 1. The 1km study area covers the entirety of Figure 1.

### 1.2.3 Aims and Objectives

The objective of this chapter is to consider the significance of the heritage assets which are likely to be affected by the proposed development, and to define their setting.

The specific aims of the study are to:

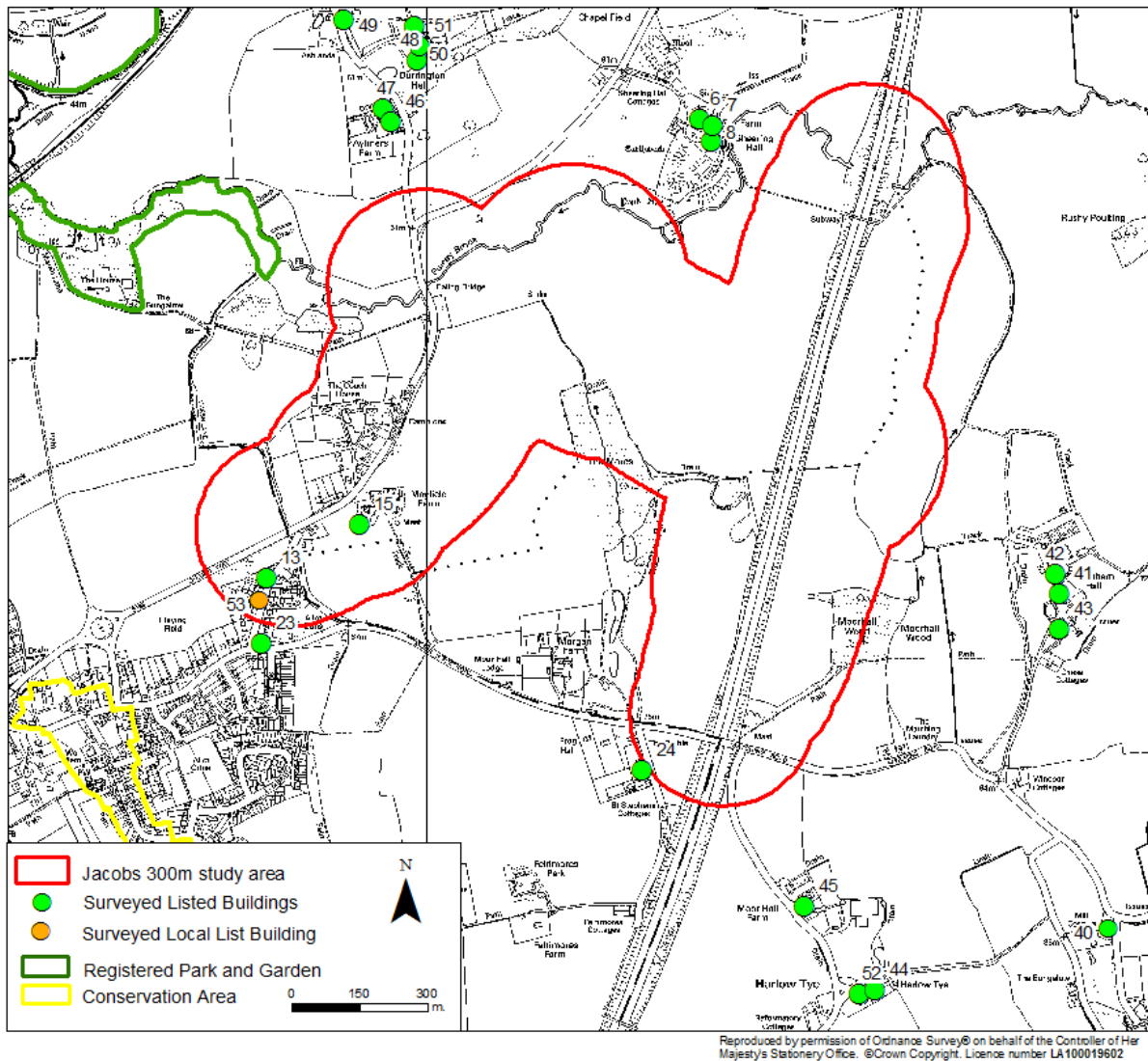
- 1) To identify all known designated heritage assets within the study area which may be susceptible to harm caused by the proposed development and;
- 2) To assess the presence and setting of any non-designated heritage assets identified by the local authorities on their Local List which may be susceptible to harm caused by the proposed development.

### 1.2.4 Sources of Information

A search of the National Heritage List was undertaken to identify all designated structures, Conservation Areas and Registered Parks and Gardens. Information relating to statutorily designated Conservation Areas and locally listed buildings was derived from information made available by Harlow District Council and Epping Forest District Council. A search of the Essex Historic Environment Record was undertaken in order to identify potential non-designated heritage assets.

A visual evaluation of the designated heritage assets and their setting was carried out during a site visit in May 2015. The site visit was also used to identify further non-designated heritage assets, as well as to provide further information as to the site topology and wider setting.

Figure 1: Map showing survey area and heritage assets covered



### 1.2.5 Criteria used for ascribing significance

For the purpose of this chapter the definition for the term significance has been taken from the glossary included as an annex to the National Planning Policy Framework, which defines significance as: *The value of a heritage asset to this and future generations because of its heritage interest. The interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting.* The relative values ascribed to each heritage asset has been derived from the standards set out in the *National Planning Policy Framework* and *Guidance by Historic England, including Conservation Principles Policy and Guidance (2008)* and *Managing Significance in Decision-Taking in the Historic Environment (2015)*. In line with the concurrent Heritage Assessment

prepared by Ringway Jacobs, the criteria for assessing significance set out in HA208/07 has been used.

**Table 1: Criteria of significance**

Significance	Criteria
Very High	<ul style="list-style-type: none"> <li>• Structures inscribed as of universal importance as World Heritage Sites.</li> <li>• Other buildings of recognised international importance.</li> <li>• World Heritage Sites inscribed for their historic landscape qualities.</li> <li>• Historic landscapes of international value, whether designated or not.</li> <li>• Extremely well preserved historic landscapes with exceptional coherence, time-depth, or other critical factor(s).</li> </ul>
High	<ul style="list-style-type: none"> <li>• Scheduled Monuments with standing remains.</li> <li>• Grade I and Grade II* Listed Buildings.</li> <li>• Other Listed Buildings that can be shown to have exceptional qualities in their fabric or historical associations not adequately reflected in the listing grade.</li> <li>• Conservation Areas containing very important buildings.</li> <li>• Undesignated structures of clear national importance.</li> <li>• Designated historic landscapes of outstanding interest.</li> <li>• Undesignated landscapes of outstanding interest.</li> <li>• Undesignated landscapes of high quality and importance, and of demonstrable national value.</li> <li>• Well preserved historic landscapes, exhibiting considerable coherence, time-depth or other critical factor(s).</li> </ul>

Significance	Criteria
Medium	<ul style="list-style-type: none"> <li>• Grade II Listed Buildings.</li> <li>• Historic (unlisted) buildings that can be shown to have exceptional qualities in their fabric or historical associations.</li> <li>• Conservation Areas containing buildings that contribute significantly to its historic character.</li> <li>• Historic Townscape or built-up areas with important historic integrity in their buildings, or built settings (e.g. including street furniture and other structures).</li> <li>• Designated special historic landscapes.</li> <li>• Undesignated historic landscapes that would justify special historic landscape designation, landscapes of regional value.</li> <li>• Averagely well-preserved historic landscapes with reasonable coherence, time-depth or other critical factor(s).</li> </ul>
Low	<ul style="list-style-type: none"> <li>• 'Locally Listed' buildings.</li> <li>• Historic (unlisted) buildings of modest quality in their fabric or historical association.</li> <li>• Historic Townscape or built-up areas of limited historic integrity in their buildings, or built settings (e.g. including street furniture and other structures).</li> <li>• Robust undesignated historic landscapes.</li> <li>• Historic landscapes with importance to local interest groups.</li> <li>• Historic landscapes whose value is limited by poor preservation and/or poor survival of contextual associations.</li> </ul>
Negligible	<ul style="list-style-type: none"> <li>• Buildings of no architectural or historical merit.</li> <li>• Buildings of an intrusive character.</li> <li>• Landscapes with little or no significant historical interest.</li> </ul>



## 1.3 Baseline Conditions

### 1.3.1 Built Heritage

A desk-based assessment carried out for this report identified 2 listed buildings within a 300m radius of the proposed development, both listed grade II. This corresponds with the assessment carried out by Ringway Jacobs in their Heritage Assessment (2014). A further eighteen designated buildings and one non-designated building included on the local authority's Local List outside this immediate area were also considered during site visits where it was considered that there was a potential for harm. In total, twenty-one historic buildings were identified within the wider study area, comprising three Grade II\* Listed Buildings, seventeen Grade II Listed Buildings, and one Locally Listed Building. The scope of this assessment has been limited to designated assets and assets included on the local authority's local list. It does not include some undesignated heritage assets assessed by Ringway Jacobs in their assessment. The assessment does however include seventeen heritage assets not covered by the Ringway Jacob's Heritage Assessment, which included two grade II\* Listed Buildings, twelve grade II Listed Buildings and one building on the Local List.

**Table 2: Designated and Undesignated buildings surveyed**

Asset No.	List Entry No.	Site Name	Significance	Designation	Setting
6	1146975	Barn approximately 10 metres north of Sheering Hall	Medium	II	The two Listed Barns lie to the north of Sheering Hall, and form part of a complex of buildings associated with the hall. The extent of the visual setting of the both barns is limited visually by the complex of buildings within which they are situated. The extent of the mature vegetation which is currently in situ further limits the
7	1111360	Barn approximately 30 metres north-west of Sheering Hall	Medium	II	

Asset No.	List Entry No.	Site Name	Significance	Designation	Setting
					extent of associated views from these assets. Historically the setting of the barns is defined by their association with Sheering Hall.
8	1306827	Sheering Hall	High (Very High)	II*	Sheering Hall is located in an elevated position to the north of Harlow and south-east of Lower Sheering, and with its associated buildings it forms part of a group of significant Listed Buildings with Durrington Hall and its associated buildings, all of which are located on this higher land. To the north the Hall's visual and historic setting is defined by associated barns and woodland. The asset is rural in setting, and views to the south are relatively screened by mature vegetation.
13	1337094	Tudor Cottage	Medium	II	The Listed Building is located on Sheering Road, and is surrounded by modern development. The visual and historic setting of the building has been substantially severed

Asset No.	List Entry No.	Site Name	Significance	Designation	Setting
					by the modern housing development, which now defines the extent of the building's current setting.
15	1111367	Pump approximately 20 metres south of Mayfield Farmhouse	Medium	II	The pump is located within the complex of buildings associated with Mayfield Farmhouse. The visual and historic setting of the pump is defined by the extent of the farmstead around it.
23	1111685	High House	Medium (High)	II	The Listed Building is located at the junction of Moor Hall Road and Sheering Road, located in the midst of more modern housing development. The visual and historic setting of the building has been substantially severed by the modern housing development, which now defines the extent of the building's current setting.
24	1337570	House 20 metres north of St. Stephen's Cottages	Medium	II	The building is located along Chalk Lane, to the east of Harlow and in close proximity to the M11 to the west. The asset

Asset No.	List Entry No.	Site Name	Significance	Designation	Setting
					is visually severed from the proposal site by the topology of the area and by the existence constricted nature of views along Chalk Lane.
40	1337572	Matching Mill	Medium	II	The building lies within open countryside to the east of Harlow and Harlow Tye, with an associated cottage, Mil Cottage directly to the south. The extent of building's visual setting is defined by its relationship with the associated cottage to the south and by the topology of the land around it, which isolates it visually and in relation to noise. The extent it setting is also currently further severed by the existence of mature vegetation to the east and west.
41	1165954	Housham Hall	Medium (High)	II	Housham Hall is located in open countryside to the north-east of Harlow and directly to the east of the current extent of the M11. The building's visual setting is limited in

Asset No.	List Entry No.	Site Name	Significance	Designation	Setting
					<p>part by the associated buildings which surround it, and the mature woodland to the south-east which severs any views further to the east. The topology of the land to the east also helps to further define its setting. Finally from certain aspects the associated views are terminated by the M11. The M11 is faintly audible from the site. Historically the building's setting is defined by the associated barns and other buildings, and by the wider open landscape surrounding, which historic OS mapping suggests was relatively compact and defined by mature trees.</p>
42	1337549	Barn approximately 25 metres North of Housham Hall	Medium	II	<p>The barns are located in a complex of buildings associated with Housham Hall. The setting of the both the barns is defined visually by the complex of buildings associated with Housham Hall within</p>
43	1165980	Barn approximately 75 metres	Medium	II	<p>Housham Hall within</p>

Asset No.	List Entry No.	Site Name	Significance	Designation	Setting
		south of Housham Hall			which they are situated, and by the open fields to the west. Views across these fields are curtailed partially by the existence of mature woodland, partially by topology and partially by the current extent of the M11. Historically the setting of the barns is defined by their association with Housham Hall.
44	1123918	Octagonal Lodge	Medium	II	The lodge and associated house are located to the south east of the application site within the settlement of Harlow Tye. The building is visually separated to the north by a considerable expanse of mature vegetation, and by the prevailing nature of the surrounding topology and settlement pattern. There is no historic link with the land to the north.
45	1309045	Pump approximately 15 metres north-east of Moor Hall	Medium	II	The pump is located within a complex of buildings associated with Moor Hal Farm. The visual and historic setting of the

Asset No.	List Entry No.	Site Name	Significance	Designation	Setting
		Farm			pump is defined by the extent of the farmstead around it.
46	1111367	Aylmers	High (Very High)	II*	Aylmers Farmhouse and associated barn are located on Sheering Lower Road, to the north-east of Harlow and to the south of Lower Sheering. Their current visual setting is defined by the undulating topology of the land around it, which creates large blind areas. This is further limited by the existence of mature vegetation to the north, south and east which substantially shortens associated views in these directions. The historic setting of these building is defined by the extent of the land which historic mapping suggests was associated with the building, which is almost entirely to the west.
47	1111365	Barn approximately 25 metres north of	Medium	II	



Asset No.	List Entry No.	Site Name	Significance	Designation	Setting
		Aylmers			
48	1111363	Durrington Hall	High (Very High)	II*	Durrington Hall is located in an elevated position to the north of Harlow and south-east of Lower Sheering, and with its associated buildings it forms part of a group of significant Listed Buildings with Sheering Hall and its associated buildings, all of which are located on this higher land. To the north the Hall's visual and historic setting is defined by the associated domestic quarters and coach house/stables and the associated woodland. To the south the land drops away sharply, which obscures much of the valley below from view. The land historically associated with Durrington Hall is terminated by Sheering Road, which still follows the same route as is evident on nineteenth century mapping.
49	1147102	Gate Piers of Durrington	Medium	II	The gate piers lie at the end of the entrance track leading to Durrington Hall.

Asset No.	List Entry No.	Site Name	Significance	Designation	Setting
		Hall			The visual setting of this asset is limited to the area immediately around it, and the historic setting is defined by its association with the hall.
50	1111364	Coach House/Stable Block approximately 60 metres north of Durrington Hall	Medium	II	The coach house/stables lie to the north of Durrington Hall and are surrounded on all sides by the grounds associated with the hall. Its setting, visually and historically, is closely defined by the nature of the grounds in which it is situated and by the extent of the mature vegetation. Its setting is also defined by its relationship with the hall and associated domestic quarters directly to the south.
51	1147117	Domestic Quarters approximately 10 metres north of Durrington Hall	Medium	II	The domestic quarters lie directly to the north of Durrington Hall and are surrounded on all sides by the grounds associated with the hall. Its setting, visually and historically, is closely defined by the

Asset No.	List Entry No.	Site Name	Significance	Designation	Setting
					stable/coach house block to the north, Durrington Hall to the south and by the extent of the mature vegetation.
52	1166235	Roffey Cottages	Medium	II	The house is located to the south east of the application site within the settlement of Harlow Tye. The building is visually separated from the application site by a considerable expanse of mature vegetation, and by the prevailing nature of the surrounding topology and settlement pattern. There is no historic link between the land to the north and the Listed Building.
53	Local List 1	Medways, 95 Sheering Road	Low	Local List	Medways is located midway along Sheering Road, and is surrounded by a modern housing development. This development defines the extent views from the asset, and thereby its visual setting.

### 1.3.2 Conservation Areas

The desk-based assessment identified no Conservation Areas within a 300m radius of the proposed development. One Conservation Area outside this immediate area was also considered during site visits where it was considered that there was a potential for harm.

**Table 3: Conservation Areas surveyed**

Asset No.	List Entry No.	Site Name	Significance	Setting
54	N/A	Churchgate Street Conservation Area	Medium	The Churchgate Street Conservation Area is located to the east of Harlow, directly east of Old Harlow. It is a relatively compact Conservation Area characterised by a linear development along Churchgate Street of buildings of sixteenth to twentieth-first century date. The setting of the Conservation Area is therefore by its nature introspective, and its setting has been further enclosed by the modern development to the north-west.

### 1.3.3 Registered Parks and Gardens

The desk-based assessment identified no Registered Parks and Gardens within a 300m radius of the proposed development. One Registered Park and Garden outside this immediate area was also considered during site visits where it was considered that there was a potential for harm.

**Table 4: Registered Parks and Gardens surveyed**

Asset No.	NHL No.	Site Name	Significance	Designation	Setting
22	1001299	The House, Marsh Lane	Medium	II	The Registered Park and Garden is located to the north of Harlow and east of Sheering Road, and incorporates extensive gardens which were laid out by the architect Sir Frederick Gibberd and housed a substantial collection of sculptures. Views within the garden are carefully designed so that the sculptures, buildings and landscape form a series of inter-related views, which interact and enhance each other. This means that the setting of the heritage asset is limited in scope, as views and associations are essentially introverted. The easternmost element is less visually integral to the character of the Park and Garden, as it forms a less formally landscaped limb.

## 1.4 Bibliography

Department of Communities and Local Government, *National Planning Policy Framework*, (2012)

Epping Forest District Council, *Epping Forest District Local Plan*, (2006)

Harlow District Council, *Harlow District Local Plan*, (2006)

Historic England, *Conservation Principles Policy and Guidance* (2008)

Historic England, *Historic Environment Good Practice Advice in Planning Note 2: Managing Significance in Decision-Taking in the Historic Environment* (2015),

Historic England, *Historic Environment Good Practice Advice in Planning Note 3: The Setting of Heritage Assets* (2015)

Her Majesty's Stationary Office, *Planning (Listed Buildings and Conservation Areas) Act 1990*, (1990)

Jacobs, *M11 Junction 7A: Heritage Statement* (2014)





## **Appendix 6.5: Results of Geophysical Survey**



MEJS/01



# M11 JUNCTION 7A, ESSEX

## GEOPHYSICAL SURVEY

commissioned by Ringway Jacobs

Pre-application

April 2016



# M11 JUNCTION 7A, ESSEX

## GEOPHYSICAL SURVEY

commissioned by Ringway Jacobs

Pre-application

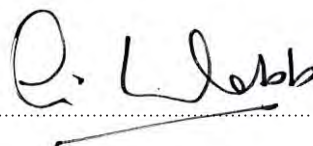
April 2016

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**LOCAL AUTHORITY** Essex  
**OASIS REF.** headland5-249547

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 **HEADLAND  
ARCHAEOLOGY**

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## PROJECT SUMMARY

Headland Archaeology (UK) Ltd undertook a geophysical (magnetometer) survey, covering approximately 16 hectares on land north-east of Harlow, Essex, to provide information on the archaeological potential of the site of a new motorway junction and associated link road. The survey has identified a probable barrow along the route of the proposed link road along with linear anomalies (ditches) which may form part of an early field system. Elsewhere, anomalies have been identified which reflect the historical layout and division of the agricultural landscape as recorded on early Ordnance Survey maps. Therefore, on the basis of the geophysical survey, the archaeological potential across the majority of the site is assessed as being low although a high archaeological potential is ascribed to the area around the probable barrow.



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# M11 JUNCTION 7A, ESSEX

## GEOPHYSICAL SURVEY

### 1 INTRODUCTION

Headland Archaeology (UK) Ltd was commissioned by Ringway Jacobs (The Client) on behalf of Essex County Council (ECC) to undertake a geophysical (magnetometer) survey at the site of a proposed new motorway junction (Junction 7A) on the M11 motorway and associated link road connecting Sheering Road (B183) to Gilden Way. The geophysical survey was requested by Maria Medlycott, ECC's archaeological planning archaeologist.

The work was undertaken in accordance with a Written Scheme of Investigation (WSI) (Ringway Jacobs 2016), with guidance within the National Planning Policy Framework (DCLG 2012) and in line with current best practice (David et al. 2008; ClifA 2014).

The survey was carried out between March 21st and March 24th 2016.

#### 1.1 SITE LOCATION, TOPOGRAPHY AND LAND-USE

The survey area covered eight irregularly-shaped parcels of land (Area 1 to Area 8) either side of the M11 motorway located approximately 6km north of the existing Junction 7. The proposed link road comprised of a corridor of land connecting the M11 with Sheering Road (B183) (see **ILLUS 1**). The site is located within a rolling landscape, being at 73m above Ordnance Datum (aOD) within the north of Area 2 and generally sloping north-westwards to 44m aOD north-west of Area 5. At the time of the survey Area 1 and Area 2 contained a short wheat crop (see **ILLUS 2** and **ILLUS 3** respectively). Area 3 and Area 5 contained no crop and were being sown at the time of the survey (see **ILLUS 4**, **ILLUS 6** and **ILLUS 7**). Area 4 was overgrown and unsuitable for survey (see **ILLUS 5**). Area 6 and Area 8 were under a young crop of oil seed rape (see **ILLUS 8** and **ILLUS 10**) and Area 7 was unsuitable for survey due to overgrown vegetation (see **ILLUS 9**).

#### 1.2 GEOLOGY AND SOILS

The underlying bedrock geology comprises London Clay Formation – clay, silt and sand, which is overlain by Lowestoft Formation – diamicton. A narrow band of Head – clay, silt, sand and gravel is recorded within the centre of the survey area running north/south alongside a drainage ditch (British Geological Survey 2016).

The soils within the lower-lying northern part of the scheme are classified in the Soilscape 7 association in the south which are characterised as freely draining, slightly acid base-rich soils. Elsewhere, the soils are classified in the Soilscape 9 association, which are characterised as lime-rich loams and clays with impeded drainage (LandIS 2016).

### 2 ARCHAEOLOGICAL BACKGROUND

A Heritage Statement (Jacobs 2014) compiled baseline heritage data for a study area extending 300m in all directions from the proposed scheme. Within the study area no heritage assets of High value were identified although nine assets of Medium value were identified including prehistoric and Roman archaeological remains, cropmarks and find spots. Four heritage assets were identified within the geophysical survey area including Potter's Croft Field Name (negligible value), the site of a Neolithic polished axe (low value), the site of Moor Hall (medium value) and the site of an Iron Age arrowhead and core (low value). The Heritage Statement concluded that there is potential for unknown archaeological remains within the scheme footprint.

### 3 AIMS, METHODOLOGY AND PRESENTATION

The main aim of the geophysical survey was to provide sufficient information to enable an assessment to be made of the impact of any proposed development on any potential sub-surface archaeological remains.

The general archaeological objectives of the geophysical survey were:

- › to determine (so far as possible) the presence or absence of buried archaeological remains in the survey areas;
- › to clarify the extent and layout of known sites of archaeological interest within or adjacent to the study area;
- › to clarify the extent and layout of previously unknown buried remains within the survey areas; and
- › to interpret any geophysical anomalies identified by the survey.

### 3.1 MAGNETOMETER SURVEY

Magnetic survey methods rely on the ability of a variety of instruments to measure very small magnetic fields associated with buried archaeological remains. Features such as a ditch, pit or kiln can act like a small magnet, or series of magnets, that produce distortions (anomalies) in the Earth's magnetic field. In mapping these slight variations, detailed plans of sites can be obtained as buried features often produce reasonably characteristic anomaly shapes and strengths (Gaffney and Gater 2003). Further information on soil magnetism and the interpretation of magnetic anomalies is provided in Appendix 1.

The survey was undertaken using four Bartington Grad601 sensors mounted at 1m intervals (1m traverse interval) onto a rigid carrying frame. The system is programmed to take readings at a frequency of 10Hz (allowing for a 10–15cm sample interval) on roaming traverses 4m apart. These readings are stored on an external weatherproof laptop and later downloaded for processing and interpretation. The system is linked to a Trimble R8s Real Time Kinetic (RTK) differential Global Positioning System (dGPS) outputting in NMEA mode to ensure a high positional accuracy for each data point.

MLGrad601 and MultiGrad601 (Geomar Software Inc.) software has been used to collect and export the data. Terrasurveyor V3.0.28.4 (DWCConsulting) software has been used to process and present the data.

### 3.2 REPORTING

A general site location plan is shown in **ILLUS 1** at a scale of 1:10,000. **ILLUS 2** to **ILLUS 10** are general site condition photographs. A large scale (1:5,000) survey location plan showing the processed greyscale magnetometer data is presented in **ILLUS 11**. An overall interpretative plot is shown at the same scale in **ILLUS 12**.

Detailed data plots (greyscale and XY trace) and interpretative illustrations are presented at a scale of 1:1,000 in **ILLUS 13** to **ILLUS 36** inclusive with 1:500 plots and interpretations of areas of significant archaeology displayed in **ILLUS 37** to **ILLUS 39** inclusive.

Technical information on the equipment used, data processing and magnetic survey methodology is given in Appendix 1. Appendix 2 details the survey location information and Appendix 3 describes the composition and location of the site archive. A copy of the OASIS entry (Online Access to the Index of Archaeological Investigations) is reproduced in Appendix 4.

The survey methodology, report and any recommendations comply with the Written Scheme of Investigation (Ringway Jacobs 2016) and guidelines outlined by English Heritage (David et al. 2008) and by the Chartered Institute for Archaeologists (CIfA 2014). All illustrations reproduced from Ordnance Survey (OS) mapping are with the permission of the controller of Her Majesty's Stationery Office (© Crown copyright).

The illustrations in this report have been produced following analysis of the data in 'raw' and processed formats and over a range of different display levels. All illustrations are presented to most suitably display and interpret the data from this site based on the experience and knowledge of management and reporting staff.

## 4 RESULTS AND DISCUSSION

Generally, the survey has detected a variable magnetic background throughout the surveyed area. Within this background, numerous areas of magnetic enhancement have been identified. These are discussed below and cross-referenced to specific examples on the interpretive figures, where appropriate.

### FERROUS ANOMALIES

Ferrous anomalies, characterised as individual 'spikes', are typically caused by ferrous (magnetic) material, either on the ground surface or in the plough-soil. Little importance is normally given to such anomalies, unless there is any supporting evidence for an archaeological interpretation, as modern ferrous debris or material is common on most sites, often being present as a consequence of manuring or tipping/infilling. A dipolar linear anomaly, A, traversing Area 1 and Area 5 on a north-west/south-east alignment is due to a buried gas main (see **ILLUS 16** – **ILLUS 18** and **ILLUS 25** – **ILLUS 27**). Other high magnitude areas of magnetic disturbance which are located at the perimeters of the survey areas are caused by ferrous material within the adjacent field boundaries and by the close proximity of buildings.

### AGRICULTURAL ANOMALIES

Analysis of historical mapping indicates that the division of land within the PDA has undergone minor alterations since unchanged since the publication of the first edition OS map in 1875. These alterations include the removal of field boundaries from within Area 2, Area 5 and Area 6. The former boundaries manifest in the data as linear anomalies, B (see **ILLUS 19** – **ILLUS 21**), C (see **ILLUS 16** – **ILLUS 18**) D and E (see **ILLUS 31** – **ILLUS 33**), and are thought to be due to soil-filled ditches. Two further clear linear anomalies, F and G, are identified within Area 6 and are thought to be caused by former boundaries which may have been removed prior to the publication of the first edition OS map (see **ILLUS 28** – **ILLUS 30**). Within the lower-lying parts of Area 5 and Area 6 several field drains are identified as faint 'speckled' linear anomalies. Elsewhere, several faint linear anomalies are identified on a number of different alignments. These are generally aligned parallel with, or at right angles to, existing or historical field boundaries and are likely to be due to plough furrows or ploughing headlands. A more clearly defined, localised area of north-west/south-east parallel linear plough trends is visible towards the east of Area 5 (see **ILLUS 22** – **ILLUS 24**).

### GEOLOGICAL ANOMALIES

Discrete areas of magnetic enhancement are identified across the proposed scheme. These are generally sparsely distributed and are thought to be due to localised variations in the soils and the diamicton superficial deposits from which they derive. A narrow band of anomalies, H, towards the west of Area 5 (see **ILLUS 22** – **ILLUS 27**) corresponds to a break of slope and also to a band of Head - clay, silt, sand and gravel (British Geological Survey 2016). The anomalies are thought to be caused by the accumulation of deposits at this location.

## ARCHAEOLOGICAL AND POSSIBLE ARCHAEOLOGICAL ANOMALIES

A clear circular anomaly, I, has been identified on the north-west facing slope within Area 5, centred on NGR 549462,212405 (see ILLUS 22 – ILLUS 27 and ILLUS 37 – ILLUS 39). The anomaly, caused by a soil-filled ditch, measures 24m in diameter and is thought to define the site of a barrow. A small gap in the south-west of the anomaly may indicate a deliberate entrance or causeway. Few clear anomalies are identified within the interior of the barrow although a probable pit is identified in the north-west.

To the immediate north and east of the probable barrow linear anomalies, J, K and L may be archaeological in origin (see ILLUS 22 – ILLUS 27). The anomalies are broader and clearer than the nearby agricultural trends and, given the close proximity of the probable barrow, an archaeological origin is possible. The anomalies locate soil-filled ditches and may form part of an early field system. It is worthy of note, however, that anomalies K and L appear at approximate right angles to a number of field drains and an agricultural origin for these anomalies is plausible.

## 5 CONCLUSION

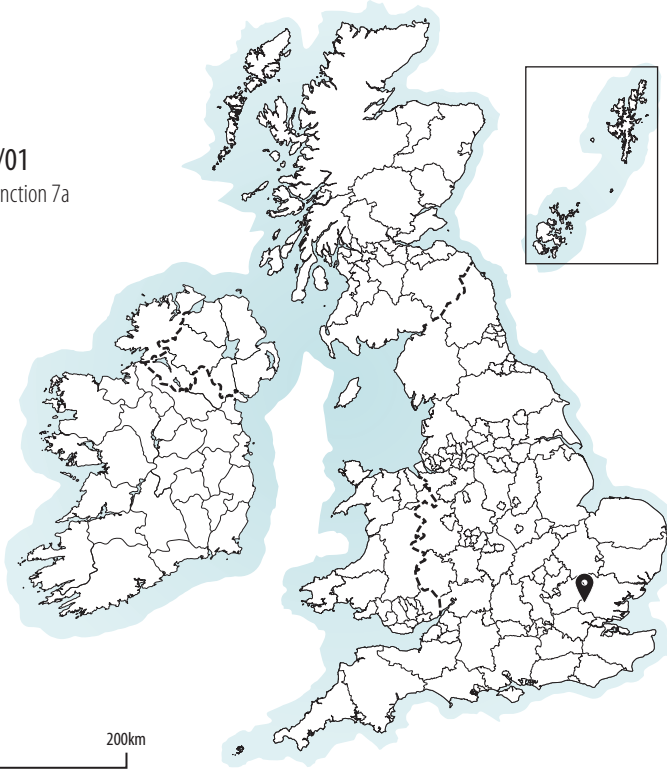
The geophysical survey has identified a definite area of archaeological potential in the form of a probable barrow. To the immediate north and east of the barrow linear ditches may form part of an early, unmapped, field system, although a modern agricultural origin is also possible. Elsewhere, no further anomalies of clear archaeological origin have been identified by the survey with the majority of the anomalies being due to the modern and historical agricultural use of the land. A gas main is also clearly identified traversing the north of the surveyed area.

Based solely on the results and interpretation of the geophysical data, the archaeological potential across the majority of the scheme is assessed to be low, although a high archaeological potential is ascribed to the area containing the probable barrow.

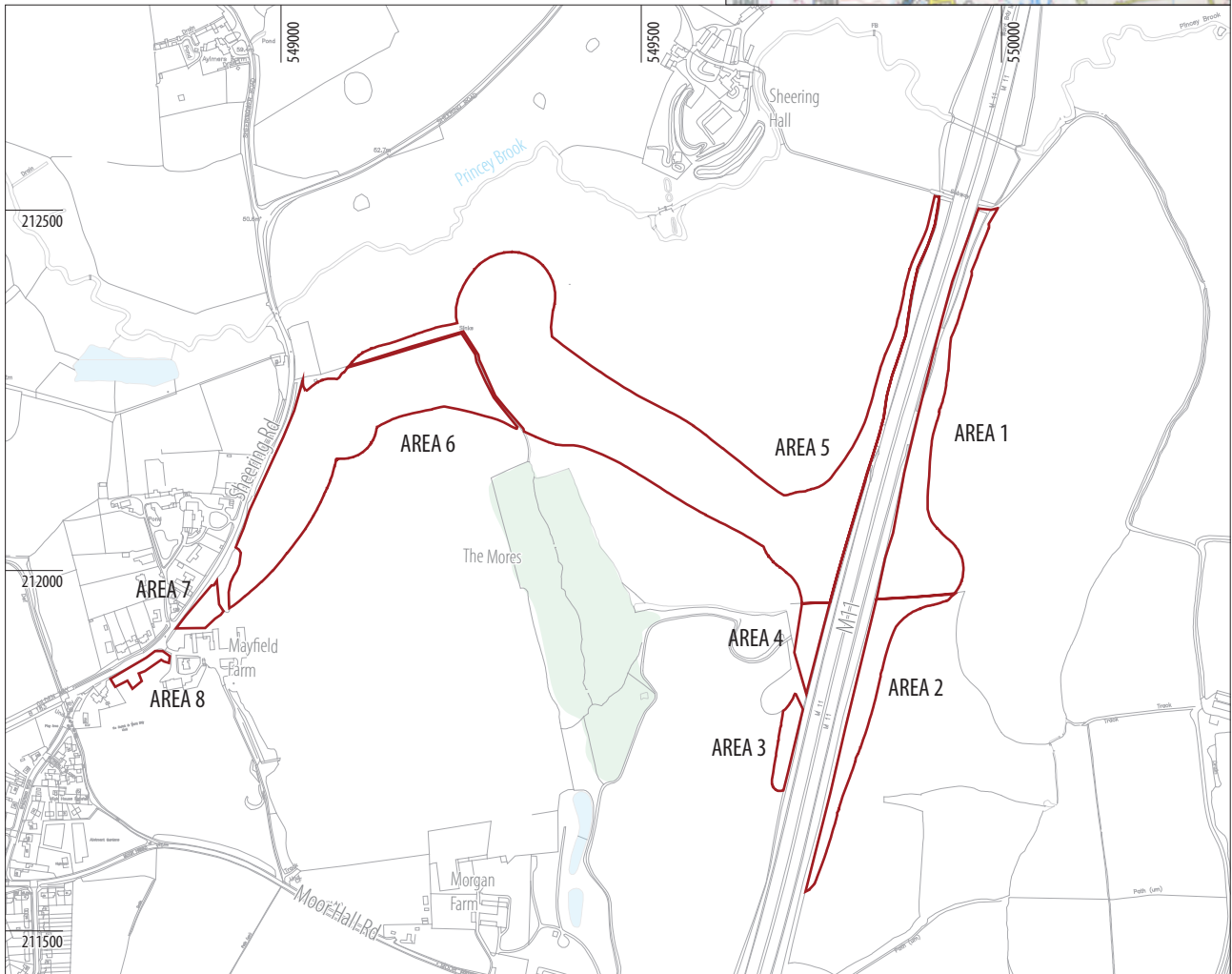
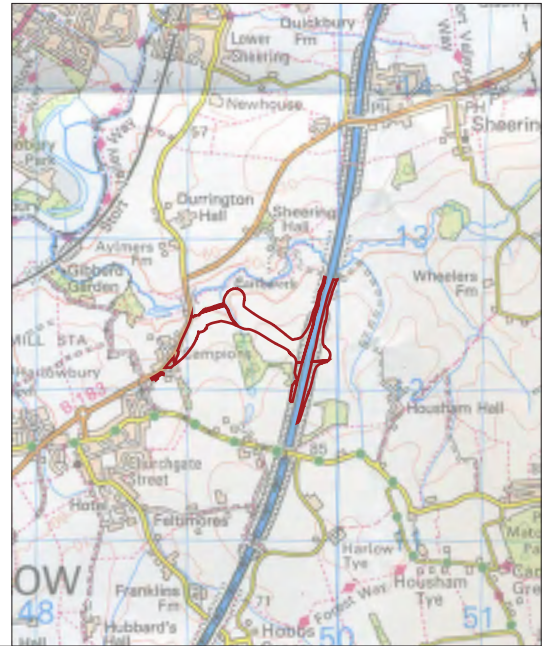
## 6 REFERENCES

- British Geological Survey* 2016 Website Available: [www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html](http://www.bgs.ac.uk/discoveringGeology/geologyOfBritain/viewer.html) Accessed: April 6th 2016.
- Chartered Institute for Archaeologists 2014 *Standard and Guidance for archaeological geophysical survey* CfA.
- David, A, Linford, N, Linford P & Martin, L 2008 *Geophysical Survey in Archaeological Field Evaluation: Research and Professional Services Guidelines (2nd edition)* English Heritage.
- DCLG 2012 *National Planning Policy Framework* Department of Communities and Local Government.
- Gaffney, C & Gater, J 2003 *Revealing the Buried Past* Tempus Publishing.
- Jacobs 2014 *M11 Junction 7A* Heritage Statement.
- LandIS* 2016 Website Available: [www.landis.org.uk/soilscapes/](http://www.landis.org.uk/soilscapes/) Accessed: April 6th 2016.
- Ringway Jacobs 2016 *M11 Junction 7a; Written Scheme of Investigation for Archaeological Geophysical Survey* R0.5.

MEJS/01  
 M11 Junction 7a  
 Harlow  
 Essex



0 200km



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KEY  
 geophysical survey area

0 500m  
 1:10,000 @ A4

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ILLUS 1 Site location





11:44 21/MAR/2016

**ILLUS 2** General view of Area 1, looking north



11:45 21/MAR/2016

**ILLUS 3** General view of Area 2, looking south





15:46 22/MAR/2016

ILLUS 4 General view of Area 3, looking south



15:44 22/MAR/2016

ILLUS 5 General view of Area 4, looking north-east





8:30 23/MAR/2016

**ILLUS 6** General view of Area 5 (east), looking north



8:35 23/MAR/2016

**ILLUS 7** General view of Area 5 (west), looking south-west





11:42 23/MAR/2016

ILLUS 8 General view of Area 6, looking north-east



8:09 24/MAR/2016

ILLUS 9 General view of Area 7, looking north

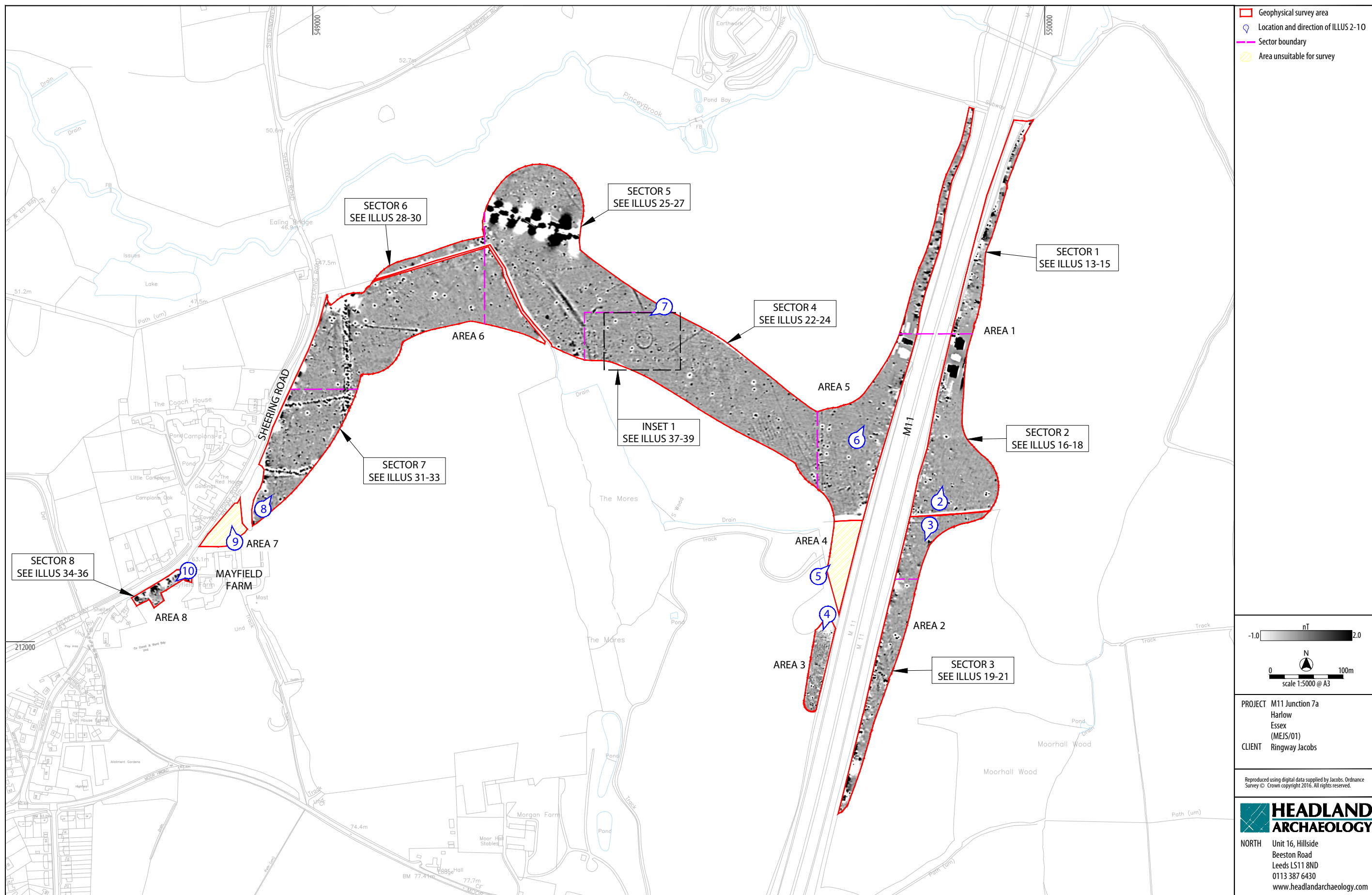




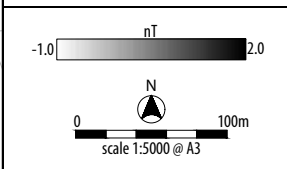
9:26 24/MAR/2016

**ILLUS 10** General view of Area 8, looking south-west





- ▭ Geophysical survey area
- Ⓣ Location and direction of ILLUS 2-10
- Sector boundary
- Area unsuitable for survey



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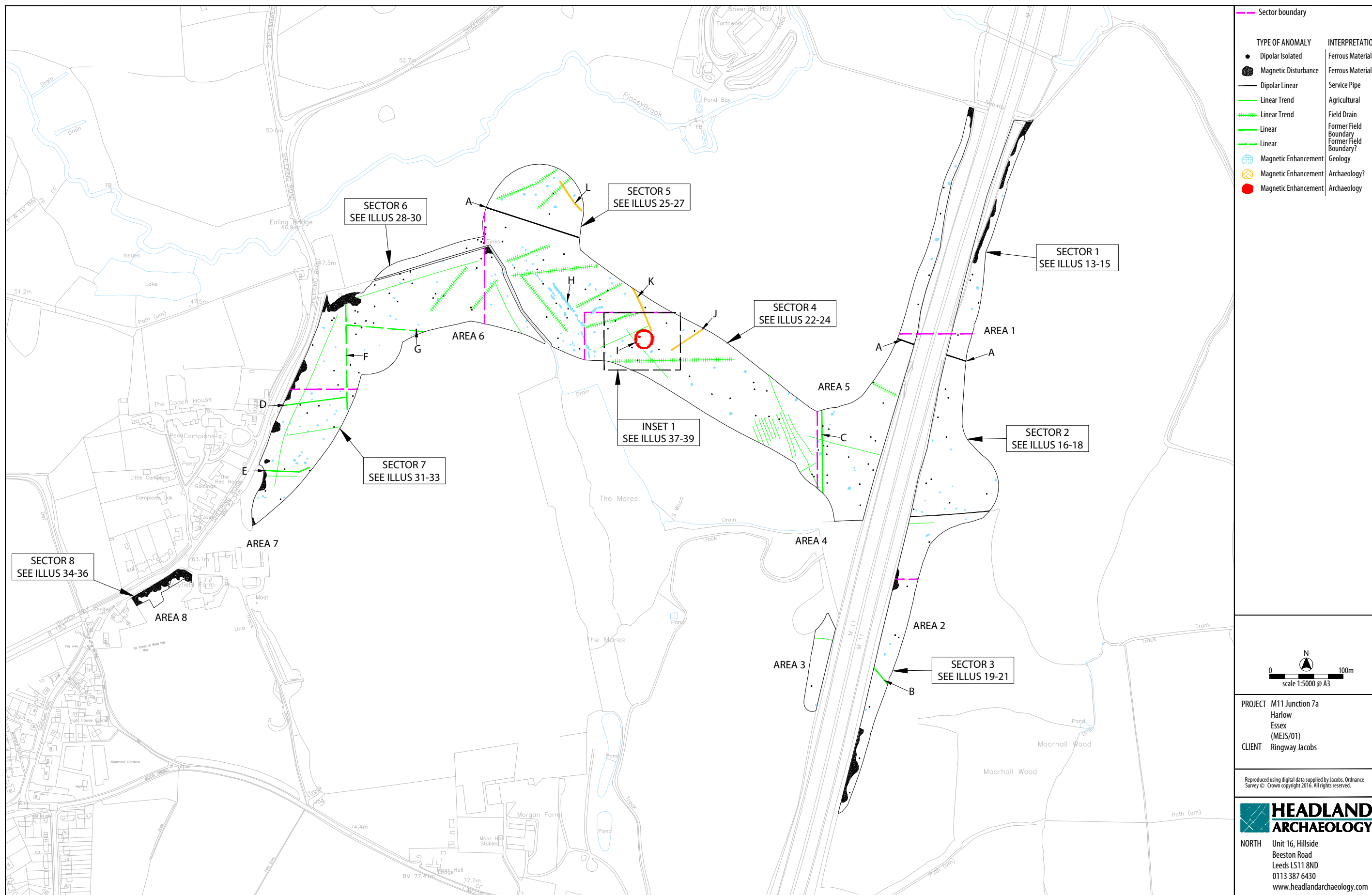
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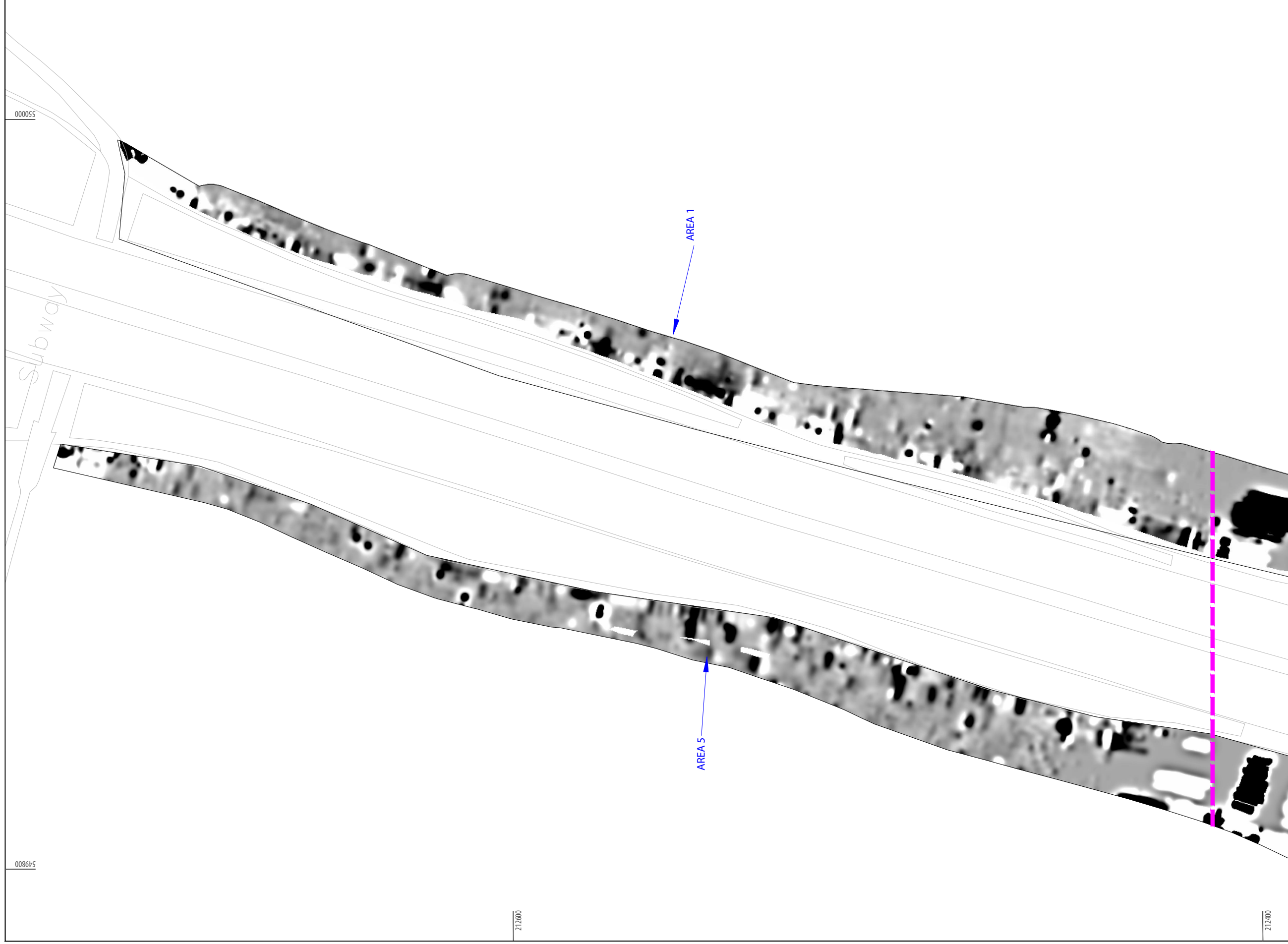
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Illus 11  
Survey location showing processed greyscale magnetometer data

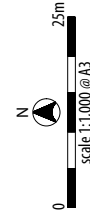
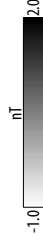




Illus 12  
Overall interpretation of magnetometer data



— Sector boundary



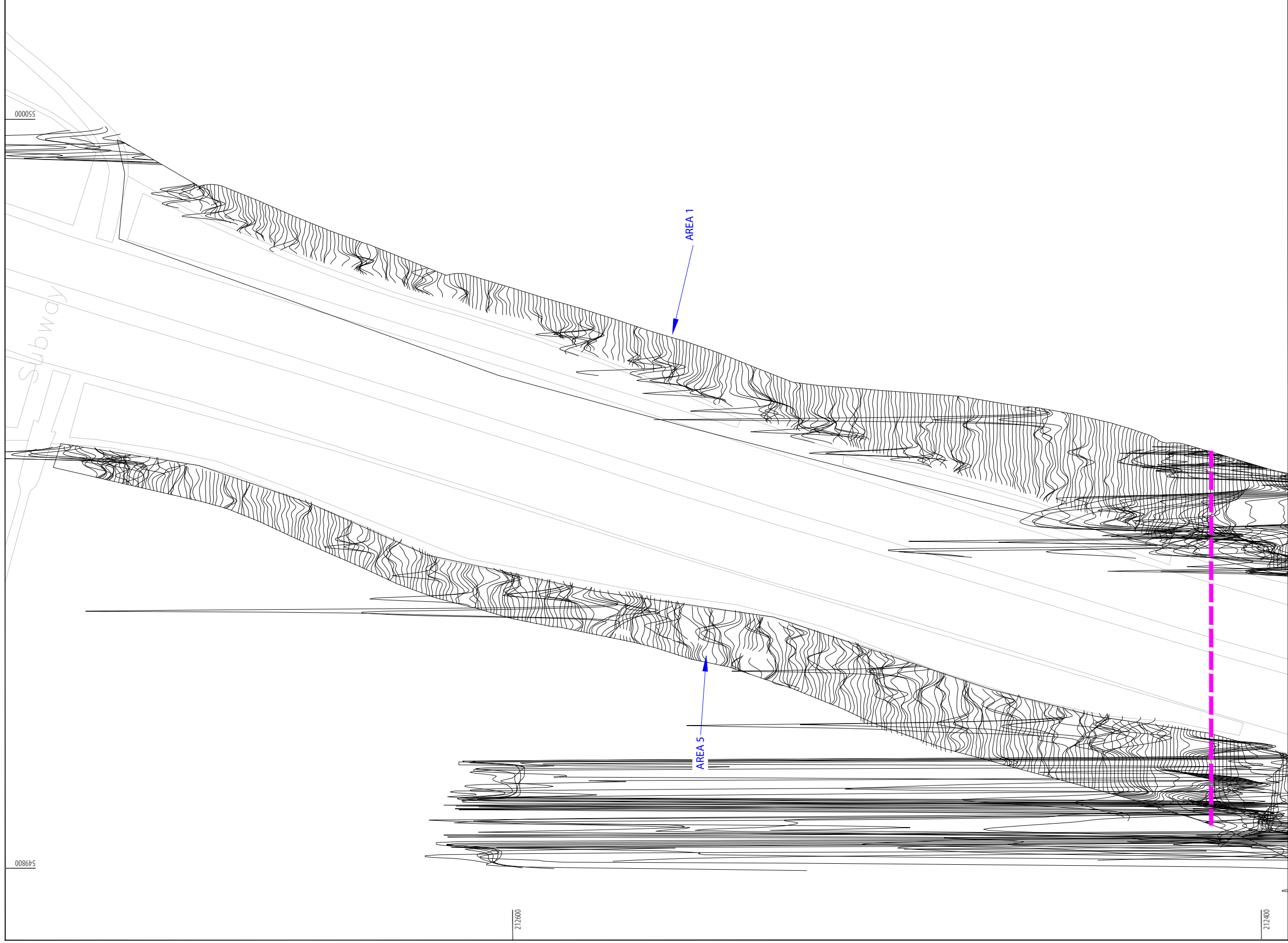
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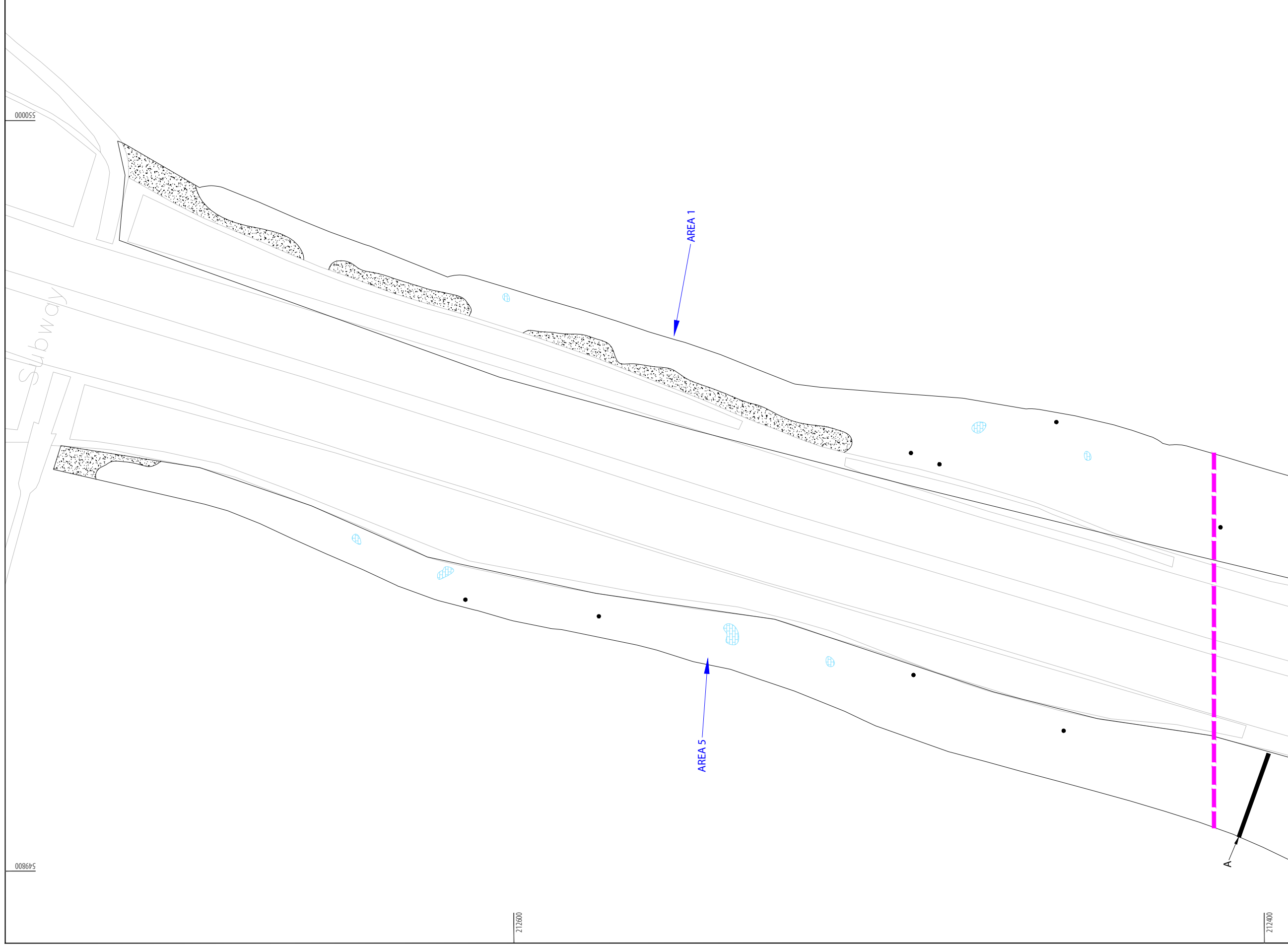


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Illus 13  
Processed greyscale magnetometer data; Sector 1



illus 14  
XY trace plot of magnetometer data, Sector 1



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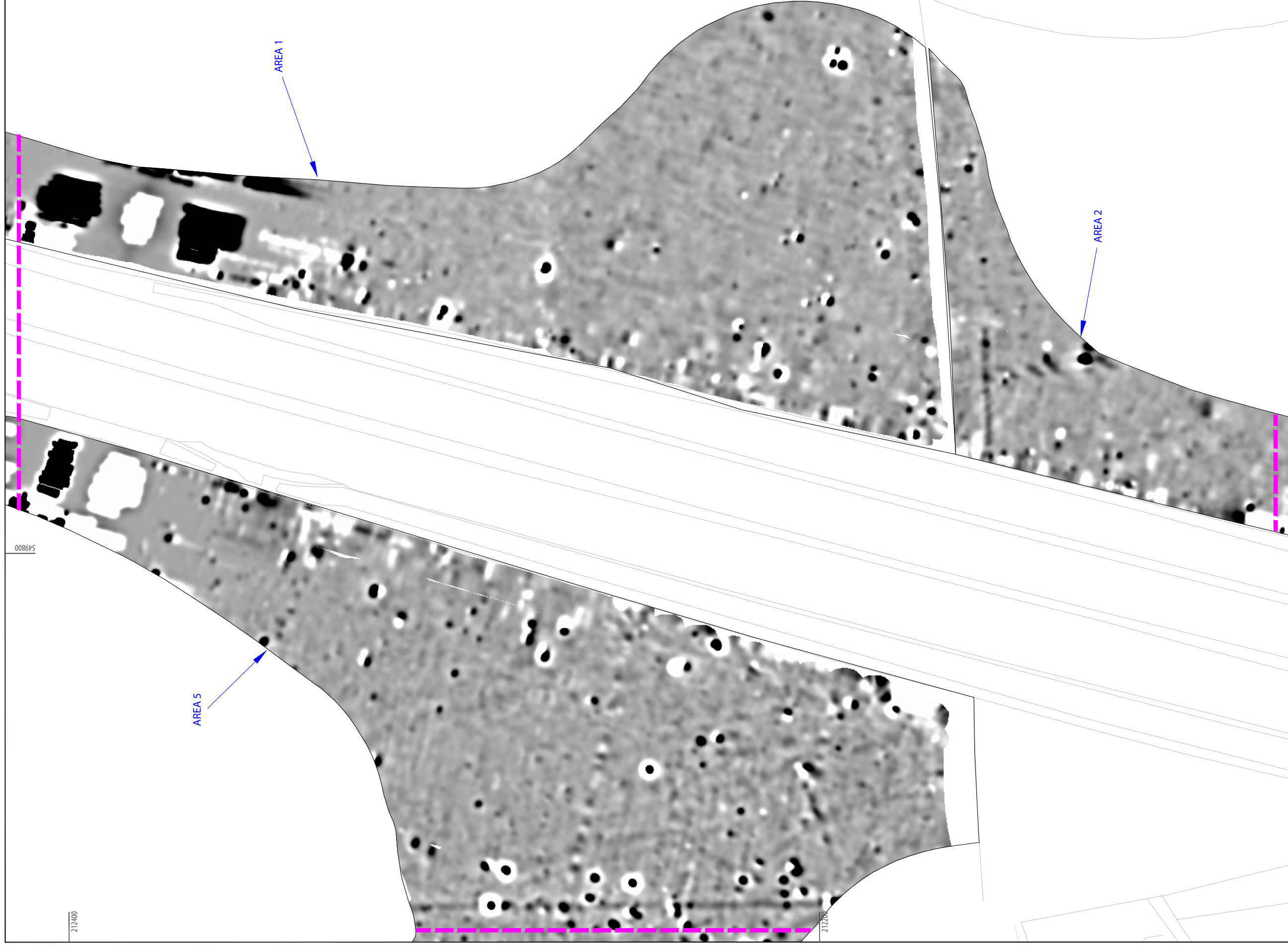
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0 25m  
 N  
 scale 1:1,000 @A3

Illus 15  
 Interpretation of magnetometer data; Sector 1






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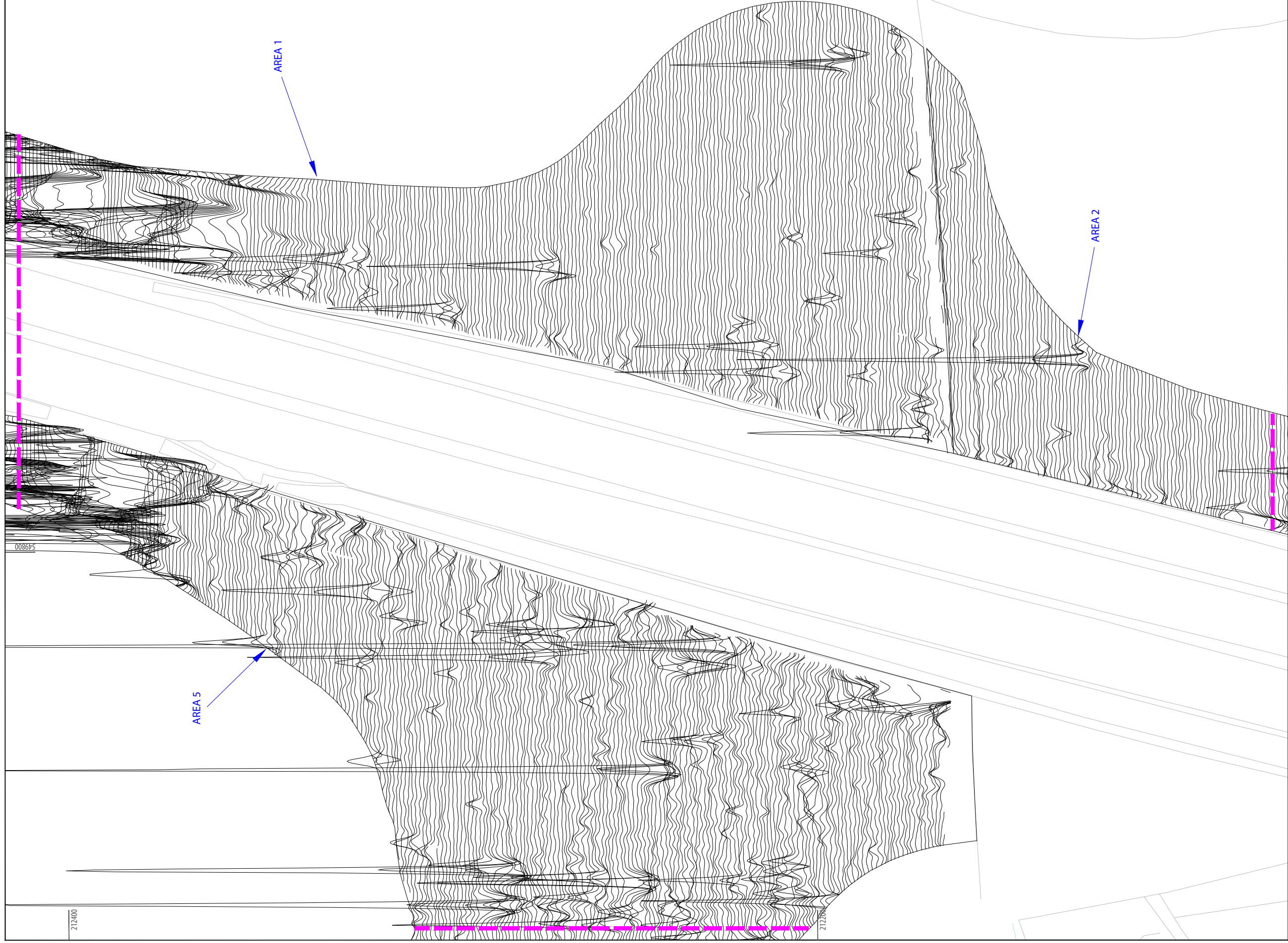
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-1.0 0 2.0 nT  
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 N  
 scale 1:1,000 @A3

--- Sector boundary

Illus 16  
 Processed greyscale magnetometer data; Sector 2



212400

212400

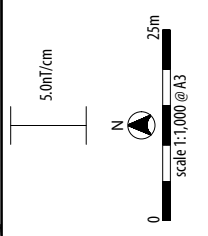
008695

AREA 5

AREA 1

AREA 2

--- Sector boundary



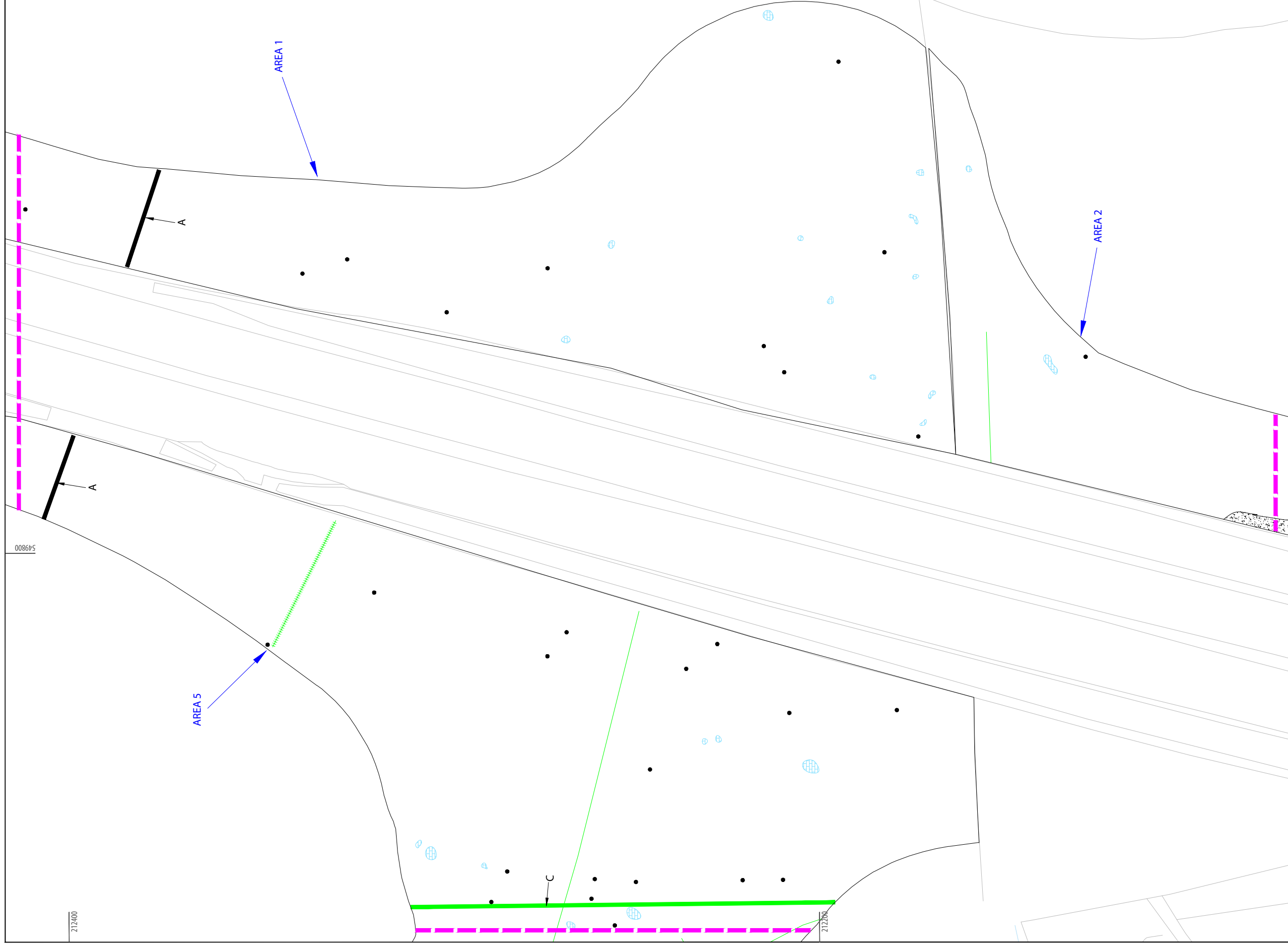
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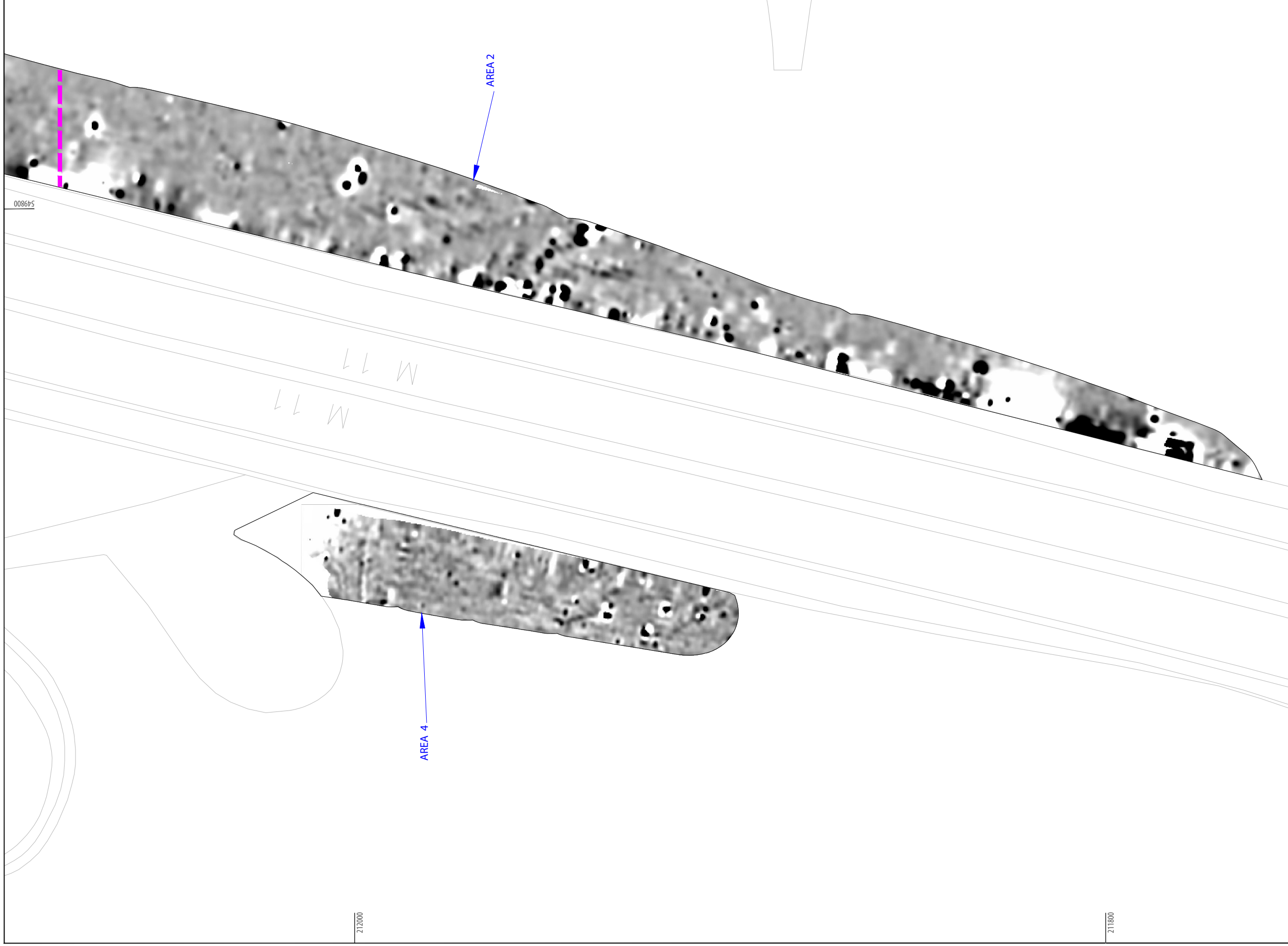
Illus 17  
XY trace plot of magnetometer data; Sector 2





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<b>TYPE OF ANOMALY</b> Magnetic Enhancement	<b>INTERPRETATION</b> Geology
<b>TYPE OF ANOMALY</b> Dipolar Isolated Magnetic Disturbance Dipolar Linear Linear Trend Linear Trend Linear	<b>INTERPRETATION</b> Ferrous Material Ferrous Material Service Pipe Agricultural Field Drain Former Field Boundary
- - - Sector boundary	

Illus 18  
 Interpretation of magnetometer data; Sector 2



00869F

M N  
M N

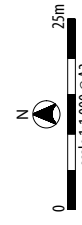
AREA 4

AREA 2

212000

211800

— Sector boundary

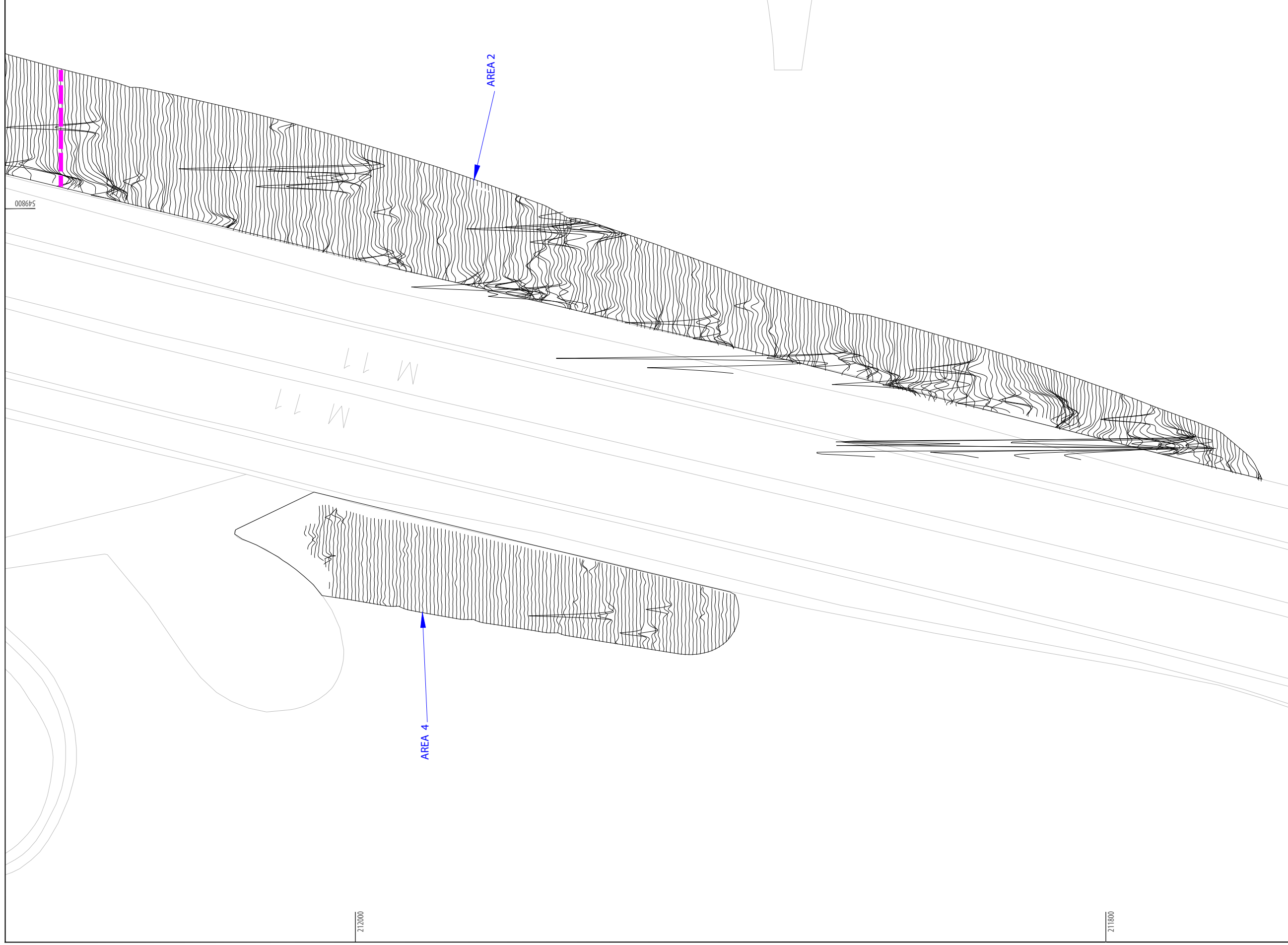


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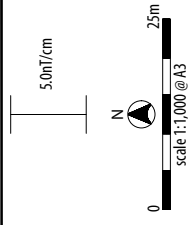
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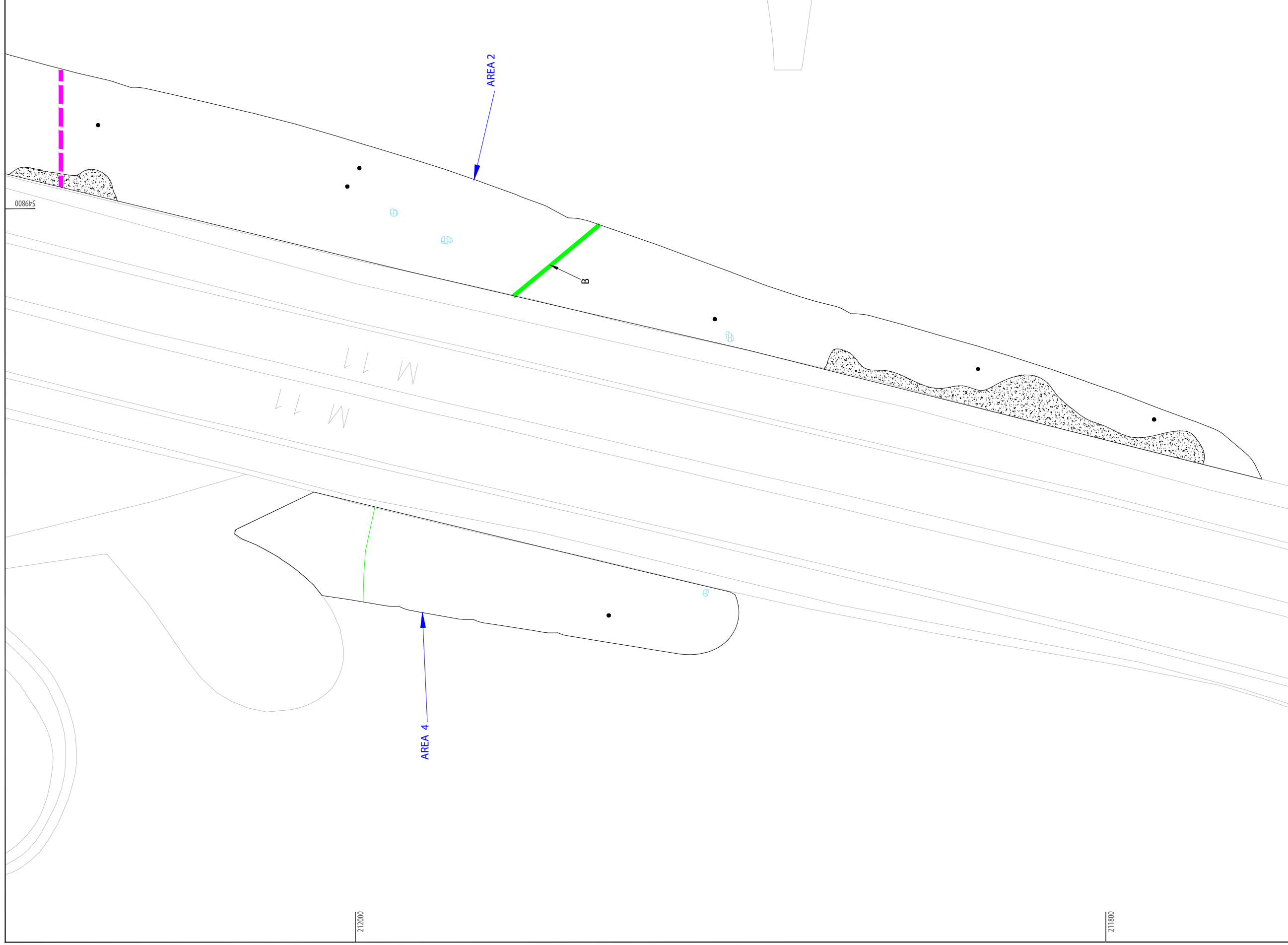
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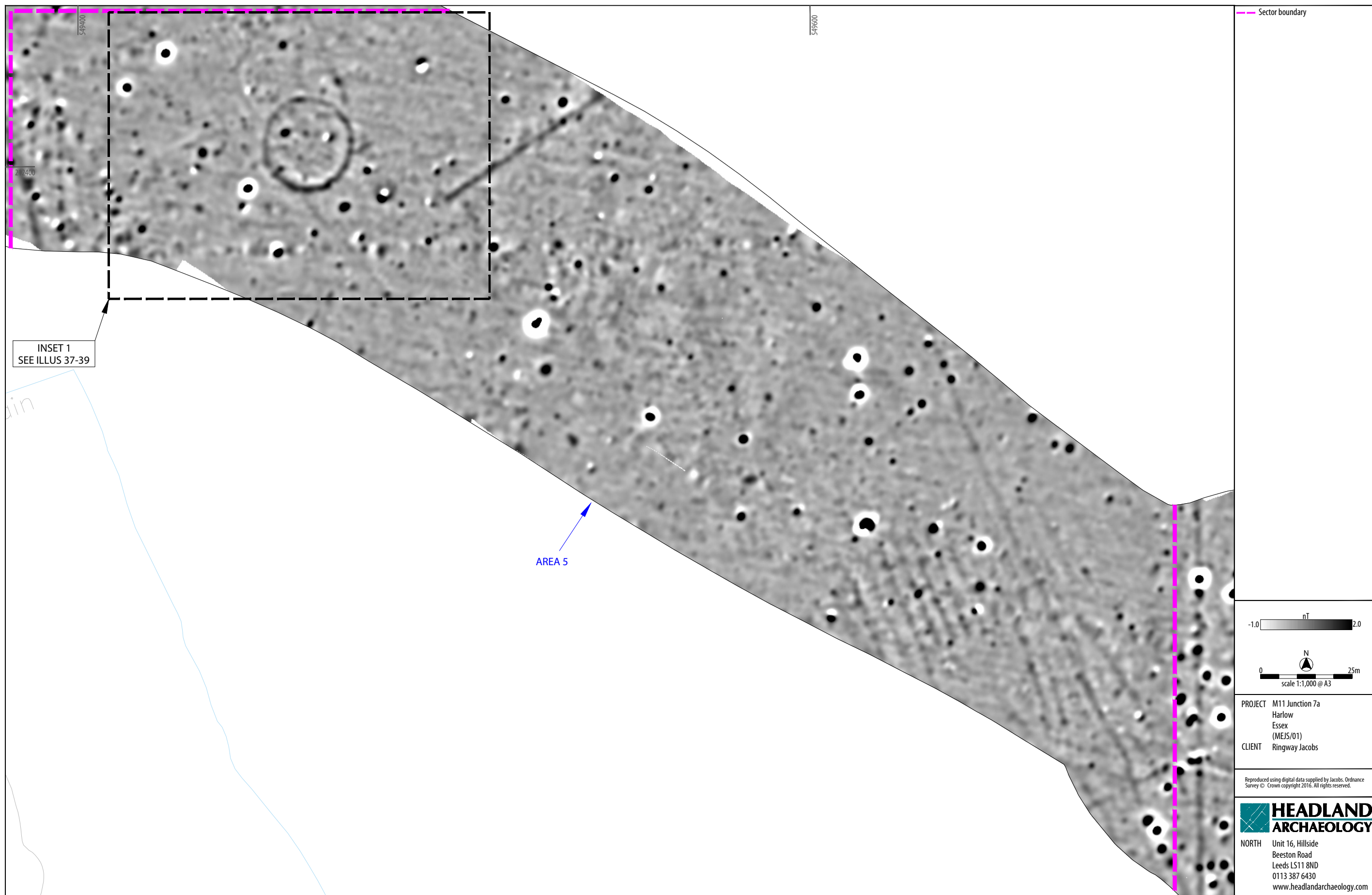
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Illus 20  
XY trace plot of magnetometer data, Sector 3



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<p><b>TYPE OF ANOMALY</b></p> <ul style="list-style-type: none"> <li>• Dipolar Isolated</li> <li>● Magnetic Disturbance</li> <li>— Linear Trend</li> <li>— Linear</li> <li>⊕ Magnetic Enhancement</li> </ul>	<p><b>INTERPRETATION</b></p> <ul style="list-style-type: none"> <li>● Ferrous Material</li> <li>● Ferrous Material</li> <li>— Agricultural</li> <li>— Former Field Boundary</li> <li>⊕ Geology</li> </ul>
<p>— Sector boundary</p>	

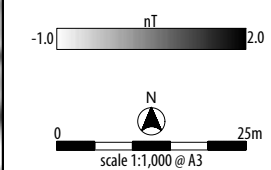
Illus 21  
Interpretation of magnetometer data; Sector 3



INSET 1  
SEE ILLUS 37-39

AREA 5

Sector boundary



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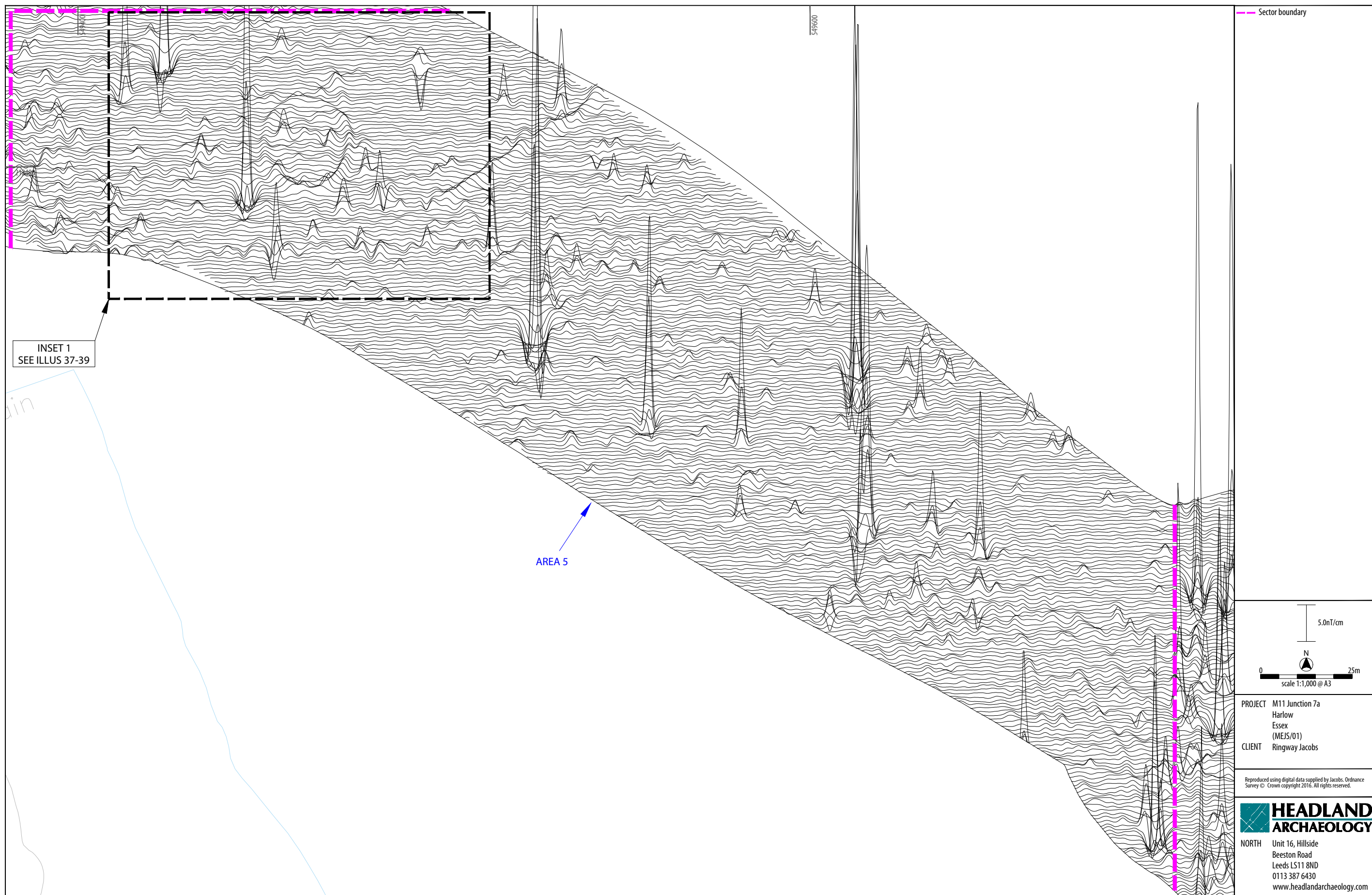
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Illus 22  
Processed greyscale magnetometer data; Sector 4

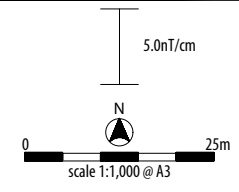




INSET 1  
SEE ILLUS 37-39

AREA 5

— Sector boundary



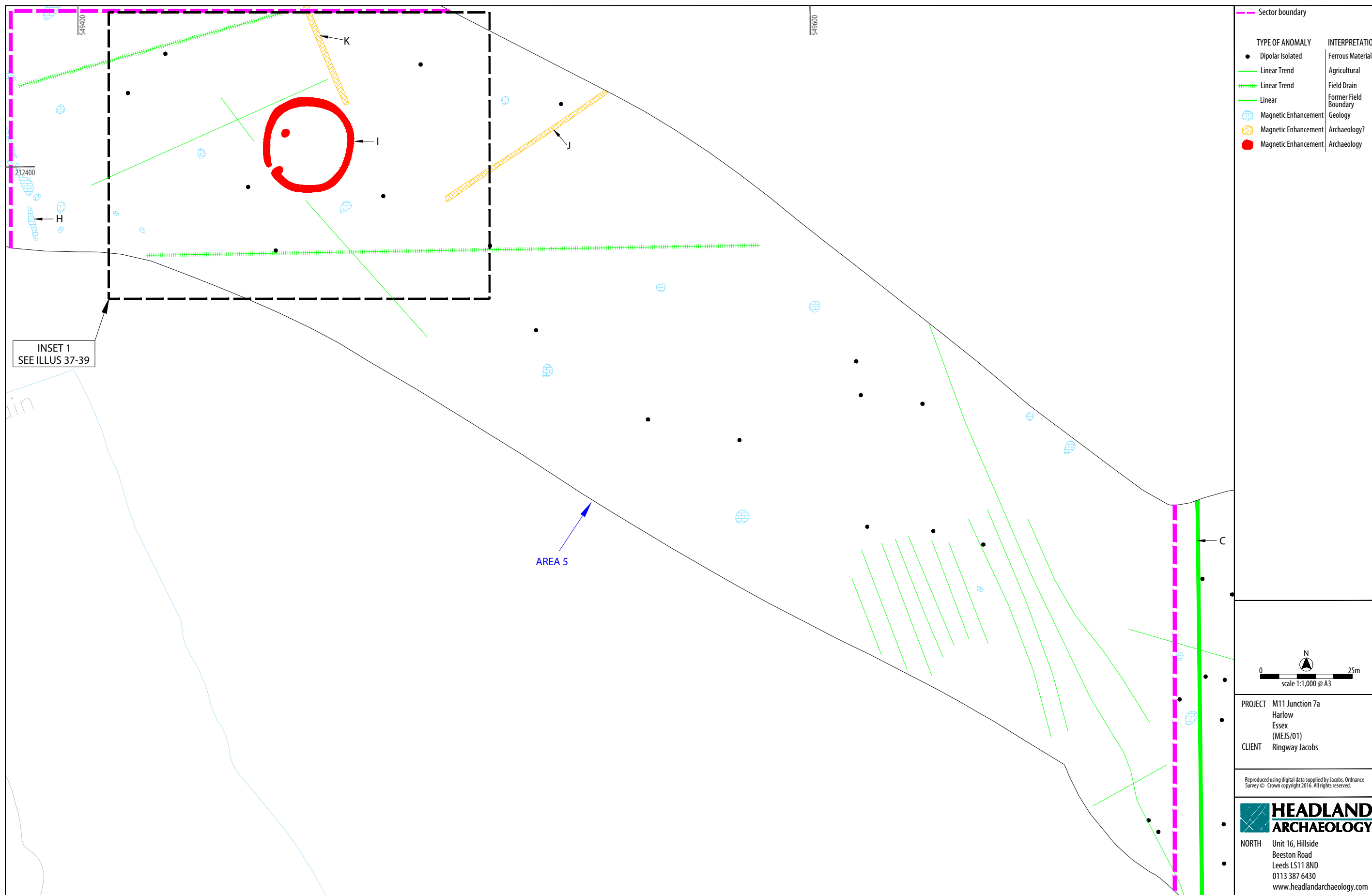
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Illus 23  
XY trace plot of magnetometer data; Sector 4

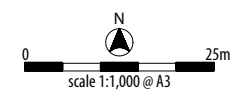




TYPE OF ANOMALY	INTERPRETATION
● Dipolar Isolated	Ferrous Material
— Linear Trend	Agricultural
--- Linear Trend	Field Drain
— Linear	Former Field Boundary
⊕ Magnetic Enhancement	Geology
⊗ Magnetic Enhancement	Archaeology?
● Magnetic Enhancement	Archaeology

INSET 1  
SEE ILLUS 37-39

AREA 5



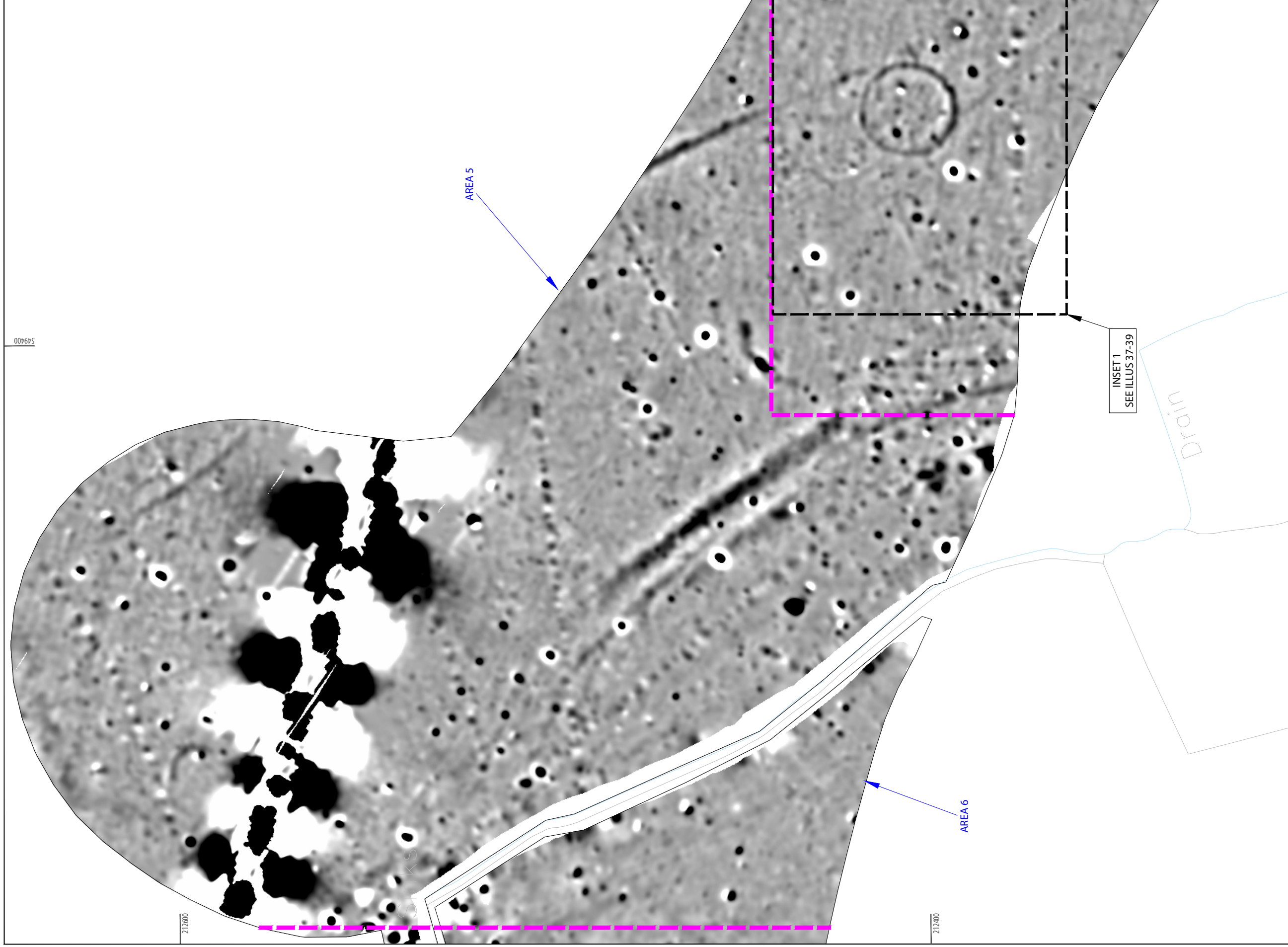
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Illus 24  
Interpretation of magnetometer data; Sector 4

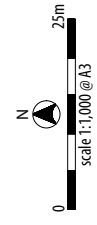


549400

212600

212600

--- Sector boundary



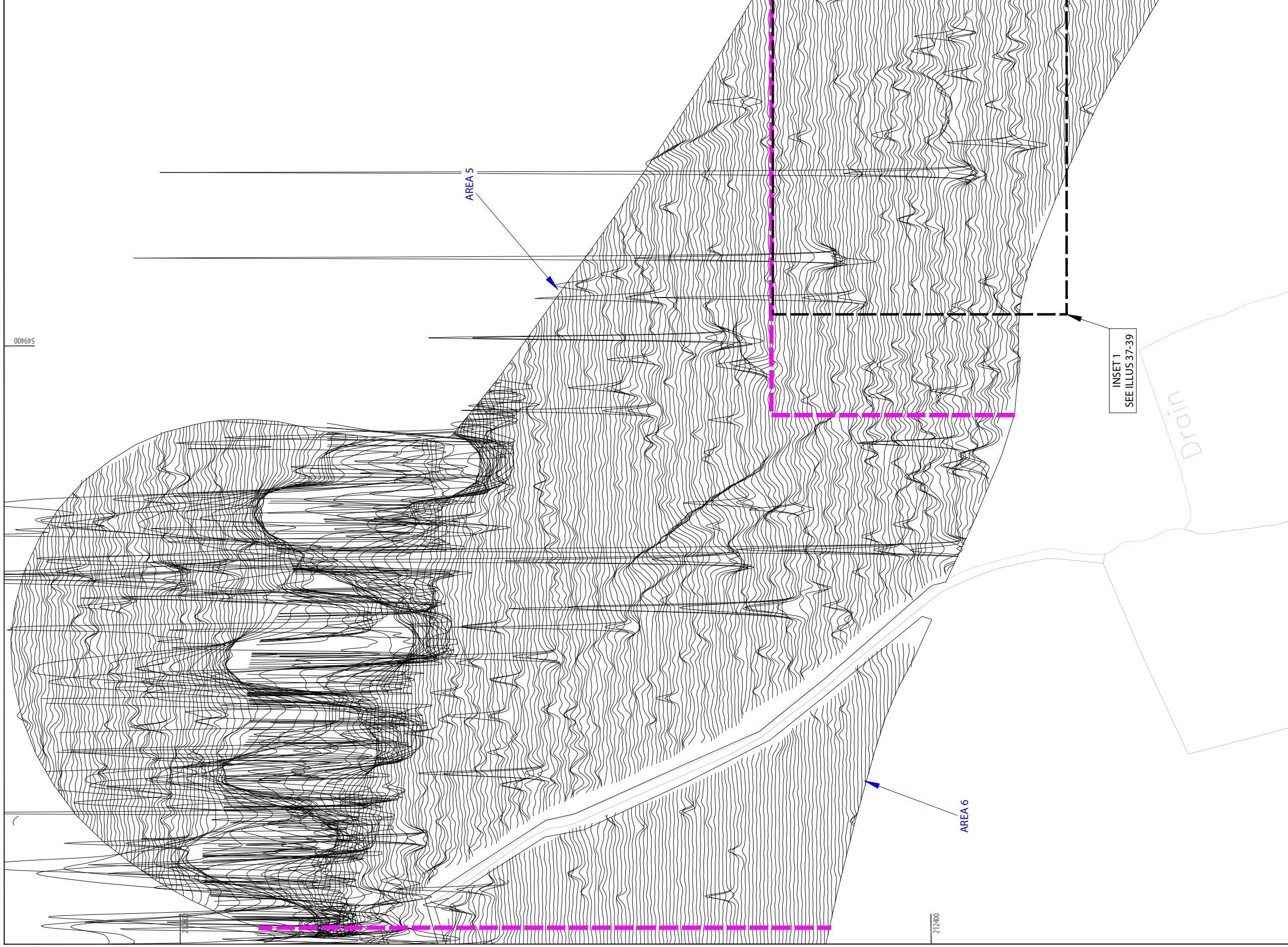
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Illus 25  
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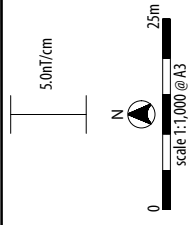
549400

212400

--- Sector boundary

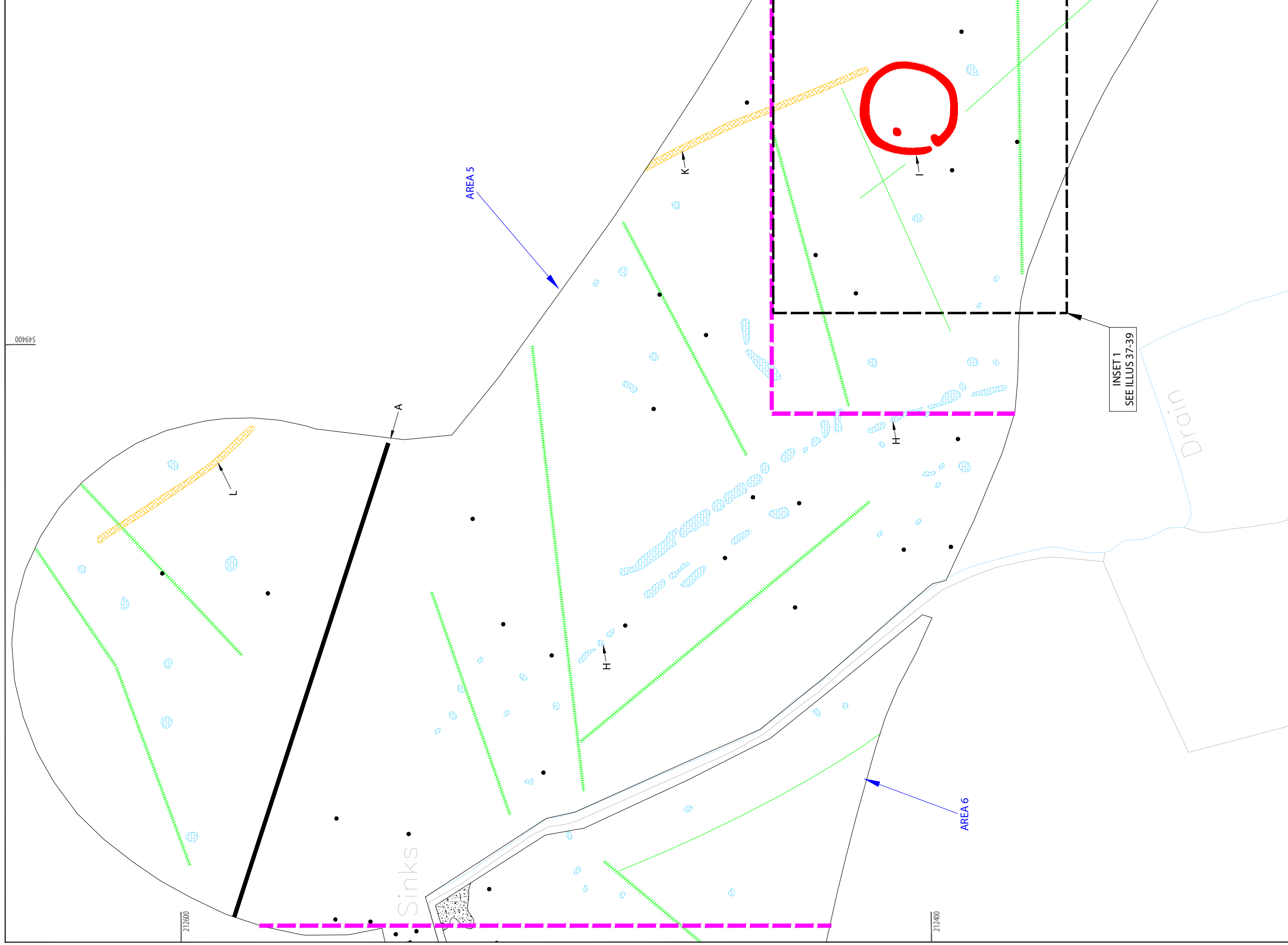
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Illus 26  
XY trace plot of magnetometer data, Sector 5

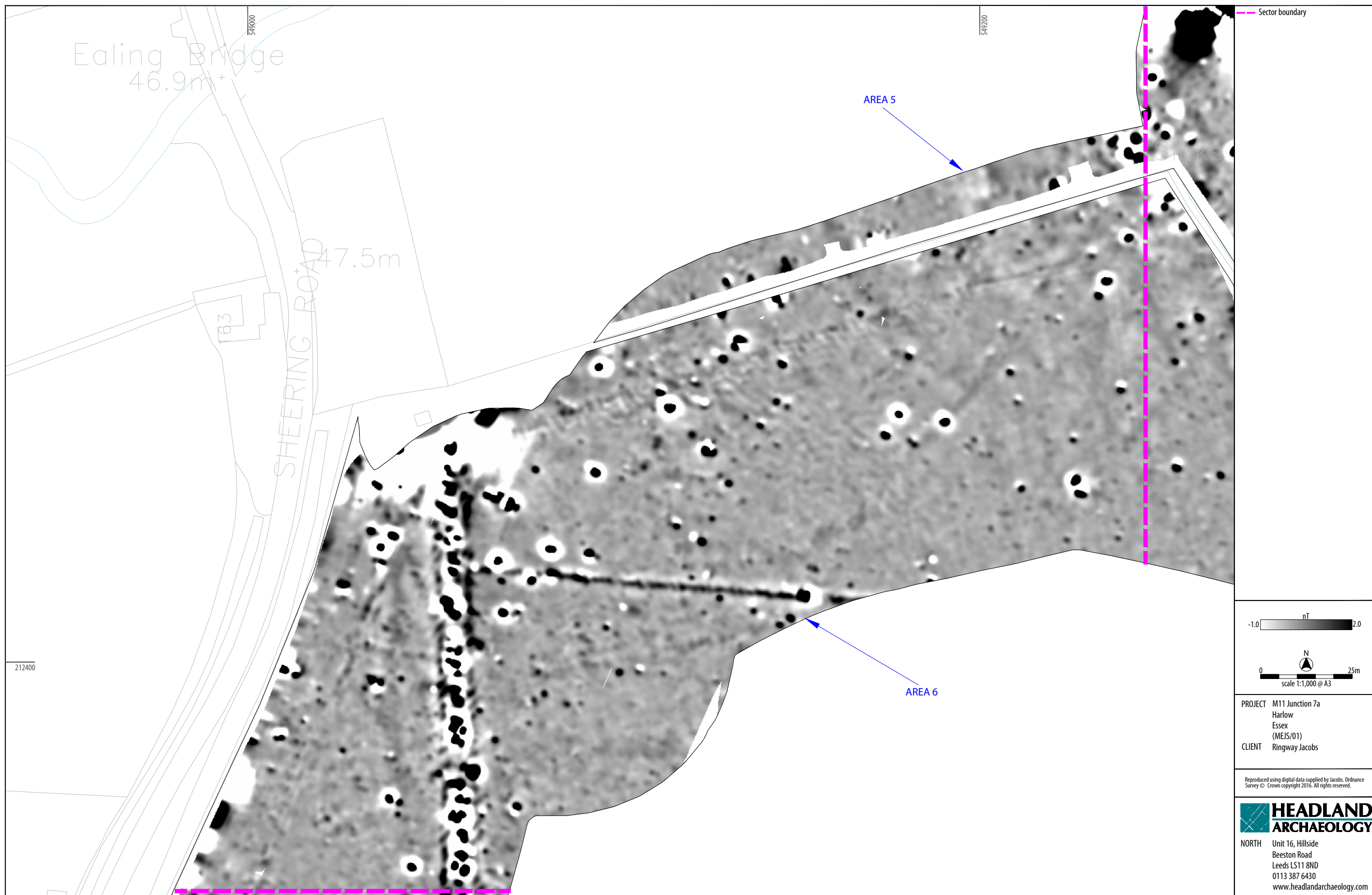


<p>— Sector boundary</p> <p>• Dipolar Isolated</p> <p>● Magnetic Disturbance</p> <p>— Dipolar Linear</p> <p>— Linear Trend</p> <p>— Linear Trend</p> <p>— Linear</p>	<p>● Ferrous Material</p> <p>● Ferrous Material</p> <p>— Service Pipe</p> <p>— Agricultural</p> <p>— Field Drain</p> <p>— Former Field Boundary</p>	<p>● Magnetic Enhancement</p> <p>● Magnetic Enhancement</p> <p>● Magnetic Enhancement</p>	<p>Geology</p> <p>Archaeology?</p> <p>Archaeology</p>	<p>PROJECT M11 Junction 7a Harlow Essex (MES/01)</p> <p>CLIENT Ringway Jacobs</p> <p>Reproduced using digital data supplied by Jacobs. Ordnance Survey © Crown copyright 2016. All rights reserved.</p>	<p><b>HEADLAND ARCHAEOLOGY</b></p> <p>NORTH</p> <p>Unit 16, Hillside Beeston Road Leeds LS11 8ND 0113 387 6430 www.headlandarchaeology.com</p>
	<p>— Ferrous Material</p> <p>— Ferrous Material</p> <p>— Service Pipe</p> <p>— Agricultural</p> <p>— Field Drain</p> <p>— Former Field Boundary</p>	<p>● Magnetic Enhancement</p> <p>● Magnetic Enhancement</p> <p>● Magnetic Enhancement</p>	<p>Geology</p> <p>Archaeology?</p> <p>Archaeology</p>		

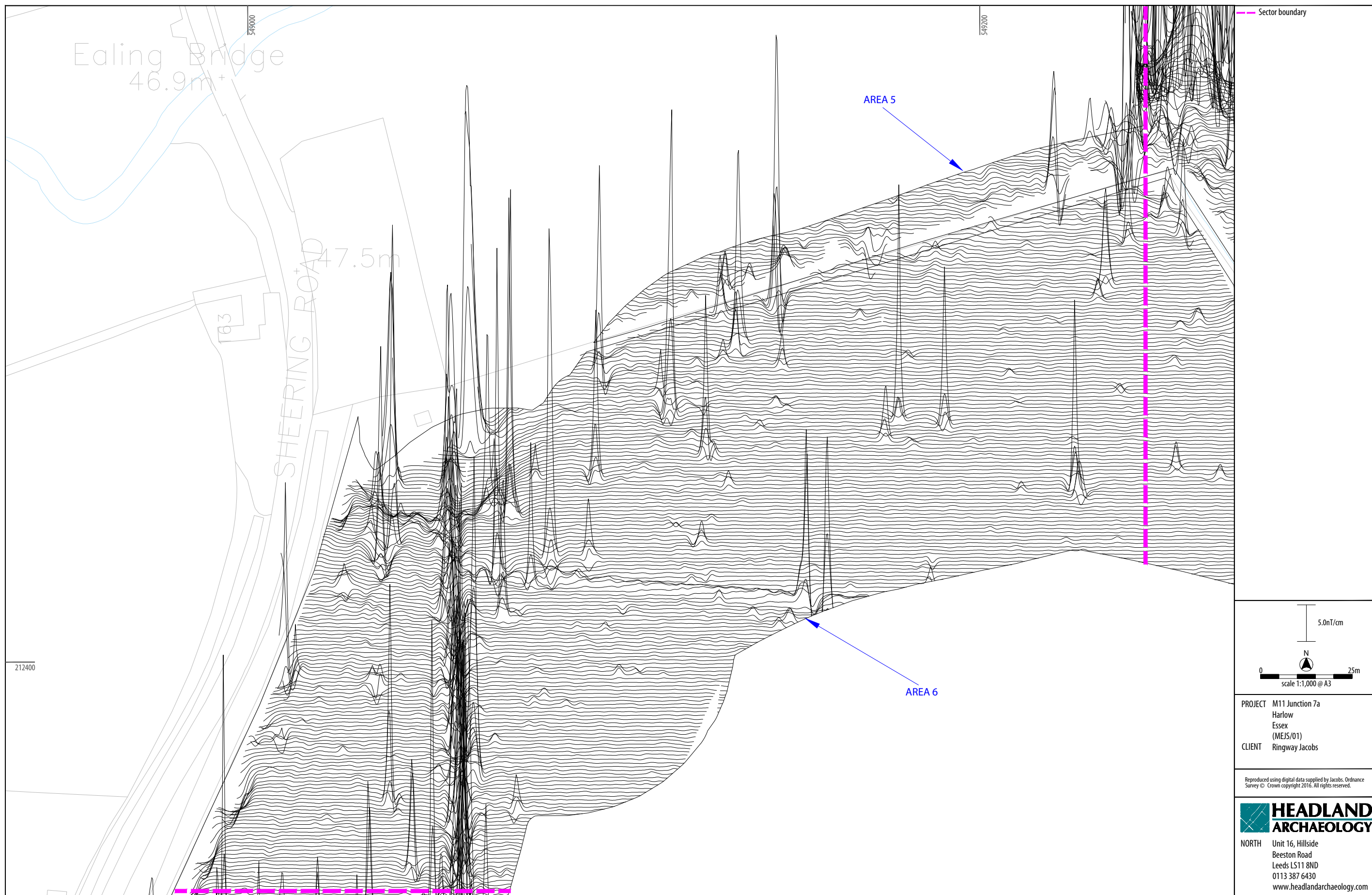


Illus 27  
Interpretation of magnetometer data; Sector 5





Illus 28  
 Processed greyscale magnetometer data; Sector 6



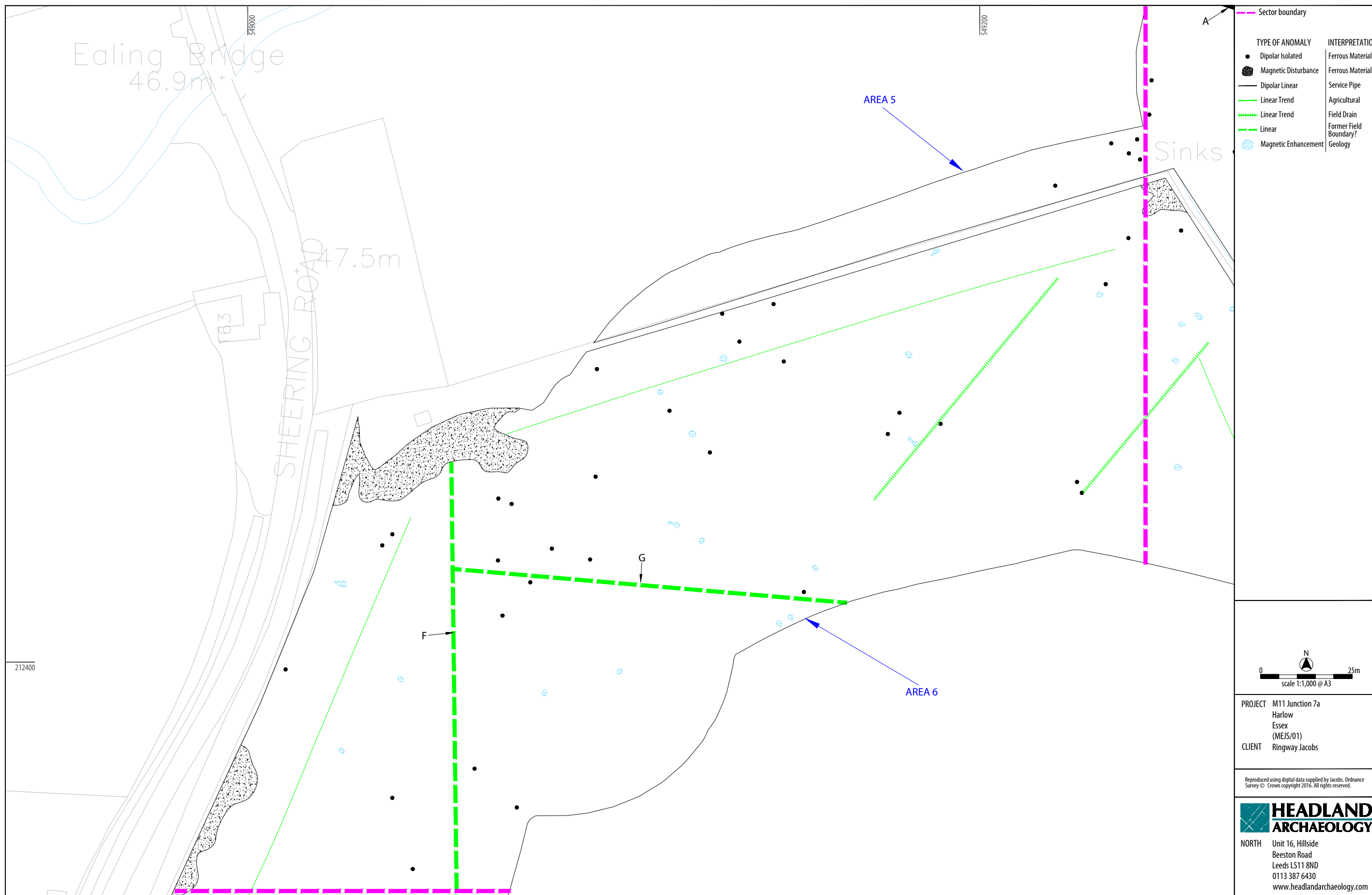
Illus 29  
 XY trace plot of magnetometer data; Sector 6

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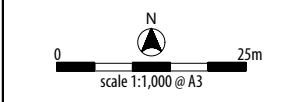
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TYPE OF ANOMALY	INTERPRETATION
● Dipolar Isolated	Ferrous Material
● Magnetic Disturbance	Ferrous Material
— Dipolar Linear	Service Pipe
— Linear Trend	Agricultural
--- Linear Trend	Field Drain
— Linear	Former Field Boundary?
⊕ Magnetic Enhancement	Geology

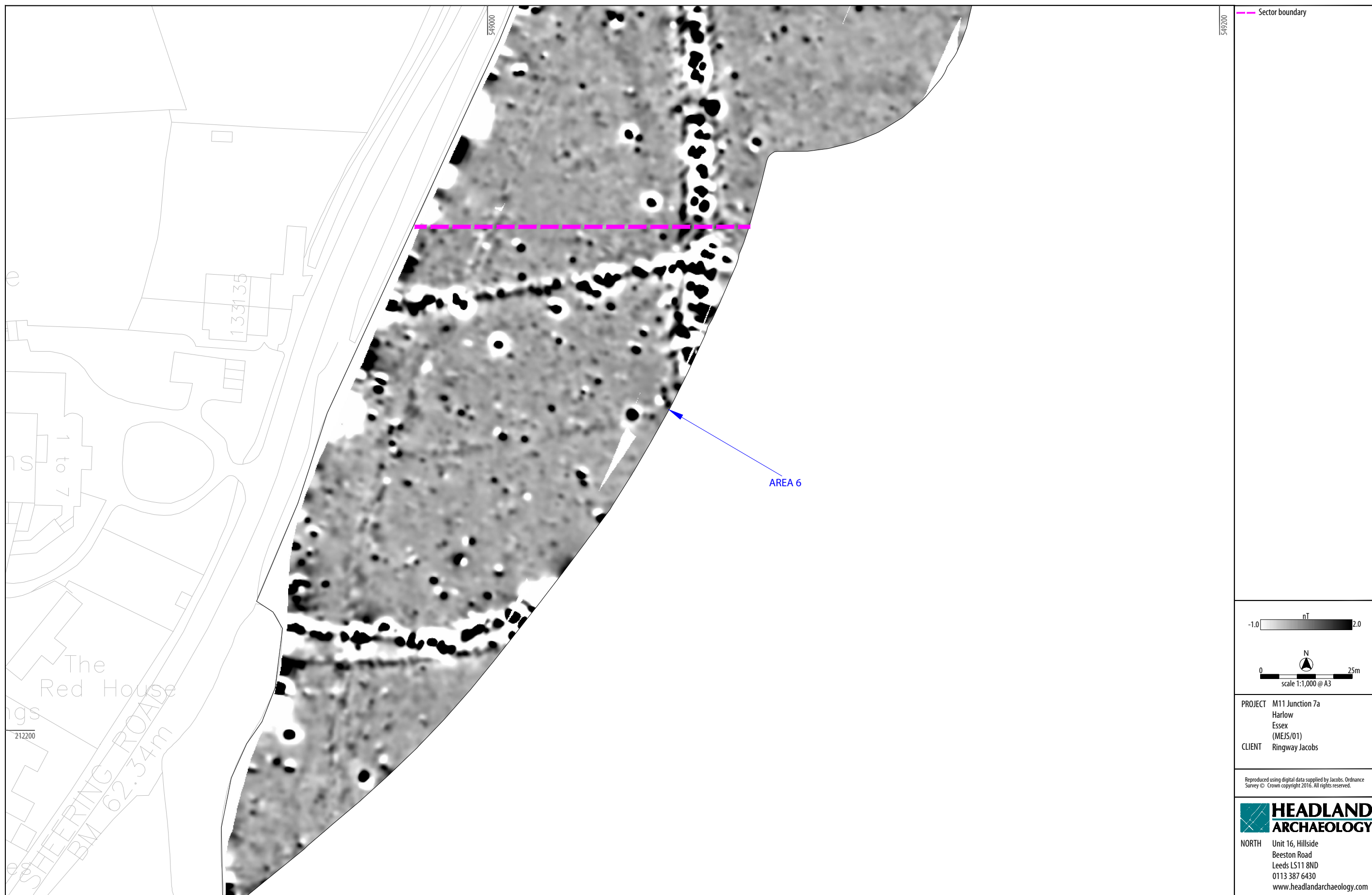


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Illus 30  
 Interpretation of magnetometer data; Sector 6



Illus 31  
 Processed greyscale magnetometer data; Sector 7

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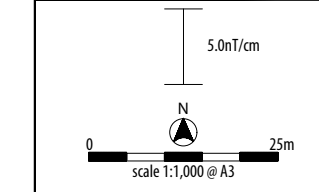
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549700  
Sector boundary

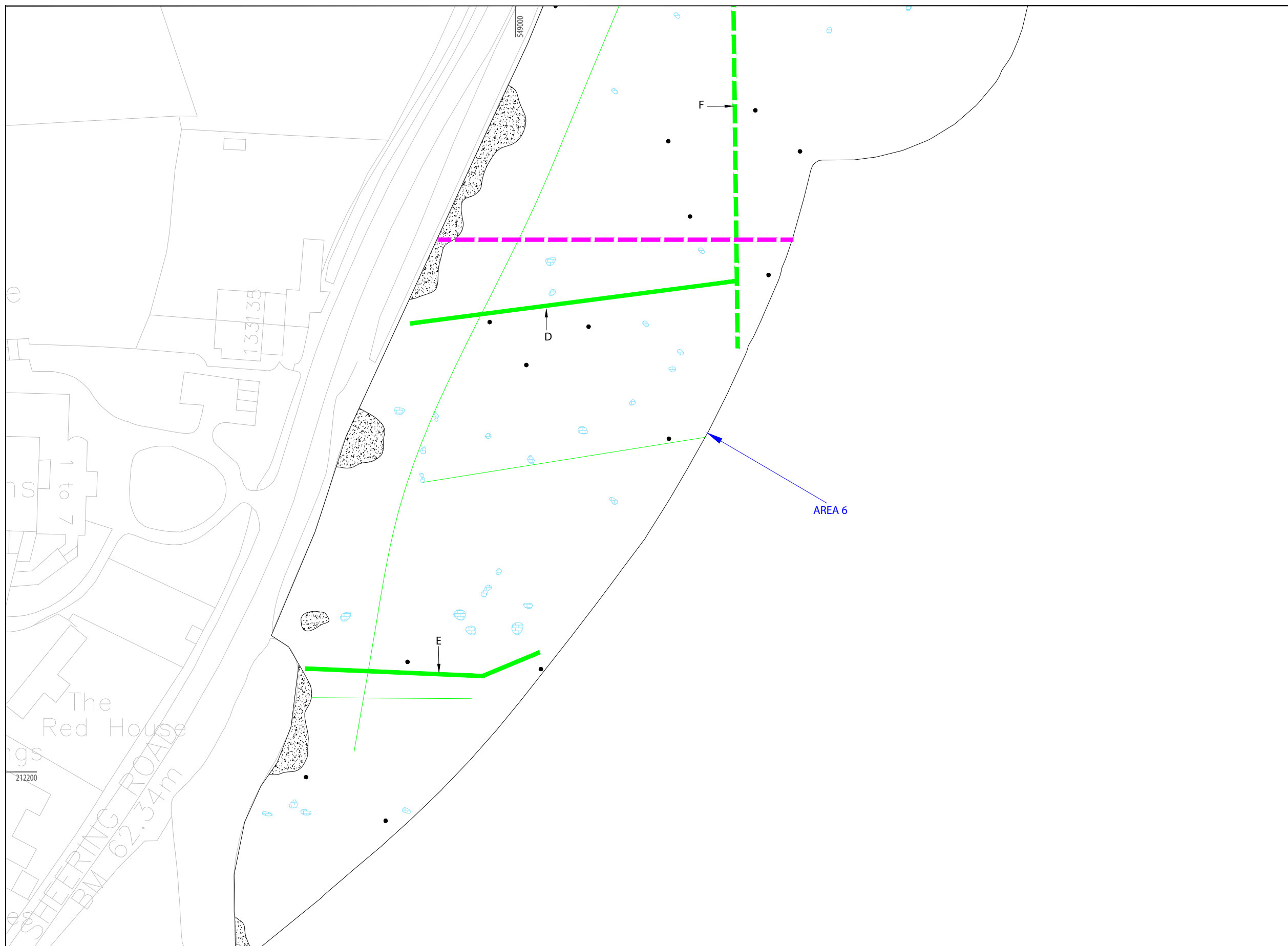


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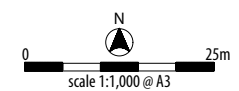
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Illus 32  
XY trace plot of magnetometer data; Sector 7



TYPE OF ANOMALY	INTERPRETATION
● Dipolar Isolated	Ferrous Material
● Magnetic Disturbance	Ferrous Material
— Linear Trend	Agricultural
— Linear	Former Field Boundary
— Linear	Former Field Boundary?
⊕ Magnetic Enhancement	Geology



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Illus 33  
 Interpretation of magnetometer data; Sector 7





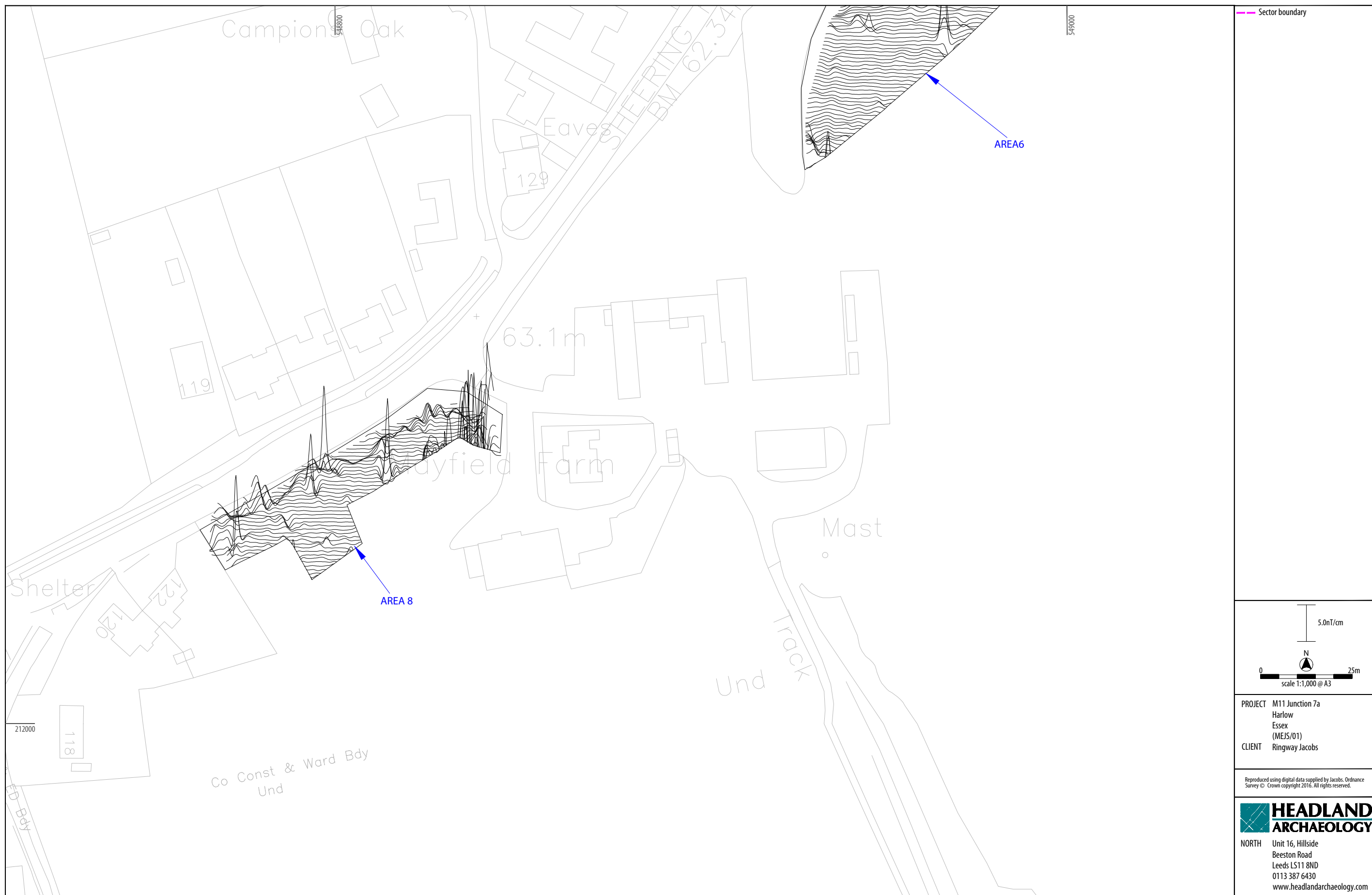
Illus 34  
 Processed greyscale magnetometer data; Sector 8

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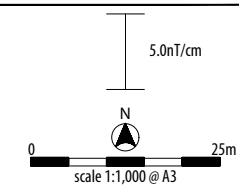
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— Sector boundary



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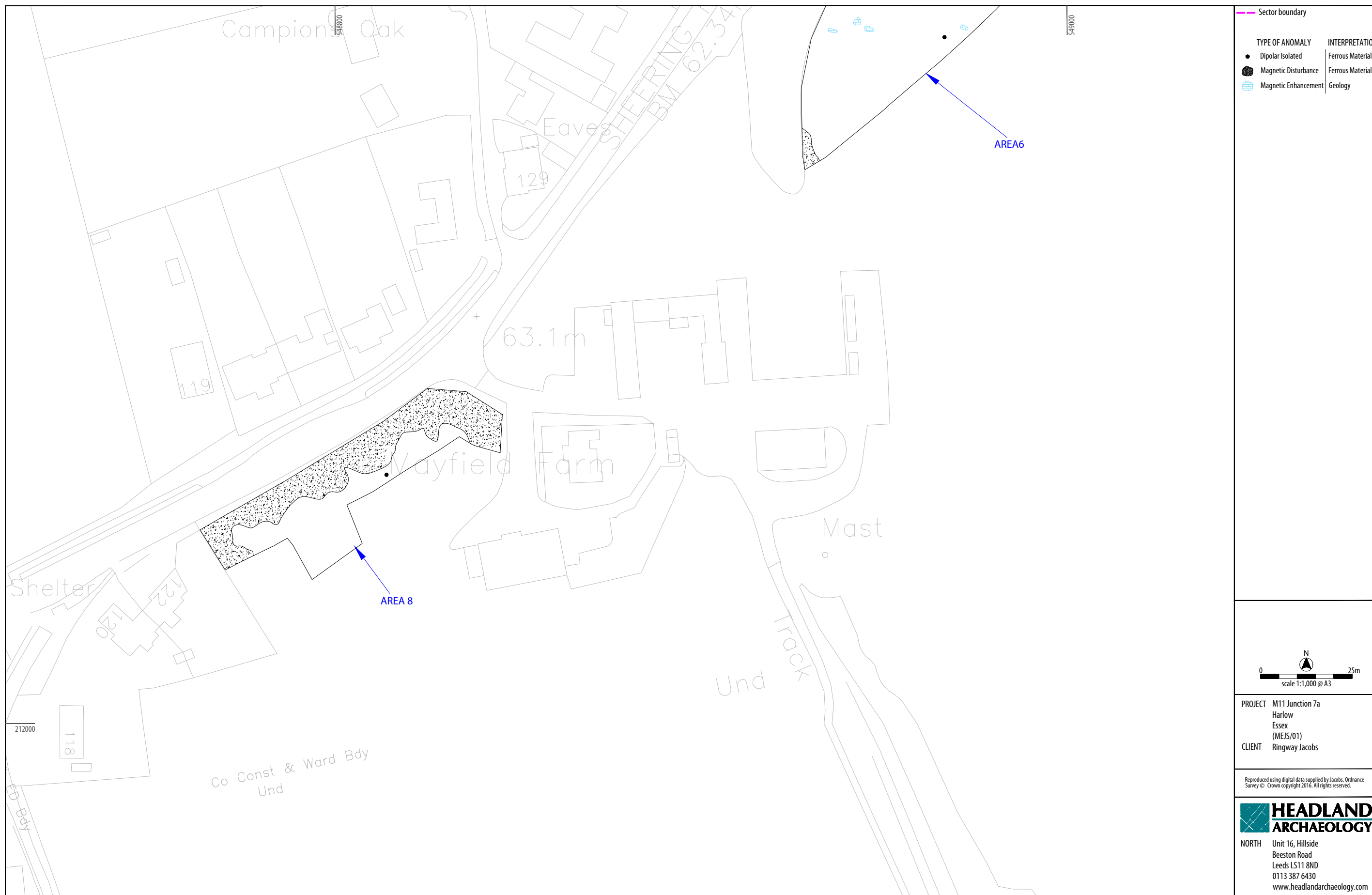
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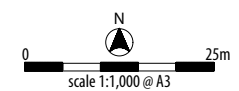
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Illus 35  
 XY trace plot of magnetometer data; Sector 8





TYPE OF ANOMALY		INTERPRETATION
●	Dipolar Isolated	Ferrous Material
■	Magnetic Disturbance	Ferrous Material
▨	Magnetic Enhancement	Geology

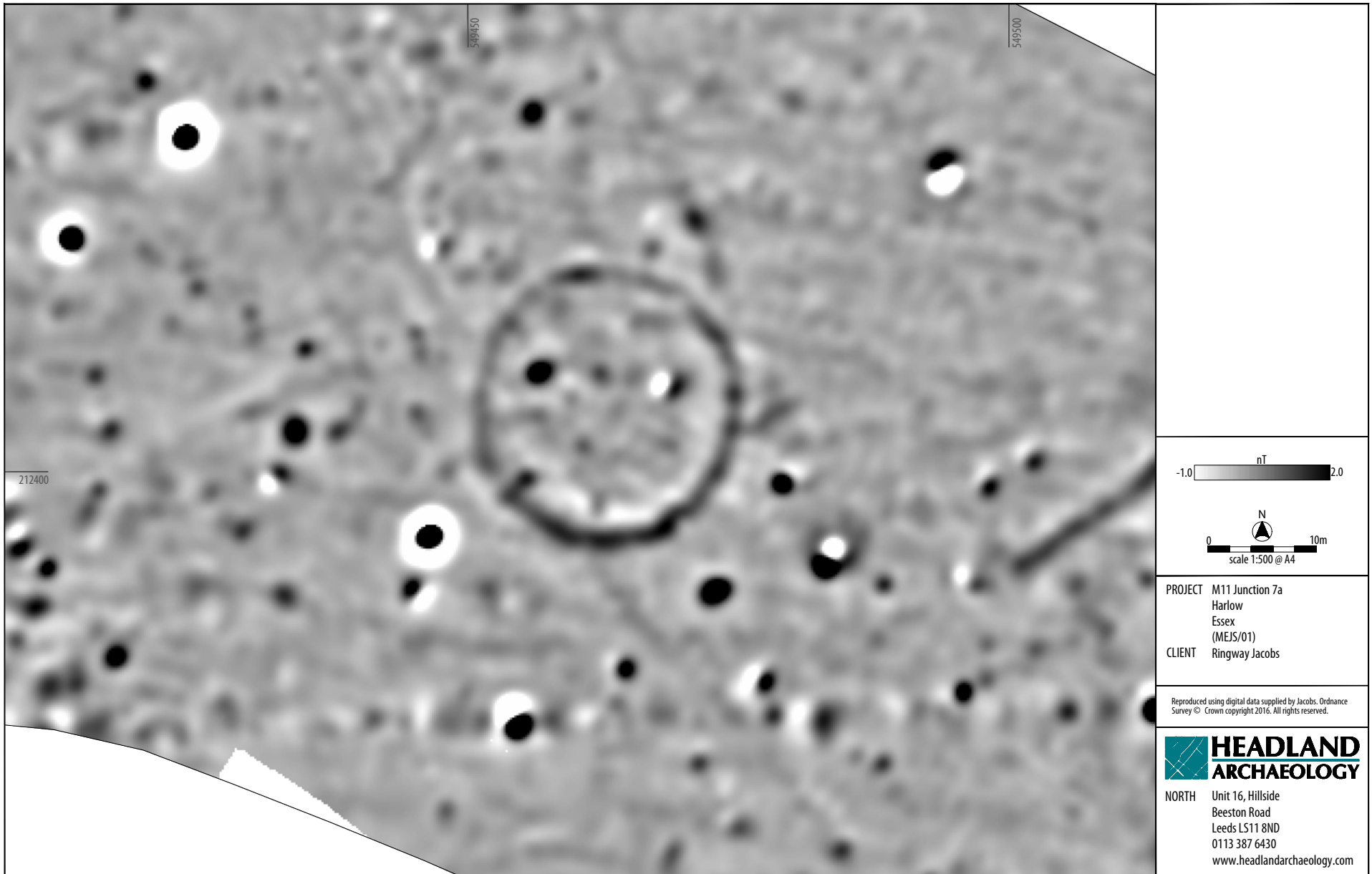


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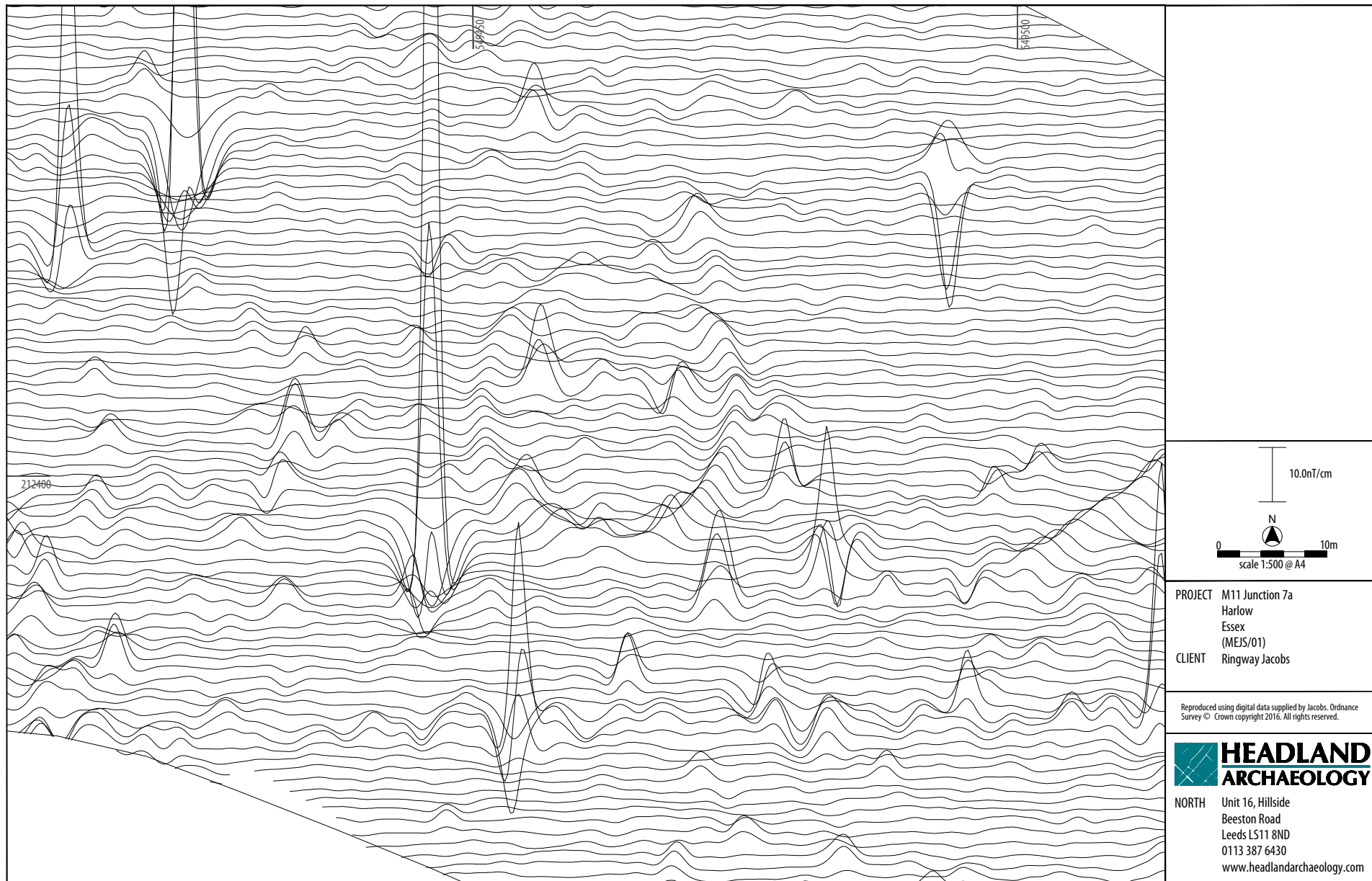
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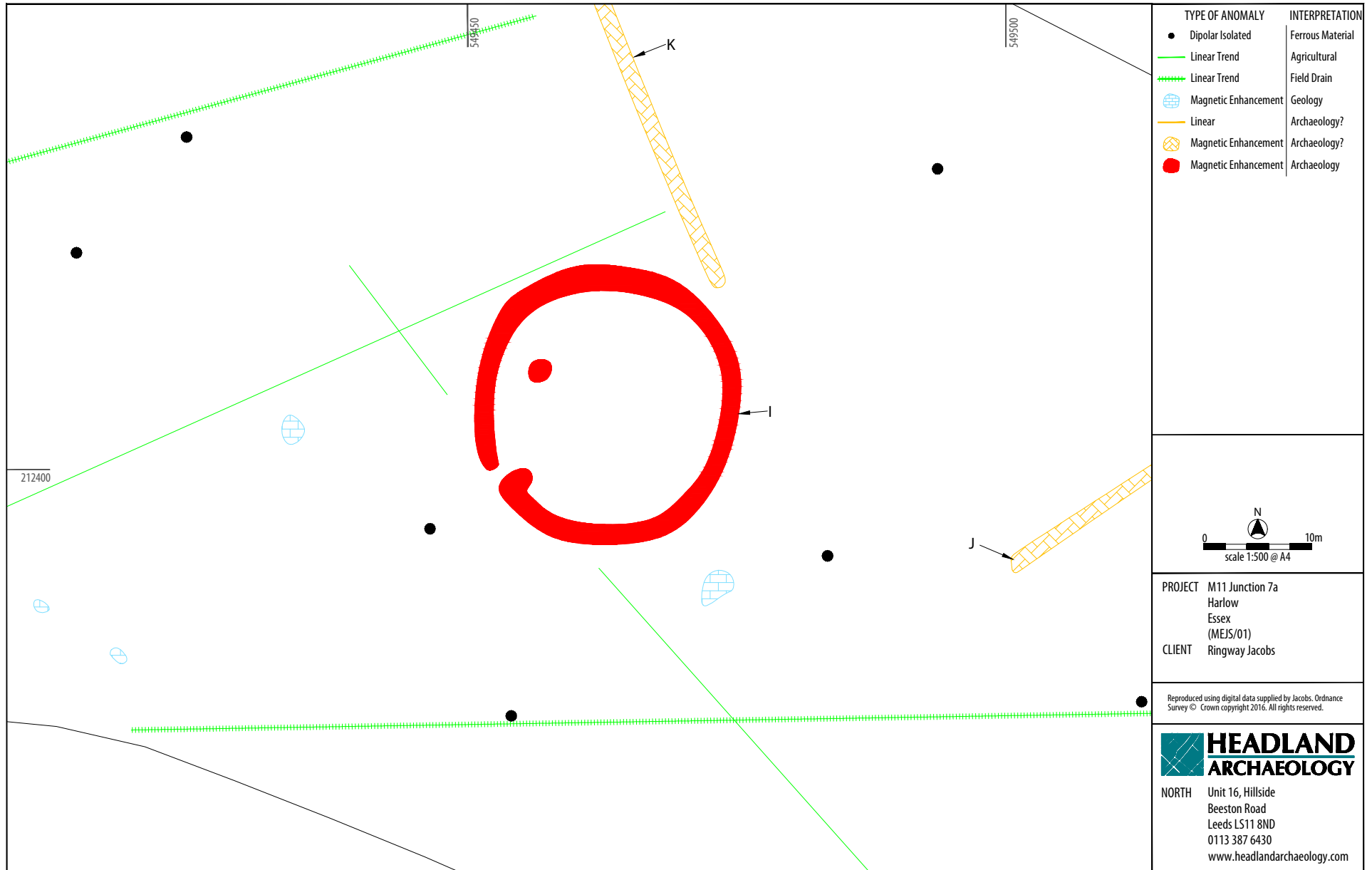
Illus 36  
 Interpretation of magnetometer data; Sector 8



Illus 37  
Processed greyscale magnetometer data; Inset 1



Illus 38  
XY trace plot of magnetometer data; Inset 1



Illus 39  
Interpretation of magnetometer data; Inset 1



## 7 APPENDICES

### APPENDIX 1 MAGNETOMETER SURVEY

#### Magnetic susceptibility and soil magnetism

Iron makes up about 6% of the Earth's crust and is mostly present in soils and rocks as minerals such as maghaemite and haematite. These minerals have a weak, measurable magnetic property termed magnetic susceptibility. Human activities can redistribute these minerals and change (enhance) others into more magnetic forms so that by measuring the magnetic susceptibility of the topsoil, areas where human occupation or settlement has occurred can be identified by virtue of the attendant increase (enhancement) in magnetic susceptibility. If the enhanced material subsequently comes to fill features, such as ditches or pits, localised isolated and linear magnetic anomalies can result whose presence can be detected by a magnetometer (fluxgate gradiometer).

In general, it is the contrast between the magnetic susceptibility of deposits filling cut features, such as ditches or pits, and the magnetic susceptibility of topsoils, subsoils and rocks into which these features have been cut, which causes the most recognisable responses. This is primarily because there is a tendency for magnetic ferrous compounds to become concentrated in the topsoil, thereby making it more magnetic than the subsoil or the bedrock. Linear features cut into the subsoil or geology, such as ditches, that have been silted up or have been backfilled with topsoil will therefore usually produce a positive magnetic response relative to the background soil levels. Discrete feature, such as pits, can also be detected.

The magnetic susceptibility of a soil can also be enhanced by the application of heat. This effect can lead to the detection of features such as hearths, kilns or areas of burning.

#### Types of magnetic anomaly

In the majority of instances anomalies are termed 'positive'. This means that they have a positive magnetic value relative to the magnetic background on any given site. However some features can manifest themselves as 'negative' anomalies that, conversely, means that the response is negative relative to the mean magnetic background.

Where it is not possible to give a probable cause of an observed anomaly a '?' is appended.

It should be noted that anomalies interpreted as modern in origin might be caused by features

that are present in the topsoil or upper layers of the subsoil. Removal of soil to an archaeological or natural layer can therefore remove the feature causing the anomaly.

The types of response mentioned above can be divided into five main categories that are used in the graphical interpretation of the magnetic data:

#### *Isolated dipolar anomalies (iron spikes)*

These responses are typically caused by ferrous material either on the surface or in the topsoil. They cause a rapid variation in the magnetic response giving a characteristic 'spiky' trace. Although ferrous archaeological artefacts could produce this type of response, unless there is supporting evidence for an archaeological interpretation, little emphasis is normally given to such anomalies, as modern ferrous objects are common on rural sites, often being present as a consequence of manuring.

#### *Areas of magnetic disturbance*

These responses can have several causes often being associated with burnt material, such as slag waste or brick rubble or other strongly magnetised/fired material. Ferrous structures such as pylons, mesh or barbed wire fencing and buried pipes can also cause the same disturbed response. A modern origin is usually assumed unless there is other supporting information.

#### *Linear trend*

This is usually a weak or broad linear anomaly of unknown cause or date. These anomalies are often caused by agricultural activity, either ploughing or land drains being a common cause.

#### *Areas of magnetic enhancement/positive isolated anomalies*

Areas of enhanced response are characterised by a general increase in the magnetic background over a localised area whilst discrete anomalies are manifest by an increased response (sometimes only visible on an XY trace plot) on two or three successive traverses. In neither instance is there the intense dipolar response characteristic exhibited by an area of magnetic disturbance or of an 'iron spike' anomaly (see above). These anomalies can be caused by infilled discrete archaeological features such as pits or post-holes or by kilns. They can also be caused by pedological variations or by natural infilled features on certain geologies. Ferrous material in the subsoil can also give a similar response. It can often therefore be very difficult to establish an anthropogenic origin without intrusive investigation or other supporting information.

#### *Linear and curvilinear anomalies*

Such anomalies have a variety of origins. They may be caused by agricultural practice (recent ploughing trends, earlier ridge and furrow regimes or land drains), natural geomorphological features such as palaeochannels or by infilled archaeological ditches.



## APPENDIX 2 SURVEY LOCATION INFORMATION

An initial survey base station was established using a Trimble VRS differential Global Positioning System (dGPS). The magnetometer data was georeferenced using a Trimble RTK differential Global Positioning System (Trimble R8s model).

Temporary sight markers were laid out using a Trimble VRS differential Global Positioning System (Trimble R8s model) to guide the operator and ensure full coverage. The accuracy of this dGPS equipment is better than 0.01m.

The survey data were then super-imposed onto a base map provided by the client to produce the displayed block locations. However, it should be noted that Ordnance Survey positional accuracy for digital map data has an error of 0.5m for urban and floodplain areas, 1.0m for rural areas and 2.5m for mountain and moorland areas. This potential error must be considered if coordinates are measured off hard copies of the mapping rather than using the digital coordinates.

Headland Archaeology cannot accept responsibility for errors of fact or opinion resulting from data supplied by a third party.

## APPENDIX 3 GEOPHYSICAL SURVEY ARCHIVE

The geophysical archive comprises:

- › an archive disk containing the raw data in XYZ format, a raster image of each greyscale plot with associate world file, and a PDF of the report

The project will be archived in-house in accordance with recent good practice guidelines ([http://guides.archaeologydataservice.ac.uk/g2gp/Geophysics\\_3](http://guides.archaeologydataservice.ac.uk/g2gp/Geophysics_3)). The data will be stored in an indexed archive and migrated to new formats when necessary.

## APPENDIX 4 OASIS DATA COLLECTION FORM: ENGLAND

OASIS ID: headland5-249547

### PROJECT DETAILS

PROJECT NAME	M11 Junction 7a, Essex
SHORT DESCRIPTION OF THE PROJECT	Headland Archaeology (UK) Ltd undertook a geophysical (magnetometer) survey, covering approximately 16 hectares on land north-east of Harlow, Essex, to provide information on the archaeological potential of the site of a new motorway junction and associated link road. The survey has identified a probable barrow along the route of the proposed link road along with linear anomalies (ditches) which may form part of an early field system. Elsewhere, anomalies have been identified which reflect the historical layout and division of the agricultural landscape as recorded on early Ordnance Survey maps. Therefore, on the basis of the geophysical survey, the archaeological potential across the majority of the site is assessed as being low although a high archaeological potential is ascribed to the area around the probable barrow.
PROJECT DATES	Start: 21-03-2016 End: 24-03-2016
PREVIOUS/FUTURE WORK	Not known / Not known
ANY ASSOCIATED PROJECT REFERENCE CODES	MEJS - Sitecode
ANY ASSOCIATED PROJECT REFERENCE CODES	01 - Contracting Unit No.
TYPE OF PROJECT	Field evaluation
SITE STATUS	None
CURRENT LAND USE	Cultivated Land 4 - Character Undetermined
MONUMENT TYPE	N/A None
MONUMENT TYPE	N/A None
SIGNIFICANT FINDS	N/A None
SIGNIFICANT FINDS	N/A None
METHODS & TECHNIQUES	"Geophysical Survey"
DEVELOPMENT TYPE	Road scheme (new and widening)
PROMPT	National Planning Policy Framework - NPPF
POSITION IN THE PLANNING PROCESS	Not known / Not recorded
SOLID GEOLOGY (OTHER)	London Clay Formation
DRIFT GEOLOGY (OTHER)	Head
TECHNIQUES	Magnetometry
PROJECT LOCATION	
COUNTRY	England
SITE LOCATION	ESSEX HARLOW HARLOW M11 Junction 7a
POSTCODE	CM17 0NG
STUDY AREA	16 Hectares
SITE COORDINATES	TL 549462 212405 51.867720180389 0.250756673246 51 52.03 N 000 15.02 E Point
PROJECT CREATORS	

NAME OF ORGANISATION Headland Archaeology  
PROJECT BRIEF ORIGINATOR Ringway Jacobs  
PROJECT DESIGN ORIGINATOR Headland Archaeology  
PROJECT DIRECTOR/MANAGER Harrison, S  
PROJECT SUPERVISOR Harrison, D  
TYPE OF SPONSOR/FUNDING BODY Developer

PROJECT ARCHIVES

PHYSICAL ARCHIVE EXISTS? No  
DIGITAL ARCHIVE EXISTS? No  
DIGITAL MEDIA AVAILABLE "Geophysics"  
PAPER ARCHIVE EXISTS? No  
PAPER MEDIA AVAILABLE "Report"

PROJECT BIBLIOGRAPHY 1

PUBLICATION TYPE Grey literature (unpublished document/manuscript)  
TITLE M11 Junction 7A, Essex; Geophysical Survey  
AUTHOR(S)/EDITOR(S) Harrison, D.  
DATE 2016  
ISSUER OR PUBLISHER H  
PLACE OF ISSUE OR PUBLICATION Leeds  
DESCRIPTION A4 report

ENTERED BY David Harrison (david.harrison@headlandarchaeology.com)  
ENTERED ON 25 April 2016





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## **Appendix 6.6: Predicted Less Than Significant Effects**





Table 1: Predicted less than significant impacts on cultural heritage assets during construction

Asset No.	Asset Name	Value	Description of Impact	Magnitude of Impact	Mitigation	Magnitude of Residual Impact	Significance of Residual Effect
5	Sheering Hall Ringwork	High	<p>Construction would be visible in glimpsed views south through the mature vegetation which surrounds this cultural heritage asset. However, the key attributes of the setting of this asset (the relationships with Pincey Brook (the source of water for the moat) and the buildings it encloses) would not be affected.</p> <p>While there would be a temporary increase in noise levels from construction plant, this would be in the context of traffic noise from the M11 motorway approximately 300m east of the asset.</p>	Minor	Photographic survey to record the current setting of this asset	Negligible	Slight
6	Barn Approximately 10m north of Sheering Hall	High	<p>Views from this asset are restricted by surrounding mature vegetation and by Assets 7 and 8. Views of construction activities would therefore largely be screened and construction would not affect the relationship between Asset 6 and Assets 7 and 8.</p> <p>While there would be a temporary increase in noise levels from construction plant, this would be in the context of existing traffic noise from the M11 motorway approximately 300m east of the asset.</p>	Minor	Photographic survey to record the current setting of this asset	Negligible	Slight
7	Barn Approximately 30m north-west of Sheering Hall	High	<p>Views from this asset are restricted by surrounding mature vegetation and by Asset 6 and 8. Views of construction activities would therefore largely be screened and construction would not affect the relationship between Asset 7 and Assets 6 and 8.</p> <p>While there would be a temporary increase in noise levels from construction plant, this would be in the context of existing traffic noise from the M11 motorway approximately 300m east of the asset.</p>	Minor	Photographic survey to record the current setting of this asset	Negligible	Slight
8	Sheering Hall	High	<p>Construction activities would be visible in glimpsed views south through mature vegetation which surrounds this cultural heritage asset. However, the relationship with Assets 5, 6 and 7 which is the key attribute of the element of this setting would not be affected.</p> <p>While there would be a temporary increase in noise levels from construction plant, this would be in the context of traffic noise from the M11 motorway approximately 300m east of the asset.</p>	Minor	Photographic survey to record the current setting of this asset	Negligible	Slight

Appendix 6.6: Less than significant impacts on cultural heritage assets



Asset No.	Asset Name	Value	Description of Impact	Magnitude of Impact	Mitigation	Magnitude of Residual Impact	Significance of Residual Effect
17	Moor Hall (site of)	Medium	Construction of the proposed northbound off slip west of the M11 would result in the partial removal of an area of trees which formed part of the landscape of Moor Hall visible on early Ordnance Survey mapping.	Minor	None proposed	Negligible	Slight
29	129 Sheering Road	Low	Construction activities would be visible in views south and southeastwards from this asset. However the key relationship with the surviving elements of The Champions group (Asset 32) such as the garden wall would not be affected. Its roadside location which contributes to our understanding of its historic function as a gatelodge would also not be affected. As traffic noise already forms an attribute of the setting of the asset, construction noise would not affect this asset.	Minor	Photographic survey to record the current setting of this asset	Negligible	Slight
31	Mayfield Farm	Low	Construction activities would be visible in views northwards, north-westwards and south-westwards from this asset. However, the range of buildings, or the relationship with other surrounding agricultural buildings would not be affected  Due to the close proximity of this historic building to the construction works, there is also a possibility for accidental damage to occur during construction.	Minor	Photographic survey to record the current setting of this asset.  Protection measures to be put in place during construction	Minor	Slight
32	Campions	Low	Construction activities would be temporarily visible in views south and southeast from this asset these would be partially screened by this asset's tall garden wall which flanks the north side of Sheering Road, and by dense mature trees. As traffic noise already forms an attribute of the setting of the asset, construction noise would not affect it.	Minor	Photographic survey to record the current setting of this asset	Negligible	Slight
49	Old Harlow Conservation Area	Medium	Construction activities along Gilden Way activities would be temporarily visible in views south from this asset. However, the key attributes of the setting of this asset which contributes to its value (the well preserved traditional buildings, focal point around the Green Man public house, and mature trees and roadside verges, which create an attractive but inward-looking scene) would not be affected. A significant amount of modern development in close proximity has already diminished the value of its wider setting. As traffic noise already forms an attribute of the setting of the asset, construction noise would not affect it.	Negligible	Photographic survey to record the current setting of this asset	No change	Neutral

## Appendix 6.6: Less than significant impacts on cultural heritage assets

Asset No.	Asset Name	Value	Description of Impact	Magnitude of Impact	Mitigation	Magnitude of Residual Impact	Significance of Residual Effect
59	Bowl Barrow / Harlow Mound	High	Construction of a Compound Site CS1 at the former plant nursery to the north of the bowl barrow will not have a physical impact on the site. A temporary visual impact from the presence and operation of the compound would occur, filtered by the existing hedgerows and dense woodland plantation surrounding the asset.	Negligible	Protection measures to be put in place during construction	Negligible	Slight
71	Long Barn / 8 to 10 Sheering Drive	Medium	Construction activities along Gilden Way would be largely screened visually by dense roadside trees and hedgerows and other properties including Newhall (Asset 74). As traffic noise already forms an attribute of the setting of the asset, construction noise would not affect this asset.	Negligible	Photographic survey to record the current setting of this asset	No Change	Neutral
76	Almshouses / 13 and 15 Sheering Road	Medium	While construction activities would introduce a source of noise and visual intrusion into the setting of this asset, it would not affect this asset's relationship with the the other well preserved designated and undesignated buildings within the Churchgate Street Conservation Area (Asset 85).	Negligible	Photographic survey to record the current setting of this asset	No Change	Neutral
77	23 Sheering Road / 1 and 2 Millhurst Mews	Medium	While construction activities would introduce a source of noise and visual intrusion into the setting of this asset, it would not affect this asset's relationship with the the other well preserved designated and undesignated buildings within the Churchgate Street Conservation Area (Asset 85).	Negligible	Photographic survey to record the current setting of this asset	No Change	Neutral
85	Churchgate Street Conservation Area	Medium	While construction activities would introduce a source visual intrusion into views northwest from the edge of this conservation area, these would be seen in the context of the existing Gilden Way and would not affect this asset's significant features namely the well preserved traditional buildings the visual relationship between them which create an attractive but inward-looking scene.	Negligible	Photographic survey to record the current setting of this asset	No Change	Neutral
98	Geophysical anomalies west of M11	Medium	Construction of the proposed Sheering Road and Pincey Brook Roundabouts, the Northern Embankment, temporary haul roads, Compound Sites CS2 and CS4, Soil Storage Areas SS2, SS3 and SS7, and Topsoil Storage Areas TS3, TS6 and TS7 would wholly remove these possible archaeological remains.	Major	Archaeological excavation informed by archaeological trial trenching	Minor	Slight
99	163 Sheering Road	Low	While construction activities would introduce a source visual intrusion into views east from this asset, these would be partially screened by all modern larch lap fencing to the east and would be seen in context of the existing Sheering Road. Construction activities would also introduce a source of noise intrusion.	Minor	Photographic survey to record the current setting of this asset	Negligible	Slight

## Appendix 6.6: Less than significant impacts on cultural heritage assets



Asset No.	Asset Name	Value	Description of Impact	Magnitude of Impact	Mitigation	Magnitude of Residual Impact	Significance of Residual Effect
105	Aylmers	High	Distant glimpses of construction activity might be visible from this asset. However, they would be filtered by dense mature tree cover and other vegetation.	Negligible	None	Negligible	Slight
107	Durrington Hall	High	The scheme is located approximately 500m to the south of this asset and would not affect the key relationship between this asset and its well preserved estate buildings (Assets 108, 109 and 110), or the main elements of its gardens and wider landscaped grounds. Views of construction activities would be available from rooms in the first floor and attic but would be filtered by existing vegetation.	Minor	Photographic survey to record the current setting of this asset	Negligible	Slight
112	Housham Hall	Medium	While glimpsed views of construction activities would be visible in views west from this asset, its key relationship its well preserved barns (Assets 113 and 114) would not be affected. Given the distance of this asset from the proposed scheme (approximately 500m) no effects from construction noise are predicted	Negligible	Photographic survey to record the current setting of this asset	No Change	Neutral
113	Barn approximately 25m north of Housham Hall	Medium	While glimpsed views of construction activities would be visible in views west from this asset, its key relationship with Assets 112 and 114 would not be affected. Given the distance of this asset from the Proposed Scheme (approximately 500m) no effects from construction noise are predicted.	Negligible	Photographic survey to record the current setting of this asset	No Change	Neutral
114	Barn approximately 75m south of Housham Hall	Medium	While construction activities would be visible in views west from this asset, its key relationship with Assets 112 and 113 would not be affected. Given the distance of this asset from the Proposed Scheme (approximately 500m) no effects from construction noise are predicted.	Negligible	Photographic survey to record the current setting of this asset	No Change	Neutral
115	Geophysical anomalies east of M11	Medium	Construction of the proposed temporary haul roads, Eastern Dumbell Roundabout, Southbound Merge Slip, Soil Storage Areas SS4 and SS5, and Topsoil Storage Area TS5 would wholly remove these possible archaeological remains.	Major	Archaeological excavation informed by archaeological trial trenching	Minor	Slight
HLT1	20 <sup>th</sup> Century Agriculture	Negligible	Construction of the proposed Sheering Road and Sheering Road Dumbell Roundabout would result in the severance of field boundaries that form elements of this historic landscape type. However given the large area of the HLT its overall legibility would not be affected.	Negligible	None	Negligible	Neutral

Table 2: Predicted less than significant impacts on cultural heritage assets during operation

Asset No.	Asset Name	Value	Description of Impact	Magnitude of Impact	Mitigation	Magnitude of Residual Impact	Significance of Residual Effect
5	Sheering Hall Ringwork	High	This asset is well screened with mature vegetation and the Proposed Scheme would only be visible in glimpsed views southwards. There would be no effect on the key attributes of the setting of this asset (the relationships with Pincey Brook (the source of water for sections of the moat) and the buildings it encloses). As traffic noise from the M11 already forms an attribute of the setting of the asset, changes in noise levels resulting from operation of the Proposed Scheme would not affect this asset.	Negligible	None	Negligible	Slight
6	Barn Approximately 10m north of Sheering Hall	High	The key attributes of setting which contribute to the value of this asset comprise its relationship with Asset 7 and 8 and this relationship would not be affected. Views from Asset 6 are restricted by these assets and surrounding mature vegetation and as such views of the Proposed Scheme would be largely screened.  As traffic noise from the M11 already forms an attribute of the setting of the asset, changes in noise levels resulting from operation of the proposed scheme would not affect this asset.	Negligible	None	Negligible	Slight
7	Barn Approximately 30m north-west of Sheering Hall	High	The key attributes of setting which contribute to the value of this asset comprise its relationship with Asset 6 and 8 and this relationship would not be affected. Views Asset 7 are restricted by these assets and surrounding mature vegetation and as such views of construction activities are likely to be screened.  As traffic noise from the M11 already forms an attribute of the setting of the asset, changes in noise levels resulting from operation of the Proposed Scheme would not affect this asset.	Negligible	None	Negligible	Slight
8	Sheering Hall	High	While the scheme would be visible in glimpsed views south through mature vegetation which surrounds this cultural heritage asset, operation of the scheme would not affect this asset's relationship with Assets 5, 6 and 7, which is the key attribute of its setting.  As traffic noise from the M11 already forms an attribute of the setting of the asset, changes in noise levels resulting from operation of the Proposed Scheme would not affect this asset.	Negligible	None	Negligible	Slight



Appendix 6.6: Less than significant impacts on cultural heritage assets



Asset No.	Asset Name	Value	Description of Impact	Magnitude of Impact	Mitigation	Magnitude of Residual Impact	Significance of Residual Effect
29	129 Sheering Road	Low	<p>Operation of the Proposed Scheme would not affect the relationship of this asset with the surviving elements of The Champions group (Asset 32) such as the garden wall. The roadside location of this asset which contributes to our understanding of its historic function as a gatelodge would also not be affected.</p> <p>As traffic noise already forms an attribute of the setting of the asset, changes in noise levels resulting from operation of the Proposed Scheme would not affect this asset.</p>	Negligible	None	Negligible	Neutral
31	Mayfield Farm	Low	<p>While visible in views to the north, northwest and southwest, operation of the scheme would not affect the relationship between the buildings in this range, or the relationship with other surrounding agricultural buildings.</p> <p>As traffic noise already forms an attribute of the setting of the asset, changes in noise levels resulting from operation of the Proposed Scheme would not affect this asset.</p>	Negligible	None	Negligible	Neutral
32	Champions	Low	<p>During operation the scheme would be visible in views south and southeast from this asset. These would be partially screened by this asset's tall garden wall which flanks the north side of Sheering Road, and by dense mature trees.</p> <p>As traffic noise already forms an attribute of the setting of the asset, changes in noise levels resulting from operation of the proposed scheme would not affect this asset.</p>	Negligible	None	Negligible	Neutral
49	Old Harlow Conservation Area	Medium	<p>While the Proposed Scheme would be visible in views south from this asset, it would not affect the key attributes of the setting of this asset which contribute to its value (the well preserved traditional buildings, focal point around the Green Man public house, and mature trees and roadside verges, which create an attractive but inward-looking scene).</p>	Negligible	None	Negligible	Neutral
71	Long Barn / 8 to 10 Sheering Drive	Medium	<p>Views of the Proposed Scheme from this assets would be largely screened, screened by existing timber fence, dense roadside trees and hedgerows and and other properties including Newhall (Asset 74).</p>	Negligible	None	Negligible	Neutral
76	Almshouses / 13 and 15 Sheering Road	Medium	<p>Operation of the Proposed Scheme would not affect this asset's relationship with the other well preserved designated and undesignated buildings within the Churchgate Street Conservation Area (Asset 85).</p>	Negligible	None	Negligible	Neutral

## Appendix 6.6: Less than significant impacts on cultural heritage assets



Asset No.	Asset Name	Value	Description of Impact	Magnitude of Impact	Mitigation	Magnitude of Residual Impact	Significance of Residual Effect
77	23 Sheering Road / 1 and 2 Millhurst Mews	Medium	Operation of the Proposed Scheme would not affect this asset's relationship with the other well preserved designated and undesignated buildings within the Churchgate Street Conservation Area (Asset 85).	Negligible	None	Negligible	Neutral
85	Churchgate Street Conservation Area	Medium	While the scheme would be visible in views northwest from the edge of this conservation area, it would not affect this asset's significant features namely the well preserved traditional buildings the visual relationship between which create an attractive but inward-looking scene.	Negligible	None	Negligible	Neutral
99	163 Sheering Road	Low	Although the asset would retain its roadside setting, the embankment of Sheering Lower Road would make the Proposed Scheme prominent in views east from the asset. The raised profile of Sheering Lower Road would also increase the prominence of traffic movement and noise, further affecting its setting.	Minor	Woodland screen planting	Negligible	Neutral
103	49 Mulberry Green / Former Police Station	Low	The proposed noise barrier south and in front of the former police station would have an impact on the setting of this asset. Like many early police stations, it was positioned close to a main road with an open aspect to advertise its presence to the public. Although now a private residence, the proposed noise barrier would impact on its setting by obscuring views of it from the street, and affecting our understanding of its function.	Moderate	Sensitive design of noise barrier and construction in materials sympathetic to the style of the asset.	Minor	Slight
105	Aylmers	High	Views of the proposed scheme and particularly of moving traffic and street lighting would be filtered by existing dense mature tree cover. The relationship between this building and its associated barn (Asset 106) would not be affected.	Minor	Woodland screen planting	Negligible	Slight
107	Durrington Hall	High	Views of the Proposed Scheme from this asset would be largely filtered by existing vegetation and the relationship between this building and its well preserved estate buildings (Assets 108, 109 and 110) and the main elements of its gardens and wider landscaped grounds would not be affected.	Minor	Woodland screen planting	Negligible	Slight
112	Housham Hall	Medium	While the Proposed Scheme would be visible in views west from this asset, operation of the Proposed Scheme would not affect this assets key relationship its well preserved barns (Assets 113 and 114).	Negligible	None	Negligible	Neutral

Appendix 6.6: Less than significant impacts on cultural heritage assets



Asset No.	Asset Name	Value	Description of Impact	Magnitude of Impact	Mitigation	Magnitude of Residual Impact	Significance of Residual Effect
113	Barn approximately 25m north of Housham Hall	Medium	While the Proposed Scheme would be visible in views west from this asset, operation of the Proposed Scheme would not affect this assets key relationship with Assets 112 and 114.	Negligible	None	Negligible	Neutral
114	Barn approximately 75m south of Housham Hall	Medium	While the Proposed Scheme would be visible in views west from this asset, operation of the Proposed Scheme would not affect this assets key relationship with Assets 112 and 113.	Negligible	None	Negligible	Neutral
HLT1	20 <sup>th</sup> Century Agriculture	Negligible	Severance of this historic landscape which started during construction would continue into operation. However given the large area of the HLT its overall legibility would not be affected.	Negligible	None	Negligible	Neutral

## **Appendix 6.7: Results of Additional Geophysical Survey**



MEJS/02



# M11 JUNCTION 7A, HARLOW, ESSEX

## ADDITIONAL GEOPHYSICAL SURVEY

commissioned by Ringway Jacobs  
on behalf of Essex County Council (ECC)

November 2016



# M11 JUNCTION 7A, HARLOW, ESSEX

## ADDITIONAL GEOPHYSICAL SURVEY

commissioned by Ringway Jacobs  
on behalf of Essex County Council (ECC)

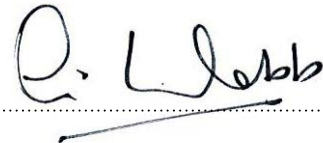
November 2016

project info

HA JOB NO. MEJS/02  
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PARISH Sheering, Matching  
LOCAL AUTHORITY Essex County Council  
OASIS REF. headland5-267219

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# PROJECT SUMMARY

Headland Archaeology (UK) Ltd undertook a second geophysical (magnetometer) survey, covering approximately 6 hectares, to provide supplementary information on the archaeological potential of land that will be impacted by the proposed scheme to construct a new junction north of Junction 7 on the M11, north-east of Harlow, Essex. The survey has identified a circular anomaly interpreted as a round barrow and other linear and discrete anomalies that may also be of archaeological origin, possibly indicative of ditches which may form part of an early field system.

The results and interpretation of the initial survey have been re-assessed in light of the current results and this has allowed for a slight revision of the overall interpretation; both data sets and interpretations are presented in this report. Overall the surveys have identified two areas of archaeological potential. The first is to the centre of the new link road which will connect the M11 with Sheering Road (Areas 5, 11 and 14). Two round barrows are clearly identified together with several discontinuous ditch type anomalies which appear to respect the barrows. This area is assessed to be of moderate to high potential. The second is to the east of the M11, in Area 15 and Area 16, where several discontinuous linear anomalies and pit type responses may locate another area of archaeological activity. However, no clear archaeological pattern is evident and these linear anomalies might equally plausibly be interpreted as the result of recent cultivation or drainage. This area is assessed as of moderate potential. Elsewhere across the majority of the scheme footprint the archaeological potential is assessed as low.

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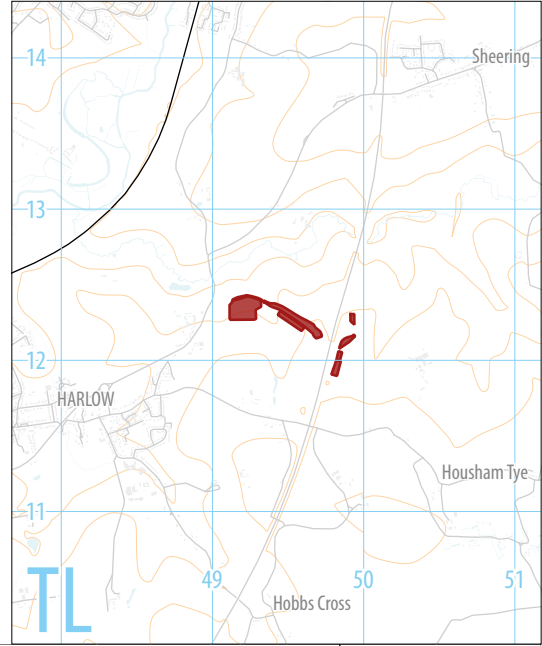
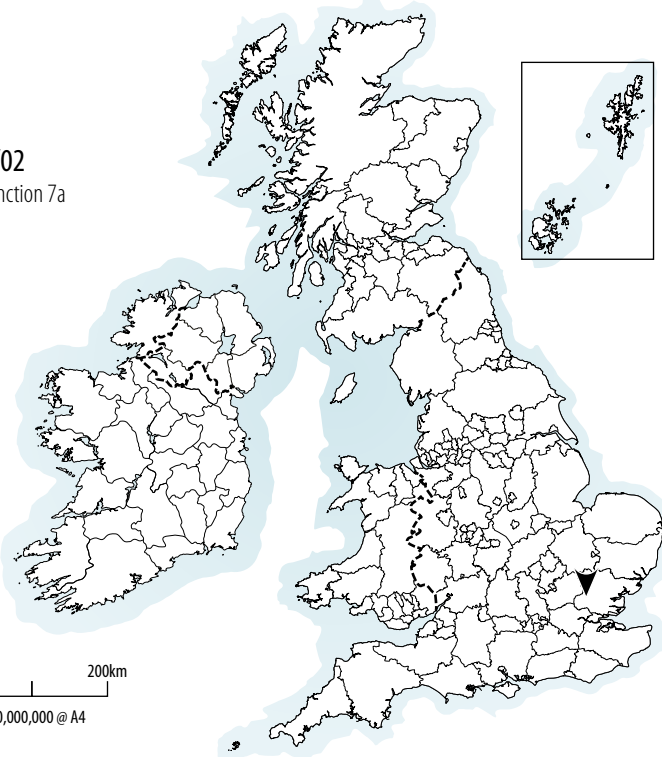
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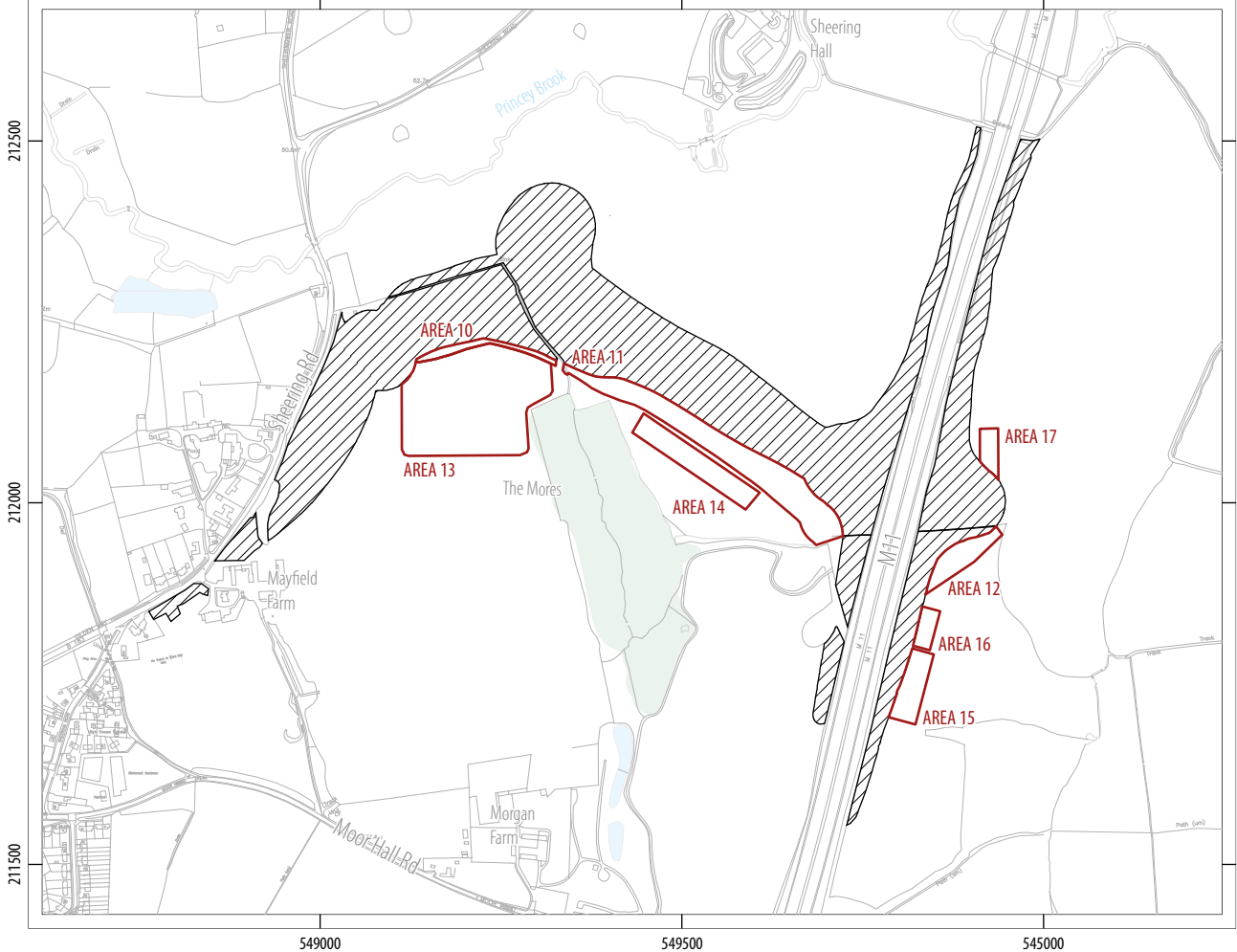
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MEJS/02  
M11 Junction 7a  
Harlow  
Essex

0 200km  
1:10,000,000 @ A4



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0 200m  
1:10,000 @ A4

KEY  
 geophysical survey area  
 previous geophysical survey area



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# M11 JUNCTION 7A, HARLOW, ESSEX

## ADDITIONAL GEOPHYSICAL SURVEY

### 1 INTRODUCTION

Headland Archaeology (UK) Ltd was commissioned by Ringway Jacobs (The Client) on behalf of Essex County Council (ECC) to undertake a geophysical (magnetometer) survey at the site of a proposed new motorway junction (Junction 7A) on the M11 motorway and associated link road connecting Sheering Road (B183) to Gilden Way (see Illus 1). The geophysical survey was requested by Maria Medlycott, Archaeological Planning Archaeologist at ECC.

The work was undertaken in accordance with a Written Scheme of Investigation (WSI) (Ringway Jacobs 2016), with guidance within the National Planning Policy Framework (DCLG 2012) and in line with current best practice (Chartered Institute for Archaeologists 2014; English Heritage 2008).

The current survey was carried out between October 17th and October 19th 2016 in order to assess the archaeological potential of eight additional parcels of land which have been added to the scheme to accommodate design changes, topsoil storage areas and contractors compounds.

#### 1.1 SITE LOCATION, TOPOGRAPHY AND LAND-USE

The survey covered eight irregularly-shaped parcels of land (Area 10 to Area 17) covering approximately 6 hectares. Areas 10, 11, 13 and 14 are on the south side of the proposed new link road corridor which will connect the M11 with Sheering Road (B183). Areas 12, 15, 16 and 17 are to the east of the M11. The road scheme footprint is located within a rolling landscape. The highest point is at 73m above Ordnance Datum (AOD) to the north of Area 2 with the land generally sloping down to the north-west towards Princey Brook. The lowest point is at 44m AOD to the north-west of Area 5. At the time of the survey Area 10 and Area 13 contained a recently germinated arable crop (see Illus 2) as did Area 11 and Area 14 (see Illus 3). Area 17 had been ploughed (see Illus 4) and Areas 12, 15 and 16 had been recently drilled and seeded (see Illus 5).

#### 1.2 GEOLOGY AND SOILS

The underlying geology comprises London Clay Formation sedimentary bedrock comprised of clay, silt and sand, which is overlain by superficial deposits of Lowestoft Formation diamicton.

A narrow band of head (clay, silt, sand and gravel) is recorded in the centre of the survey area running north/south alongside a drainage ditch through Area 5, Area 11 and Area 14 (NERC 2016).

The soils within the lower-lying northern part of the scheme are classified in the Soilscape 7 association which are characterised as freely draining, slightly acid base-rich soils. Elsewhere, the soils are classified in the Soilscape 9 association, which are characterised as lime-rich loams and clays with impeded drainage (Cranfield University 2016).

### 2 ARCHAEOLOGICAL BACKGROUND

A Heritage Statement (Jacobs 2014) compiled baseline heritage data for a study area extending 300m in all directions from the proposed scheme. Within the study area no heritage assets of High value were identified although nine assets of Medium value were identified including prehistoric and Roman archaeological remains, cropmarks and find spots. Four heritage assets were identified within the geophysical survey area including Potter's Croft Field Name (Negligible value), the site of a Neolithic polished axe (Low value), the site of Moor Hall (Medium value) and the site of an Iron Age arrowhead and core (Low value). The Heritage Statement concluded that there is potential for unknown archaeological remains within the scheme footprint.

The first stage of geophysical survey (Headland 2016a) identified a circular anomaly, interpreted as a round barrow, in Area 5 together with three ditch type anomalies.

#### 2.1 AIMS, METHODOLOGY AND PRESENTATION

The main aim of the geophysical survey was to provide sufficient information to enable an assessment to be made of the impact of the proposed road scheme on any potential sub-surface archaeological remains.

The general archaeological objectives of the geophysical survey were:

- › to determine (so far as possible) the presence or absence of buried archaeological remains in the survey areas;





**ILLUS 2** Area 13 and Area 10, looking north-west    **ILLUS 3** Area 11 and Area 14, looking south    **ILLUS 4** Area 17, looking east    **ILLUS 5** Area 12, Area 16 and Area 15, looking south-east

- › to clarify the extent and layout of known sites of archaeological interest within or adjacent to the study area;
- › to clarify the extent and layout of previously unknown buried remains within the survey areas; and
- › to interpret any geophysical anomalies identified by the survey.

## 2.2 MAGNETOMETER SURVEY

Magnetic survey methods rely on the ability of a variety of instruments to measure very small magnetic fields associated with buried archaeological remains. Features such as a ditch, pit or kiln can act like a small magnet, or series of magnets, that produce distortions (anomalies) in the earth's magnetic field. In mapping these slight variations, detailed plans of sites can be obtained as buried features often produce reasonably characteristic anomaly shapes and strengths (Gaffney and Gater 2003). Further information on soil magnetism and the interpretation of magnetic anomalies is provided in Appendix 1.

The survey was undertaken using four Bartington Grad601 sensors mounted at 1m intervals (1m traverse interval) onto a rigid carrying frame. The system was programmed to take readings at a frequency of 10Hz (allowing for a 10–15cm sample interval) on roaming traverses 4m apart. These readings were stored on an external weatherproof laptop and later downloaded for processing and interpretation. The system was linked to a Trimble R8s Real Time Kinetic (RTK) differential

Global Positioning System (dGPS) outputting in NMEA mode to ensure a high positional accuracy for each data point.

MLGrad601 and MultiGrad601 (Geomar Software Inc.) software was used to collect and export the data. Terrasurveyor V3.0.31.0 (DWConsulting) software has been used to process and present the data.

## 2.3 REPORTING

A general site location plan is shown in Illus 1 at a scale of 1:10,000. Illus 2 to Illus 5 are site condition photographs. A large scale (1:5,000) survey location plan showing the processed greyscale magnetometer data is presented in Illus 6. An overall interpretative plot is shown at the same scale in Illus 7.

Detailed data plots (greyscale and XY trace) and interpretative illustrations are presented at a scale of 1:1000 in Illus 8 to Illus 19.

Technical information on the equipment used, data processing and magnetic survey methodology is given in Appendix 1. Appendix 2 details the survey location information and Appendix 3 describes the composition and location of the site archive. Data processing details are presented in Appendix 4. A copy of the OASIS entry (Online Access to the Index of Archaeological Investigations) is reproduced in Appendix 5.

The survey methodology, report and any recommendations comply with the Written Scheme of Investigation (Ringway Jacobs 2016)

and guidelines outlined by Historic England (English Heritage 2008) and by the Chartered Institute for Archaeologists (CIfA 2014). All illustrations reproduced from Ordnance Survey (OS) mapping are with the permission of the controller of Her Majesty's Stationery Office (© Crown copyright).

The illustrations in this report have been produced following analysis of the data in 'raw' and processed formats and over a range of different display levels. All illustrations are presented to most suitably display and interpret the data from this site based on the experience and knowledge of management and reporting staff.

### 3 RESULTS AND DISCUSSION

Generally, the survey has detected a variable magnetic background throughout partly due to the presence of superficial deposits of head and diamicton throughout the scheme but also due to the survey areas having been recently ploughed and re-seeded. The recent agricultural activity accounts for the noticeable difference in magnetic background between the data from this survey when compared to the background in adjoining areas surveyed seven months previously. Against this background, numerous discrete and linear anomalies have been identified. These are discussed below and cross-referenced to specific examples on the interpretive figures, where appropriate.

#### 3.1 FERROUS ANOMALIES

Ferrous anomalies, characterised as individual 'spikes', are typically caused by ferrous (magnetic) material, either on the ground surface or in the plough-soil. Little importance is normally given to such anomalies, unless there is any supporting evidence for an archaeological interpretation, as modern ferrous debris or material is common on most sites, often being present as a consequence of manuring or tipping/infilling. There is no clustering to the ferrous anomalies to suggest that the responses are caused by anything other than random ferrous debris in the plough-soil.

#### 3.2 AGRICULTURAL ANOMALIES

Analysis of historical mapping indicates that the division of land within the PDA has undergone minor alterations since unchanged since the publication of the first edition OS map in 1875. These alterations include the removal of field boundaries from within Area 13, Area 11 and Area 15. The former boundaries manifest in the data as linear anomalies, (see Illus 7 – FB1–FB3). FB2 and FB3 were identified in the previous survey as anomalies B and C (Headland 2016a).

Within the lower-lying parts of the survey area in Area 11, Area 13 and Area 14 linear trend anomalies of varying magnitude are interpreted as field drains.

Elsewhere, several faint linear anomalies are identified on a number of different alignments. These are generally aligned parallel with, or at right angles to, existing or historical field boundaries and are likely to be reflect the direction of recent cultivation.

#### 3.3 GEOLOGICAL ANOMALIES

Discrete areas of magnetic enhancement are identified across the proposed scheme. These are generally sparsely distributed and are thought to be due to localised variations in the soils and the superficial deposits from which they derive.

A narrow band of enhanced responses, G1, extending across the western end of Area 11 is the continuation of anomaly H recorded in the previous survey which corresponds to a slight break of slope and also to a band of superficial head deposits. The anomaly is caused by the accumulation of deposits at this location.

#### 3.4 ARCHAEOLOGICAL AND POSSIBLE ARCHAEOLOGICAL ANOMALIES

A clear circular anomaly, RB1, has been identified in Area 14, centred on NGR TL 4957 1222. The anomaly, caused by a soil-filled ditch, measures 24m in diameter and is interpreted as a round barrow. It is located 220m south-east of another barrow of identical dimensions identified by the previous survey in Area 5. A linear ditch type anomaly, D1, is also recorded immediately to the south of the barrow, aligned east/west and this is also interpreted as of probable archaeological origin. A very weak linear trend, D2, further to the west in Area 14 marks the continuation of another possible ditch type anomaly identified in the previous survey which skirts the eastern side of another barrow.

To the east of the M11, in Area 12, a short linear anomaly, D3, and two possible pit anomalies, P1 and P2, have been interpreted as of possible archaeological origin.

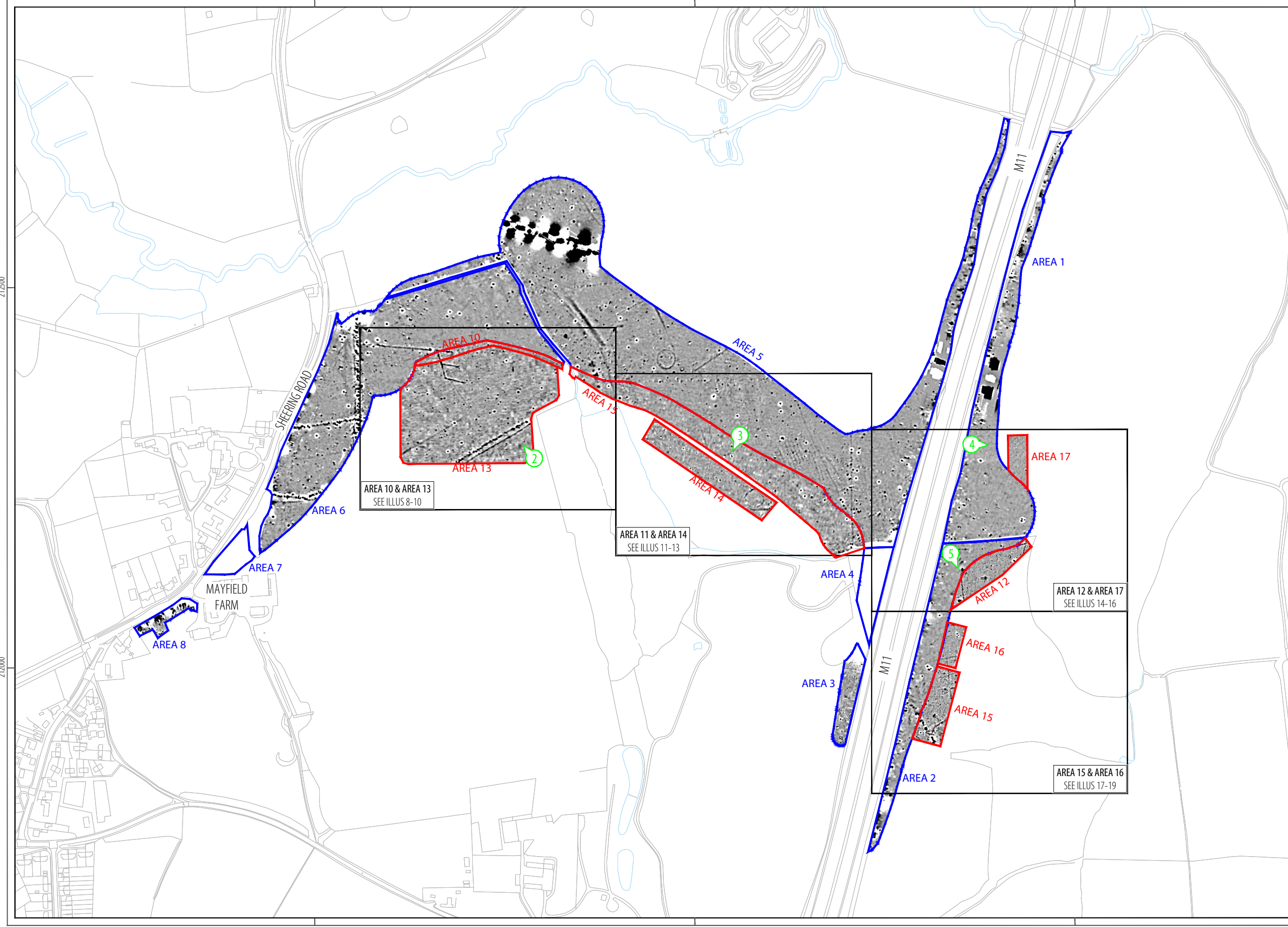
Immediately to the south of Area 12, in Area 15 and Area 16, a cluster of low magnitude linear trend anomalies and discrete anomalies has been identified (Illus 19 – D4, D5, and P4–P8) are also interpreted as possible ditches and pits. In all three of these areas it is difficult to be confident of an archaeological interpretation given the relatively small survey area and the absence of an obvious pattern. Nevertheless an archaeological interpretation is considered possible although recent agricultural activity and geological variation could equally account for the recorded responses.

### 4 CONCLUSION

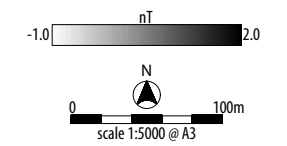
Assessed together the two geophysical surveys have demonstrated the potential for the presence of sub-surface archaeological remains within the areas that will be directly impacted by the proposed road scheme improvements and indirectly through the temporary creation of soil storage areas and site compounds. Of most clear potential are the two round barrows located to the west of the M11. Linear ditch type anomalies appear to respect the barrows and may form part of an early field system. The archaeological potential here is assessed as moderate to high. To the east of the motorway a cluster of ditch and pit type anomalies may locate a small area of archaeological activity although the limited survey area and absence of a clear pattern makes an archaeological interpretation less certain. The archaeological potential here is assessed as moderate. Across the remainder of the survey areas the potential is considered to be low.

## 5 REFERENCES

- Chartered Institute for Archaeologists (CIfA) 2014 *Standard and guidance for archaeological geophysical survey* [online document] Accessed from [http://www.archaeologists.net/sites/default/files/CIfA&GGeophysics\\_1.pdf](http://www.archaeologists.net/sites/default/files/CIfA&GGeophysics_1.pdf)
- Cranfield University 2016 *Cranfield Soil and Agrifood Institute Soilscales* [online] Accessed 25 October 2016 from [www.landis.org.uk/soilscales/](http://www.landis.org.uk/soilscales/)
- Department of Communities and Local Government (DCLG) 2012 *National Planning Policy Framework* [online document] Accessed from [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/6077/2116950.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf)
- English Heritage 2008 *Geophysical Survey in Archaeological Field Evaluation: Research and Professional Services Guidelines* (2nd edition) [online document] Accessed from <http://content.historicengland.org.uk/images-books/publications/geophysical-survey-in-archaeological-field-evaluation/geophysics-guidelines.pdf>
- Gaffney, C & Gater, J 2003 *Revealing the Buried Past: Geophysics for Archaeologists* The History Press: Stroud
- Headland Archaeology 2016a *M11 Junction 7a, Essex; Geophysical Survey* Unpublished document
- Jacobs 2014 *M11 Junction 7A; Heritage Statement*
- Natural Environment Research Council (NERC) 2016 *British Geological Survey* [online] Accessed 25 October 2016 from <http://www.bgs.ac.uk/>
- Ringway Jacobs 2016 *M11 Junction 7a; Written Scheme of Investigation for Archaeological Geophysical Survey* R0.5



- geophysical survey area
- previous geophysical survey area
- location and direction of ILLUS 2-5



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M11 Junction 7a  
Additional Geophysical Survey  
Harlow  
Essex

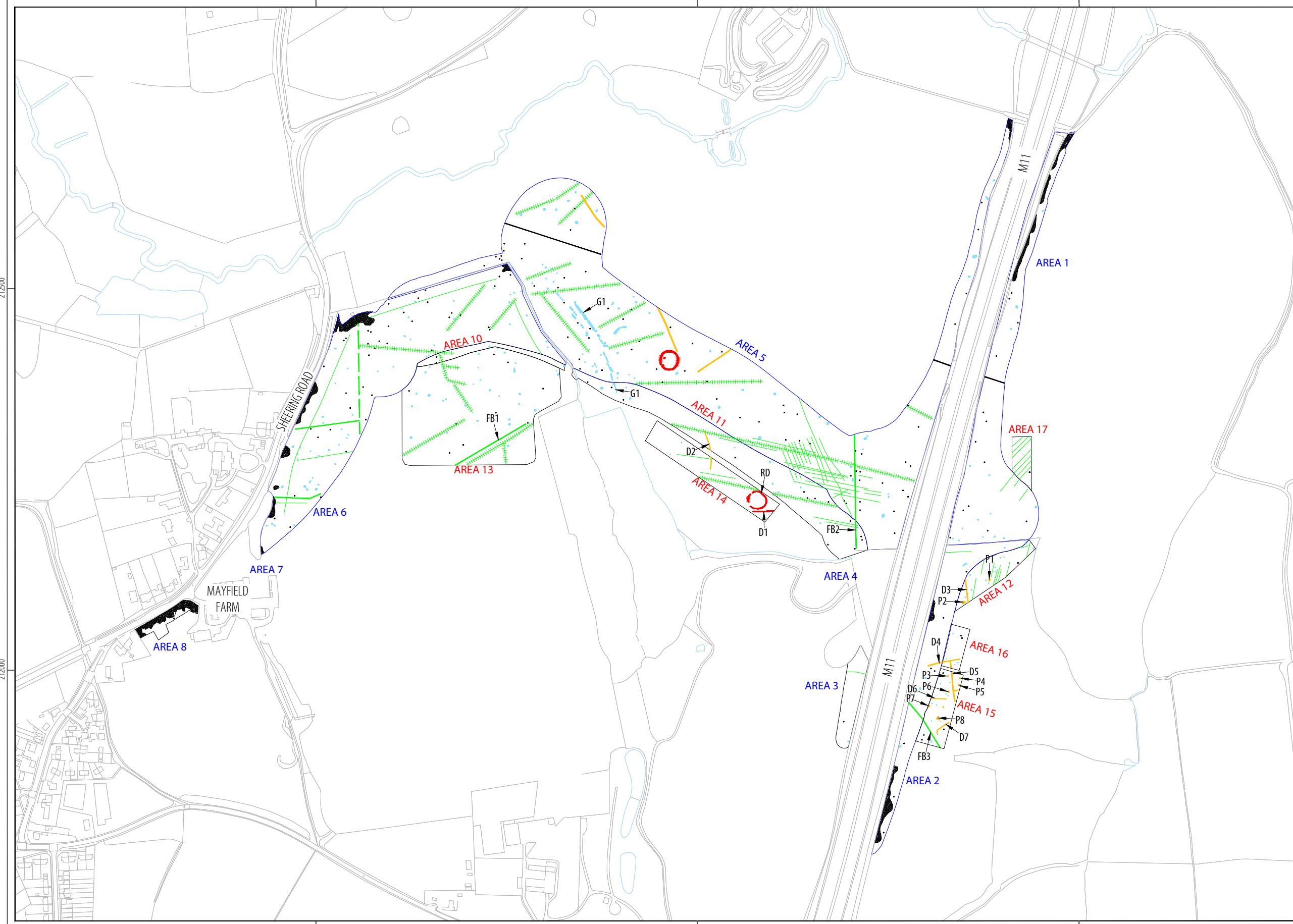
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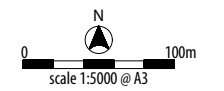
ILLUS 6 Survey location showing processed greyscale magnetometer data





TYPE OF ANOMALY	INTERPRETATION
● dipolar isolated	ferrous material
● magnetic disturbance	ferrous material
— dipolar linear	service pipe
— linear trend	agricultural
— linear trend	field drain
— linear	former field boundary
— linear	former field boundary?
● magnetic enhancement	geology?
● magnetic enhancement	archaeology?
● magnetic enhancement	archaeology

ABBREVIATIONS	
D	ditch
FB	former boundary
G	geology
P	pit
RD	ring-ditch



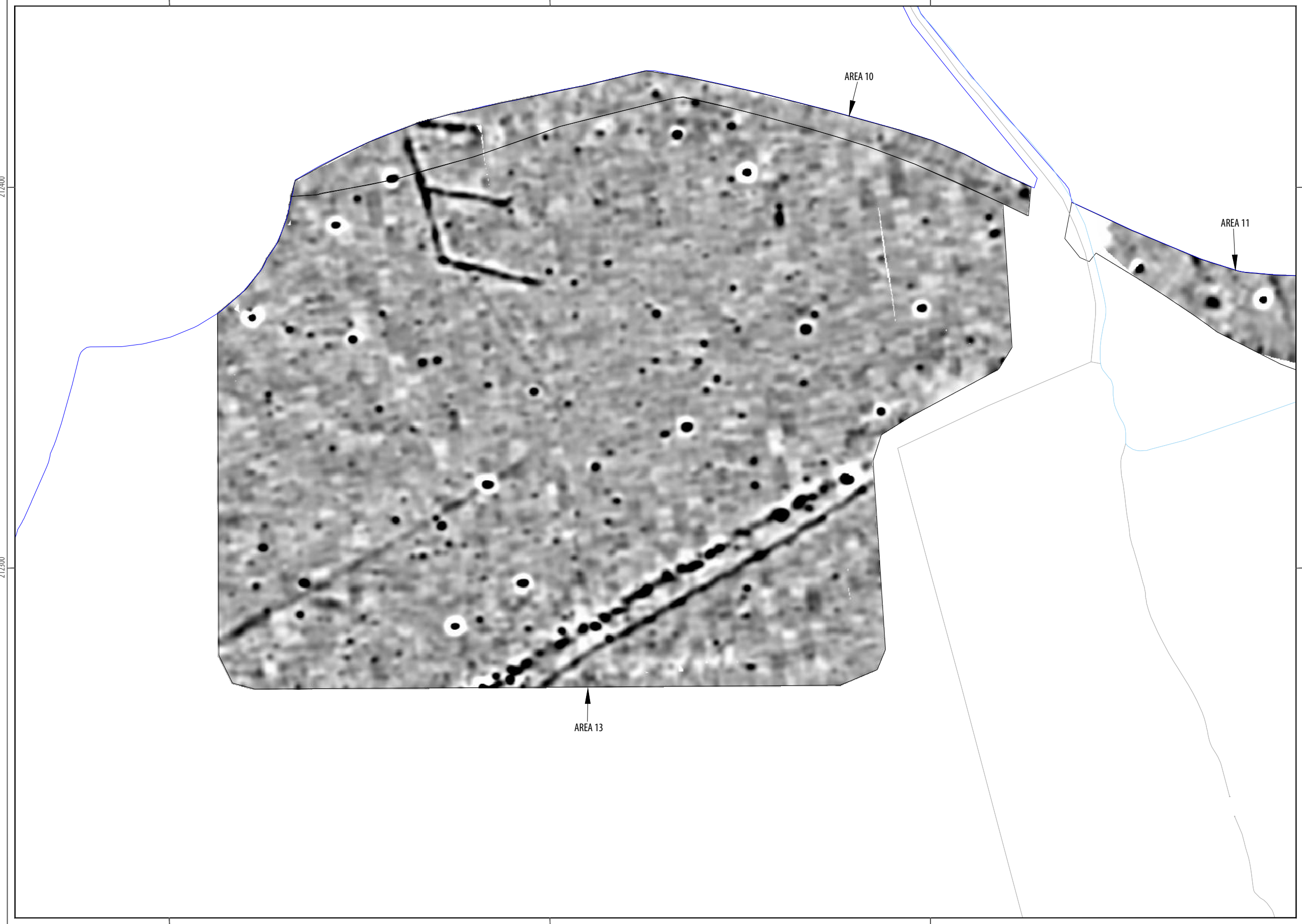
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Harlow  
Essex

CLIENT Ringway Jacobs

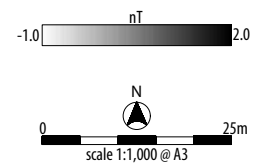


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ILLUS 7 Overall interpretation of geophysical survey



previous geophysical survey area

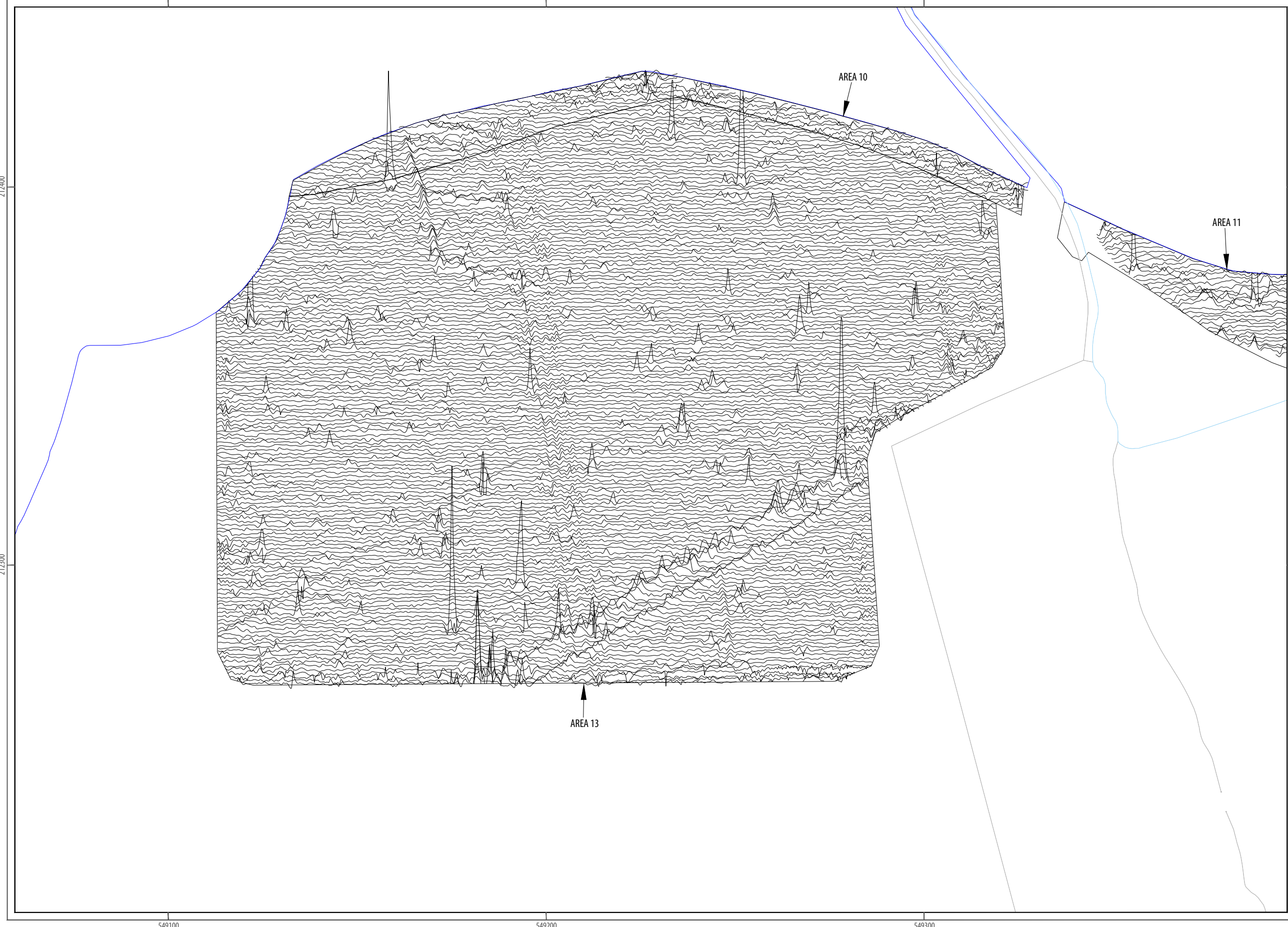


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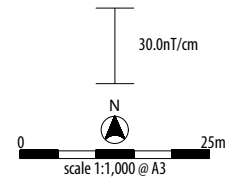


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previous geophysical survey area

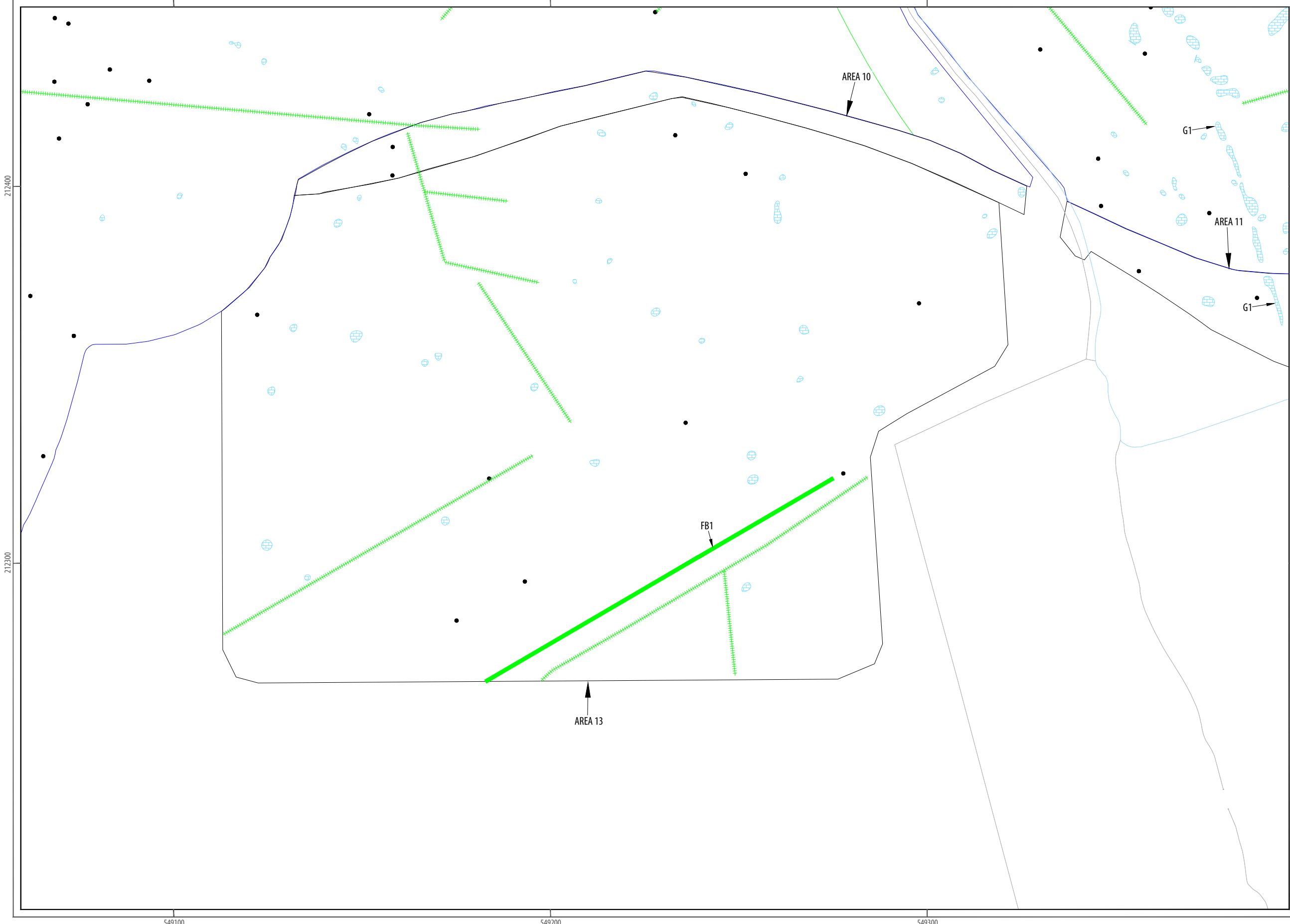


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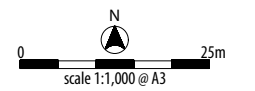
ILLUS 9 XY trace plot of minimally processed magnetometer data; Area 10 & Area 13



TYPE OF ANOMALY	INTERPRETATION
● dipolar isolated	ferrous material
— linear trend	agricultural
--- linear trend	field drain
— linear	former field boundary
⊕ magnetic enhancement	geology?

ABBREVIATIONS
FB former boundary
G geology



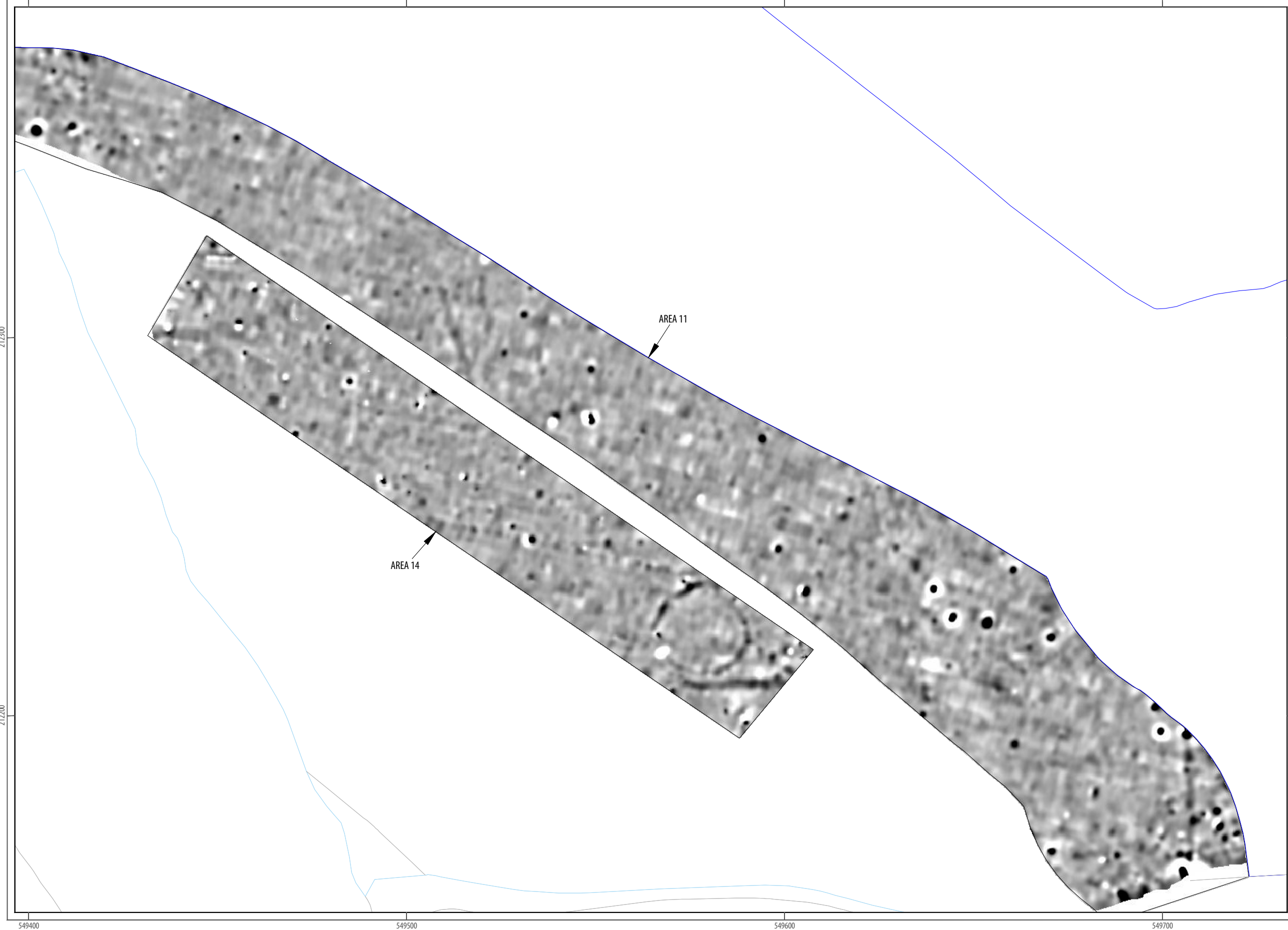
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Harlow  
Essex

CLIENT Ringway Jacobs

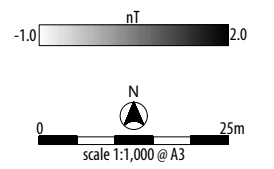


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ILLUS 10 Interpretation of processed magnetometer data; Area 10 & Area 13



previous geophysical survey area



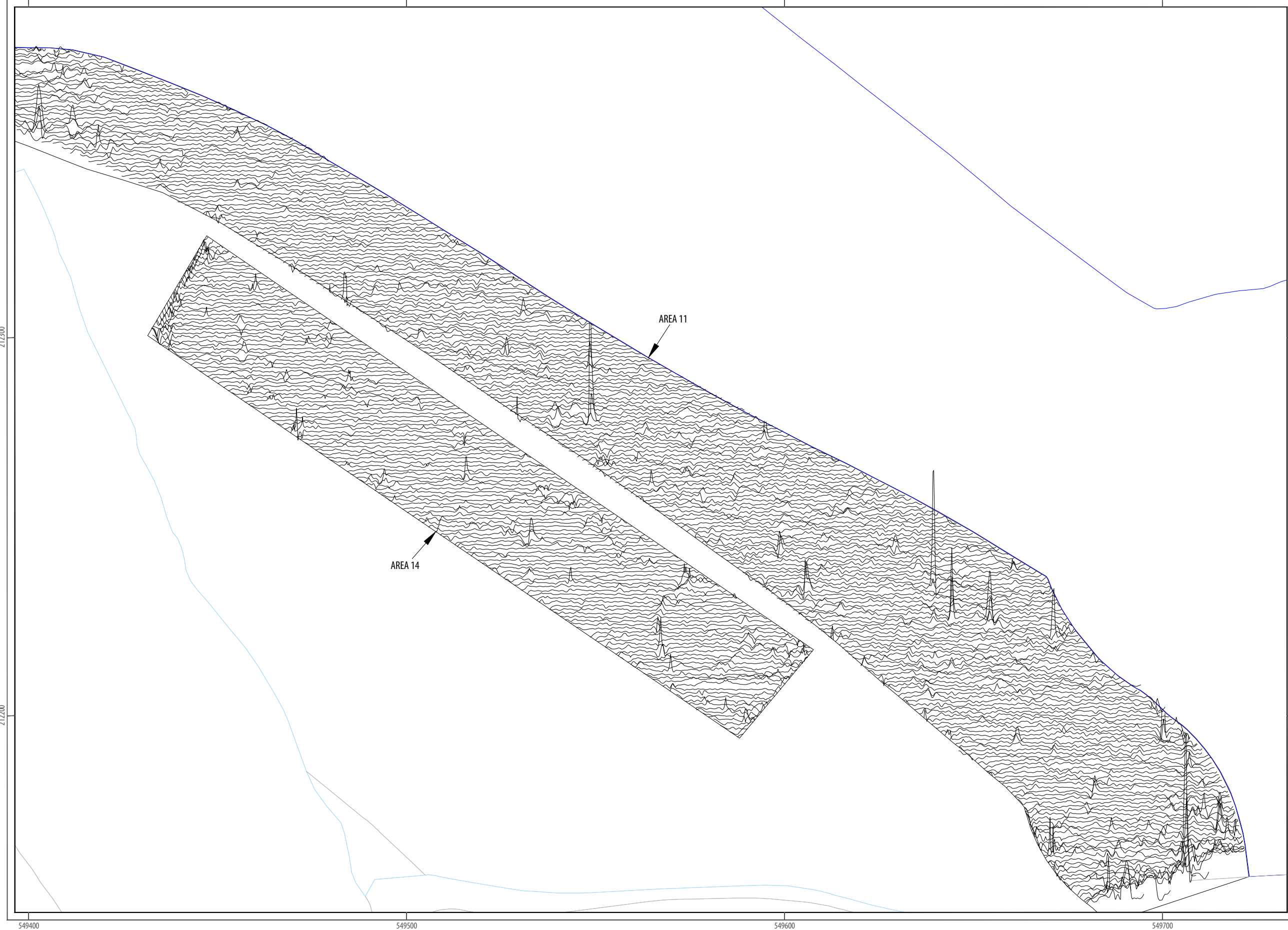
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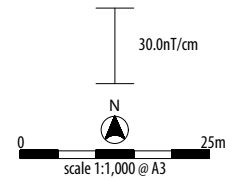
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ILLUS 11 Processed greyscale magnetometer data; Area 11 & Area 14





previous geophysical survey area

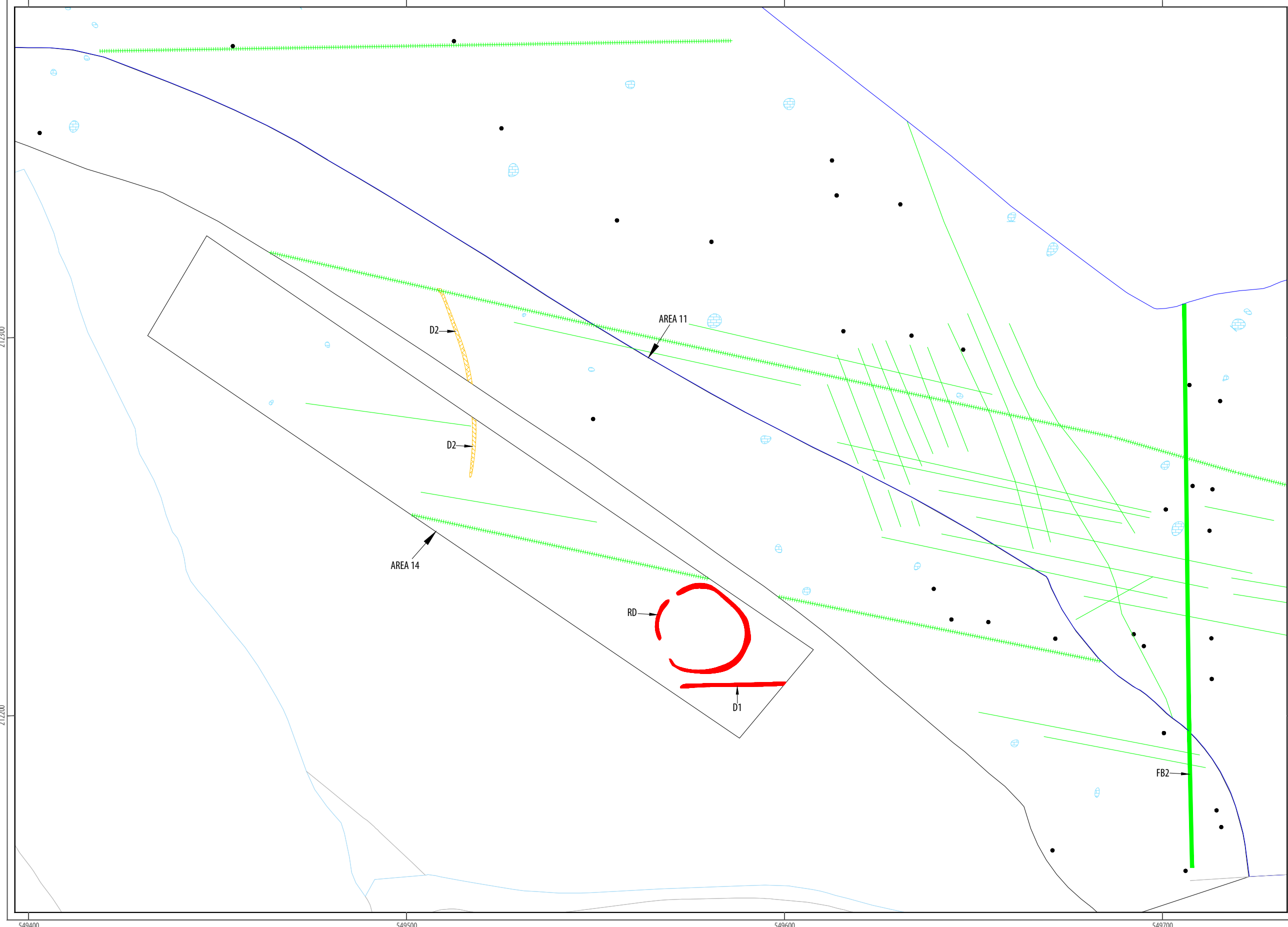


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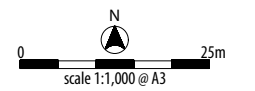
ILLUS 12 XY trace plot of minimally processed magnetometer data; Area 11 & Area 14



TYPE OF ANOMALY	INTERPRETATION
● dipolar isolated	ferrous material
— linear trend	agricultural
— linear trend	field drain
— linear	former field boundary
⊕ magnetic enhancement	geology?
⊗ magnetic enhancement	archaeology?
● magnetic enhancement	archaeology

ABBREVIATIONS	
D	ditch
FB	former boundary
RD	ring-ditch

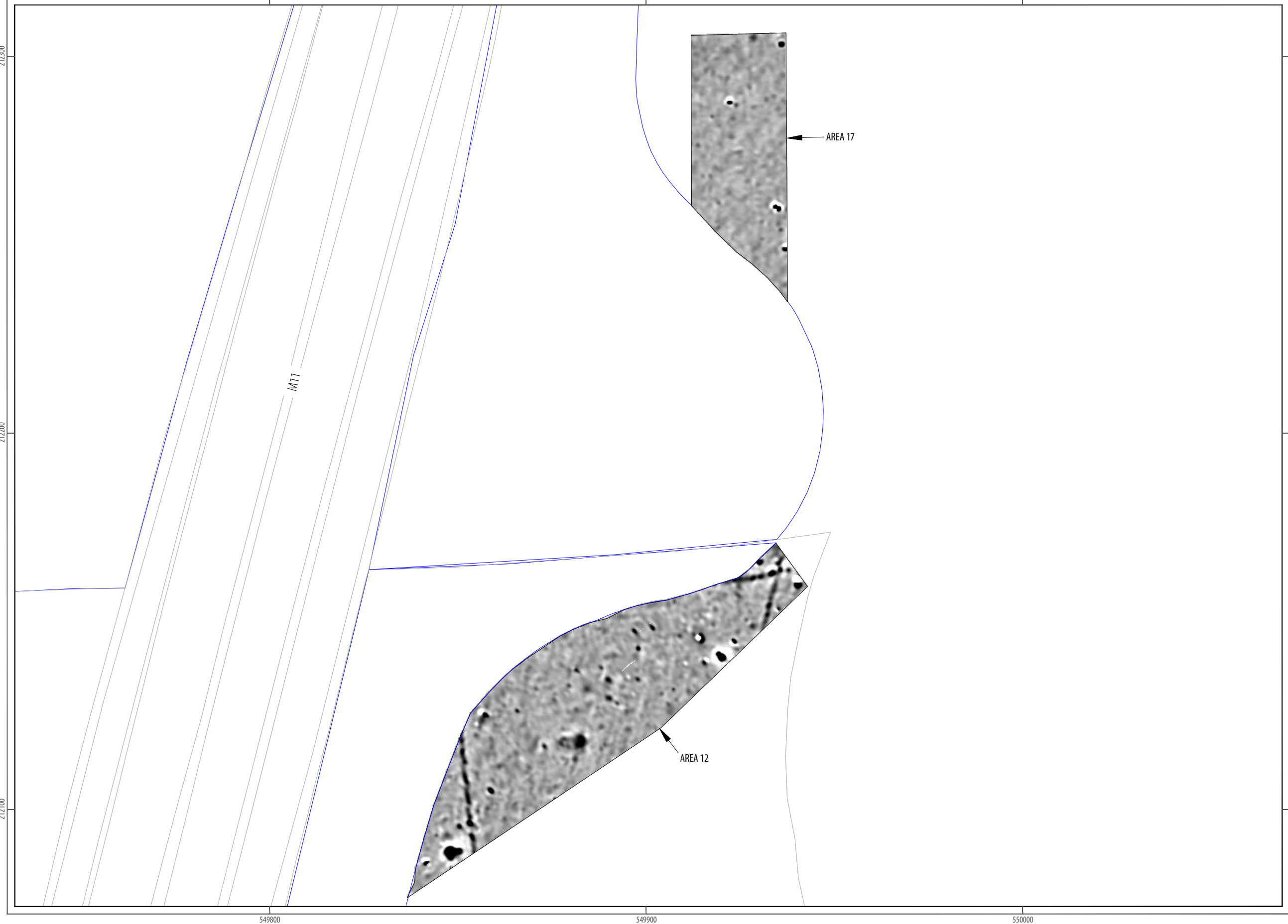


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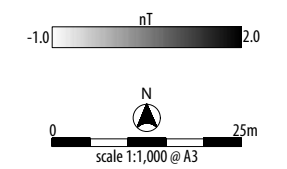


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ILLUS 13 Interpretation of magnetometer data; Area 11 & Area 14



previous geophysical survey area



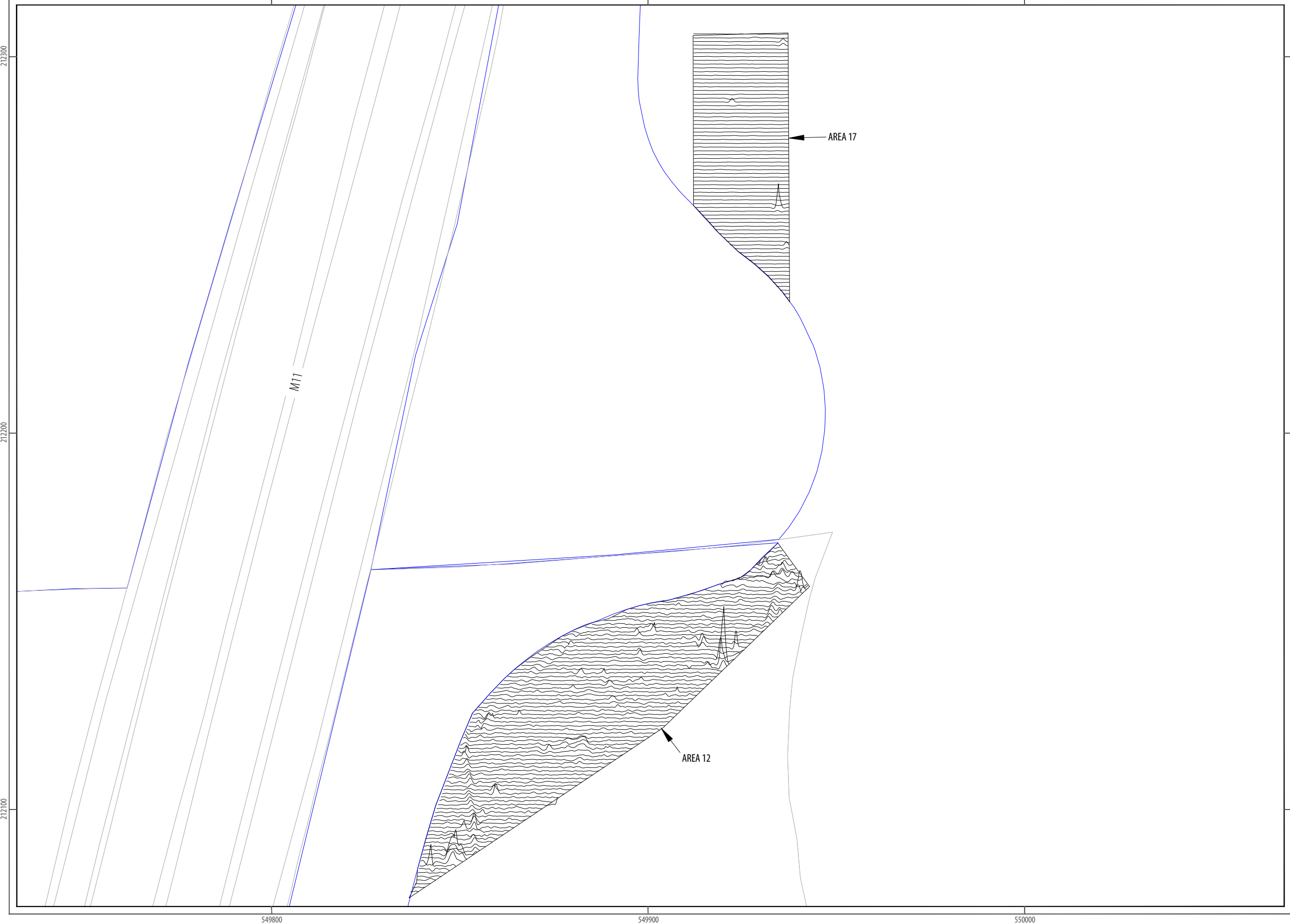
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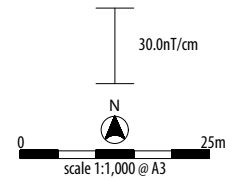
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ILLUS 14 Processed greyscale magnetometer data; Area 12 & Area 17





previous geophysical survey area

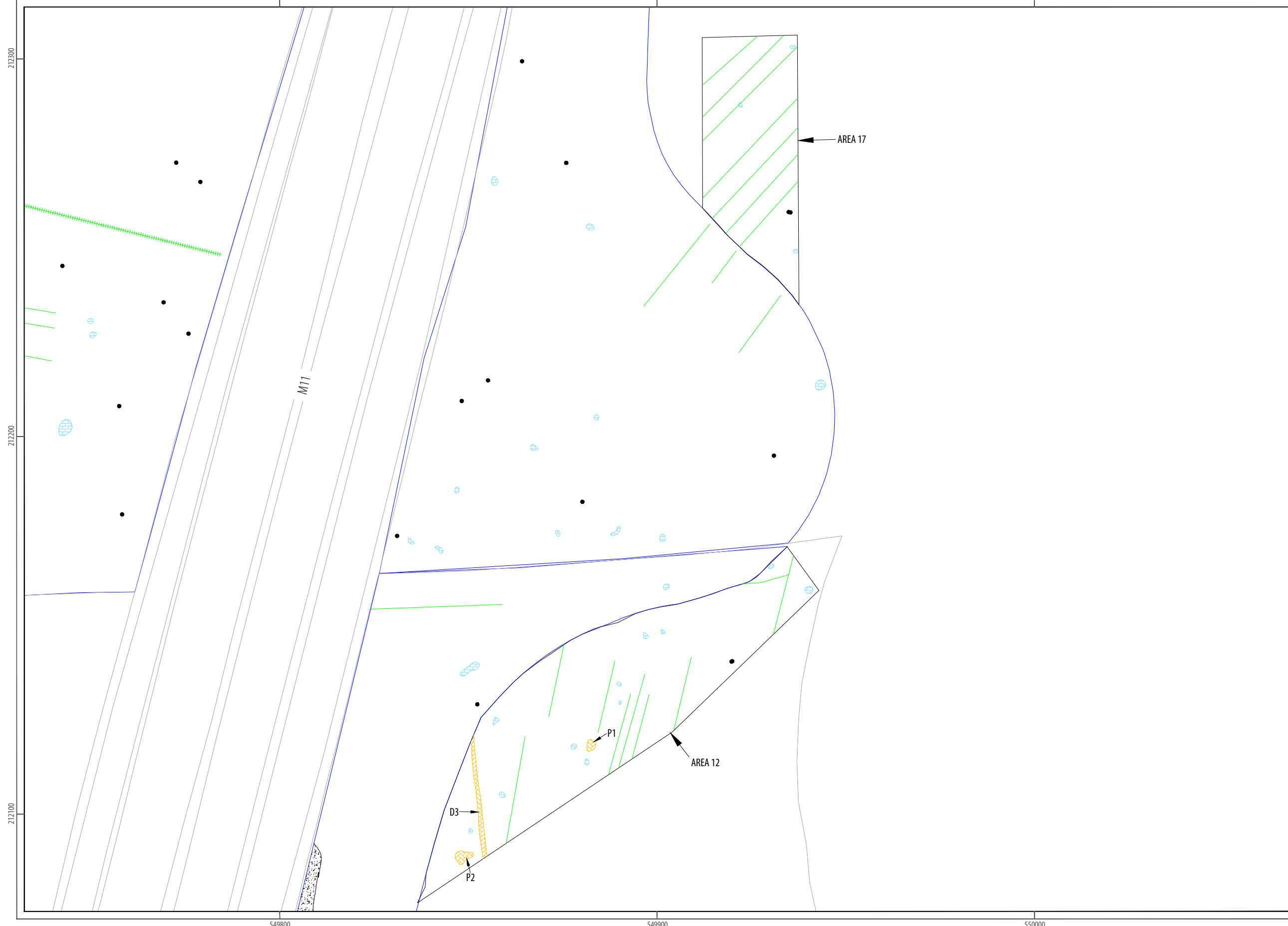


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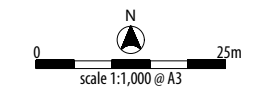
ILLUS 15 XY trace plot of minimally processed magnetometer data; Area 12 & Area 17



TYPE OF ANOMALY	INTERPRETATION
● dipolar isolated	ferrous material
● magnetic disturbance	ferrous material
— linear trend	agricultural
— linear trend	field drain
⊕ magnetic enhancement	geology

ABBREVIATIONS	
D	ditch
P	pit



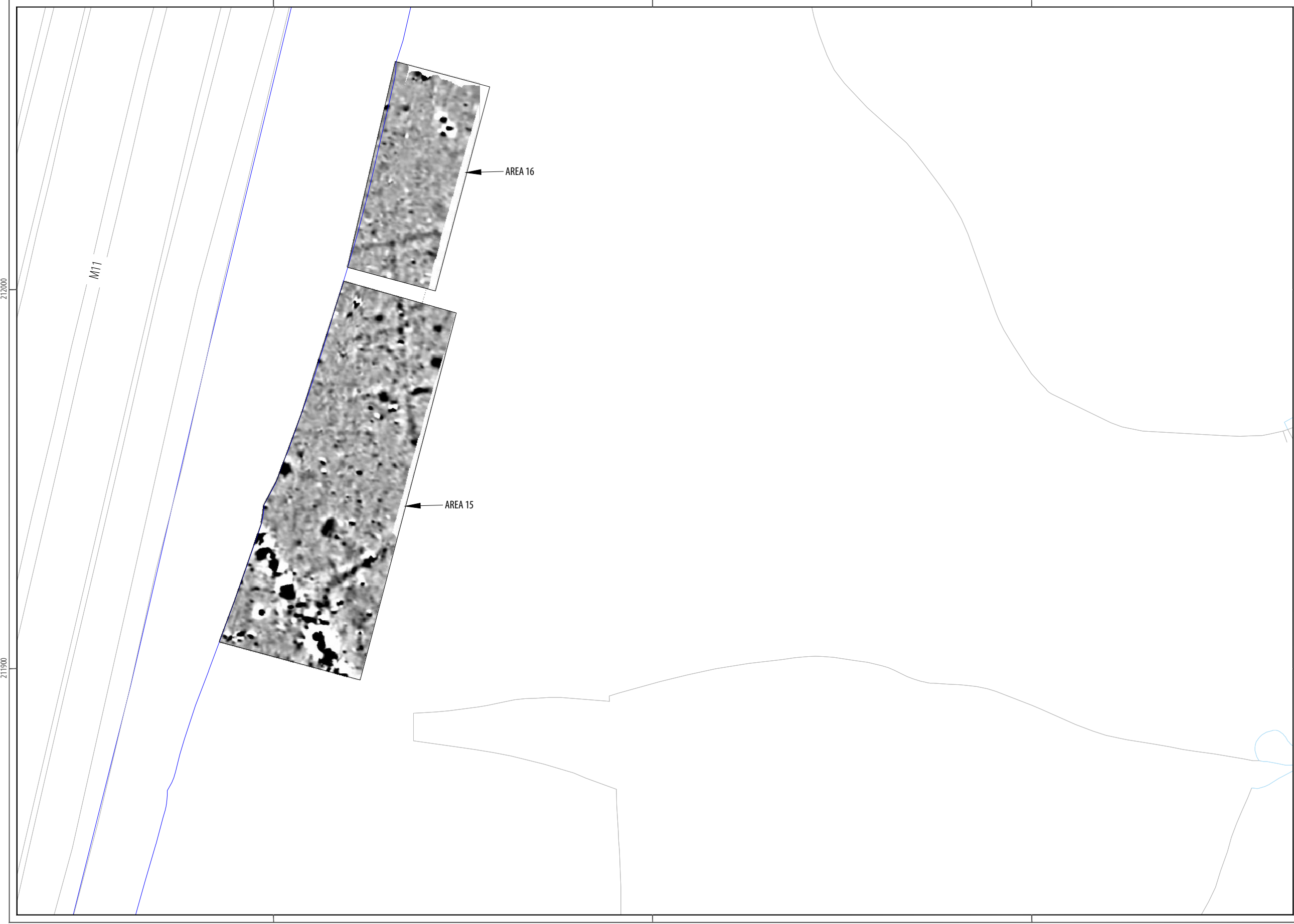
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Additional Geophysical Survey  
Harlow  
Essex

CLIENT Ringway Jacobs

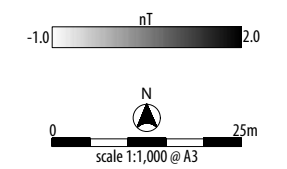


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ILLUS 16 Interpretation of magnetometer data; Area 12 & Area 17



previous geophysical survey area

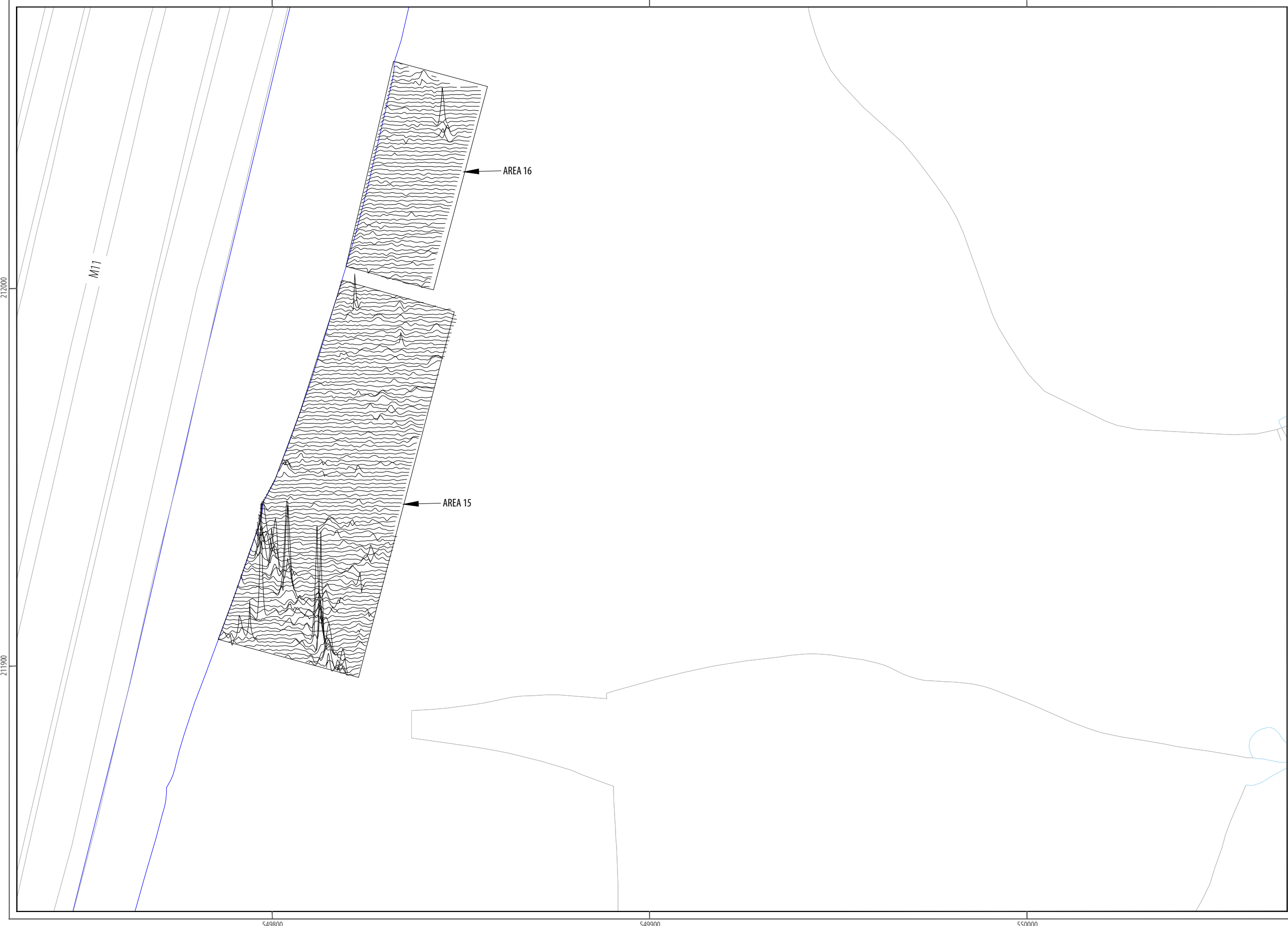


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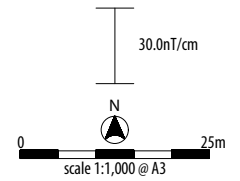


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ILLUS 17 Processed greyscale magnetometer data; Area 15 & Area 16



previous geophysical survey area

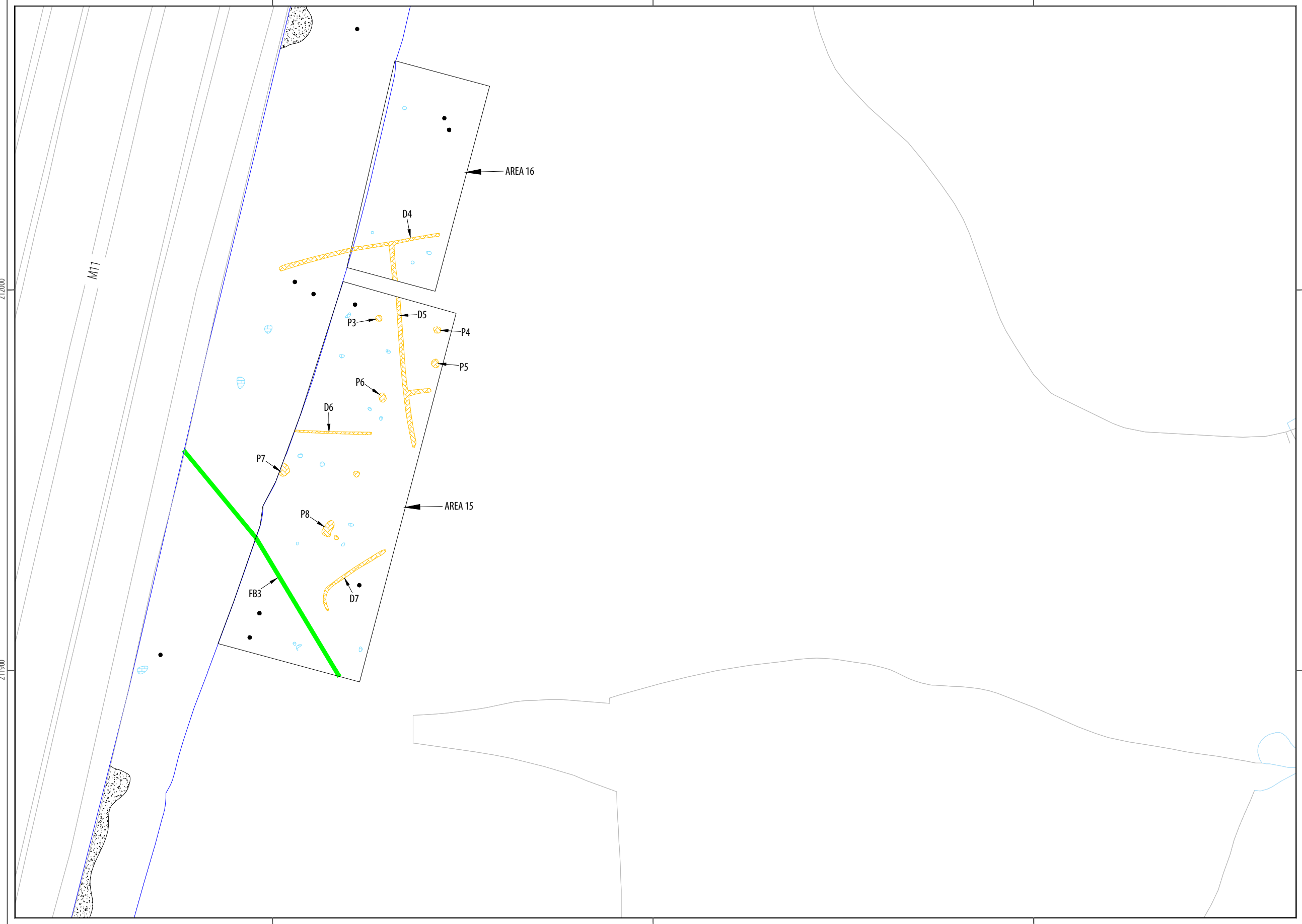


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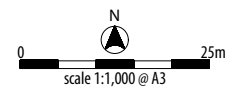
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ILLUS 18 XY trace plot of minimally processed magnetometer data; Area 15 & Area 16



TYPE OF ANOMALY	INTERPRETATION
● dipolar isolated	ferrous material
● magnetic disturbance	ferrous material
— linear trend	agricultural
— linear trend	field drain
— linear	former field boundary
● magnetic enhancement	geology
● magnetic enhancement	archaeology?

ABBREVIATIONS  
 D ditch  
 FB former boundary  
 RD ring-ditch



PROJECT MEJS/02  
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 Additional Geophysical Survey  
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 Essex  
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ILLUS 19 Interpretation of magnetometer data; Area 15 & Area 16

## 6 APPENDICES

### APPENDIX 1 MAGNETOMETER SURVEY

#### Magnetic susceptibility and soil magnetism

Iron makes up about 6% of the earth's crust and is mostly present in soils and rocks as minerals such as maghaemite and haematite. These minerals have a weak, measurable magnetic property termed magnetic susceptibility. Human activities can redistribute these minerals and change (enhance) others into more magnetic forms so that by measuring the magnetic susceptibility of the topsoil, areas where human occupation or settlement has occurred can be identified by virtue of the attendant increase (enhancement) in magnetic susceptibility. If the enhanced material subsequently comes to fill features, such as ditches or pits, localised isolated and linear magnetic anomalies can result whose presence can be detected by a magnetometer (fluxgate gradiometer).

In general, it is the contrast between the magnetic susceptibility of deposits filling cut features, such as ditches or pits, and the magnetic susceptibility of topsoils, subsoils and rocks into which these features have been cut, which causes the most recognisable responses. This is primarily because there is a tendency for magnetic ferrous compounds to become concentrated in the topsoil, thereby making it more magnetic than the subsoil or the bedrock. Linear features cut into the subsoil or geology, such as ditches, that have been silted up or have been backfilled with topsoil will therefore usually produce a positive magnetic response relative to the background soil levels. Discrete feature, such as pits, can also be detected.

The magnetic susceptibility of a soil can also be enhanced by the application of heat. This effect can lead to the detection of features such as hearths, kilns or areas of burning.

#### Types of magnetic anomaly

In the majority of instances anomalies are termed 'positive'. This means that they have a positive magnetic value relative to the magnetic background on any given site. However some features can manifest themselves as 'negative' anomalies that, conversely, means that the response is negative relative to the mean magnetic background.

Where it is not possible to give a probable cause of an observed anomaly a '?' is appended.

It should be noted that anomalies interpreted as modern in origin might be caused by features

that are present in the topsoil or upper layers of the subsoil. Removal of soil to an archaeological or natural layer can therefore remove the feature causing the anomaly.

The types of response mentioned above can be divided into five main categories that are used in the graphical interpretation of the magnetic data:

#### *Isolated dipolar anomalies (iron spikes)*

These responses are typically caused by ferrous material either on the surface or in the topsoil. They cause a rapid variation in the magnetic response giving a characteristic 'spiky' trace. Although ferrous archaeological artefacts could produce this type of response, unless there is supporting evidence for an archaeological interpretation, little emphasis is normally given to such anomalies, as modern ferrous objects are common on rural sites, often being present as a consequence of manuring.

#### *Areas of magnetic disturbance*

These responses can have several causes often being associated with burnt material, such as slag waste or brick rubble or other strongly magnetised/fired material. Ferrous structures such as pylons, mesh or barbed wire fencing and buried pipes can also cause the same disturbed response. A modern origin is usually assumed unless there is other supporting information.

#### *Linear trend*

This is usually a weak or broad linear anomaly of unknown cause or date. These anomalies are often caused by agricultural activity, either ploughing or land drains being a common cause.

#### *Areas of magnetic enhancement/positive isolated anomalies*

Areas of enhanced response are characterised by a general increase in the magnetic background over a localised area whilst discrete anomalies are manifest by an increased response (sometimes only visible on an XY trace plot) on two or three successive traverses. In neither instance is there the intense dipolar response characteristic exhibited by an area of magnetic disturbance or of an 'iron spike' anomaly (see above). These anomalies can be caused by infilled discrete archaeological features such as pits or post-holes or by kilns. They can also be caused by pedological variations or by natural infilled features on certain geologies. Ferrous material in the subsoil can also give a similar response. It can often therefore be very difficult to establish an anthropogenic origin without intrusive investigation or other supporting information.

#### *Linear and curvilinear anomalies*

Such anomalies have a variety of origins. They may be caused by agricultural practice (recent ploughing trends, earlier ridge and furrow regimes or land drains), natural geomorphological features such as palaeochannels or by infilled archaeological ditches.



## APPENDIX 2 SURVEY LOCATION INFORMATION

An initial survey base station was established using a Trimble VRS differential Global Positioning System (dGPS). The magnetometer data was georeferenced using a Trimble RTK differential Global Positioning System (Trimble R8s model).

Temporary sight markers were laid out using a Trimble VRS differential Global Positioning System (Trimble R8s model) to guide the operator and ensure full coverage. The accuracy of this dGPS equipment is better than 0.01m.

The survey data were then super-imposed onto a base map provided by the client to produce the displayed block locations. However, it should be noted that Ordnance Survey positional accuracy for digital map data has an error of 0.5m for urban and floodplain areas, 1.0m for rural areas and 2.5m for mountain and moorland areas. This potential error must be considered if coordinates are measured off hard copies of the mapping rather than using the digital coordinates.

Headland Archaeology cannot accept responsibility for errors of fact or opinion resulting from data supplied by a third party.

## APPENDIX 3 GEOPHYSICAL SURVEY ARCHIVE

The geophysical archive comprises an archive disk containing the raw data in XYZ format, a raster image of each greyscale plot with associated world file, and a PDF of the report

The project will be archived in-house in accordance with recent good practice guidelines ([http://guides.archaeologydataservice.ac.uk/g2gp/Geophysics\\_3](http://guides.archaeologydataservice.ac.uk/g2gp/Geophysics_3)). The data will be stored in an indexed archive and migrated to new formats when necessary.

## APPENDIX 4 DATA PROCESSING

The gradiometer data has been presented in this report in processed greyscale and minimally processed XY trace plot format.

Data collected using RTK GPS-based methods cannot be produced without minimal processing of the data. The minimally processed data has been interpolated to project the data onto a regular grid and de-striped to correct for slight variations in instrument calibration drift and any other artificial data.

A high pass filter has been applied to the greyscale plots to remove low frequency anomalies (relating to survey tracks and modern agricultural features) in order to maximise the clarity and interpretability of the archaeological anomalies.

Data is also clipped to remove extreme values and to improve data contrast.

## APPENDIX 5 OASIS DATA COLLECTION FORM: ENGLAND

OASIS ID: headland5-267219

## PROJECT DETAILS

Project name	M11 Junction 7A, Harlow, Essex Additional Geophysical Survey
Short description of the project	Headland Archaeology (UK) Ltd undertook a second geophysical (magnetometer) survey, covering approximately 6 hectares, to provide supplementary information on the archaeological potential of land that will be impacted by the proposed scheme to construct a new junction north of Junction 7 on the M11, north-east of Harlow, Essex. The survey has identified a circular anomaly interpreted as a round barrow and other linear and discrete anomalies that may also be of archaeological origin, possibly indicative of ditches which may form part of an early field system. The results and interpretation of the initial survey have been re-assessed in light of the current results and this has allowed for a slight revision of the overall interpretation; both data sets and interpretations are presented in this report. Overall the surveys have identified two areas of archaeological potential. The first is to the centre of the new link road which will connect the M11 with Sheering Road (Areas 5, 11 and 14). Two round barrows are clearly identified together with several discontinuous ditch type anomalies which appear to respect the barrows. This area is assessed to be of moderate to high potential. The second is to the east of the M11, in Area 15 and Area 16, where several discontinuous linear anomalies and pit type responses may locate another area of archaeological activity. However, no clear archaeological pattern is evident and these linear anomalies might equally plausibly be interpreted as the result of recent cultivation or drainage. This area is assessed as of moderate potential. Elsewhere across the majority of the scheme footprint the archaeological potential is assessed as low.
Project dates	Start: 17-10-2016 End: 19-10-2016
Previous/future work	Yes / Not known
Any associated project reference codes	MEJS/02 - Sitecode
Type of project	Field evaluation
Site status	None
Current Land use	Cultivated Land 4 - Character Undetermined
Monument type	RING DITCH Uncertain
Monument type	N/A None
Significant Finds	N/A None
Significant Finds	N/A None
Methods & techniques	"Geophysical Survey"
Development type	Amenity area (e.g. public open space)
Prompt	National Planning Policy Framework - NPPF
Position in the planning process	Pre-application
Solid geology (other)	London Clay Formation
Drift geology (other)	Lowestoft Formation diamicton
Techniques	Magnetometry

## PROJECT LOCATION

Country	England
Site location	ESSEX HARLOW HARLOW M11 Junction 7A
Study area	5.8 Hectares
Site coordinates	TL 4946 1240 51.789784786967 0.167308770023 51 47 23 N 000 10 02 E Polygon

## PROJECT CREATORS

Name of Organisation	Headland Archaeology
Project brief originator	Ringway Jacobs

Project design originator	Headland Archaeology
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**Appendix 7.1: Methodology for Landscape and Visual  
Assessment**







## **M11 Junction 7A**

Essex County Council

### **Appendix 7.1: Methodology for Landscape and Visual Assessment**

December 2016



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# 1. Methodology for Assessment of Landscape and Visual Effects

## 1.1 Criteria for Assessment

The criteria tables in this appendix are based on the criteria tables in Interim Advice Note 135/10 - Landscape and Visual Effects Assessment (IAN 135/10) (Highways Agency, 2010) which replaces guidance in the Design Manual for Roads and Bridges (DMRB) Volume 11, Section 3, Part 5 also produced by Highways Agency (now Highways England).

### 1.1.1 Landscape and Visual Sensitivity

The sensitivity of a landscape reflects its vulnerability to change. It also reflects the importance of the landscape in relation to national and local designations, its perceived value to local users and consultees and any intrinsic aesthetic characteristics such as its contribution to local landscape quality or sense of place.

In some instances a landscape with important elements may be of lower sensitivity as a result of its potential tolerance to change, for example, a variable landform or high levels of tree cover. Conversely, a landscape with few features of interest may be of a higher sensitivity because it is vulnerable to the introduction of a development, for example, a flat landscape with an open character where screen planting would be inappropriate.

The sensitivity of a visual receptor depends on the viewer's familiarity with the scene, the activity or occupation that brings them into contact with the view and the nature of the view, whether full or glimpsed, near or distant. It is also determined by the importance of the receptor, the importance of the view, the perceived quality of the view and its ability to accommodate change. The criteria for landscape and visual sensitivity are defined in Table 1 on the following page.

**Table 1: Criteria for Landscape and Visual Sensitivity**

Sensitivity	Landscape – typical criteria descriptors	Visual - typical criteria descriptors
High	<p>Landscapes which by nature of their character would be unable to accommodate change of the type proposed. Typically these would be:</p> <ul style="list-style-type: none"> <li>• of high quality with distinctive elements and features making a positive contribution to character and sense of place;</li> <li>• likely to be designated, but the aspects which underpin such value may also be present outside designated areas, especially at the local scale;</li> <li>• areas of special recognised value through use, perception or historic and cultural associations; and</li> <li>• likely to contain features and elements that are rare and could not be replaced.</li> </ul>	<ul style="list-style-type: none"> <li>• Residential properties.</li> <li>• Users of public rights of ways or other recreational trails e.g. national trails, footpaths and bridleways.</li> <li>• Users of recreational facilities where the purpose of that recreation is enjoyment of the countryside e.g. country parks, National Trust or other access land.</li> </ul>
Moderate	<p>Landscapes which by nature of their character would be able to partly accommodate change of the type proposed. Typically these would be:</p> <ul style="list-style-type: none"> <li>• commonplace elements and features creating generally unremarkable character but with some sense of place;</li> <li>• locally designated, or their value may be expressed through non-statutory local publications;</li> <li>• containing some features of value through use, perception or historic and cultural associations; and</li> <li>• likely to contain some features and elements that could not be replaced.</li> </ul>	<ul style="list-style-type: none"> <li>• Outdoor workers.</li> <li>• Users of scenic roads, railways or waterways or users of designated tourist routes.</li> <li>• Schools and other institutional buildings, and their outdoor areas.</li> </ul>
Low	<p>Landscapes which by nature of their character would be able to accommodate change of the type proposed. Typically these would be:</p> <ul style="list-style-type: none"> <li>• inclusive of some features and elements that are discordant, derelict or in decline, resulting in indistinct character with little or no sense of place;</li> <li>• not designated;</li> <li>• containing few, if any, features of value through use, perception or historic and cultural associations; and</li> <li>• likely to contain few, if any, features and elements that could not be replaced.</li> </ul>	<ul style="list-style-type: none"> <li>• Indoor workers.</li> <li>• Users of main roads (e.g. trunk roads) or passengers in public transport on main arterial routes.</li> <li>• Users of recreational facilities where the purpose of that recreation is not related to the view e.g. sports facilities.</li> </ul>



### 1.1.2 Magnitude of impact

The magnitude of landscape and visual impact relates to the degree of change the scheme would cause. Magnitude is determined by the perceived contrast or integration with the existing scenic features and aesthetic character in terms of its form, line, colour, texture and scale. It also considers the geographical extent and duration of the impacts. Criteria relating to the magnitude of landscape and visual impact are defined in Tables 2 and 3 respectively below.

**Table 2: Magnitude of landscape impact criteria**

Magnitude of impact	Typical criteria descriptors
Major	Adverse: Total loss or large scale damage to existing character or distinctive features and elements, and/or the addition of new but uncharacteristic conspicuous features and elements. Beneficial: Large scale improvement of character by the restoration of features and elements, and/or the removal of uncharacteristic and conspicuous features and elements, or by the addition of new distinctive features.
Moderate	Adverse: Partial loss or noticeable damage to existing character or distinctive features and elements, and/or the addition of new but uncharacteristic noticeable features and elements. Beneficial: Partial or noticeable improvement of character by the restoration of existing features and elements, and/or the removal of uncharacteristic and noticeable.
Minor	Adverse: Slight loss or damage to existing character or features and elements, and/or the addition of new but uncharacteristic features and elements. Beneficial: Slight improvement of character by the restoration of existing features and elements, and/or the removal of uncharacteristic features and elements, or by the addition of new characteristic elements.
Negligible	Adverse: Barely noticeable loss or damage to existing character or features and elements, and/or the addition of new but uncharacteristic features and elements. Beneficial: Barely noticeable improvement of character by the restoration of existing features and elements, and/or the removal of uncharacteristic features and elements, or by the addition of new characteristic elements.
No change	No noticeable loss, damage or alteration to character or features or elements.

**Table 3: Magnitude of visual impact criteria**

Magnitude of impact (adverse or beneficial)	Typical criteria descriptors
Major	The scheme, or a part of it, would become the dominant feature or focal point of the view.
Moderate	The scheme, or a part of it, would form a noticeable feature or element of the view which is readily apparent to the receptor.
Minor	The scheme, or a part of it, would be perceptible but not alter the overall balance of features and elements that comprise the existing view.
Negligible	Only a very small part of the scheme would be discernible, or it is at such a distance that it would form a barely noticeable feature or element of the view.
No change	No part of the scheme, or work or activity associated with it, is discernible.

### 1.1.3 Significance of landscape and visual effects

The significance of landscape and visual effect is determined by combining the sensitivity of the landscape and visual receptors with the magnitude of landscape and visual impact. Table 4 below has been used as a guide to

assist the professional judgement of the landscape architect in deciding the significance of landscape and visual effects. The assessment of significance of effect relies upon common sense, experience and professional judgement, supported by substantiated reasoning. Where there is a choice of category in the matrix, the assessor has given reasoned justification for the decision e.g. where a highly sensitive receptor experiences a moderate magnitude of impact, justification for the assessment of either a moderate or large degree of significance is given.

**Table 4: Significance of landscape and visual effect categories**

Landscape/ visual sensitivity	Magnitude of impact				
	No change	Negligible	Minor	Moderate	Major
High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
Moderate	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate

The significance of landscape and visual effects can either be beneficial or adverse. Typical descriptors of these categories are provided in Tables 5 and 6 on following pages.

**Table 5: Descriptors of significance of landscape effects**

Significance category	Typical descriptors of effect
Very large beneficial (positive) effect	The scheme would: <ul style="list-style-type: none"> <li>• greatly enhance the character (including quality and value) of the landscape;</li> <li>• create an iconic high quality feature and/or series of elements; and</li> <li>• enable a sense of place to be created or greatly enhanced.</li> </ul>
Large beneficial (positive) effect	The scheme would: <ul style="list-style-type: none"> <li>• enhance the character (including quality and value) of the landscape;</li> <li>• enable the restoration of characteristic features and elements lost as a result of changes from inappropriate management or development; and</li> <li>• enable a sense of place to be enhanced.</li> </ul>
Moderate beneficial (positive) effect	The scheme would: <ul style="list-style-type: none"> <li>• improve the character (including quality and value) of the landscape;</li> <li>• enable the restoration of characteristic features and elements partially lost or diminished as a result of changes from inappropriate management or development; and</li> <li>• enable a sense of place to be restored.</li> </ul>
Slight beneficial (positive) effect	The scheme would: <ul style="list-style-type: none"> <li>• complement the character (including quality and value) of the landscape;</li> <li>• maintain or enhance characteristic features and elements; and</li> <li>• enable some sense of place to be restored.</li> </ul>
Neutral effect	The scheme would: <ul style="list-style-type: none"> <li>• maintain the character (including quality and value) of the landscape;</li> <li>• blend in with characteristic features and elements; and</li> </ul>

	<ul style="list-style-type: none"> <li>• enable a sense of place to be retained.</li> </ul>
Slight adverse (negative) effect	<p>The scheme would:</p> <ul style="list-style-type: none"> <li>• not quite fit the character (including quality and value) of the landscape;</li> <li>• be at variance with characteristic features and elements; and</li> <li>• detract from a sense of place.</li> </ul>
Moderate adverse (negative) effect	<p>The scheme would:</p> <ul style="list-style-type: none"> <li>• conflict with the character (including quality and value) of the landscape;</li> <li>• have an adverse impact on characteristic features or elements; and</li> <li>• diminish a sense of place.</li> </ul>
Large adverse (negative) effect	<p>The scheme would:</p> <ul style="list-style-type: none"> <li>• be at considerable variance with the character (including quality and value) of the landscape;</li> <li>• degrade or diminish the integrity of a range of characteristic features and elements; and</li> <li>• damage a sense of place.</li> </ul>
Very large adverse (negative) effect	<p>The scheme would:</p> <ul style="list-style-type: none"> <li>• be at complete variance with the character (including quality and value) of the landscape;</li> <li>• cause the integrity of characteristic features and elements to be lost; and</li> <li>• cause a sense of place to be lost.</li> </ul>

**Table 6: Descriptors of significance of visual effects**

Significance	Typical descriptors of effect
Very large beneficial (positive) effect	The scheme would create an iconic new feature that would greatly enhance the view.
Large beneficial (positive) effect	The scheme would lead to a major improvement in a view from a highly sensitive receptor.
Moderate beneficial (positive) effect	The scheme would cause obvious improvement to a view from a moderately sensitive receptor, or perceptible improvement to a view from a more sensitive receptor.
Slight beneficial (positive) effect	The scheme would cause limited improvement to a view from a receptor of medium sensitivity, or would cause greater improvement to a view from a receptor of low sensitivity.
Neutral effect	No perceptible change in the view.
Slight adverse (negative) effect	The scheme would cause limited deterioration to a view from a receptor of medium sensitivity, or cause greater deterioration to a view from a receptor of low sensitivity.
Moderate adverse (negative) effect	The scheme would cause obvious deterioration to a view from a moderately sensitive receptor, or perceptible damage to a view from a more sensitive receptor.
Large adverse (negative) effect	The scheme would cause major deterioration to a view from a highly sensitive receptor, and would constitute a major discordant element in the view.
Very large adverse (negative) effect	The scheme would cause the loss of views from a highly sensitive receptor, and would constitute a dominant discordant feature in the view.

The assessment considers the impact at the following timeframes:

- during construction;
- during operation, year 1 - following scheme opening and in the first winter one year following planting completion (to represent a worst case scenario, before any planted mitigation can take effect), taking account of the completed scheme and the traffic using it; and
- during operation year 15 - following scheme opening and during summer 15 years following planting completion, (to represent a best case scenario, where any planted mitigation measures can be expected to be reasonably effective), taking account of the completed scheme and the traffic using it.

## 2. Photomontage Methodology

### 2.1 Definition

A photomontage is the superimposition of a rendered (photorealistic) image of scheme proposals onto a base photograph to visually represent the scheme.

### 2.2 Published sources of guidance

This methodology is intended to provide transparency of the process undertaken to produce photomontages for illustrative purposes only. This means that the images produced using these methods have not been used to directly inform the Landscape and Visual Impact Assessment (undertaken by a qualified Landscape Architect in the field), but are provided to sit alongside the report for information.

The photomontages have been produced in accordance with the following core guidance documents:

- Landscape Institute, March 2011, Landscape Institute Advice Note 01-11 'Photography and Photomontage in Landscape and Visual Impact Assessment'
- Landscape Institute/ Institute of Environmental Management and Assessment (LI/ IEMA), 2013, Guidelines for Landscape and Visual Impact Assessment, 3rd Edition, Routledge (GLVIA3).

### 2.3 Assumptions and Limitations

Whilst every effort has been made to ensure a suitable level of accuracy was maintained throughout the production of the photomontages, no final image is 100% accurate. Where possible all design information has been provided in suitable 3D format by Jacobs Highways Engineers (a list of the core design information used located in sections 2.5.1 and 2.5.2 below). However there have been cases where the Jacobs Landscape Architect (LA) has been required to expand on the supplied design to inform photomontage production.

The following list identifies the assumptions made, data discrepancies and limitations encountered during the production of photomontages:

#### 2.3.1 Viewpoint omissions / additions to the set of photomontages displayed at the Public Exhibition

- One viewpoint has been omitted (PM01 previously at Public Exhibition, now PM02 on plan) due to the revised design extinguishing further public access to this location due to redirecting the new footpath link to the south east.
- One additional viewpoint has been added (PM01) to the set of photomontages to the list to reflect online improvement works to Gilden Way.

#### 2.3.2 Data recording for base image compilation

- Handheld GPS surveys are only as accurate as the amount of available satellites at the time of recording as identified by Ordnance Survey: *"Positional accuracy with a single receiver, to civilian users approximately equals 5m to 10m, 95% of the time, and the height accuracy is generally 15m to 20m 95% of the time."*<sup>1</sup>.
- Different models of handheld GPS receivers were used to be able to cover the site visits undertaken. The tolerances of the two devices used is specified below for information:
  - a) Magellan Meridian GPS, Europe (WAAS enabled): +/- 3 m (horizontal)
  - b) Garmin Etrex 20x (WAAS enabled): +/- 3 m (horizontal)

<sup>1</sup> For further information on GPS see the Ordnance Survey website for details: <https://www.ordnancesurvey.co.uk/business-and-government/help-and-support/navigation-technology/gps-beginners-guide.html> (accessed 07.03.16)

- Ordnance Survey 10m contour data used for topography terrain is based on DTM mapping generally considered to be accurate to +/- 10m;
- The photographs that form the basis of the photomontage are a flattened 2D representation of what the eye would see;
- Photomontages show year 1 and year 15 scenarios in late spring/ early summer due to project timescales the restricting available time to undertake winter photographs.
- Where Latitude and Longitude has been recorded in site instead of OS National Grid, the Ordnance Survey Coordinate Transformer tool has been used to convert for use in modelling and positioning the camera<sup>2</sup>.

### 2.3.3 Design information

Ongoing iterative design changes have been during the production of the photomontages and following receipt of the then frozen designs as a result of consultation with the public and client stakeholders and specialist consultants (noise). These changes have affected noise and bat fencing, earthworks and landscape mitigation design. Changes have been managed through coordination and liaison with the Landscape Architect undertaking Landscape and Visual Impact Assessment (LVIA) and the landscape mitigation design.

### 2.3.4 Mitigation

- The representation of all soft landscape / mitigation planting has been developed based on experience and knowledge of planting techniques for native species. This includes suitable sizes for planting stock as freshly planted in Year 1 as well as assume planting heights for 15 years after completion (Year 15 - identified in section 2.5.2 below). These assumptions have been agreed by the LA undertaking the LVIA.

## 2.4 Viewpoint locations and base photographs

The locations of viewpoints have been selected whilst on site by the Landscape Architect to maximize proportionate and representative views of the schemes' main permanent structures and/or features.

The majority of the photographs have been taken in April 2015 with additional viewpoint photography on Gilden Way in May 2016 at a time when weather conditions provided suitable light levels.

### Site photography survey data

At each viewpoint location, the following survey data has been collected:

- GPS reference noting the location of the camera;
- Date and time photograph was taken;
- The height of the camera above ground level (approximately 1.5 to 1.6 m); and
- Weather conditions at the time of photograph.

The baseline photographs have been taken using a Canon EOS 5D Mark II Digital SLR camera with a fixed 50mm lens. All photographs were taken on a tripod levelled to the vertical and horizontal axes as well as using a high resolution setting for the images.

The panoramic photography was undertaken using a series of photographs taken with a panoramic tripod head set to 60% (15° increments) overlap between frames to reduce barrel distortion. These photographs were then manually stitched together in Adobe Photoshop software to produce a single panoramic image. During this process only minor improvements have been made to the photographs to balance brightness, contrast etc. where necessary. None of the photographs have been distorted. All survey information as well as other important information has been provided on the viewpoint figures.

<sup>2</sup> OS Coordinate Transformer: <https://www.ordnancesurvey.co.uk/gps/transformation/> (accessed 10.10.16)



Final images were then cropped to 87.5° field of view to ensure a suitable image size for a comfortable viewing distance (approx. 27 cm from eye). These images were used as the basis for the photomontages for Year 1 and Year 15 (see section 2.6).

## **2.5 Reference points and other information**

To assist the process of matching the baseline photograph with the 3D digital model of the proposals, reference points were identified at each viewpoint location. Reference points are features within a photograph that can be identified from a topographical survey or Ordnance Survey (OS) and aerial photographic data. Examples include telegraph poles, field boundaries and pylons.

## **2.6 Construction of the 3D base model and camera matching**

From the final existing panoramic images, backgrounds for use in the camera matching process were cropped to the exact 4:3 ratio of 50mm lens image. These images were then used as backdrops to the 50 mm 3D camera within Autodesk 3DS Max Design (3DS Max), the main 3D modelling software.

The base model (i.e. existing environment and site context) was modelled by creating a base 3D terrain at a local grid with a common global shift identified. This was produced using information from topographical survey, 2D and 3D contour information provided by UU which was then used to vertically place reference objects.

In 3DS Max, locations of the viewpoints were added to the model using the survey data (section 2.2) which were then used as starting points for fixing the location of the 3D camera. The 3D camera and 3DS Max viewport was calibrated to exactly match the lens type, exposure, and shutter speed settings recorded for each set of photographs.

The modelled terrain, reference points and other information in the model were then aligned to the corresponding features in the background image (3D camera backdrop) through minor adjustment of the 3D camera and its target location.

Once the 3D model is fixed in the 3D cameras the perspective to the background image, a fix 3D line is then snapped to the 3D camera and its target pivot points as a fix alignment line. This is to allow a full panoramic to be rendered from the correct camera location, thus mimicking the photography taken on site.

## **2.7 Construction of 3D model of scheme proposals**

3D models of proposals of the scheme design were produced in 3DS Max using the core design drawings or 3D models provided by Jacobs Highways Engineers (section 2.5.1 below), and added to the main model. All proposed materials were confirmed between Jacobs LA and UU Engineers. Environmental lighting in the 3D model was matched to the date, time and weather conditions as well as camera exposure and shutter settings used when the photograph was taken at each viewpoint.

### **2.7.1 Core design information**

#### **Highways / Earthworks design**

- B3553F05-0000-M3-0005.dwg – received 17.08.16

#### **Pond and watercourses Design**

- B3553F05-0500-M3-0007.dwg – received 24.10.16

#### **Highway Fencing**

- B3553F05-0300-M2-0001.dwg – received 28.10.16

#### **Noise Mitigation Design**

- Noise Barrier Model.dwg – received 23.11.16

### **Landscape Mitigation Design**

- B3553F05-3000-M2-0012.dwg – received 14.09.16 and as updated through to December 2016 (see section 2.1.3 above).

#### **2.7.2 Mitigation planting details**

All mitigation planting has been modelled in accordance with design information and mitigation planting to the Landscape Architects assumptions for planting stock height and plant protection elements.

##### **Year 1**

- Woodland and tree and shrub planting: 80 mm dia. tree / shrub shelters with the occasional 1.2m feathered trees;
- Native shrub planting: 80 mm and 300 mm dia. shelters;
- Individual native trees: 2.3-3.0 m standard trees,
- Individual Native Trees (Bat hop over): 4.0 m Extra Heavy Standard trees,
- Species rich / wildflower seeding: not visible / established therefore shown as standard grass.

##### **Year 15**

- Woodland and tree and shrub planting: 7-8 m tall;
- Hedgerow and shrub only planting: 3 m tall.
- Individual native trees: 6 m tall
- Species rich / wildflower seeding: mix of flowers and grass species up to total height of 500 mm.

## **2.8 Final output**

### **2.8.1 Photomontages**

Once the 3D model of the proposals is complete and the 3D camera is matched accurately to the background images, renders can be generated from 3DS Max to produce raw images for use in final production. At this point, subtle adjustments to the environmental lighting settings (as set to weather, date and time information surveyed on site) are adjusted to get a good natural lighting of the scheme proposals to match the light of the original photography.

The raw images are then stitched back together and compiled in Adobe Photoshop, using layering of parts of the image to enable foreground to be put back in front and any lost elements removed (e.g. large trees removed due to the scheme).



## **Appendix 7.2: Schedule of Visual Effects**





## **M11 Junction 7A**

Essex County Council

### **Appendix 7.2: Landscape Visual Impact Assessment - Schedule of Visual Effects**

December 2016





## M11 Junction 7A

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0	14/07/2016	First issue	AS	HM	PM

## Schedule of Visual Effects

Note 1: Opportunities for off-site planting by agreement with landowners to improve screening or for replacement planting are identified at some properties. The off-site planting proposals are not taken into account in the assessment of visual effects in this schedule

Note 2: Proposed noise barriers shown on the landscape figures 7.3, 7.6 and 7.7, and in photomontages on Figure 7.8, and mentioned in this schedule are indicative. The extent, size, positioning and design of any noise barriers would be subject to consultation with affected property owners and Harlow Council before detailed design.

Receptor Number R = residential C = commercial P = Public Right of Way /1 = no. of properties * = Listed Building	Distance to scheme (to nearest main carriageway)	Sensitivity	Existing winter view towards site	Change to view during construction	Change to view in Year 1 (winter)	Magnitude of change to view (Y1 winter)	Mitigation	Significance of visual effect during construction	Significance of visual effect at completion of construction (Year1 winter)	Significance of visual effect 15 years after completion (Year 15 winter) with mitigation	Significance of visual effect 15 years after completion (Year 15 summer) with mitigation
<b>Residential properties</b>											
R01/3 Two storey terraced houses at Chippingfield (Nos.85-89)	28m	High	First floor views of Gildea Way over and through trees. Oblique views of Gildea Way through large gap in roadside vegetation. Views from back gardens and ground floor windows partially screened by 1.8m tall garden fences.	Road widening works (and traffic) visible mainly from 1st floor windows, through trees and in oblique view through existing large gap in boundary vegetation.	Increase in traffic on widened road visible through existing gap in vegetation on highway boundary. The m high noise barrier to be installed on the highway boundary would provide partial screening.	Minor Adverse	Climbing plants to be planted with support wires on the noise barrier.  <i>Opportunity for off-site tree planting in strip of land between Gildea Way and houses at Chippingfield.</i>	Slight Adverse	Slight Adverse	Neutral	Neutral
R01A/5 Two storey terraced houses at Chippingfield (Nos.75-83)	27m	High	Clear first floor view of Gildea Way through large gap in roadside vegetation. Views from back gardens and ground floor windows partially screened by 1.8m tall garden fences.	Road widening works (and traffic) clearly visible mainly from 1st floor windows, through existing large gap in vegetation on highway boundary	Increase in traffic on widened road visible through existing gap in vegetation on highway boundary, but 2m high noise barrier to be installed on the highway boundary would provide partial screening.	Minor Adverse	Climbing plants to be planted with support wires on the noise barrier.  <i>Opportunity for off-site tree planting in strip of land between Gildea Way and houses at Chippingfield.</i>	Slight Adverse	Slight Adverse	Neutral	Neutral
R01B/10 Two storey terraced houses at Chippingfield (Nos.45-63)	100m	High	First floor views across allotment gardens towards Gildea Way which is substantially screened by trees.	Erection of a 3m high timber noise barrier on the boundary between the highway and the allotment gardens.	3m high noise barrier would be clearly visible from first floor windows at 85-100m distance from the houses.	Minor Adverse	No mitigation	Slight Adverse	Slight Adverse	Slight Adverse	Slight Adverse

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R02/2 Houses at Mulberry Gardens (3 storeys - attic dormer windows)	3m	High	Close 1 <sup>st</sup> and 2 <sup>nd</sup> floor views of Gildea Way framed by mature trees. Ground floor views partially screened by 1.8m close-board fence on property boundaries and shrubs along highway verge.	Traffic and construction works open to view from first and second floor windows. Roadside shrubs removed and existing close-board fence would be replaced with 2m high noise barrier, partially screening ground floor views.	Traffic and construction works open to view from first and second floor windows. Roadside shrubs removed and existing close-board fence would be replaced with 2m high noise barrier, partially screening ground floor views.	Minor Adverse	Climbing plants and amenity groundcover shrubs to be planted in narrow strip on highway side of noise barrier.  <i>Opportunity for off-site tree planting in private gardens to screen traffic from upper floor windows</i>	Slight Adverse	Slight Adverse	Slight Adverse	Slight Adverse
R02A/1 House at Mulberry Gardens (3 storeys – attic dormer windows)	10m	High	House set back with view to Gildea Way framed and partially screened by mature trees and two other houses nearer Gildea Way (see above) 1.8m close-board fence, tree and shrubs on highway verge add further screening.	Felling of roadside shrubs and one medium sized deciduous tree to allow widening would open a slightly clearer view of the construction works. A 2m to 2.5m high noise barrier would replace the close-board fence screening lower vehicles.	Felling of roadside shrubs and one medium sized deciduous tree to allow widening would open a slightly clearer but still narrowly framed view of Gildea Way traffic. A 2m high noise barrier would replace the close-board fence screening lower vehicles.	Minor Adverse	Climbing plants and amenity groundcover shrubs to be planted in narrow strip on highway side of new noise barrier. <i>Opportunity for off-site tree planting in private gardens to screen traffic from upper floor windows.</i>	Slight Adverse	Slight Adverse	Neutral	Neutral
R03/1 Two storey house at junction of Mulberry Green and Gildea Way (No.49 – locally listed building; former magistrates court)	12m	High	Open view from ground floor and first floor across wide pavement to Gildea Way.	2m high brick wall noise barrier with entrance gates to be built close to, or on the front boundary of the property. Brickwork and gate detailing and colours to respect the aesthetic quality of the building.	Substantial traffic screening in views from garden and ground floor provided by new brick wall noise barrier, but property would feel enclosed and would no longer have the same attractive frontage. Traffic still visible from first floor.	Moderate Adverse	Amenity tree and grass or groundcover planting in pavement where services permit, if necessary in a raised bed.	Large Adverse	Moderate Adverse	Moderate Adverse	Moderate Adverse
R04/2* Long Barn Cottage (One storey) and No. 8 Sheering Drive, grade II listed (two storeys).	2m	High	Properties enclosed by trees shrubs and tall evergreen hedge. View towards Gildea Way screened by trees, in garden and by hedge and high fence.	Boundary fence to be replaced with 2.5m high absorptive noise barrier. Existing tall hedge, shrubs and trees along boundary close to the fence would be removed exposing Gildea Way traffic and construction works to view from both properties until the barrier is installed. High vehicles would still be partially visible above the barrier.	Loss of the boundary vegetation would leave new barrier openly visible and passing high vehicles partially visible above the barrier.	Moderate Adverse	Climbing plants to be planted to grow on noise barrier supported with climbing wires. <i>Opportunity to provide further screening with off-site planting in gardens by agreement with owners.</i>	Large Adverse	Moderate Adverse	Slight Adverse	Slight Adverse

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R04A/1* Two storey grade II listed house at 10 Sheering Drive	23m	High	Property enclosed by tall trees and shrubs. View towards Gilden Way partially obscured by Long Barn Cottage; also screened by hedge and noise barrier/fence, and by trees in garden.	Boundary fence to be replaced with new 2.5m high absorptive noise barrier. Existing vegetation along boundary would be removed temporarily exposing Gilden Way traffic and construction works to view from garden until barrier is installed. High vehicles would still be partially visible above the barrier.	Noise barrier would substantially screen the traffic in views from the garden but high vehicles would still be partially visible above the barrier.	Minor Adverse	Climbing plants to be planted on barrier supported with climbing wires.	Moderate Adverse	Slight Adverse	Neutral	Neutral
R05/1 One storey house at No.2 Sheering Road	23m	High	Oblique view toward Gilden Way through entrance gate of property enclosed with trees shrubs and fencing. Gilden Way screened by roadside hedge and cherry trees at Gilden Close	Roadside hedge and some of the cherry trees would be removed to allow road widening and construction of highway drainage system, partially exposing construction works and traffic to view through residential gateway.	2.5m high absorptive noise barrier to be installed along highway boundary would partially restore traffic screening, but would be less attractive than the hedge it would replace.	Minor Adverse	Replacement hedge planting on road side of noise barrier. Climbing plants to be planted to grow on climbing wires on the noise barrier and replacement planting of individual cherry trees on the residential side of the barrier where space permits.	Slight Adverse	Slight Adverse	Neutral	Neutral
R06/2 One storey terraced houses at The Oxleys (Nos. 2-3)	11m	High	View of Gilden Way through gap between groups of trees and amenity shrubs.	Construction works and traffic clearly visible in framed view. Most of the amenity shrubs and trees removed to regrade embankment.	Increased traffic visible on widened Gilden Way. 2m high noise barrier with transparent panels in the upper half would provide partial traffic screening while limiting shadowing effect of barrier. Pedestrian access through barrier to bus stop maintained. Amenity shrubs and trees lost for road widening.	Moderate Adverse	New amenity tree and shrub planting on regraded embankment.	Moderate Adverse	Moderate Adverse	Slight Adverse	Slight Adverse
R06A/1 One storey terraced house at No.1 The Oxleys	11m	High	Close framed view of Gilden Way beneath canopy of tall mature willow.	Willow and other vegetation to be removed to install drainage settlement tank and outfall to Harlowbury Brook. Construction works visible close to property.	2m high noise barrier with transparent panels in the upper half would provide partial traffic screening while limiting shadowing effect of barrier.	Moderate Adverse	Individual tree planting (small-medium size). Minor regrading of grass next to resurfaced footway	Large Adverse	Moderate Adverse	Slight Adverse	Slight Adverse

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R07/8 Two storey terraced houses at The Oxleys (Nos. 67-74)	11-21m	High	View from ground and first floor south east towards Gilden Way. Amenity shrubs and trees between Gilden Way and The Oxleys provide partial screening	Construction works and traffic clearly visible. Some losses of amenity shrubs for road widening but trees retained near street continue to provide partial screen.	Increased traffic on widened Gilden Way; some losses of amenity shrubs for road widening. 2m high noise barrier with transparent panels in the upper half would provide partial traffic screening while limiting shadowing effect of barrier. (Pedestrian access through barrier to bus stop maintained.)	Minor Adverse	New amenity tree and shrub planting	Slight Adverse	Slight Adverse	Slight Adverse (noise barrier)	Slight Adverse (noise barrier)
R07A/2 Two storey terraced houses at The Oxleys (Nos 75 and 76)	8m	High	Ground and first floor view of Gilden Way partially filtered by a row of widely spaced trees.	Screen trees removed to allow road widening. Construction works and traffic fully exposed.	Increased traffic on widened Gilden Way. Trees lost to road widening. 2m high noise barrier with transparent panels in the upper half would provide partial traffic screening while limiting shadowing effect of barrier.	Moderate Adverse	Replacement tree and shrub planting	Moderate Adverse	Moderate Adverse	Slight Adverse (noise barrier)	Slight Adverse (noise barrier)
R08/6 Single storey terraced houses (Nos. 1-6) at Gilden Close	13-27m	High	Ground floor view towards Gilden Way screened by dense hedge along the highway boundary and small to medium size cherry trees between the hedge and houses.	Vegetation lost along highway boundary to allow road widening. Some of the cherry trees on green space in front of houses lost to install drainage pipes, exposing traffic and construction works to view.	Lost boundary vegetation and cherry trees replaced with 2.5m high absorptive noise barrier screening most traffic apart from highest portions of high vehicles. Barrier would appear bare and harsh with the loss of the cherry trees.	Moderate Adverse	Climbers supported on wires to be planted to grow on barrier, softening its appearance. Two replacement cherry trees to be planted where space permits. <i>Opportunity to provide further screening with off-site planting in small green space in front of houses by agreement with Harlow Council.</i>	Large Adverse	Large Adverse	Slight Adverse	Slight Adverse.
R09/2 Two storey houses at Millhurst Mews (Nos.3-4, in Churchgate Street Conservation Area)	1-2m	High	Direct and oblique ground and first floor views towards Gilden Way partially filtered by groups of mature trees, also by boundary fences/hedges and by a hedge along part of Gilden Way.	2m high noise barrier to replace existing garden fence. Felling of existing trees within the gardens close to the boundary required, further exposing Gilden Way traffic, particularly from 1 <sup>st</sup> floor windows.	Existing boundary fence replaced with noise barrier, but loss of boundary trees would open up the view of increased traffic on widened Gilden Way from first floor windows.	Moderate Adverse	New hedge proposed next to portion of noise barrier between bus stop and subway ramps would partially screen oblique views of Gilden Way from properties. Climbing plants to grow on wires on highway side of noise barrier on property boundary.	Large Adverse	Moderate Adverse	Moderate Adverse	Moderate Adverse



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R09A/2* Two storey houses at Millhurst Mews. (Nos.1-2, in Churchgate Street Conservation Area) Grade II listed properties	45-65m	High	Oblique first floor view toward Gilden Way with partial screening from other houses, intervening trees and fences, and hedge along part of the highway boundary.	Removal of hedge on highway boundary south of bus stop would expose more of the traffic and construction works in this partial oblique first floor view.	2m and 2.5m high noise barriers to be installed partially restoring the screening that was provided by the hedge. As was the case before, a gap would remain giving access to the bus stop.	Minor Adverse	New hedge proposed next to portion of noise barrier between bus stop and subway ramps to soften its appearance. Climbing plants to grow on wires on highway side of noise barrier south of bus stop.	Slight Adverse	Minor Adverse	Neutral	Neutral
R10/1 Walnut Cottage Three storey house at Drakes Meadow  (small dormer windows on top floor)	1.5m	High	Ground and first floor view north west towards Gilden Way partially screened by tall mature trees on boundary leaning over Gilden Way, and by close-board fence on highway boundary. Other vegetation within garden provides partial screening.	Boundary fence to be replaced with 2.5m high absorptive noise barrier. Tall overhanging trees to be felled, adversely affecting character of view from house and making Gilden Way and construction works more visible from property, at least until noise barrier installation. .	Boundary fence to be replaced with 2.5m high absorptive noise barrier. Top portions of high vehicles on the widened Gilden Way visible above the barrier. New barrier and lost vegetation would be noticeable from the house. Other trees within the garden would continue to provide partial screening.	Moderate Adverse	Climbing plants to be planted with support wires on the noise barrier.  <i>Opportunity for off-site tree planting within the property.</i>	Moderate Adverse	Moderate Adverse	Moderate Adverse	Moderate Adverse
R10A/1 No.25 Sheering Road, two storey house with large garden extending from Sheering Rd. to Gilden Way.	1.8m	High	Close-board fence with trees and shrubs on boundary with Gilden Way screen the traffic in views from the property. Gilden Way traffic probably visible from the garden in winter.	Trees close to highway boundary to be felled and fence to be replaced with 2m high noise barrier. Temporary open views of traffic and construction works on Gilden Way from the garden, until partial restoration of screen when noise barrier is installed. Other trees in the garden would continue to screen Gilden Way in views from the house.	New noise barrier would substantially screen the traffic but lost boundary vegetation would leave high vehicles visible above the barrier from the garden. Other trees in the garden would continue to screen views of Gilden Way from the house.	Moderate Adverse	Climbing plants to be planted with support wires on the noise barrier.  <i>Opportunity for off-site screen planting with trees and shrubs on the property.</i>	Moderate Adverse	Moderate Adverse	Moderate Adverse	Moderate Adverse



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R11/1 The Rookery, two storey house at Drakes Meadow.	7m	High	Oblique first floor view of Gilden Way through/between trees in garden and adjacent garden of Walnut Cottage.	Close-board fence on highway boundary to be replaced with 2.5m high absorptive noise barrier. Probable limited loss of existing trees and shrubs near the boundary. Other trees and shrubs within the property would continue to screen Gilden Way. Loss of tall trees on highway boundary at Walnut Cottage would affect oblique first floor views from the house with increased visibility of Gilden Way traffic and construction works.	Loss of tall trees on boundary at Walnut Cottage would affect oblique first floor views from property with increased visibility of Gilden Way traffic.	Minor Adverse	Climbing plants to be planted with support wires on the new boundary fence.	Slight Adverse	Slight Adverse	Slight Adverse	Slight Adverse
R11A/1 Pitten House, two storey house and garden on Sheering Road near Churchgate Roundabout	32m	High	Oblique view of Churchgate roundabout from driveway and front garden. Trees and shrubs in the centre of the roundabout screen traffic on the other side of the roundabout. Trees on the property frame and limit the view.	Trees and shrubs to be removed within Roundabout. Tall trees in football ground south east of roundabout to be felled for construction of drainage attenuation pond. Loss of vegetation would expose construction works and Gilden Way traffic in oblique view. Excavation works for drainage attenuation tank in tree surrounded plot near roundabout would be partially visible through trees from buildings on northern edge of property.	Loss of trees and shrubs on the roundabout and nearby would make Gilden Way traffic more visible in oblique view partially screened by trees on the property. 2.5m high absorptive noise barrier on highway boundary at roundabout would provide partial screening.	Minor Adverse	New tree and shrub planting within islands on the new roundabout would partially screen traffic passing through middle and northern side of the roundabout. A row of individual trees to be planted along the boundary of the drainage attenuation pond near the noise barrier, next to Churchgate Roundabout.	Moderate Adverse	Slight Adverse	Neutral	Neutral

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R11B/2 New detached two storey houses numbered 41 & 43, in the former half of back gardens of Nos. 45 and 47 Sheering Road.	40m	High	Very oblique views of Churchgate roundabout area from 1 <sup>st</sup> floor of both properties substantially screened by trees at edge of playing fields. Dormer window at No.41 directly overlooks playing fields. A shed, fencing and hedge along residential boundary with playing fields screen ground floor views.	Trees near Churchgate roundabout at edge of playing fields would be felled, exposing excavation works for drainage attenuation pond and drainage attenuation tank in oblique view from 1 <sup>st</sup> floor and direct view from dormer window at No41. Vegetation within Churchgate Roundabout would be removed exposing whole roundabout in oblique view from 1 <sup>st</sup> floor and direct view from dormer/attic window. 2.5m high absorptive noise barrier to be installed along highway boundary providing a partial screen.	New roundabout, traffic, road lighting and drainage attenuation pond would be visible at oblique angle from first floor and directly from attic/dormer window at No41. New noise barrier would provide partial screen.	Moderate Adverse	New tree and shrub planting within islands on the new roundabout would partially screen traffic passing through the middle and northern side of the roundabout. A row of individual trees to be planted along the boundary of the drainage attenuation pond near the new noise barrier at Churchgate Roundabout. Climbers to be planted to grow up mesh fencing around drainage attenuation pond. <i>Potential for off-site planting of hedge on playing field side of noise barrier by agreement with Harlow Council.</i>	Moderate Adverse	Slight Adverse	Slight Adverse	Slight Adverse
R11C/1 No. 26 Sheering Road, two storey house,	135m	High	Ground floor view screened by dense hedge but narrow 1st floor view framed by trees and buildings down branch of Sheering Road that leads to Churchgate Roundabout. Shrubs and trees on roundabout limit visibility of traffic.	Vegetation on roundabout removed to construct new 'hamburger' layout, exposing more of traffic and construction works.	Increased visibility of traffic on roundabout due to loss of trees.	Minor Adverse	New tree and shrub planting within islands on the new roundabout would partially screen traffic passing through the middle and northern side of the roundabout.	Slight Adverse	Slight Adverse	Neutral	Neutral

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R11D/Nos. 51-81 Sheering Road (odd nos. only) and Nos.3-7 Mayfield Close. Total 16 properties	60-140m	High	Views through trees and garden vegetation across playing fields towards Gilden Way.	Part of roadside hedge near playing fields would be removed to provide safe sight line for traffic approaching Churchgate Roundabout. Mature trees near entrance to playing fields removed to construct proposed drainage attenuation pond. Construction works and traffic on Gilden Way and roundabout partially exposed to view from properties. 2-2.5m high absorptive noise barrier on new highway boundary would partially restore screening.	Part of roadside hedge near playing fields would be removed to provide safe sight line for traffic approaching Churchgate Roundabout. Mature trees near entrance to playing fields removed for proposed drainage attenuation pond. New 2-2.5m high absorptive noise barrier would screen most traffic on Gilden Way and roundabout. New road lighting would be visible above barrier, hedges and through/between trees.	Minor Adverse	Lost section of hedge would be reinstated on new boundary line. Individual trees would be planted along boundary between roundabout and drainage attenuation pond. <i>Potential for off-site planting of hedge on playing field side of noise barrier by agreement with Harlow Council.</i>	Slight Adverse	Slight Adverse	Slight Adverse (road lighting)	Slight Adverse (road lighting)
R12/1 120 Sheering Road. Two storey semi-detached house at junction of Sheering Road and Gilden Way	2.5m	High	Ground and first floor view north towards Sheering Road partially screened by fence and narrow, dense belt of trees and shrubs.	Realignment of Sheering Road would avoid property. New 2m high noise barrier would be installed between the highway and the property retaining existing trees and shrubs at the property boundary. Construction works partially visible from 1 <sup>st</sup> floor and from entrance to property.	Realignment of Sheering Road would avoid property. Existing boundary vegetation would be retained. Noise barrier would screen traffic apart from upper part of high vehicles. New road lighting visible	Minor Adverse	Native shrub planting in the severed space between the noise barrier and the property.	Slight Adverse	Slight Adverse (road lighting)	Slight Adverse (road lighting)	Slight Adverse (road lighting)
R12A/1 122 Sheering Road. Two storey semi-detached house at junction of Sheering Road and Gilden Way.	1.1m	High	Open and close views from ground and first floor towards busy traffic on Sheering Road framed by trees either side of broad driveway area at front entrance.	Realignment works to Sheering Road would narrowly avoid property but would be clearly visible. Possible loss of trees/shrubs on boundary north of property entrance. 2m high noise barrier and gates to be installed at the front of the property on the highway boundary, screening the traffic.	Realignment of Sheering Road would narrowly avoid property with pedestrian pavement reduced to 1.2m width, and possible loss of trees/shrubs on boundary north of entrance. Noise barrier would screen traffic apart from high vehicles In ground level views. New road lighting intrusive	Minor Adverse	<i>Opportunity for off-site planting on the private side of the barrier to soften its appearance by agreement with the owner.</i>	Moderate Adverse	Slight Adverse (road lighting)	Slight Adverse (road lighting)	Slight Adverse (road lighting)

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R13/4 Houses on Sheering Road - Two storeys except for bungalow at No.119.	6m	High	Open view south east towards (unlit) Sheering Road from 1st storey windows and mixed views from the ground floors of these properties, some of which are filtered by front garden hedges.	Realignment works to Sheering Road and construction of separate residential access road with footway would avoid properties but would be visible through/between vegetation in front gardens.	Increased traffic on widened and slightly realigned Sheering Road with road lighting. 2m high noise barrier would provide separation and headlight screening between new wider road and old road retained for residential access, but high vehicles would be visible above the barrier. New road lighting intrusive	Minor Adverse	Climbing plants to grow on both sides of noise barrier with climbing support wires. Amenity tree and shrub planting on opposite side of Sheering Road.	Moderate Adverse	Slight Adverse (road lighting)	Slight Adverse (road lighting)	Slight Adverse (road lighting)
R14/1 Two storey house at Mayfield Farm	21m	High	First floor views northwest towards Sheering Road filtered by trees. View to northeast is partially screened by single storey commercial buildings, fencing and trees. Ground floor views partially screened by close-board fencing. Open upper storey view of Sheering Road towards west. View from the ground floor partially screened by the boundary fence.	Existing garden fence would remain but works to realign Sheering Road and construct retaining structures would be closer to house and visible from first floor encroaching on the car park of Mayfield Farm with losses of trees and shrubs. Works to realign and widen Sheering Road with road lighting and alternative access drive to Mayfield Farm clearly visible from west-facing upstairs windows.	Existing garden fence would remain but realigned Sheering Road would be closer to house, visible from first floor encroaching on the car park of Mayfield Farm with losses of trees and shrubs. Realigned and widened Sheering Road with road lighting and alternative access drive to Mayfield Farm clearly visible from west-facing upstairs windows. 2m high noise barrier installed between highway and realigned access drive would provide partial traffic screening.	Major Adverse	Amenity tree, shrub and groundcover planting along Sheering Road near Mayfield Farm and either side of realigned access.	Large Adverse	Large Adverse (road lighting)	Moderate Adverse (road lighting)	Moderate Adverse (road lighting)
R15/1 (Campions Lodge) Two storey house on Sheering Road at turning for Campions.	7m	High	Ground floor view south east and east towards (unlit) Sheering Road filtered by a boundary hedge and shrubs. Oblique first floor view towards Sheering Road.	Works to realign Sheering Road further from property and downgrade old road for residential access visible with partial screening from vegetation at property. Clump of mature trees removed southeast of property on opposite verge of Sheering Road.	Sheering Road to be realigned further from property and old road to be downgraded for residential access only. Clump of mature trees removed southeast of property. 2m high noise barrier would provide separation between the new and old roads but high vehicles would be visible above the barrier. Intrusion from proposed road lighting.	Moderate Adverse	Partial screening with noise barrier, hedge and tree planting. Climbing plants to grow on noise barrier with climbing support wires.	Moderate adverse	Moderate Adverse (road lighting)	Slight Adverse (road lighting)	Slight Adverse (road lighting)

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R16/2 Houses on Sheering Road ('Eaves' - two storey and No.129 - one storey)	65m	High	Ground floor view south east towards (unlit) Sheering Road partially screened by 1.7m high brick wall and garden shrubs. First floor view from Eaves towards Sheering Road partially filtered by tall garden vegetation.	Works to realign Sheering Road further from property and downgrade old road for residential access visible from front of properties.	Sheering Road to be realigned further from property and old road to be downgraded for residential access only. 2m high noise barrier to be installed set back from the new road providing partial traffic screening. Intrusion from road lighting	Minor Adverse	Extra Heavy Standard individual trees to be planted in space between new and old roads. Hedges to be planted on both sides of the noise barrier.	Moderate Adverse	Slight Adverse (road lighting)	Slight Adverse (road lighting)	Slight Adverse (road lighting)
R17/1 Goldings One storey house on Sheering Road	67m	High	Ground floor view south east towards (unlit) Sheering Road partially screened by high brick wall.	Works to realign Sheering Road further from property and downgrade old road for residential access partially visible from front of property over existing boundary wall. Mature trees removed from opposite side of Sheering Road.	Sheering Road to be realigned further from property and old road to be downgraded for residential access only. 2m high noise barrier to be installed set back from the new road providing partial traffic screening. Intrusion from road lighting	Minor Adverse	Groups of Extra Heavy Standard trees to be planted in space between new and old roads. Hedges to be planted on both sides of the noise barrier.	Slight Adverse	Slight Adverse (road lighting)	Slight Beneficial	Slight Beneficial
R17A/1 The Red House. Large bungalow Sheering Road	35m	High	Wall along Sheering Road screens most traffic in views from the property. High lorries are frequently visible above the wall, seen between and through trees in the garden.	Existing trees on opposite side of Sheering Road would be retained. The existing wall would be retained. Sheering Road would remain unchanged in this area. Construction works would cause little disturbance to views from the property.	The heavy traffic on Sheering Road would be relocated further from the property, behind existing woodland opposite the property. 2m high noise barrier (also concealed by existing trees) to be installed set back slightly from the new road. High vehicles would no longer intrude on views from the house and garden.	Minor Beneficial	Existing trees between new and old roads would provide a sufficient visual screen. Hedge to be planted along road side of noise barrier.	Neutral	Slight Beneficial	Slight Beneficial	Slight Beneficial



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R18/7 Nos.1-7 at Campions – Large two storey house on Sheering Road converted to flats	48m	High	Possibly not all the flats have windows facing Sheering Road. Evergreen trees and a high hedge screen the property from Sheering Road but there are fragmentary close views of the traffic through/over parts of the boundary wall, railings and vegetation. Trees and shrubs on opposite side of road block any distant view.	Existing trees on the property would remain but trees and hedging on opposite side of Sheering Road would be cleared locally to create a new residential access from the realigned Sheering Road. Works to construct the realignment, as well as the residential access and proposed earth mounds would be visible through trees on the property.	Existing Sheering Road would become a quiet residential lane. Traffic on realigned Sheering road with road lighting and the new residential access would be partially visible through trees and hedging on the property and framed by remaining trees on opposite side of Sheering Road. Further partial screening would be provided by proposed earth mounds between the new and old alignments of Sheering Road.	Minor Adverse	Dense woodland planting on proposed earth mounds either side of the new residential access. Individual trees planted at large size in new grass verge area opposite the turning for the new residential access.	Slight Adverse	Slight Adverse	Neutral	Slight Beneficial
R18A/2 - Two storey semi-detached houses on Sheering Road (Nos.133 and 135)	71m	High	Ground floor view east towards (unlit) Sheering Road partially screened by 1.9m high brick walls, but open gated driveways. Gaps in brick wall screen for driveway access. First floor view east towards Sheering Road.	Loss of existing mature trees opposite properties and works to divert Sheering Road to new roundabout and construct earth mounds all visible from front of properties.	Sheering Road to be diverted to new roundabout requiring removal of mature trees on opposite side of road. Sheering Road would move slightly further from properties. Intrusion from lighting.	Moderate Adverse	Woodland planting and large size tree planting on earth mounds either side of Sheering Road diversion to new roundabout.	Large Adverse	Moderate Adverse	Slight Adverse (road lighting)	Slight Adverse (road lighting)
R19/1 - Two storey cottage on Sheering Road (No. 63) with small front garden.	3m	High	Close views of heavy traffic on (unlit) Sheering Road and of mature trees across the road from house and garden.	Realignment works for Sheering Road would encroach slightly on front garden. Partial encroachment and tree losses from copse opposite property.	Realigned Sheering Road would encroach slightly on front garden. Alternative vehicular access and parking would be provided from old Sheering Road at south end of garden. Partial encroachment and tree losses from copse opposite property. Intrusion from road lighting.	Moderate Adverse	Hedge to be planted at back of verge of realigned Sheering Road.	Large Adverse	Moderate Adverse	Slight Adverse	Slight Adverse.
R20/1 Aylmers * - Three storey Grade II* Listed	400m	High	3 storey Grade II* listed house on hill top surrounded by tall evergreen trees but with views from back garden between/over trees across valley.	Possible partial screened view of site compound, storage areas and construction works for roads and roundabouts in valley.	Road lighting visible - Possible partial screened view of traffic and road in valley. Construction compounds and storage areas removed and reinstated to farmland.	Minor Adverse	Woodland planting around roundabout and along link road to M11.	Slight Adverse	Slight Adverse	Slight Adverse (road lighting)	Slight Adverse (road lighting)



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R21/1 - Durrington Hall* Two storey (+ attics with windows) Grade II* listed country house	500m from garden 370m from park	High	Partially screened view across valley between/over trees in garden and park.	Partially screened view of construction compound, storage areas and construction works for roads and roundabouts in valley, visible from garden and upper floor windows of house.	Partial view of road, traffic and lighting between/over trees, from park and garden, and from upper floor windows.	Minor Adverse	Woodland planting around roundabout and along link road to M11.	Moderate Adverse	Moderate Adverse	Slight Adverse (road lighting)	Slight Adverse (road lighting)
R22/2 - Campfield and Campdell. Two storey semi-detached houses.	390-400m	High	View over Sheering Road and distant oblique, tree framed view across Pincey Brook Valley.	Construction compound, storage areas and construction works for link roads and new roundabouts would be visible in oblique view across valley partially screened by trees.	Link road traffic on embankment and new Sheering Road roundabout would be visible on the opposite side of the valley in oblique view partially screened by trees. Road lighting intrusive	Minor Adverse	Woodland planting around roundabout and along link road to M11.	Slight Adverse	Slight Adverse	Slight Adverse (road lighting)	Slight Adverse (road lighting)
R23/2 - Nos. 1&2 Sheering Hall Cottages. Two storey houses on hillside near entrance to Sheering Hall.	390-395m	High	Open attractive views of Pincey Brook valley across fields from houses and from gardens with little screen vegetation in gardens.	Construction works for link roads and new roundabouts would be clearly visible on the opposite side of the valley. Construction compound and storage areas visible.	Link road traffic on embankment and new Sheering Road Roundabout would be clearly visible on the opposite side of the valley. Road lighting intrusive. Construction compound and storage areas removed and returned to agriculture.	Moderate Adverse	Woodland planting around roundabout and along link road to M11.	Large Adverse	Large Adverse	Moderate Adverse	Moderate Adverse
R24/2 - Nos. 3&4 Sheering Hall Cottages. Two storey houses on entrance drive to Sheering Hall	447m	High	Partial view along valley, over hedge and between trees from upper floor windows.	Hedge and tree filtered view along valley toward construction works for link roads and Sheering Road Roundabout. Construction compound and storage areas partially visible.	Hedge and tree filtered view of link roads and roundabouts with road lighting.	Minor Adverse	Woodland planting around roundabout and along link road to M11.	Slight Adverse	Slight Adverse	Slight Adverse	Neutral
R25/1 – Sheering Hall; two storey country house, Grade II* Listed with several out buildings	230m	High	House garden and outbuildings surrounded by concentric belts of trees obscuring views out of the property. Narrow framed eastward view toward M11 from track out of property.	Excavations for drainage attenuation pond visible from east side of property through gaps in trees with possible oblique view through trees of earthworks and construction for M11 J7A northbound on slip.	New drainage attenuation pond. Traffic and road lighting partially visible through trees from east side of property and through dense trees toward the south.	Minor Adverse	Woodland planting along embankment slopes of link road and near roundabout of new M11 Junction and on regraded embankment for slip road, and hedge planting around attenuation pond.	Slight Adverse	Slight Adverse	Slight Adverse	Neutral

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R26/1 - Ridgedale Two storey house at edge of Sheering village	1.4 - 1.8 km	High	Distant view across valley from house and garden. M11 traffic visible.	Junction 7A construction works visible in distance.	Traffic and lighting at New junction 7A visible in distance.	Minor Adverse	Woodland planting along slip roads and near roundabouts of new M11 Junction and along link road embankment.	Slight Adverse	Slight Adverse road lighting	Slight Adverse (road lighting)	Slight Adverse (road lighting)
R27/1 – Pondfield -Two storey house at edge of Sheering village	1.2 – 1.8 km	High	Distant view across valley from house and garden. M11 traffic visible.	Junction 7A construction works visible in distance.	Traffic and lighting at New junction 7A visible in distance.	Minor Adverse	Woodland planting along slip roads and near roundabouts of new M11 Junction and along link road embankment.	Slight Adverse	Slight Adverse (road lighting)	Slight Adverse (road lighting)	Slight Adverse (road lighting)
R28* - Housham Hall. Two storey farmhouse.	520m	High	View toward M11 (in cutting) screened by hedge and trees on boundary of park/garden.	Construction works and lighting to construct M11 Junction visible through trees in winter	Lighting at roundabouts of M11 Junction 7A visible through trees on property boundary	Minor Adverse	Woodland planting along slip roads and near roundabouts of new M11 Junction.	Slight Adverse	Slight Adverse (road lighting)	Slight Adverse (road lighting)	Neutral
R29/1 – The Engine House. Two storey house on Moor Hall Road.	200m – 470m	High	Oblique view toward M11 partially concealed in cutting, screened by roadside hedge and nearby belt of trees.	Tree felling, scrub removal and enlargement of cutting for slip roads of M11 junction visible would expose sidelong view of higher vehicles on M11. Slip road construction works visible.	Tree felling, scrub removal and enlargement of cutting for slip roads of M11 junction visible would expose sidelong view of higher vehicles on M11 and slip roads. Road lighting visible.	Minor Adverse	Woodland and hedge planting along slip roads and near roundabouts of new M11 Junction.	Slight Adverse	Slight Adverse (road lighting)	Slight Adverse (road lighting)	Slight Adverse (road lighting)
R29A/1 Bungalow north of the Engine House	534m	High	View across fields in Pincey Brook Valley	Site compound, soil storage heaps and road construction activities visible in middle distance lower in the valley, partially screened by The Mores Wood.	New Sheering Road roundabout and link road visible in middle distance lower in the valley. Road lighting intrusive. Site compound and storage areas restored to agriculture.	Moderate Adverse	Planting of woodland around Sheering Road roundabout and large trees and hedges along link road.	Moderate Adverse	Moderate Adverse	Slight Adverse (road lighting)	Slight Adverse (road lighting)
R30/1 - Moor Hall Lodge. Two storey lodge on Moor Hall Road.	510m	High	North view over clipped boundary hedge across field toward Mayfield Farm and valley of Pincey Brook. Sheering Road concealed by trees.	Site compound, soil storage heaps and road construction activities in middle distance lower in the valley, partially screened by landform and by The Mores wood.	New Sheering Road roundabout and link road visible lower down at other end of large arable field. Partial screening by landform and by The Mores wood. Road lighting intrusive.	Moderate Adverse	Planting of woodland around Sheering Road roundabout and large trees and hedges along link road.	Moderate Adverse	Moderate Adverse	Slight Adverse (road lighting)	Slight Adverse (road lighting)

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R31/1 – Morgans Farmhouse. Seven bedroom two storey residence	430m	High	North view over clipped boundary hedge across field toward Mayfield Farm and valley of Pincey Brook. Sheering Road concealed by trees. Some screening provided by existing barn on the property.	Site compound, soil storage heaps and road construction activities in middle distance lower in the valley, especially visible from upstairs windows. View partially screened by landform, by The Mores Woodland and by the barn	New Sheering Road roundabout and link road visible lower down at other end of large arable field. Partial screening by landform and by The Mores Woodland, and the barn. Road lighting intrusive.	Moderate Adverse	Planting of woodland around Sheering Road roundabout and large trees and hedges along link road.	Moderate Adverse	Moderate Adverse	Moderate Adverse (road lighting) especially from upstairs windows.	Moderate Adverse (road lighting) especially from upstairs windows.
<b>Commercial properties</b>											
C01 Three businesses at Mayfield Farm: Mayfield Farm Bakery and Tea Room, Churchgate Sausage Shop and Mutz Kutz (dog grooming)	0m	Low	Slightly elevated view of Sheering Road from yard and parking area. View framed by existing shrubs and trees either side of entrance drive.	Realignment of Sheering Road requires 5 to 20m+ of encroachment on property with realignment of front entrance. Loss of parking at front entrance. Sheering Road traffic closer to property. Retaining wall to be constructed along roadside at back of verge to limit landtake on the property. Construction works openly visible.	Realignment of Sheering Road requires landtake with closure of front entrance and provision of alternative indirect access. Loss of parking at front entrance. Sheering Road traffic closer to property. 2m high noise barrier to be installed on new highway boundary above retaining wall.	Major Adverse	Amenity planting of trees, shrubs and groundcover along new highway boundary and realigned entrance to Mayfield Farm. Climbing plants to grow on noise barrier supported by climbing wires.	Large Adverse	Moderate Adverse	Slight Adverse	Slight Adverse
C02* Gardencare Tree Services at Sheering Hall	365m	Low	Partially screened tree-framed eastward view from property toward M11 on embankment. Traffic on M11 partially screened by roadside trees.	Excavations for drainage attenuation pond visible through gap in trees with possible oblique view through trees of earthworks and construction for M11 J7A northbound on slip.	Drainage attenuation pond visible through gap in trees. Traffic on northbound slip road and M11 partially visible in oblique view through trees.	Minor Adverse	Woodland and hedge planting along slip roads and near roundabouts of new M11 Junction.	Slight Adverse	Slight Adverse	Neutral	Neutral

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C03 The Coffee Officina at Housham Hall	400m	Low	Business located at entrance to commercial area at Housham Hall with open view across fields towards site for Junction 7A. M11 is concealed in cutting.	Construction works for M11 Junction 7A visible across fields from property entrance.	New M11 Junction 7A with raised roundabouts clearly visible	Major Adverse	Woodland and hedge planting along slip roads and near roundabouts of new M11 Junction.	Moderate Adverse	Moderate Adverse	Slight Adverse (road lighting)	Slight Adverse (road lighting)
C04 Morgans Farm and stables (currently for sale)	430-600m	Low	View across large arable field toward site for Sheering Road Junction. Field view partially obscured by landform and enclosed by mature trees at The Mores Woodland and trees concealing Sheering Road.	Site compound, soil storage heaps and road construction activities visible in middle distance lower in the valley, partially screened by The Mores Woodland.	New Sheering Road Roundabout and link road visible in middle distance lower in the valley. Road lighting intrusive. Site compound and storage areas restored to agriculture.	Moderate Adverse	Planting of woodland around Sheering Road Roundabout and large trees and hedges along link road.	Slight Adverse	Slight Adverse	Neutral	Neutral
<b>Playing Fields</b>											
Fawbert and Barnard's Primary School * Playing Field	2.5m	Moderate	Roundabout lighting and traffic partially visible through boundary hedge and trees. Grass area on school property between Gilden Way and terraced houses at Chippingfield provides oblique views of Gilden Way though chainlink fence and large gaps in boundary vegetation.	Removal of a 40m (approx.) length of boundary hedge would expose more of the traffic and construction works to view.	Removal of a 40m (approx.) length of boundary hedge would open up more of the traffic on widened highway to view. 2m high noise barrier to be installed on highway boundary would provide partial screening.	Minor Adverse	Climbing plants to be planted with support wires on noise barrier. <i>Opportunity for off-site tree planting in strip of land between Gilden Way and houses at Chippingfield.</i>	Slight Adverse	Slight Adverse	Neutral	Neutral

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Public playing fields near Churchgate Roundabout	Adjacent	Moderate	Gilden Way screened by hedge along boundary. High vehicles visible above the hedge. Partial higher screening provided by row of horse chestnut trees near boundary. Churchgate Roundabout screened by a group of tall trees near entrance at west end of playing fields.	Removal of approximately 200m of boundary hedge along Gilden Way and next to Churchgate Roundabout would expose traffic and construction works. Group of tall trees to be felled and drainage attenuation pond excavated near entrance to playing fields. Excavation works openly visible.	2m high noise barrier to be erected along highway boundary providing partial traffic screen next to Gilden Way. 2.5m absorptive barrier near Churchgate Roundabout. High vehicles would still be visible. New drainage attenuation pond enclosed with 2m mesh fencing visible from playing fields where existing hedge and trees were removed.	Moderate Adverse	Planting to restore hedge along Gilden Way on playing field side of noise barrier. Closely spaced row of individual trees to be planted between attenuation pond and barrier near roundabout. Climbers supported on wires to be planted on the road side of the noise barrier.	Moderate Adverse	Moderate Adverse	Slight Adverse	Slight Adverse
<b>Public Rights of Way</b>											
P01 Footpath 185-168 (Harlow)	2-80m	High	Path emerges through trees at Gilden Way grass verge.	Tree clearance within proposed construction compound area near path. Compound fencing, cabins, vehicles, equipment, stored materials visible through/behind narrow strip of mature trees and shrubs next to path.	Construction compound removed but new fencing would remain and felled trees within compound area would still be absent.	Minor Adverse	No planting proposed within former construction compound.	Moderate Adverse	Slight Adverse	Slight Adverse (Loss of trees in former construction compound would continue to have a slight effect on views from the path.)	Slight Adverse (Loss of trees in former construction compound would continue to have a slight effect on views from the path.)
P02 Footpath 185-136 (Harlow)	2m	High	Close view of Gilden Way as path emerges from behind trees to join roadside footway of Gilden Way	Construction works open to view where path joins Gilden Way.	Increased traffic on widened Gilden Way and marginal loss of roadside trees and shrubs would affect view from end of path. Existing residential fence replaced with 2-2.5m high noise barrier close to end of path.	Minor Adverse	Climbing plants supported with wires to be planted to grow up noise barrier. Amenity shrub planting proposed at foot of noise barrier.	Slight Adverse	Slight Adverse	Neutral	Neutral
P03 Footpath 185-20 (Harlow)	2-60m and 120-150m	High	Close view of traffic and Gilden Way as path emerges from trees, ending at verge of Gilden Way.	Construction works open to view where path joins Gilden Way. Tree clearance and excavations for nearby drainage attenuation pond visible between trunks of remaining mature trees and shrubs.	Increased traffic on widened Gilden Way and marginal loss of roadside trees and shrubs would affect view from end of path. Fencing, grass covered slopes and inlet/outfall headwalls of completed attenuation pond visible through trees.	Moderate Adverse	Replacement hedge and tree planting in affected places along Gilden Way. Strips of native shrub planting around banks of attenuation pond.	Moderate Adverse	Slight Adverse	Neutral	Neutral



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P04 Footpath 185-22 (Harlow)	2-60m	High	Portion of path ending at Sheering Drive and Sheering Road near Gildea Way. Gildea Way traffic screened by roadside hedge and trees.	Temporary loss of boundary fence and loss of some roadside trees along Gildea Way would expose traffic and construction works to view from last 30m of path.	Installation of new 2.5m high absorptive noise barrier on boundary would partially restore screening.	Moderate Adverse	Climbing plants to be planted to grow on both sides of the noise barrier supported by wires.	Moderate Adverse	Slight Adverse	Neutral	Neutral
P05 Footpath 185-14 (Harlow) South of Churchgate Roundabout	2-50m	High	Path approaches south side of Gildea Way through semi-mature Lime trees at Churchgate Roundabout.	Removal of existing vegetation in roundabout and construction of 'hamburger' roundabout with traffic lights visible at end of path near junction. Strip of trees lost to excavate large drainage attenuation tank and outlet pipe in clearing between trees would opening a direct view from path to the excavation works.	Clearing restored to grass with most of surrounding trees retained on north and south sides but a gap would remain on the west side next to the footpath. 2.5m absorptive noise barriers installed facing roundabout, slightly set back on verge either side of path.	Slight Adverse	Replacement planting of native shrubs in felled area near path. Hedges to be planted facing the roundabout in front of noise barriers.	Large Adverse	Slight Adverse	Slight Adverse	Slight Adverse
P05A Footpath 185-14 (Harlow)	0-270m	High	Path along field boundary on land for Harlowbury Development – Almost perpendicular to unlit section of Gildea Way with open views of the traffic and roundabout.	Road widening works clearly visible from path as it approaches roundabout on Gildea Way.	Increased traffic visible on widened Gildea Way with road lighting. Churchgate roundabout to be remodelled with Gildea Road continuing through the middle of the roundabout and traffic lights. 2.5m high absorptive noise barriers to be installed along road boundary of the Harlowbury development screening the traffic, but also adversely affecting views from the path.	Minor Adverse	Hedge and tree planting along highway boundary next to noise barriers, on side facing the road.	Slight Adverse	Slight Adverse	Slight Adverse Harlowbury Development building work soon to commence, obscuring views along most of the path.	Slight Adverse Harlowbury Development building work soon to commence, obscuring views along most of the path.



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P06 Footpath 204-35 (Sheering)	0-260m	High	Path along Marsh Lane adjacent to fields of the Harlowbury Development. This lane is the access to the Gibberd Garden. Open view of the traffic on Gilden Way from the first 330m of the path.	Road widening works clearly visible from path on Marsh Lane as it approaches Gilden Way.	Increased traffic visible on widened Gilden Way with road lighting. 2.5m high absorptive noise barrier to be installed along road boundary of the Harlowbury development screening the traffic, but also adversely affecting views from the path.	Minor Adverse	Hedge and tree planting along highway boundary next to noise barriers, on side facing the road	Slight Adverse	Slight Adverse	Slight Adverse Harlowbury Development building work soon to commence, obscuring views along most of the path.	Slight Adverse Harlowbury Development building work soon to commence, obscuring views along most of the path.
P07 Footpath 204-30 (Sheering)	170-360m	High	Path along belt of trees with view across field toward Mayfield Farm Barn and Sheering Road. Traffic visible in middle distance between roadside properties. <b>Portion of path to be diverted not included in this assessment.</b>	Construction works for widening and realigning Sheering Road with road lighting visible from path, framed between barn at Mayfield Farm and No122 Sheering Road. Possible partial view through trees toward construction of new Sheering Road roundabout and link road and construction compound lower in the valley.	Widened and realigned Sheering Road with road lighting visible from path framed between barn at Mayfield Farm and No122 Sheering Road. Possible partial view through trees toward new Sheering Road roundabout and link road with lighting lower in the valley.	Minor Adverse	Amenity planting of trees, shrubs and groundcover along verge of realigned Sheering Road and realigned access to Mayfield Farm.  Hedge and tree planting around New Sheering Road Roundabout and along link road.	Slight Adverse	Slight Adverse	Slight Adverse (road lighting)	Slight Adverse (road lighting)
P08 Footpath 204-29 (Sheering)	50-200m	High	View of horse pastures, water meadow and large pond near Pincey Brook. Trees and scrub along stream plus hedges and woods limit the view.	Works would remain substantially screened by trees and hedges although small vegetation losses could be visible near the new access to No. 63 Sheering Road	Road lighting at the new Sheering Road roundabout would be visible above/through the trees.	Minor Adverse	Woodland planting near the roundabout. (The proposed planting would require many years of growth before it would be effective at screening road lighting).	Neutral	Slight Adverse	Slight Adverse	Slight Adverse

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P09 Footpath 204-17 (Sheering)	98m-800m	High	View of fields and woods from path along bank of Pincey Brook near western end of path. M11 traffic visible nearby at northeast end of path.	Construction compound and soil storage areas nearby. Works to construct M11 Junction, link roads on embankment and two roundabouts near Sheering Road plus drainage attenuation pond, all openly visible near the path. Some screening provided by existing oak trees to be retained between the two roundabouts near Sheering Road.	M11 Junction, link Road on embankment and roundabouts intrusively visible, particularly near western portion of path. Link road on embankment and M11 Junction 7A would also affect views from further east. Road lighting intrusive.	Major Adverse in western portion of path, reducing to Moderate and Minor Adverse toward north-eastern end of path.	Woodland planting around roundabout, along link road, and around M11 Junction 7A.	Large Adverse in western portion, reducing to Moderate and Slight Adverse with distance.	Large Adverse in western portion, reducing to Moderate and Slight Adverse with distance.	Large Adverse in western portion, reducing to Moderate and Slight Adverse with distance, but smaller lengths of Large and Moderate Adverse, and greater length of Slight Adverse.	Large Adverse in western portion, reducing to Moderate and Slight Adverse with distance, but smaller lengths of Large and Moderate Adverse, and greater length of Slight Adverse.
P10 Footpath 204-16 (Sheering)	800m - 1.2km	High	Distant views from hill top across Pincey Valley. M11 traffic is visible in the middle to far distance.	Construction works for M11 Junction 7A visible in the distance.	Traffic and lighting at New M11 Junction 7A visible in distance.	Minor Adverse	Woodland planting along slip roads and near roundabouts of new M11 Junction and along link road embankment.	Slight Adverse	Slight Adverse	Slight Adverse (road lighting)	Slight Adverse (road lighting)
P11 Footpath 198-2 and Bridleway 2 (Matching)	1.1-1.2km	High	Path on slope from High Lane. Distant views from path/bridleway across undulating farmland toward M11 and site for Junction 7A. Overgrown hedge along this part of the path partially obscures the view.	Construction works to build M11 Junction 7A visible in distance	Traffic and lighting at New M11 Junction 7A visible in distance.	Minor Adverse	Woodland planting along slip roads and near roundabouts of new M11 Junction and along link road embankment.	Slight Adverse	Slight Adverse	Slight Adverse (road lighting)	Neutral
P12 Footpath 198-1 (Matching)	500-600m	High	Track across field west of Housham Hall with view toward site for Junction 7A partially screened by hedges and by Moorhall Wood. M11 concealed in cutting apart from distant view towards the north.	Construction works for M11 Junction 7A visible from path above hedges and between intervening trees.	Traffic on raised roundabouts of new M11 Junction 7A with road lighting visible above hedges and between intervening trees.	Minor Adverse	Woodland planting along slip roads and near roundabouts of new M11 Junction	Slight Adverse	Slight Adverse	Slight Adverse (road lighting)	Slight Adverse (road lighting)

Receptor Number R = residential C = commercial P = Public Right of Way /1 = no. of properties * = Listed Building	Distance to scheme (to nearest main carriageway)	Sensitivity	Existing winter view towards site	Change to view during construction	Change to view in Year 1 (winter)	Magnitude of change to view (Y1 winter)	Mitigation	Significance of visual effect during construction	Significance of visual effect at completion of construction (Year1 winter)	Significance of visual effect 15 years after completion (Year 15 winter) with mitigation	Significance of visual effect 15 years after completion (Year 15 summer) with mitigation
P13 Sheering Road	240-370m	Moderate	Views of Pincey Brook valley over roadside hedge. High wheelbase vehicles, buses and lorries are high enough for travellers to see over the hedge, but ordinary cars are too low to provide the view. There is no footway or safe verge space for pedestrians.	Earthworks, construction compounds and storage areas for the scheme on the opposite side of the valley would be visible between and over the shrubs and trees along Pincey Brook. Closer intervening clumps of trees would also break up the view of the works.	Sites of construction compound and storage areas restored to agriculture but newly constructed road embankments, roads roundabouts, traffic and road lighting open to view between trees.	Moderate Adverse reducing to Minor Adverse further northeast along road with increased screening from existing trees and a more distant view.	Extensive woodland screen planting around roundabouts and along north verge of link roads. Road lighting would be visible above the trees for many years.	Moderate Adverse, reducing to Slight Adverse further northeast along Sheering Road with increased screening from existing trees and a more distant view.	Moderate Adverse, reducing to Slight Adverse further northeast along Sheering Road with increased screening from existing trees and a more distant view.	Slight Adverse	Slight Adverse
P14 Sheering Road at Junction with Sheering Lower Road	270m	Moderate	View of Pincey Brook valley framed by roadside trees and scrub. Vegetation along Pincey Brook partially screens the view. There is no footway or safe verge space for pedestrians.	Earthworks, construction compounds and storage areas for the scheme partially visible in middle distance between/behind trees and scrub.	Construction compound and storage areas restored to agriculture but newly constructed road embankments, roads roundabouts, traffic and road lighting partially visible between trees and scrub.	Minor Adverse	Extensive woodland screen planting around roundabouts and along north verge of link roads.	Slight Adverse	Slight Adverse	Slight Adverse (road lighting)	Slight Adverse (road lighting)

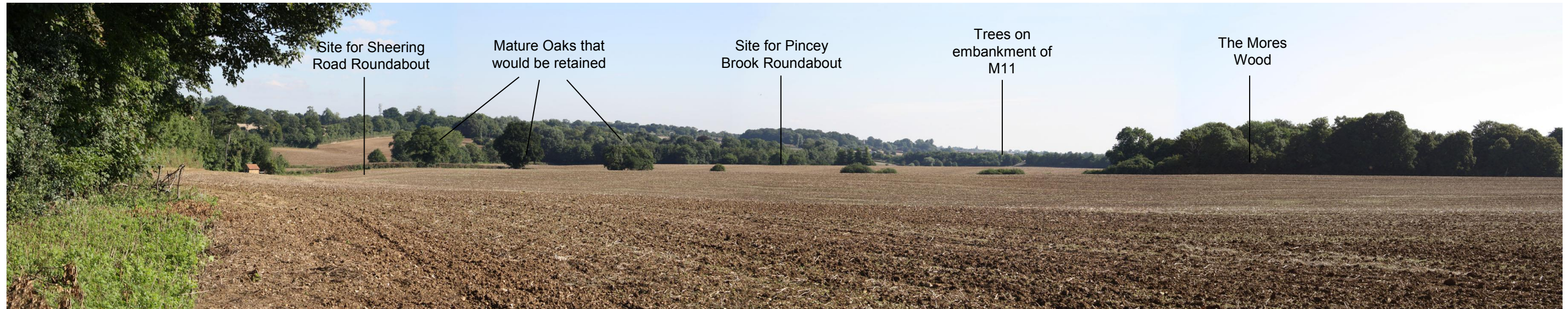
## **Appendix 7.3: Site Photographs**





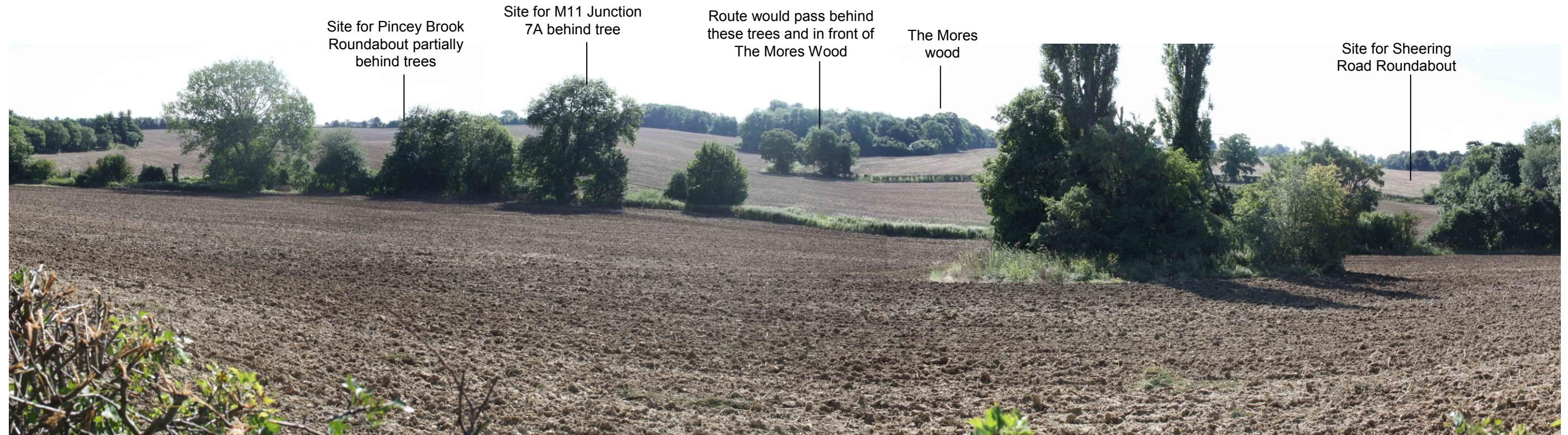


View 1: From rear of Sheering Hall Cottages (R23) across valley of Pincey Brook toward the site for the Pincey Brook and Sheering Road Roundabouts and proposed link roads.

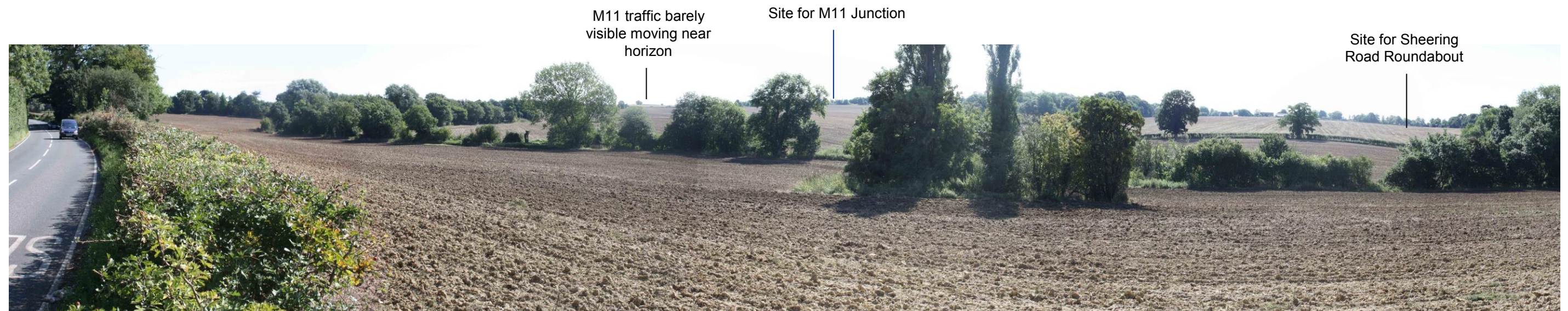


View 2: From north of Mayfield Farm toward site for New Sheering Road Roundabout. The TPO protected trees in the left foreground would be removed for the realignment of Sheering Road.





View 3: From Sheering Road looking south across Pincey Brook Valley. The trees across the middle of the view are on the line of Pincey Brook.



View 4: From Sheering Road looking south across Pincey Brook Valley.





View 5: From Sheering public footpath 204\_17 near Pincey Brook looking south. The Mores Wood is in the background on the left. Sheering Road is behind the trees on the right. The link roads would cross the view to join the Sheering Road Roundabout (site indicated) passing behind the hedge and oak trees. The oaks and most of the hedge would be retained apart from a length to the right of the right-hand oak that would be removed for a drainage attenuation pond.

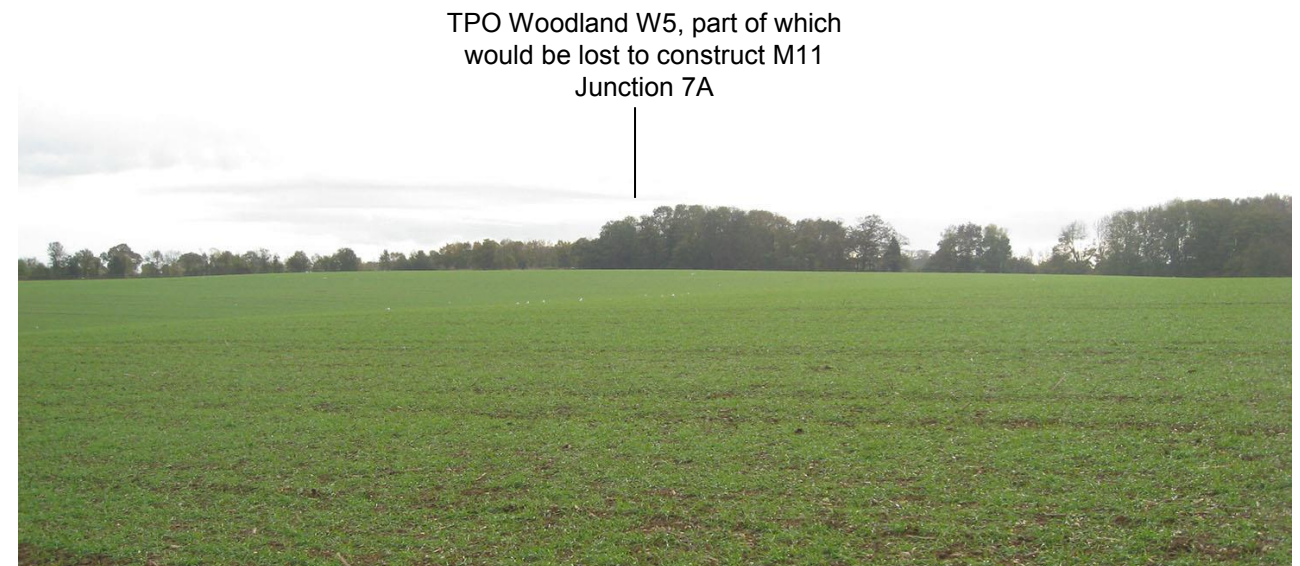


View 6: Sheering Road looking north. The road would be realigned eastward to join the proposed roundabout and link to the M11. The existing road would be downgraded & narrowed for residential access. Most of the trees to the right and all to left would be retained.





View 7: View looking north from proposed route near site for junction with M11. The M11 is on the right. Sheering hall (R25) and Pincey Brook are behind the trees on the left.



View 8: View from the proposed route near the north end of the Mores Wood looking southeast towards the site for the new M11 Junction 7A.



View 9: Sheering Road looking north. The hedge in the middle of the view would be removed as part of the realignment of Sheering Road encroaching on the frontage of Mayfield Farm with a realigned entrance to the property. The hedges and wall in front of the houses to the left would be retained.





View 10: Entrance to Mayfield Farm (C01) would be realigned to join Gilden Way/ Sheering Road to the right, just out of the view. The realignment of Sheering Road would encroach on the property with a brick-faced retaining wall. The foreground trees to the left and right in the picture would be removed. New trees and shrubs would be planted along the new entrance.



View 11: 122 Sheering Road (R12A). The current entrance arrangement at this property would be retained. The brick wall and gate posts would remain but part of the clump of trees to the left and the vegetation in front of the wall would be lost to construct a public footway leading to the bus stop and Pelican crossing.



View 12: Front garden of No. 163 Sheering Road. Sheering Road is behind the fence on the left. The road would be widened and slightly realigned to the left encroaching on the TPO protected wood (W1).



View 13: Pincey Brook, looking west towards Sheering Hall (R25).





View 14: Gildden Way looking south. The turning on the right is Marsh Lane leading to the Gibberd Garden. The farmland to the right is included in the Harlowbury Development soon to start construction. Gildden Way road widening would encroach slightly on the belt of trees on the left side of the road and remove the tree clump in the foreground on the right. Noise barriers are proposed both sides of the road, next to the wood and along the boundary with the Harlowbury Development.



Houses at The Oxleys (R07 & R07A)

Hedge to be removed and replaced further back to allow proposed widening of Gildden Way

View 15: Pedestrian Underpass and bus stop on Gildden Way. The houses on the right (R09), behind the bus shelter are within Churchgate Conservation Area. Indicative noise barriers proposed for this area are shown in the photomontages on Figure 7.8





View 16: Gilden Way looking north towards houses at Mulberry Gardens (R02).



View 17: View from footway on north side of Gilden Way looking across a green space belonging to Fawbert and Barnard Primary School. The houses at Chippingfield (R01 & R01A) are in the background. A close-board fence or noise barrier with climbing plants would be installed to screen the widened Gilden Way, but there would be no space here for tree planting. There would be opportunity for off-site tree planting on school property (subject to agreement) to screen the traffic from the houses and school grounds.



View 18: Gilden Way looking northeast toward the entrance to Long Barn Cottage. The turning for Mulberry Green is visible in the middle distance on the left.





**Appendix 7.4: Tree Survey Report and Arboricultural Impact Assessment**





## **M11 Junction 7a**

Essex County Council

### **Appendix 7.4: BS5837:2012 Tree survey report and Arboricultural Impact Assessment**

B3553F05-3000-REP-0038 | 3

18 October 2016



## M11 Junction 7a

Project No: B3553F05  
 Document Title: Appendix 7.4: BS5837:2012 Tree survey report and Arboricultural Impact Assessment  
 Document No.: B3553F05-3000-REP-0038  
 Revision: 3  
 Date: 18 October 2016  
 Client Name: Essex County Council  
 Project Manager: Paul Manamike  
 Author: Peter Small  
 File Name: C:\pwworking\jacobs\_uk\_highways\_ss4\smallp\dms42713\Appendix 7.5\_Tree report\_M11J7A\_R3.0.docx

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### Document history and status

Revision	Date	Description	By	Review	Approved
0	23/12/15	M11 junction 7a Tree Report – BS5837:2012	Peter Small/ Simon Ffoulkes	Alan Riley	Paul Manamike
01	04/02/2016	M11 junction 7a Tree Report – BS5837:2012	Peter Small/Simon Ffoulkes	Alan Riley	Paul Manamike
02	27/06/2016	M11 junction 7a Tree Report (Amendment – Phase 2 revision) – BS5837:2012	Peter Small	Mark Watson	Paul Manamike
03	20/09/2016	M11 junction 7a Tree Report (Combined report) – BS5837:2012	Peter Small	Mark Watson	Paul Manamike



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**APPENDIX F – Tree Constraints Plan and Mitigation Measures for Phase 1 Site Compound**

## 1 Introduction

### 1.1 Client Instruction

- 1.1.1 Jacobs UK Ltd. was instructed by Ringway Jacobs, who in turn are commissioned by Essex County Council, to undertake a tree survey along the B183 (Gilden Way and Sheering Road), the areas designated for the proposed M11 Junction 7A and the proposed link road, in accordance with 'BS5837:2012 – Trees in Relation to Design, Demolition and Construction' and to provide a report.
- 1.1.2 The requirements of the survey were to:-
- Record information about the trees, hedges and woodlands that may be impacted upon by the proposed development (extension road, new junction and the associated works along Gilden Way and Sheering Road);
  - Assess the potential impact upon those trees likely to be affected by the development, including potential tree loss and also protection measures required for retained trees; and
  - Provide a tree survey report with all information recorded and any appropriate mitigation and protection measures to safeguard the retained trees.

### 1.2 Documents Provided

- General Arrangement Key Plan - Preliminary
    - Drawing no. (x8): B3553F05-100-DR-000 to 007/RevP0
    - Drawing no. (x8): B3553F05-0100-DR-0100 to 0107/RevP1
  - Topographical surveys
    - Drawing no. JG14-029/Topo/OS Grid/3D/01 to 39/Rev1
    - Drawing no. 41352B/200/2 to 16
  - Construction Site Layout Plans
    - Drawing no. B3553F05-0100-DR-0813 to 0818
- 1.2.1 On-line aerial photography of the survey site was also used during a desktop study of the areas included in this report.

### 1.3 Documents Produced (as appendices to this report)

- Tree Survey and Protection Schedule – **Appendix C**
  - Tree Constraints Plans, sheets 1-37 (drawing no. B5335F05/LE/01/Rev1) – **Appendix D**
  - Tree Constraints Plan and Mitigation Measures for Phase 1 Site Compound (drawing no. B3553F05/P1-5C/Rev0) – **Appendix F**
- 1.3.1 Additional trees that were surveyed within key woodland areas were tagged with aluminium tags running consecutively from 134-172. This numbering sequence is independent to the primary tree numbering system (1 to 222) used in this report and is denoted within the schedule and plans with the suffix 'i' and tree groups the suffix 'a' or 'b' in order to differentiate this numbering sequence from the primary tree survey numbering sequence.

## 1.4 Scope of Survey

- 1.4.1 The survey relates to trees with a stem diameter of 75mm or more (measured at 1.5m above ground level) located within the area highlighted on the site plan. Trees, hedges and woodlands included in the survey included those in close proximity/within the footprint of the proposed development and also arboricultural features in the wider landscape which are considered important and require consideration in terms of recording the arboricultural character of the surrounding area (e.g. species mix, distribution of trees, presence of veteran trees/trees of historical importance).
- 1.4.2 Areas re-surveyed and those included following the preliminary tree survey relate to developments of the scheme design and the progression of the design process. As more design detail has become available the scope and extents of the tree survey has been modified to meet these requirements. The main elements of the scheme which have required additional survey work are:
- Change in the design of Phase 2 of the scheme, link road from Gilden Way and Sheering Road to the proposed new M11 junction; and
  - Re-location of site compounds for both Phase 1 and 2.

## 1.5 Survey Method

- 1.5.1 Observations were conducted from ground level, using the 'Visual Tree Assessment' system (VTA by Mattheck, C & Breloer, H (1994) and The Body Language of Trees, Research for Amenity Trees No 4 Department of the Environment). No internal diagnostic equipment was used other than a sounding mallet.
- 1.5.2 No internal investigations were carried out or tissue samples taken from the surveyed trees. Information was collected in accordance with the recommendations in subsections 4.4.2.5 and 4.4.2.6 of BS 5837:2012 and included species, height, diameter, branch spread, crown clearance, age class, physiological condition, structural condition and estimated remaining contribution. Stem diameters of each tree were taken using a rounded down diameter tape in millimetres at 1.5m above ground level. All other dimensions were estimated. No soil samples were taken.
- 1.5.3 Tree species identification was based on a visual observation. The quality and value of the trees surveyed was categorised in accordance with 'Table 1 Cascade chart for tree quality assessment', in BS5837:2012 (a full copy extract is attached in **Appendix A**). The 'Root Protection Area' (RPA) of each tree was determined using the calculation methods detailed in BS 5837: 2012 and are shown in **Appendix C** and **Appendix D** ('Tree Survey and Protection Schedule' and the 'Tree Constraints Plans'). In this report, the radius given was measured from the centre of the main trunk for individual trees. Hedge and tree group RPAs, in the schedule, are measured from the edge of the crown canopies unless otherwise stated. For selected groups of trees the radius given is applied to each tree within the respective arboricultural feature.

## 1.6 Limitations

- 1.6.1 A topographical survey was provided with locations for many of the trees within and directly adjacent to the proposed development. Where arboricultural features included in the tree survey were not individually identified on the topographical plans (primarily due to notable trees being grouped with adjacent vegetation during the topographical survey), on-site hand plotting of these trees was used and is therefore approximate. Jacobs accepts no liability for the accuracy of the tree survey drawings.

- 1.6.2 Trees are living organisms whose health and condition can change rapidly and all trees, even healthy ones, are at risk from unpredictable climatic and man-made events. The assessment of risk for any tree is based upon factors evident at the time of the inspection and the interpretation of those factors by suitably qualified inspectors. The health, condition and safety of trees should be checked on a basis commensurate with the level of risk and preferably on an annual basis.

## 2 Site Visit and Observations

### 2.1 Site Visit

- 2.1.1 Initial site visits were undertaken by trained arboriculturists during October and November 2015. These visits involved the surveying of trees located along Gilden Way and the area designated to be affected by the proposed development. This included Sheering Road, Moor Hall Road and the woodland within these boundaries. The embankment areas of the existing M11 between Moor Hall Road and Sheering Hall Drive were also included.
- 2.1.2 Further visits occurred during June and September 2016, following changes made to the proposed route of the link roads and placement of the junction connecting these to the M11, and also the re-location of the site compounds for both phases.

### 2.2 Site Observations

- 2.2.1 The survey areas lie on the north east limits of Harlow, Essex. The proposed location of the Junction 7A (M11) development is in an area which contains arable and grazing farmland, public highways/footways and encompasses a small brook (Pincey Brook) along the northern part of the survey site, running east to west. There are numerous woodlands, hedges, open grown trees and shrubs that could potentially be impacted upon by the proposed route of the link roads connecting Gilden Way/Sheering Road to the motorway and the associated works.
- 2.2.2 The majority of the site is arable farm land interspersed with woodland fragments of varying size and quality. There are drainage ditches present along field boundaries and also a number of hedge and linear tree groups demarcating these features. The M11 runs along the eastern edge of the survey site with Moor Hall Road partially marking the southern boundary and Gilden Way the western/southern limits of the survey area. Residential properties and places of work are limited to sections of both Moor Road and Gilden Way, along which off-site privately owned trees were included in the survey where potential impacts, due to the development, were deemed possible.
- 2.2.3 The survey area contains a mixture of trees of varying age, species and quality as listed in the 'Tree Survey and Protection Schedule' in **Appendix C**.
- 2.2.4 Several arboricultural features were not accessible due to restrictions on access to the associated land for either safety issues (proximity to highways) or refusal of access by the landowners. These trees were assessed from the most appropriate positions within the survey site and measurements were estimated for stem diameter. Those trees, tree groups and hedges that were not inspected directly for these reasons, are marked on the 'Tree Survey and Protection Schedule' (**Appendix C**), tree removal tables (subsection 4.2.1, **Table 2** and **Table 3**) and RPA encroachment table (subsection 4.9.1, **Table 4**) with an asterisk (\*).
- 2.2.5 All the fenced off trees located along the embankments (east and west) of the M11 within the survey area, were assessed in-line with the methodology cited above in subsection 2.2.4, due to the health and safety implications of surveying in close proximity to a major highway.

### 3 Tree survey

#### 3.1 Tree Survey and Constraints

- 3.1.1 The results of the tree survey are shown in **Appendix C** 'Tree Survey and Protection Schedule' and **Appendix D** 'Tree Constraints Plans' (drawing no. B3553F05/LE/01/Rev1, Sheets 1 – 37).
- 3.1.2 The tree survey identified 270 arboricultural features which include trees, tree groups, hedges and woodlands. The amounts of each feature attributed to the respective grading categories are given in **Table 1**. Details of the graded trees and their locations can be found in **Appendix C** and **Appendix D**.

**Table 1: Grading and tally of arboricultural features included in survey**

Totals for arboricultural features and grades					
BS5837:2012 grades	Trees	Tree Groups	Woodlands	Hedges	Sub Totals
A	24	15	9	0	48
B	48	49	6	13	116
C	32	43	1	2	78
U	15	10	0	2	27
Sub Totals	119	117	16	17	<b>TOTAL= 269</b>

- 3.1.3 'A' grade trees are of high quality and value and should be retained. 'B' grade trees are of moderate quality and value and should be considered for retention where possible, although care should be taken to avoid misplaced retention. Any scheme should take into account the retention and protection of trees, but also the tree's future growth. The 'C' grade trees are of low quality and value and should not place a constraint on the proposals. From an arboricultural point of view, the 'U' grade trees cannot realistically be considered for retention as a living tree in the context of the current land use due to their low life expectancy of less than 10 years in their current poor condition.

#### 3.2 Legal Constraints

- 3.2.1 Information has been obtained from Epping Forest District Council and Harlow District Council giving the locations of all trees and groups of trees under the protection of Tree Protection Orders (TPOs) and within the boundaries of Conservation Areas (CAs), within and adjacent to the surveyed areas. The following information was up to date at the time of writing the original version of this report (January 2016).
- 3.2.2 All trees requiring works due to the proposals that are protected by a group TPO (order no. TPO/EPF/55/09), administered by Epping Forest District Council, are identified below. For easy reference details of which trees and groups, protected by the TPO, that are expected to be impacted by the development proposals are indicated within **Table 2**.

**Table 2: Details of protected trees included within tree survey**



TPO (number & LA)	TPO tree/tree group/woodland survey numbers	TPO trees indicated for removal in AIA	TPO trees or tree groups indicated for full or partial removal in AIA	TPO trees or tree groups indicated for RPA encroachment in AIA
<b>TPO/EPF/55/09</b> (W1 to W6) Epping Forest District Council	118 to 128, 131, 132, 136, 137, 140 to 148, 156, 159, 160, 161, 177, 182 to 185, 213	T120, T121, T122 T124, T126, T131	<u>Full removal</u> G119, G123, G159, G160, G183 <u>Partial removal</u> <u>(see constraints plans for details)</u> W156, W182, W184	T118, T125, T127, T161, W177

3.2.3 No trees included in this survey, at the time of surveying, lay within any CA administered by Epping Forest District Council.

3.2.4 There were no active TPOs upon the surveyed trees administered by Harlow District Council, at the time of writing this report. However, the south east corner of the 'Old Harlow Conservation Area' boundary runs close to Gilden way, directly adjacent to G84 to G87. No trees included in this survey lay within this CA or any other administered by Harlow District Council.

3.2.5 Applications to carry out tree works or tree removals to those trees with TPOs must be made to the appropriate local authority prior to any such actions, unless planning permission has been granted, which supersedes this requirement.

### 3.3 Root Protection Area

3.3.1 The Root Protection Area (RPA) has been plotted as a circle which centres on the base of the stem (subsection 4.6.2 of British Standard 5837:2012).

3.3.2 Deviation in the RPA (subsection 4.6.3 of British Standard 5837:2012) from the original would have to take into account the following factors whilst still providing adequate protection for the root system.

- Morphology and disposition of the roots, when influenced by past or existing site conditions e.g. the presence of roads.
- Topography and drainage.
- The soil type and structure.
- The likely tolerance of the tree to root disturbance or damage, based on factors such as species, age, condition and past management.

3.3.3 No RPA deviation has been applied to the surveyed trees as demonstrated within the Tree Constraints Plans, however, the effects of underground structures upon tree root morphology has been considered during the formulation of the impact assessment.

## 4 Arboricultural Impact Assessment (AIA)

### 4.1 Tree Survey Plans

- 4.1.1 The tree survey plans are based on the topographical plans provided and can only be used in relation to the tree issues. The tree survey plans show the existing trees numbered and categorised in accordance with BS 5837:2012. Below ground constraints are represented by the RPA. The above ground constraints arise from the current and ultimate height and structure of the trees.
- 4.1.2 The 'Tree Constraints Plans' (**Appendix D**) show the extent of the RPAs of the surveyed arboricultural features, in relation to the design proposals. An assessment of these has determined the likely impact of the design proposals on the trees/hedges/woodlands and vice-versa.

### 4.2 AIA summary tables

- 4.2.1 **Appendix E** shows a summary of the expected impacts of the scheme upon those trees included within the tree survey. Numbers of the different arboricultural features categories and grading categories are displayed in corresponding impact assessment outcomes.

### 4.3 Trees to Be Removed

- 4.3.1 An assessment of the 'Tree Constraints Plans' indicates that the trees detailed in **Table 3** below will be impacted by the scheme proposals and will need to be removed. Those tree groups, hedges and woodlands listed in **Table 3** have been assessed to be partially impacted upon and therefore only some of the trees within those features are recommended for removal.

**Table 3: Trees, tree groups and hedges to be fully removed**

**KEY:** T=Tree, G=Tree group, H=Hedge, W=Woodland

\* = Trees located on privately owned land/inaccessible land therefore all survey data estimated.

i = Suffix denoting tagged trees (alternate number sequence)

Tree ref No.	Species	Category grading
G1	Hazel, damson, field maple	C2
T2*	Field maple	B1
G3*	Hazel	C2
H7	Maple, damson, viburnum, hazel	B1
G8	Ash x 4, silver maple x 3	A2
G11*	Birch x 4, ash x 2, cherry x 2	B2
G12*	Viburnum spp., elder, hawthorn, field maple	B2
T18*	Black poplar	B1
G19	Black poplar, elm, sycamore	C1
G21	Sycamore x 3	C1
T22	Black poplar	U
T24	Black poplar	U
H27	Hornbeam, elder, sycamore	B2

Tree ref No.	Species	Category grading
H32*	Leyland cypress	U
T34	Birch	B1
T35	Birch	B1
G36	Hawthorn	U
T37	Cherry	U
T38	Cherry	U
T39	Crack willow	U
T40	Crack willow, hawthorn	U
T42	Crack willow	C1
G45	Elm, sycamore	U
T54	Oak	A3
T55	Oak	B1,2
T58	Field maple	B1,2
T59	Field maple	B1
T72	Oak	A1
T74	Oak	B1,2
H76	Hawthorn, sycamore, field maple	B1,2
T78	Cotoneaster	B1
G79	Ash, field maple	B1
G88	Hawthorn, hazel, elder, holly	U
H95	Viburnum, sycamore	B1
G96	Crack willow x 2	U
H97	Cotoneaster	C1
H98	Damson and purple plum	U
G100*	Sycamore, hawthorn	U
G102	Sycamore x 1, elm x 4	C1
G105	Ash x 6, black poplar x 1	C1
G106	Ash x 8	C1
H107	Blackthorn	C1
G108	Field maple x 3	C1
G109	Hawthorn, field maple	C1
T111	Sycamore	C1
G112	Field maple, hazel, blackthorn	B2
G113	Cypress x 3, Norway spruce x 2	B1
G114	Damson	B2
G115	Apple x 6	C1
G119	Elm	U
T120	Horse chestnut	C1
T121	Elm	U
T122	Copper Beech	A1
G123	Elm	U
T124	Norway maple	B1
T126	Ash	B1
G129	Elm	U
T131	Sycamore	B1
T133*	Unidentified	U
G149	Sycamore x 6	A2
G150	Sycamore	A2
G151	Blackthorn	B1,2
G159	Willow, elder, field maple	B2
G160	Ash, sycamore, Viburnum	C2
T174	Hawthorn	B1

Tree ref No.	Species	Category grading
G175	Goat willow	C1
H176	Blackthorn, goat willow, hazel, hawthorn	C1
G181*	Sycamore, ash, willow, Prunus, hawthorn, rose	C2
G183 (including surveyed trees G183a - T153i to T155i)	Oak (turkey and English), lime (European) ash, hawthorn	B2/3
G187*	Sycamore, ash, oak, hawthorn	B2
T188	English oak	A1
G189*	Sycamore, ash, oak (English & Turkey), blackthorn	C2
G190*	Field maple, ash, sycamore, Corsican pine, blackthorn, hawthorn,	C2
G191*	Corsican pine, sycamore, field maple, elm, ash	C2
G205*	Norway maple, sycamore, Corsican/Scots pine, ash, elm, hawthorn, apple, blackthorn	B2
T206	Sycamore	B1
G207*	Ash, oak, sycamore	B2
G208*	Ash, sycamore, oak	C2
G209*	Ash, sycamore, oak	C2
G210*	Elm, sycamore, ash, oak, gorse	C2
G211*	Oak, ash, sycamore, hawthorn, beech	B2

**Table 4: Tree groups, woodlands and hedges to be partially removed**

**KEY:** T=Tree, G=Tree group, H=Hedge, W=Woodland

\* = Trees located on privately owned land/inaccessible land therefore all survey data estimated

i = Suffix denoting tagged trees (alternate number sequence)

Tree ref No.	Species	Category grading
G4	Damson, hazel	C2
W5	Corsican/Scots pine and birch	A1,2
W6	Oak, Corsican/Scots pine, birch	A1,2
G13	Small leaved lime x 14	A2
G14	Elm, hawthorn, damson	C2
G25	Sycamore x 2	B1
G31	Ash, horse chestnut, damson	U
G44	Lime, horse chestnut	B1,2
H48	Mixed hedge, sycamore, hazel, maple, hawthorn	B1,2
H61	Field maple, hawthorn	B1
W77	Sycamore and ash	A1,2
G87*	Alder, Leyland cypress	B1

Tree ref No.	Species	Category grading
G99	Birch x 5	C1
G109	Hawthorn, field maple	C1
G139	Sycamores	B1,2
G152	Norway maple, sycamore, ash	A2
W156 (including surveyed trees T162i to T164i, T167i to T171i)	Sycamore, ash, field maple, Corsican pine, cherry, hawthorn, elder	B3
G157	Corsican pine x 7	B2
G158	Ash (80%), sycamore	B2
H168	Hawthorn, elder, Viburnum	B3
H176	Blackthorn, goat willow, hazel, hawthorn	B3
W182 (Including surveyed trees G182a, T158i)	Sycamore, oak, ash, elm, hawthorn, damson	B2
W184 (including surveyed trees G184a, T148i to T150i)	Sycamore, ash, oak (English & Turkey), beech hawthorn, elm, honeysuckle, elder	B2
G201*	Ash, hazel x 2	C2
G204*	Sycamore, ash, field maple, Corsican pine, elm, blackthorn, hawthorn	B2
G212*	Ash, sycamore, oak, hawthorn, Prunus spp., gorse	B3
G215	Sycamore, oak, ash, elm, hawthorn, wingnut, Leyland cypress	B2
G217	Sycamore, oak, ash, horse chestnut	B2/3
G224	Sycamore, ash, blackthorn, elder	C2
G227	Ash, sycamore, oak, field maple, Scots pine, blackthorn	C2

4.3.2 Several trees and groups included in the survey were considered unsafe for retention due to the condition of the trees (these fall within the U grade category, for the purposes of development) and their proximity to targets such as roads, buildings or public rights of way; and therefore the management recommendations have indicated these for removal, independent of the development proposals.

4.3.3 'U' grade trees are not considered a constraint to development (subsection 3.1.3); however, these have been included in the tree removal table (**Table 3**) to provide a comprehensive record of the potential tree loss as a result of the current design proposals, regardless of grading. Not all the U grade trees included in the survey require removal in order for the scheme to be implemented and/or present a hazard to persons or property (i.e. not all U grade trees included in the survey appear within the removals list in **Table 3**).

#### 4.4 Gilden Way

4.4.1 Much of the tree loss associated with Phase 1 of the scheme is as a result of the effects of road widening and modification along Gilden Way and Sheering Road. Tree root development, where trees are located close to roadside kerbs, will usually be restricted to areas outside of the established road surface and associated sub-base. Where widening of the road occurs the kerb line requires re-alignment further into any adjacent verges, which will be the primary rooting area for any trees present. This incursion into the RPA of any mature trees can have an unsustainable effect through the necessary root disturbance/severance required.

#### 4.5 Sheering Road

4.5.1 The impacts to tree rooting areas adjacent to road widening operations, as discussed above in subsection 4.3.1 also applies to Sheering Road.

4.5.2 The primary arboricultural concern located along this section of the scheme is the small woodland block W156. This is under the protection of an area TPO/EPF/55/09 and as such was re-visited during the scheme design development in order to determine the amount of effect the proposals will have upon these trees. Further trees listed within the same TPO, located north of Mayfield Farm are also considered not sustainable with the scheme proposals. Several of the higher quality trees within this group (T217 and T128 in particular) can be retained with special mitigation measures in place.

4.5.3 The woodland W156 is significantly impacted along the western edge abutting Sheering Road. Due to the alignment change of the road and the necessary working space needed on that side, there will be some tree loss. This area affected increases to the south west corner of W156 and a number of trees within the expected clearance areas have been tagged and surveyed in order to provide a reference for expected losses. Protection and mitigation measures will need to be employed adjacent to this area of the works in order to ensure the retention of the remaining trees. T161 (ash) is another significant tree (under the same TPO) in this area and will need to be considered when planning the works.

#### 4.6 Phase 1 site compound

4.6.1 The 'Tree Constraints Plan and Mitigation Measures for Phase 1 Site Compound' plan (**Appendix F**) shows the tree constraints impacting the site currently selected for the proposed Phase 1 site compound. Details include extent of RPA ingress onto the site from surrounding trees, canopy clearance details and expected tree clearance extents. The plan also demonstrates where ground protection measures could be placed to minimise damage to the surrounding retained tree's RPAs (see section 4.6.3 below).

4.6.2 Several of the tree groups surrounding the proposed site for the Phase 1 site compound, are indicated for partial removal. This only relates to the self-sown on-site trees of a relatively young age, within these groups. The off-site large mature and over mature trees surrounding the site on the east, south and west sides are recommended for retention and also protection measures should be employed whilst the compound is built and whilst occupied to prevent damage to these. There are moderate to large sections of deadwood within some of these perimeter trees surrounding the site and therefore the removal of any deadwood overhanging the site is recommended prior to any construction activity beginning.

4.6.3 A 'no-dig' installation is recommended around the inside perimeter of the site compound where the mature tree RPAs are expected to ingress and be exposed to potential soil compaction and/or root disturbance. Details of this low impact hard surfacing technique should be included within the Arboricultural Method Statement (AMS).



- 4.6.4 Facilitation pruning of T223, T225 and T226 may be required in order to utilise the space fully within the compound area. These trees are off-site, mature and sensitive to pruning. Any such works should be compliant to BS3998 – ‘Tree work, recommendations’.

#### 4.7 Areas to the east of Sheering Road

- 4.7.1 The woodland W177 (under the area TPO detailed in **Table 2**) will not be impacted by the scheme design. Further to the east of W177 are additional areas covered by the same area TPO. Due to the embankment and adjacent haul route it is anticipated that tree clearance will be required with G183 being fully cleared; W184 requiring tree loss from the north east corner of the area and also W182 likely to loss approximately 50% of the tree canopy cover. Mitigation and protection measures will be required in these areas to protect the retained trees closest to the works.
- 4.7.2 Details relating to the design and placement of the drainage pond located to the east of Sheering Road and also the placement of the expected haul routes, site compound and soil storage areas required for the construction phase of both Phase 2A and 2B, were reviewed during the writing of this report. The current pond design will not require any additional tree removals although the RPAs of T155, T169, T171 and T173 will require protection measures and inclusion in the Tree Protection Plan (TPP) and Arboricultural Method Statement (AMS), however the hedge H154 would require removal to accommodate these proposals.

#### 4.8 Phase 2 site compound

- 4.8.1 Tree losses and impacts to adjacent trees have been minimised with the design for the phased implementation of the compounds for the various stages of Phase 2 of the scheme. There are no additional losses or RPA encroachment as a result of the Phase 2 compound, above those relating to the alignment of the link road and haul routes.

#### 4.9 M11 embankment areas

- 4.9.1 These areas running alongside the M11 constitute a large proportion of the tree loss expected following the AIA. Due to the four slip roads proposed around the new motorway junction and the overpass most of the tree cover upon the embankments is expected to be cleared. These trees are of a relatively young age and are assumed to have been planted during the initial construction of the motorway. Although the expected numbers of trees lost in these areas is the highest across the various parts of the scheme highlighted within this AIA, the arboricultural impact of this is considered to be less. Replacement planting following the completion of the construction phase upon the newly formed embankment areas will mitigate for these losses.
- 4.9.2 All of the tree groups along these embankment areas are currently recommended for either full or partial removal within the AIA of this report.

#### 4.10 Trees with encroachment into RPAs

- 4.10.1 The proposed scheme is likely to result in encroachment within the RPAs of the trees detailed in **Table 5** below.

**Table 5: Arboricultural features with encroached RPAs**

KEY: T=Tree, G=Tree group, H=Hedge, W=Woodland

\* = Trees located on privately owned land/inaccessible land therefore all survey data estimated

i = Suffix denoting tagged trees (alternate number sequence)

Tree ref No.	Species	Category grading
G17	White poplar x 2	C1
G20*	Lawson cypress x 11	C1
G28	Cherry x 9	B1,2
G29	Ash, damson x 2	B1,2
T33*	Blue cedar	A1
G41	Sycamore x 2, ash, hawthorn, maple	C1
W43	Horse chestnut	B1,2
T46	Oak	A1,2
G47*	Ash x 3, sycamore x 1	B1,2
T49*	Apple	C1
H50	Hawthorn, sycamore, field maple	B2
G52	Ash, beech, cherry, maple	A2
H53	Field maple, viburnum, beech, cherry	B2
T56	Oak	B1
T57	Oak	B1
G63*	Sycamore x 2	B1
T65	Oak	A1,2
G66	Wellingtonia	A1
W68	Scots/Corsican pine	A1,2
T69	Acacia	B1
G80*	Sycamore, oak	B1
G82*	Sycamore	B1
G85	Alder, ash	B1
T86*	Black poplar	A1
T89*	Ash	B1
W93	Sycamore (50%), ash, beech	B1
T101	Lombardy poplar	C1
G103*	Sycamore x 10	C1
T118	Turkey oak	A1
T125	Horse chestnut	B1
T127	Sycamore	A1
T128	Oak	A2
T134i (in W177)	Ash	B1,3
T155	Oak	A1
T161	Ash	A3
T169	Oak	A1
T171	Oak	A1
T172i	Ash	B1
T173	Field maple	B1
G215	Sycamore, oak, ash, elm, hawthorn, wingnut, Leyland cypress	B2
T216	Oak	U
G217	Sycamore, oak, ash, horse chestnut	B2,3
T218	Horse chestnut	A1,3
T219	Horse chestnut	B2
T220	Oak	C1
T221	Horse Chestnut	B1
T222	Oak	C1,3
T223	Oak	B1,3
G224	Sycamore, ash, blackthorn, elder	C2
T225	Oak	C1,3
T226	Oak	C1/3
G227	Ash, sycamore, oak, field maple, Scots pine, blackthorn	C2
G228	Hybrid black poplar, field maple, tree of Heaven	C2
G229	Sycamore, tree of heaven, cypress spp.,	B2,3

#### **4.11 Arboricultural Impact Assessment – General**

- 4.11.1 To mitigate any potential impact on the retained trees, a method statement should be provided by the contractor to demonstrate that all operations proposed within or near to the RPAs can be undertaken to ensure their safe protection and retention. The works should also be supervised by a competent arboriculturist and include adequate protection measures as detailed in Section 5.1 – General Tree Protection Measures, particularly where there is potentially a greater risk of root damage occurring to trees by virtue of their age/size and close proximity to the development. No roots over 25mm in diameter should be severed without consultation with a competent arboriculturist.
- 4.11.2 Protective barriers, fit for purpose, should be placed around the retained trees, to provide a construction exclusion zone and prevent incursion within the RPAs where practicable (see Section 5.1 General Tree Protection Measures).
- 4.11.3 No drainage or other underground apparatus details were provided at the time of writing this report. Particular care should be given to positioning all underground apparatus outside the RPAs of all retained trees. If this is not possible, detailed plans showing the proposed routing will need to be provided for further assessment by a competent arboriculturist.

## 5 Tree Protection Measures

### 5.1 General Tree Protection Measures

- 5.1.1 It is important that measures for protection are in place throughout the scheme and for as long as a risk of damage remains and also installed prior to work being conducted. Particular care and planning is necessary in the operation of excavators, lifting machinery and cranes to ensure all vehicle movements and lifting operations will not impact on retained trees.
- 5.1.2 Trees to be retained should be adequately protected by stout fencing, 'fit for purpose' and preferably as prescribed in BS5837:2012, section 6.2, in order to provide an adequate RPA that will allow its successful retention within the development.
- 5.1.3 The RPA should be regarded as sacrosanct and the fencing should be installed prior to construction works and plant and machinery arriving on site. The fencing should remain intact throughout the duration of the scheme and should only be removed upon completion. The position of the fencing around the trees should be shown on the TPP once the scheme layout has been finalised.
- 5.1.4 During construction, there should be no materials stored or dumped and no vehicular or plant movement within the RPA to minimise the risk to trees from soil compaction. Where compaction has occurred, advice should be sought from an arboriculturist and a structural engineer on decompaction methods. This is in accordance with BS5837:2012, section 8.4.
- 5.1.5 All site storage areas, cement mixing, washing points for equipment, vehicles and fuel storage areas should be outside of RPA's unless otherwise agreed with the LPA. No discharge of potential contaminants should occur within the RPA of a retained tree stem or where there is a risk of run off into RPA.
- 5.1.6 Excavations within the RPA should be avoided. If excavations are necessary however, works should be limited to the use of hand tools. Great care should be taken to preserve and work around roots greater than 25mm in diameter and clusters of smaller roots, avoiding damage to bark. Where it is necessary to sever roots greater than 25mm in diameter, advice must be sought from an arboriculturist. Where smaller roots must be severed, they should be cut back using secateurs or a sharp pruning saw.
- 5.1.7 Where construction working space or temporary construction access is justified within the RPA, this should be facilitated by a setback in the alignment of the tree protection barrier. Where the setback of the new tree protection barrier would expose unmade ground to construction damage, new temporary ground protection should be installed as part of the implementation of physical tree protection measures prior to work starting on site.
- 5.1.8 New temporary ground protection should be capable of supporting any traffic entering or using the site without being distorted or causing compaction of the underlying soil. The ground protection might comprise of one of the following:
- i. For pedestrian movements only, a single thickness of scaffold boards placed either on top of a driven scaffold frame, so as to form a suspended walkway, or on top of a compression-resistant layer (e.g. 100mm depth of woodchip), laid onto a geotextile membrane.
  - ii. For pedestrian-operated plant up to a gross weight of 2t, proprietary, inter-linked ground protection boards, placed on top of a compression-resistant layer (e.g. 150mm depth of woodchip), laid onto a geotextile membrane.

- iii. For wheeled or tracked construction traffic exceeding 2t gross weight, an alternative system (e.g. proprietary systems or pre-cast reinforced concrete slabs) to an engineering specification designed in conjunction with arboricultural advice, to accommodate the likely loading to which it will be subjected.

5.1.9 Wherever possible, underground utility services should be routed outside the RPA. Where underground apparatus is to pass within the RPA, detailed plans showing the proposed routing should be drawn up in conjunction with a competent arboriculturist.

## **1. Site Management and Supervision**

### **5.2 Site Management and Supervision**

- 5.2.1 Consideration should be given to a competent arboriculturist visiting site and monitoring the works at an interval agreed at the pre-commencement site meeting. The interval should be sufficiently flexible to allow the supervision of key works as they occur. The arboriculturist's role is to monitor compliance with arboricultural conditions and advising on any tree problems that arise or modification that become necessary.
- 5.2.2 The key stages requiring supervision will be agreed at the pre-commencement site meeting, but will usually include:
- Tree pruning and felling operations;
  - Installation of tree protection barriers;
  - Installation of ground protection; and
  - Regular monitoring of compliance.



## 6 Conclusions

### 6.1 Conclusions

- 6.1.1 Consideration has been given to retaining all trees where appropriate depending upon their general condition and value. However, ultimately their removal is dependent on their proximity to the footprint of the proposed development.
- 6.1.2 The trees listed in **Table 3** and **Table 4**, are located within or directly adjacent to the proposed development footprint and will need to be removed. The loss of these trees can be mitigated by appropriate replacement tree planting as part of the scheme. Suitability of species selection should be made regarding their location, potential ultimate size, life span, shade tolerance and growth habits.
- 6.1.3 Using the data gathered from those trees within the TPO protected tree groups and woodlands, those which are expected to be impacted upon by the final design can be identified. This information can be utilised to calculate safe buffer zones, when considering the development footprint and vegetation clearance plans.
- 6.1.4 Trees listed for removal situated along Gilden Way, due to the proposed road improvements, have been assessed as impacted upon by the current design due to curb line adjustments/verge development within the RPAs and/or crowns of these trees. Although the proposed widening of the carriageway rarely involves the complete loss of the existing verges, any loss of this rooting area used by the adjacent trees could potentially initiate a terminal decline in tree health and/or compromise tree stability; determined in part by tree age, condition and species. Older more mature trees (veteran trees especially) are unable to adapt to changes in their environment (both above and below ground) as effectively as younger more dynamic trees and are thus highly sensitive to such incursions.
- 6.1.5 The scheme proposals are likely to result in encroachment within the RPAs of those trees listed in **Table 5**. Encroachment within the RPAs of these trees should be limited to only those works necessary to enable the construction of the required works and include all mitigation and protective measures (including the supervision of works by a competent arboriculturist), as recommended in subsection 5.1 'General Tree Protection Measures'. No other excavations or encroachment should be carried out within the RPA of the remaining retained trees, unless approved by a competent arboriculturist.
- 6.1.6 It is recommended that a method statement is produced specifying the methodology to be used for all works within the RPAs, to ensure the safe protection and retention of these trees, prior to the commencement of works. A TPP should also be produced prior to works beginning in order to plan and design the placement of tree protection fencing.
- 6.1.7 Particular care should be given to positioning all underground apparatus outside the RPAs of all retained trees. If this is not possible, detailed plans showing the proposed routing will need to be provided for further assessment by a competent arboriculturist.
- 6.1.8 Design detail available at the time of writing this report, relating to the construction site layout plans for Phase 1 of the scheme, indicates the requirement for specific tree protection measures to be applied to those trees recommended for retention which may be potentially affected (i.e. those along Gilden Way included in Revision 1 of this report). This information should form a part of the AMS and TPP.

- 6.1.9 Prior to the removal of the trees listed in **Table 3** and **Table 4**, it is essential that the trees are assessed for the presence of nesting birds and protected species such as bats. The disturbance or destruction of nesting sites is an offence under the Wildlife and Countryside Act 1981 and the Countryside and Rights of Way Act 2000. Further advice on bats can be obtained from the Bat Conservation Trust (tel: 0845 1300 2280 / [www.bats.org.uk](http://www.bats.org.uk)). Advice on nesting birds can be obtained from Natural England (tel: 08456003078 / [www.naturalengland.org.uk](http://www.naturalengland.org.uk)) or The Royal Society for the Protection of Birds (tel: 01767 693690 / [www.rspb.org.uk](http://www.rspb.org.uk)).

## APPENDIX A – Cascade chart for tree quality assessment

**Category and definition**      **Criteria (including subcategories where appropriate)**

**Trees unsuitable for retention (see note)**

### Category U

Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years

Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other category U trees (e.g. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning)

Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline

Trees infected with pathogens of significance to health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality.  
NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve.

**Trees to be considered for retention**

### 1 Mainly arboricultural qualities

### 2 Mainly landscape qualities

### 3 Mainly cultural values Including conservation

#### Category A

**Trees of high quality** with an remaining estimated life expectancy of at least 40 years

Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)

Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features

Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran or semi-formal arboricultural trees or wood-pasture)

#### Category B

**Trees of moderate quality** with an remaining estimated life expectancy of at least 20 years

Trees that might be included in Category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such as they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation

Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality

Trees with material conservation or other cultural value

#### Category C

**Trees of low quality** with an remaining estimated life expectancy of at least 10 years, or younger trees with a stem diameter below 150mm

Unremarkable trees of very limited merit or such impaired condition that they do not qualify in higher categories

Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value; and/or trees offering low or only temporary/transient landscape benefits

Trees with no material conservation or other cultural value

## APPENDIX B – Schedule Key

<b>Age Class</b>	
<p>Young - A tree in the first quarter of its life span.</p> <p>Semi Mature - A tree beyond the first quarter of its life span but not yet at the half way stage.</p> <p>Early Mature - A tree half way through its life span with significant further growth potential.</p> <p>Mature - A tree at or near its potential maximum size which is still growing vigorously in its third quarter of life span.</p> <p>Over Mature - A tree in decline in its final quarter of life span.</p> <p>Veteran - A tree that by recognised criteria shows features of biological, cultural or aesthetic value that are characteristic of, but not exclusive to, individuals surviving beyond the typical age range for the species concerned.</p>	
<b>Physiological Condition (P)</b>	<b>Structural Condition (S)</b>
<p>Good – Showing no adverse risk of failure/defects.</p> <p>Fair – Showing minor signs of deterioration.</p> <p>Poor – Unlikely to recover to a good condition.</p> <p>Dead</p>	<p>Good – No signs of decay or structural weakness.</p> <p>Fair – Minor defects not causing structural weakness.</p> <p>Poor – severe decay in the main stem or branches/structurally weak.</p>
<b>Estimated Remaining Contribution</b>	<b>Bat Roost Potential (if surveyed)</b>
<p>&lt;10 - Less than 10 years of normal life expectancy remaining.</p> <p>10+ - Between 10 and 20 years of normal life expectancy remaining.</p> <p>20+ - Between 20 and 40 years of normal life expectancy remaining.</p> <p>40+ - Tree would normally expect to live for more than 40 more years.</p>	<p><b>Negligible</b> – Saplings or semi-mature trees with a small girth. No ivy cover, loose bark, cracks or fissures.</p> <p><b>Moderate</b> – Small or semi-mature trees. May have small amounts of ivy present, stems of small diameter. Trees may have some loose bark but no obvious cracks, fissures or holes.</p> <p><b>High</b> – Trees with large crack, crevices or disused woodpecker holes that can provide refuge for bats. Trees may support dense ivy with multiple stems.</p>

## APPENDIX C – Tree Survey and Protection Schedule

Related drawing: Tree Survey - Drawing no. B3553F05/LE/01/Rev1 (Sheets 1 – 37)

Schedule Key: Tree (T), Group (G), Hedge (H), Woodland (W)

\* = Trees located on privately owned land/inaccessible land therefore all survey data estimated

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
G1	Hazel, damson, field maple	up to 6	up to 100	-	-	1	3	1	3	0	Early mature	(S) Good (P) Good <b>No work</b>	10+	C2	1.2 from each stem
T2*	Field maple	10	300	-	-	2	4	2	3	2	Early mature	(S) Fair (P) Fair Ivy clad trunk <b>Sever ivy at base for future inspection</b>	20+	B1	3.6
G3*	Hazel	up to 6	up to 150	-	-	1	3	1	3	1	Mature	(S) Fair (P) Fair Ivy clad trunk <b>No Work</b>	10+	C2	1.8 from each stem
G4	Damson, hazel	up to 5	up to 150	-	-	2	79	2	79	2	Mature	(S) Fair (P) Fair Ivy clad trunk <b>No Work</b>	10+	C2	1.8 from each stem
W5	Corsican/Scots pine, birch	up to 16	up to 540	-	-	4	27	2	27	2	Mature	(S) Good (P) Good Ivy clad trunks on several trees <b>No Work</b>	40+	A1,2	6.5 from each stem

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations)	Estimated remaining contribution (years)	Category grading	RPA radius (m)
W6	Oak, birch, Corsican/Scots pine	16	up to 420	-	-	5	58	2	58	4	Early mature	(S) Fair (P) Fair Ivy clad trunks on several trees <b>No Work</b>	40+	A1,2	5.0 from each stem
H7	Maple, damson, Viburnum, hazel	2	up to 75	-	-	1	115	1	115	0	Semi mature	(S) Good (P) Good Managed hedge <b>No work</b>	20+	B1	1.0 beyond crown
G8	Ash x 4, silver maple x 3	20+	up to 640	-	-	15	10	15	10	1	Mature	(S) Fair (P) Fair Ivy clad trunk <b>Sever ivy at base for future inspection</b>	40+	A2	7.7 from each stem
T9	Horse chestnut	8	-	240 250 290	-	7	7	7	6	2	Mature	(S) Poor (P) Fair Bark peeling and rot present <b>Fell</b>	<10	U	5.4
G10	Horse chestnut x 16, silver maple x1	11	up to 520	-	-	5	105	6	105	3	Mature	(S) Good (P) Good <b>No work</b>	20+	B1	6.2 from each stem
G11*	Birch x 4, ash x 2, cherry x 2	15	up to 400	-	-	8	7	8	7	1	Mature	(S) Good (P) Good Situated in the middle of a roundabout <b>No work</b>	20+	B2	4.8 from each stem
G12*	Viburnum spp., elder, hawthorn, field maple	8	up to 200	-	-	10	5	10	5	0	Early mature	(S) Good (P) Good Situated in the middle of a roundabout and were inspected from a distance <b>No work</b>	20+	B2	2.4 from each stem
G13	Small leaved lime x 14	18	up to 460	-	-	15	20	15	20	0	Early mature	(S) Good (P) Good <b>No work</b>	40+	A2	5.5 from each stem



Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations)	Estimated remaining contribution (years)	Category grading	RPA radius (m)
G14	Elm, hawthorn, damson	6	up to 750	-	-	2	26	1	26	0	Over mature	(S) Poor (P) Poor Mainly dead elms - Dutch elm disease suspected (DED) <b>Fell the dead trees</b>	10+	C2	9.0 from each stem
T15*	Large leaved lime	20+	600	-	-	6	5	5	6	3	Mature	(S) Good (P) Good <b>No work</b>	40+	A1	7.2
G16*	White poplar x 4	20+	up to 550	-	-	6	5	8	7	5	Mature	(S) Good (P) Good One tree leans towards the road <b>No work</b>	20+	B1	6.6 from each stem
G17	White poplar x 2	10	up to 140	-	-	2	1	1	1	1	Young	(S) Good (P) Good <b>No work</b>	20+	C1	1.7 from each stem
T18*	Black poplar	20+	-	500 550	-	4	6	6	6	4	Mature	(S) Good (P) Good Included union <b>No work</b>	20+	B1	8.9
G19	Black poplar, elm, sycamore	15	up to 260	-	-	2	4	2	4	3	Semi mature	(S) Fair (P) Fair Elm tree is dead <b>Fell dead tree</b>	20+	C1	3.1 from each stem
G20*	Lawson cypress x 11	12	up to 200	-	-	1	4	2	4	0	Mature	(S) Fair (P) Fair <b>No work</b>	10+	C1	2.4 from each stem
G21	Sycamore x 2	17	up to 360	-	-	3	5	3	5	3	Semi mature	(S) Fair (P) Good <b>No work</b>	10+	C1	4.3 from each stem
T22	Black poplar	5	190	-	-	1	1	1	1	1	Dead	A dead tree <b>Fell</b>	<10	U	-

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
G23*	Leyland cypress	5	up to 200	-	-	2	1	1	2	0	Mature	(S) Fair (P) Good Heavily reduced <b>No Work</b>	<10	U	2.4 from each stem
T24	Black poplar	5	150	-	-	2	1	1	1	2	Young	(S) Fair (P) Fair Leans towards the road, Ivy clad <b>No work</b>	<10	U	1.8
G25	Sycamore x 2	16	up to 350	-	-	5	5	3	5	4	Mature	(S) Fair (P) Fair <b>No Work</b>	20+	B1	4.2 from each stem
T26	Sycamore	16	-	200 250 250	-	6	5	3	5	2	Mature	(S) Fair (P) Fair Ivy clad trunk impeding full inspection <b>Sever ivy at base for future inspection</b>	20+	B1	4.9
H27	Hornbeam, elder, sycamore	2	-	-	-	2	55	2	55	0	Mature	(S) Good (P) Good Managed hedge <b>No Work</b>	20+	B2	1.0 beyond crown
G28	Cherry x 9	10	up to 300	-	-	4	25	4	25	2	Mature	(S) Good (P) Good <b>No work</b>	20+	B1,2	3.6 from each stem
G29	Ash x 1, damson x 2	17	up to 270	-	-	4	4	5	4	3	Mature	(S) Fair (P) Fair Ivy clad trunk <b>No Work</b>	20+	B1,2	3.2 from each stem
G30*	Alder x 14	12	up to 200	-	-	3	27	3	27	2	Early mature	(S) Good (P) Good <b>No work</b>	40+	A1	2.4 from each stem

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations)	Estimated remaining contribution (years)	Category grading	RPA radius (m)
G31	Ash, horse chestnut, damson	6	up to 190	-	-	2	11	1	11	1	Semi mature	(S) Fair (P) Fair/Dead <b>Fell the dead trees</b>	<10	U	2.3 from each stem
H32*	Leyland cypress	8	up to 200	-	-	2	8	2	8	0	Mature	(S) Fair (P) Fair <b>No work</b>	<10	U	2.4 from each stem
T33*	Blue cedar	15	500	-	-	5	4	4	5	3	Mature	(S) Good (P) Good <b>No work</b>	40+	A1	6.0
T34	Birch	15	380	-	-	5	3	5	4	2	Mature	(S) Fair (P) Fair Ivy clad stems, the tree leans towards the road <b>Sever ivy at base for future inspection</b>	20+	B1	4.6
T35	Birch	17	350	-	-	4	3	3	4	2	Mature	(S) Good (P) Good <b>No work</b>	20+	B1	4.2
G36	Hawthorn	8	up to 300	-	-	2	5	2	5	1	Over mature	(S) Poor (P) Poor Some are dead, ivy clad <b>Fell the dead trees</b>	<10	U	3.6 from each stem
T37	Cherry	8	-	200 180	-	1	0	1	2	3	Dead	A dead tree <b>Fell</b>	<10	U	-
T38	Cherry	8	200	-	-	1	1	1	1	0	Dead	Ivy clad dead tree. <b>Fell</b>	<10	U	-
T39	Crack willow	8	200	-	-	2	2	2	1	3	Dead	A dead tree <b>Fell</b>	<10	U	-
T40	Crack willow, hawthorn	9	210	-	-	4	2	1	1	4	Dead	Ivy clad dead tree. <b>Fell</b>	<10	U	-

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Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
G41	Sycamore x 2, ash, hawthorn, maple	12	up to 210	-	-	4	11	4	11	2	Semi mature	(S) Good (P) Good <b>No work</b>	10+	C1	2.5 from each stem
T42	Crack willow	15	830	-	-	5	3	6	5	1	Over mature	(S) Fair (P) Fair Low limb tear out and Ivy clad <b>No work</b>	10+	C1	10.0
W43	Horse chestnut	15	up to 240	-	-	20	5	20	5	2	Early mature	(S) Good (P) Fair <b>No Work</b>	20+	B1,2	2.9
G44	Lime, horse chestnut	15	up to 330	-	-	10	11	10	11	3	Early mature	(S) Good (P) Good <b>No Work</b>	20+	B1,2	4.0 from each stem
G45	Elm, sycamore	10	up to 200	-	-	4	3	1	3	1	Early mature	(S) Fair (P) Fair Stem removal wound at 3m <b>No work</b>	10+	C1	2.4 from each stem
T46	Oak	20+	1000	-	-	10	10	6	5	4	Mature	(S) Good (P) Good Ivy clad trunk <b>No work</b>	40+	A1,2	12.0
G47*	Ash x 3, sycamore x 1	15	up to 350	-	-	5	4	4	4	3	Mature	(S) Fair (P) Fair Ivy clad on some trunks <b>No Work</b>	20+	B1,2	4.2 from each stem
H48	Mixed hedge, sycamore, hazel, maple, hawthorn	2	up to 100	-	-	1	19	1	19	0	Mature	(S) Good (P) Good <b>No work</b>	20+	B1,2	1.0 beyond crown
T49*	Apple	8	200	-	-	2	2	2	2	2	Mature	(S) Fair (P) Fair <b>No Work</b>	10+	C1	2.4
H50	Hawthorn, sycamore, field maple	2	100	-	-	2	42	2	42	0	Mature	(S) Good (P) Good <b>No work</b>	20+	B2	1.2

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
G51	Ash, maple, cherry	12	up to 200	-	-	3	15	1	15	1	Early mature	(S) Good (P) Good <b>No work</b>	20+	B1,2	2.4 from each stem
G52	Ash, beech, cherry, maple	10	up to 180	-	-	7	245	7	245	1	Early mature	(S) Good (P) Good <b>No work</b>	40+	A2	2.2 from each stem
H53	Field maple, Viburnum, beech, cherry	2.5	up to 150	-	-	1	245	1	245	0	Early mature	(S) Good (P) Good A managed hedge <b>No work</b>	20+	B2	1.0 beyond crown
T54	Oak	10	1325	-	-	4	4	3	4	2	Over mature	(S) Fair (P) Poor A tree in decline, upper crown missing but with ecological value. Retrenched crown (naturally reducing) with good vitality in lower crown <b>Remove deadwood on road side. Reduce upper crown to prevent further collapse</b>	40+	A3	15.0
T55	Oak	10	330	-	-	2	3	2	3	0	Early mature	(S) Good (P) Good The roadside lower limbs have been flailed <b>No work</b>	20+	B1,2	4.0
T56	Oak	6	180	-	-	1	1	1	1	3	Semi mature	(S) Good (P) Good <b>No work</b>	20+	B1	2.2
T57	Oak	9	280	-	-	3	3	3	3	2	Early mature	(S) Good (P) Good <b>No work</b>	20+	B1	3.4

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
T58	Field maple	7	260	-	-	3	2	2	3	2	Semi mature	(S) Good (P) Good <b>No work</b>	20+	B1	3.1
T59	Field maple	7	190	-	-	2	2	2	2	1	Semi mature	(S) Good (P) Good The roadside lower limbs have been flailed <b>No work</b>	20+	B1	2.3
W60	Hornbeam, oak, ash, beech, field maple	10	up to 200	-	-	5	39	5	39	1	Semi mature	(S) Good (P) Good <b>No work</b>	40+	A1,2	2.4 from each stem
H61	Field maple, hawthorn	9	up to 200	-	-	1	13	1	13	0	Semi mature	(S) Good (P) Good <b>No work</b>	20+	B1	1.0 beyond crown
G62*	Purple plum x 4	5	up to 150	-	-	2	2	2	2	1	Semi mature	(S) Good (P) Good <b>No work</b>	20+	B1	1.8 from each stem
G63	Sycamore x 2	9	up to 202	-	-	3	3	2	3	0	Semi mature	(S) Good (P) Good <b>No work</b>	20+	B1	2.4 from each stem
W64*	Oak	10	up to 200	-	-	2	38	2	38	1	Semi mature	(S) Good (P) Good <b>No work</b>	40+	A1	2.4 from each stem
T65	Oak	10	210	-	-	3	4	2	3	0	Semi mature	(S) Good (P) Good <b>No work</b>	40+	A1,2	4.0 #
G66	Wellingtonia	15	up to 650	-	-	4	4	4	4	0	Early mature	(S) Good (P) Good <b>No work</b>	40+	A1	7.8 from each stem



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Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
W67	Corsican/Scots pine, oak, red oak	15	up to 420	-	-	8	49	8	49	1	Early mature	(S) Good (P) Good <b>No work</b>	40+	A1,2	5.0
W68	Scots/Corsican pine	13	up to 420	-	-	4	35	4	35	1	Early mature	(S) Good (P) Good <b>No work</b>	40+	A1,2	5.0 from each stem
T69	Acacia	13	320	-	-	3	4	3	3	3	Early mature	(S) Good (P) Good. This tree has an included union <b>No Work</b>	20+	B1	3.8
T70	Amelanchier	8	120	-	-	1	1	1	2	1	Early mature	(S) Good (P) Good <b>No work</b>	20+	B1	2.0 #
T71	Acacia	9	-	110 220 150	-	3	3	3	3	1	Early mature	(S) Good (P) Good <b>No work</b>	40+	A1	3.5
T72	Oak	18	830	-	-	5	6	6	6	2	Mature	(S) Good (P) Good Ivy clad trunk. Some major dead wood. <b>Remove the large dead wood, sever ivy at base for future inspection</b>	40+	A1	10.0
W73*	Scots pine (90%), oak, birch	15	<380	-	-	9	52	9	52	1	Early mature	(S) Good (P) Good <b>No work</b>	40+	A1,2	4.6 from each stem
T74	Oak	10	-	380 170 220	-	3	3	5	3	1	Mature	(S) Good (P) Good An ivy clad tree <b>Sever ivy at base for future inspection</b>	20+	B1,2	5.7

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Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations)	Estimated remaining contribution (years)	Category grading	RPA radius (m)
T75	Oak	20+	1000	-	-	7	7	10	8	3	Over mature	(S) Fair (P) Good Split limbs throughout crown <b>No Work</b>	40+	A2,3	12.0
H76	Hawthorn, sycamore, field maple	3	up to 150	-	-	1	55	1	55	0	Mature	(S) Good (P) Good <b>No work</b>	20+	B1,2	1.0 beyond crown
W77	Sycamore, ash	17	up to 420	-	-	4	55	4	55	2	Mature	(S) Good (P) Good <b>No work</b>	40+	A1,2	5.0 from each stem
T78	Cotoneaster	8	-	300 190 160	-	2	3	3	3	3	Mature	(S) Good (P) Good <b>No work</b>	20+	B1	4.7
G79	Ash, field maple	10	up to 210	-	-	2	1	3	1	3	Early mature	(S) Good (P) Good <b>No work</b>	20+	B1	2.5 from each stem
G80*	Sycamore, oak	20+	up to 450	-	-	4	5	7	6	2	Mature	(S) Good (P) Good <b>No work</b>	20+	B1	5.4 from each stem
T81*	Large leaved lime	20+	750	-	-	5	6	6	6	3	Mature	(S) Good (P) Good <b>No work</b>	20+	B1	9.0
G82*	Sycamore	20+	up to 450	-	-	4	8	4	8	1	Mature	(S) Good (P) Good Ivy clad trees <b>No work</b>	20+	B1	5.4 from each stem
T83*	Red oak	20+	350	-	-	2	4	6	3	4	Early mature	(S) Good (P) Good <b>No work</b>	40+	A1	6.0 #
G84*	Black poplar x 2	20+	600	-	-	5	6	6	6	3	Mature	(S) Good (P) Good Ivy clad trunks <b>No work</b>	40+	A1	7.2 from each stem

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
G85	Alder and ash	15	230	-	-	2	4	4	4	4	Early mature	(S) Good (P) Good <b>No work</b>	20+	B1	2.8 from each stem
T86*	Black poplar	20+	550	-	-	8	6	10	9	5	Mature	(S) Good (P) Good Ivy clad tree <b>No work</b>	40+	A1	6.6
G87*	Alder, Leyland cypress	15	200	-	-	2	2	3	2	1	Early mature	(S) Good (P) Good Ivy clad tree <b>Sever ivy at base for future inspection</b>	20+	B1	2.4 from each stem
G88*	Hawthorn, hazel, elder, holly	4	up to 150	-	-	2	30	1	30	0	Mature	(S) Poor (P) Poor Trees are in terminal decline <b>Fell</b>	<10	U	1.8 from each stem
T89*	Ash	20+	300	-	-	4	3	4	4	3	Mature	(S) Fair (P) Fair Ivy clad tree <b>No work</b>	20+	B1	3.6
T90	Norway maple	15	330	-	-	3	5	4	3	3	Mature	(S) Fair (P) Fair Ivy clad tree <b>Sever ivy at base for future inspection</b>	20+	B1	4.0
G91	Western red cedar x 2	15	up to 300	-	-	3	3	3	3	0	Mature	(S) Good (P) Good <b>No work</b>	20+	B1	3.6 from each stem
G92	Norway maple x 2	12	up to 590	-	-	6	8	7	5	3	Mature	(S) Fair (P) Good Large dead wood within crown <b>No work</b>	20+	B1	7.1 from each stem
W93	Sycamore, ash, beech	18	up to 330	-	-	5	7	5	7	3	Mature	(S) Fair (P) Fair Ivy clad trees <b>No work</b>	20+	B1	4.0 from each stem

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
G94	Lombardy poplar x 2	20+	up to 620	-	-	3	3	3	3	10	Over mature	(S) Poor (P) Fair One tree is heavily decayed at the base <b>Crown reduce decayed tree by 50%</b>	10+	C1	7.4 from each stem
H95	Viburnum, sycamore	4	up to 150	-	-	6	8	7	5	3	Mature	(S) Fair (P) Good Minor dead wood <b>No work</b>	20+	B1	1.8 from each stem
G96	Crack willow x 2	10	up to 1000	-	-	2	4	3	3	1	Over mature	(S) Poor (P) Poor Both trees have been heavily pollarded and reduced in height. Decay present at both bases <b>Fell</b>	<10	U	12.0 from each stem
T97	Cotoneaster	1	70	-	-	1	7	1	7	0	Mature	(S) Fair (P) Fair <b>No work</b>	10+	C1	0.8
H98	Damson, purple plum	8	up to 200	-	-	2	14	2	14	4	Over mature	(S) Poor (P) Poor <b>No Work</b>	<10	U	1 beyond crown
G99	Birch x 5	8	up to 260	-	-	2	8	2	8	2	Mature	(S) Fair (P) Fair No work	10+	C1	3.1 from each stem
G100*	Sycamore, hawthorn	6	up to 150	-	-	1	1	1	1	0	Semi mature	(S) Fair (P) Poor Ivy covered <b>No Work</b>	<10	U	1.8 from each stem
T101	Lombardy poplar	20+	-	600 580	-	3	2	3	2	10	Over mature	(S) Poor (P) Poor Ivy covered, unable to view the trunk <b>No Work</b>	10+	C1	10.0

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
G102	Sycamore x 1, elm x 4	10	up to 250	-	-	0	0	3	2	3	Semi mature	(S) Fair/Poor (P) Poor The elm stems are dead <b>Fell dead elms</b>	10+	C1	3.0 from each stem
G103*	Sycamore x 10	12	up to 250	-	-	2	7	3	7	4	Mature	(S) Fair/Poor (P) Poor Two of the trees are in a poor condition. The others are ivy clad <b>Fell declining trees. Sever ivy at base for future inspection</b>	10+	C1	3.0 from each stem
G104	Elm	12	up to 250	-	-	7	2	7	4	2	Over mature	(S) Fair (P) Poor Most of the larger elms are dead (DED suspected) <b>Fell dead/declining trees</b>	10+	C1	3.0 from each stem
G105	Ash x 6, black poplar x 1	10	up to 210	-	-	3	3	3	3	0	Semi mature	(S) Fair (P) Fair Self set trees <b>No Work</b>	10+	C1	2.5 from each stem
G106	Ash x 8	8	up to 200	-	-	1	1	2	1	0	Semi mature	(S) Fair (P) Fair Self set trees <b>No Work</b>	10+	C1	2.4 from each stem
H107	Blackthorn	4	up to 100	-	-	1	5	1	5	0	Mature	(S) Good (P) Good <b>No Work</b>	10+	C1	1.0 beyond crown
G108	Field maple x 3	6	up to 320	-	-	1	2	1	2	0	Semi mature	(S) Good (P) Good <b>No Work</b>	10+	C1	3.8 from each stem
G109	Hawthorn, field maple	8	up to 200	-	-	3	1	2	1	0	Mature	(S) Fair (P) Fair Ivy clad tree <b>No work</b>	10+	C1	2.4 from each stem

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Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
G110	Blackthorn	5	up to 205	-	-	1	1	2	1	0	Mature	(S) Poor (P) Poor <b>No Work</b>	<10	U	1.2 from each stem
T111	Sycamore	7	-	-	343	2	3	3	2	0	Semi mature	(S) Fair (P) Fair <b>No Work</b>	10+	C1	4.1
G112	Field maple, hazel, blackthorn	8	up to 240	-	-	3	6	3	6	1	Mature	(S) Fair (P) Fair Ivy clad trees <b>No Work</b>	20+	B2	2.9 from each stem
G113	Cypress x 3, Norway spruce x 2	10	up to 290	-	-	6	3	6	3	1	Semi mature	(S) Good (P) Good <b>No work</b>	20+	B1	3.5 from each stem
G114	Damson	6	up to 200	-	-	20	5	20	5	0	Mature	(S) Fair (P) Good <b>No work</b>	20+	B2	2.4 from each stem
G115	Apple x 6	4	up to 250	-	-	4	5	4	5	1	Over mature	(S) Poor (P) Poor Old orchard trees <b>No Work</b>	10+	C1	3.0 from each stem
T116	Hawthorn	4	210	-	-	2	2	2	2	1	Mature	(S) Good (P) Good No work	20+	B1	2.5
T117	Field maple	5	290	-	-	3	3	3	3	0.5	Early mature	(S) Fair (P) Good Some damaged bark on trunk <b>No Work</b>	20+	B1	3.5
T118	Turkey oak	23	780	-	-	7	6	7	7	10	Mature	(S) Good (P) Good <b>No work</b>	40+	A1	9.4



Appendix 7.4: BS5837:2012 Tree survey report and  
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Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations)	Estimated remaining contribution (years)	Category grading	RPA radius (m)
G119	Elm	12	up to 280	-	-	4	2	2	3	1	Over mature	(S) Poor (P) Poor Numerous trees in terminal decline (DED suspected) <b>Fell diseased trees</b>	<10	U	3.4 from each stem
T120	Horse chestnut	22	790	-	-	7	5	4	6	1	Over mature	(S) Fair (P) Fair Decay in the trunk <b>No work</b>	10+	C1	9.5
T121	Elm	18	400	-	-	0	2	3	2	1	Over mature	(S) Poor (P) Poor Die back in the crown and decay in the trunk <b>No Work</b>	<10	U	4.8
T122	Copper beech	20+	430	-	-	6	4	7	3	5	Mature	(S) Good (P) Good <b>No work</b>	40+	A1	7.0 #
G123	Elm	8	<200	-	-	5	7	5	7	1	Over mature	(S) Fair (P) Fair <b>No work</b>	<10	U	2.4 from each stem
T124	Norway maple	20+	940	-	-	5	7	8	6	2	Mature	(S) Fair (P) Good Some damaged bark on trunk <b>No Work</b>	20+	B1	11.3
T125	Horse chestnut	20+	1000	-	-	8	8	5	6	1	Mature	(S) Good (P) Good <b>No work</b>	20+	B1	12.0
T126	Ash	16	240	-	-	3	2	3	3	2	Early mature	(S) Fair (P) Fair Ivy clad <b>Sever ivy at base for future inspection</b>	20+	B1	2.9
T127	Sycamore	20+	670	-	-	8	8	6	7	3	Mature	(S) Good (P) Good Ivy clad trunk <b>Sever ivy at base for future inspection</b>	40+	A1	8.0

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
T128	Oak	20+	780	-	-	6	6	6	5	3	Mature	(S) Fair (P) Fair Ivy clad, die back in the crown <b>Sever ivy at base for future inspection</b>	40+	A2	9.4
G129	Elm	10	up to 250	-	-	5	1	5	1	0	Semi mature	(S) Poor (P) Poor One dead tree and remaining in terminal decline <b>Fell</b>	<10	U	3.0 from each stem
G130*	Damson	8	up to 150	-	-	1	2	3	2	0	Mature	(S) Fair (P) Fair Ivy clad <b>Sever ivy at base for future inspection</b>	10+	C1	1.8 from each stem
T131	Sycamore	18	420	-	-	3	3	4	3	2	Mature	(S) Fair (P) Fair Ivy clad <b>No work</b>	20+	B1	5.0
T132	Sycamore	18	410	-	-	4	3	4	3	3	Mature	(S) Good (P) Good Ivy clad trunk <b>Sever ivy at base for future inspection</b>	20+	B1	4.9
T133*	(Unidentified)	8	300	-	-	1	1	1	1	0	Dead	A dead tree with ivy mass <b>Fell</b>	<10	U	-
G134	Field maple x 2, cherry x 1.	12	640	-	-	4	2	6	3	2	Mature	(S) Fair (P) Fair Ivy clad trees. Cherry leans towards the road <b>Sever ivy at base for future inspection</b>	20+	B1,2	7.7 from each stem
G135	Sycamore x 2	20+	up to 520	-	-	4	2	5	3	6	Mature	(S) Fair (P) Fair Ivy clad with one leaning towards the road <b>No work</b>	20+	B1,2	6.2 from each stem

Appendix 7.4: BS5837:2012 Tree survey report and  
Arboricultural Impact Assessment



Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
G136	Horse chestnut x 2, sycamore, hornbeam	20+	up to 600	-	-	4	4	3	4	4	Mature	(S) Good (P) Good <b>No work</b>	20+	B1,2	7.2 from each stem
G137	Norway maple x 1, hornbeam x 2	20+	up to 560	-	-	3	3	5	4	4	Mature	(S) Good (P) Good <b>No work</b>	40+	A1,2	6.7 from each stem
G138	Norway maple, field maple	20+	up to 400	-	-	5	3	3	4	4	Mature	(S) Fair (P) Fair Ivy clad, one is in poor condition others are good with and leaning towards the road <b>Sever ivy at base for future inspection</b>	20+	B1,2	4.8 from each stem
G139	Sycamore	20+	up to 200	-	-	20	20	5	5	4	Mature	(S) Good (P) Fair Ivy clad but they appear healthy <b>Sever ivy at base for future inspection</b>	20+	B1,2	2.4 from each stem
G140	Sycamore x 2	20+	up to 420	-	-	8	6	8	4	4	Mature	(S) Good (P) Good <b>No work</b>	40+	A1	5.0 from each stem
T141	Copper beech	20+	760	-	-	5	4	5	5	3	Mature	(S) Good (P) Good <b>No work</b>	40+	A1	9.1
G142	Corsican pine	20+	up to 570	-	-	3	3	3	3	10	Over mature	(S) Fair (P) Poor Wound on trunk of one, poor vitality (leaf cover) <b>No work</b>	10+	C1	6.8 from each stem
T143	Norway maple	16	420	-	-	4	4	4	3	1	Over mature	(S) Poor (P) Fair Decay present in trunk <b>No work</b>	10+	C1	5.0

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
G144	Sycamore x 2, Corsican pine x 2	20+	up to 540	-	-	6	4	6	8	2	Mature	(S) Fair (P) Good One tree with wound on trunk <b>No work</b>	20+	B1,3	6.5 from each stem
G145	Ash x 3	20+	up to 710	-	-	8	4	4	5	3	Over mature	(S) Fair/Poor (P) Good/Poor Two of these trees are in decline, the remaining one is healthy <b>No Work</b>	10+	C1,2	8.5 from each stem
G146	Corsican pine, oak, horse chestnut, sycamore	20+	up to 1000	-	-	6	5	6	6	6	Mature	(S) Good (P) Good The large pine has a wound on the trunk <b>No Work</b>	40+	A2	12.0 from each stem
G147	Corsican pine x 2, ash x 2, Norway maple x 1, sycamore x 1	20+	up to 450	-	-	5	4	4	5	3	Mature	(S) Fair (P) Good Maple has decay in one stem <b>No Work</b>	40+	A2	5.4 from each stem
G148	London plane, Corsican pine, ash, hornbeam, sycamore	20+	up to 410	-	-	5	5	4	6	1	Mature	(S) Poor (P) Fair London plane has a dead upper crown. Pine tree is dead and has fallen and damaged the ash and the hornbeam <b>Remove the dead pine tree and remove dead parts of plane tree</b>	40+	A2	4.9 from each stem
G149	Sycamore x 6	20+	up to 400	-	-	8	3	5	3	3	Mature	(S) Good (P) Good Multi-stemmed trees all ivy clad but they all appear to be healthy <b>Sever ivy at base for future inspection</b>	40+	A2	4.8 from each stem

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
G150	Sycamore	20+	up to 400	-	-	8	4	4	3	4	Mature	(S) Good (P) Good Multi-stemmed trees all Ivy clad but they all appear to be health <b>Sever ivy at base for future inspection</b>	40+	A2	4.8 from each stem
G151	Blackthorn	4	up to 100	-	-	2	1	2	1	0	Mature	(S) Good (P) Good <b>No work</b>	20+	B1,2	1.2 from each stem
G152	Norway maple, sycamore, ash	20+	up to 400	-	-	70	5	70	5	0	Mature	(S) Good (P) Good A self-set group of trees mostly in good condition and ivy clad. Some in group of lower quality <b>No Work</b>	40+	A2	4.8 from each stem
G153	Ash, field maple, sycamore, Norway maple	17	up to 300	-	-	3	3	3	3	6	Early mature	(S) Good (P) Good Mainly multi-stemmed. <b>No Work</b>	40+	A2	3.6 from each stem
H154	Elm, elder, hornbeam	2	up to 150	-	-	2	30	2	30	0	Middle aged	(S) Good (P) Good <b>No work</b>	20+	B2	1.8
T155	Oak	18	650	-	-	8	7	6	7	4	Mature	(S) Good (P) Good Ivy clad <b>Sever ivy at base for future inspection</b>	40+	A1	7.8
W156	Sycamore, ash, field maple, Corsican pine, cherry, hawthorn, elder	up to 17	up to 750	-	-	18	40	18	40	2	Mature	(S) Fair (P) Good Road side woodland remnant with large mature trees, sparse understory, standing dead, some wind-throw <b>No work</b>	20+	B3	9.0 from each stem

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations)	Estimated remaining contribution (years)	Category grading	RPA radius (m)
G157 (in W156)	Corsican pine x 7	up to 17	up to 640	-	-	18	8	18	8	4	Mature	(S) Fair (P) Good Medium sized deadwood and some closed/weak unions <b>No work</b>	20+	B2	7.7 from each stem
T160i Tagged tree (no. 160) within W156	Corsican pine	18	590	-	-	5	4	5	3	14	Mature	(S) Good (P) Good Ivy clad, high canopy. <b>Constraints due to this tree supersede those applied to this area of W156, in previous report.</b> <b>No work</b>	20+	B1	7.1
T161i Tagged tree (no. 161) within W156	Corsican pine	20	530	-	-	4	4	4	4	16	Mature	(S) Good (P) Good Healthy specimen, no defects and a high crown. <b>Constraints due to this tree supersede those applied to this area of W156, in previous report.</b> <b>No work</b>	20+	B1	6.4
T162i Tagged tree (no. 162) within W156 & G5i	Corsican pine	16	500	-	-	2	4	3	3	12	Mature	(S) Good (P) Fair Lean to the east, suppressed form and sparse canopy. <b>Constraints due to this tree supersede those applied to this area of W156, in previous report.</b> <b>No work</b>	10+	C1	6.0



Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
T163i Tagged tree (no. 163) within W156	Ash	17	390	-	-	6	6	3	2	9	Middle aged	(S) Good (P) Good Suppressed form and growth to the north. <b>Constraints due to this tree supersede those applied to this area of W156, in previous report.</b> <b>No work</b>	10+	C1	4.7
T164i Tagged tree (no. 164) within W156 & G5i	Ash	21	410	-	-	5	4	4	3	17	Middle aged	(S) Good (P) Fair Etiolated high contorted canopy and Ivy around the base, full inspection not possible. <b>Constraints due to this tree supersede those applied to this area of W156, in previous report.</b> <b>No work</b>	10+	C1	4.9
T165i Tagged tree (no. 165) within W156 & G5i	Ash	21	380	-	-	7	6	4	5	10	Middle aged	(S) Fair(P) Good Etiolated high canopy and Ivy around the base and lower canopy, full inspection not possible. <b>Constraints due to this tree supersede those applied to this area of W156, in previous report.</b> <b>No work</b>	10+	C1	4.6

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
T166i Tagged tree (no. 166) within W156	Ash	20	730	-	-	3	4	6	5	13	Mature	(S) Good (P) Good A small crown with lvy to the high canopy. <b>Constraints due to this tree supersede those applied to this area of W156, in previous report.</b> <b>No work</b>	20+	B1	8.8
T167i Tagged tree (no. 167) within W156	Ash	20	730	-	-	5	7	5	10	15	Mature	(S) Good (P) Good Stem to the south west is end loaded with snags. Thin crown and decay fungus on the trunk. Ivy on the trunk to the mid-crown preventing full assessment. At risk of failure. <b>Constraints due to this tree supersede those applied to this area of W156, in previous report.</b> <b>Remove tree within 6 months.</b>	<10	U	8.8
T168i Tagged tree (no. 168) within W156	Ash	23	730	-	-	1	12	12	10	18	Mature	(S) Fair (P) Good A suppressed Ivy clad tree. <b>Constraints due to this tree supersede those applied to this area of W156, in previous report.</b> <b>No work</b>	20+	B1	8.8

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
T169i Tagged tree (no. 169) within G6i	Ash	25	710	-	-	6	5	6	10	2	Mature	(S) Fair (P) Good A large spreading canopy, biased to the west and overhanging Sheering Road. Ivy clad stem to mid crown preventing full assessment. <b>Constraints due to this tree supersede those applied to this area of W156, in previous report.</b> <b>No work</b>	20+	B2,3	8.5
T170i Tagged tree (no. 170) within W156	Corsican pine	20	670	-	-	5	3	5	6	15	Mature	(S) Fair (P) Good Ivy around the base preventing full assessment and a small crown. <b>Constraints due to this tree supersede those applied to this area of W156, in previous report.</b> <b>No work</b>	20+	B1	8.0

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
T171i Tagged tree (no. 170) within W156	Red horse chestnut	14	470	-	-	0	7	8	0	1	Mature	(S) Poor (P) Fair Root and base decay. Partial collapse to the south east, leaning due to partial root plate shear but supported by adjacent tree. No right of way through wood (very low freq. of use) and direction of lean away from road (no target beneath tree). <b>Constraints due to this tree supersede those applied to this area of W156, in previous report.</b> <b>No work</b>	<10	U	5.6
T172i Tagged tree (no. 170) within W156	Ash	18	770	-	-	9	7	3	5	4	Mature	(S) Fair (P) Good This is two trees very close together. Suppressed growth and a lean to the north. Ivy clad to the mid crown. <b>Constraints due to this tree supersede those applied to this area of W156, in previous report.</b> <b>No work</b>	20+	B1	9.2

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations)	Estimated remaining contribution (years)	Category grading	RPA radius (m)
G158 (in W156)	Ash (80%), sycamore	up to 15	up to 750	-	-	18	20	18	20	3	Mature	(S) Fair (P) Fair Area of mature ash with some recent wind-throw <b>No work</b>	20+	B2	9.0 from each stem
G159	Willow, elder, field maple	10	up to 400	-	-	5	6	5	6	0	Mature	(S) Poor (P) Good Large collapsed willow developing new roots and regenerating (layering) next to stream <b>No work</b>	10+	C2	4.8 from each stem
G160	Ash, sycamore, Viburnum	up to 8	up to 350	-	-	3	3	3	3	0	Middle aged	(S) Fair (P) Good Road side ivy clad ash and sycamore on bank <b>No work</b>	20+	B2	4.2 from each stem
T161	Ash	10	790	-	-	6	11	7	4	0	Veteran	(S) Fair (P) Fair Growing on bank with retrenched crown (naturally reducing) with good vitality in lower crown, decay at base, ivy clad, dead wood in top <b>No work</b>	40+	A3	9.5 #
H162	Hawthorn, hazel, Euonymus	up to 6	up to 150	-	-	2	9	2	9	0	Mature	(S) Good (P) Good Hedge providing wildlife cover/corridor along stream <b>No work</b>	20+	B3	1.0 beyond crown
H163	Hawthorn, blackthorn, field maple, hazel, beech	up to 6	up to 170	-	-	3	19	3	19	0	Middle aged	(S) Good (P) Good Mixed hedge along stream <b>No work</b>	20+	B3	1.0 beyond crown

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
G164	Ash x 2	13	up to 400	-	-	5	6	5	6	1	Middle aged	(S) Poor (P) Good Multi stemmed coppice with closed unions and conflicting limbs <b>No work</b>	10+	C2	4.8 from each stem
G165	Apple x 2	up to 6	up to 180	-	-	2	4	1	5	0	Middle aged	(S) Fair (P) Good Flailed on field side <b>No work</b>	10+	C2	2.2 from each stem
G166	Hazel, field maple, ash, elm	up to 7	up to 190	-	-	5	40	3	40	0	Middle aged	(S) Good (P) Good-Poor Mixed trees and hedge on stream bank. Eastern end DED infected elm regeneration <b>No work</b>	20+	B3	2.3 from each stem
G167	Field maple, blackthorn, hawthorn	up to 6	up to 250	-	-	3	13	3	13	0	Middle aged	(S) Good (P) Good Hedge providing wildlife cover/corridor along stream <b>No work</b>	20+	B3	3.0 from each stem
H168	Hawthorn, elder, Viburnum	1.5	up to 120	-	-	1	105	1	105	1.5	Middle aged	(S) Good (P) Good Field boundary hedge <b>No work</b>	20+	B3	1.0 beyond crown
T169	English oak	16	1450	-	-	9	8	6	7	2	Over mature	(S) Fair (P) Good Large, open grown next to ploughed field but in good condition. Cavity at base with burrow activity, Ivy clad <b>No work</b>	40+	A1	17.4



Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
T170	Ash	9	840	-	-	2	3	4	3	5	Over mature	(S) Fair (P) Poor Top of tree blown out with die back in remaining crown and old <i>Inonotus hispidus</i> (decay fungus) bracket at base. Major deadwood. Stable form due to reduced height to stem diameter ratio. <b>Remove deadwood, leave as habitat</b>	<10	U	10.1
T171	English oak	14	970	-	-	9	11	9	5	2	Mature	(S) Good (P) Good Large, open grown, prominent landscape tree in good condition. Some medium sized deadwood <b>No work</b>	40+	A1	11.6
T172	Hawthorn	4	-	160 100 80 140	-	3	1	2	3	1	Middle aged	(S) Fair (P) Good Growing to west, suppressed by T173 <b>No work</b>	10+	C1	3.0
T173	Field maple	14	-	590 630	-	5	7	6	4	1	Mature	(S) Good (P) Good Growing to east, asymmetric. Large for species <b>No work</b>	20+	B1	10.4
T174	Hawthorn	5	300	-	-	3	3	3	2	1	Middle aged	(S) Good (P) Good <b>No work</b>	20+	B1	3.6

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
G175	Goat willow	5	up to 150	-	-	15	2	15	2	0	Middle aged	(S) Fair (P) Good Growing out of stream bank, flailed on one side <b>No work</b>	10+	C1	1.8 from each stem
H176	Blackthorn, goat willow, hazel, hawthorn	4	up to 120	-	-	35	2	35	2	0	Middle aged	(S) Fair (P) Fair Growing out of stream bank, some dead stems <b>No work</b>	20+	B3	1.0 beyond crown
W177	Oak, sycamore, ash, willow, pine, alder, beech, cherry, hazel, apple	up to 20	up to 1400	-	-	165	65	165	65	1	Mature	(S) Good (P) Good Significant woodland remnant in landscape. Mixed structure and species with recent planting (<10yrs of oak and ash), previous pheasant management, cleared areas, numerous veteran trees on boundary. Lapsed coppice (hazel/alder) with standards (oak and ash) Wetland habitat created and stand of planted willows, lots of deadwood habitats - standing/aerial/ground (see numbered features on 'Tree Survey Plan') <b>No work</b>	40+	A2/3	15.0 from each stem

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
T134i Tagged tree (no. 134) within W177	Ash	20	760	-	-	8	7	0	7	10	Mature	(S) Fair (P) Good A large edge grown tree with a bias to the north. Growing on the edge of the ditch. Decay on a side limb and at the base. Good habitat potential (GHP). <b>Constraints due to this tree supersede those applied to this area of W177, in previous report. No work</b>	20+	B1,3	9.1
T135i Tagged tree (no. 135) within W177	Ash	19	-	440 440	-	9	6	1	3	15	Mature	(S) Fair (P) Good High crown and three stems. One 6m high decayed stem with woodpecker holes. GHP in decayed stem. <b>Constraints due to this tree supersede those applied to this area of W177, in previous report. No work</b>	10+	C1,3	7.1

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
T136i Tagged tree (no. 136) within W177	Ash	21	400	-	-	8	4	0	5	16	Mature	(S) Fair (P) Fair A suppressed and etiolated tree with a lean to the north. Heavily end loaded stem. Decay in a side branch and the base. <b>Constraints due to this tree supersede those applied to this area of W177, in previous report.</b> <b>No work</b>	10+	C1,3	4.8
T137i Tagged tree (no. 137) within W177	Ash	20	450	-	-	4	2	1	7	10	Mature	(S) Fair (P) Fair An etiolated tree with a bias to the west. An elbow on stem at 14m. Rot hole at 3m with wood pecker hole. <b>Constraints due to this tree supersede those applied to this area of W177, in previous report.</b> <b>No work</b>	10+	C1/3	5.4

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
T138i Tagged tree (no. 138) within W177	Ash	22	-	440 420	-	9	0	0	6	16	Mature	(S) Good (P) Good A suppressed and etiolated tree with a bias to the north. Failed stem still attached and contacting the ground. Decay at the base of missing stem. <b>Constraints due to this tree supersede those applied to this area of W177, in previous report.</b> <b>No work</b>	10+	C1,3	7.3
T139i Tagged tree (no. 139) within W177	Ash	16	-	160 290	-	4	4	0	3	8	Middle aged	(S) Fair (P) Good A twin stemmed suppressed tree with a sparse canopy. <b>Constraints due to this tree supersede those applied to this area of W177, in previous report.</b> <b>No work</b>	10+	C1	4.0

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
T140i Tagged tree (no. 140) within W177	Ash	23	-	670 250	-	15	8	0	3	10	Mature	(S) Fair(P) Fair A partially uprooted tree with a 40% lean and the root plate has lifted exposing roots. End loading to the north. It has stabilised but will eventually fail. Functioning well. Very low freq. of use within woodland and no targets present beneath tree. <b>Constraints due to this tree supersede those applied to this area of W177, in previous report.</b> <b>No work</b>	10+	C1	8.6
T141i Tagged tree (no. 141) within W177	Ash	23	-	530 310	-	7	5	5	8	16	Mature	(S) Good (P) Good A relatively balanced crown and stable form. Minor decay around the base. A small stem in decline has snapped out. GHP. <b>Constraints due to this tree supersede those applied to this area of W177, in previous report.</b> <b>No work</b>	20+	B1,3	7.4



Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
T142i Tagged tree (no. 142) within W177	Beech	23	1270	-	-	8	10	12	12	8	Over mature	(S) Fair (P) Fair Dominant tree maiden tree in this group. High canopy and good function. No visible defects. <b>Constraints due to this tree supersede those applied to this area of W177, in previous report.</b> <b>No work</b>	40+	A1,3	15.0
T143i Tagged tree (no. 143) within W177	Ash	17	-	410 410	-	9	2	1	6	7	Mature	(S) Good (P) Fair Growing on the side of a ditch. Decay in the main stem union limb. High crown. Suppressed and leaning to the North. <b>Constraints due to this tree supersede those applied to this area of W177, in previous report.</b> <b>No work</b>	10+	C1	7.0

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
T144i Tagged tree (no. 144) within W177	Ash	22	520	-	-	6	3	4	6	18	Mature	(S) Fair (P) Good Good form and a small crown. Decay with woodpecker holes to the north stem. Crown breaks at 8m. <b>Constraints due to this tree supersede those applied to this area of W177, in previous report.</b> <b>No work</b>	10+	C1,3	6.2
T145i Tagged tree (no. 145) within W177	Ash	26	600 470	-	-	10	6	1	10	15	Mature	(S) Fair(P) Good Ivy clad stem to 14m. Cannot reasonably assess the stem. Good form and a small crown. <b>Constraints due to this tree supersede those applied to this area of W177, in previous report.</b> <b>No work</b>	20+	B1,3	9.1

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
T146i Tagged tree (no. 146) within W177	Ash	16	520	-	-	6	8	0	0	6	Mature	(S) Good (P) Good Snap out to the north (hanging to the ground). Growing in the ditch side. Severe lean to the north east. Corrective growth pattern. Ivy on the stem. <b>Constraints due to this tree supersede those applied to this area of W177, in previous report. No work</b>	10+	C1	6.2
T147i Tagged tree (no. 147) within W177	Ash	25	910	-	-	10	8	12	12	7	Over Mature	(S) Good (P) Good A large spreading and balanced crown. Growing at the edge of the woodland. A large wound with decay at 8m. GHP. <b>Constraints due to this tree supersede those applied to this area of W177, in previous report. No work</b>	20+	B1,3	10.9
T178 (within W177)	English oak	11	1650	-	-	5	7	5	8	3	Veteran	(S) Good (P) Fair Boundary veteran tree with multiple cavities and deadwood sections. <b>No work</b>	40+	A3	15.0

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
G179 (within W177)	White willow (>10)	up to 14	up to 440	-	-	70	27	70	27	3	Middle aged	(S) Good (P) Good Some recently planted specimens and some long established. Maintained area adjacent to wetland habitat site <b>No work</b>	20+	B2	5.3 from each stem
G180*	Sycamore, Corsican pine, ash, field maple, oak, hawthorn, pear	up to 10	280	-	-	3	65	3	65	0	Middle aged	(S) Good (P) Good Screen planted trees on M11 embankment <b>No work</b>	10+	C2	3.4 from each stem
G181*	Sycamore, ash, willow, Prunus, hawthorn, rose	up to 7	230	-	-	5	105	5	105	0	Middle aged	(S) Good (P) Good Screen planted trees on M11 embankment <b>No work</b>	10+	C2	2.8 from each stem
W182	Sycamore, oak, ash, elm, hawthorn, damson	up to 17	up to 640	-	-	35	22	35	22	0	Middle aged	(S) Good (P) Fair Woodland with oak standards and standing dead, elm regeneration. <b>No work</b>	20+	B2	7.7 from each stem
G182a (within W182)	Sycamore, ash, oak, field maple, hawthorn, elder	up to 20	up to 633	-	-	28	20	28	20	0	Middle aged	(S) Good (P) Fair Mostly early mature trees, some multi-stemmed coppice re-growth. An understory of hawthorn. <b>No work</b>	20+	B2/3	7.6 from each stem

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
T156i Tagged tree (no. 156) within W182	Sycamore	21	410	-	-	5	5	5	4	4	Middle aged	(S) Good (P) Good A straight stem. Good condition. <b>Constraints due to this tree supersede those applied to this area of W182, in previous report.</b> <b>No work</b>	20+	B1	4.9
T157i Tagged tree (no. 157) within W182	Field maple	19	360	-	-	4	4	4	5	5	Middle aged	(S) Good (P) Good Very tall and thin crown/stem for species. Appears to be in good condition. <b>Constraints due to this tree supersede those applied to this area of W182, in previous report.</b> <b>No work</b>	20+	B1	4.3
T158i Tagged tree (no. 158) within W182	English oak	18	310 410 370	-	-	3	6	6	7	9	Mature	(S) Fair(P) Fair Old lapsed coppice stool. Missing stems at the base. Tree is resting on two stems causing damage. Suppressed growth to the north and west. <b>Constraints due to this tree supersede those applied to this area of W182, in previous report.</b> <b>No work</b>	10+	C1/3	7.6

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
G183	Oak (English & turkey), large leaved lime, sycamore, horse chestnut, hornbeam, elder, hawthorn	up to 15	up to 570	-	-	5	18	5	18	0	Mature	(S) Good (P) Good Field boundary group with linearly planted mature limes and ditch present to south. <b>No work</b>	20+	B2	6.8 from each stem
T153i Tagged tree (no. 153) within G183	Oak	16	330	1	330	2	1	2	2	11	Middle aged	(S) Good (P) Fair Wound with decay at the base. Small crown. <b>Constraints due to this tree supersede those applied to this area of G183, in previous report.</b> <b>No work</b>	10+	C1	4.0
T154i Tagged tree (no. 154) within G183	Turkey oak	18	570	1	570	4	4	6	2	2	Mature	(S) Good (P) Fair Suppressed form with lean to the west, barbed wire occlusion.. Ivy on the stem is minor. <b>Constraints due to this tree supersede those applied to this area of G183, in previous report.</b> <b>No work</b>	10+	C1	6.8



Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
T155i Tagged tree (no. 155) within G183	Ash	15	-	240 260 310 370	-	5	4	5	4	6	Mature	(S) Good (P) Fair A field boundary line. Regrown old lime pollards from avenue planting. <b>Constraints due to this tree supersede those applied to this area of G183, in previous report.</b> <b>No work</b>	20+	B1	7.2
W184	Sycamore, ash, oak (English & Turkey), beech hawthorn, elm, honeysuckle, elder	up to 17	up to 450	-	-	35	36	35	36	2	Mature	(S) Good (P) Fair Mixed age with some standing dead and cleared area with mass of honeysuckle. <b>No work</b>	20+	B2	5.4 from each stem
G184a (within W184)	Field maple, hawthorn, oak, ash, sycamore (within W184)	up to 18	up to 510	-	-	17	12	17	12	1	Mature	(S) Good (P) Good Predominantly early mature trees with larger edge grown trees to the east. Understory of oak, ash and hawthorn. <b>No work</b>	10+	C2,3	6.1 from each stem

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
T148i Tagged tree (no. 148) within W184	Field maple	14	-	220 210 410	-	5	6	5	3	G	Middle aged	(S) Fair(P) Good An edge grown tree in the ditch. Ivy clad to the mid-crown. Suppressed growth to the west. <b>Constraints due to this tree supersede those applied to this area of W184, in previous report.</b> <b>No work</b>	10+	C1	6.1
T149i Tagged tree (no. 149) within W184	English oak	18	400	-	-	6	6	3	7	10	Middle aged	(S) Fair (P) Fair Ivy clad to the lower crown, twin stem forms at crown break. Healthy example. <b>Constraints due to this tree supersede those applied to this area of W184, in previous report.</b> <b>No work</b>	10+	C1	4.8
T150i Tagged tree (no. 150) within W184	Ash	18	390	-	-	6	5	5	5	10	Middle aged	(S) Good (P) Good Good form, no visible defects. <b>Constraints due to this tree supersede those applied to this area of W184, in previous report.</b> <b>No work</b>	20+	B1,3	4.7

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
T151i Tagged tree (no. 151) within W184	Ash	19	450	-	-	3	1	3	3	13	Middle aged	(S) Good (P) Good Edge of the buffer zone. Straight stem and a suppressed crown to the east. Crown break at 8m. Healthy small crown. <b>Constraints due to this tree supersede those applied to this area of W184, in previous report.</b> <b>No work</b>	10+	C1	5.4
T152i Tagged tree (no. 152) within W184	Oak	19	330	-	-	4	3	3	2	5	Middle aged	(S) Good (P) Good Suppressed within the woodland. <b>Constraints due to this tree supersede those applied to this area of W184, in previous report.</b> <b>No work</b>	10+	C1	4.0
T185 (within W184)	Horse chestnut	18	970	-	-	7	5	8	4	3	Mature	(S) Good (P) Good On boundary of woodland, good specimen. <b>No work</b>	40+	A1	11.6
W186	Sycamore, elm, oak (English & Turkey), field maple, ash, beech, blackthorn, hawthorn	up to 17	up to 910	-	-	55	10	55	10	0	Mature	(S) Fair (P) Fair Thin strip of woodland on field boundary. Semi mature elms present suffering from DED (numerous standing dead). <b>No work</b>	20+	B2	10.9 from each stem

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
G187*	Sycamore, ash, oak, hawthorn	up to 12	up to 300	-	-	6	90	6	90	0	Middle aged	(S) Good (P) Good Screen planted trees on M11 embankment <b>No work</b>	20+	B2	3.6 from each stem
T188	English oak	9	560	-	-	4	4	4	4	3	Mature	(S) Good (P) Good Open grown tree in good condition, Growing from boundary ditch <b>No work</b>	40+	A1	6.7
G189*	Sycamore, ash, oak (English & Turkey), blackthorn	up to 6	up to 220	-	-	3	98	3	98	0	Middle aged	(S) Good (P) Good Screen planted trees on M11 embankment <b>No work</b>	10+	C2	2.6 from each stem
G190*	Field maple, ash, sycamore, Corsican pine, blackthorn, hawthorn,	up to 7	up to 230	-	-	4	70	4	70	0	Middle aged	(S) Good (P) Good Screen planted trees on M11 embankment <b>No work</b>	10+	C2	2.8 from each stem
G191*	Corsican pine, sycamore, field maple, elm, ash	up to 8	up to 250	-	-	7	44	7	44	0	Middle aged	(S) Good (P) Good Screen planted trees on M11 embankment <b>No work</b>	10+	C2	3.0 from each stem
G192*	Sycamore, ash, Scots pine, field maple, elm, willow, blackthorn, damson	up to 10	up to 250	-	-	15	49	15	49	0	Middle aged	(S) Good (P) Good Larger area of M11 screen planting with varied structure and areas of scrub <b>No work</b>	20+	B2,3	3.0 from each stem

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
T193*	Sycamore	13	580	-	-	7	6	7	4	3	Mature	(S) Fair (P) Good Off site tree in private garden, <1m from road and next to wall. Closed union @ 6m, decay in pruning wounds, adjacent to power line <b>No work</b>	20+	B1	7.0
G194*	Sycamore x 2, yew x 2, maple x 1	up to 12	up to 250	-	-	5	3	5	3	2	Semi mature	(S) Good (P) Good Off site private trees growing close to boundary wall and road (<3m) <b>No work</b>	20+	B2	3.0 from each stem
G195*	Sycamore x 3	up to 13	up to 360	-	-	6	5	6	5	4	Semi mature	(S) Good (P) Good Off site private trees growing close to boundary wall and road (<4m) <b>No work</b>	20+	B2	4.3 from each stem
T196*	Sycamore	15	450	-	-	4	4	4	4	3	Mature	(S) Good (P) Good Boundary tree in raised bank <2m from road. Ivy clad and good condition <b>Sever ivy at base for future inspection</b>	20+	B2	5.4
G197*	Sycamore, ash, field maple, elm	up to 13	up to 220	-	-	28	3	28	3	2	Early mature	(S) Fair (P) Fair Growing from bank by road with poor taper (thin stems). Elm regeneration with some minor deadwood <b>Remove deadwood on road side</b>	10+	C2	2.6 from each stem

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
T198*	Field maple	8	200	-	-	1	3	3	1	5	Semi mature	(S) Poor (P) Poor Growing out of bank and partially across road, in terminal decline, previous limb loss, hazardous <b>Remove - Priority</b>	<10	U	2.4
T199*	Field maple	7	230	-	-	3	4	1	2	4	Semi mature	(S) Poor (P) Poor Adjacent to T197, heavily end loaded stem leaning over road with ivy mass. Previous stem failure at base <b>Remove - Priority</b>	<10	U	2.8
G200*	Field maple, sycamore, hawthorn, yew, blackthorn	up to 10	up to 180	-	-	24	3	24	3	3	Semi mature	(S) Fair (P) Good Growing from bank next to road, poor form, boundary screen <b>No work</b>	10+	C2	2.2 from each stem
G201*	Ash, hazel x 2	up to 8	up to 210	-	-	4	5	4	5	1	Middle aged	(S) Good (P) Good Ash tree growing from stream bank by road. Co-dominant leaders at 2m, adjacent to power line <b>No work</b>	10+	C2	2.5 from each stem
T202*	Ash	8	280	-	-	3	3	3	4	4	Middle aged	(S) Good (P) Good Growing from stream bank, good form, tight unions at 3m <b>No work</b>	20+	B1	4.0 #
H203*	Blackthorn, elm, hawthorn	up to 4	up to 100	-	-	10	2	10	2	0	Middle aged	(S) Good (P) Good Road side mixed hedge <b>No work</b>	10+	C1	1.0 beyond crown



Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
G204*	Sycamore, ash, field maple, Corsican pine, elm, blackthorn, hawthorn	up to 8	up to 190	-	-	15	47	15	47	0	Middle aged	(S) Good (P) Good Screen planted trees on M11 embankment. Variation in tree and shrub levels in larger area <b>No work</b>	20+	B3	2.3 from each stem
G205*	Norway maple, sycamore, Corsican/Scots pine, ash, elm hawthorn, apple, blackthorn	up to 7	up to 180	-	-	5	90	5	90	0	Middle aged	(S) Fair (P) Good Screen planted trees on M11 embankment. Multi stemmed trees possibly due to browsing during establishment <b>No work</b>	20+	B2	2.2 from each stem
T206*	Sycamore	7	350	-	-	4	4	3	4	0	Middle aged	(S) Good (P) Good Prominent tree in group due to age. Older than planting scheme, co-dominant leaders, good condition <b>No work</b>	20+	B1	4.2
G207*	Ash, oak, sycamore	7	up to 320	-	-	5	61	5	61	0	Middle aged	(S) Fair (P) Good Screen planted trees on M11 embankment. Multiple trees with co-dominant leaders and closed unions at base (result of browsing during establishment) <b>No work</b>	20+	B2	3.8 from each stem

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations)	Estimated remaining contribution (years)	Category grading	RPA radius (m)
G208*	Ash, sycamore, oak	up to 6	up to 220	-	-	6	55	6	55	0	Middle aged	(S) Fair (P) Good Similar to G207. Dense ash regeneration close to motorway and throughout <b>No work</b>	10+	C2	2.6 from each stem
G209*	Ash, sycamore, oak	up to 7	up to 200	-	-	6	46	6	46	0	Middle aged	(S) Good (P) Good Screen planted trees on M11 embankment. Mostly ash regeneration with older sycamore on the southern boundary with field <b>No work</b>	10+	C2	2.4 from each stem
G210*	Elm, sycamore, ash, oak, gorse	up to 7	up to 280	-	-	6	50	6	50	0	Middle aged	(S) Fair (P) Fair Screen planted trees on M11 embankment. Ash regeneration by motorway, elm regeneration by field (DED throughout). Mixed cover and scrub areas <b>No work</b>	10+	C2	3.4 from each stem
G211*	Oak, ash, sycamore, hawthorn, beech	up to 6	up to 260	-	-	5	10	5	10	0	Middle aged	(S) Good (P) Good Screen planted trees on M11 embankment. Small group of oaks and sycamores. Ash regeneration by motorway <b>No work</b>	20+	B2	3.1 from each stem

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
G212*	Ash, sycamore, oak, hawthorn, Prunus, gorse	up to 8	up to 200	-	-	5	110	5	110	0	Middle aged	(S) Good (P) Good Screen planted trees on M11 embankment. Mix of tree, shrub and scrub. <b>No work</b>	20+	B3	2.4 from each stem
W213	Sycamore, Scots pine, holm oak, elder, holly, elm	up to 16	up to 740	-	-	8	28	8	28	0	Mature	(S) Poor (P) Fair Largely unmanaged woodland with multiple tear outs from mature trees (large decay pockets on larger trees), large amounts of deadwood on the ground, wind throw throughout (especially on edges) and standing dead. Ivy clad trees throughout <b>No work</b>	10+	C3	8.9 from each stem
G214*	Sycamore, cherry, Scots pine, birch, elm	up to 9	up to 200	-	-	7	15	7	15	1	Middle aged	(S) Good (P) Good Screen planted trees on M11 embankment. Mainly cherry and pine <b>No work</b>	10+	C2	2.4 from each stem

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
G215	Sycamore, oak, ash, elm, hawthorn, wingnut, Leyland cypress	22	1300			7	7	7	7	2	M	(S) Good (P) Good Linear boundary group with large mature specimens. Some ornamental trees within boundary, most outside. Unmanaged for some time, large dead monolith by boundary (stable). Crowns growing over site boundary.	20+	B2	15.0 max
T216	Oak	18	1300			4	5	9	7	3	OM	(S) Poor (P) Good Hollowed main stem with extensive fire damage on the inside within large basal cavity. Numerous decay fungi within cavity, large pruning wounds at 3m, large crown, potentially unstable and prone to stem failure.	<10	U	15.0

Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
G217	Sycamore, oak, ash, horse chestnut	26	1180			8	8	8	8	O	M	(S) Fair (P) Fair Linear group mostly behind site boundary fence. Mature trees with limb removal to north over site up to 8m. Site side are young to semi mature sycamore regen, some limb loss to mature trees and minor to moderate deadwood throughout.	20+	B2/3	14.2 max
T218	Horse chestnut	16	1100			7	5	8	6	4	OM	(S) Poor (P) Fair Veteran tree with retrenching crown and large cavities and hollowing out at the base. Over extended to the east but stable form, leaf miner present, cleared area around tree (halo tree). 6m from fence line.	40+	A1/3	13.2
T219	Horse chestnut	23	1080	-	-	8	8	9	7	6	M	(S) Good (P) Fair Large spread crown, ivy clad to 3m prevents full assessment. Early defoliation (leaf miner) but plenty of buds and live growth. Open structure. 4m from fence.	20+	B2	13.0

Appendix 7.4: BS5837:2012 Tree survey report and  
Arboricultural Impact Assessment



Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
T220	Oak	22	1000	-	-	6	3	7	7	10	M	(S) Good (P) Poor Suppressed by T219, numerous large tear outs wounds, asymmetric crown, ivy clad stem. 8m from fence.	20+	C1	12.0
T221	Horse Chestnut	25	1000	-	-	7	9	6	6	3	OM	(S) Good (P) Good Large tear out at 12m, Early defoliation (leak miner), crown lifted to 8m leaving large pruning wounds. 7m from fence.	20+	B1	12.0
T222	Oak	20	880	-	-	6	6	6	3	8	M	(S) Good (P) Fair Thinning crown, previously crown lifted leaving a very high crown - poor form. 3m from fence.	10+	C1/3	10.6
T223	Oak	26	1180	-	-	9	6	7	8	5	OM	(S) Good (P) Fair Large crown with low levels of secondary branching and signs of decline. Prominent tree on edge of group visible to surrounding area, Major deadwood to south, moderate deadwood throughout. 3m from fence.	20+	B1/3	14.2

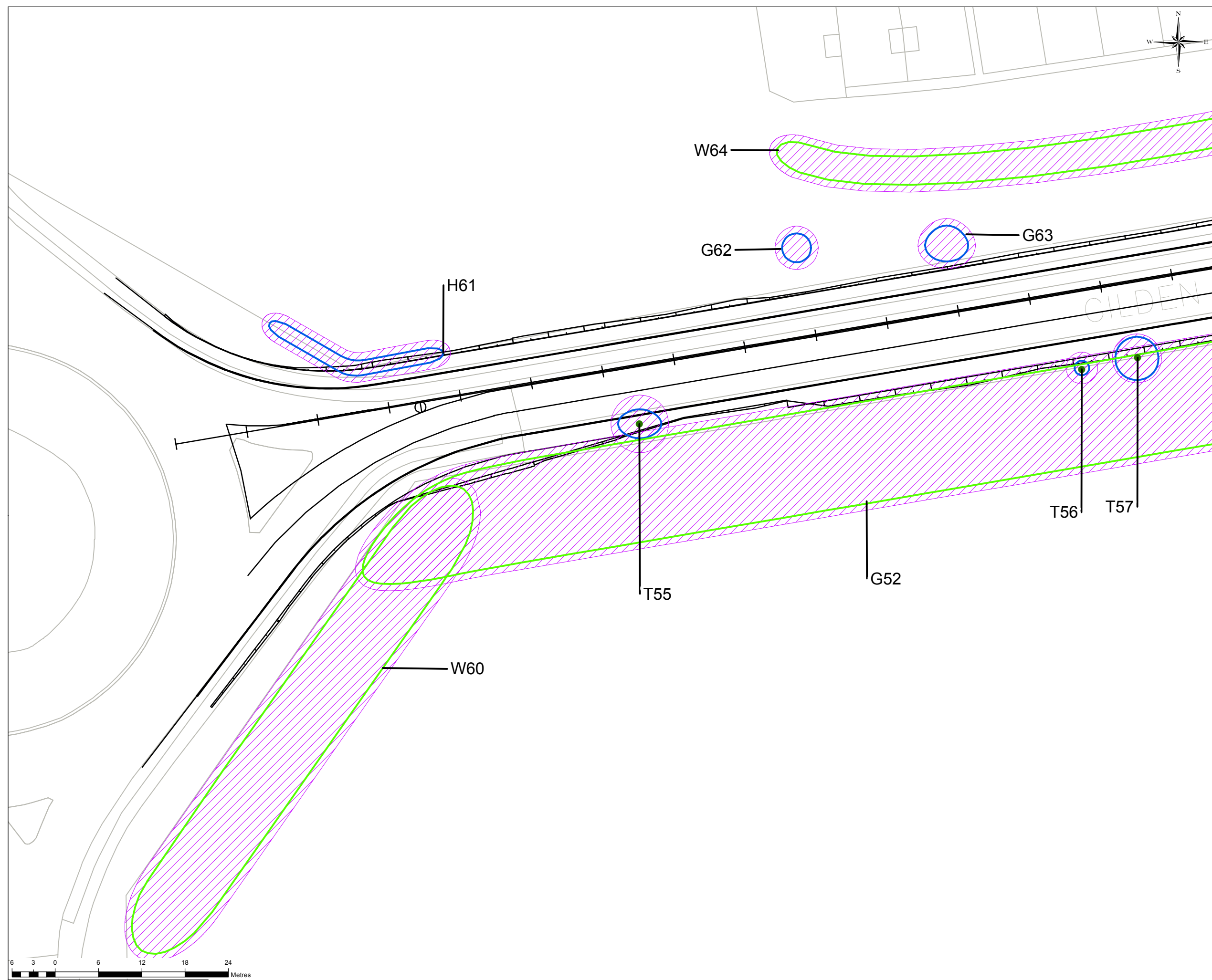


Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
G224	Sycamore, ash, blackthorn, elder	16	1070	-	-	6	6	6	6	0	EM	(S) Fair (P) Fair Group of 2 large mature oaks and younger trees along site boundary. Self-sown sycamore and ash on site side of fence encroaching on site. Unmanaged.	20+	C2	12.8 max
T225	Oak	18	1070	-	-	7	8	7	6	3	OM	(S) Fair (P) Fair Signs of decline with die back in upper crown and signs of retrenchment. Large limb removal to west near base. Moderate deadwood throughout. 2m to fence.	20+	C1/3	12.8
T226	Oak	18	850	-	-	6	7	5	5	5	OM	(S) Fair (P) Fair AsT225, with signs of decline and deadwood. Decay fungi remnants at base with woodpecker holes at 5m to west. Retrenching.	20+	C1/3	10.2
G227	Ash, sycamore, oak, field maple, Scots pine, viburnum, blackthorn	16	500	-	-	6	6	6	6	0	EM	(S) Good (P) Good Self-sown trees and group of blackthorn mostly off site. Several planted trees closer to road.	20+	C2	6.0 max

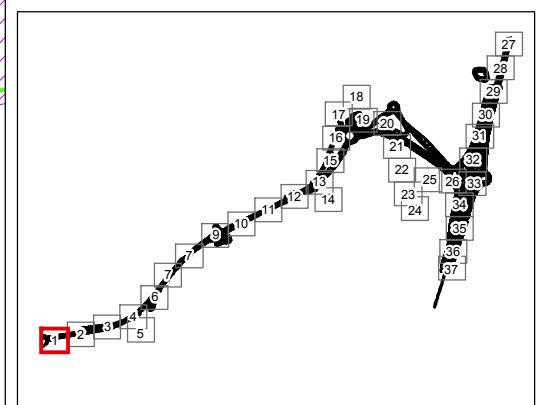
Tree ref No.	Species	Height (m)	Single Stem diameter (mm)	<=5 Stem diameter (mm)	>5 Stem combined diameter (mm)	N	E	S	W	Height of crown clearance (m)	Age class	General Observations (Structural (S) and Physiological (P) Conditions, Comments and Management Recommendations	Estimated remaining contribution (years)	Category grading	RPA radius (m)
G228	Hybrid black poplar, field maple, tree of Heaven	13	230	-	-	4	4	4	4	1	SM	(S) Fair (P) Fair Growing from concrete bays from the old nursery. Possibly grown for transplanting purposes and abandoned. Hard surfacing to south.	20+	C2	2.8 max
G229	Sycamore, tree of heaven, cypress spp.,	14	400	-	-	5	5	5	5	0	SM	(S) Good (P) Good Former lapsed garden of disused residence on site. Surrounded to the south by hard standing, good condition.	20+	B2/3	4.8 max

## APPENDIX D – Tree Constraints Plans





- Notes**
1. Do not scale
- Key**
- Group category A
  - Group category B
  - Group category C
  - Tree category A
  - Tree category B
  - Tree category C
  - Root protection area
  - Design Iteration 1 PCF Stage 3



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
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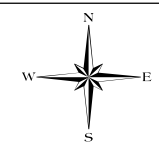
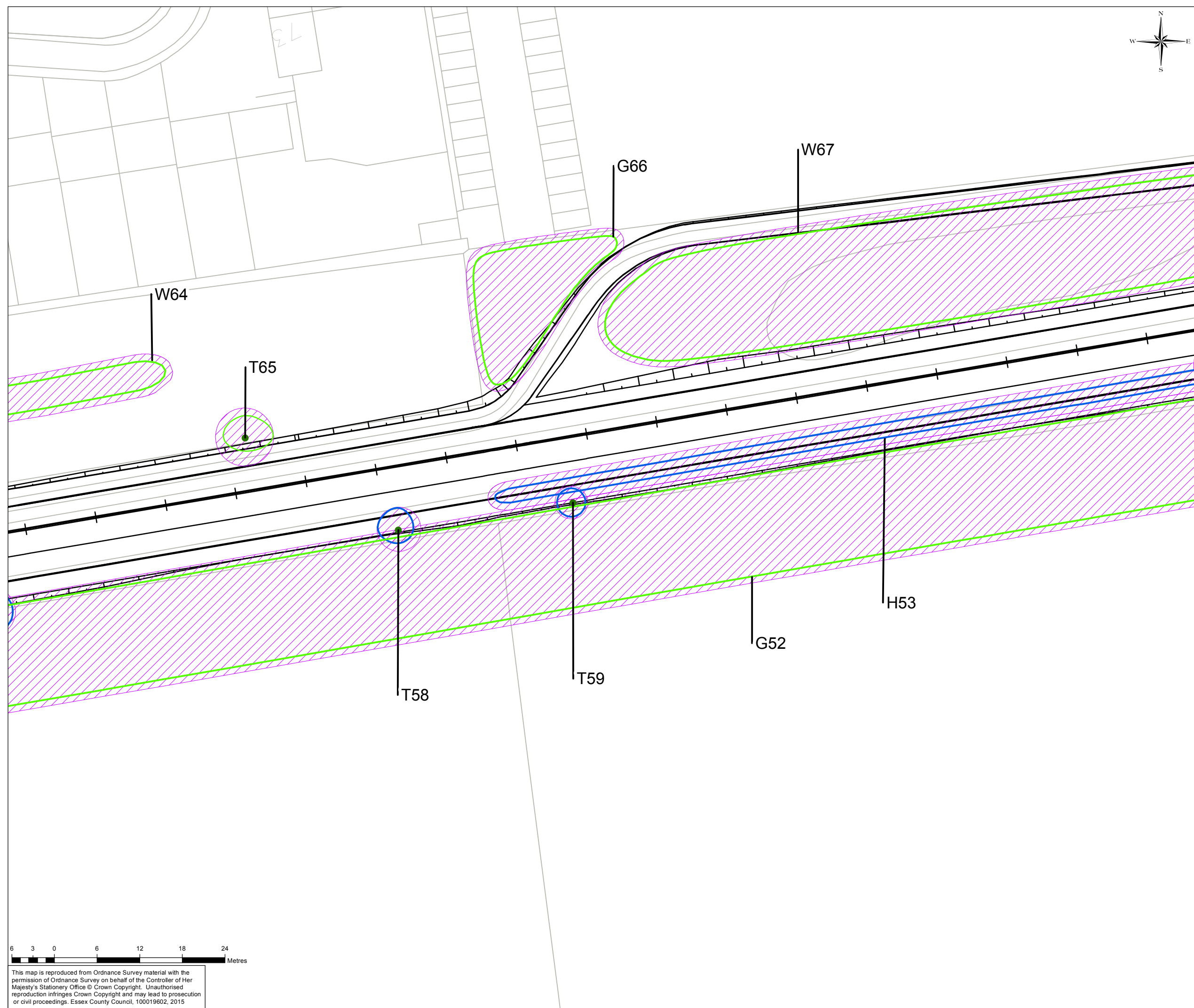
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EW	EW	PS	MW	SK
DATE	DATE	DATE	DATE	DATE
OCT16	OCT16	OCT16	OCT16	OCT16

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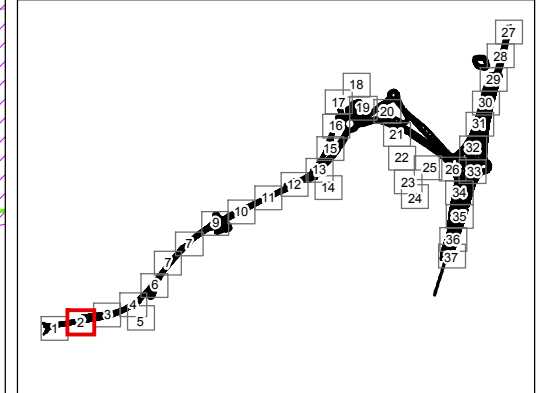


**Notes**

1. Do not scale

**Key**

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- Tree category B
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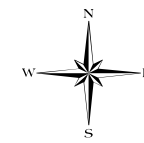
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Allotment Gardens

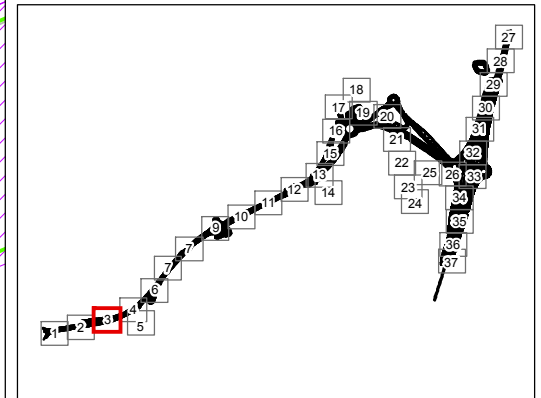
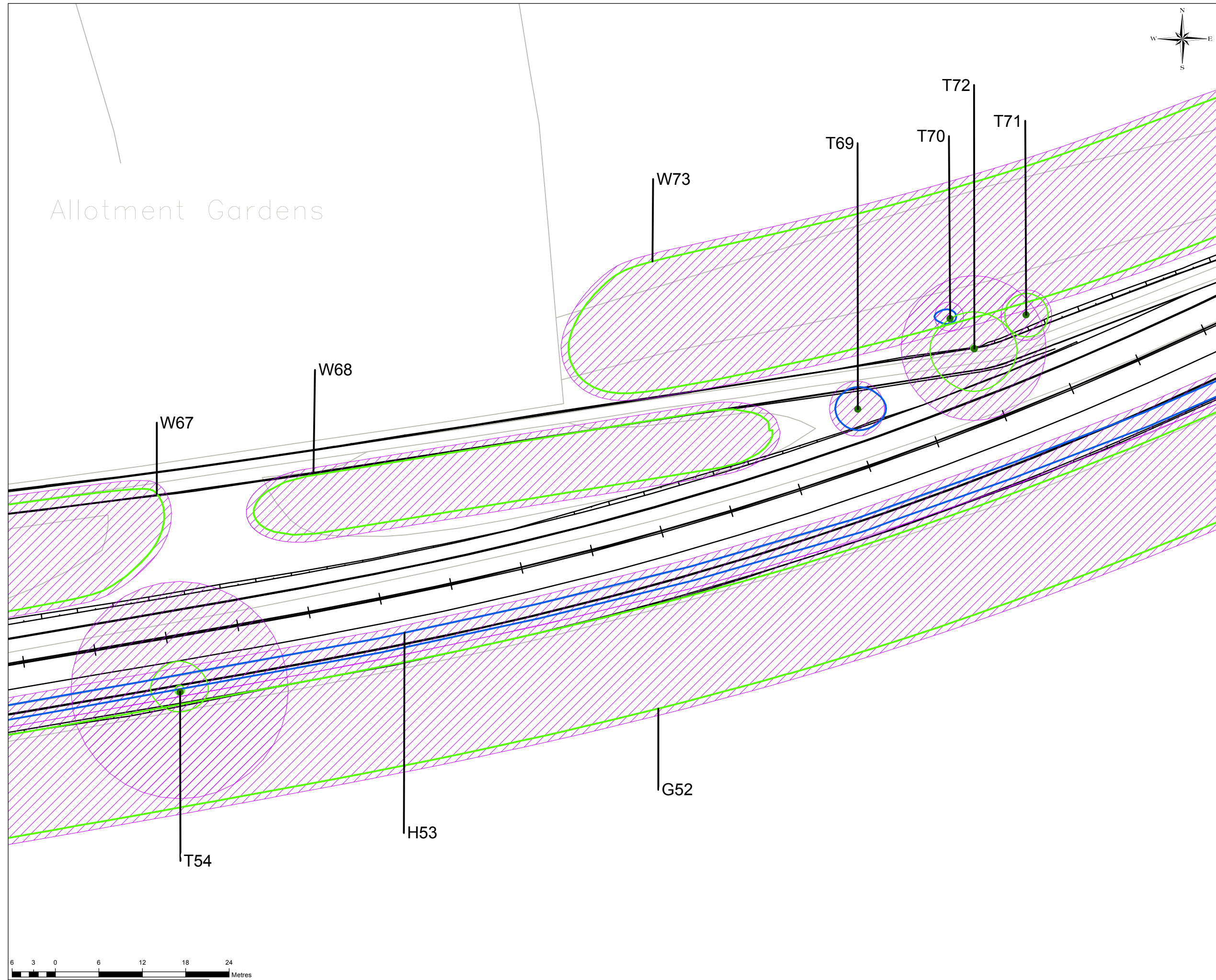


**Notes**

1. Do not scale

**Key**

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- Group category B
- Group category C
- Tree category A
- Tree category B
- Tree category C
- Root protection area
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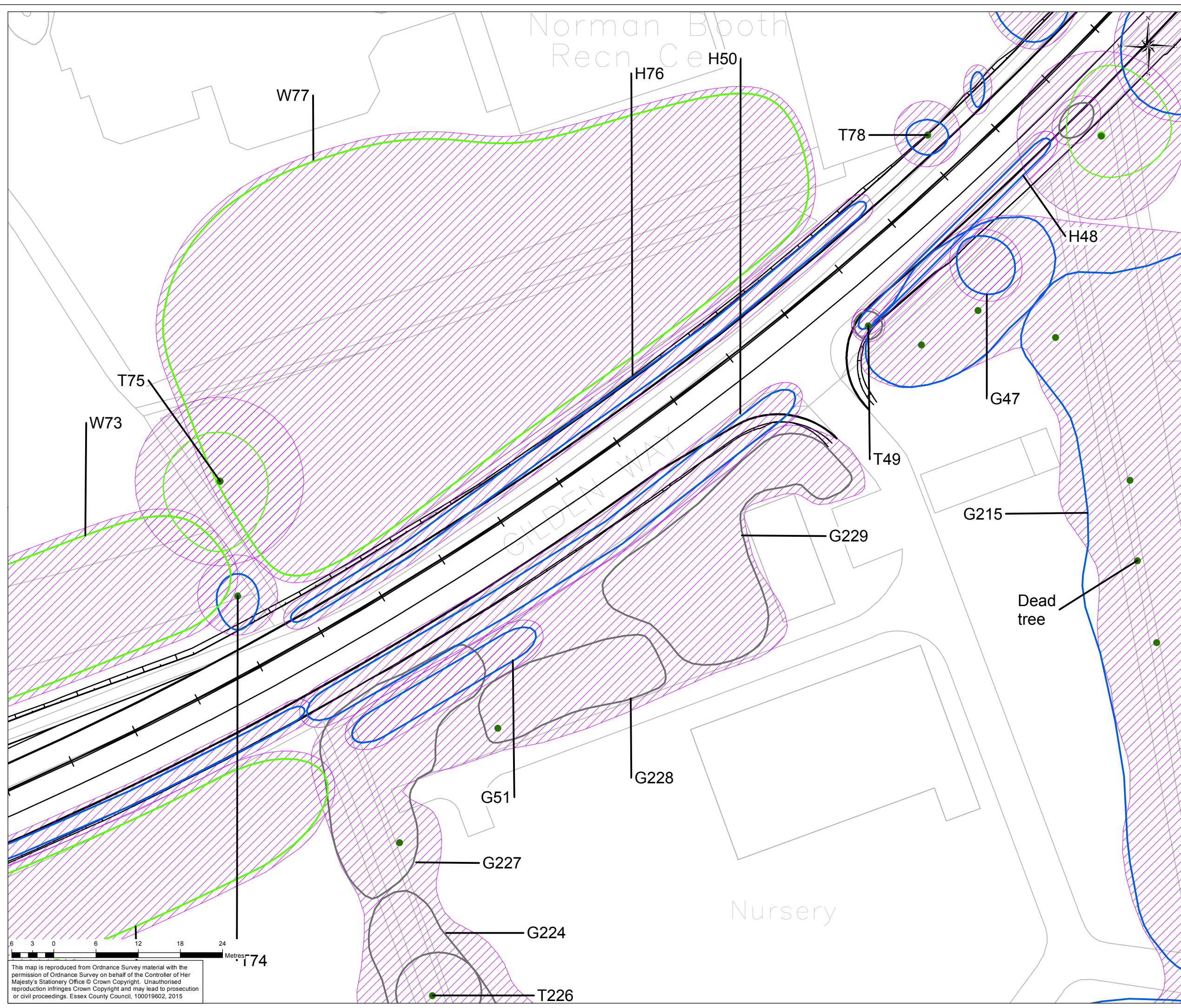
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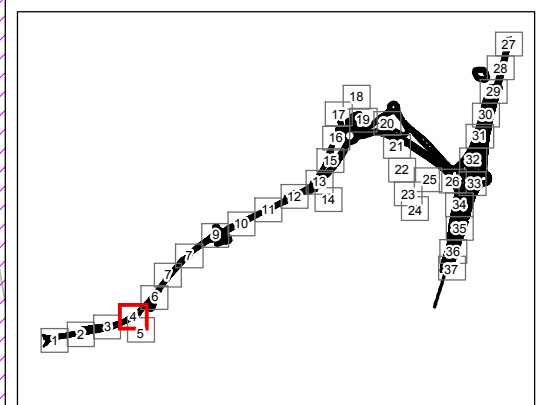
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- Notes**
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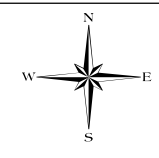
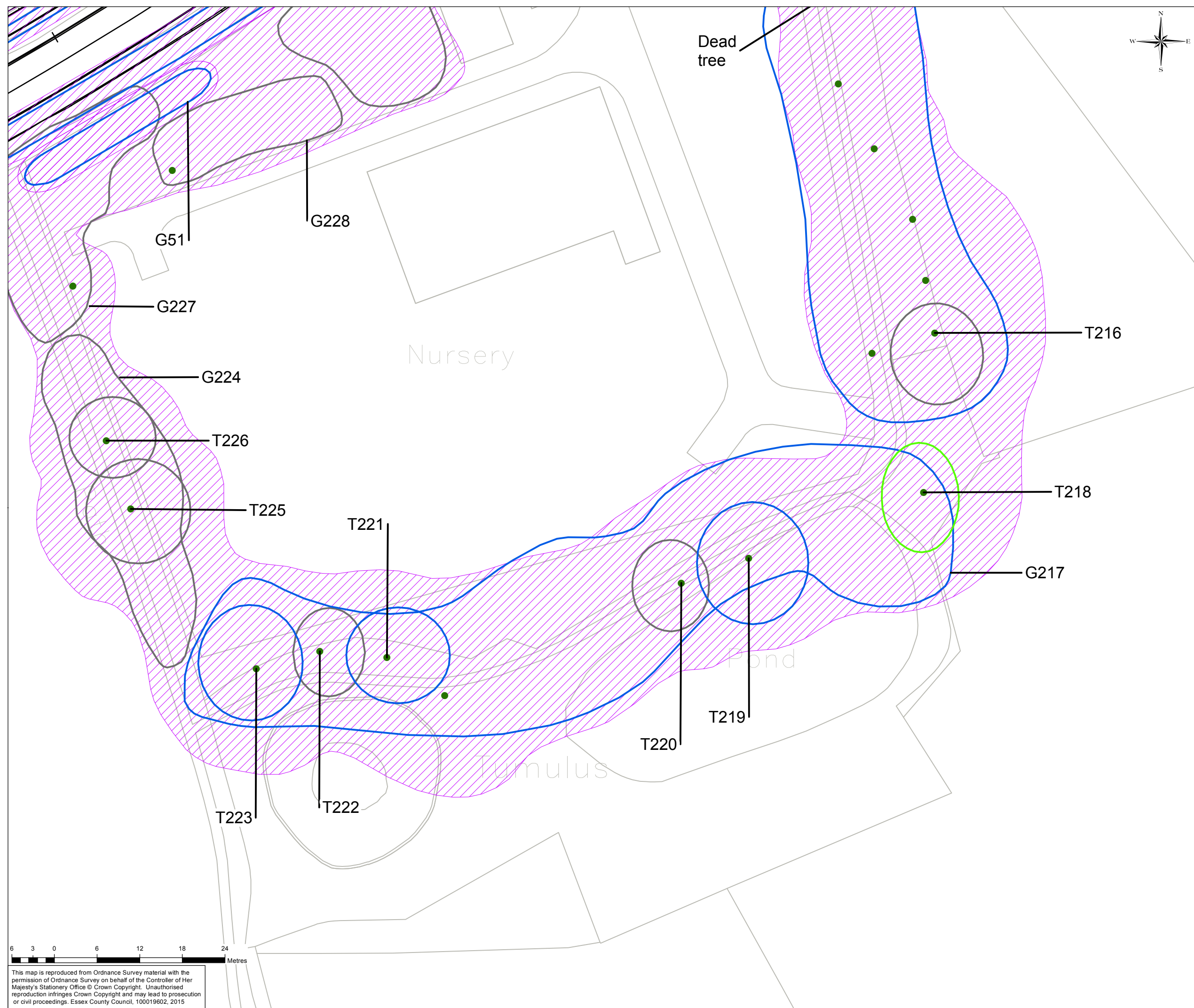
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DATE	DATE	DATE	DATE	DATE
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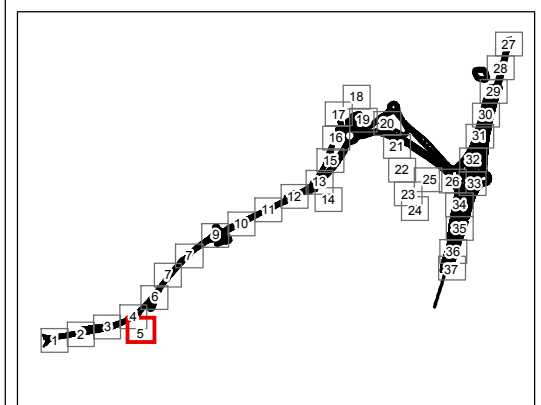


**Notes**

1. Do not scale

**Key**

- Group category A
- Group category B
- Group category C
- Tree category A
- Tree category B
- Tree category C
- Root protection area
- Design Iteration 1 PCF Stage 3



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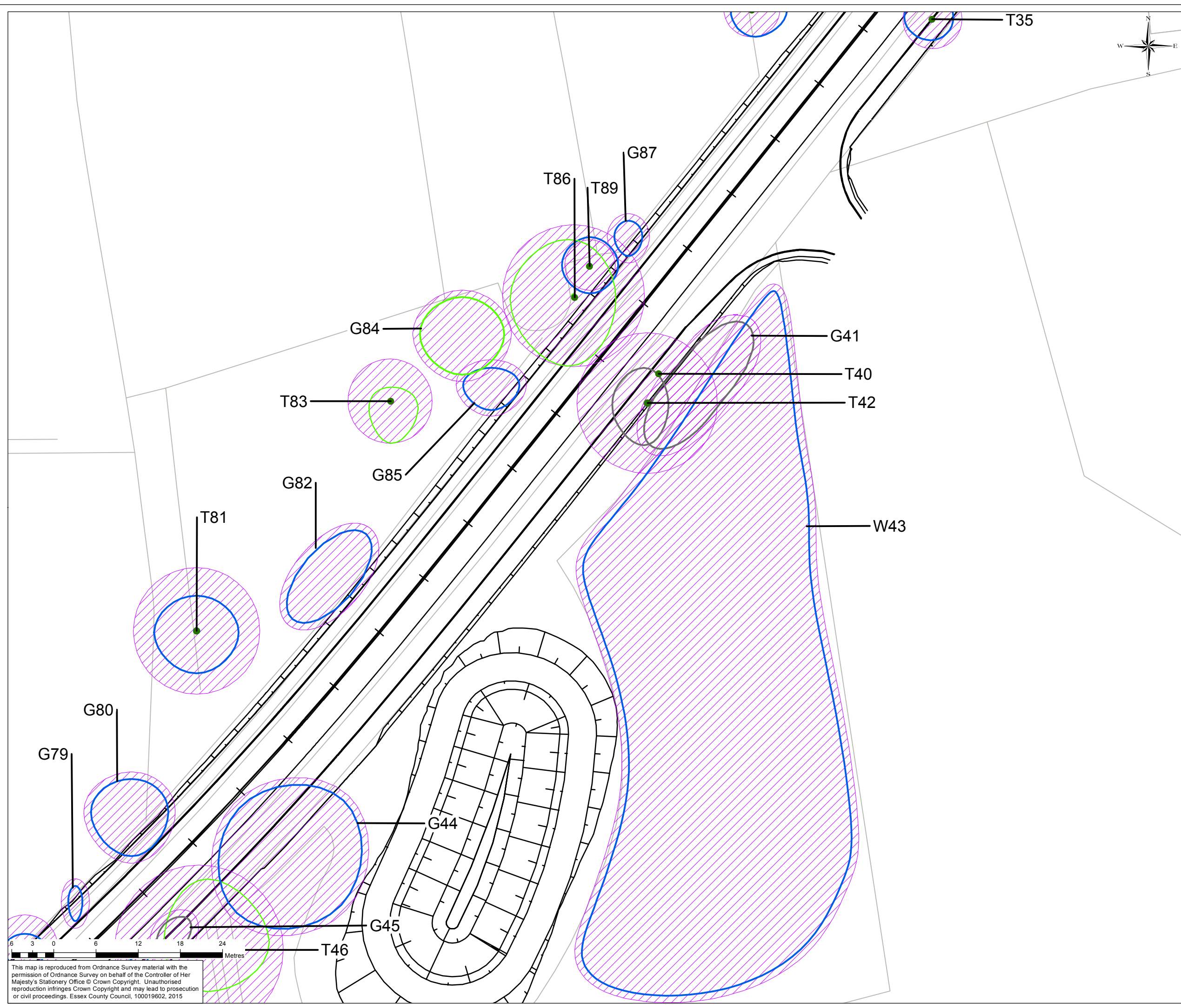
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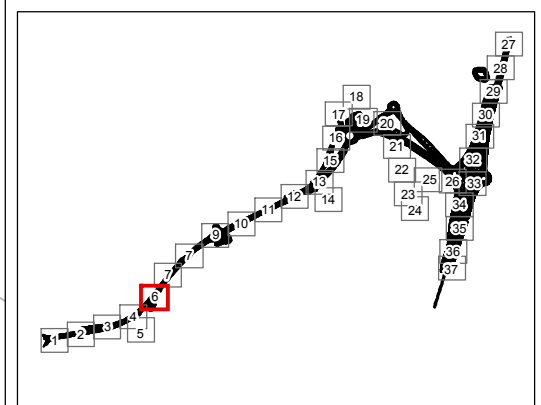
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  - Tree category B
  - Tree category C
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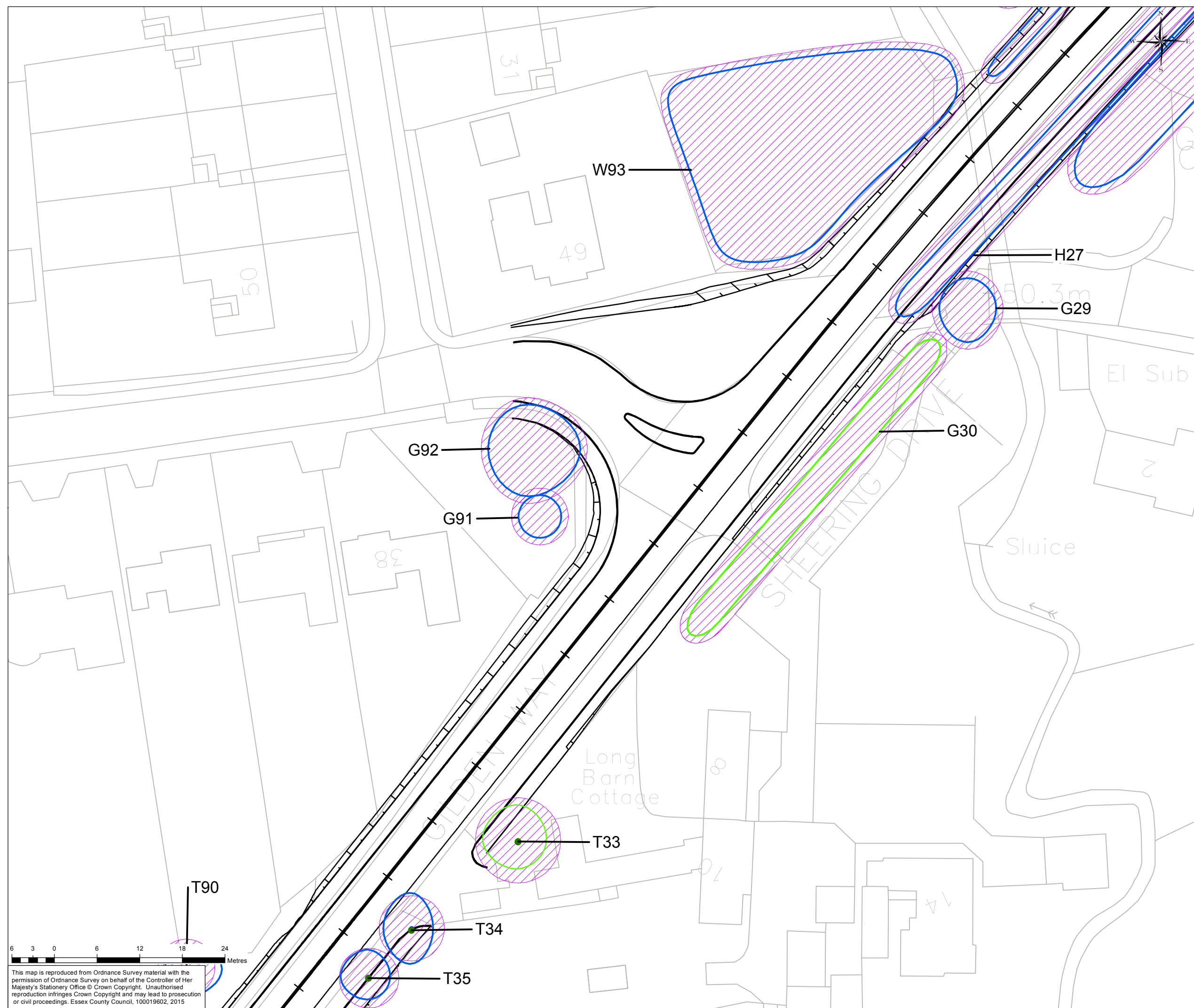
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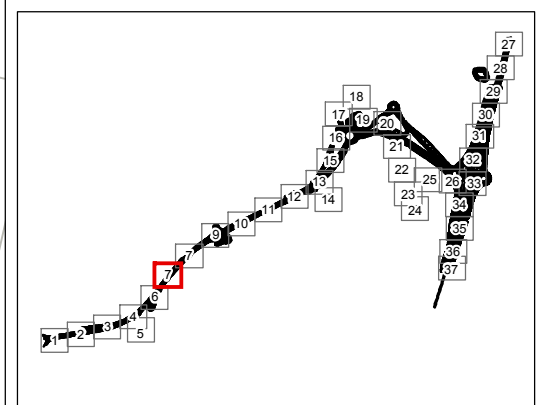
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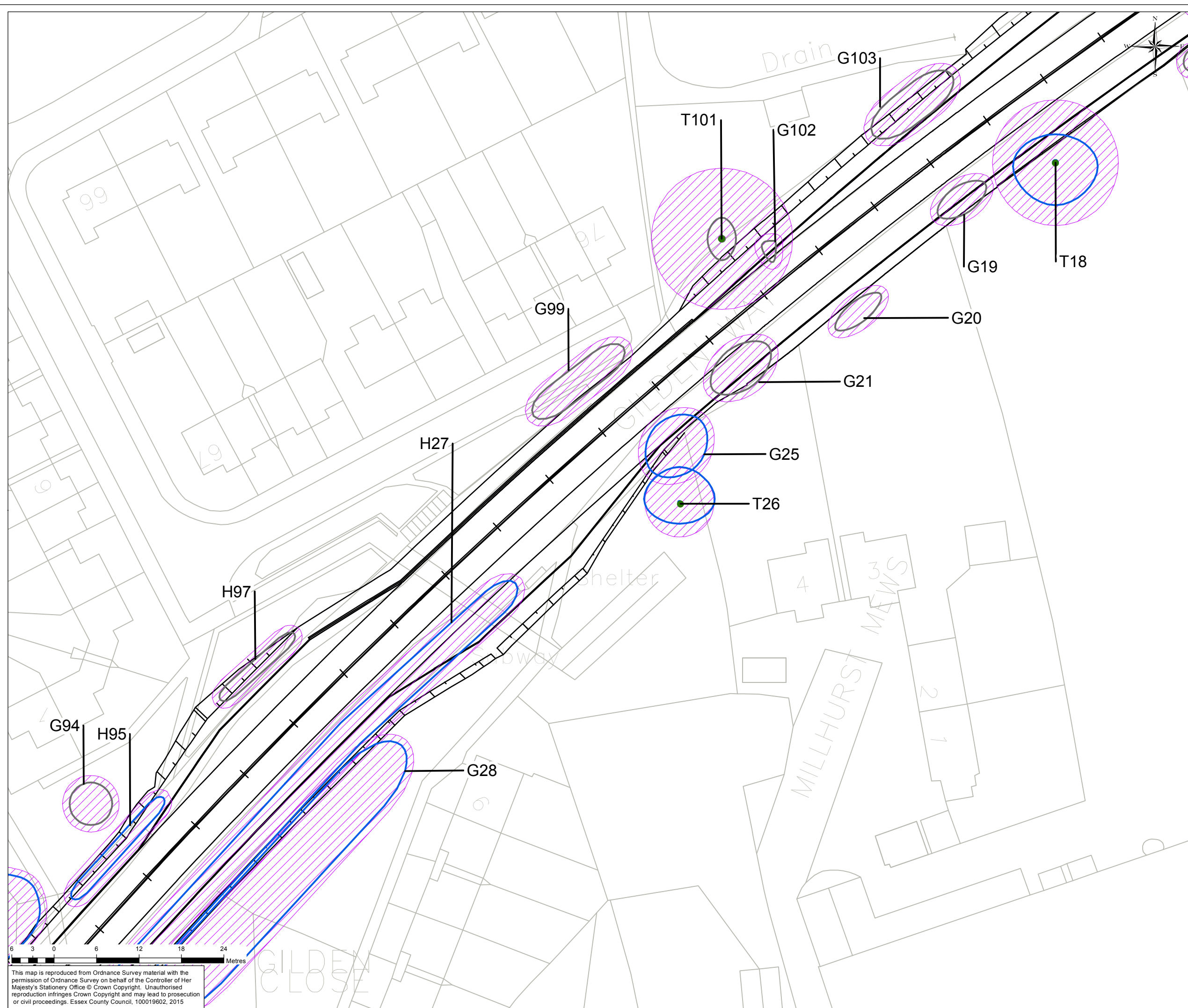
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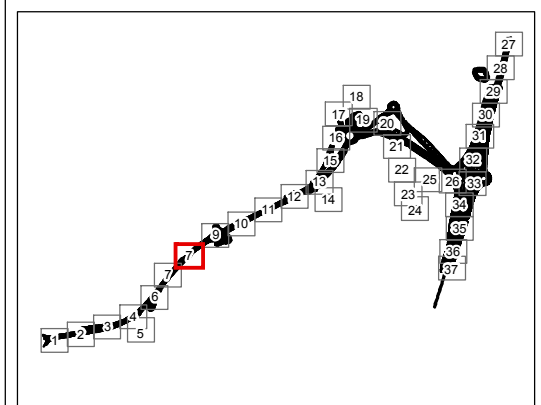
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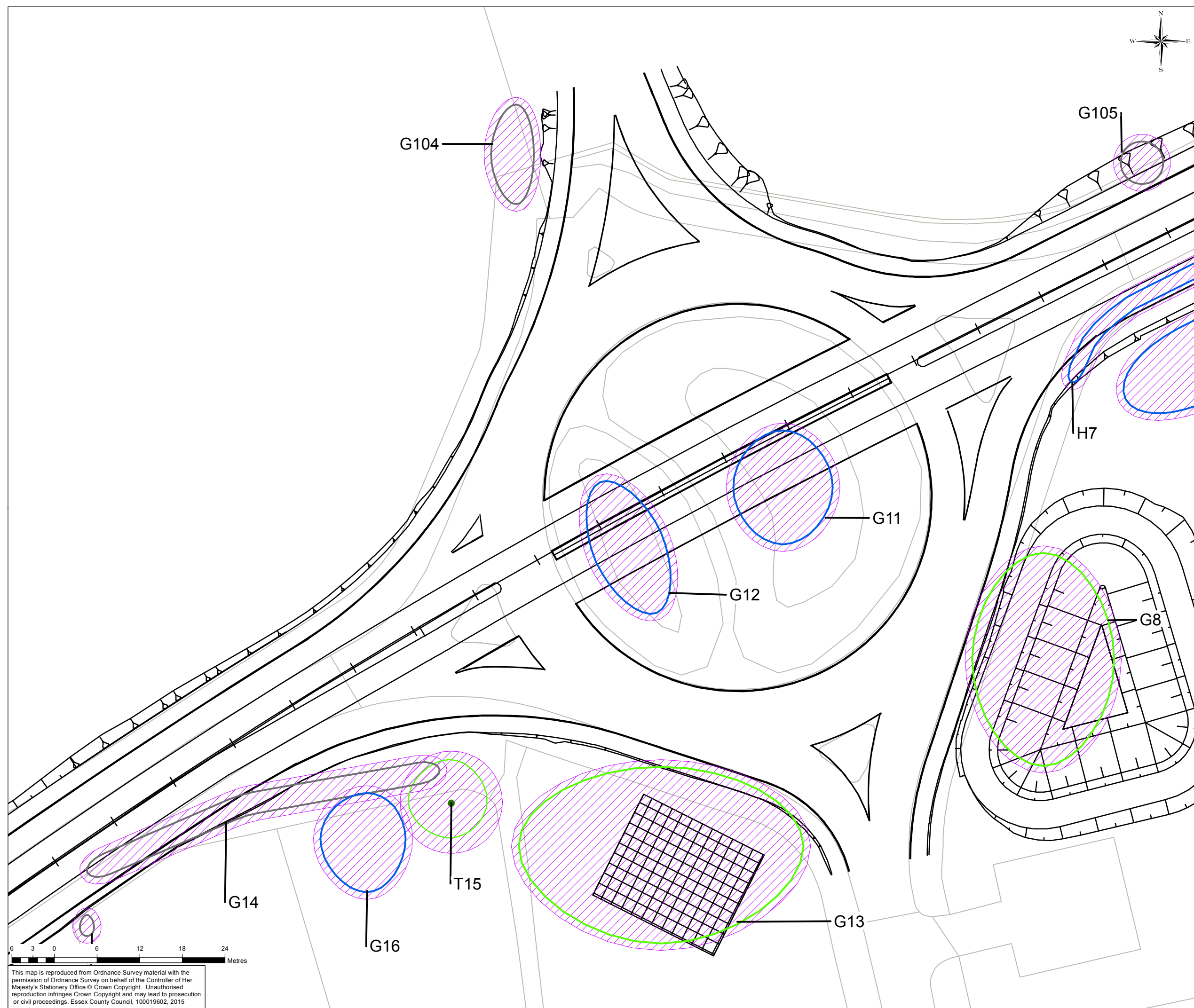
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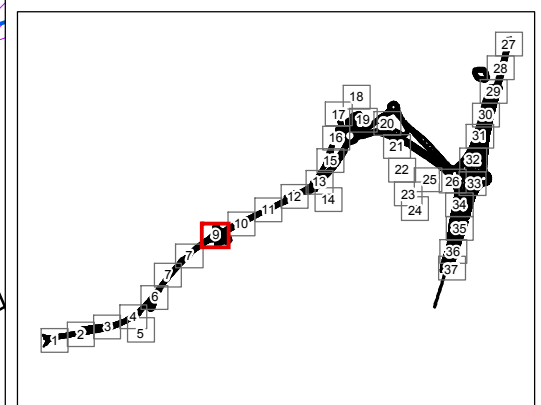
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- Notes**
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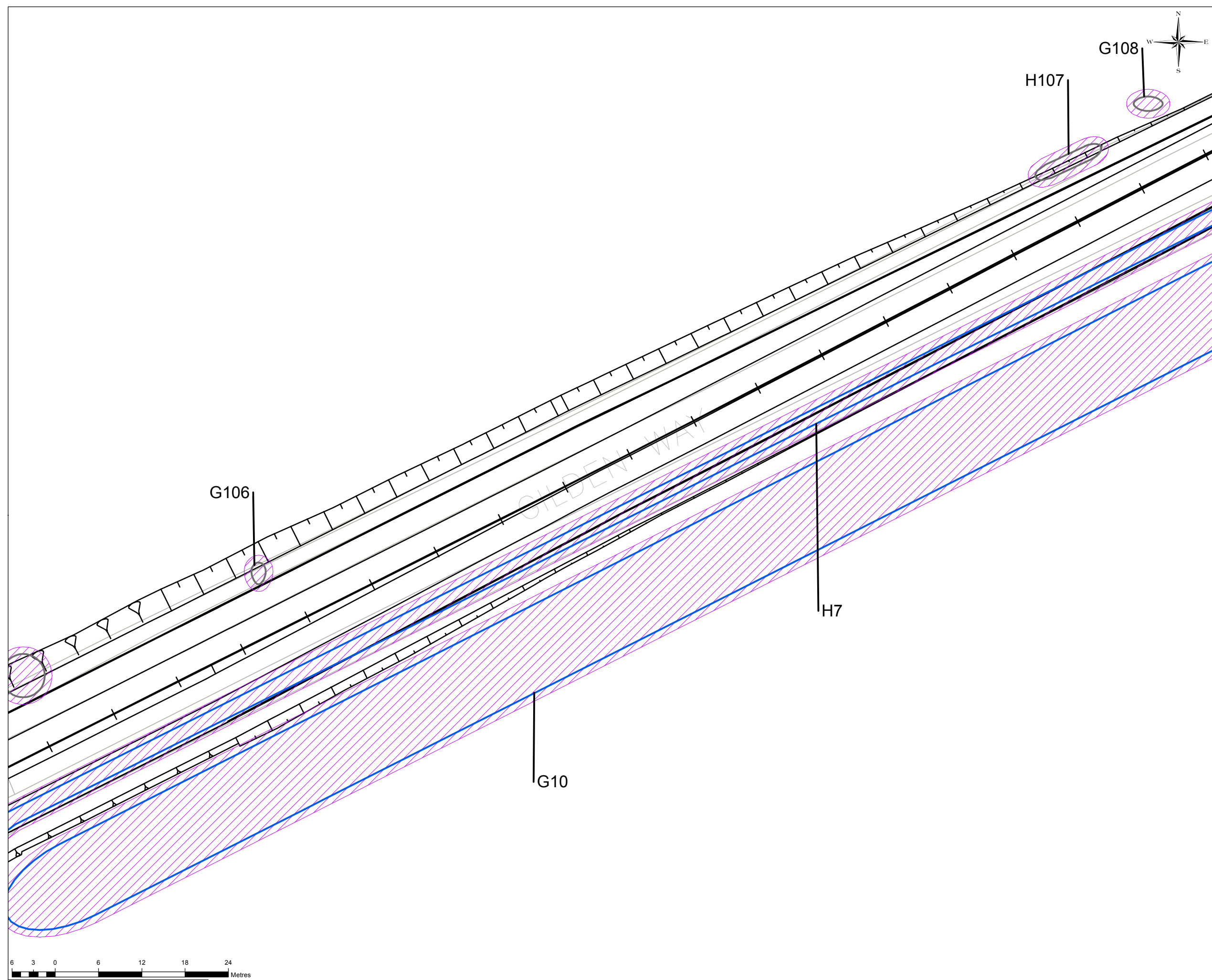
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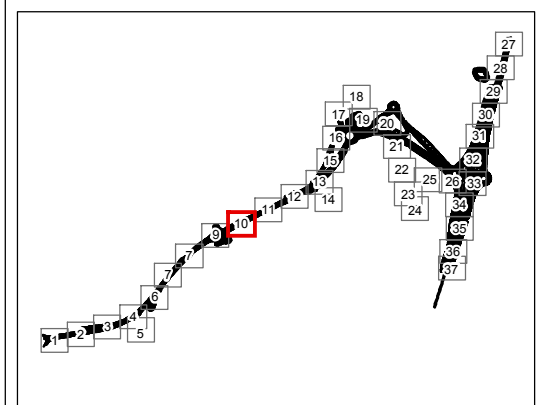
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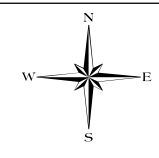
DRAWING UNITS U.N.O. SCALE AT A3 (420 x 297 mm) **1:500**

DRAWING NO. **B3553F05/LE/01** REV. **1**

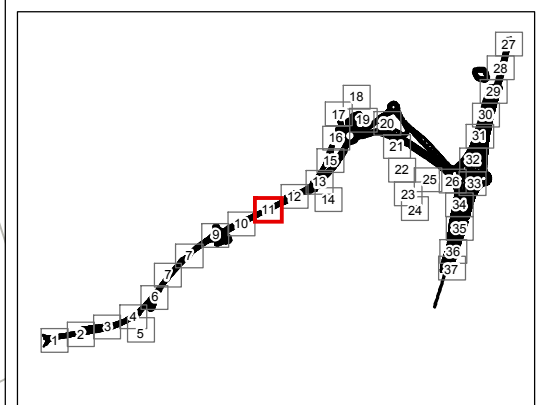
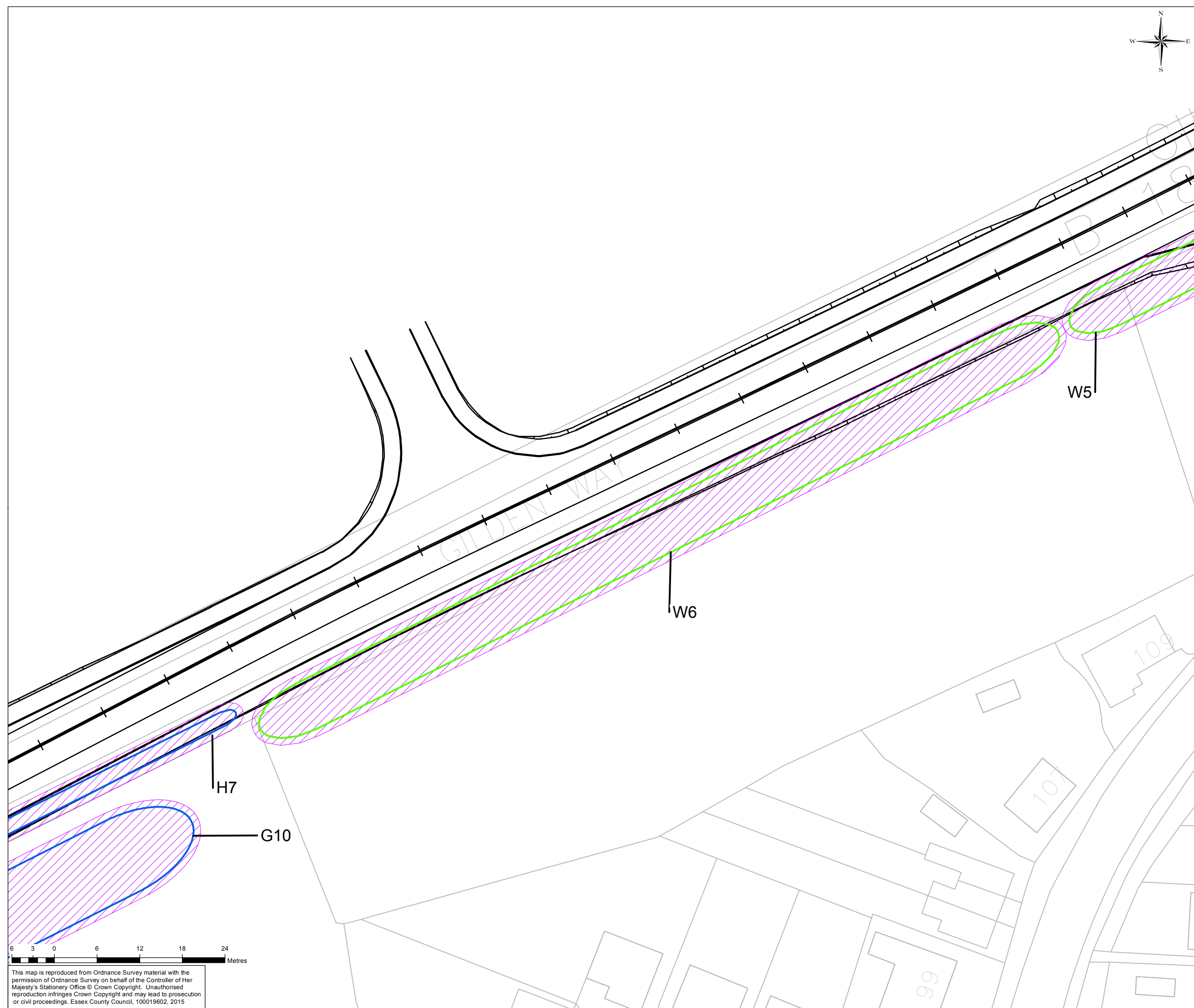


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Playing Field



- Notes**
- Do not scale
- Key**
- Group category A
  - Group category B
  - Group category C
  - Tree category A
  - Tree category B
  - Tree category C
  - ▨ Root protection area
  - Design Iteration 1 PCF Stage 3



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
1	19/10/2016	COMPLETE SURVEY	EW	PS	MW	PM
0	13/01/16	ORIGINAL ISSUE	CN	SF	AR	PM

Drawing Status: **DRAFT**



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Scheme Title: **M11 JUNCTION 7A**

Drawing Title: **TREE CONSTRAINTS PLAN SHEET 11 OF 37**

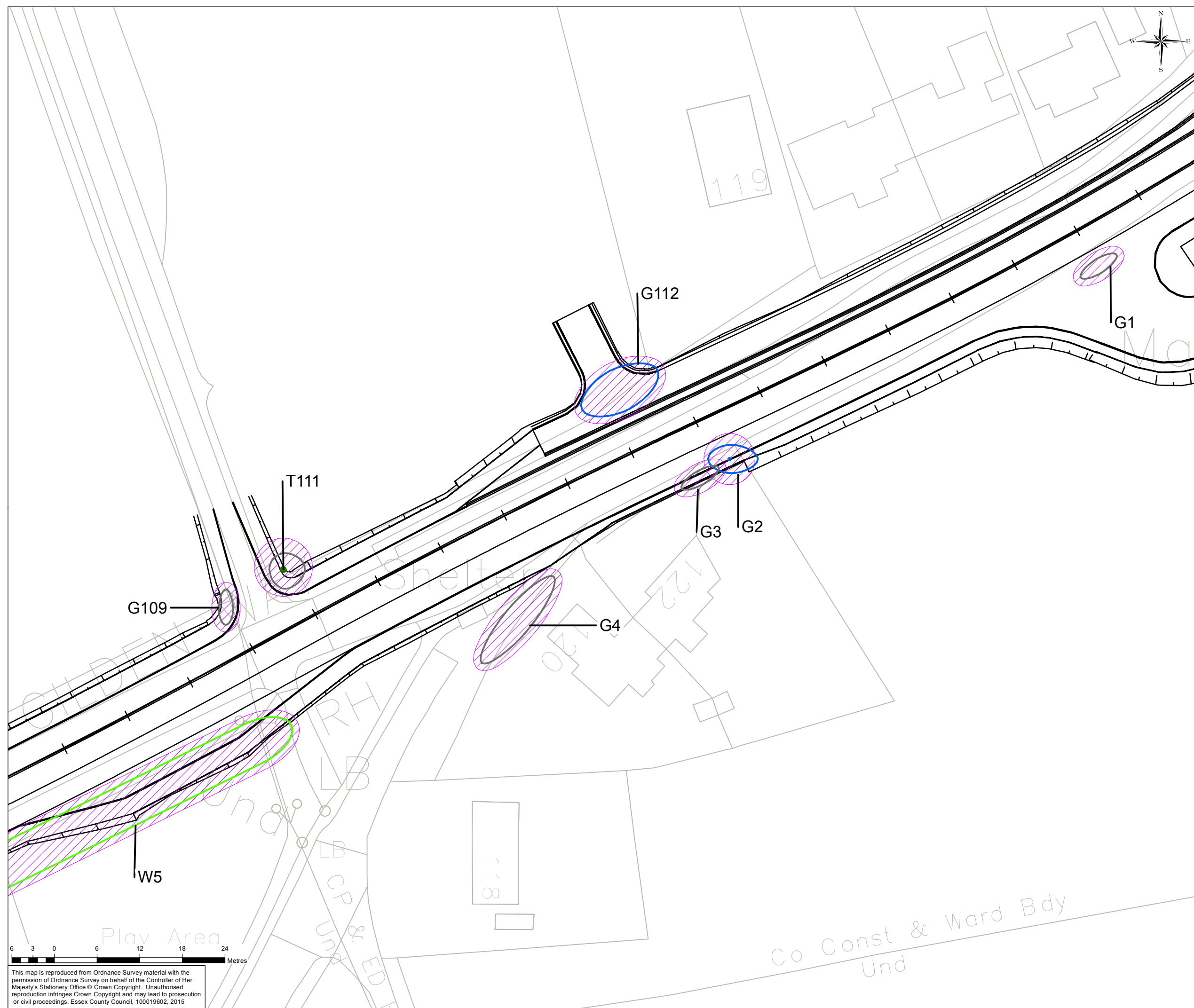
DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
EW	EW	PS	MW	SK
DATE	DATE	DATE	DATE	DATE
OCT16	OCT16	OCT16	OCT16	OCT16

DRAWING UNITS U.N.O. SCALE AT A3 (420 x 297 mm)  
**1:500**

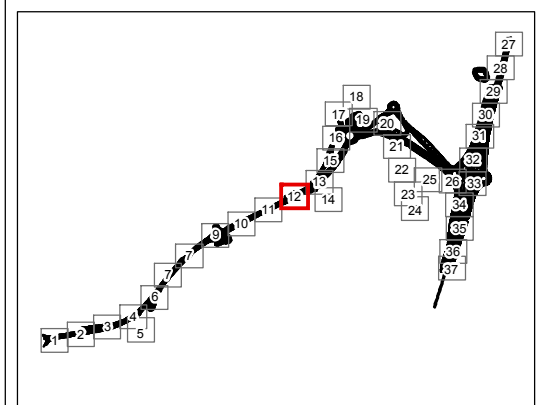
DRAWING NO. **B3553F05/LE/01** REV. **1**

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- Notes**
1. Do not scale
- Key**
- Group category A
  - Group category B
  - Group category C
  - Tree category A
  - Tree category B
  - Tree category C
  - Root protection area
  - Design Iteration 1 PCF Stage 3



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
1	19/10/2016	COMPLETE SURVEY	EW	PS	MW	PM
0	13/01/16	ORIGINAL ISSUE	CN	SF	AR	PM

Drawing Status: **DRAFT**



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Scheme Title: **M11 JUNCTION 7A**

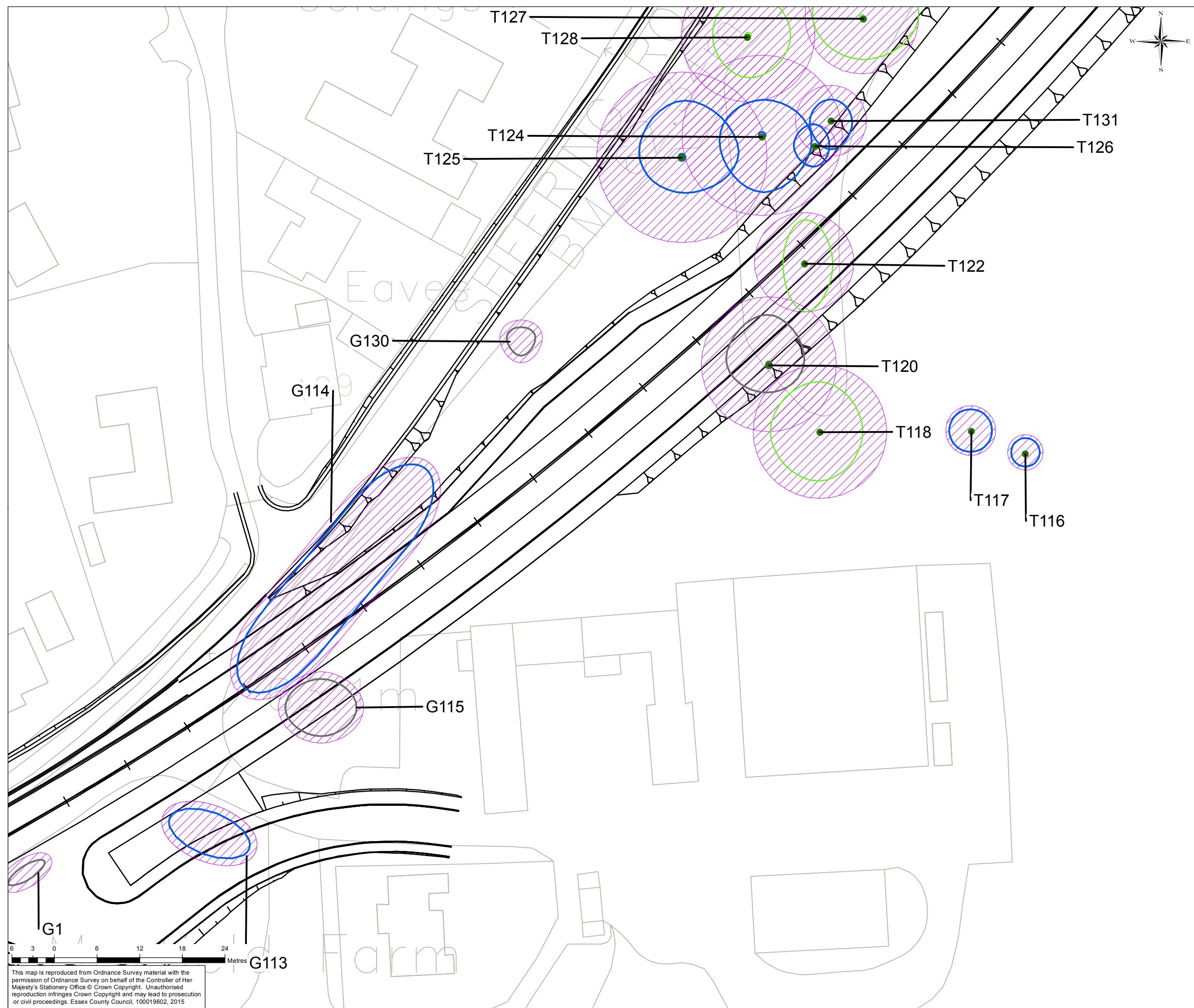
Drawing Title: **TREE CONSTRAINTS PLAN SHEET 12 OF 37**

DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
EW	EW	PS	MW	SK
DATE	DATE	DATE	DATE	DATE
OCT16	OCT16	OCT16	OCT16	OCT16

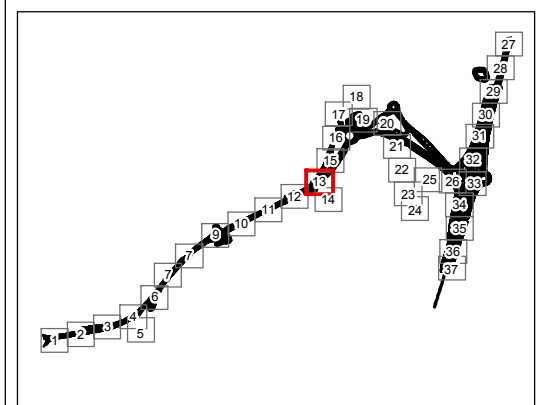
DRAWING UNITS U.N.O. SCALE AT A3 (420 x 297 mm)  
**1:500**

DRAWING NO. **B3553F05/LE/01** REV. **1**

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- Notes**
1. Do not scale
- Key**
- Group category A
  - Group category B
  - Group category C
  - Tree category A
  - Tree category B
  - Tree category C
  - Root protection area
  - Design Iteration 1 PCF Stage 3



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
1	19/10/2016	COMPLETE SURVEY	EW	PS	MW	PM
0	13/01/16	ORIGINAL ISSUE	CN	SF	AR	PM

Drawing Status: **DRAFT**



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Scheme Title: **M11 JUNCTION 7A**

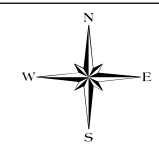
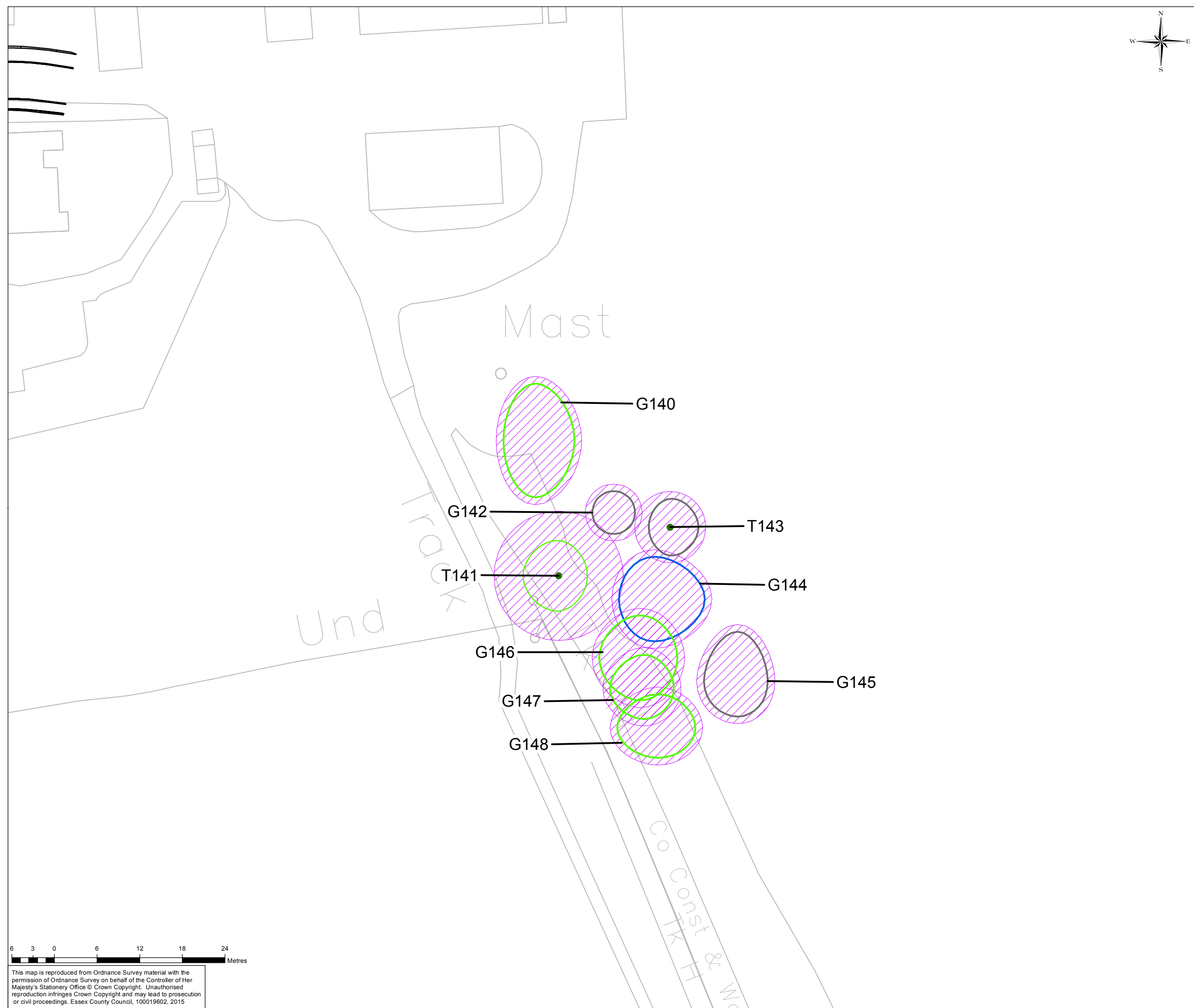
Drawing Title: **TREE CONSTRAINTS PLAN SHEET 13 OF 37**

DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
EW	EW	PS	MW	SK
DATE	DATE	DATE	DATE	DATE
OCT16	OCT16	OCT16	OCT16	OCT16

DRAWING UNITS U.N.O. SCALE AT A3 (420 x 297 mm) **1:500**

DRAWING NO. **B3553F05/LE/01** REV. **1**

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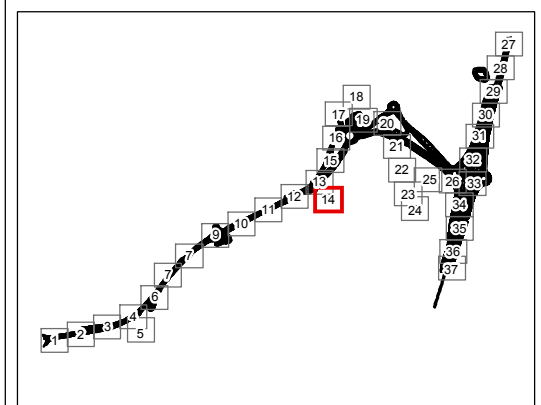


**Notes**

1. Do not scale

**Key**

- Group category A
- Group category B
- Group category C
- Tree category A
- Tree category B
- Tree category C
- Root protection area
- Design Iteration 1 PCF Stage 3



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
1	19/10/2016	COMPLETE SURVEY	EW	PS	MW	PM
0	13/01/16	ORIGINAL ISSUE	CN	SF	AR	PM

Drawing Status: **DRAFT**



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Drawing Title: **TREE CONSTRAINTS PLAN SHEET 14 OF 37**

DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
EW	EW	PS	MW	SK
DATE	DATE	DATE	DATE	DATE
OCT16	OCT16	OCT16	OCT16	OCT16

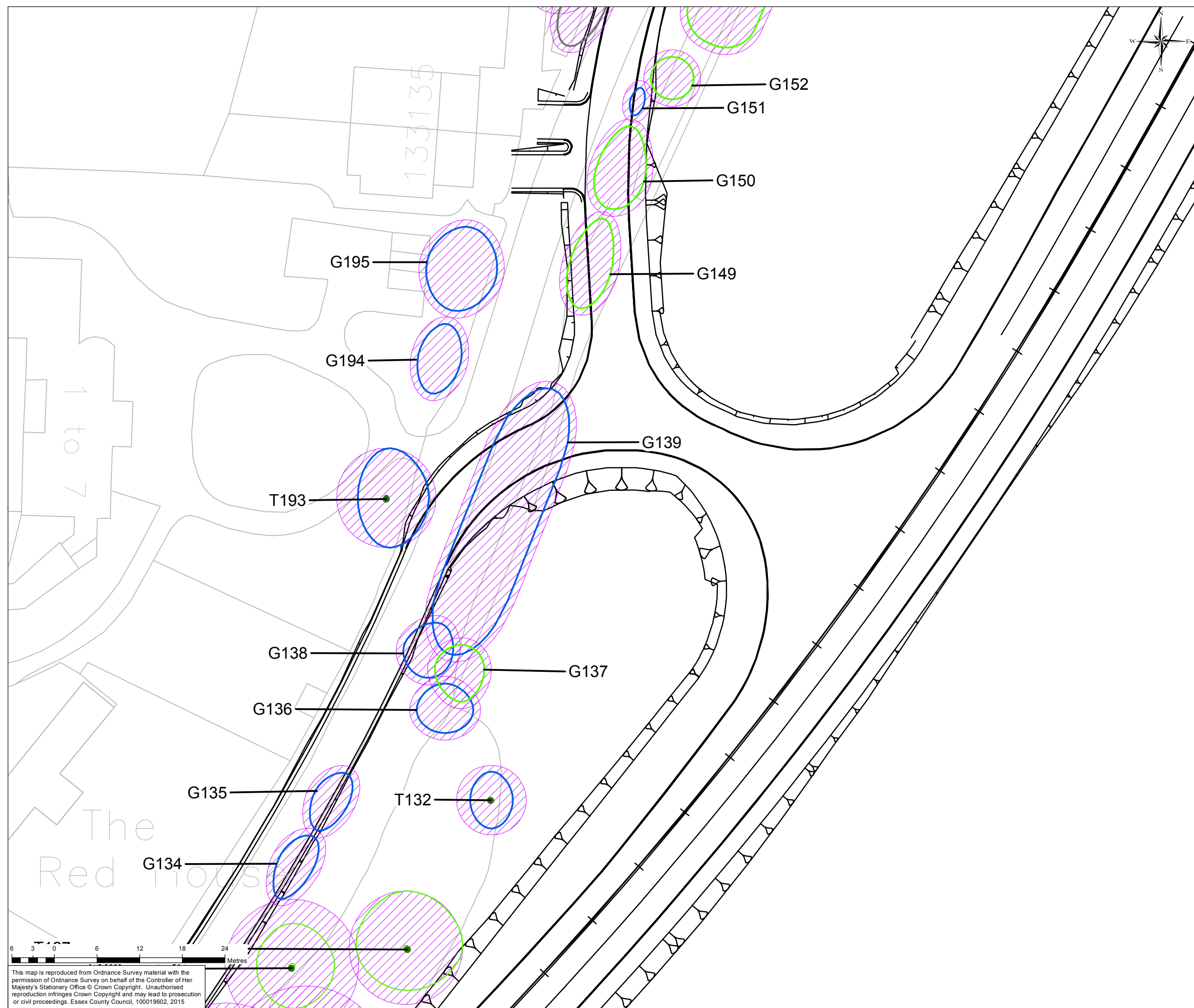
DRAWING UNITS U.N.O. SCALE AT A3 (420 x 297 mm) 1:500

DRAWING NO. **B3553F05/LE/01** REV. **1**



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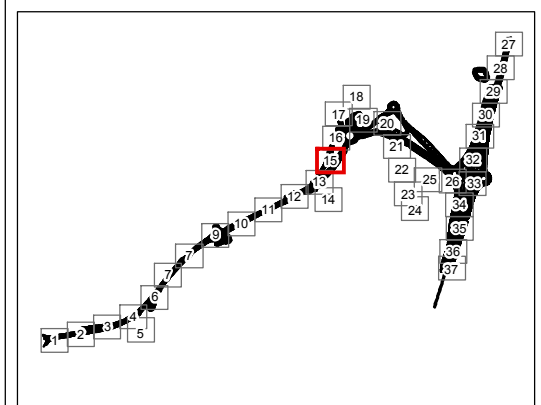


Notes

1. Do not scale

Key

- Group category A
- Group category B
- Group category C
- Tree category A
- Tree category B
- Tree category C
- Root protection area
- Design Iteration 1 PCF Stage 3



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
1	19/10/2016	COMPLETE SURVEY	EW	PS	MW	PM
0	13/01/16	ORIGINAL ISSUE	CN	SF	AR	PM

Drawing Status: **DRAFT**



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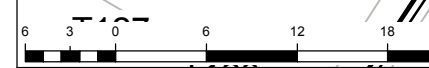
Scheme Title: **M11 JUNCTION 7A**

Drawing Title: **TREE CONSTRAINTS PLAN SHEET 15 OF 37**

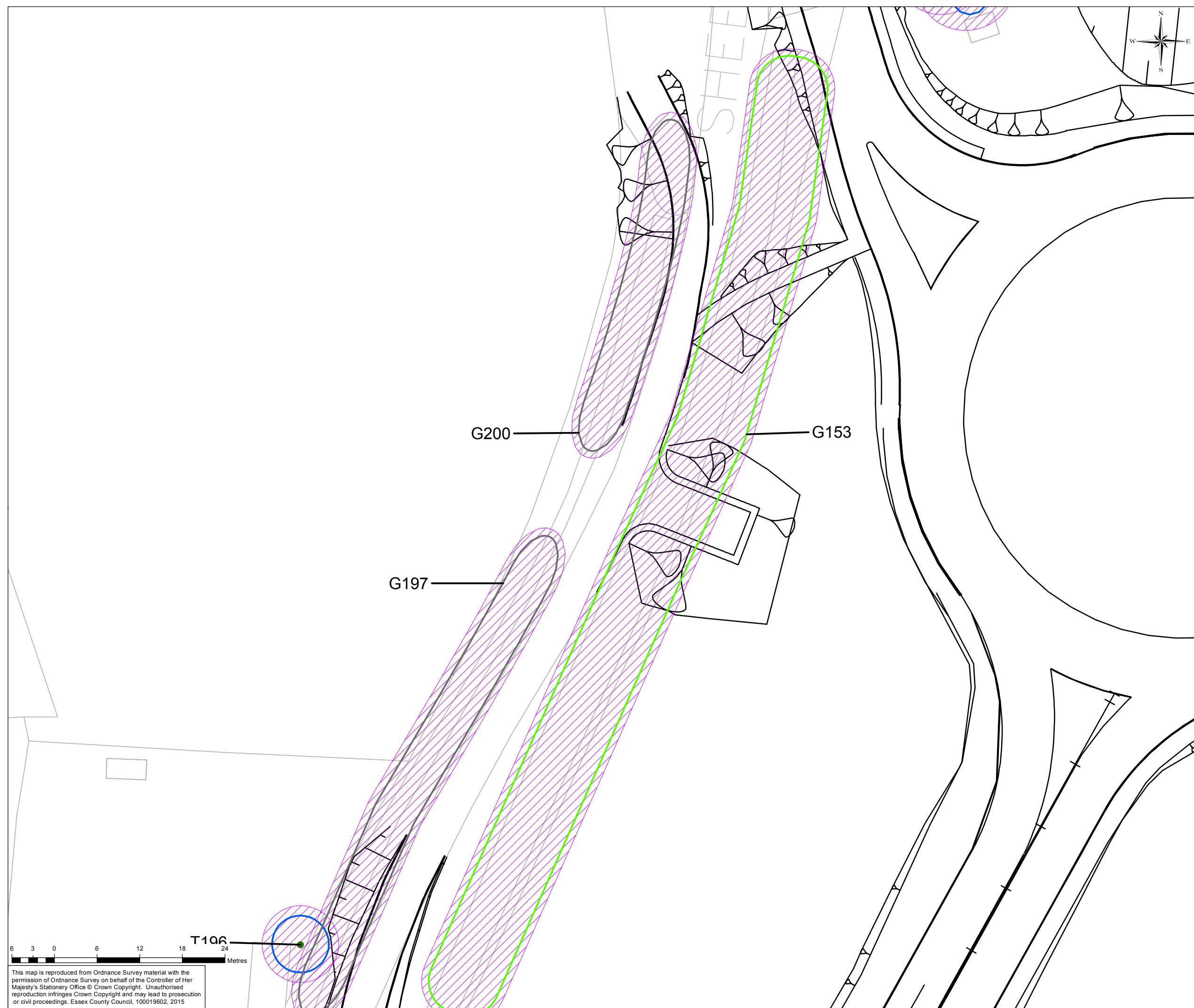
DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
EW	EW	PS	MW	SK
DATE	DATE	DATE	DATE	DATE
OCT16	OCT16	OCT16	OCT16	OCT16

DRAWING UNITS U.N.O. SCALE AT A3 (420 x 297 mm) **1:500**

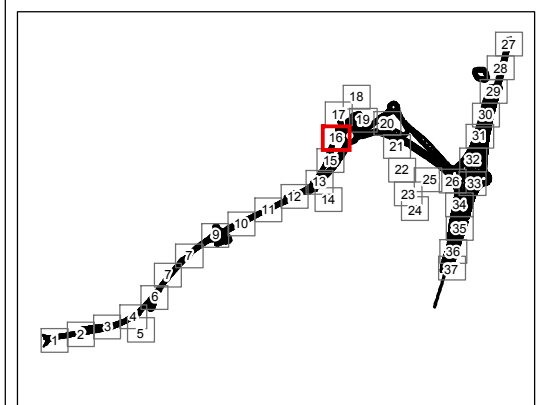
DRAWING NO. **B3553F05/LE/01** REV. **1**



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- Notes**
1. Do not scale
- Key**
- Group category A
  - Group category B
  - Group category C
  - Tree category A
  - Tree category B
  - Tree category C
  - / Root protection area
  - Design Iteration 1 PCF Stage 3



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
1	19/10/2016	COMPLETE SURVEY	EW	PS	MW	PM
0	13/01/16	ORIGINAL ISSUE	CN	SF	AR	PM

Drawing Status: **DRAFT**



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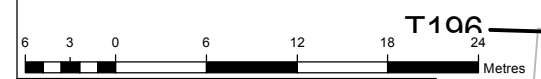
Scheme Title: **M11 JUNCTION 7A**

Drawing Title: **TREE CONSTRAINTS PLAN SHEET 16 OF 37**

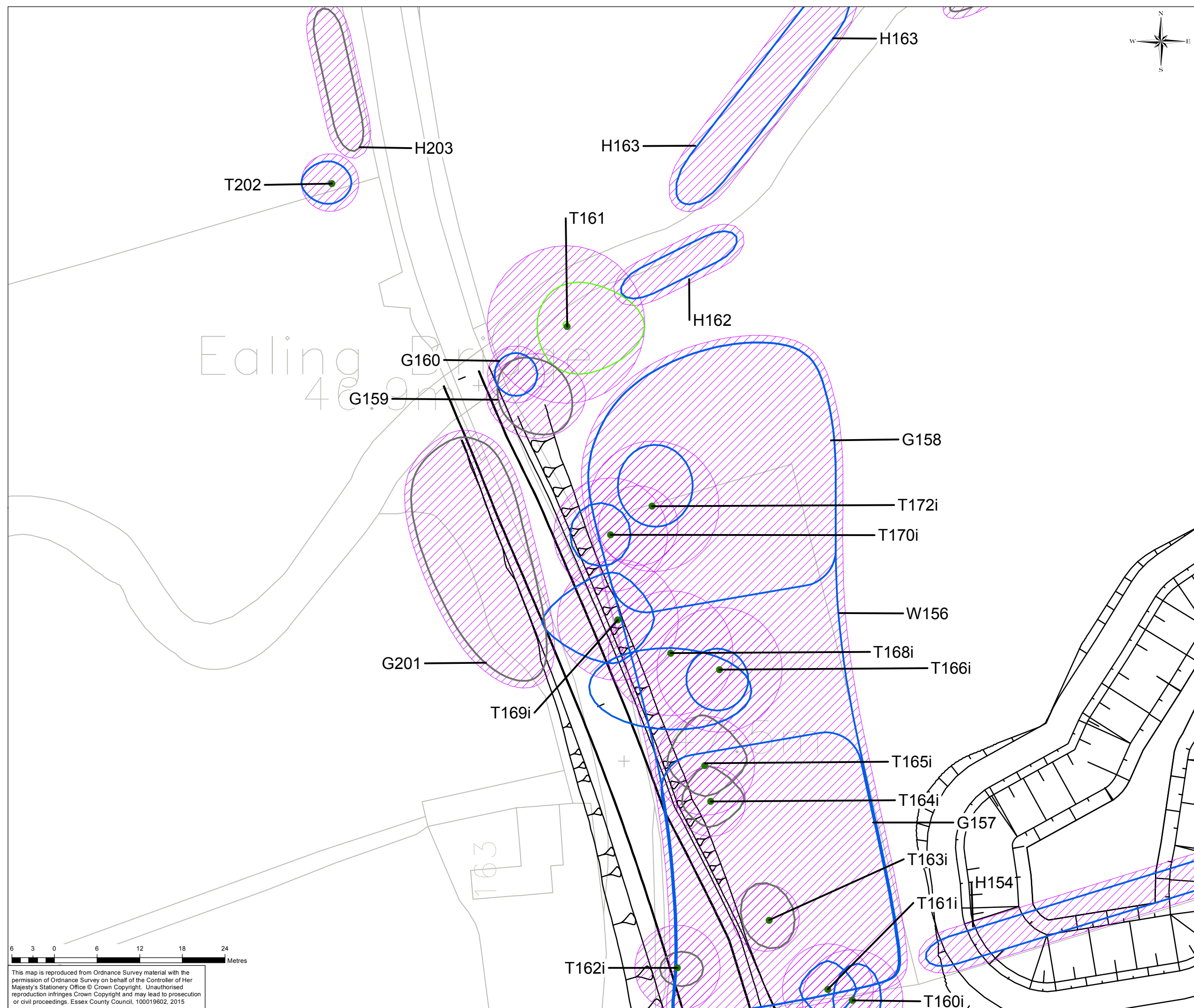
DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
EW	EW	PS	MW	SK
DATE	DATE	DATE	DATE	DATE
OCT16	OCT16	OCT16	OCT16	OCT16

DRAWING UNITS U.N.O. SCALE AT A3 (420 x 297 mm) **1:500**

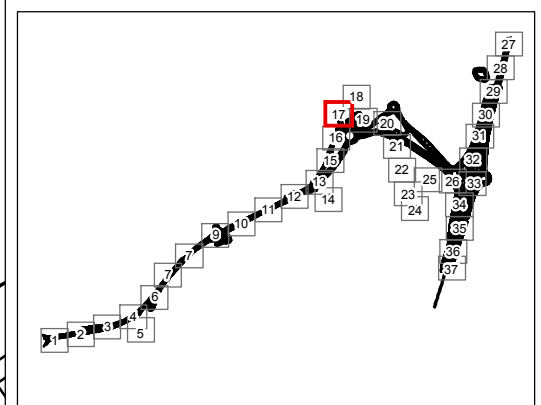
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- Notes**
1. Do not scale
- Key**
- Group category A
  - Group category B
  - Group category C
  - Tree category A
  - Tree category B
  - Tree category C
  - ▨ Root protection area
  - Design Iteration 1 PCF Stage 3



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
1	19/10/2016	COMPLETE SURVEY	EW	PS	MW	PM
0	13/01/16	ORIGINAL ISSUE	CN	SF	AR	PM

Drawing Status: **DRAFT**



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Scheme Title: **M11 JUNCTION 7A**

Drawing Title: **TREE CONSTRAINTS PLAN SHEET 17 OF 37**

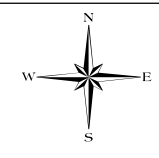
DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
EW	EW	PS	MW	SK
DATE	DATE	DATE	DATE	DATE
OCT16	OCT16	OCT16	OCT16	OCT16

DRAWING UNITS U.N.O. SCALE AT A3 (420 x 297 mm) **1:500**

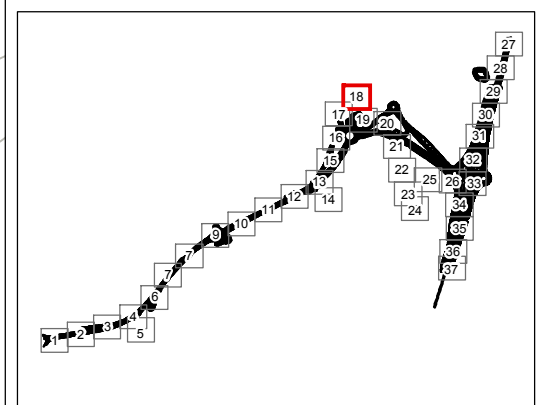
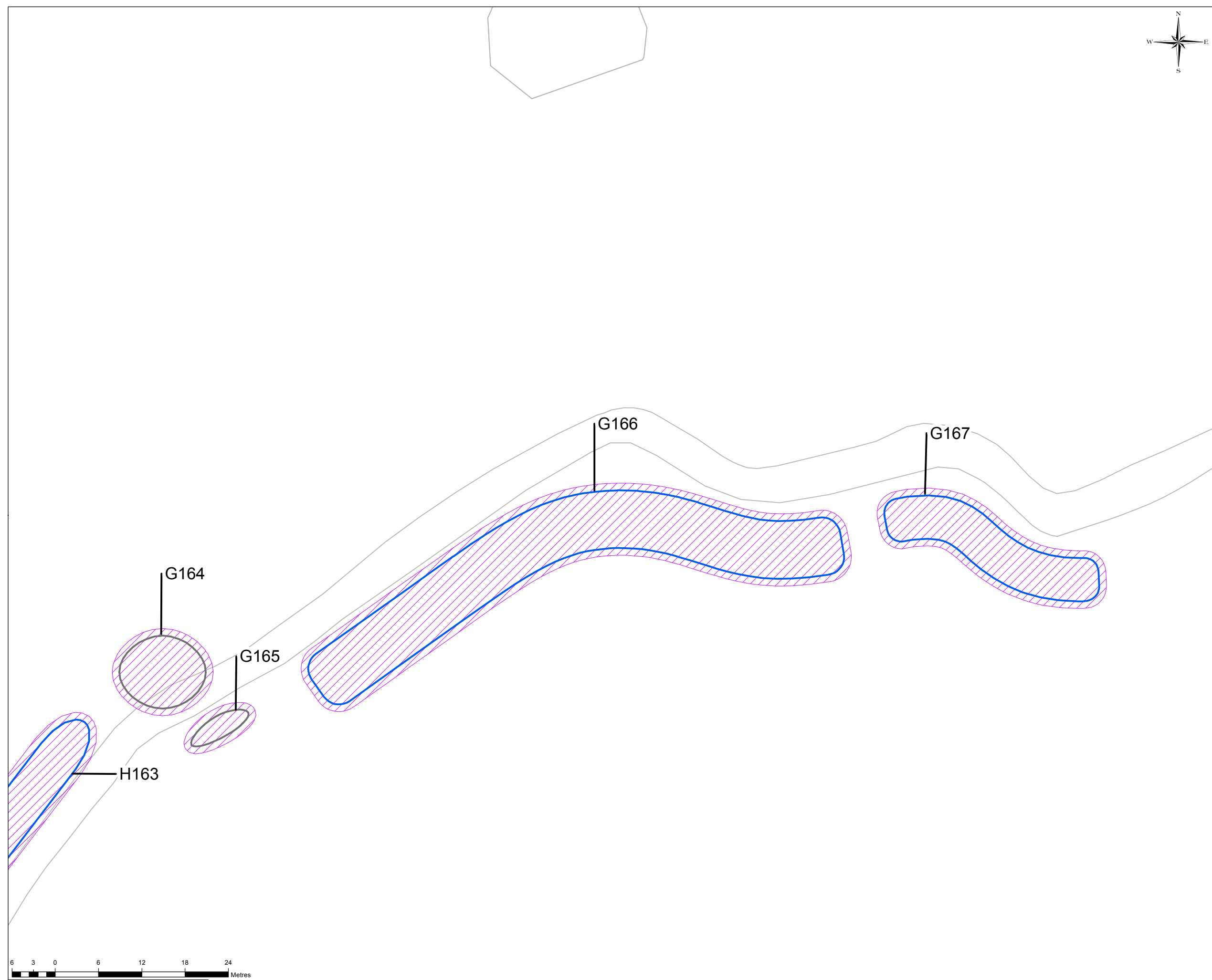
DRAWING NO. **B3553F05/LE/01** REV. **1**

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- Notes**
- Do not scale
- Key**
- Group category A
  - Group category B
  - Group category C
  - Tree category A
  - Tree category B
  - Tree category C
  - Root protection area
  - Design Iteration 1 PCF Stage 3



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
1	19/10/2016	COMPLETE SURVEY	EW	PS	MW	PM
0	13/01/16	ORIGINAL ISSUE	CN	SF	AR	PM

Drawing Status: **DRAFT**



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Scheme Title: **M11 JUNCTION 7A**

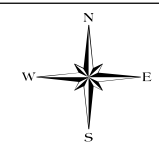
Drawing Title: **TREE CONSTRAINTS PLAN SHEET 18 OF 37**

DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
EW	EW	PS	MW	SK
DATE	DATE	DATE	DATE	DATE
OCT16	OCT16	OCT16	OCT16	OCT16

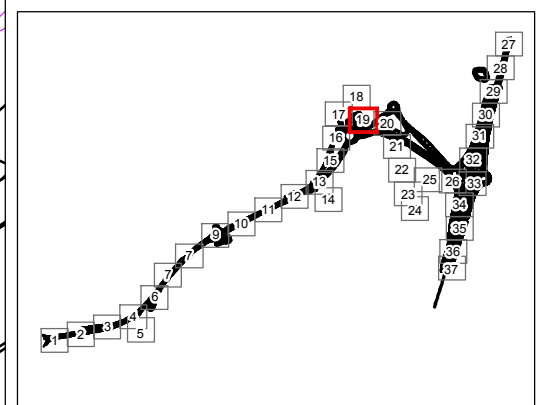
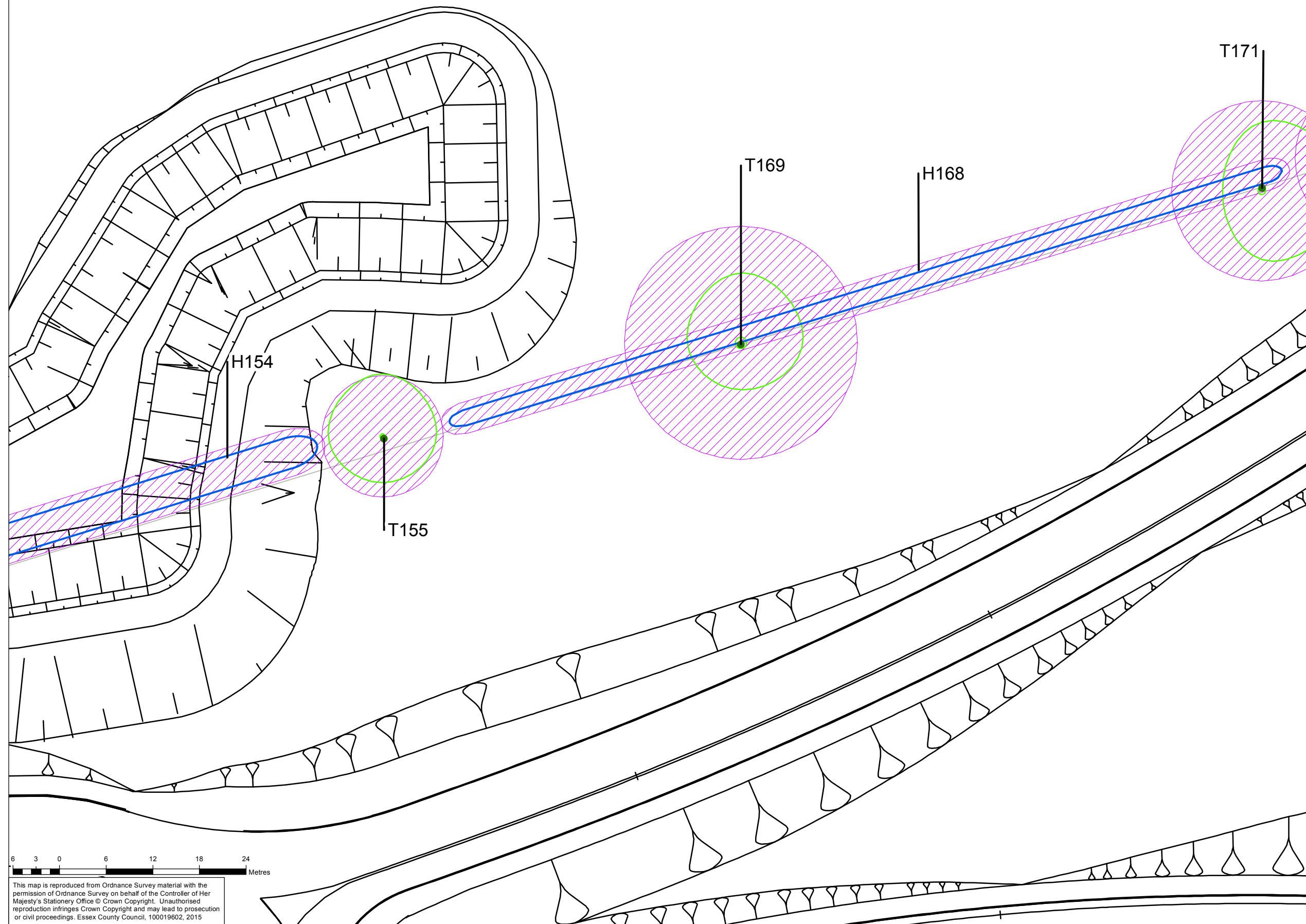
DRAWING UNITS U.N.O. SCALE AT A3 (420 x 297 mm) **1:500**

DRAWING NO. **B3553F05/LE/01** REV. **1**

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- Notes**
- Do not scale
- Key**
- Group category A
  - Group category B
  - Group category C
  - Tree category A
  - Tree category B
  - Tree category C
  - Root protection area
  - Design Iteration 1 PCF Stage 3



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
1	19/10/2016	COMPLETE SURVEY	EW	PS	MW	PM
0	13/01/16	ORIGINAL ISSUE	CN	SF	AR	PM

Drawing Status: **DRAFT**



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Scheme Title: **M11 JUNCTION 7A**

Drawing Title: **TREE CONSTRAINTS PLAN SHEET 19 OF 37**

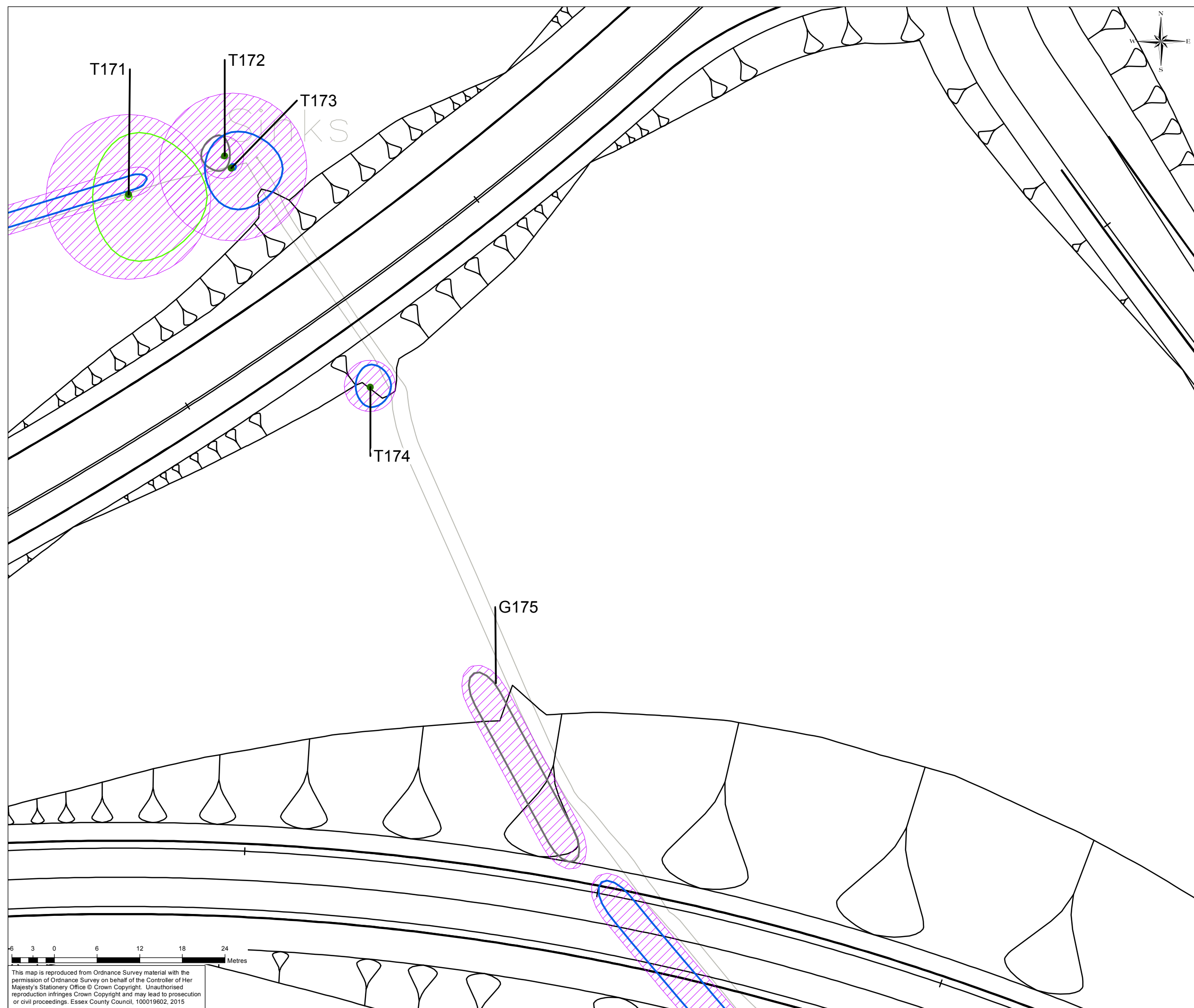
DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
EW	EW	PS	MW	SK
DATE	DATE	DATE	DATE	DATE
OCT16	OCT16	OCT16	OCT16	OCT16

DRAWING UNITS U.N.O. SCALE AT A3 (420 x 297 mm) **1:500**

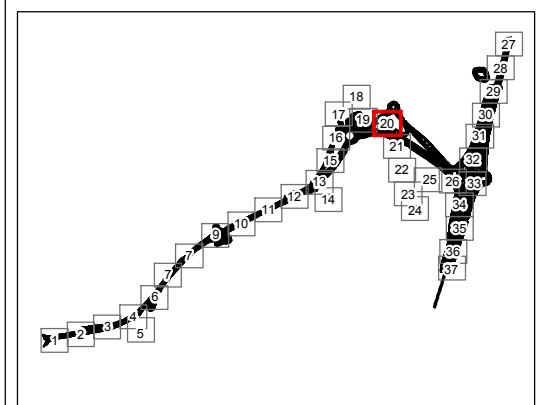
DRAWING NO. **B3553F05/LE/01** REV. **1**



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- Notes**
- Do not scale
- Key**
- Group category A
  - Group category B
  - Group category C
  - Tree category A
  - Tree category B
  - Tree category C
  - Root protection area
  - Design Iteration 1 PCF Stage 3



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
1	19/10/2016	COMPLETE SURVEY	EW	PS	MW	PM
0	13/01/16	ORIGINAL ISSUE	CN	SF	AR	PM

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Drawing Title: **TREE CONSTRAINTS PLAN SHEET 20 OF 37**

DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
EW	EW	PS	MW	SK
DATE	DATE	DATE	DATE	DATE
OCT16	OCT16	OCT16	OCT16	OCT16

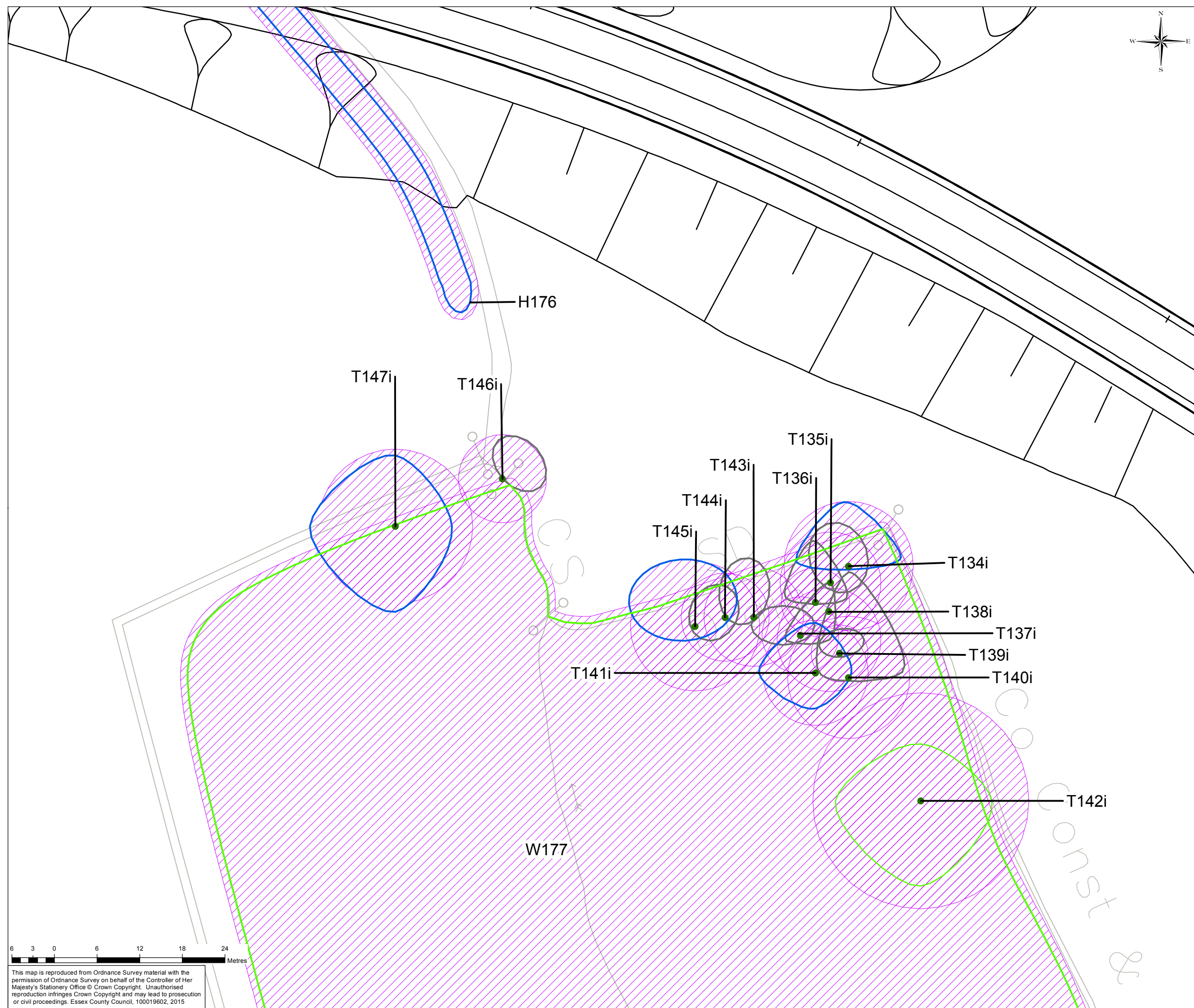
DRAWING UNITS U.N.O. SCALE AT A3 (420 x 297 mm) **1:500**

DRAWING NO. **B3553F05/LE/01** REV. **1**

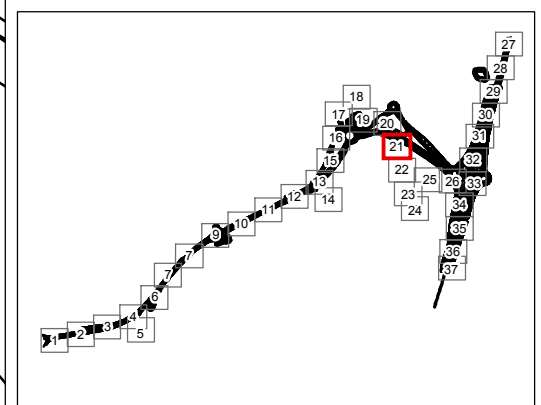


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- Notes**
- Do not scale
- Key**
- Group category A
  - Group category B
  - Group category C
  - Tree category A
  - Tree category B
  - Tree category C
  - / Root protection area
  - Design Iteration 1 PCF Stage 3



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
1	19/10/2016	COMPLETE SURVEY	EW	PS	MW	PM
0	13/01/16	ORIGINAL ISSUE	CN	SF	AR	PM

Drawing Status: **DRAFT**



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Scheme Title: **M11 JUNCTION 7A**

Drawing Title: **TREE CONSTRAINTS PLAN SHEET 21 OF 37**

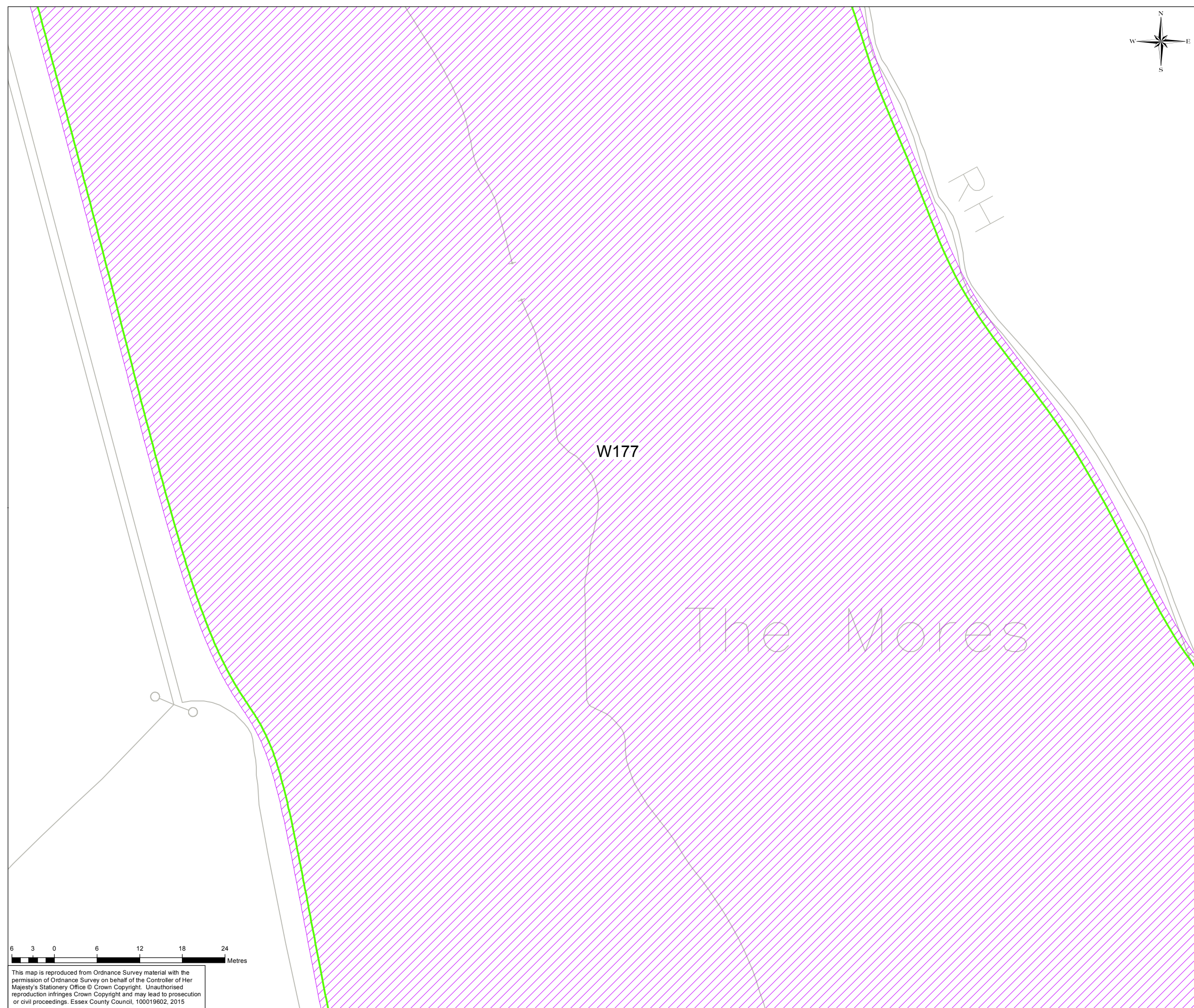
DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
EW	EW	PS	MW	SK
DATE	DATE	DATE	DATE	DATE
OCT16	OCT16	OCT16	OCT16	OCT16

DRAWING UNITS U.N.O. SCALE AT A3 (420 x 297 mm)  
**1:500**

DRAWING NO. **B3553F05/LE/01** REV. **1**



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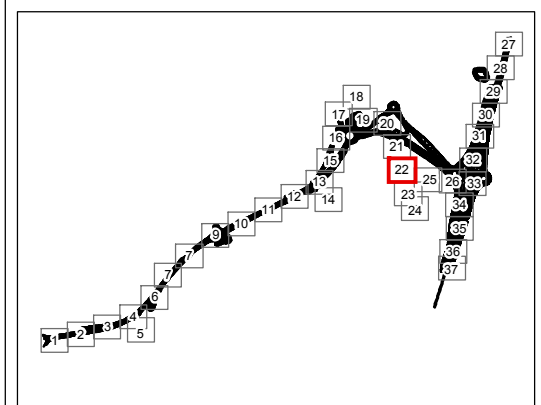


**Notes**

1. Do not scale

**Key**

- Group category A
- Group category B
- Group category C
- Tree category A
- Tree category B
- Tree category C
- Root protection area
- Design Iteration 1 PCF Stage 3



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
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0	13/01/16	ORIGINAL ISSUE	CN	SF	AR	PM

Drawing Status: **DRAFT**



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Scheme Title: **M11 JUNCTION 7A**

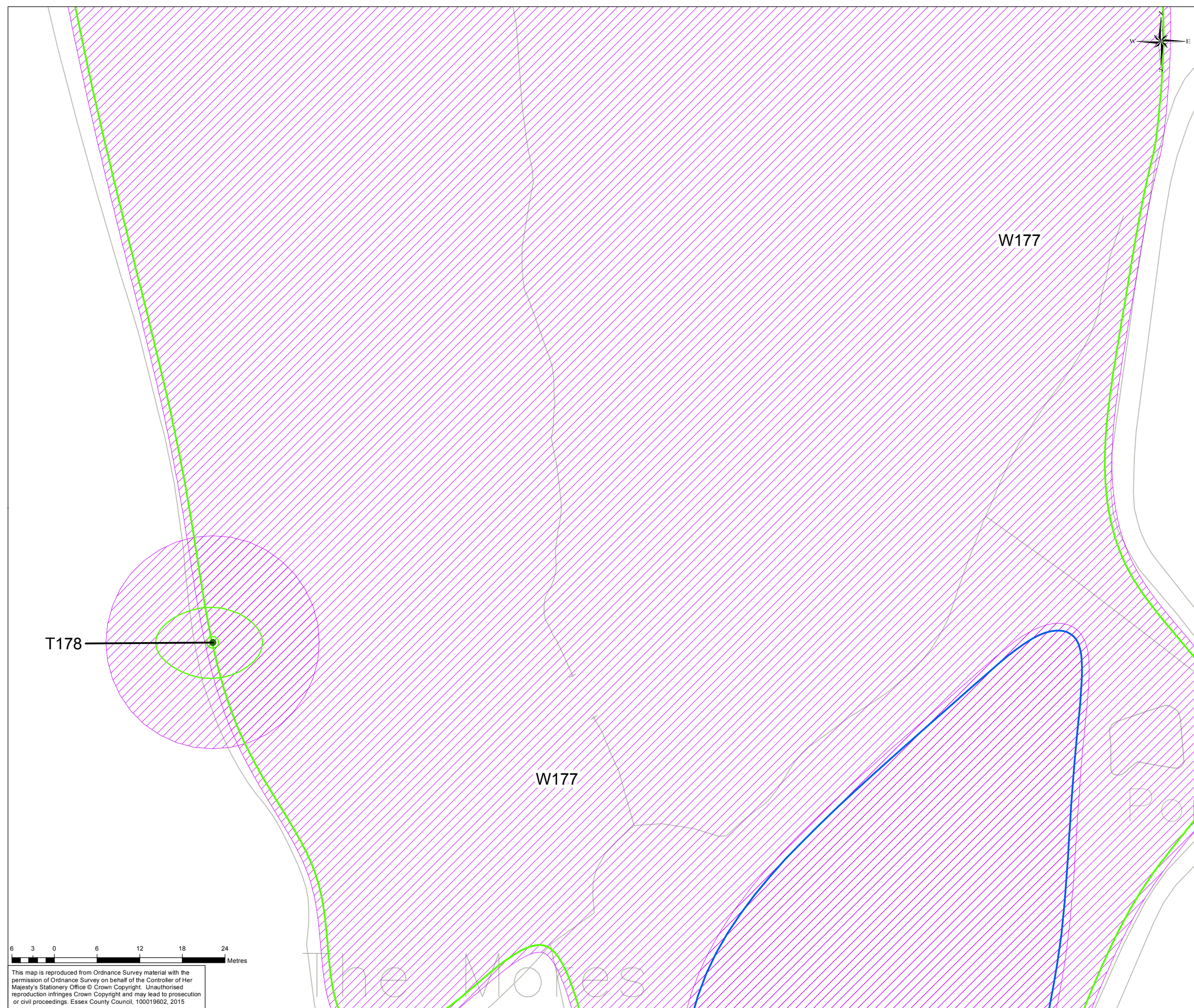
Drawing Title: **TREE CONSTRAINTS PLAN SHEET 22 OF 37**

DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
EW	EW	PS	MW	SK
DATE	DATE	DATE	DATE	DATE
OCT16	OCT16	OCT16	OCT16	OCT16

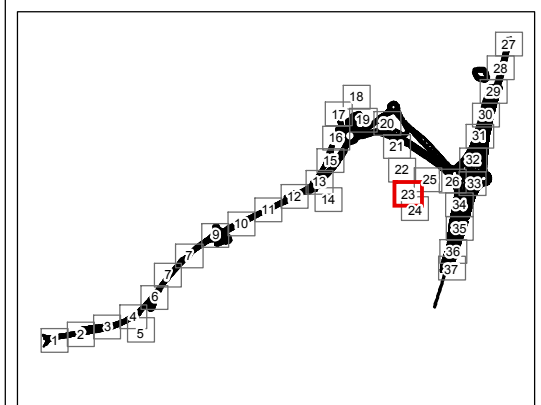
DRAWING UNITS U.N.O. SCALE AT A3 (420 x 297 mm) **1:500**

DRAWING NO. **B3553F05/LE/01** REV. **1**

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- Notes**
- Do not scale
- Key**
- Group category A
  - Group category B
  - Group category C
  - Tree category A
  - Tree category B
  - Tree category C
  - Root protection area
  - Design Iteration 1 PCF Stage 3



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
1	19/10/2016	COMPLETE SURVEY	EW	PS	MW	PM
0	13/01/16	ORIGINAL ISSUE	CN	SF	AR	PM

Drawing Status: **DRAFT**



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Scheme Title: **M11 JUNCTION 7A**

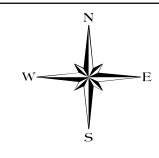
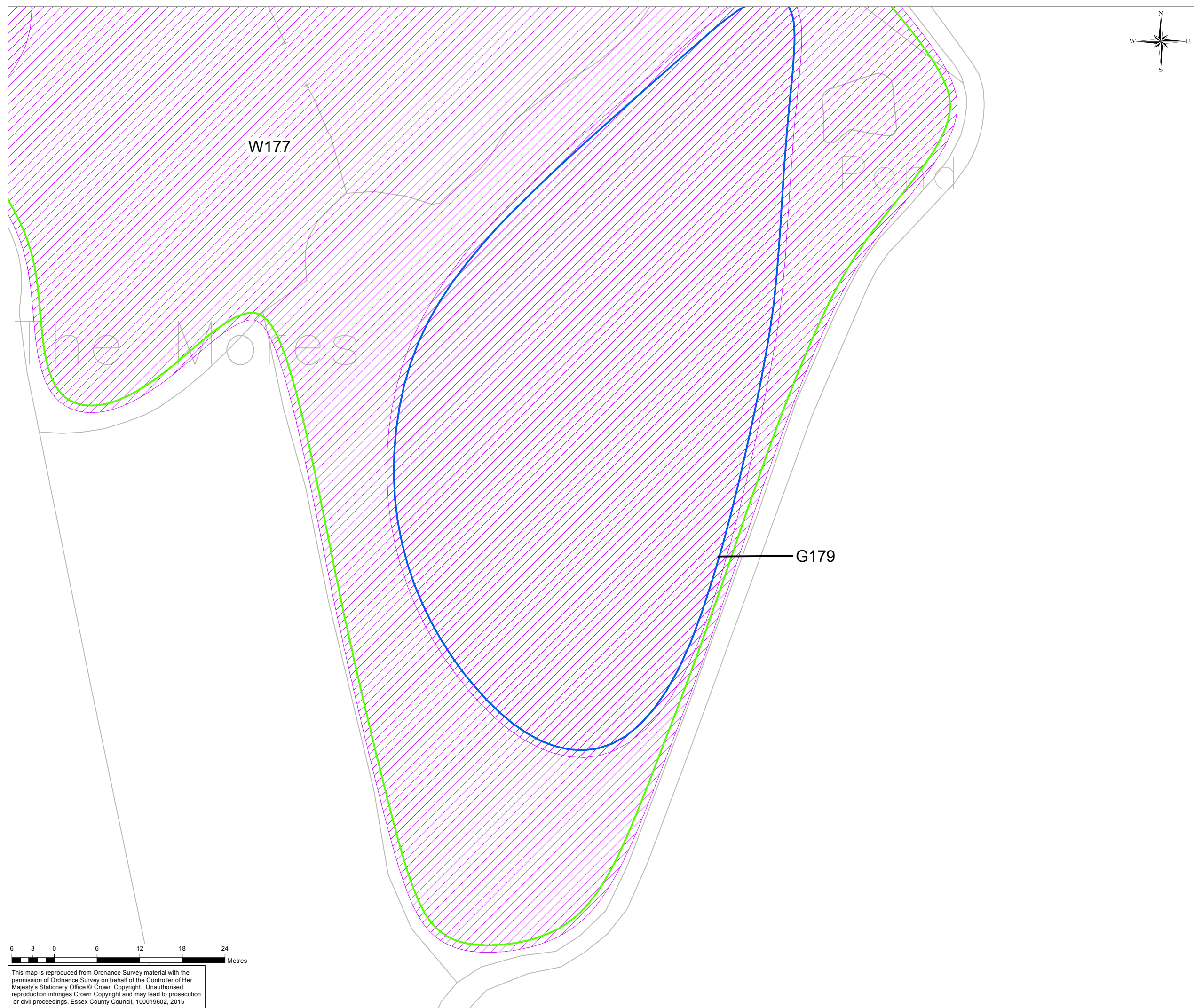
Drawing Title: **TREE CONSTRAINTS PLAN SHEET 23 OF 37**

DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
EW	EW	PS	MW	SK
DATE	DATE	DATE	DATE	DATE
OCT16	OCT16	OCT16	OCT16	OCT16

DRAWING UNITS U.N.O. SCALE AT A3 (420 x 297 mm)  
**1:500**

DRAWING NO. **B3553F05/LE/01** REV. **1**

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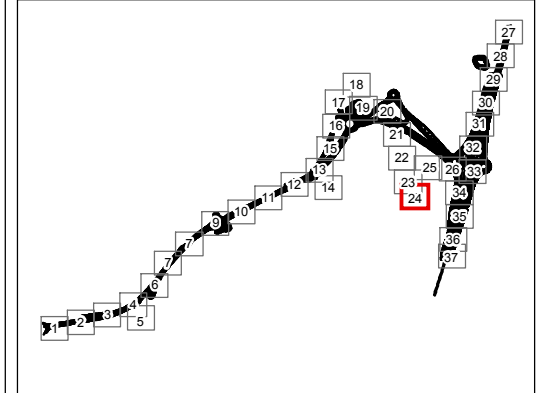


**Notes**

1. Do not scale

**Key**

- Group category A
- Group category B
- Group category C
- Tree category A
- Tree category B
- Tree category C
- Root protection area
- Design Iteration 1 PCF Stage 3



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
1	19/10/2016	COMPLETE SURVEY	EW	PS	MW	PM
0	13/01/16	ORIGINAL ISSUE	CN	SF	AR	PM

Drawing Status: **DRAFT**



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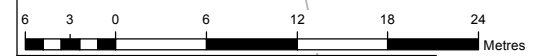
Scheme Title: **M11 JUNCTION 7A**

Drawing Title: **TREE CONSTRAINTS PLAN SHEET 24 OF 37**

DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
EW	EW	PS	MW	SK
DATE	DATE	DATE	DATE	DATE
OCT16	OCT16	OCT16	OCT16	OCT16

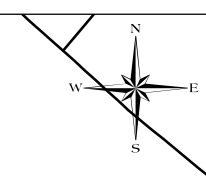
DRAWING UNITS U.N.O. SCALE AT A3 (420 x 297 mm) **1:500**

DRAWING NO. **B3553F05/LE/01** REV. **1**



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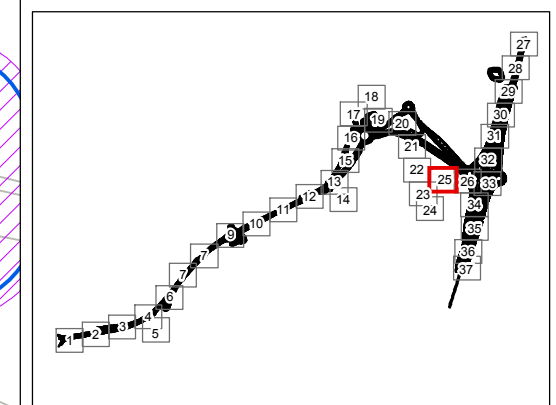
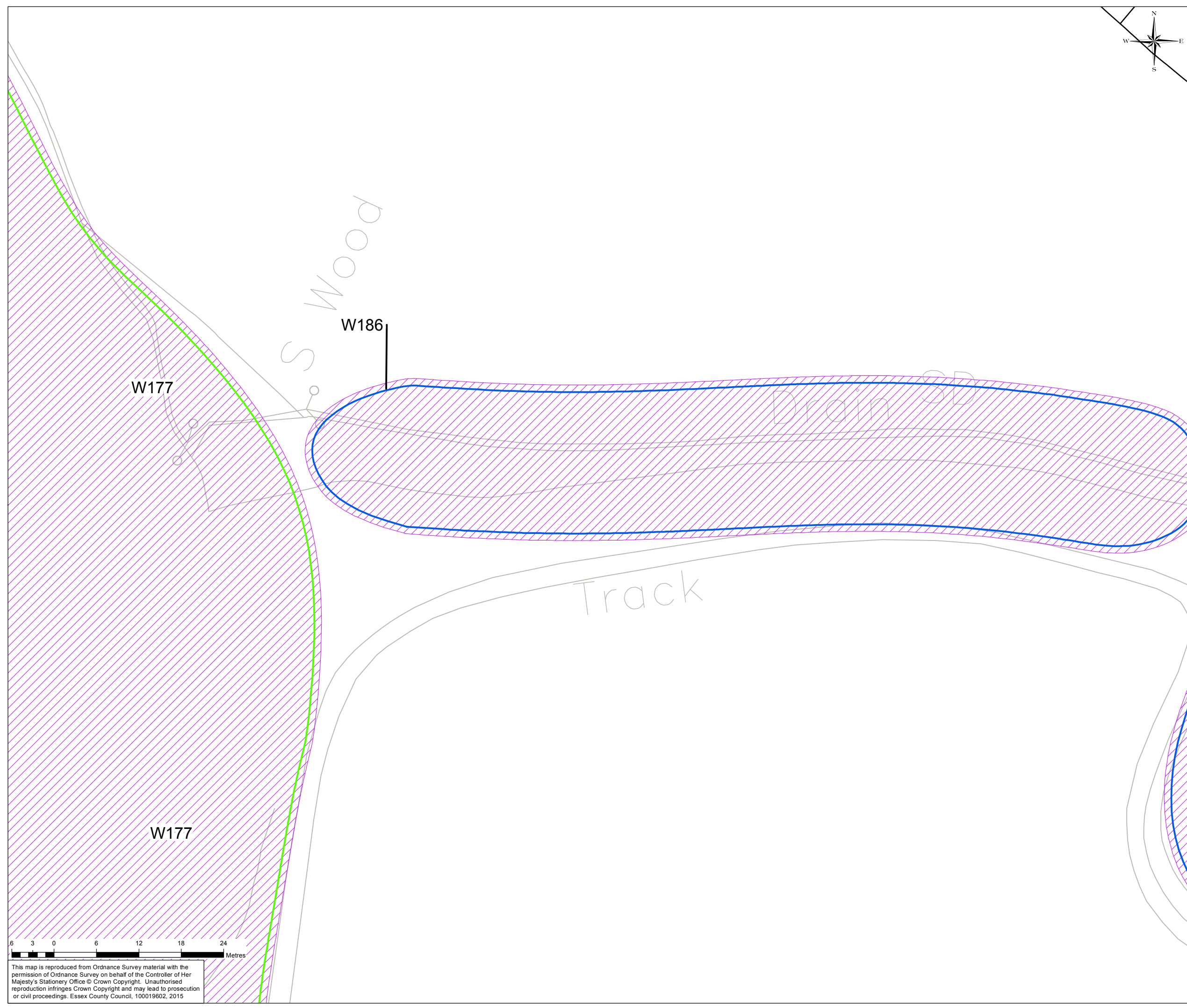


**Notes**

- 1. Do not scale

**Key**

- Group category A
- Group category B
- Group category C
- Tree category A
- Tree category B
- Tree category C
- Root protection area
- Design Iteration 1 PCF Stage 3



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
1	19/10/2016	COMPLETE SURVEY	EW	PS	MW	PM
0	13/01/16	ORIGINAL ISSUE	CN	SF	AR	PM

Drawing Status: **DRAFT**



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Scheme Title: **M11 JUNCTION 7A**

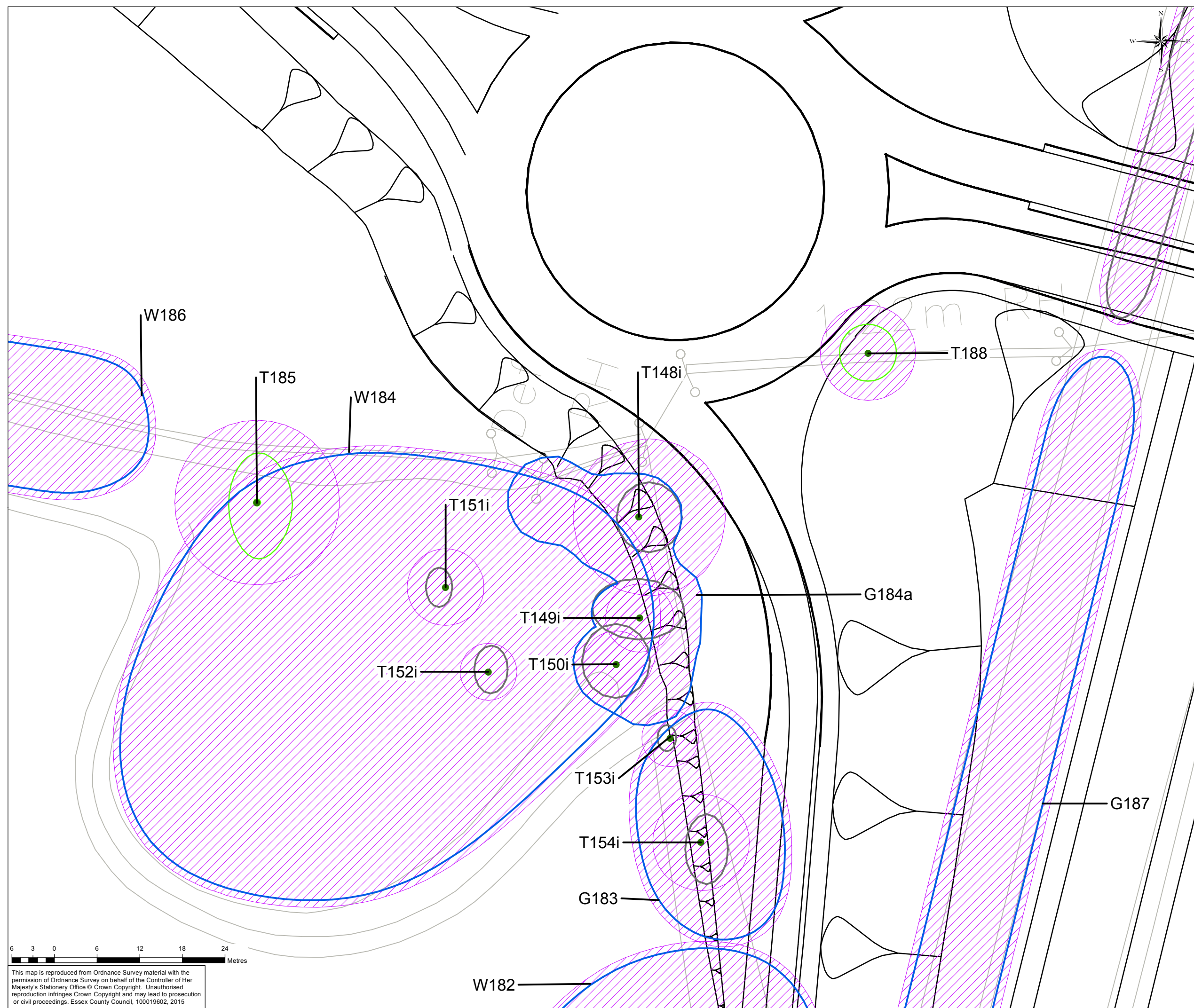
Drawing Title: **TREE CONSTRAINTS PLAN SHEET 25 OF 37**

DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
EW	EW	PS	MW	SK
DATE	DATE	DATE	DATE	DATE
OCT16	OCT16	OCT16	OCT16	OCT16

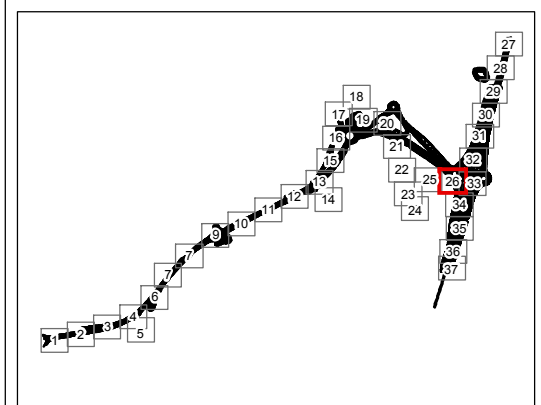
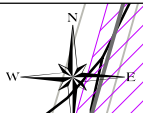
DRAWING UNITS U.N.O. SCALE AT A3 (420 x 297 mm) **1:500**

DRAWING NO. **B3553F05/LE/01** REV. **1**

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- Notes**
1. Do not scale
- Key**
- Group category A
  - Group category B
  - Group category C
  - Tree category A
  - Tree category B
  - Tree category C
  - Root protection area
  - Design Iteration 1 PCF Stage 3



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
1	19/10/2016	COMPLETE SURVEY	EW	PS	MW	PM
0	13/01/16	ORIGINAL ISSUE	CN	SF	AR	PM

Drawing Status: **DRAFT**



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Scheme Title: **M11 JUNCTION 7A**

Drawing Title: **TREE CONSTRAINTS PLAN SHEET 26 OF 37**

DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
EW	EW	PS	MW	SK
DATE	DATE	DATE	DATE	DATE
OCT16	OCT16	OCT16	OCT16	OCT16

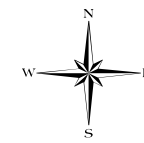
DRAWING UNITS U.N.O. SCALE AT A3 (420 x 297 mm) **1:500**

DRAWING NO. **B3553F05/LE/01** REV. **1**



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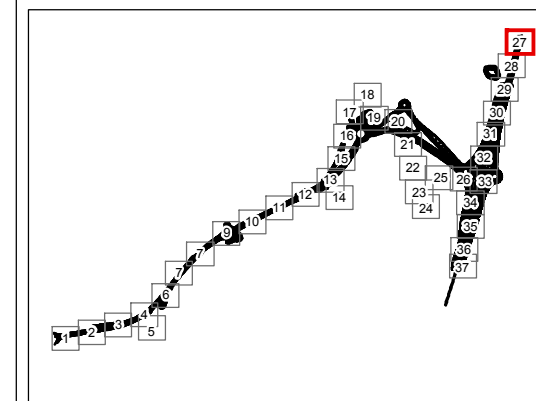
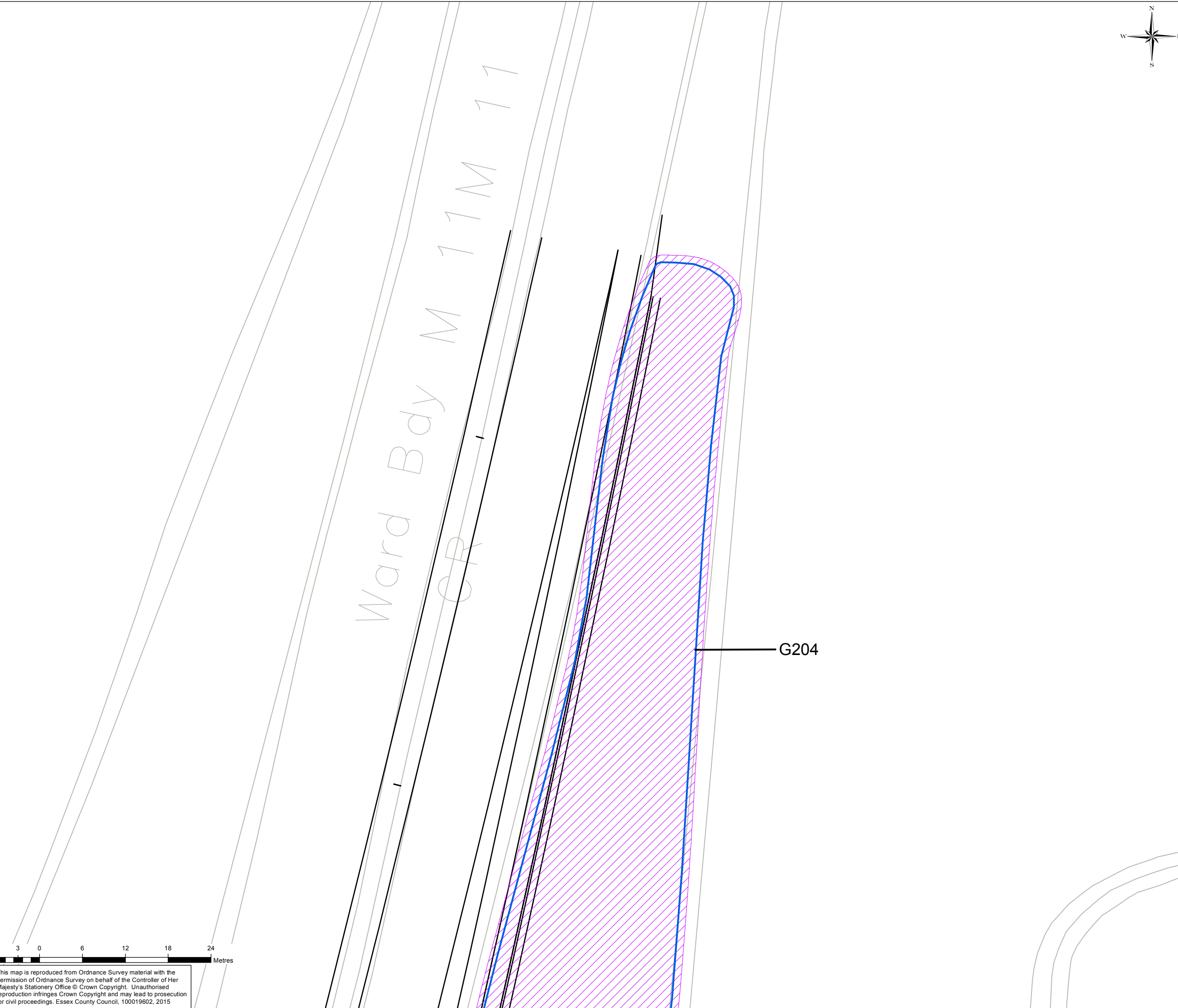


**Notes**

1. Do not scale

**Key**

- Group category A
- Group category B
- Group category C
- Tree category A
- Tree category B
- Tree category C
- Root protection area
- Design Iteration 1 PCF Stage 3



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
1	19/10/2016	COMPLETE SURVEY	EW	PS	MW	PM
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Drawing Status: **DRAFT**



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Scheme Title: **M11 JUNCTION 7A**

Drawing Title: **TREE CONSTRAINTS PLAN SHEET 27 OF 37**

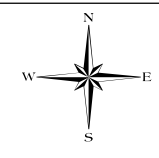
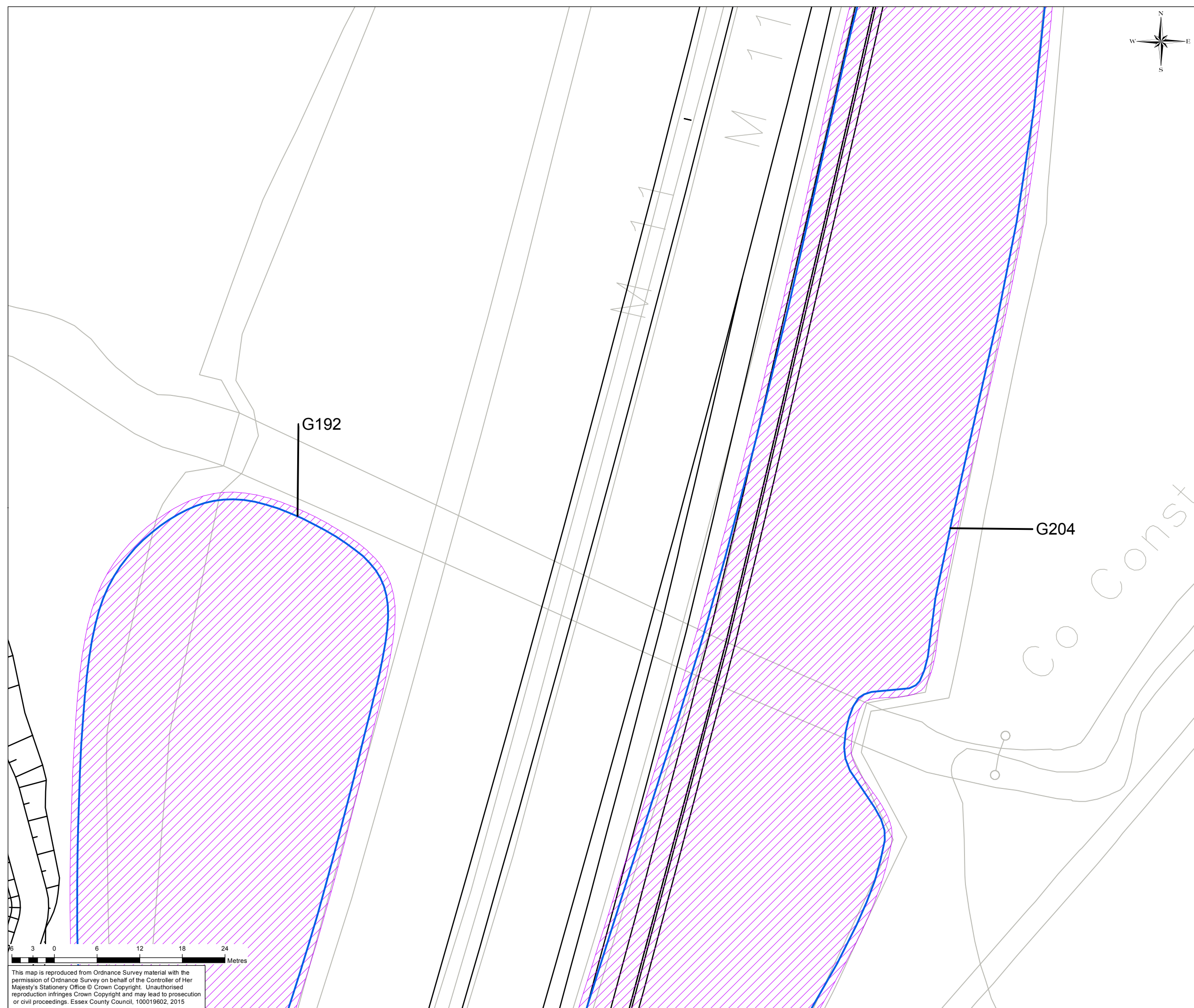
DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
EW	EW	PS	MW	SK
DATE	DATE	DATE	DATE	DATE
OCT16	OCT16	OCT16	OCT16	OCT16

DRAWING UNITS U.N.O. SCALE AT A3 (420 x 297 mm) 1:500

DRAWING NO. B3553F05/LE/01 REV. 1



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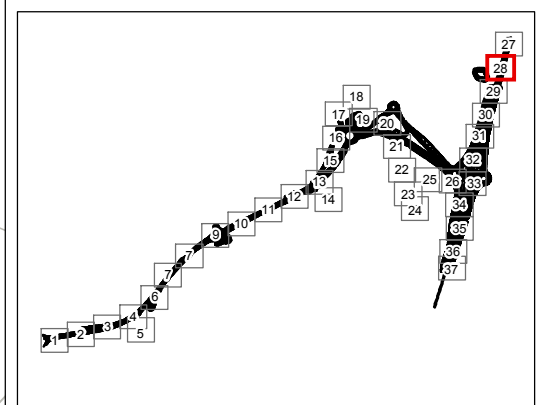


**Notes**

1. Do not scale

**Key**

- Group category A
- Group category B
- Group category C
- Tree category A
- Tree category B
- Tree category C
- Root protection area
- Design Iteration 1 PCF Stage 3



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
1	19/10/2016	COMPLETE SURVEY	EW	PS	MW	PM
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Drawing Status: **DRAFT**



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Scheme Title: **M11 JUNCTION 7A**

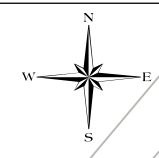
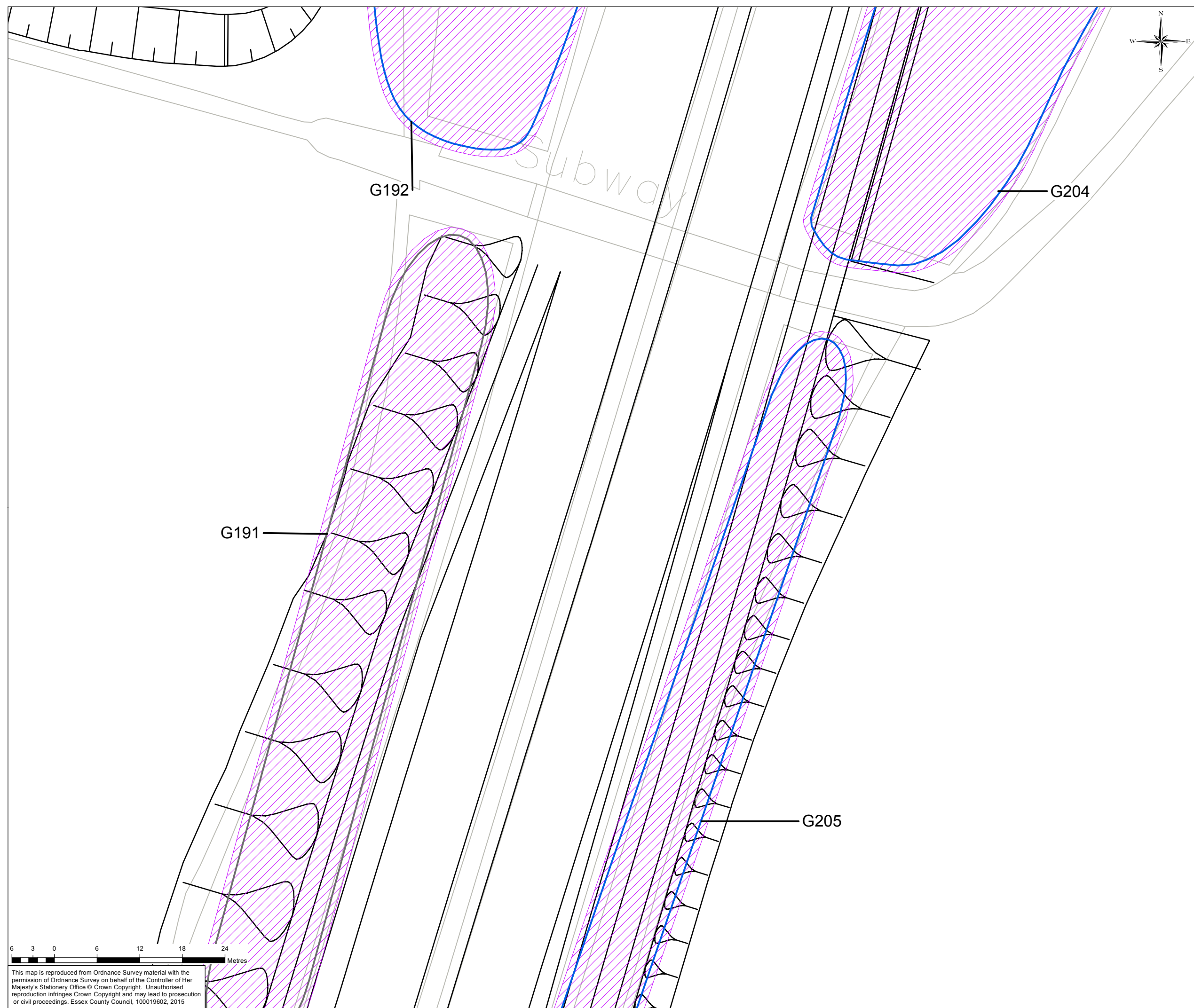
Drawing Title: **TREE CONSTRAINTS PLAN SHEET 28 OF 37**

DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
EW	EW	PS	MW	SK
DATE	DATE	DATE	DATE	DATE
OCT16	OCT16	OCT16	OCT16	OCT16

DRAWING UNITS U.N.O. SCALE AT A3 (420 x 297 mm) **1:500**

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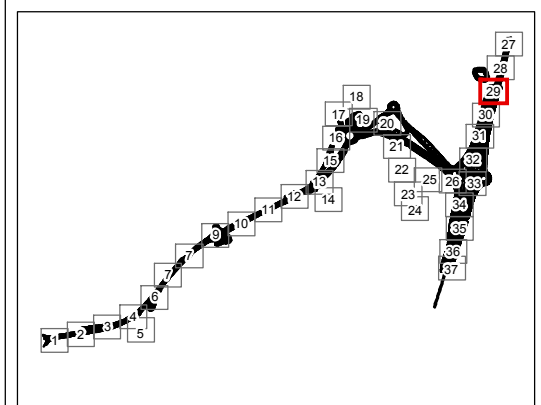


**Notes**

1. Do not scale

**Key**

- Group category A
- Group category B
- Group category C
- Tree category A
- Tree category B
- Tree category C
- Root protection area
- Design Iteration 1 PCF Stage 3



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
1	19/10/2016	COMPLETE SURVEY	EW	PS	MW	PM
0	13/01/16	ORIGINAL ISSUE	CN	SF	AR	PM

Drawing Status: **DRAFT**



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Scheme Title: **M11 JUNCTION 7A**

Drawing Title: **TREE CONSTRAINTS PLAN SHEET 29 OF 37**

DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
EW	EW	PS	MW	SK
DATE	DATE	DATE	DATE	DATE
OCT16	OCT16	OCT16	OCT16	OCT16

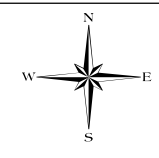
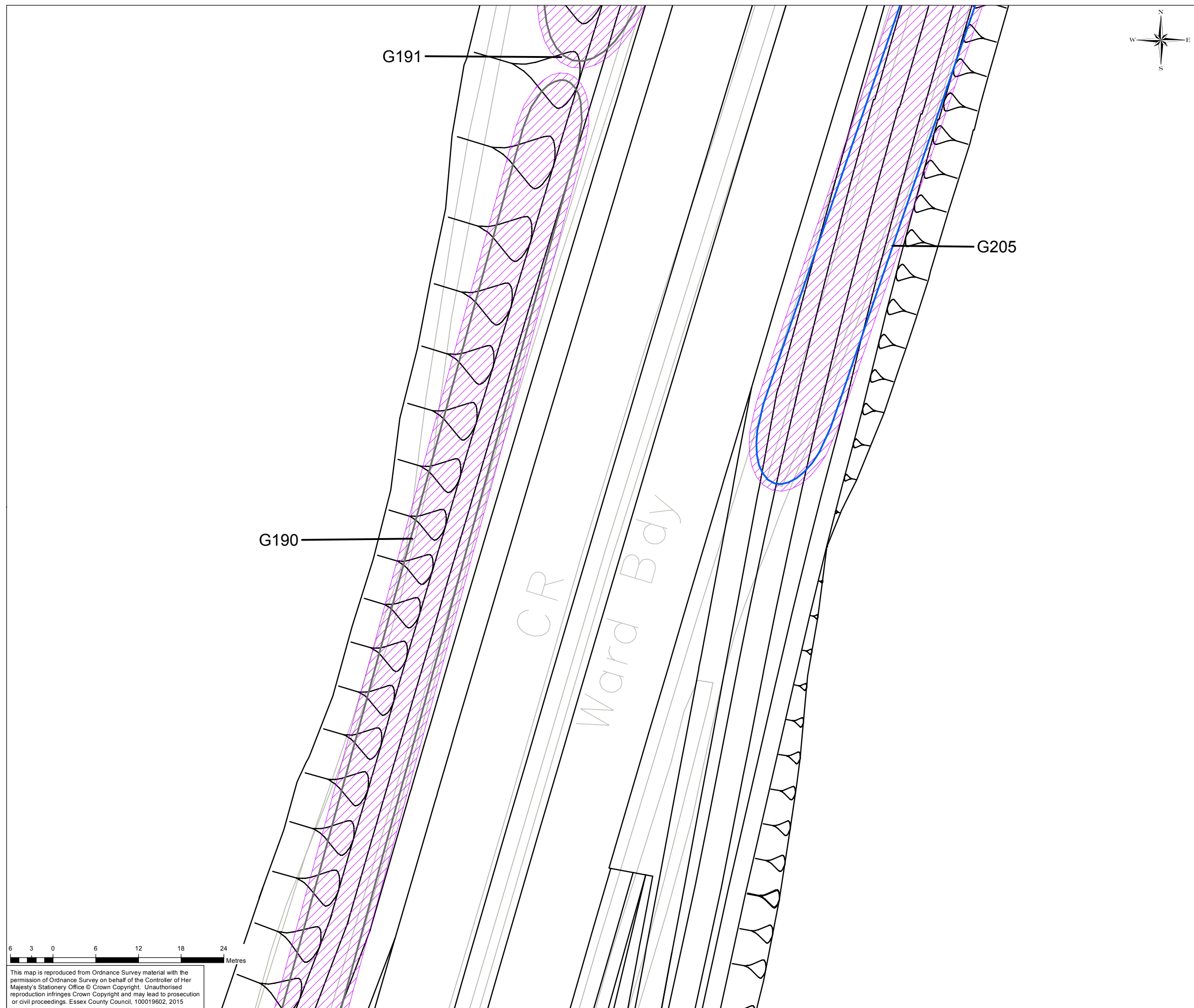
DRAWING UNITS U.N.O. SCALE AT A3 (420 x 297 mm) 1:500

DRAWING NO. B3553F05/LE/01 REV. 1



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


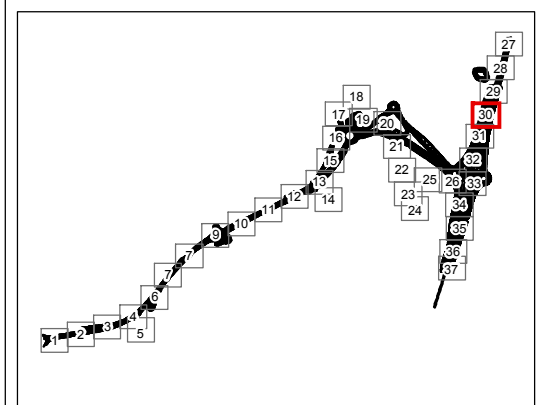


**Notes**

1. Do not scale

**Key**

-  Group category A
-  Group category B
-  Group category C
-  Tree category A
-  Tree category B
-  Tree category C
-  Root protection area
-  Design Iteration 1 PCF Stage 3



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
1	19/10/2016	COMPLETE SURVEY	EW	PS	MW	PM
0	13/01/16	ORIGINAL ISSUE	CN	SF	AR	PM

Drawing Status: **DRAFT**



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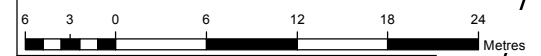
Scheme Title: **M11 JUNCTION 7A**

Drawing Title: **TREE CONSTRAINTS PLAN SHEET 30 OF 37**

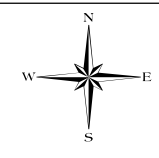
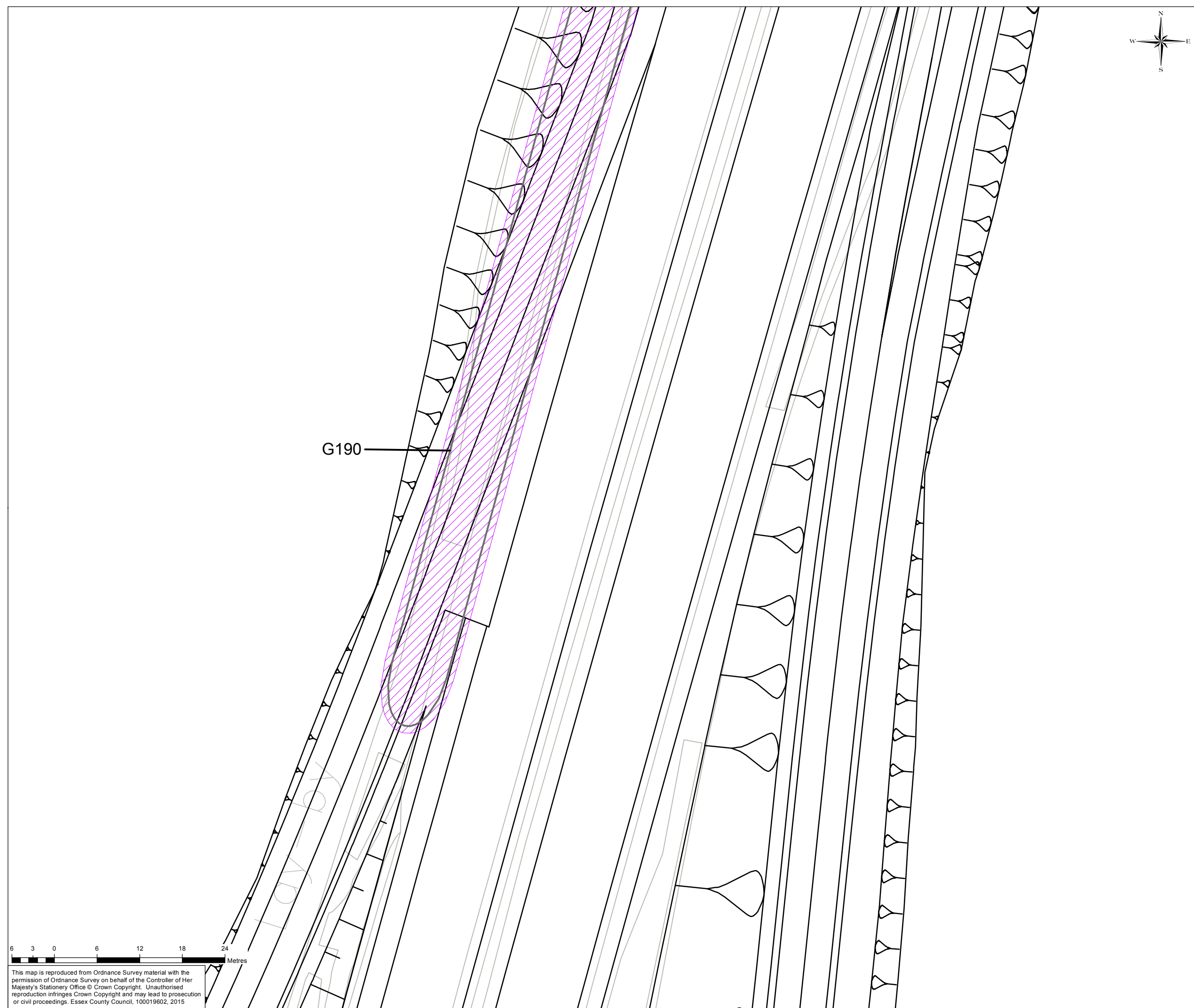
DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
EW	EW	PS	MW	SK
DATE	DATE	DATE	DATE	DATE
OCT16	OCT16	OCT16	OCT16	OCT16

DRAWING UNITS U.N.O. SCALE AT A3 (420 x 297 mm) 1:500

DRAWING NO. **B3553F05/LE/01** REV. **1**



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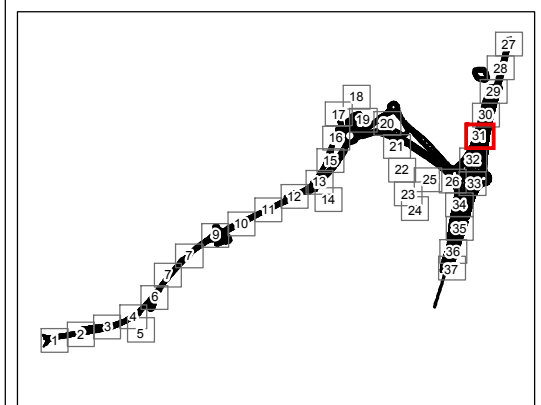


**Notes**

1. Do not scale

**Key**

- Group category A
- Group category B
- Group category C
- Tree category A
- Tree category B
- Tree category C
- Root protection area
- Design Iteration 1 PCF Stage 3



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
1	19/10/2016	COMPLETE SURVEY	EW	PS	MW	PM
0	13/01/16	ORIGINAL ISSUE	CN	SF	AR	PM

Drawing Status: **DRAFT**



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Scheme Title: **M11 JUNCTION 7A**

Drawing Title: **TREE CONSTRAINTS PLAN SHEET 31 OF 37**

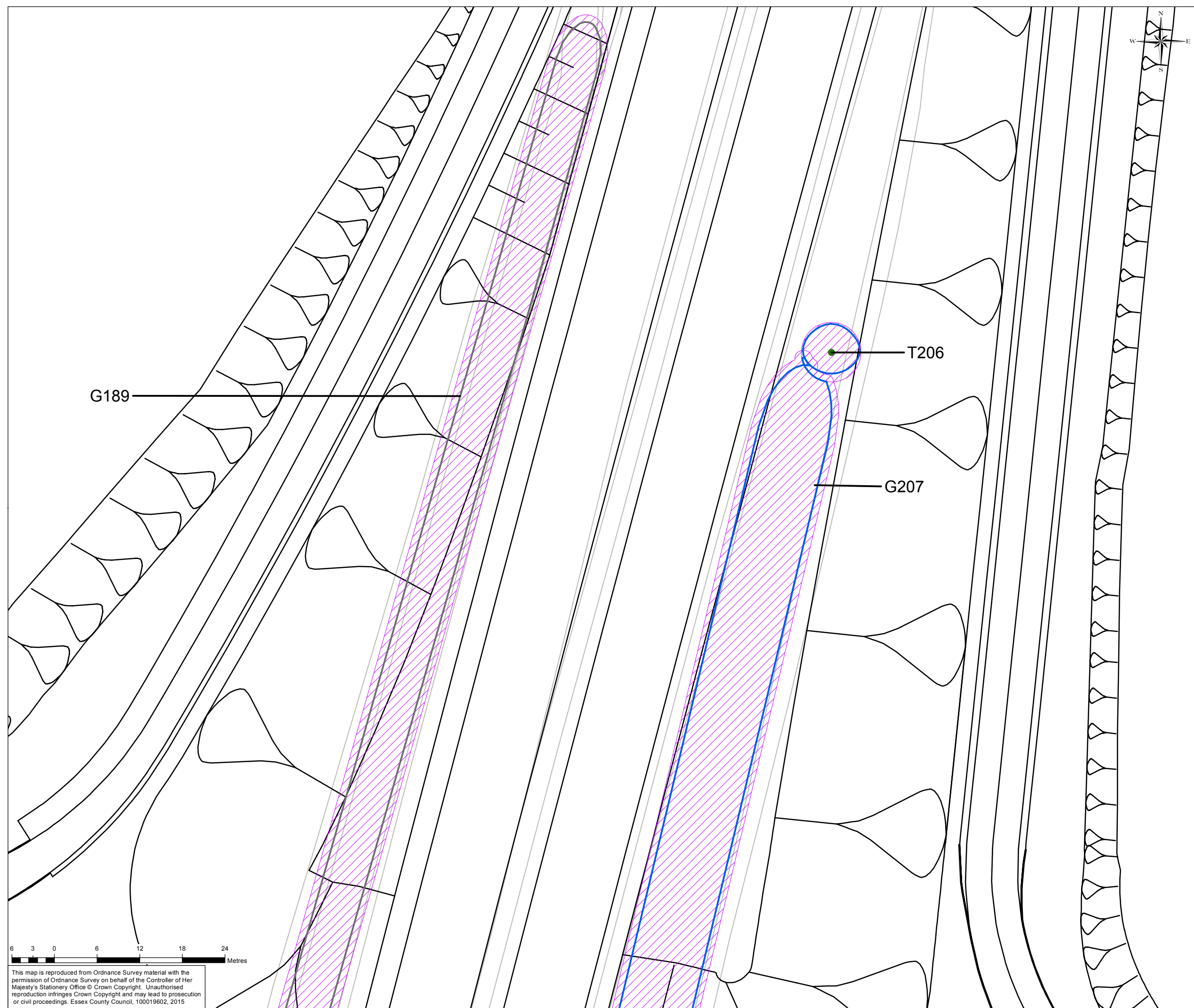
DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
EW	EW	PS	MW	SK
DATE	DATE	DATE	DATE	DATE
OCT16	OCT16	OCT16	OCT16	OCT16

DRAWING UNITS U.N.O. SCALE AT A3 (420 x 297 mm) **1:500**

DRAWING NO. **B3553F05/LE/01** REV. **1**



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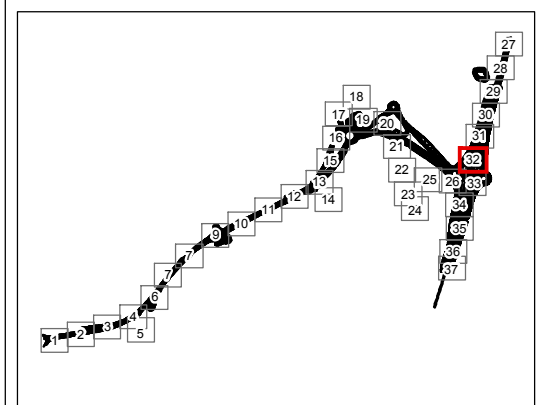


**Notes**

1. Do not scale

**Key**

- Group category A
- Group category B
- Group category C
- Tree category A
- Tree category B
- Tree category C
- / Root protection area
- Design Iteration 1 PCF Stage 3



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
1	19/10/2016	COMPLETE SURVEY	EW	PS	MW	PM
0	13/01/16	ORIGINAL ISSUE	CN	SF	AR	PM

Drawing Status: **DRAFT**



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Scheme Title: **M11 JUNCTION 7A**

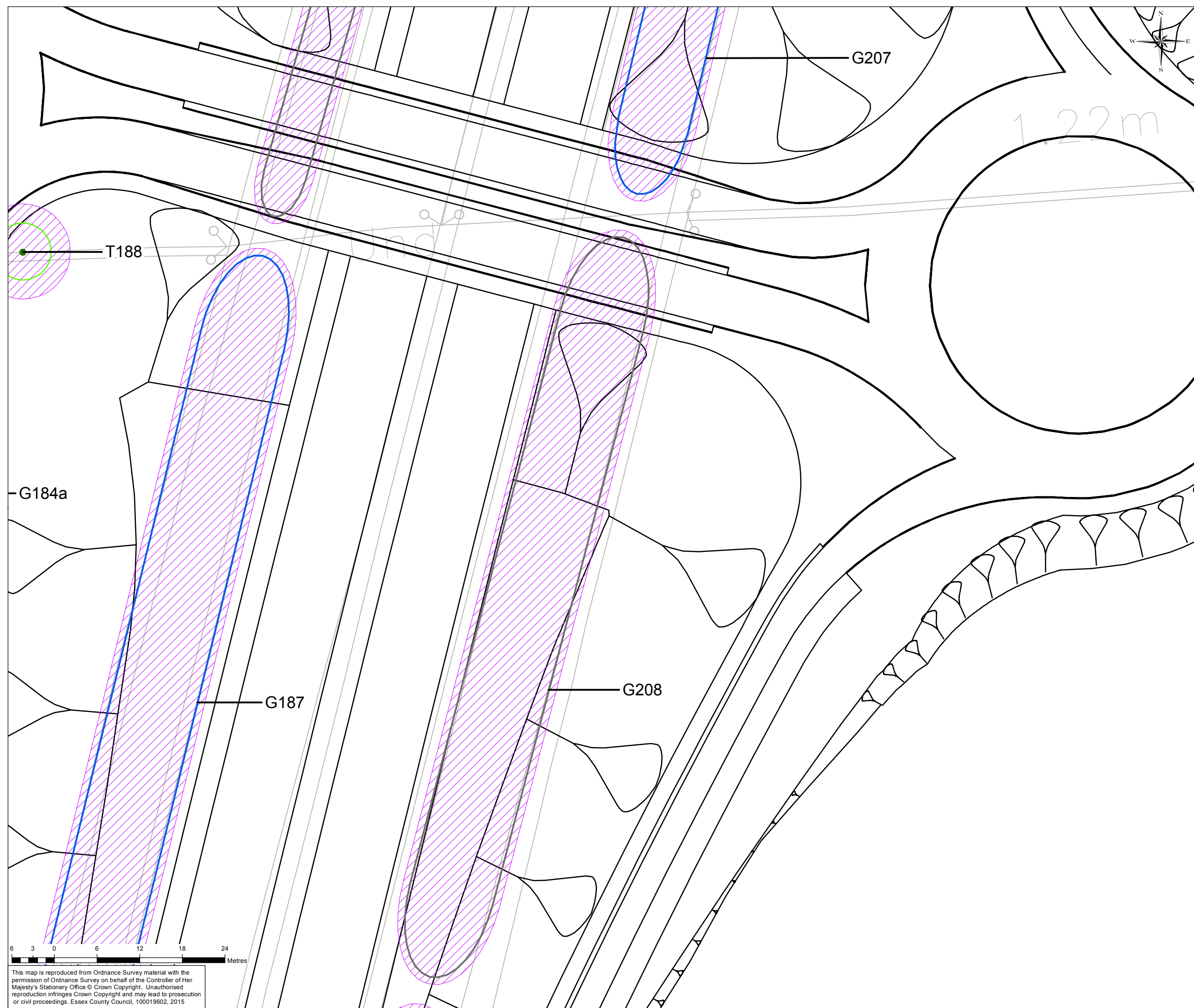
Drawing Title: **TREE CONSTRAINTS PLAN SHEET 32 OF 37**

DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
EW	EW	PS	MW	SK
DATE	DATE	DATE	DATE	DATE
OCT16	OCT16	OCT16	OCT16	OCT16

DRAWING UNITS U.N.O. SCALE AT A3 (420 x 297 mm) **1:500**  
 DRAWING NO. **B3553F05/LE/01** REV. **1**

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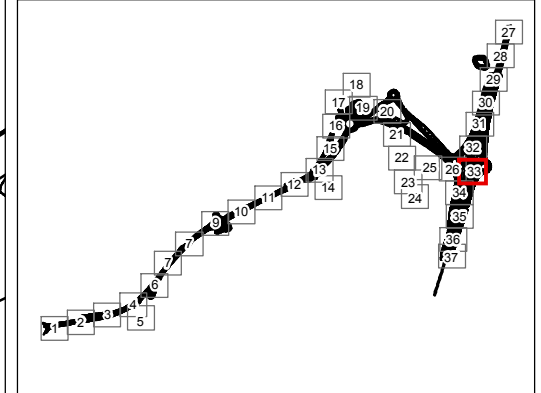


**Notes**

1. Do not scale

**Key**

- Group category A
- Group category B
- Group category C
- Tree category A
- Tree category B
- Tree category C
- Root protection area
- Design Iteration 1 PCF Stage 3



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
1	19/10/2016	COMPLETE SURVEY	EW	PS	MW	PM
0	13/01/16	ORIGINAL ISSUE	CN	SF	AR	PM

Drawing Status: **DRAFT**



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Scheme Title: **M11 JUNCTION 7A**

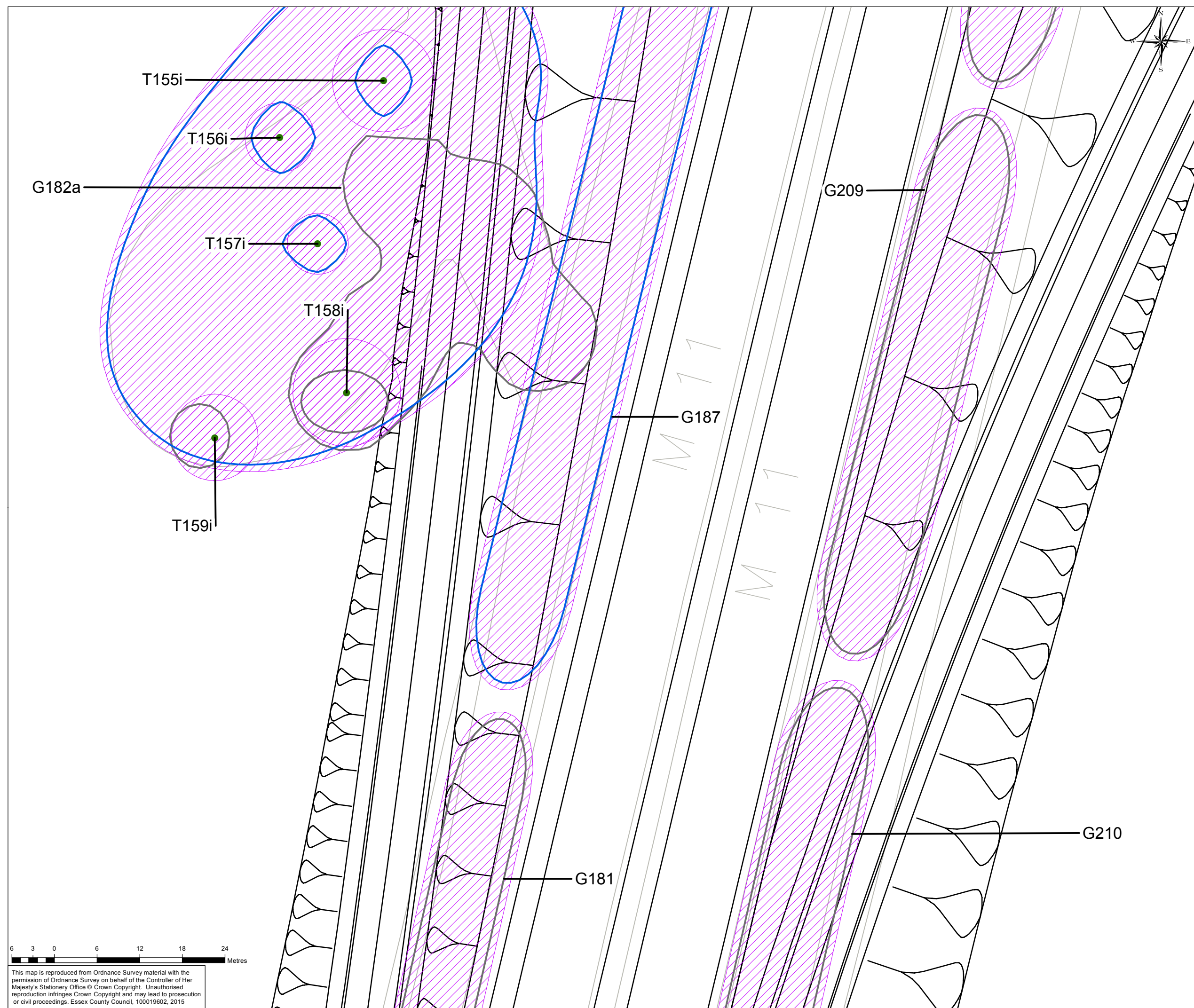
Drawing Title: **TREE CONSTRAINTS PLAN SHEET 33 OF 37**

DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
EW	EW	PS	MW	SK
DATE	DATE	DATE	DATE	DATE
OCT16	OCT16	OCT16	OCT16	OCT16

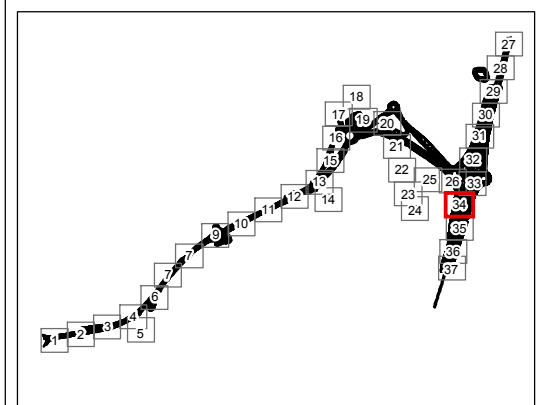
DRAWING UNITS U.N.O. SCALE AT A3 (420 x 297 mm) 1:500

DRAWING NO. **B3553F05/LE/01** REV. **1**

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- Notes**
1. Do not scale
- Key**
- Group category A
  - Group category B
  - Group category C
  - Tree category A
  - Tree category B
  - Tree category C
  - ▨ Root protection area
  - Design Iteration 1 PCF Stage 3



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
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Scheme Title: **M11 JUNCTION 7A**

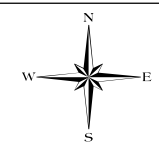
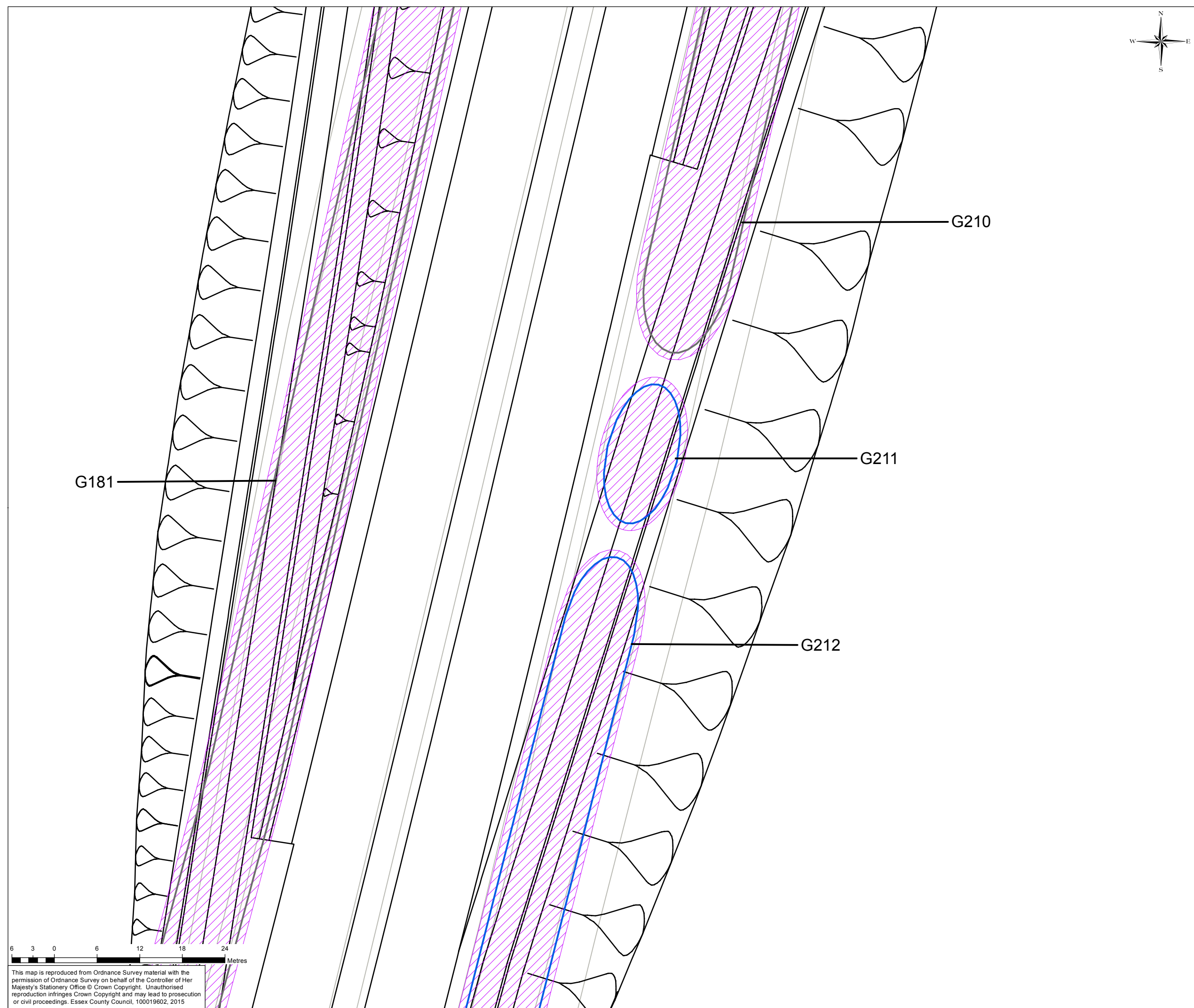
Drawing Title: **TREE CONSTRAINTS PLAN SHEET 34 OF 37**

DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
EW	EW	PS	MW	SK
DATE	DATE	DATE	DATE	DATE
OCT16	OCT16	OCT16	OCT16	OCT16

DRAWING UNITS U.N.O. SCALE AT A3 (420 x 297 mm) 1:500  
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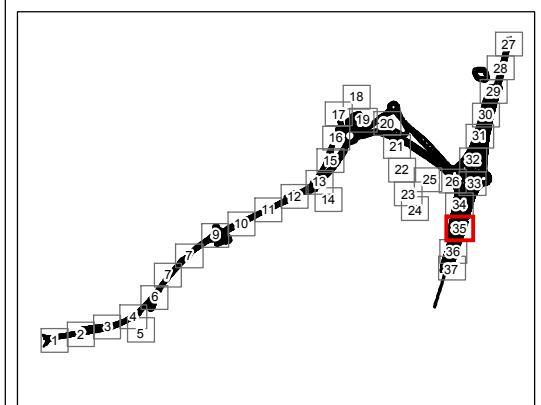
- Notes**
1. Do not scale
- Key**
- Group category A
  - Group category B
  - Group category C
  - Tree category A
  - Tree category B
  - Tree category C
  - ▭ Root protection area
  - Design Iteration 1 PCF Stage 3

G181

G210

G211

G222



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
1	19/10/2016	COMPLETE SURVEY	EW	PS	MW	PM
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Drawing Status: **DRAFT**



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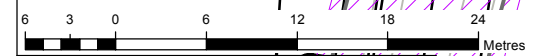
Scheme Title: **M11 JUNCTION 7A**

Drawing Title: **TREE CONSTRAINTS PLAN SHEET 35 OF 37**

DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
EW	EW	PS	MW	SK
DATE	DATE	DATE	DATE	DATE
OCT16	OCT16	OCT16	OCT16	OCT16

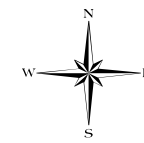
DRAWING UNITS U.N.O. SCALE AT A3 (420 x 297 mm) **1:500**

DRAWING NO. **B3553F05/LE/01** REV. **1**



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**Notes**

1. Do not scale

**Key**

- Group category A
- Group category B
- Group category C
- Tree category A
- Tree category B
- Tree category C
- Root protection area
- Design Iteration 1 PCF Stage 3

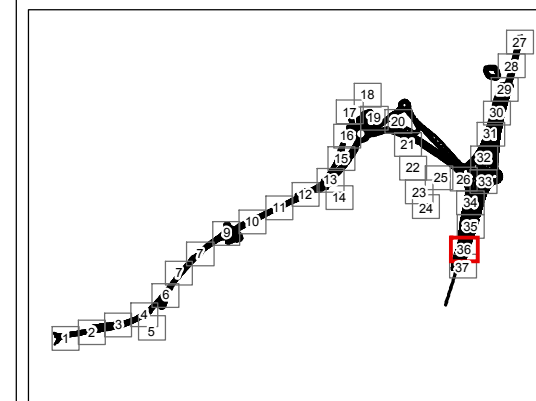
G181

G212

G180

G212

W213



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
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Drawing Status: **DRAFT**



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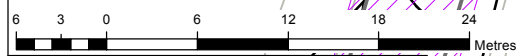
Scheme Title: **M11 JUNCTION 7A**

Drawing Title: **TREE CONSTRAINTS PLAN SHEET 36 OF 37**

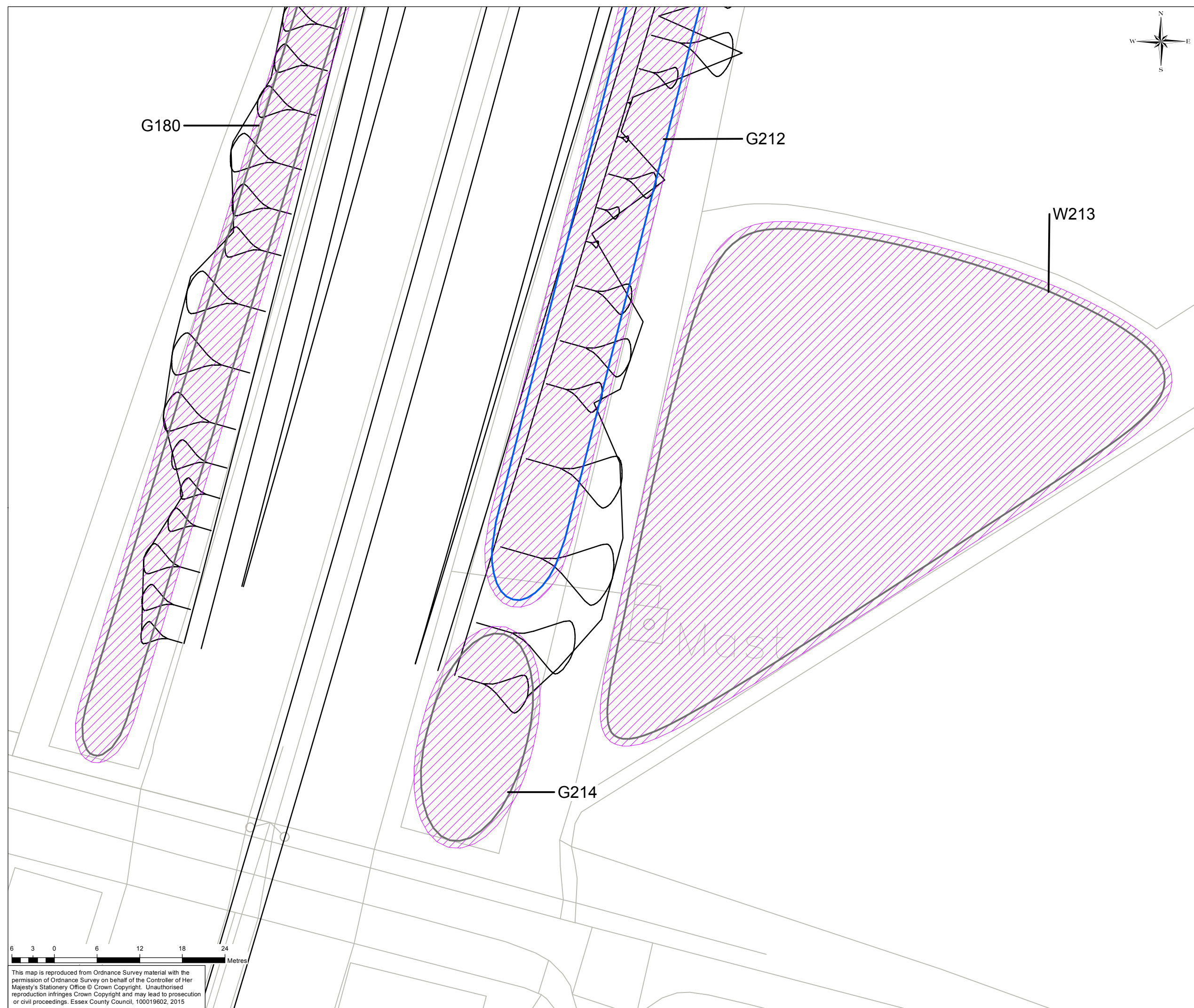
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EW	EW	PS	MW	SK
DATE	DATE	DATE	DATE	DATE
OCT16	OCT16	OCT16	OCT16	OCT16

DRAWING UNITS U.N.O. SCALE AT A3 (420 x 297 mm) **1:500**

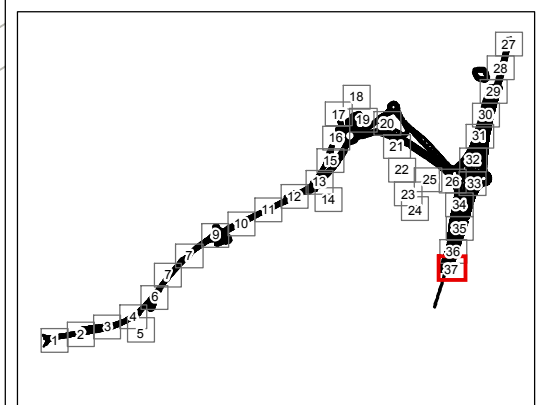
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- Notes**
- Do not scale
- Key**
- Group category A
  - Group category B
  - Group category C
  - Tree category A
  - Tree category B
  - Tree category C
  - Root protection area
  - Design Iteration 1 PCF Stage 3



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OCT16	OCT16	OCT16	OCT16	OCT16

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## APPENDIX E – AIA Summary Tables

AIA Table of impacts (Trees)					
BS5837:2012 grades	Removals	Partial Removals	Encroached	No Impacts	SUB TOTALS
A	4	0	12	8	24
B	19	0	10	19	48
C	12	1	6	13	32
U	10	0	0	5	15
SUB TOTALS	47	1	27	44	<b>119</b>

AIA Table of impacts (Tree Groups)					
BS5837:2012 grades	Removals	Partial Removals	Encroached	No Impacts	SUB TOTALS
A	3	2	2	8	15
B	14	7	10	18	49
C	21	4	7	11	43
U	7	1	0	2	10
SUB TOTALS	45	13	19	40	<b>117</b>

AIA Table of impacts (Woodlands)					
BS5837:2012 grades	Removals	Partial Removals	Encroached	No Impacts	SUB TOTALS
A	0	3	1	5	9
B	0	3	2	1	6
C	0	0	0	1	1
U	0	0	0	0	0
SUB TOTALS	0	6	2	8	<b>16</b>

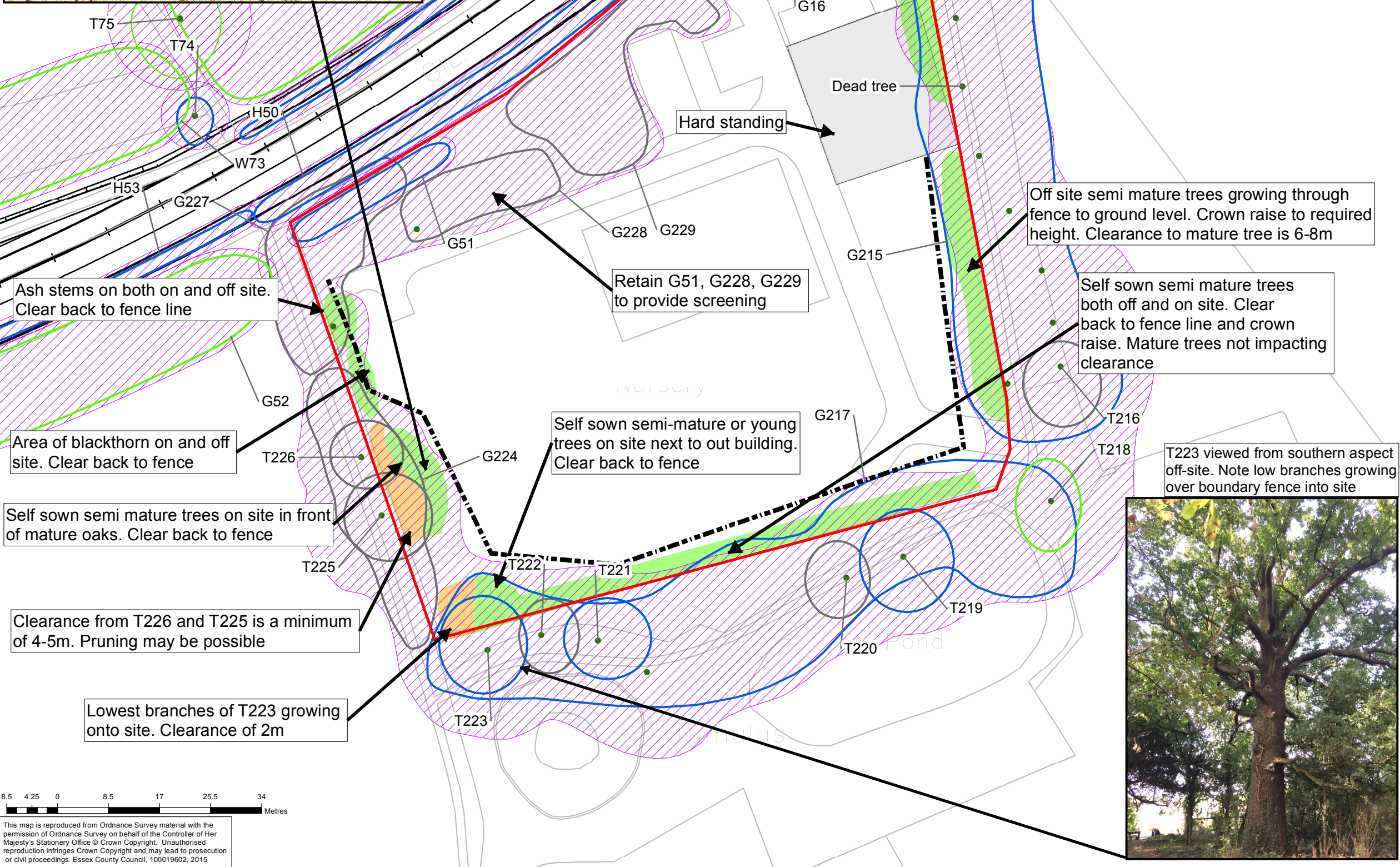
AIA Table of impacts (Hedges)					
BS5837:2012 grades	Removals	Partial Removals	Encroached	No Impacts	SUB TOTALS
A	0	0	0	0	0
B	4	4	2	3	13
C	1	0	0	1	2
U	2	0	0	0	2
SUB TOTALS	7	4	2	4	<b>17</b>

NB – results in this table refer to the scheme proposals as supplied for revision 3 of the tree report (20/9/2016). Any further alterations in the scheme design will affect the figures given in this table.



## **APPENDIX F – Tree Constraints Plan and Mitigation Measures for Phase 1 Site Compound**





- Notes**
- Do not scale
- Key**
- Design Iteration 1 PCF Stage 3
  - Compound site boundary
  - L-Group category A
  - L-Group category B
  - L-Group category C
  - L-Tree category A
  - L-Tree category B
  - L-Tree category C
  - L-RPA
  - Indicative extents of cell web installation
  - Areas for clearance or pruning
  - Areas for working under low clearance
  - Hard standing



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Drawing Status: DRAFT

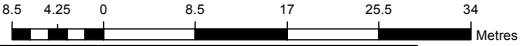
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Scheme Title: M11 JUNCTION 7A

Drawing Title: TREE CONSTRAINTS PLAN AND MITIGATION MEASURES FOR PHASE 1 SITE COMPOUND

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		1:700		
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## **Appendix 8.1: Legislative Compliance Report**





## M11 Junction 7a

Essex County Council

### Legislative Compliance Report

B3553F05-3000-REP-0040 | 0

December 2016

#### Document history and status

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## 1. Introduction

This report sets out an overview of the protected and controlled species present in the vicinity of the Proposed Scheme alongside the legislation that would be at risk of being breached. The report then sets out the approach that would be taken when implementing the Proposed Scheme, in order to avoid committing offences.

The report considers species that are protected or controlled by UK law, but it does not constitute legal advice.

The following legislation has been considered:

- Conservation of Habitats and Species Regulations 2010 (as amended);
- Wildlife and Countryside Act 1981 (as amended);
- Protection of Badgers Act 1992; and,
- Environmental Protection Act 1990.

## 2. Methodology

The legislation under which species are protected or controlled has been reviewed to identify the potential for offences arising from the Proposed Scheme from being committed.

The protected and controlled species relevant to the Proposed Scheme have been identified through a review of the ecological baseline information collated.

The ecological baseline information is based on a desk-based study, which included consultation with Essex Wildlife Trust, Essex Ecology Services Ltd. (EECOS), Harlow District Council, Essex County Council, Natural England (NE), Environment Agency (EA), and ecological survey work undertaken by Jacobs. The results of the desk study, ecological surveys and consultations form the basis of the detailed Ecological Impact Assessment (EclA) presented in Chapter 8 of the ES.

The mitigation to avoid offences being committed (or required to secure a derogation licence) over and above the mitigation proposed to prevent likely significant effects are then described.

### 3. Species/ Habitats and Applicable Legislation

Table 3.1 sets out the relevant legislation and potential offences that could occur as a result of the proposed Scheme.

Offences considered in this report are only those that could occur as a result of the Proposed Scheme. Offences relating to cruelty, possession, transport, sale and certain methods for capturing/ taking and killing have not been considered as such activities are not required for the implementation of the proposals and, therefore, any such offence committed would be the personal liability of the individual concerned and not the proponent of the Proposed Scheme (Essex County Council).

For species protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), there is no provision for derogation and no licence can be issued (as is the case for species protected by the Conservation of Habitats and Species Regulations 2010 (as amended)). The Act says that, if it can be shown that the potentially unlawful act was the incidental result of a lawful operation and could not reasonably have been avoided, no offence will have been committed. To demonstrate that potential offences have been avoided as far as is reasonable, a Method Statement should be prepared and agreed with NE if deemed appropriate prior to the commencement of works.

All wild plants are protected under the Wildlife and Countryside Act 1981 (as amended) from unauthorised removal. As vegetation clearance for the Proposed Scheme would be a lawful operation, authorised by the proponent and land owner this legislation does not apply.

The Hedgerow Regulations (1997) do not apply as the Proposed Scheme would only be taken forward if Orders under the Highways Act were made by the Secretary of State, meaning any hedgerow removal would be considered to be permitted work under regulation 6(1)(h) of the Hedgerow Regulations (1997).

In relation to the offence of introducing new species to the wild, the disposal of waste from controlled species such as Himalayan Balsam (*Impatiens glandulifera*) falls under the Environmental Protection Act 1990.



Table 3.1 : Legislation and potential offences that could occur as a result of the proposed Scheme

General Descriptor	Conservation of Habitats and Species Regulations 2010 (as amended)	Wildlife and Countryside Act 1981 (as amended)	Protection of Badgers Act 1992
Capturing, killing, and injuring.	To deliberately capture, injure or kill any wild animal of a European Protected Species (EPS) (Reg41(1)(a)).	To intentionally kill, injure or take any wild bird (s1(1)). To intentionally kill, injure or take any wild animal included in Schedule 5 (s9(1)).	To wilfully kill, injure or take, or attempt to kill, injure or take a badger (s1(1)).
Disturbing (affecting ability to survive, breed or rear young).	To deliberately disturb wild animals of a EPS [note wherever they are occurring] (Reg41(1)(b)) Reg 41(2)(a)(i) For the purposes of Reg 41(1)(b), disturbance of animals includes in particular any disturbance likely to impair their ability to survive, to breed or reproduce, or to rear or nurture their young.	-	-
Disturbing (impairing ability to migrate or hibernate).	To deliberately disturb wild animals of an EPS [note wherever they are occurring] (Reg41(1)(b)) Reg 41(2)(a)(ii) For the purposes of Reg 41(1)(b), disturbance of animals includes in particular any disturbance which is likely to impair their ability, in the case of animals of a hibernating or migratory species, to hibernate or migrate.	-	-
Disturbing (affecting local distribution or abundance).	To deliberately disturb wild animals of an EPS [note wherever they are occurring] (Reg41(1)(b)) Reg 41(2)(b) For the purposes of Reg 41(1)(b), disturbance of animals includes in particular any disturbance likely to affect significantly the local distribution or	-	-

General Descriptor	Conservation of Habitats and Species Regulations 2010 (as amended)	Wildlife and Countryside Act 1981 (as amended)	Protection of Badgers Act 1992
	abundance of the species to which they belong.		
Disturbance (whilst occupying a structure or place used for shelter or protection).	-	To intentionally or recklessly disturb any wild bird included in Schedule 1 while it is building a nest or is in, on or near a nest containing eggs or young; or disturbs dependent young of such a bird (s1(5)). To intentionally or recklessly disturb any wild Schedule 5 animal while it is occupying a structure or place which it uses for shelter or protection (s9(4)(b)).	To disturb a badger when it is occupying a badger sett (s3(e)).
Taking eggs.	To deliberately take or destroy the eggs of such a EPS (Reg 41(1)(c)).	To intentionally take or destroy an egg of any wild bird (s(1)(c)).	-
Obstructing access.	-	To intentionally or recklessly obstruct access to any structure or place which any Schedule 5 animal uses for shelter or protection (s9(4)(c)).	To obstruct access to, or any entrance of, a badger sett (s3(c)).
Damage or destruction of a breeding site or resting place.	To damage or destroy a breeding site or resting place of a EPS (Reg 41(1)(d)).	To intentionally take, damage or destroy the nest of a wild bird included in Schedule 1 (s1(1)(aa)). To intentionally take, damage or destroy the nest of any wild bird while that nest is in use or being built (s1(1)(b)). To intentionally or recklessly damage or destroy any structure or place which any wild animal specified in Schedule 5 uses for shelter or protection (s(4)(a)).	To damage a badger sett or any part of it or to destroy a badger sett (s3(a)(b)).
Introducing new species.	-	To plant or otherwise cause to grow in the wild any plant which is included in Part II	-



General Descriptor	Conservation of Habitats and Species Regulations 2010 (as amended)	Wildlife and Countryside Act 1981 (as amended)	Protection of Badgers Act 1992
		<p>of Schedule 9 (s14 (2)).                      Waste produced from management of some species would be “controlled waste” and managed accordingly under the Environmental Protection Act (s33 (1a) and (1b)).</p>	



## 4. Relevant Species/ Species Groups

The baseline data collection has recorded evidence of the following species or species groups for which the Proposed Scheme has the potential to cause offences:

- Protected species:
  - Breeding birds;
  - Bats;
  - Great crested newt (GCN) (*Triturus cristatus*);
  - Otter (*Lutra lutra*);
  - Badger (*Meles meles*); and,
  - Reptiles;
- Controlled species:
  - Himalayan balsam (*Impatiens glandulifera*).

The species and relevant legislation are set out in the subsequent sections.

## 5. Breeding Birds

### 5.1 Summary of Baseline

No birds listed on Schedule 1 of the WCA were recorded nesting within the Study Area.

Within the Link Area, 40 species of bird were recorded, including six species which are listed on Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006: dunnoek (*Prunella modularis*), house sparrow (*Passer domesticus*), skylark (*Alauda arvensis*), song thrush (*Turdus philomelos*), starling (*Sturnus vulgaris*) and yellowhammer (*Emberiza citronella*).

The Gilden Way surveys recorded 27 species of bird, including five species listed in Section 41 of the NERC Act 2006: dunnoek, house sparrow, skylark, song thrush and starling.

### 5.2 Relevant Legislation

The legislation relevant to nesting birds is as the Wildlife and Countryside Act 1981 (as amended).

### 5.3 Potential for an offence

Table 5.1 below shows the relevant legislation and potential for committing an offence with regard to birds.

Table 5.1 : Potential for an offence

Wildlife and Countryside Act 1981	Offence Likely (in absence of mitigation)
To intentionally kill, injure or take any wild bird.	No.
To intentionally or recklessly disturb any wild bird included in Schedule 1 while it is building a nest or is in, on or near a nest containing eggs or young; or disturbs dependent young of such a bird.	No, none present in Study Area.
To intentionally take, damage or destroy the nest of a wild bird included in Schedule 1.	No, none present in Study Area.
To take or destroy an egg of any wild bird.	No - site clearance programmed to be undertaken outside the main breeding season (considered to be March to August).
To intentionally take, damage or destroy the nest of any wild bird while that nest is in use or being built.	No – see above.

### 5.4 Activities potentially causing an offence

The current programme has been designed to avoid the removal of bird nesting habitat (vegetation), during the breeding season. However, it is acknowledged that programmes can slip, and therefore, should the timetable require that vegetation clearance be undertaken within the breeding season, the approach set out below would be adopted.

### 5.5 Proposed approach

#### 5.5.1 Provision and implementation of management plans, method statements and protocols

A Construction Method Statement would be produced including a section relating to breeding birds identifying/demonstrating how damage or disturbance to bird nests would be avoided.

### **5.5.2 Protection of Habitats and Features**

The areas of vegetation to be cleared each day would be walked by a suitably qualified and experienced ecologist or Ecological Clerk of Works (ECoW) prior to the arrival on site of clearance contractors to avoid the risk of disturbance to birds from excessive movement of vehicles/ people or through the noise created by hand tools used during clearance works.

The ECoW would look for signs of nesting activity within the areas to be cleared: males singing; individuals carrying nesting material into these areas; and agitated behaviour during the walkover. Should any signs be identified, an immediate detailed inspection of the vegetation would be undertaken in an effort to locate any active nest(s) present.

Should a nest be identified, works in the vicinity would stop and the ECoW present would determine a suitable buffer zone around the nest within which no further clearance or other works would occur. This would be dependent on the type and density of vegetation surrounding the nest and the species present. A minimum buffer zone would be 5m from a nest but could be extended on advice from the ECoW. The buffer zone would be clearly marked using demarcation tape or fencing to ensure no works occurred within that area. These would also be marked on an Environmental Constraints map and displayed in the site office as well as being issued to all contractors on site. The ECoW would monitor activity at each nest to determine when it was no longer active (when all young had fledged the nest) and works could continue. Should there be no sign of birds nesting in an area the clearance contractor would undertake vegetation clearance.

The ECoW would be available on site should any further input/ assistance be required.

### **5.5.3 Habitat Management**

Once cleared, vegetation within the construction footprint would be maintained at ground level i.e. would not be allowed to re-grow, to ensure that the area remained unsuitable for bird nesting.

## **5.6 Conclusion**

Assuming that the measures outlined above were implemented, it is considered that the Proposed Scheme would not lead to an offence being committed.

## 6. Bats

### 6.1 Summary of Baseline

Common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), Nathusius' pipistrelle (*Pipistrellus nathusii*), *Myotis* bats (*Myotis* sp.), long-eared bat (assumed to be *Plecotus auritus* due to geographical location), noctule (*Nyctalus noctula*), big bat (a bat from either the *Nyctalus* or *Serotinus* genus that could not be identified to species level due to overlapping call characteristics) and barbastelle bat (*Barbastellus barbastellus*) were recorded within the Study Area.

Six non-breeding summer roosts, supporting low numbers of common and widespread species of bat (common pipistrelle, soprano pipistrelle, brown long-eared bat and a *Myotis* bat) were recorded. The roost recorded in a barn at Mayfield Farm Barn and a tree roost within The Mores Wood would not be affected by the Proposed Scheme, however, the remaining four roosts are in trees/ groups of trees that would be directly affected by the widening of the Gilden Way.

The greatest activity within the Link Area was recorded along the tree-lined Sheering Road, the edges of The Mores Wood, and the ponds to the south of The Mores Wood. However, with regard to *Myotis* and long-eared bats, the hedgerow / ditch leading north from The Mores Wood is the key area of activity within the site.

### 6.2 Relevant Legislation

Legislation that is relevant to bats is as follows:

- Wildlife and Countryside Act 1981 (as amended), Schedule 5; and,
- Conservation of Habitats and Species Regulations 2010 (as amended).

### 6.3 Potential for an Offence

Table 6.1 below shows the relevant legislation and potential for committing an offence with regard to bats

Table 6.1 : Potential for an offence

Conservation of Habitats and Species Regulations 2010 (as amended)	Wildlife and Countryside Act 1981 (as amended)	Offence Likely (in absence of mitigation / derogation licence)
To deliberately capture, injure or kill any wild animal of an EPS (Reg41(1)(a)).	Intentionally kills, injures or takes any wild animal included in Schedule 5 (s9(1)).	If bats are present within trees directly impacted by the Proposed Scheme at the time of felling.
To deliberately disturb wild animals of a EPS [note wherever they are occurring] (Reg41(1)(b)). Reg 41(2)(a)(i) For the purposes of Reg 41(1)(b), disturbance of animals includes in particular any disturbance likely to impair their ability to survive, to breed or reproduce, or to rear or nurture their young.	-	If bats are present within trees impacted by the proposed Scheme at the time of felling there is a risk that they could be killed (impaired ability to survive).  No maternity roosts or swarming/ mating sites were recorded, therefore no offences in relation to impairment of ability to breed, reproduce, or rear or nurture young would be likely to be committed.



Conservation of Habitats and Species Regulations 2010 (as amended)	Wildlife and Countryside Act 1981 (as amended)	Offence Likely (in absence of mitigation / derogation licence)
<p>To deliberately disturb wild animals of a EPS [note wherever they are occurring] (Reg41(1)(b)).</p> <p>Reg 41(2)(a)(ii) For the purposes of Reg 41(1)(b), disturbance of animals includes in particular any disturbance likely to impair their ability, in the case of animals of a hibernating or migratory species, to hibernate or migrate.</p>	-	If hibernating bats present within trees directly impacted by the Scheme at the time of felling.
<p>To deliberately disturb wild animals of a EPS [note wherever they are occurring] (Reg41(1)(b)).</p> <p>Reg 41(2)(b) For the purposes of Reg 41(1)(b), disturbance of animals includes in particular any disturbance likely to affect significantly the local distribution or abundance of the species to which they belong.</p>	-	No. With respect to distribution - no species recorded as roosting was at the edge of their range, and there are abundant alternative roost sites in the local area. With respect to species abundance, only low numbers of common and widespread bats were recorded, therefore, the loss of these bats would be unlikely to significantly affect the size of the local population.
-	To intentionally or recklessly disturb any Schedule 5 wild animal while it is occupying a structure or place which it uses for shelter or protection (s9(4)(b)).	If bats present within trees directly impacted by the Scheme at the time of felling.
-	To intentionally or recklessly obstruct access to any structure or place which any Schedule 5 wild animal uses for shelter or protection (s9(4)(c)).	Street lighting and traffic on the link roads could act as a barrier to movement for light-shy and low-flying bats, and obstruct access to roosts within The Mores Wood from the north.
To damage or destroy a breeding site or resting place of a wild animal of an EPS (Reg 41(1)(d)).	Intentionally or recklessly damages or destroys any structure or place which any wild animal specified in Schedule 5 uses for shelter or protection (s(4)(a)).	Yes – the Proposed Scheme requires the removal of four trees recorded as bat roosts.

## 6.4 Activities Potentially Causing an Offence

The removal of bat roost trees is the primary activity with the potential to cause offences, namely that the action is itself illegal (without an EPS licence), and that if bats were present at the time of felling, this could lead to the disturbance of bats and, in a worst case scenario, the injury or killing of bats.

Street lighting along the link roads has the potential to obstruct bats from accessing roost within trees in The Mores Wood. The traffic along the link road would be likely to create at least a partial barrier to movements, and could also be considered to be an obstruction.

## **6.5 Provision and Implementation of Management Plans, Method Statements and Protocols**

### **6.5.1 EPS Licence**

An EPS licence application for the removal of the tree roosts, would be accompanied by Method Statements outlining the work to be undertaken. These would be adhered to to safeguard any bats on site during the works. If applicable, the method for a pre-works check and, if necessary, capture and exclusion of bats from the roost(s) prior to felling would be detailed in the bat licence Method Statement. It would include timings and weather conditions during which exclusion work would be carried out.

A licensed ecologist would be present to undertake any exclusion works required as specified in the licence and supervise the felling works.

### **6.5.2 Specified Standards**

If required, sympathetic tree felling techniques (soft felling) would be employed and these would be agreed in advance of the works in consultation between the contractor and bat ecologist. Tree felling would be timed to avoid the hibernation season.

### **6.5.3 Trapping Translocation and Exclusion**

Trees would be subject to a pre-works climb or survey to establish if bats were present. Where present, bats would be excluded from roosts prior to felling of the trees. Methods would follow best practice guidelines (Mitchell-Jones and McLeish, 2004) as defined within the Method Statement of the EPS development licence.

The method for capturing and excluding bats would include a contingency plan for dealing with injured bats and/or those found unexpectedly during the works.

### **6.5.4 Habitat (and feature) Creation**

Prior to clearance of habitats, bat boxes would be provided throughout retained woodland and trees within the proposed Scheme to offset the loss of potential roost features in the short-term. A minimum of three bat boxes would be provided for every high potential and confirmed tree roost lost. A range of woodcrete maternity boxes, hibernation boxes and boxes designed for crevice dwelling species would be used.

### **6.5.5 Monitoring**

Bats would be monitored in line with the EPS licence conditions.

### **6.5.6 Reporting**

An EPS development licence return would be submitted to NE following completion of the works, including results of monitoring.

### **6.5.7 Underpass and Hop-over Creation**

To prevent intentional or reckless obstruction of the roosts within The Mores Wood, from the habitat to the north, underpasses and hop-overs have been designed into the link road. The success of these measures would be assessed on an on-going basis through monitoring.

## **6.6 Conclusion**

If the measures set out above were to be implemented, it is considered that no offence with regard to bats would be committed.

## 7. Great Crested Newts

### 7.1 Summary of Baseline

A medium size class for GCN was recorded within the pond in the Gilden Way Meadow Local Wildlife Site (LWS). No GCN were recorded within any other pond within the Study Area.

Other common species of amphibians were also recorded. It is considered that measures presented for GCN would prevent offences in relation to common amphibians and therefore this group are not discussed further.

### 7.2 Relevant Legislation

Legislation that is relevant to GCN is as follows:

- Wildlife and Countryside Act 1981 (as amended), Schedule 5; and,
- Conservation of Habitats and Species Regulations 2010 (as amended).

### 7.3 Potential for an Offence

Table 7.1 below shows the relevant legislation and potential for committing an offence with regard to GCN.

Table 7.1 : Potential for an offence

Conservation of Habitats and Species Regulations 2010	Wildlife and Countryside Act 1981	Offence Likely (in absence of mitigation)
To deliberately capture, injure or kill any wild animal of an EPS (Reg41(1)(a)).	To intentionally kill, injure or take any wild animal included in Schedule 5 (s9(1)).	Yes – during vegetation clearance, soil strip and construction of areas within 250m of the GCN pond.
To deliberately disturb wild animals of an EPS [note wherever they are occurring] (Reg41(1)(b)). Reg 41(2)(a)(i) For the purposes of Reg 41(1)(b), disturbance of animals includes in particular any disturbance likely to impair their ability to survive, to breed or reproduce, or to rear or nurture their young.	-	Yes – risk of killing or injury of GCN during works within 250m of the GCN pond, however no disturbance likely to impair ability to breed or reproduce. GCN do not rear/ nurture their young.
To deliberately disturb wild animals of an EPS [note wherever they are occurring] (Reg41(1)(b)). Reg 41(2)(a)(ii) For the purposes of Reg 41(1)(b), disturbance of animals includes in particular any disturbance likely to impair their ability, in the case of animals of a hibernating or migratory species, to hibernate or migrate.	-	No – no ground works proposed during hibernation season. GCN do not migrate in the sense intended by the legislation.

Conservation of Habitats and Species Regulations 2010	Wildlife and Countryside Act 1981	Offence Likely (in absence of mitigation)
To deliberately disturb wild animals of an EPS [note wherever they are occurring] (Reg41(1)(b)). Reg 41(2)(b) For the purposes of Reg 41(1)(b), disturbance of animals includes in particular any disturbance likely to affect significantly the local distribution or abundance of the species to which they belong.	-	No – no loss of GCN pond proposed and no permanent loss of terrestrial habitat. New habitats (drainage ponds, ditches, hedgerows, grassland) would benefit the local population.
-	To intentionally or recklessly disturb any wild schedule 5 animal whilst occupying a structure or place which it uses for shelter or protection (s9(4)(b)).	Yes – during vegetation clearance, soil strip and construction of areas within 250m of the GCN pond.
-	To intentionally or recklessly obstruct access to any structure or place which any Schedule 5 animal uses for shelter or protection (s9(4)(c)).	Yes – terrestrial habitat only, during vegetation clearance, soil strip and construction of areas within 250m of the GCN pond.
To damage or destroy a breeding site or resting place of a wild animal of a EPS (Reg 41(1)(d)).	To intentionally or recklessly damage or destroy any structure or place which any wild animal specified in Schedule 5 uses for shelter or protection (s(4)(a)).	Yes – terrestrial habitat only, during vegetation clearance, soil strip and construction of areas within 250m of the GCN pond.

## 7.4 Activities Potentially Causing an Offence

The removal of vegetation and soil stripping has the potential to cause offences. Such work would be illegal (without an EPS licence) if it affected terrestrial shelter sites and hibernacula. Additionally, if GCN were present within the works area, there would be a risk of disturbance of GCN and, in a worst case scenario, the injury or killing of GCN.

## 7.5 Provision and Implementation of Management Plans, Method Statements and Protocols

### 7.5.1 EPS Licence

An EPS licence would be secured prior to the start of construction. The licence would include a Method Statement, developed to ensure the protection of GCN, including the temporary exclusion of GCN from the Phase 1 compound and the trapping and relocation of GCN to the Gilden Way Meadow LWS.

### 7.5.2 Exclusion, Trapping and Translocation

Temporary GCN exclusion fencing would be erected along the Scheme boundary within 250m of the GCN pond within the Gilden Way Meadow LWS. Pitfall traps and carpet tiles would be installed every 5m along the works side of the exclusion fence, and carpet tiles would be placed at a density of 80/ ha within areas of suitable terrestrial habitat on the works side of the fence and within a 250m radius of the GCN pond. Those areas of habitat within 250m of the GCN pond, but separated from it by the Gilden Way, would not be subject to trapping given the presence of this partial barrier to dispersal. Beyond 250m from the GCN pond, the risk of

encountering GCN is considered to be minimal and would be captured by the presence of an ECOW during the works.

The pitfall traps and carpet tiles would be checked daily before 11:00 am, or earlier after periods of heavy rainfall or dry weather by a suitably qualified, experienced and licenced ecologist. All captures would be recorded with notes on location, species, sex and life-stage. All amphibians captured would be moved in buckets to the Gilden Way Meadow LWS and released into suitable habitat (piles of logs and dense scrub) as soon as possible.

The trapping exercise would be undertaken in combination with habitat manipulation techniques for a period of 60 days, in line with English Nature (2001) Guidelines. However, a mechanism would be in place within the licence to enable the area to be announced clear of GCN should an agreed number of days (usually seven) pass with no GCN trapped. Pitfall traps would be immediately removed and the holes backfilled.

When all works, including landscaping, were completed within 250m of the Gilden Way Meadow LWS, the fences would be removed and GCN would then be free to naturally recolonize the areas.

### **7.5.3 Monitoring**

GCN would be monitored in line with the EPS licence conditions.

### **7.5.4 Reporting**

An EPS development licence return would be submitted to NE following completion of the works, including results of monitoring.

## **7.6 Conclusion**

If the measures set out above are implemented, it is considered that no offence with regard to GCN would be committed.

## 8. Otter

### 8.1 Summary of Baseline

A single otter spraint was recorded on the Pincey Brook in 2014. Dense vegetation prevented a comprehensive survey in 2014 and again in 2016, and so the presence of holts or couches along this watercourse could not be completely ruled out.

### 8.2 Relevant Legislation

Legislation that is relevant to otter is as follows:

- Wildlife and Countryside Act 1981 (as amended), Schedule 5; and,
- Conservation of Habitats and Species Regulations 2010 (as amended).

### 8.3 Potential for an Offence

Table 8.1 below shows the relevant legislation and potential for committing an offence with regard to otter.

Table 8.1 : Potential for an offence

Conservation of Habitats and Species Regulations 2010	Wildlife and Countryside Act 1981	Offence Likely (in absence of mitigation)
To deliberately capture, injure or kill any wild animal of an EPS (Reg41(1)(a)).	To intentionally kill, injure or take any wild animal included in Schedule 5 (s9(1)).	No.
To deliberately disturb wild animals of an EPS [note wherever they are occurring] (Reg41(1)(b)). Reg 41(2)(a)(i) For the purposes of Reg 41(1)(b), disturbance of animals includes in particular any disturbance likely to impair their ability to survive, to breed or reproduce, or to rear or nurture their young.	-	Yes - during construction if an active natal holt were to be encountered within 30m of the Scheme footprint.
To deliberately disturb wild animals of an EPS [note wherever they are occurring] (Reg41(1)(b)). Reg 41(2)(a)(ii) For the purposes of Reg 41(1)(b), disturbance of animals includes in particular any disturbance likely to impair their ability, in the case of animals of a hibernating or migratory species, to hibernate or migrate.	-	No.
To deliberately disturb wild animals of an EPS [note wherever they are occurring] (Reg41(1)(b)). Reg 41(2)(b) For the purposes of Reg 41(1)(b), disturbance of animals includes in particular any disturbance likely to affect significantly the local distribution or abundance of the species to which they belong.	-	No.



Conservation of Habitats and Species Regulations 2010	Wildlife and Countryside Act 1981	Offence Likely (in absence of mitigation)
-	To intentionally or recklessly disturb any wild animal listed on Schedule 5 whilst occupying a structure or place used for shelter or protection (s9(4)(b)).	Yes - during construction if an active otter holt or couch were to be encountered within 30m of the Scheme footprint.
-	To intentionally or recklessly obstruct access to any structure or place which any animal listed on Schedule 5 used for shelter or protection (s9(4)(c)).	Yes - during construction if an active otter holt or couch were to be encountered within 30m of the Scheme footprint.
To damage or destroy a breeding site or resting place of a wild animal of a EPS (Reg 41(1)(d)).	To intentionally or recklessly damage or destroy any structure or place which any wild animal listed on Schedule 5 used for shelter or protection (S9(4)(a)).	No.

## 8.4 Activities Potentially Causing an Offence

The construction of the Scheme would involve some vegetation clearance and road construction near to Pincey Brook where it passes under Sheering Road Bridge. No direct impacts upon bankside vegetation would be expected. However the noise and light disturbance generated by the works could impact upon otters commuting along the Pincey Brook to access holts or couches, or if a holt is present within 30m of Sheering Road Bridge.

## 8.5 Proposed Approach

### 8.5.1 Pre-construction Surveys and Assessments

Otter surveys would be carried out in advance of any site clearance works. This could involve boat-based surveys to gain access to all bankside areas. If any holts or couches were to be discovered within 30m of the Scheme, they would be assessed to consider whether they would need to be closed under licence from the NE. To minimise risks to the construction programme, the surveys and any subsequent mitigation work would be scheduled at least 12 weeks in advance of works to enable an EPS development licence to be secured, if required.

### 8.5.2 Consents and Licences

If otter holts or couches were to be encountered within 30m of the Scheme boundary prior to or during construction, an EPS development licence would be secured if required.

### 8.5.3 Provision and Implementation of Management Plans, Method Statements and Protocols

Working protocols during construction would ensure that construction lighting and activities were minimised at night and that an undisturbed route of passage along watercourses was maintained through the provision of acoustic fencing following the watercourse, designed also to prevent light-spill onto watercourses.

The Construction Method Statement would contain a section developed to ensure the protection of otters and to specify actions necessary to secure a development licence from NE, if required. An emergency response

protocol to set out the appropriate course of action in the unlikely event of a water pollution incident would also be produced.

#### **8.5.4 Habitat Creation**

If an otter holt were to be lost to the Proposed Scheme an artificial alternative would be provided on the same watercourse outside the footprint prior to its loss.

#### **8.5.5 Monitoring**

Otters would be monitored in line with any EPS development licence conditions.

#### **8.5.6 Reporting**

An EPS development licence return would be submitted to NE following completion of the works, including results of monitoring.

### **8.6 Conclusion**

If the measures set out above were to be implemented, it is considered that no offence with regard to otter would be committed.

## 9. Badger

### 9.1 Summary of Baseline

Badger setts were recorded within The Mores Wood and in close proximity to the Proposed Scheme boundary to the east of the M11. Throughout 2014 and 2015, the distribution of active badger setts changed across the Link Area. No active setts were found along the Gilden Way.

### 9.2 Relevant Legislation

Legislation relevant to badger is The Protection of Badgers Act 1992.

### 9.3 Potential for an Offence

Table 9.1 below shows the relevant legislation and potential for committing an offence with regard to badgers.

Table 9.1 : Potential for an offence

Protection of Badgers Act 1992	Offence likely (in absence of mitigation)
To wilfully kill, injure or take, or attempt to kill, injure or take a badger (s1(1)).	Yes – but only if active sett entrances present within 30 m of Scheme boundary.
To disturb a badger when it is occupying a badger sett (s3(e)).	Yes – but only if active sett entrances present within 30 m of Scheme boundary.
To obstruct access to, or any entrance of, a badger sett (s3(c)).	Yes – but only if active sett entrances present within 30 m of Scheme boundary.
To damage a badger sett or any part of it or to destroy a badger sett (s3(a)(b)).	Yes – but only if active sett entrances present within 30 m of Scheme boundary.

### 9.4 Activities Potentially Causing an Offence

Based on the existing data, no setts would be lost, damaged or disturbed. As such, no offence would be committed. However, the distribution of active badger setts across the Proposed Scheme has changed from year-to-year and so the absence of active setts within 30m of the Scheme boundary could not be guaranteed into the future.

### 9.5 Proposed Approach

#### 9.5.1 Pre-construction Surveys and Assessments

Badger surveys would be carried out in advance of any site clearance works. A pre-construction survey within 50 m of the Scheme boundary would be carried out immediately prior to the start of site clearance in order to identify whether new badger setts have been dug in the area.

Any active sett identified in pre-construction surveys, or during construction would be assessed as to whether it is within 30 m of works requiring the use of machinery. Any works within 30 m of an active sett would then be assessed as potentially causing an offence and mitigation and/ or licensing would be implemented as appropriate.

#### 9.5.2 Provision and Implementation of Management Plans, Method Statements and Protocols

If an active badger sett(s) is identified, a Method Statement would be developed to ensure the protection of badgers and their setts and to specify the actions necessary to secure a licence to disturb a badger sett.

### **9.5.3 Consents and Licences**

If an active badger sett is discovered within 30 m of an area required for construction during the pre-construction survey or construction period, work would not proceed or would cease in that area until a licence had been obtained from NE under the Protection of Badgers Act (1992), to permit sett exclusion.

Badger licences are normally only granted for exclusions between July and November, which would be incorporated into construction phase work scheduling. If a main sett was to be closed, a compensatory sett would be built prior to that sett being closed, along with evidence of use of the compensatory sett.

The procedure for excluding badgers from a sett would be supervised by an ecologist named on the licence.

### **9.5.4 Trapping, Translocation and Exclusion**

The following method would be followed if a badger sett was to be subsequently established within 30 m of the area required for construction prior to the start of works:

- All active sett entrances would be fitted with badger gates, using the designs shown in Design Manual for Roads and Bridges (DMRB) Volume 10 Part 4;
- The gates would be kept open for two weeks, and then allowed to swing freely for a further two weeks; and then set to one way to effect exclusion; and,
- The sett would then be excavated under the supervision of the licenced ecologist. The excavation would be conducted to avoid collapsing any chambers within the sett because of the possibility of badgers remaining undetected. If any badgers were disturbed, all work would cease to allow any badgers to leave the area without interference.

### **9.5.5 Monitoring**

Any active sett identified would be monitored throughout the exclusion process and considered empty only when the one way gates were in place and there were no indications of badger activity within the fence for two weeks.

## **9.6 Conclusion**

The Scheme proposals would mean that commitments and actions would not result in an offence being committed with regard to badgers.

## 10. Reptiles

### 10.1 Summary of Baseline

Small populations of common lizard (*Zootoca vivipara*) and grass snake (*Natrix natrix*) were recorded within the Scheme boundary.

### 10.2 Relevant Legislation

Legislation relevant to reptiles is Wildlife and Countryside Act 1981 (as amended) only part of sub-section 9(1) (killing & injuring).

### 10.3 Potential for an Offence

Table 10.1 below shows the relevant legislation and potential for committing an offence with regard to reptiles.

Figure 10.1 : Potential for an offence

Wildlife and Countryside Act 1981	Offence Likely Without Mitigation
To intentionally kill, injure or take any wild animal included in Schedule 5 (s9(1)).	Yes – during site clearance phase.

### 10.4 Activities Potentially Causing an Offence

It is likely that low numbers of reptiles would be present in the verges, field margins and embankments affected by the Proposed Scheme. Site clearance could, therefore, kill or injure reptiles, resulting in an offence being committed.

### 10.5 Proposed Approach

#### 10.5.1 Provision and Implementation of Management Plans, Method Statements and Protocols

The Construction Method Statement would contain a section developed to ensure the protection of reptiles and to specify the actions necessary to avoid killing or injuring them.

#### 10.5.2 Habitat Enhancement

Where sufficient suitable habitat required for displacement or translocation did not exist close to site clearance, habitat enhancements including the creation of hibernation features, such as log piles and artificial hibernacula, would be carried out within retained vegetation and mitigation areas to increase carrying capacity of the receptor sites.

#### 10.5.3 Habitat Management

The approach to reptile mitigation would be displacement undertaken within suitable seasonal constraints, i.e. during the active season (generally taken as April to October). Habitat manipulation would be utilised to displace reptiles from an area subject to clearance into an adjacent undisturbed habitat. This would be achieved by cutting and clearance of vegetation in stages towards the direction of the receptor area. Vegetation to be cleared would first be cut with hand tools (for example using strimmers/ brushcutters and chainsaws), with cut material being removed from the site and the remaining habitat cleared with machinery. This would be undertaken under the supervision of a suitably qualified ecologist.

Where potential refugia/ hibernacula are identified within the construction footprint and their destruction could not be avoided, these would be dismantled by hand by the on-site ecologist under suitable weather conditions.

## 10.6 Conclusion

Through the commitments and actions undertaken no offence being would be committed with regard to reptiles.



## 11. Himalayan Balsam

### 11.1 Summary of Baseline

A stand of Himalayan balsam was recorded within the area to be used for the Phase 1 construction compound.

No other controlled species were recorded within the Scheme boundary.

### 11.2 Relevant Legislation

Legislation relevant to Himalayan balsam is as follows:

- Wildlife and Countryside Act 1981 (as amended) – Schedule 9; and,
- Environmental Protection Act 1990.

### 11.3 Potential for an Offence

Table 11.1 below shows the relevant legislation and potential for committing an offence with regard to controlled species.

Table 11.1 : Controlled species – relevant legislation and potential for an offence

Wildlife and Countryside Act 1981	Environmental Protection Act 1990	Offence Likely (in absence of mitigation)
To plant or otherwise cause to grow in the wild any plant which is included in Part II of Schedule 9 (s14 (2)).	-	Yes, by spread of existing plants in footprint or importation of plants from outside proposed Scheme.
Section 33 (1a) and (1b). These create offences to do with the deposit, treating, keeping or disposing of controlled waste without a permit. Section 33 (1)(c) makes it an offence to keep, treat or dispose of controlled waste in a manner likely to cause pollution of the environment.	(a) To deposit controlled waste or extractive waste, or knowingly cause or knowingly permit controlled waste or extractive waste to be deposited in or on any land unless an environmental permit authorising the deposit is in force and the deposit is in accordance with the licence. (b) submit controlled waste, or knowingly cause or knowingly permit controlled waste to be submitted, to any listed operation (other than an operation within subsection (1)(a)) that - (i) is carried out in or on any land, or by means of any mobile plant, and (ii) is not carried out under and in accordance with an environmental permit. (c) treat, keep or dispose of controlled waste or extractive waste in a manner likely to cause pollution of the environment or harm to human health.	Yes, by management and disposal of existing plants cleared from site.

### 11.4 Activities Potentially Causing an Offence

Site clearance and/ or inappropriate disposal could lead to the spread of invasive species.

## **11.5 Proposed Approach**

### **11.5.1 Provision and Implementation of Management Plans, Method Statements and Protocols**

A Method Statement detailing control and, if possible, eradication methods of the invasive species present would be produced, using best practice guidance publications for example Managing Invasive Non-native Plants (Environment Agency, 2010).

### **11.5.2 Protection of Habitats and Features**

All areas of controlled species would be fenced and/ or clearly marked with hazard warning tape and the Method Statement adhered to throughout the works.

### **11.5.3 Consents and Licences**

A waste licence would be secured to remove any soil contaminated with Himalayan balsam. Disposal of the soil would only be permitted at landfill sites licensed to receive hazardous waste of this type. It could be possible to bury the material on site under a Method Statement agreed with NE.

### **11.5.4 Pre-construction Surveys**

Pre-construction surveys would be undertaken to record the location and extent of controlled species, such as Himalayan balsam within the footprint of the Proposed Scheme immediately prior to the start of works. An assessment of control measures required, including waste disposal, would then be made.

### **11.5.5 Monitoring**

An ECoW would be employed to ensure that the implementation of the appropriate control measures were undertaken during construction. Post construction monitoring would be undertaken to confirm that non-native invasive species had not spread as a result of the Proposed Scheme.

### **11.5.6 Reporting**

An ecological monitoring report would be produced annually during construction and for a specified period post-construction to provide a review of the monitoring results and recommendations for remedial action if required.

## **11.6 Conclusion**

Commitments and actions undertaken for the Proposed Scheme would result in no offence being committed with regard to controlled species.

## 12. References

Design Manual for Roads and Bridges (DMRB) Volume 10 Part 4

English Nature (2001) *Great Crested Newt Mitigation Guidelines*. English Nature, Peterborough.

Environment Agency (2010) *Managing Invasive Non-native Plants: managing invasive non-native plants in or near fresh water*. EA.

Mitchell-Jones, A.,J., McLeish, A.P. Ed. (2004) *Bat Workers' Manual*. 3<sup>rd</sup> Edition. JNCC

Ruddock, M. and Whitfield, D.P. (2007) *A Review of Disturbance Distances in Selected Bird Species*. A report from Natural Research (Projects) Ltd to Scottish Natural Heritage



**Appendix 8.10: Technical Report: Gilden Way Roundabout  
Botanical Survey**



## M11 Junction 7A

Essex County Council

### Technical Report - Gilden Way Roundabout Botanical Survey

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**Appendix A. Species Recorded**

## **1. Methodology**

### **1.1 Botanical Survey**

The location of Gilden Way roundabout is shown on Plan 1. It is designated as a Protected Wildlife Verge, a Harlow District Council local designation that is likely to be impacted by the widening proposals for the Gilden Way.

The botanical survey of the roundabout consisted of a walkover on May 19<sup>th</sup> 2016, during which an inventory of vascular plant taxa, together with their relative frequency, was made. Notes were taken on community structure and relative frequency was scored according to the DAFOR system, where:

D = dominant species, A = abundant, F = frequent, O = occasional and R = rare.

The prefix 'local' may be added to the first three to indicate heterogeneity in distribution; thus, LA means 'locally abundant'.

Vascular plant nomenclature followed Stace (2010).

### **1.2 Limitations**

The results of the survey may be limited by the timing of the visit, with later or earlier flowering species overlooked. However, this is unavoidable with any survey of strongly seasonal organisms whatever the time of year, and all plants encountered were identified, including those for which only vegetative material was available.

## 2. Results

Vascular plant taxa recorded from Gilden Way roundabout are listed in Appendix A. Relative frequencies are not provided for trees as these were planted. In total 13 woody species, seven grasses and 40 forbs were recorded.

From a distance, the most striking vegetation on the roundabout island consisted of trees and shrubs. These have evidently been planted: the shrubs, all native species such as hawthorn (*Crataegus monogyna*) and wayfaring-tree (*Viburnum lantana*), in a broken circle around the circumference of the island; and trees, mostly silver birch (*Betula pendula*), in the center. The open spacing of trees and shrubs permits sufficient incident light to allow the grassland to flourish.

The composition of the grassland varies across the roundabout, but the whole conforms to the description of neutral grassland community MG1 *Arrhenatherum elatius* grassland provided in the National Vegetation Classification (Rodwell, 1991). False oat-grass (*Arrhenatherum elatius*) was dominant across the island except for shaded areas. MG1 is a typical community of unmanaged dry neutral grasslands, forming a coarse sward in which only bulkier forbs can survive. Much of the grassland on the roundabout was therefore species poor, although lady's bedstraw (*Galium verum*) and oxeye daisy (*Leucanthemum vulgare*), for instance, were quite frequent.

Only one small area of the roundabout attained a greater than average diversity of forbs; opposite Sheering Road on the eastern face of the roundabout (refer to Figure 2.1). In this area betony (*Betonica officinalis*) was dominant and grasses were of low cover. Black knapweed (*Centaurea nigra*), common vetch (*Vicia sativa* subsp. *segetalis*), cowslip (*Primula veris*) and meadow buttercup (*Ranunculus acris*) were frequent associates. This community covered only a few square meters. A small colony of betony was also found in coarse grassland amongst young trees and shrubs facing east along Gilden Way.



Figure 2.1 : The main area of betony, here forming a carpet with other forbs such as lady's bedstraw

### 3. Discussion

#### 3.1 Threatened Plants

On the whole, the vegetation of the roundabout island was unremarkable, supporting a common assemblage of widespread grasses and forbs, together with planted trees and shrubs. The only exception to this was the population of betony, which while of Least Concern Nationally (Stroh, et al., 2014) is listed on the Essex Red Data List (Essex Field Club, 2014). There it is described as having undergone a ‘drastic decline, [and] likely to be on the verge of extinction within the next few decades’.

This local decline of betony is borne out on the distribution map available from the Botanical Society of Britain and Ireland (BSBI, 2016). In Essex, the map (presented as Figure 3.1) also shows an at least superficial correlation between recent records of betony and road corridors. (N.B. the Gilden Way roundabout population is absent from this map.)

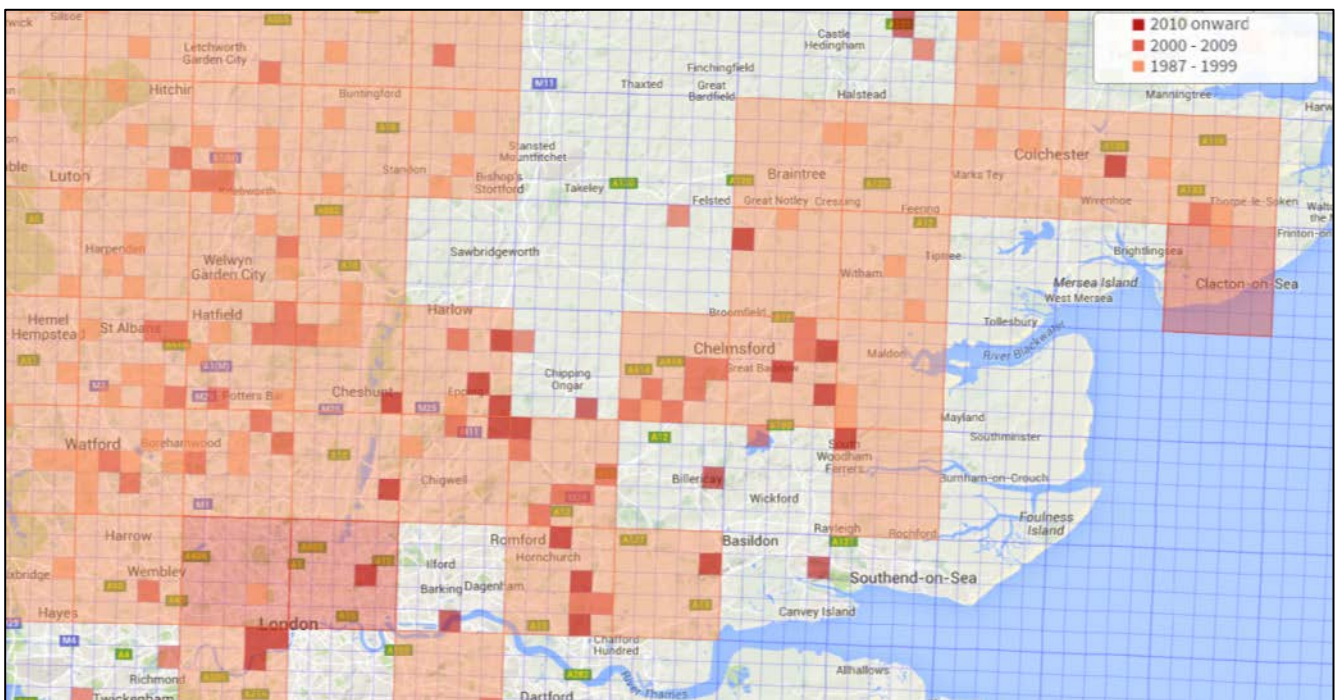


Figure 3.1 : Distribution of betony in the Essex area. Small squares are 2km x 2km. Courtesy of BSBI

Betony is a species with a very strong association with old unimproved grassland, and it is quite unlikely that it would have arrived naturally on the roundabout after construction. The population may, therefore, be derived from older vegetation/ soil introduced during construction of the roundabout, or it may have been deliberately introduced as part of the landscaping for the roundabout.

#### 3.2 Local Nature Conservation Designations

Given the presence of a locally threatened plant and the existing local designation on the Gilden Way roundabout island, it is pertinent to assess the grassland against Essex County Council Local Wildlife Site (LoWS) selection criteria.

The island can be assessed under two criteria for inclusion in the LoWS network: either as a habitat, ‘Other Neutral Grassland’, or for supporting a locally important species, i.e. betony.



For sites supporting notable vascular plants, the selection criteria state that (Essex Local Wildlife Site Partnership, 2010, p. 56) '*Sites supporting significant populations of 'notable' vascular plants will be eligible for selection.*'

While betony is certainly 'notable', the population is not large and would presumably not make the grassland eligible under this criterion. However, the term 'significant population' is open to interpretation: if betony is likely to verge on a local extinction in the coming decades, then this cannot be avoided or reversed without proper regard and protection for *all* populations.

The selection criterion for 'Other Neutral Grassland' states that (Essex Local Wildlife Site Partnership, 2010, p. 32) '*Unimproved or semi-improved pastures or meadows that do not clearly fit criterion HC9 [Lowland Meadows] shall be eligible for selection if they support features that indicate long continuity as grassland or support notable populations of invertebrates. Special consideration should be given to sites listed in the Grassland Inventory for Essex and to sites supporting plants listed in Appendix 4.*'

The appendix alluded to includes betony, cowslip (*Primula veris*) and lady's bedstraw, which were recorded during the survey. These are regarded as indicators of unimproved grassland in Essex, though not as 'plants which seldom occur outside unimproved grasslands/ marshes or are particularly indicative of a long period of traditional grassland management' (Essex Local Wildlife Site Partnership, 2010, p. 85). While cowslip and lady's bedstraw were relatively frequent, the populations of these indicators were not appreciable. Their presence cannot overcome, in the assessment of this habitat, the overall dominance by very common generalist grassland species and lack of diversity. It is therefore considered that the roundabout does not qualify under the 'Other Neutral Grassland' habitat criterion as a LoWS.



## 4. References

BSBI. (2016). *BSBI Distribution Maps*. Retrieved June 23, 2016, from <http://bsbi.org/maps>

Essex Field Club. (2014). *Essex Red Data List*. Retrieved June 23, 2016, from <http://www.essexfieldclub.org.uk/portal/p/Essex+Red+Data+List>

Essex Local Wildlife Site Partnership. (2010). *Local Wildlife Site Selection Criteria*. Essex Wildlife Trust.

Rodwell, J. (. (1991). *British Plant Communities*. Cambridge: CUP.

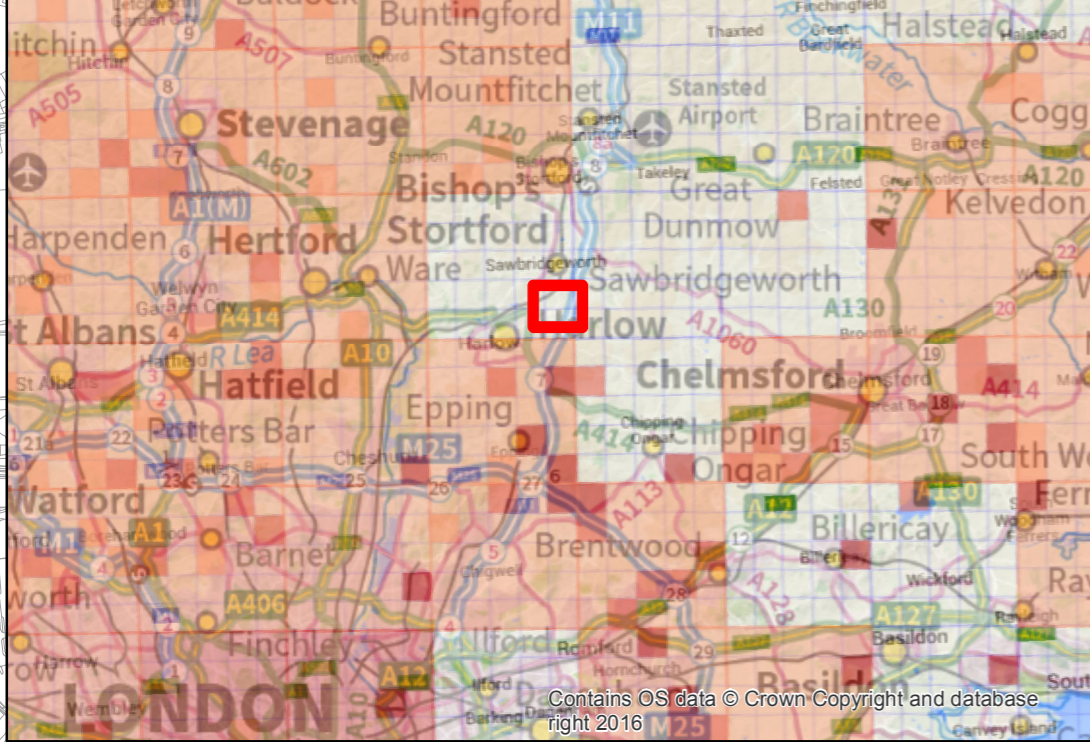
Stace, C. A. (2010). *A New Flora of the British Isles* (3 ed.). Cambridge: Cambridge University Press.

Stroh, P. A., Leach, S. J., August, T. A., Walker, K. J., Pearman, D. A., Rumsey, F. J., et al. (2014). *A Vascular Plant Red List for England*. Bristol: Botanical Society of Britain and Ireland.

## **Plan 1: Location of Gilden Way Roundabout Protected Wildlife Verge**



# BETONY DISTRIBUTION



Sheering Lower Road

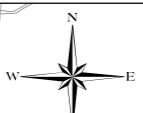
Pincey Brook

Proposed Junction 7a

Sheering Road

Gilden Way

Moor Hall Road



**Notes**

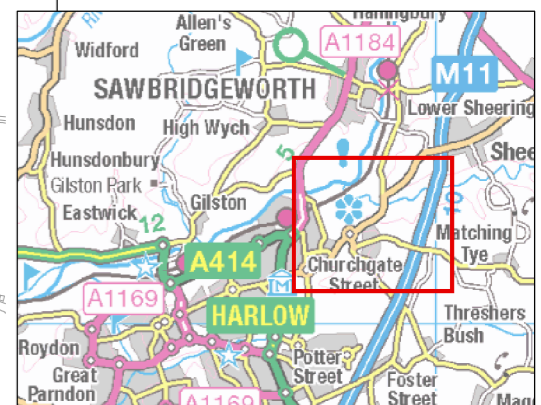
1. Do not scale

**Key**

- Design Iteration 1 PCF Stage 3
- Attenuation Pond
- Betony Location 2016 Survey
- Protected Wildlife Verge

**Betony Distribution (BSBI 2016)**

- 2010 onward
- 2000 - 2009
- 1987 - 1999



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Appro'd
0	10/16	ISSUED FOR PLANNING APPLICATION	KK	CB	SK	SG

Drawing Status: PRELIMINARY DESIGN



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Scheme Title: M11 JUNCTION 7A

Drawing Title: PLAN 1 - GILDEN WAY BOTANICAL SURVEY

DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
EW	KK	CB	SB	SK
DATE	DATE	DATE	DATE	DATE
25/10/2016	25/10/2016	25/10/2016	25/10/2016	25/10/2016

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## Appendix A. Species Recorded

Table A.1 : Vascular plant species recorded from the island of Gilden Way roundabout, May 2016

Scientific name	Common name	Frequency
<b>Trees, shrub and woody climbers</b>		
<i>Betula pendula</i>	Silver birch	
<i>Crataegus monogyna</i>	Hawthorn	
<i>Fraxinus excelsior</i>	Ash	
<i>Hedera helix</i>	Ivy	
<i>Ligustrum vulgare</i>	Privet	
<i>Prunus avium</i>	Wild cherry	
<i>Quercus cerris</i>	Turkey oak	
<i>Quercus robur</i> (sapling)	Oak	
<i>Rosa canina</i> agg.	Dog rose	
<i>Rubus caesius</i>	Dewberry	
<i>Rubus fruticosus</i> agg.	Bramble	
<i>Sorbus aucuparia</i>	Rowan	
<i>Viburnum lantana</i>	Wayfaring-tree	
<b>Grasses</b>		
<i>Anisantha sterilis</i>	Barren brome	LA
<i>Arrhenatherum elatius</i>	False oat-grass	D
<i>Bromus hordeaceus</i>	Soft brome	LA
<i>Dactylis glomerata</i>	Cock's-foot	F
<i>Festuca rubra</i>	Red fescue	A
<i>Holcus lanatus</i>	Yorkshire fog	F-LD
<i>Poa pratensis</i>	Smooth meadow-grass	A
<i>Poa trivialis</i>	Rough meadow-grass	F
<i>Schedonorus arundinaceus</i>	Tall fescue	O
<b>Forbs</b>		
<i>Achillea millefolium</i>	Yarrow	F
<i>Anthriscus sylvestris</i>	Cow parsley	F-D
<i>Bellis perennis</i>	Daisy	F
<i>Betonica officinalis</i>	Betony	LA
<i>Centaurea nigra</i>	Black knapweed	O
<i>Cirsium vulgare</i>	Spear thistle	R
<i>Epilobium tetragonum</i>	Square-stalked willowherb	O
<i>Equisetum arvense</i>	Field horsetail	O-LA
<i>Ficaria verna</i> subsp. <i>verna</i>	Lesser celandine	LA
<i>Galium aparine</i>	Cleavers	F
<i>Galium verum</i>	Lady's bedstraw	F
<i>Geranium dissectum</i>	Cut-leaved cranesbill	F
<i>Geum urbanum</i>	Wood avens	F
<i>Glechoma hederacea</i>	round ivy	F

Scientific name	Common name	Frequency
<i>Helminthotheca echioides</i>	Prickly oxtongue	O
<i>Heracleum sphondylium</i>	Hogweed	F
<i>Lapsana communis</i>	Nipplewort	O
<i>Leucanthemum vulgare</i>	Oxeye daisy	F
<i>Lotus corniculatus</i>	Bird's-foot-trefoil	R
<i>Malva moschata</i>	Musk mallow	R
<i>Medicago lupulina</i>	Black medick	LA
<i>Narcissus</i> sp.	Daffodil	F
<i>Persicaria amphibia</i>	Amphibious bistort	LA
<i>Plantago lanceolata</i>	Ribwort plantain	O
<i>Potentilla reptans</i>	Creeping cinquefoil	F
<i>Primula veris</i>	Cowslip	F-LA
<i>Prunella vulgaris</i>	Selfheal	F-LA
<i>Ranunculus acris</i>	Meadow buttercup	O
<i>Ranunculus repens</i>	Creeping buttercup	LF
<i>Rumex acetosa</i>	Common sorrel	O
<i>Rumex crispus</i>	Curled dock	O
<i>Senecio erucifolius</i>	Hoary ragwort	O
<i>Senecio jacobaea</i>	Ragwort	F
<i>Sonchus asper</i>	Prickly sowthistle	O
<i>Taraxacum officinale</i> agg.	Dandelion	F
<i>Trifolium repens</i>	White clover	O
<i>Urtica dioica</i>	Stinging nettle	R
<i>Veronica chamaedrys</i>	Germander speedwell	LA
<i>Vicia sativa</i> subsp. <i>segetalis</i>	Common vetch	F-LA
<i>Vicia tetrasperma</i>	Smooth tare	F



**Appendix 8.2: Technical Report: Breeding Bird Survey**



## M11 Junction 7a

Essex County Council

### Technical Report: Breeding Bird Survey

B3553F05-3000-REP-0041 | 0

December 2016

#### Document history and status

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**Appendix A. Full Bird List for Link Area Surveys**

**Appendix B. Full Bird List for Gilden Way Surveys**

## 1. Methods

### 1.1 Study Areas

#### 1.1.1 2014 Breeding Bird Survey Study Area

The 2014 survey areas are located within the land to the west of The Campions (off Sheering Lower Road), and eastwards to Moorhall farm to the east of the M11 motorway; this includes the land surrounding Mayfield Farm. The Pincey Brook provides the northern boundary of the survey area with the southern boundary served by Moor Hall Road. The report herein describes this area of the site as the 'Link Area'.

The Link Area consists primarily of large arable fields and areas of semi-improved grassland, with young broadleaved woodland along the motorway embankments. Mature hedgerows and a watercourse (Pincey Brook) are also present. The wider area supports a large fishing lake, horse grazed pasture and smaller areas of scrub and ruderal vegetation. The M11 motorway runs centrally through the site in a north/ south direction.

#### 1.1.2 2016 Breeding Bird Survey Study Area

Due to the evolution of the Proposed Scheme to include widening proposals along the Gilden Way, additional areas were subject to survey in 2016. The 2016 Study Area consisted of two transects along the northern side of Gilden Way. The report herein describes this area of the site as 'Gilden Way'.

Gilden Way consists of large arable fields and amenity grassland with areas of broadleaved woodland along road verges, mature hedgerows, individual broadleaved trees and smaller areas of scrub and ruderal vegetation.

#### 1.1.3 2016 Kingfisher Habitat Survey

An incidental sighting of kingfisher (*Alcedo atthis*) at the Pincey Brook was reported in late 2016. A survey for suitable nesting habitat for this species (exposed earth banks) was consequently recommended and undertaken on a stretch of the brook 250m to the east and west of where it passes beneath the M11.

### 1.2 Desk Study

A desktop survey was originally undertaken in September 2013 and updated in 2015, to obtain baseline ecological information relating to the Proposed Scheme and its surroundings. Bird records within 2km of the site were requested from Essex Ecology Services Limited (EECOS) (on behalf of the Essex Wildlife Trust), and The Essex Field Club (EFC). Subsequent to the request being submitted, it was discovered that neither EECOS nor Essex Field Club, maintain a database of bird records. Further enquiry located the web-based repository of the Essex Birdwatching Society<sup>1</sup>, which was searched for bird records from Harlow.

In addition, the internet was searched for publicly available information regarding large developments within the local area, namely Newhall Farm (Roger Evans Associates, 2004) and Harlowbury (LDA Design, 2011).

The local and UK Biodiversity Action Plan (BAP) plans are now strictly redundant, but the species covered under these plans are protected through the Natural Environment and Rural Communities (NERC) Act (Section 41 list) and are included in the UK Post 2010 Biodiversity Framework. Therefore their conservation is still considered to be a priority at the local level at least.

<sup>1</sup> [http://www.ebws.org.uk/ebs/List\\_Records.asp](http://www.ebws.org.uk/ebs/List_Records.asp) accessed 18/08/2016

## 1.3 Field Study

### 1.3.1 Breeding Bird Survey

The breeding bird surveys followed the methodology used by the British Trust for Ornithology (BTO) Breeding Bird Survey (BTO, undated). The survey method employs the use of transect surveys to record birds within suitable breeding habitats within the proposed construction footprint.

During 2014, three transect routes were surveyed to encompass areas affected by the Scheme's proposed route options at that time, the Link Area. The transect locations are illustrated in Plans 1a to 1c.

During 2016, two transect routes were surveyed following the route of the Gilden Way. The 2016 survey transect routes are shown in Plan 4.

Each transect was walked twice during the breeding season; the first in early May and the second between the period June to early July), to ensure that late arriving migrants were recorded.

The surveys were undertaken in dry and calm weather conditions, early in the morning when bird activity was at its peak. The location and behaviour of all birds observed by surveyors (visually and audibly) was recorded on maps. Habitat descriptions were also noted.

Birds were recorded in three distance categories: within 25m, 25–100m, or more than 100m, measured at right angles to the transect line. If in flight, the number of birds and direction of travel was recorded. If the bird was observed (as opposed to heard), notes relating to the bird's behaviour were taken. Recording birds within distance bands provides a measure of bird detectability in different habitats and thus allows population densities to be estimated more accurately. The total numbers of each species, excluding juveniles, were recorded in each 200m transect section and distance category (BTO, undated).

All birds recorded were classified according to their conservation status on the lists of Birds of Conservation Concern (BoCC) in the UK (Eaton *et al.*, 2009). Species on this list are ranked as being 'red', 'amber' or 'green' according to their conservation concern, with red being of most concern and green of least concern.

### 1.3.2 Kingfisher nesting habitat survey

A 500m stretch of the Pincey Brook, 250m east and 250m west of where it passes beneath the M11, was subject to a visual search for exposed earth banks and cliffs that might provide suitable nesting habitat for kingfishers (*Alcedo atthis*) on the 4<sup>th</sup> October 2016.

## 1.4 Limitations

Every effort was made to detect and record all species present during the breeding bird surveys. However, some species are more difficult to detect due to their elusive nature and therefore could have gone undetected.

The June 2014 survey of Transect 1 omitted a small area of woodland. As a result, woodland specialist birds may have been under recorded on this occasion.

The second visit to the transects undertaken in 2016, in early July, did not coincide with optimal timing (June would have been more appropriate) however nesting was recorded along with migratory species i.e. blackcap (*Sylvia atricapilla*) and swift (*Apus apus*), therefore this is not considered to be a significant constraint on the quality of the survey data, or any assessment based upon it.

Dense scrub prevented surveyors from accessing areas of the Pincey Brook for the kingfisher nesting habitat survey. As kingfishers require exposed earth banks free from vegetation to nest, it is unlikely that the densely vegetated stretches would support nesting activity by this species. Therefore, the presence of dense vegetation limiting access to surveyors is not considered to constrain the assessment based on the survey results.



## 2. Results

### 2.1 Desk study

#### 2.1.1 Records Requests

Table 2.1 presents records that were available on The Essex Birdwatching Society's website (Essex Birdwatching Society). Data recorded between 2001 (the oldest available on the website) until the present was searched.

Table 2.1 : Bird records obtained from the Essex Birdwatching Society's website

Species	Site	Date	Count	Notes
Blackcap	Harlow	02/05/2015	4	male and female
Chiffchaff ( <i>Phylloscopus collybita</i> )	Harlow	02/05/2015	4	
Herring gull ( <i>Larus argentatus</i> )	Harlow	08/06/2014	8	
Herring gull	Harlow	02/05/2015	16	
Lesser black-backed gull ( <i>Larus fuscus</i> )	Harlow	08/06/2014	9	
Lesser black-backed gull	Harlow	02/05/2015	7	
Peregrine falcon ( <i>Falco peregrinus</i> )	Harlow	11/07/2016	1	Juvenile roosting every night on chimney at glass works off River Way for last fortnight.
Peregrine falcon	Harlow	31/07/2016	1	Juvenile on glassworks chimney by River Way
Red kite ( <i>Milvus milvus</i> )	Harlow	16/04/2013	1	Over Katherines Way/ Third Ave R/ About
Reed warbler ( <i>Acrocephalus scirpaceus</i> )	Harlow	02/05/2015	4	All sightings at Marshgate spring
Ringed plover ( <i>Charadrius hiaticula</i> )	Harlow	14/05/2016	1	By Parndon Mill just north of Elizabeth Way. From the River Stort towpath looking north in wet part of field.
Waxwing ( <i>Bombycilla garrulous</i> )	Harlow	26/03/2013	1	Perched in almost bare tree in Church Langley Way, directly opposite Mallards Rise.

#### 2.1.2 Bird Records from Harlowbury Environmental Statement

##### 2.1.2.1 Breeding Bird Surveys

A total of 32 bird species were recorded during surveys at land around Gilden Way during the 2004 breeding season. Of these, 27 were considered to be holding territories.

Seven of these species were Red List species on the BoCC list (Gregory *et al.*, 2002); starling *Sturnus vulgaris*, house sparrow (*Passer domesticus*), linnets (*Carduelis cannabina*), marsh tit (*Poecile palustris*), skylark (*Alauda*

*arvensis*), song thrush (*Turdus philomelos*), and yellowhammer (*Emberiza citronella*), and two were Amber List species; dunnock (*Prunella modularis*), and kestrel (*Falco tinnunculus*).

In addition, linnets, skylark, house sparrow, marsh tit, starling, yellowhammer and song thrush are also listed as UK BAP species, while skylark and song thrush are also priority Essex LBAP. The bird territories were associated mainly with the peripheral scrub and woodland habitats and in the hedgerow features that crossed the site. Open habitat species such as skylark were found within the arable fields.

### 2.1.2.2 Wintering Bird Surveys

44 bird species were recorded during the winter including nine Red List species; fieldfare (*Turdus pilaris*), house sparrow, linnets, marsh tit, mistle thrush (*Turdus viscivorus*), skylark, starling, song thrush and yellowhammer. Ten Amber List species were also recorded; black-headed gull (*Chroicocephalus ridibundus*), bullfinch (*Pyrrhula pyrrhula*), common gull (*Larus canus*), dunnock, goldcrest (*Regulus regulus*), herring gull, kestrel, reed bunting (*Emberiza schoeniclus*), song thrush, and redwing (*Turdus iliacus*).

### 2.1.3 Bird records from Newhall Farm Environmental Statement

#### 2.1.3.1 Breeding Bird Surveys

Three Red List species; skylark, song thrush and starling, were described in the Newhall Farm Environmental Statement. In addition, 10 Amber List species were reported; mute swan (*Cygnus olor*), kestrel, black-headed gull, green woodpecker (*Picus viridis*), grey wagtail (*Motacilla cinerea*), yellow wagtail (*Motacilla flava*), dunnock, mistle thrush, redwing and fieldfare.

## 2.2 Field Study

### 2.2.1 2014 Survey Results

During the 2014 breeding bird surveys of the Link Area, 40 species were recorded. Three additional incidental records were captured whilst completing other surveys within the Link Area. The full list of species is presented as Appendix A.

Table 2.2 displays the number of bird species recorded on each Link Area transect in 2014.

Table 2.2 : Total number of bird species recorded at each Link Area transect in 2014

2014 Transect Route	Number of Species Recorded
Transect 1	35
Transect 2	30
Transect 3	22

The results of the 2014 transects are presented as Plans 2a – c (May) and Plans 3a – c (June).

### Section 41 Species

Six of the species recorded are listed on Section 41 of the NERC Act 2006: dunnock, house sparrow, skylark, song thrush, starling and yellowhammer.

### Essex Biodiversity Action Plan Species

Four of the species recorded are listed on the Local BAP for Essex, including: skylark, yellowhammer, house sparrow and song thrush. Four species are also on the UK BAP: dunnock, house sparrow, starling and song thrush.

### **Birds of Conservation Concern - Red list**

The following five species recorded during the surveys are included on the red list of BoCC: house sparrow, skylark, song thrush, starling and yellowhammer.

### **UK Rare Breeding Birds Panel list**

Shoveler (*Anas clypeata*) is the only species recorded during the surveys that is included on the UK Rare Breeding Birds Panel (RBBP) list; this species is classed by RBBP as being a 'regular' breeder (RBBP, 2013).

#### **2.2.2 2016 Survey Results**

During the 2016 breeding bird surveys of the Gilden Way, 27 species were recorded, supplemented by two incidental records captured during other surveys at Gilden Way. 21 species were recorded on Transect 1, and 20 species were recorded on Transect 2. The full list of species is presented as Appendix B.

The results of the May 2016 and July 2016 transects are presented as Plan 5 (May) and 6 (July).

### **Section 41 Species**

Five species that are listed in Section 41 of the NERC Act (2006) were recorded: dunnock, house sparrow, skylark, song thrush and starling.

### **Biodiversity Action Plan Species**

Three of the species recorded are listed on the Local BAP for Essex including: skylark, house sparrow and song thrush. Five species are also on the UK BAP, including: dunnock, house sparrow, starling, skylark and song thrush. The local and UK BAP is now known as the UK Post 2010 Biodiversity Framework.

### **Birds of Conservation Concern - Red list**

The following four species recorded during the surveys are included on the red list of BoCC: house sparrow, skylark, song thrush and starling.

#### **2.2.3 Incidental Bird Records during April to November 2014**

In addition to those species recorded during the targeted breeding bird survey, tawny owl (*Strix aluco*), little owl (*Athene noctua*) and kestrel have been recorded within the Link Area Study Area.

#### **2.2.4 Incidental Bird Records during March to July 2016**

Further to the targeted breeding bird survey, tawny owl and moorhen (*Gallinula chloropus*) have been recorded within the Gilden Way Study Area.

#### **2.2.5 Link Area Species Assessment**

In total, there were 43 species of bird recorded during the 2014 breeding bird surveys within the Link Area including incidental sightings. The majority of the species recorded during the field surveys are considered to be widespread and common, and use a wide range of habitats. However, skylark and yellowhammer could both be classed as 'farmland specialists' and are more strongly associated with the agricultural habitats found within the survey area (especially when in lowland south-east England); both species also feature on the BoCC red list and Section 41 of the NERC Act.

Red list species including house sparrow, song thrush and starling, and amber list species including dunnock were recorded during the survey. These species are also listed as UK BAP species and all but dunnock are also priority Essex LBAP species.

Although these species are not exclusively restricted to the agricultural habitats that dominate the survey area, the declining conservation status of all of them can be linked (at least in part) to changes in agricultural land management practices. However, their presence within the survey area is not considered to be significant as these species are still widespread and relatively abundant.

A single shoveler was recorded on a fishing lake on Transect 1. This species is listed as a 'regular breeder' by the RBBP. No evidence of breeding activity was observed during this survey and the presence of a single shoveler is not considered to be significant.

### **2.2.6 Gilden Way Species Assessment**

In 2016, a total of 29 bird species were recorded during surveys at land around Gilden Way. Of these, 27 were considered to be holding territories. Four of these species were red list species including starling, house sparrow, skylark and song thrush and three were amber list species including dunnock, swift and common whitethroat (*Sylvia communis*). Dunnock, skylark, house sparrow, starling and song thrush are also listed as UK BAP species, while house sparrow, skylark and song thrush are also priority Essex LBAP species.

The bird territories were associated mainly with the peripheral scrub and woodland habitats in addition to the hedgerow features that crossed the site. Open habitat species such as skylark were found within the arable fields.

### **2.2.7 Link Area Population Assemblage Assessment**

The greatest number of species was recorded on Transect 1 (35). This transect has the most diverse habitat; containing grazed pasture, rough grassland, woodland, hedgerows and the Pincey Book watercourse. Although the other transects contained a variety of habitat types, they were predominantly homogenous arable fields that would appeal to fewer species. The greater number of species recorded along Transect 1 therefore reflects the diversity of habitats encompassed by this survey.

The number of bird species recorded on Transect 1 indicates that the habitats encompassed by this survey area are of 'Local (District) Importance', a category that spans between 25-54 species. Transect 1 would fall in the lower third of the spectrum for this category; this makes it more consistent with sites of 'local' value. The remaining transects all scored between 22 and 30 species and are therefore also considered to be of local conservation value for breeding birds (Fuller, 1980).

The Essex Local Wildlife Sites Partnership states that Local Wildlife Site (LWS) criterion species are those that are afforded the following probably notable status:

- Wildlife and Countryside Act 1981 (as amended) (species listed in Schedules 1, 5 and 8);
- Priority species under the UK and/ or Essex BAPs; and,
- Red Data Lists and Red Data Books, including with specific International Union for Conservation of Nature (IUCN) designation, and species with a non-IUCN designation of 'rare' or 'scarce'

Although there were species recorded during the survey that are afforded the required protection status (i.e. Priority BAP species), their assemblages are not considered to be significant populations and therefore the habitats encompassed by the survey are not likely to be valuable enough to require LWS protection (Essex Local Wildlife Site Partnership, 2010). As such, none of the areas surveyed can be considered to be of greater than local or district value for birds.

### **2.2.8 Gilden Way Population Assemblage Assessment**

Transect 1 held the greatest number of bird species (21), this could be put down to a greater diversity in habitats along the transect. Transect 1 encompassed residential gardens, allotments, amenity grassland, woodland, hedgerows and scrub. In contrast, Transect 2 consisted mainly of homogenous arable fields that would appeal to fewer species.

The numbers of bird species recorded for both transects in 2016 fall below the threshold (25 species) for local importance (Fuller, 1980).

It is considered that the habitats along Gilden Way are not worthy of LWS designation, as the bird assemblage and species that they support are not valued above the local level.

### **2.2.9 Kingfisher Nesting Habitat Survey**

The visual search for habitat suitable for nesting kingfishers was undertaken on 6<sup>th</sup> October 2016. No habitats suitable for supporting nesting kingfisher were recorded.

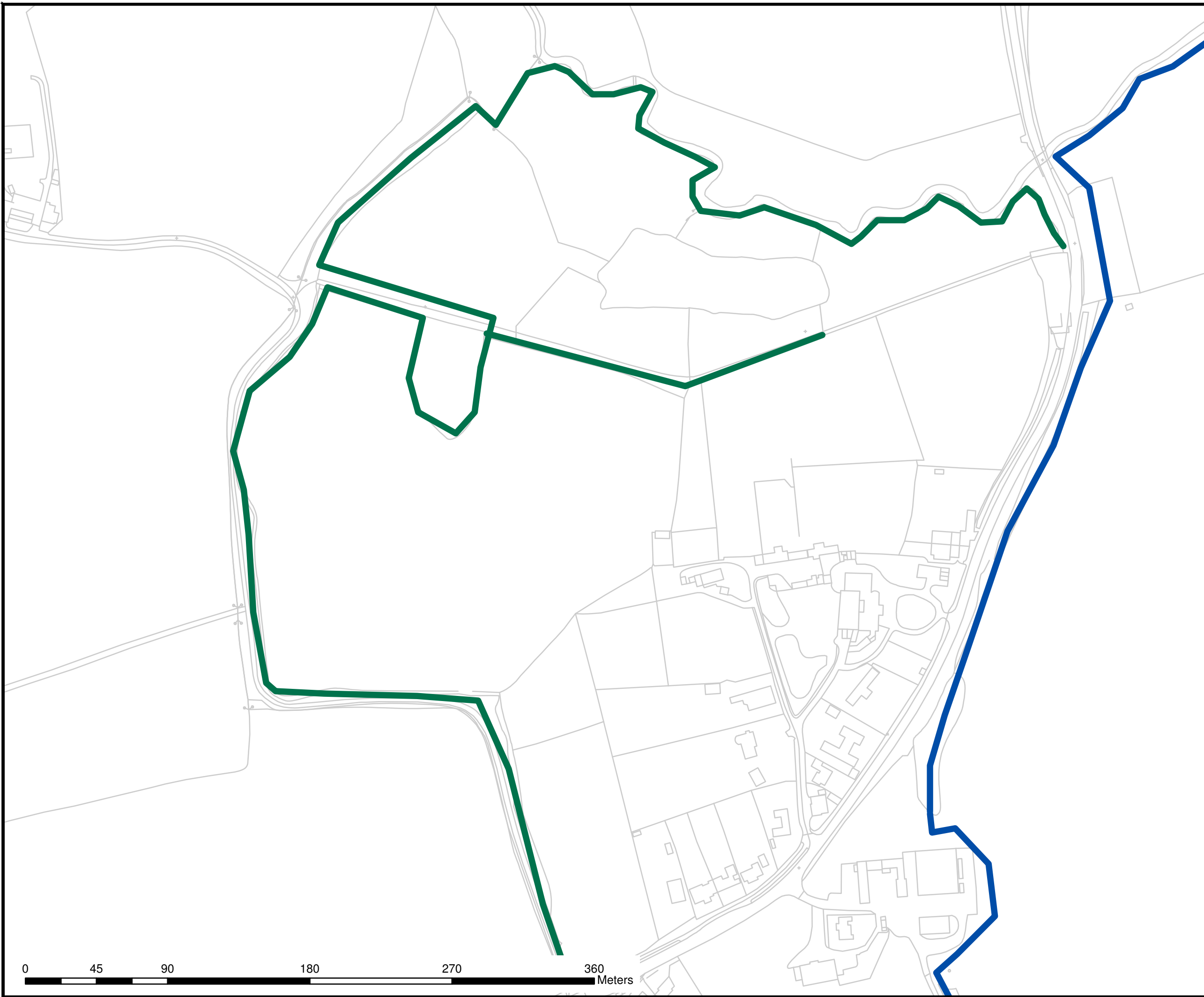
### 3. References

- BTO (updated) *The Breeding Bird Survey* [online] Accessed October 2014. <http://www.bto.org/volunteer-surveys/bbs>.
- Eaton, M.A., Brown, A.F., Noble, D.G., Musgrove, A.J., Hearn, R., Aebischer, N.J., Gibbons, D.W., Evans, A., Gregory, R.D. (2009) *Birds of Conservation Concern 3: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man*. *British Birds* **102** 296-341.
- Essex Birdwatching Society [online] Accessed August 2016. [http://www.ebws.org.uk/ebs/List\\_Records.asp](http://www.ebws.org.uk/ebs/List_Records.asp).
- Essex Local Wildlife Sites Partnership (2010) *Local Wildlife Site Selection Criteria*, 58-60.
- Fuller, R.J. (1980). *A method for assessing the ornithological interest of sites for conservation*. *Biological Conservation*. **17**(3)229-239.
- Gregory, R. D., Wilkinson, N. I., Noble, D. G., Robinson, J.A., Brown, A. F., Hughes, J., Procter, D., Gibbons, D.W., & Galbraith, C.A. 2002. The population status of birds in the United Kingdom, Channel Islands and Isle of Man: an analysis of conservation concern 2002–2007. *Brit. Birds* 95: 410–448.
- Hockin, D., Ounsted, M., Gormon, M., Hill, D., Keller, V., Barker, M.A (1992) *Examination of the effects of disturbance on birds with reference to its importance in ecological assessments*. *Journal of Environmental Management*. **36**(4)253–286.
- Joint Nature Conservation Committee (JNCC) (2004) *Common Standards Monitoring Guidance for Birds* [online] Accessed October 2014. [http://jncc.defra.gov.uk/pdf/CSM\\_birds\\_incadditionalinfo.pdf](http://jncc.defra.gov.uk/pdf/CSM_birds_incadditionalinfo.pdf).
- LDA Design (2011) *Land North of Gilden Way Environmental Statement*.
- Natural England (undated) *Wild birds: protection, surveys and licences* [online] Accessed October 2014. <https://www.gov.uk/wild-birds-protection-surveys-and-licence>.
- RBBP (2013) *Rare Breeding Bird Species List*. [online] Accessed July 2014. <http://www.rbbp.org.uk>.
- Roger Evans Associates (2004) *Newhall Phase II Environmental Statement*.



## **Plans 1a – 1c 2014 Transect Routes**

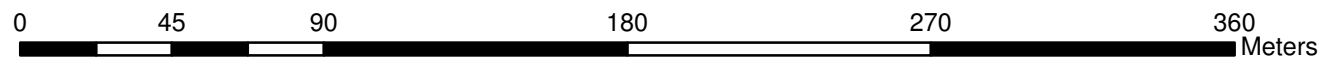




**Legend**

**Breeding Bird Transects**

- Transect 1
- Transect 2
- Transect 3



0	Sept 13	For Information	LHB	DJ	NC	AB
Rev	Rev. Date	Purpose of revision	Drawn	Checked	Rev'd	Approved

**JACOBS**  
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Project  
**M11 Junction 7A**

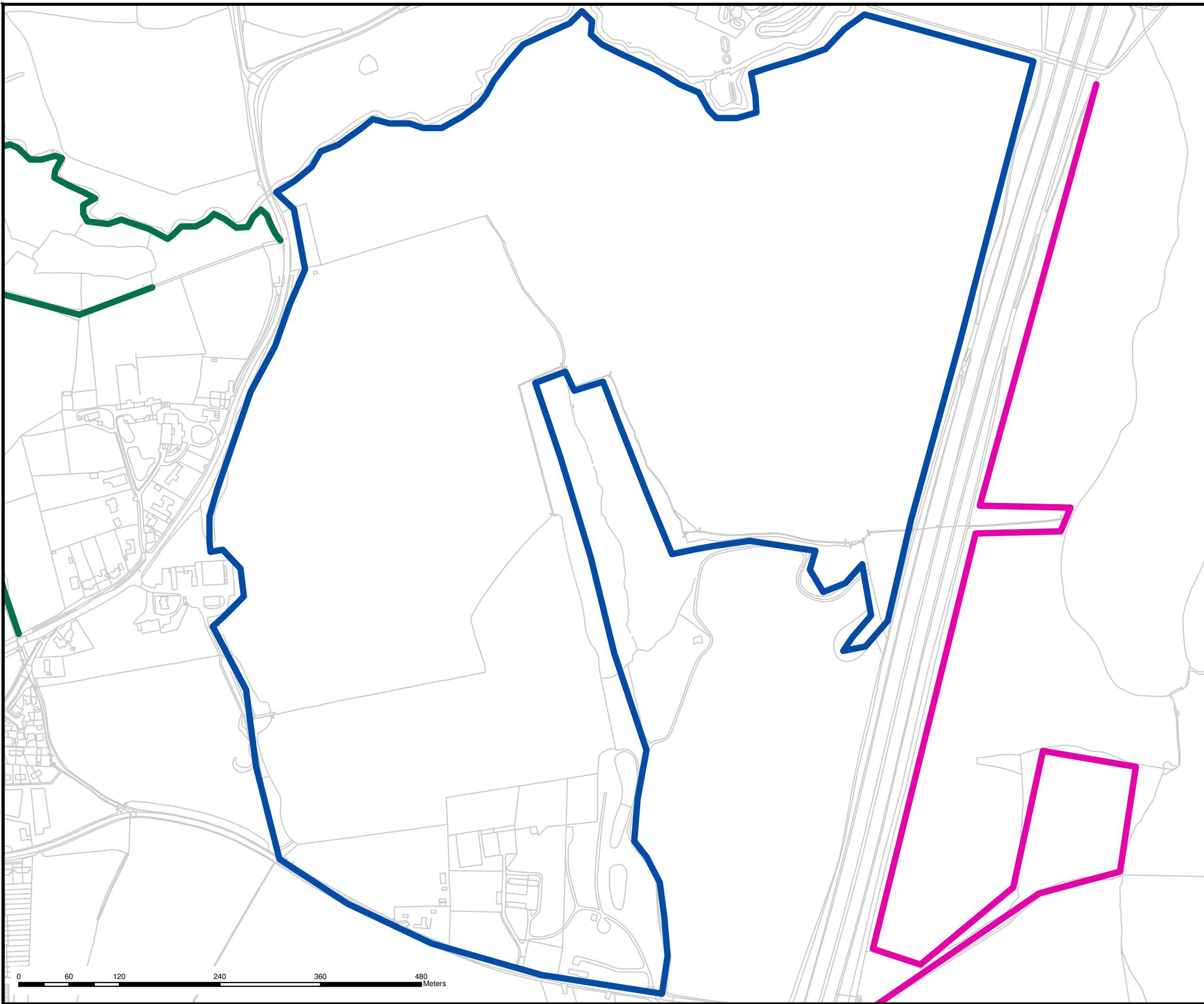
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Drawing status **FINAL**

Scale 1:7500 @ A3 DO NOT SCALE  
 Jacobs No. B3553F05

Drawing number B3553F05/Ecology/Phase1/01/01 Rev 0

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**Legend**

**Breeding Bird Transects**

- Transect 1
- Transect 2
- Transect 3



Rev	Rev. Date	Purpose of revision	Drawn	Checked	Rev'd	Apprv'd
0	Sept 13	For Information	LHB	DJ	NC	AB

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Client **Essex Highways**

Project **M11 Junction 7A**

Drawing title **Breeding Bird Survey Area**

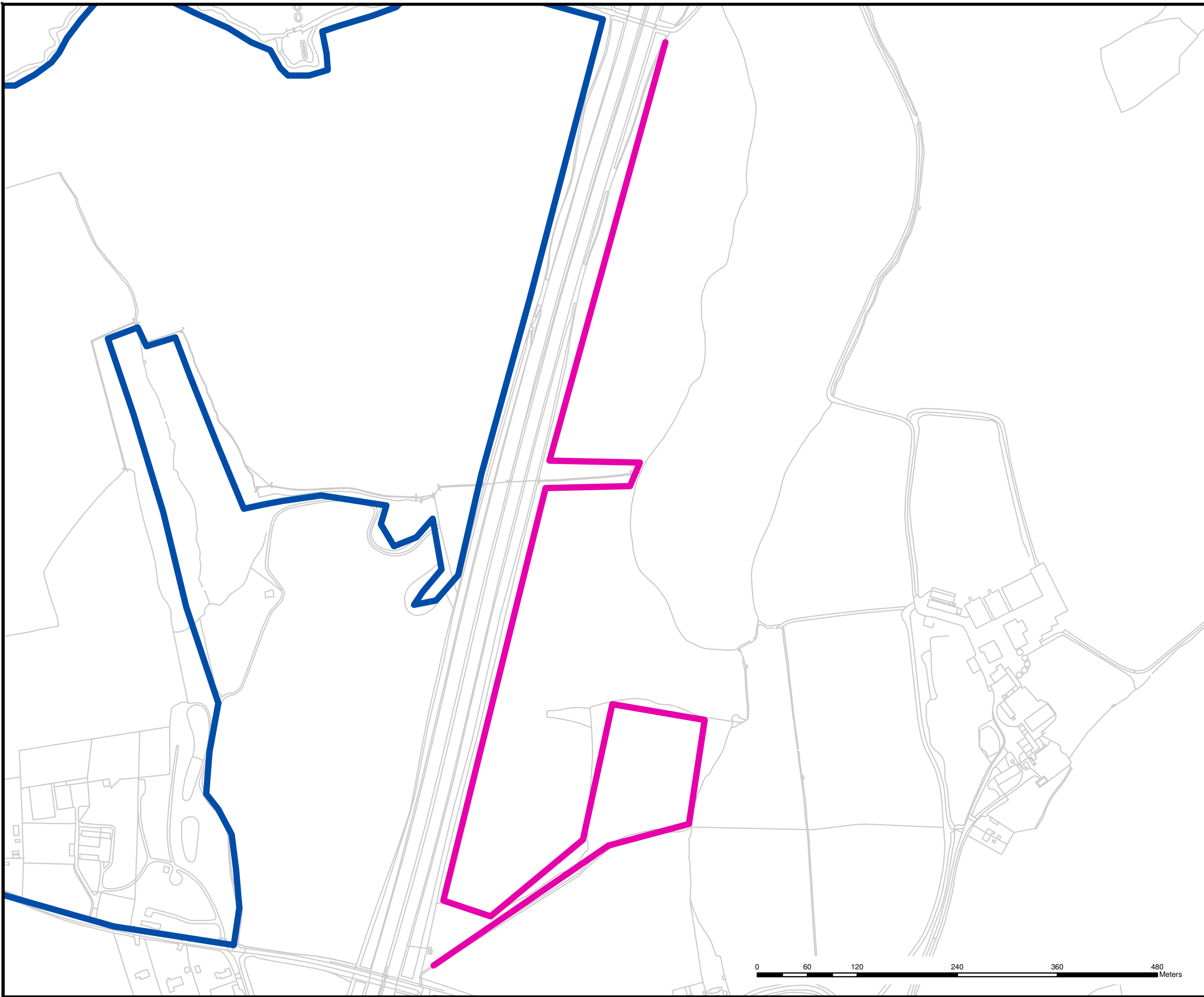
Drawing status **FINAL**

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Jacobs No. B3553F05

Drawing number B3553F05/Ecology/Phase1/01/01 Rev 0

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**Legend**

**Breeding Bird Transects**

- Transect 1
- Transect 2
- Transect 3



0	Sept 13	For Information	LHB	DJ	NC	AB
Rev	Rev. Date	Purpose of revision	Drawn	Checked	Rev'd	Approved

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Client **Essex Highways**

Project **M11 Junction 7A**

Drawing title **Breeding Bird Survey Area**

Drawing status **FINAL**

Scale 1:7500 @ A3 DO NOT SCALE

Jacobs No. B3553F05

Drawing number B3553F05/Ecology/Phase1/01/01 Rev 0

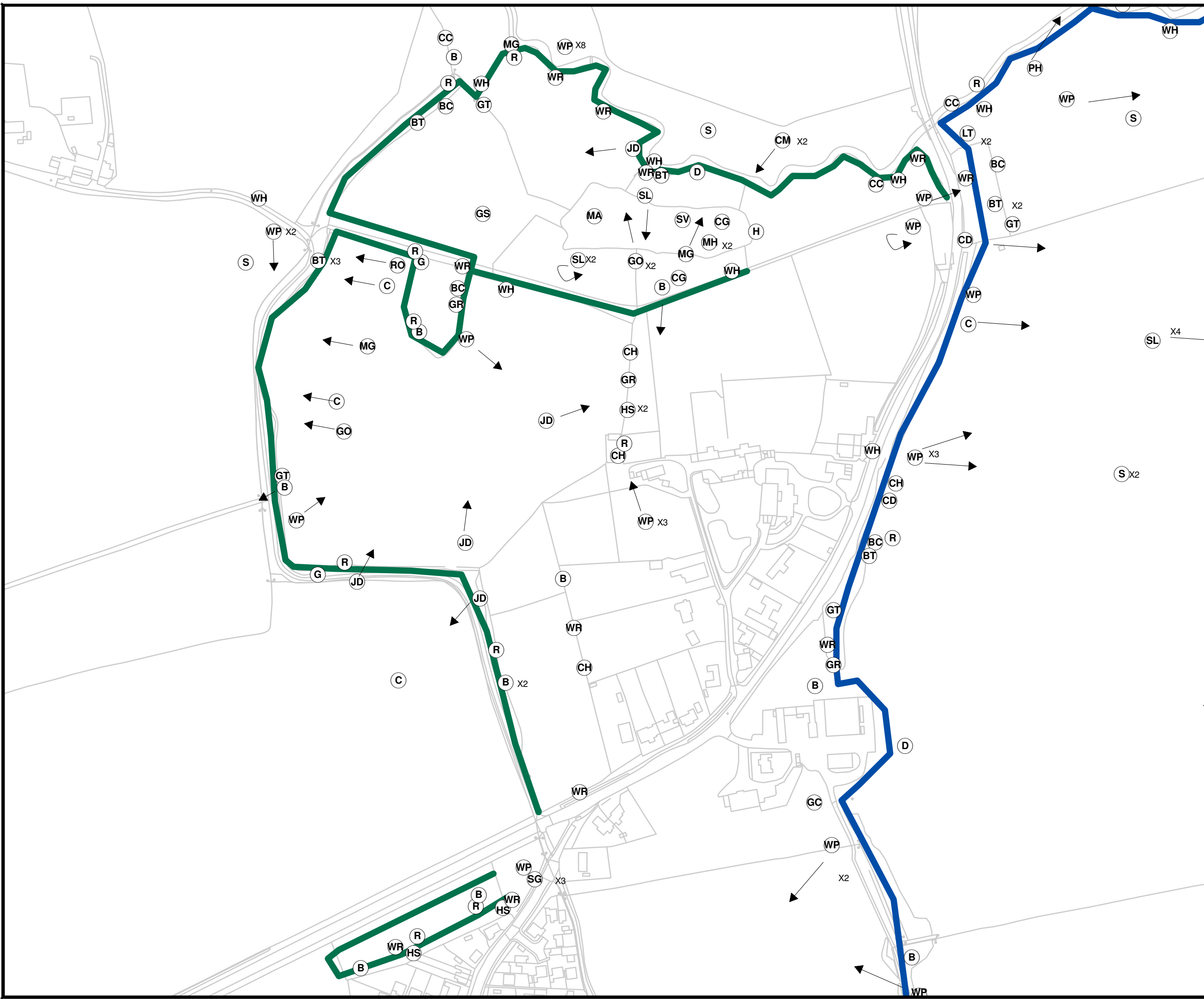
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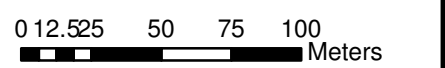
## **Plans 2a – 2c 2014 Transect Routes**





- Legend**
- Breeding bird species location
  - Direction of flight
  - Transect 1
  - Transect 2
  - Transect 3

**N.B. The definitions of the breeding bird species codes is contained within the report B3553F05/Ecology/BB/01**



Rev	Rev. Date	Purpose of revision	Drawn	Checked	Rev'd	Apprv'd
0	Nov 14	For Information	RW	EJ	DJ	PM

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Client: **Essex Highways**

Project: **M11 Junction 7A**

Drawing title: **Breeding Bird Survey Results  
 Transect 1 - May**

Drawing status: **FINAL**

Scale: 1:2700 @ A3 DO NOT SCALE

Jacobs No. B3553F05

Drawing number: B3553F05/Ecology/BB/01/01 Rev: 0

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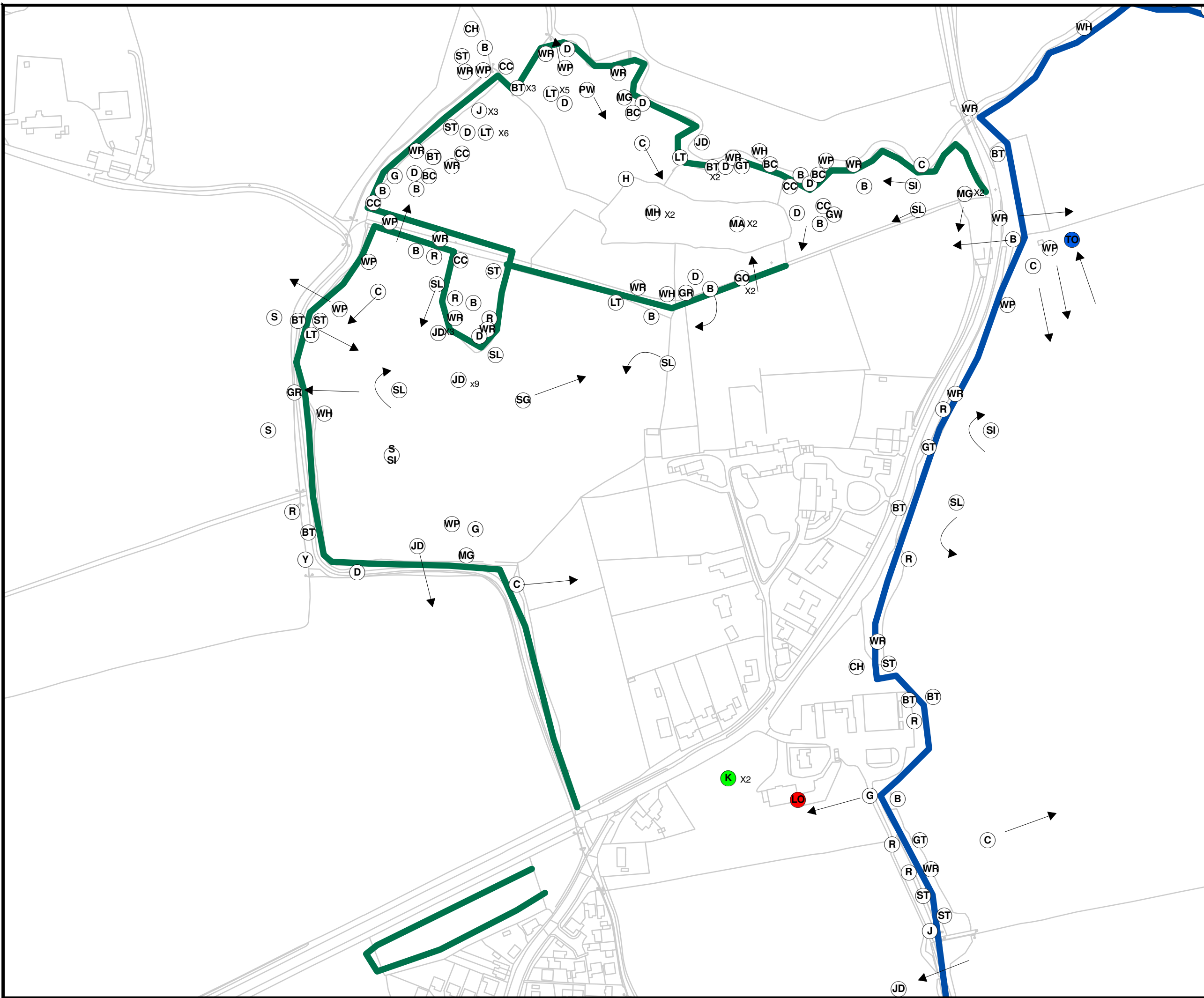






## **Plans 3a – 3c 2014 Transect Routes**



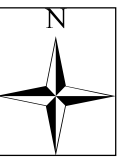


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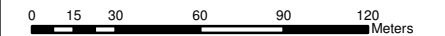
- Breeding bird species location
- Direction of flight
- Transect 1
- Transect 2
- Transect 3

**Incidental Bird Recordings**

- Kestrel recorded on 26/06/14
- Little owl recorded on 22/09/14
- Tawny owl recorded on 30/07/14



**N.B. The definitions of the breeding bird species codes is contained within the report B3553F05/Ecology/BB/01**



0	Nov 14	For Information	RW	EJ	DJ	PM
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Client  
**Essex Highways**

Project  
**M11 Junction 7A**

Drawing title  
**Breeding Bird Survey Results  
Transect 1 - June**

Drawing status  
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Scale 1:2700 @ A3 DO NOT SCALE

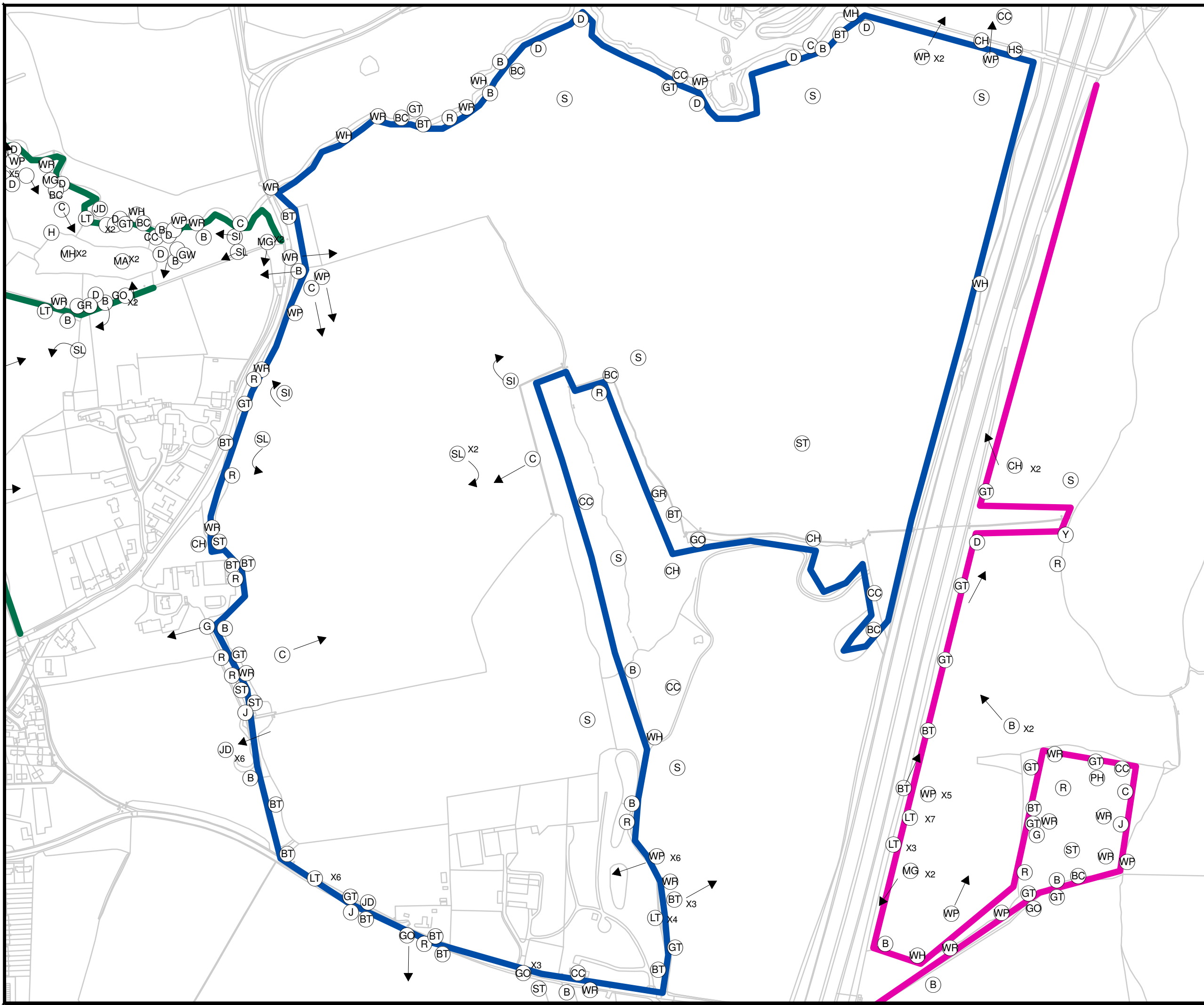
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Client no.

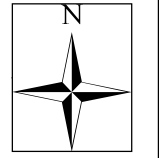
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Rev 0

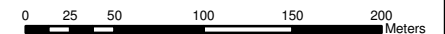
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- Legend**
- Breeding bird species location
  - Direction of flight
  - Transect 1
  - Transect 2
  - Transect 3



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0	Nov 14	For Information	RW	EJ	DJ	PM
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Client  
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Project  
**M11 Junction 7A**

Drawing title  
**Breeding Bird Survey Results  
 Transect 2 - June**

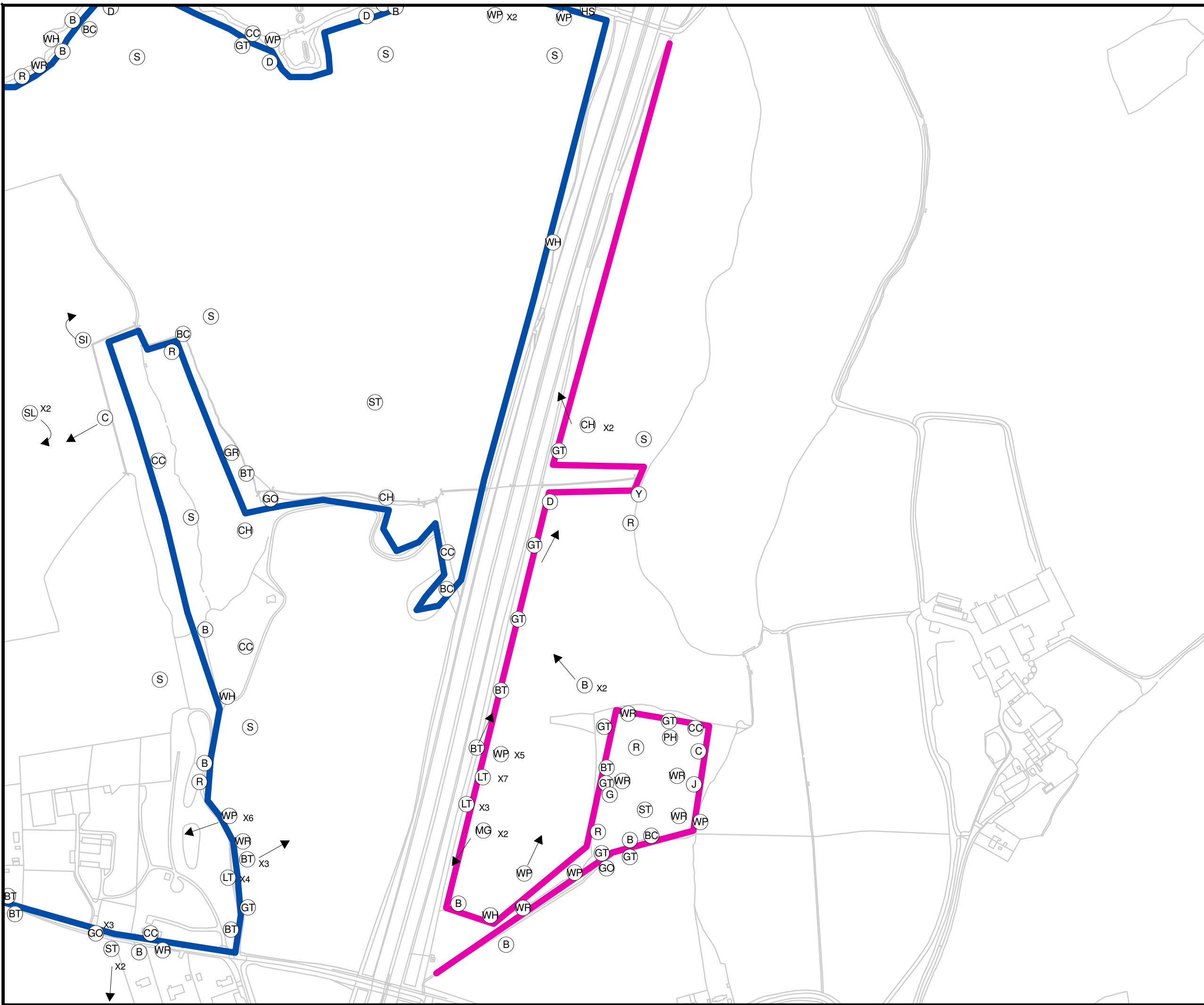
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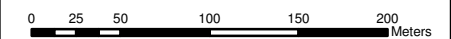


**Legend**

- Breeding bird species location
- Direction of flight
- █ Transect 1
- █ Transect 2
- █ Transect 3



**N.B. The definitions of the breeding bird species codes is contained within the report B3553F05/Ecology/BB/01**



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Rev	Rev. Date	Purpose of revision	Drawn	Checked	Rev'd	Approved

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Client  
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Project  
**M11 Junction 7A**

Drawing title  
**Breeding Bird Survey Results  
 Transect 3 - June**

Drawing status  
**FINAL**

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Drawing number  
 B3553F05/Ecology/BB/01/06

Rev  
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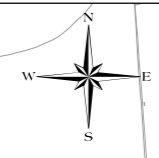
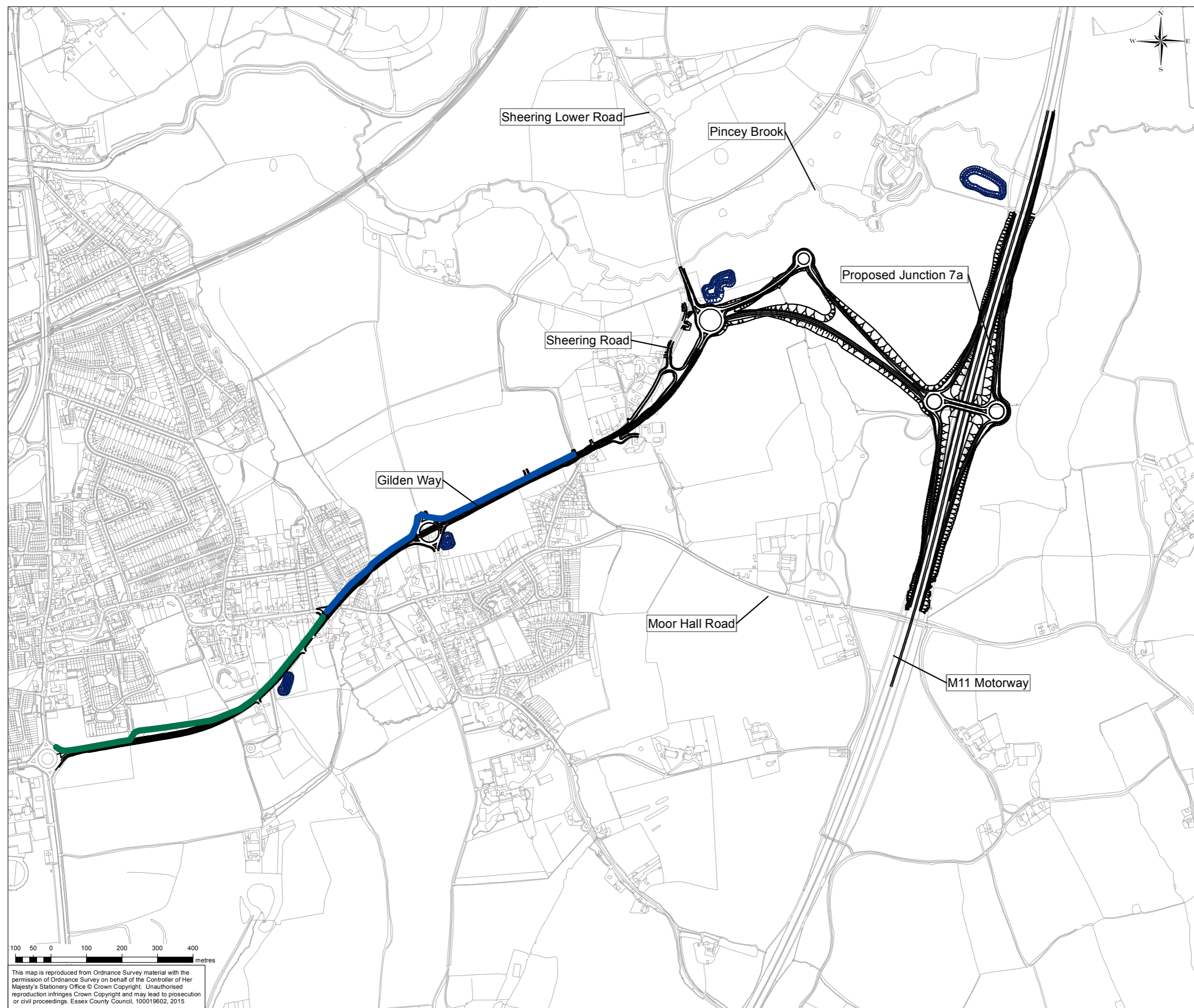
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## Plan 4 2016 Transect Routes





**Notes**

1. Do not scale

**Key**

- Design Iteration 1 PCF Stage 3
- Attenuation Pond

**Breeding Birds Transects**

- Transect 1
- Transect 2



Rev.	Date	Description of revision	Drawn	Checked	Reviewed	Approved
0	11/16	ISSUED FOR PLANNING APPLICATION	KK	CB	SB	HK

Drawing Status: PRELIMINARY DESIGN



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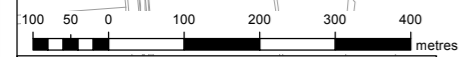
Scheme Title: M11 JUNCTION 7A

Drawing Title: PLAN 4 - 2016 TRANSECT ROUTES

DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
EW	KK	CB	SB	HK
DATE	DATE	DATE	DATE	DATE
04/11/2016	04/11/2016	04/11/2016	04/11/2016	04/11/2016

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## **Plan 5 2016 May Results**











- Notes**
1. Do not scale
- Key**
- Design Iteration 1 PCF Stage 3
  - Attenuation Pond
  - Breeding Bird Species Location May 2016
  - Direction of Flight
- Breeding Bird Transects**
- Transect 1
  - Transect 2



Rev.	Date	Description of revision	Drawn	Checked	Reviewed	Approved
0	11/16	ISSUED FOR PLANNING APPLICATION	KK	CB	SB	HK

Drawing Status: PRELIMINARY DESIGN



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Scheme Title: M11 JUNCTION 7A

Drawing Title: PLAN 5 - 2016 MAY RESULTS

DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
EW	KK	CB	SB	HK
DATE	DATE	DATE	DATE	DATE
10/11/2016	10/11/2016	10/11/2016	10/11/2016	10/11/2016

DRAWING UNITS U.N.O. SCALE AT A3 (420 x 297 mm) 1:3,000

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## **Plan 6 2016 July Result**











- Notes**
1. Do not scale
- Key**
- Design Iteration 1 PCF Stage 3
  - Attenuation Pond
  - Breeding Bird Species Location July 2016
  - Direction of Flight
- Breeding Bird Transects**
- Transect 1
  - Transect 2



Rev.	Date	Description of revision	Drawn	Checked	Review'd	Approv'd
0	11/16	ISSUED FOR PLANNING APPLICATION	KK	CB	SB	HK

Drawing Status: PRELIMINARY DESIGN



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Scheme Title: M11 JUNCTION 7A

Drawing Title: PLAN 6 - 2016 JULY RESULTS

DESIGNED	DRAWN	CHECKED	REVIEWED	APPROVED
EW	KK	CB	SB	HK
DATE	DATE	DATE	DATE	DATE
10/11/2016	10/11/2016	10/11/2016	10/11/2016	10/11/2016

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## Appendix A. Full Bird List for Link Area Surveys

Common Name	Scientific Name	BTO Code	Location Recorded (Transect 1, Transect 2, Transect 3)	Section 41 NERC 2006	EC Bird Directive	BoCC status (R=Red A=Amber G=Green)	Rare Breeding Birds Panel List	UK or Local (Essex) BAP
Blackbird	<i>Turdus merula</i>	B	1, 2, 3		2 b	G		
Blackcap	<i>Sylvia atricapilla</i>	BC	1, 2, 3			G		
Blue tit	<i>Cyanistes caeruleus</i>	BT	1, 2, 3			G		
Buzzard	<i>Buteo buteo</i>	BZ	3			G		
Canada Goose	<i>Branta canadensis</i>	CG	1		2 a	n/a		
Carrion crow	<i>Corvus corone</i>	C.	1, 2, 3		2 b	G		
Chaffinch	<i>Fringilla coelebs</i>	CH	1, 2, 3			G		
Chiffchaff	<i>Phylloscopus collybita</i>	CC	1, 2, 3			G		
Collared dove	<i>Streptopelia decaocto</i>	CD	2		2 b	G		
Dunnock	<i>Prunella modularis</i>	D.	1, 2, 3	X		A		UK
Garden warbler	<i>Sylvia borin</i>	GW	1			G		
Goldcrest	<i>Regulus regulus</i>	GC	2			G		
Goldfinch	<i>Carduelis carduelis</i>	GO	1, 2, 3			G		
Great spotted woodpecker	<i>Dendrocopos major</i>	GS	1, 2			G		
Great tit	<i>Parus major</i>	GT	1, 2, 3			G		
Greenfinch	<i>Chloris chloris</i>	GR	1, 2			G		
Green woodpecker	<i>Picus viridis</i>	G	1, 2, 3			A		
Grey heron	<i>Ardea cinerea</i>	H.	1			G		
House sparrow	<i>Passer domesticus</i>	HS	1	X		R		UK, LBAP
Jackdaw	<i>Corvus</i>	JD	1, 2		2 b	G		

Common Name	Scientific Name	BTO Code	Location Recorded (Transect 1, Transect 2, Transect 3)	Section 41 NERC 2006	EC Bird Directive	BoCC status (R=Red A=Amber G=Green)	Rare Breeding Birds Panel List	UK or Local (Essex) BAP
	<i>monedula</i>							
Jay	<i>Garrulus glandarius</i>	J.	1, 2, 3		2 b	G		
Kestrel	<i>Falco tinnunculus</i>	K	Incidental			A		
Little owl	<i>Athene noctua</i>	LO	Incidental			n/a		
Long-tailed tit	<i>Aegithalos caudatus</i>	LT	1, 2, 3			G		
Magpie	<i>Pica pica</i>	MG	1, 2, 3		2 b	G		
Mallard	<i>Anas platyrhynchos</i>	MA	1		2 a	A		
Mistle thrush	<i>Turdus viscivorus</i>	M.	2		2 b	A		
Moorhen	<i>Gallinula chloropus</i>	MH	1		2 b	G		
Pheasant	<i>Phasianus colchicus</i>	PH	2, 3		2 a	n/a		
Pied wagtail	<i>Motacilla alba</i>	PW	1, 2			G		
Robin	<i>Erithacus rubecula</i>	R.	1, 2, 3			G		
Rook	<i>Corvus frugilegus</i>	RO	1, 2		2 b	G		
Shoveler	<i>Anas clypeata</i>	SV	1		2 b	A	Regular breeder	
Skylark	<i>Alauda arvensis</i>	S.	1, 2, 3	X	2 b	R		LBAP
Song thrush	<i>Turdus philomelos</i>	ST	1, 2, 3	X	2 b	R		UK, LBAP
Starling	<i>Sturnus vulgaris</i>	SG	1, 2	X	2 b	R		UK
Swallow	<i>Hirundo rustica</i>	SL	1, 2			A		
Swift	<i>Apus apus</i>	SI	1, 2			A		
Tawny owl	<i>Strix aluco</i>	TO	Incidental			G		
Whitethroat	<i>Sylvia communis</i>	WH	1, 2, 3			A		

Common Name	Scientific Name	BTO Code	Location Recorded (Transect 1, Transect 2, Transect 3)	Section 41 NERC 2006	EC Bird Directive	BoCC status (R=Red A=Amber G=Green)	Rare Breeding Birds Panel List	UK or Local (Essex) BAP
Woodpigeon	<i>Columba palumbus</i>	WP	1, 2, 3		2 a	G		
Wren	<i>Troglodytes troglodytes</i>	WR	1, 2, 3			G		
Yellowhammer	<i>Emberiza citrinella</i>	Y.	1, 3	X		R		UK, LBAP

## Appendix B. Full Bird List for Gilden Way Surveys

Common Name	Scientific Name	BTO Code	Location Recorded (Transect 1, Transect 2)	Section 41 NERC 2006	EC bird Directive	BoCC Status (R=Red A=Amber G=Green)	UK or Local (Essex) BAP
Blackbird	<i>Turdus merula</i>	B	1, 2		2 b	G	
Blackcap	<i>Sylvia atricapilla</i>	BC	1, 2			G	
Blue tit	<i>Cyanistes caeruleus</i>	BT	1, 2			G	
Buzzard	<i>Buteo buteo</i>	BZ	2			G	
Carrion crow	<i>Corvus corone</i>	C.	1, 2		2 b	G	
Chaffinch	<i>Fringilla coelebs</i>	CH	1, 2			G	
Coal tit	<i>Periparus ater</i>	CT	2			G	
Collared dove	<i>Streptopelia decaocto</i>	CD	2		2 b	G	
Dunnock	<i>Prunella modularis</i>	D.	1, 2	X		A	UK
Garden Warbler	<i>Sylvia borin</i>	GW	1			G	
Goldcrest	<i>Regulus regulus</i>	GC	1			G	
Goldfinch	<i>Carduelis carduelis</i>	GO	2			G	
Great spotted woodpecker	<i>Dendrocopos major</i>	GS	1, 2			G	
Great tit	<i>Parus major</i>	GT	1, 2			G	
Greenfinch	<i>Chloris chloris</i>	GR	1			G	
House sparrow	<i>Passer domesticus</i>	HS	1	X		R	UK, LBAP
Jackdaw	<i>Coloeus monedula</i>	JD	2		2 b	G	
Long-tailed tit	<i>Aegithalos caudatus</i>	LT	1			G	
Magpie	<i>Pica pica</i>	MG	1, 2		2 b	G	
Moorhen	<i>Gallinula chloropus</i>	MH	Incidental		2 b	G	
Robin	<i>Erithacus rubecula</i>	R.	1, 2			G	

Common Name	Scientific Name	BTO Code	Location Recorded (Transect 1, Transect 2)	Section 41 NERC 2006	EC bird Directive	BoCC Status (R=Red A=Amber G=Green)	UK or Local (Essex) BAP
Skylark	<i>Alauda arvensis</i>	S.	2	X	2 b	R	LBAP
Song thrush	<i>Turdus philomelos</i>	ST	1, 2	X	2 b	R	UK, LBAP
Starling	<i>Sturnus vulgaris</i>	SG	1, 2	X	2 b	R	UK
Swift	<i>Apus apus</i>	SI	1			A	
Tawny owl	<i>Strix aluco</i>	TO	Incidental			G	
Whitethroat	<i>Sylvia communis</i>	WH	1			A	
Woodpigeon	<i>Columba palumbus</i>	WP	1, 2		2 a	G	
Wren	<i>Troglodytes troglodytes</i>	WR	1, 2			G	