



# Melton Mowbray Eastern Distributor Road

Leicestershire County Council

## Concept Design Report

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## Contents

<b>Executive Summary.....</b>	<b>1</b>
<b>1. Introduction.....</b>	<b>2</b>
1.1 Background .....	2
1.2 Purpose of the report.....	2
1.3 Existing Features and Constraints .....	2
1.3.1 Watercourses .....	2
1.3.2 High Tension Overhead Power Lines and Pylons.....	2
1.3.3 Roads .....	2
1.3.4 Railway .....	3
1.3.5 Footpaths.....	3
1.3.6 Existing Properties.....	3
1.3.7 Proposed Development Areas .....	3
1.3.8 Existing Ground Conditions .....	4
1.4 Approach and Methodology of Design Development .....	5
1.5 Road Design Standards .....	5
1.6 Existing Information .....	6
<b>2. Options Appraisal.....</b>	<b>8</b>
2.1 Introduction .....	8
2.2 Appraisal Process.....	8
2.3 Option 1 .....	8
2.3.1 Detailed Description .....	8
2.3.2 Option 1 Appraisal .....	9
2.4 Option 2 .....	13
2.4.1 Detailed Description .....	13
2.4.2 Option 2 Appraisal .....	13
2.5 Comparison of Options.....	17
2.5.1 Highways .....	17
2.5.2 Structures .....	17
2.5.3 Environmental.....	17
2.5.4 Geotechnical.....	17
2.6 Conclusion.....	17
<b>3. Details of Option 1.....</b>	<b>18</b>
3.1 Highways .....	18
3.1.1 Mainline Alignment .....	18
3.1.2 Junction Assessment.....	19
3.1.3 Roundabout 1 – A606 Nottingham Road Ch.0.....	19
3.1.4 Roundabout 2 – Scalford Road Ch. 975 .....	20
3.1.5 Roundabout 3 – Melton Spinney Road Ch. 2590.....	20
3.1.6 Roundabout 4 – A607 Melton Road Ch. 3500 .....	20
3.1.7 Roundabout 5 – B676 Saxby Road Ch. 4650 .....	20

3.1.8	Roundabout 6 – A606 Burton Road Ch. 6940 .....	21
3.2	Structures .....	21
3.2.1	Culvert at chainage 150.....	21
3.2.2	Culvert at chainage 680.....	21
3.2.3	Scalford Brook culvert at chainage 1810.....	21
3.2.4	Culvert at chainage 3070 .....	21
3.2.5	Structure at chainage 3770 .....	21
3.2.6	River Eye Bridge.....	22
3.2.7	Flood relief culverts .....	22
3.2.8	Leicester to Peterborough railway Bridge .....	22
3.3	Environmental.....	22
3.4	Geotechnical.....	23
4.	<b>Assumptions and Risks.....</b>	<b>24</b>

**Appendix A. Drawings**

## Executive Summary

This report summarises the outcome of a study undertaken by Jacobs for Leicestershire County Council (LCC) for the Melton Mowbray Eastern Distributor Road (EDR) concept design development. The design was carried out in support of a submission to DfT for Major Local Scheme development funding to give confidence that there is a feasible/number of feasible route options for an EDR at Melton Mowbray.

Following a workshop with LCC and identification of key constraints, high level route options were developed and design criteria established. The road is to consist of a new 7.3m carriageway with a design speed of 60 miles per hour (100kmh) and with optional allowance for a 3m footway/cycleway on the western side to encourage non-motorised users and to link with local public footpaths. In order to confirm that there is a viable and deliverable alignment, two options were then designed in more detail.

In comparing and assessing the viability of the options, existing geographical and environmental features and constraints such as existing residential property, crossing of the River Eye and its flood plain, junctions with existing roads, crossing of the railway, overhead power lines, environmental and heritage features have been taken into account, based on high-level desk-top data reviews.

Of the options developed and based on the data available, Option 1 appears preferable at this stage of the design (when considering the existing features, constraints and engineering components), although further assessment and design is required before this can be confirmed. The key features of this route option include roundabout junctions with six major existing roads, bridge crossings of the railway and River Eye and a number of culverts for flood relief and minor watercourse crossings.

As this is not a final design, the limitations of the work carried out and base data used, key assumptions and the project risks are included within this report for consideration during the next stages of development.

# 1. Introduction

## 1.1 Background

Leicestershire County Council (LCC) has been assessing highway options to address congestion issues within and through Melton Mowbray town centre to divert traffic away from the town centre onto more suitable local distributor roads.

A preference has been identified for an Eastern Distributor Road (EDR) which will also unlock and support future development and growth in the town.

Jacobs was commissioned by LCC to develop a highways concept design for the Eastern Distributor Road, taking account of key constraints and local features.

## 1.2 Purpose of the report

This report summarises the outcome of the study undertaken by Jacobs for the EDR concept design development.

This report also summarises the limitations and various risks and assumptions made during development of the concept design.

## 1.3 Existing Features and Constraints

There are a number of constraints to the eastern side of Melton Mowbray which limited the development of the route and alignment of the EDR. This section of the report details the key constraints and existing features identified around the eastern side of Melton Mowbray. These existing features and constraints have been taken into account while developing the proposed road alignment. Drawing number B2271700/GEN/GA/001 in Appendix A to this report contains a plan of the area which shows the existing features and constraints.

### 1.3.1 Watercourses

There are several watercourses within the area that will require special attention. The River Eye that runs east to west through Melton Mowbray is the main watercourse within the area under consideration.

Furthermore, there are six smaller watercourses that are tributaries of the River Eye within the proposed corridor of the EDR.

The flood plains of the aforementioned watercourse, including that of the River Eye, are shown on the constraints and features plan in Appendix A.

### 1.3.2 High Tension Overhead Power Lines and Pylons

Construction near high tension power cables and pylons provides additional risk and should be avoided where possible. The document Development near Overhead Lines by National Grid sets out amenity aspects which are relevant to proposed development near National Grid's electricity transmission equipment.

Within the corridor of the EDR there are two high tension powerlines that run west to east starting at the substation located on B676 Saxby Road. Along these lines, pylons are situated approximately every 300m.

### 1.3.3 Roads

The EDR needs to intersect with six main roads. These are:

- A606 Nottingham Road
- Scalford Road
- Melton Spinney Road
- A607 Melton Road

- B676 Saxby Road
- and A606 Burton Road

Junction options need to be developed for the crossing of these roads. Additionally, the EDR also need to interact with Lag Lane, Sawgate Road and private access near Saxby Road.

#### 1.3.4 Railway

The Leicester to Peterborough railway runs east – west through Melton Mowbray. The proposed EDR corridor will cross the railway line. An existing minor road, Lag Lane crosses the railway line on an existing structure. In addition to the Leicester to Peterborough railway line, there is a disused railway that runs north from the Melton Mowbray town centre.

#### 1.3.5 Footpaths

Within the vicinity of the proposed road corridor, there is an extensive network of public footpaths that are likely to intersect the proposed EDR alignment. These existing footpaths are:

- Footpath E17 (Running North/South from town centre to agricultural land)
- Footpath E18 (Running North/South from town centre to agricultural land)
- Footpath F4 (Access to Twin lakes Leisure Park from Melton Spinney Road)
- Footpath F25 (Running from Twin Lakes Leisure Park to A607 Melton Road and Thorpe Arnold)
- Footpath F2/3 (Running East/West from A607 Melton Road to agricultural land)
- Footpath E20 (Running East/West from B676 Saxby Road to agricultural land)
- Footpath E1 (Running North/South from Grange Drive to Burton Lazars)

#### 1.3.6 Existing Properties

There are several existing properties and built up areas within and adjacent to the proposed corridor of EDR which will require careful consideration. A few of these key features are listed below:

- Sysonby Lodge (off A606 Nottingham Road)
- John Fernerley College (off Scalford Road)
- Twin Lakes Leisure Park
- Thorpe Arnold and Thorpe Arnold Cricket Club
- Shipman's Barn Stud
- Melton Country Park

#### 1.3.7 Proposed Development Areas

There are a number of current and approved planning applications for development surrounding Melton Mowbray. The committed development sites are shown on the figure below.

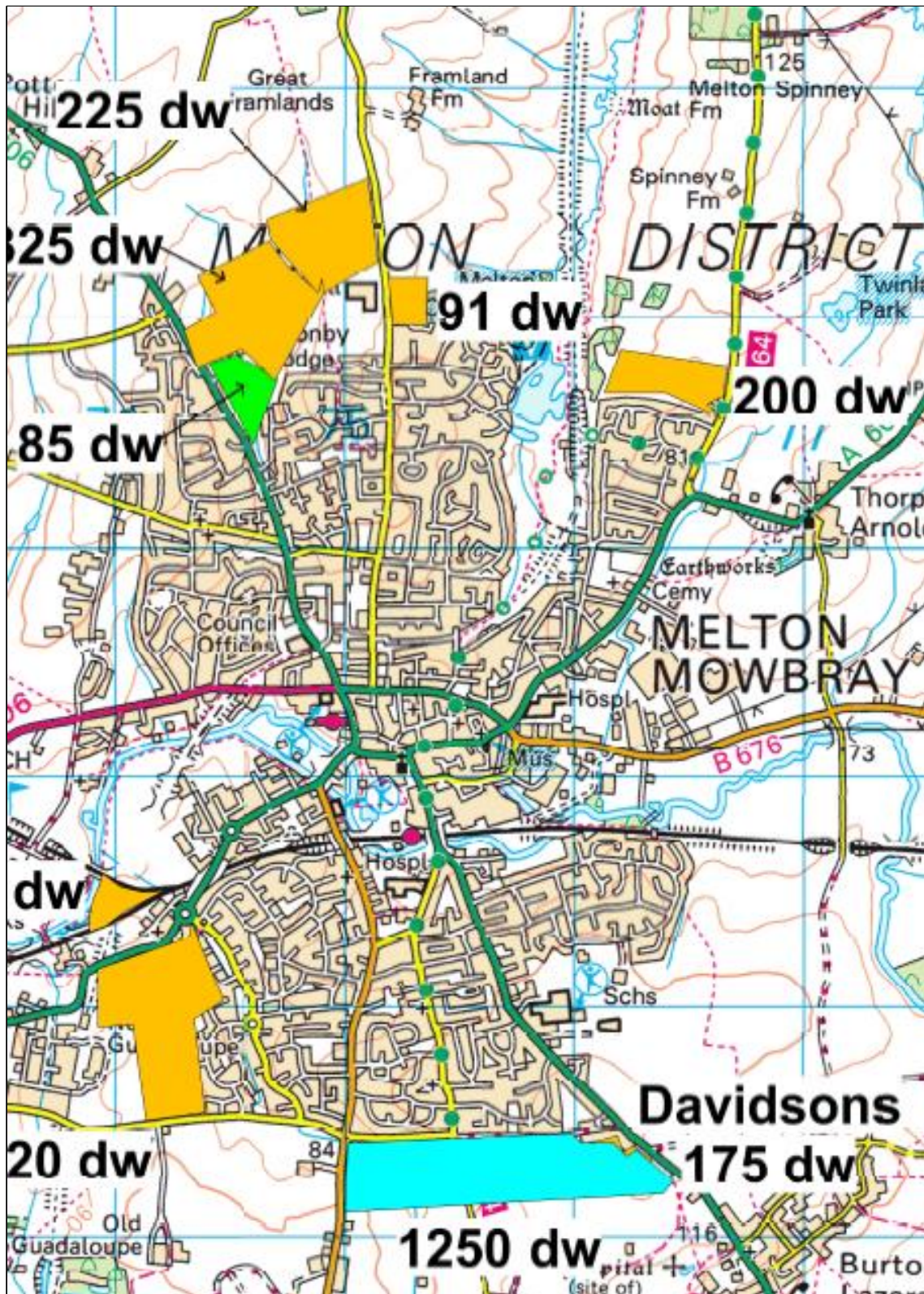


Figure 1: Proposed Development Areas

### 1.3.8 Existing Ground Conditions

Available geological mapping and historical borehole records indicate the geology along the EDR route to predominantly comprise superficial deposits of glacial till (Oadby Member Diamicton) overlying Jurassic



mudstones (Blue Lias and Charnmouth Formations), located at depth. Superficial deposits of Alluvium are indicated to be present associated with the floodplain of the River Eye and other minor watercourses.

Based on the information available, the EDR route is not indicated to be affected by former shallow coal mining, surface mineral extraction, landfilling or historical land instability.

## 1.4 Approach and Methodology of Design Development

The purpose of the concept design is to assess whether a feasible and deliverable route exists around the eastern side of Melton Mowbray. This work has been carried out to support a funding submission by LCC to the Department for Transport (DfT) as a part of the DfT Major Local Scheme submission. The options developed represent an initial concept design which is subject to change when the design is developed further during the next stages.

The approach taken in developing the concept design for the EDR is given below.

- A workshop was held with members of LCC to identify suitable route options at the start of the project. This was necessary to obtain local background knowledge and identify any previous work carried out by LCC on the opportunity to introduce an eastern distributor route;
- Design criteria were established for development of route options;
- Route options were developed considering the existing features and constraints. Advantages and constraints for these route options were considered in regard to Highways, Structures, and Geotechnical and Environmental impacts. A route was chosen, following the assessment, for further consideration;
- There are six junctions along the corridor. Based on the projected traffic, the form of junctions was identified and concept designs were developed for all these junctions; and
- This report was produced detailing the development of the concept design along with limitations, assumptions and risks.

## 1.5 Road Design Standards

Design criteria were established prior to the development of the route options. This was based on the discussion with LCC members and on traffic study undertaken previously by Jacobs. The key criteria used are:

- Design Speed: Based on previous traffic modelling assumptions and discussion with LCC, a design speed of 100 kph (60mph) was used in the design development. It should be noted however, that the speed limit through the development masterplan areas may vary and have lower speed limits.
- Cross-Section: The proposed road cross-section was established based on the discussion with LCC members. The cross-section is shown below. A combined footway and cycleway is proposed to the right hand side of the route (with respect to the increasing chainage). The footway is designed in line with the discussions at the workshop. There are a number of public footway crossings of the new route which may benefit from connection to the proposed facility. The continuous combined footway and cycleway was included in the design to ensure that space was available along the route and it can be removed at sections during the design development if not required.

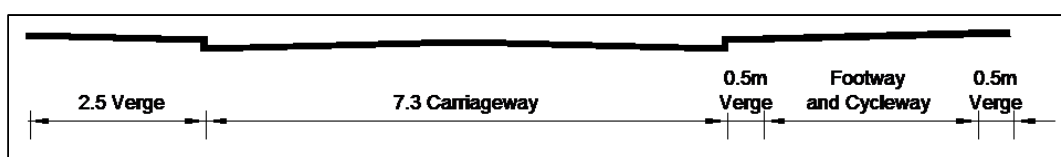


Figure 2: Proposed Cross-Section

- Alignment: Alignment design to be based on DMRB TD 9/93 – Highway Link Design.

- Junction Type: Figure 2/2 of DMRB TD42/95 – Geometric Design of Major/Minor Priority Junctions.
- Junction Design: DMRB TD42/95 – Geometric Design of Major/Minor Priority Junctions and TD16/07 – Geometric Design of Roundabouts.

## 1.6 Existing Information

The following information was considered in the development of route options.

- Lidar Survey – Lidar Survey was used in developing the vertical alignment design of the options.
- OS Survey – OS survey, as received from LCC, was used as a background on the drawings.
- Melton Mowbray Constraints Map provided by LCC.
- British Geological Survey (BGS) – Geological mapping and features viewed using the BGS Onshore Geoindex ([mapapps2.bgs.ac.uk/geoindex/home.html](http://mapapps2.bgs.ac.uk/geoindex/home.html)).
- The Coal Authority – Coal mining areas and features viewed using the BGS Onshore Geoindex website ([mapapps2.bgs.ac.uk/coalauthority/home.html](http://mapapps2.bgs.ac.uk/coalauthority/home.html))
- Environment Agency (EA) – Current and historical landfill sites viewed using the EA website ([maps.environment-agency.gov.uk](http://maps.environment-agency.gov.uk))
- Environmental assessment was based on the following baseline datasets obtained by Jacobs.

<b>Designation</b>	<b>Source</b>
<b>Landscape and Visual</b>	
Area of Outstanding Natural Beauty	MAGIC Website
National Park	MAGIC Website
Country Park	MAGIC Website
<b>Ecology and Biodiversity</b>	
Biosphere Reserve	MAGIC Website
Site of Special Scientific Interest	MAGIC Website
Ancient Woodland	MAGIC Website
National Nature Reserve	MAGIC Website
Local Nature Reserve	MAGIC Website
Local Wildlife Site	Leicestershire County Council
RAMSAR	MAGIC Website
Special Protection Area	MAGIC Website
Special Area of Conservation	MAGIC Website
Nature Improvement Area	MAGIC Website
RSPB Important Bird Area	MAGIC Website
RSPB Nature Reserve	MAGIC Website
<b>Cultural Heritage</b>	
World Heritage Site	MAGIC Website
Scheduled Monument	MAGIC Website
Registered Park and Garden	MAGIC Website
Registered Battlefield	MAGIC Website
Conservation Area	Leicestershire County Council
Listed Buildings	MAGIC Website

<b>Designation</b>	<b>Source</b>
<b>Water Resources</b>	
Main Rivers	Environment Agency
Flood Zone 2 (1 in 1000)	Environment Agency
Flood Zone 3 (1 in 100)	Environment Agency
Source Protection Zone 1 (Inner Zone)	Environment Agency
Source Protection Zone 2 (Outer Zone)	Environment Agency
Source Protection Zone 3 (Total Catchment)	Environment Agency
<b>Access</b>	
National Trails / National Cycle Route	MAGIC Website
National Trust (Inalienable Land)	National Trust
Crown Land	Crown Estates

## 2. Options Appraisal

### 2.1 Introduction

Considering the constraints detailed in the section above, two options were developed. These were named as Option 1 and Option 2 and shown on drawings B2271700/OP1/GA/001 & B2271700/OP2/GA/001 in Appendix A.

It should be noted that a third option which passed to the west of Thorpe Arnold was initially identified for assessment, however the geometry required for road design when considered with the key constraints and the topography of the route meant that this option was not developed further for detailed consideration.

The following sections outline the details of the two options. Advantages and constraints for these two options were also identified and tabulated below. A summary is provided at the end of this section along with a conclusion for the more beneficial option. These routes have been developed as part of the concept design process and the chosen route may require further amendments during the next stage of the design.

### 2.2 Appraisal Process

The process undertaken in assessing the options is detailed below. The appraisal process is limited to developing an initial concept design and subject to change when the design is developed further during the next stages. The limitations and assumptions for the design are provided in Section 4 below.

- Horizontal alignment for the options was developed based on the OS data followed by vertical alignment based on the Lidar Survey information. Thereafter a corridor was developed for both the options including the earthworks extents. The earthworks batter slopes were assumed to be 1 in 2 for both cut and fill areas. Geometric transitions were also provided for the horizontal curvatures as per the requirements of DMRB TD 9/93 – Highway Link Design.
- The two options were assessed based on the structures, environmental and geotechnical impacts and requirements. The existing information listed in the section above was used as the base information in doing the assessments.
- The high level structures assessment was based on the proposed corridor model and the OS survey. The requirement for structures and culverts were identified based on the constraints map. An estimated span of the structures was determined from the OS survey information.
- The environmental assessment was carried out by superimposing the proposed EDR route to the datasets mentioned in the previous section.
- The preliminary geotechnical assessment of EDR route was undertaken using readily available desk based resources. The review has been used to identify potential geotechnical constraints to each route option and locations where special ground engineering measures or precautions may be required to address associated ground related risks. The route alignments have also been reviewed to confirm acceptability for the use of conventional earthworks and potential locations where steepened earthworks solutions or retaining wall structures may be required.

### 2.3 Option 1

#### 2.3.1 Detailed Description

Option 1 is shown on drawing number B2271700/OP1/GA/001 in Appendix A and is approximately 6.95km long. The route runs north-east for 1km from A606 Nottingham Road, south of Sysonby Farm and meets Scalford Road, north of John Fernerley College. It continues east to the dismantled railway, north of Melton Country Park for another 0.8km and then runs south-east for 1.7km. From here the proposed route crosses Melton Spinney Road and the existing Transco National Gas pipeline to the south of Twinlakes Park. It then intersects with the

A607 Melton Road, north-east of Thorpe Arnold. It runs on the eastern side of Thorpe Arnold, going south for 1.8km. Within this section, it crosses B676 Saxby Road on the west side of Shipman’s Barn Stud, before crossing the River Eye and continuing along Lag Lane until Brentingby Junction.

After crossing over the railway line, the route heads south-west for 1.6km to A606 Burton Road and ties-in to this route at the existing intersection of Sawgate Road. A 3m combined footway/cycleway is proposed on the western side of the scheme for the full length.

Option 1 crosses six watercourses including flood plain of the River Eye and the Leicester to Peterborough railway line. Four culverts will be required at chainages 150, 680, 1810 and 3070 at crossings of the watercourses. Bridge structures will be required at watercourse crossing at chainage 3770, the River Eye crossing at chainage 4730 and the railway line crossing at chainage 5270. A multi span culvert structure will be also required in order to mitigate flood flow within the River Eye flood plain between chainages 4730 and 5030.

Six at grade junctions will be required at the intersection with the following roads: A606 Nottingham Road, Scalford Road, Melton Spinney Road, A607 Melton Road, B676 Saxby Road and A606 Burton Road. Furthermore, there will be a proposed at grade priority junction with Lag Lane at approximate chainage 5870. The existing private access to the weir of the River Eye at chainage 5330 will require a new connection from Lag Lane. The Sawgate Road access to A606 Burton Road will be terminated and the traffic will be diverted through Cross Lane.

Accident data analysis, accommodation works, widening to accommodate visibility requirements, connection to existing public footpaths, drainage etc. were not assessed at this stage of the design.

### 2.3.2 Option 1 Appraisal

A detailed appraisal was carried out and the advantages and constraints for Option 1 are provided below.

Advantages	Constraints
<b>Highways</b>	
<p><b>Alignment</b></p> <p>All horizontal radii are equal to or above the desirable minimum radius of 720m as per Table 3 of DMRB TD9/93 for a design speed of 100kph.</p> <p>There are no horizontal curves which fall in to the Band C category as shown on Figure 24 of DMRB TD9/93.</p> <p>All vertical radii have a K value above the desirable minimum K value (Hog =100, Sag =26) as per Table 3 of DMRB TD9/93 for a design speed of 100kph. The minimum ‘K’ value for a Hog=110 and the minimum for a Sag=37.</p> <p>The maximum gradient along the alignment is 4.7% which is below the desirable maximum of 6% for all-purpose single carriageway roads as per Clause 4.1 of DMRB TD 9/93.</p> <p>A ‘q’ value of 0.3 has been used along the entire route for designing transitions.</p> <p>At the proposed structure over the railway the headroom between the railway and the vertical profile</p>	<p><b>Alignment</b></p> <p>The proposed alignment will require six at-grade roundabouts and one at-grade direct access to tie-in with the roads in the existing highway network.</p> <p><b>Junctions</b></p> <p>Six at grade junctions will be required with the major roads.</p> <p>Lag Lane will require an at-grade priority junction with the proposed route of Option 1.</p> <p>Private access to the weir of the River Eye will require a new 540m long connection from Lag Lane.</p> <p><b>Existing Features</b></p> <p>The proposed alignment crosses the Transco National Gas Pipeline. The impact on this pipeline will need to be considered during the next stage of the design.</p> <p>The proposed alignment crosses a pond situated east of Scalford Road. The impact on this pond may need</p>

Advantages	Constraints
<p>is approximately 9.0m which is assumed to be sufficient to accommodate railway infrastructure and maintain appropriate clearance.</p> <p><b>Existing Features</b></p> <p>The proposed alignment, associated earthworks and fencing, will not directly impact on any existing buildings.</p> <p>There is at least 50m clearance between the proposed earthworks extent and any existing overhead line pylons.</p> <p>With the exception of one pond that is directly impacted by the proposed alignment, there is at least 15m clearance between the proposed earthworks extent and any other known existing pond features.</p> <p><b>Servicing the Developments</b></p> <p>The proposed alignment connects to proposed development areas and consequently gives access to these areas from the main arterial routes that surround Melton Mowbray.</p>	<p>to be considered during the next stage of the design.</p> <p>The proposed alignment intersects five existing footpaths. The impact on these footpaths may need to be considered during the next stage of the design.</p>
Structures	
<p>It is expected that all proposed bridge and culvert structures can be designed to meet the required road and rail design standards.</p>	<p>Four box culverts are required with a combined span of 18.5 m and width of 155m.</p> <p>A further 300m spanning multi box culvert will be needed to provide flood relief in the flood plain of the River Eye.</p> <p>A further 3 structures will be required with a combined span of 65m. Two structures will be built at a skew which will add complications in design and construction.</p>
Environmental	
<p><b>Landscape and Visual</b></p> <p>There are no Areas of Outstanding Natural Beauty (AONB) directly affected by, or within 1km of, the EDR route corridor.</p> <p>There are no National Parks (NP) directly affected by, or within 1km of, the proposed EDR route corridor.</p> <p>With the exception of Melton Country Park, there are no other Country Parks (CP) within 1km of the proposed EDR route corridor.</p>	<p><b>Landscape and Visual</b></p> <p>The proposed EDR route corridor passes through the northern tip of Melton Country Park for approximately 50m.</p> <p><b>Ecology and Biodiversity</b></p> <p>The proposed EDR route corridor crosses through a short section of the River Eye Site of Special Scientific Interest (SSSI).</p> <p><b>Cultural Heritage</b></p> <p>None identified.</p>

Advantages	Constraints									
<p><b><i>Ecology and Biodiversity</i></b></p> <p>There are no Ramsar sites directly affected by, or within 1km of, the proposed EDR route corridor.</p> <p>There are no Special Protection Areas (SPA) directly affected by, or within 1km of, the proposed EDR route corridor.</p> <p>There are no Special Areas of Conservation (SAC) directly affected by, or within 1km of, the proposed EDR route corridor.</p> <p>There are no National Nature Reserves (NNR) directly affected by, or within 1km of, the proposed EDR route corridor.</p> <p>There are no Local Nature Reserve (LNR) directly affected by, or within 1km of, the proposed EDR route corridor.</p> <p>There are no Local Wildlife Sites (LWS) directly affected by the proposed EDR route corridor.</p> <p>There are no Ancient Woodlands (AW) directly affected by, or within 1km of, the proposed EDR route corridor.</p> <p>There are no Nature Improvement Areas (NIA) directly affected by, or within 1km of, the proposed EDR route corridor.</p> <p>There are no Royal Society for the Protection of Birds (RSPB) sites directly affected by, or within 1km of, the proposed EDR route corridor.</p> <p><b><i>Cultural Heritage</i></b></p> <p>There are no WHS directly affected by, or within 1km of, the proposed EDR route corridor.</p> <p>There are no Conservation Areas (CA) directly affected by, or within 1km of, the proposed EDR route corridor.</p> <p>There are no Scheduled Monuments (SM) directly affected by the proposed EDR route corridor.</p> <p>There are no Listed Buildings (LB) directly affected by the proposed EDR route corridor.</p> <p>There are no Registered Park and Gardens (RPG) directly affected by, or within 1km of, the proposed EDR route corridor.</p> <p><b><i>Water Resources</i></b></p>	<p><b><i>Water Resources</i></b></p> <p>The proposed EDR route corridor passes through a short section of the River Eye, Scalford Brook and Thorpe Brook.</p> <p>The proposed EDR route corridor passes through a section of Flood Zone 2 &amp; 3 for approximately 300m.</p> <p><b><i>Public Access</i></b></p> <p>The proposed EDR route corridor passes through a short section of National Cycle Route (NR 64).</p> <p>The proposed EDR route corridor passes through short sections of five footpaths.</p> <p><b><u>Constraints Within 1km</u></b></p> <p><b><i>Landscape and Visual</i></b></p> <p>None</p> <p><b><i>Ecology and Biodiversity</i></b></p> <p>Additional sections of the River Eye Site of Special Scientific Interest (SSSI) are also located within 1km of the proposed EDR route corridor.</p> <p>There is one Local Wildlife Site (LWS) approximately 100m northwest, one LWS approximately 550m east and one LWS approximately 750m west of the proposed EDR route corridor.</p> <p><b><i>Cultural Heritage</i></b></p> <p>There is one Scheduled Monument (SM) approximately 250m west (Sysonby Grange), one SM approximately 450m south (St Mary and St Lazarus Hospital) and one SM approximately 600m north (Spinney Farm), of the proposed EDR route corridor.</p> <p>There is one Grade I, two Grade II* and nine Grade II Listed Buildings within 1km of the proposed EDR route corridor, as noted below.</p> <table border="1" data-bbox="829 1792 1404 2094"> <thead> <tr> <th>Listed Status</th> <th>Within 500m</th> <th>Within 1km</th> </tr> </thead> <tbody> <tr> <td>Grade I Listed Building</td> <td></td> <td>1. Church of St James</td> </tr> <tr> <td>Grade II* Listed Building</td> <td>1. Church of St Mary the Virgin</td> <td>1. Squires Monument</td> </tr> </tbody> </table>	Listed Status	Within 500m	Within 1km	Grade I Listed Building		1. Church of St James	Grade II* Listed Building	1. Church of St Mary the Virgin	1. Squires Monument
Listed Status	Within 500m	Within 1km								
Grade I Listed Building		1. Church of St James								
Grade II* Listed Building	1. Church of St Mary the Virgin	1. Squires Monument								

Advantages	Constraints			
<p>There are no Source Protection Zones directly affected by, or within 1km of, the proposed EDR route corridor.</p> <p><b>Public Access</b></p> <p>There are no National Trails directly affected by, or within 1km of, the proposed EDR route corridor.</p> <p>There is no National Trust Inalienable Land (NTIL) directly affected by, or within 1km of, the proposed EDR route corridor.</p> <p>There is no Crown Land (CL) directly affected by, or within 1km of, the proposed EDR route corridor.</p>	<p>Grade II Listed Building</p>	<table border="1"> <tr> <td data-bbox="954 353 1179 707"> <ol style="list-style-type: none"> <li>1. St Mary's C of E Infants School</li> <li>2. Syonsby Lodge</li> <li>3. Milepost</li> <li>4. Wold House</li> <li>5. Home Farmhouse</li> <li>6. Base of Cross</li> <li>7. Row of 3 headstones</li> <li>8. The Hall</li> </ol> </td> <td data-bbox="1179 353 1495 707"> <ol style="list-style-type: none"> <li>1. Chestnut Farmhouse</li> </ol> </td> </tr> </table>	<ol style="list-style-type: none"> <li>1. St Mary's C of E Infants School</li> <li>2. Syonsby Lodge</li> <li>3. Milepost</li> <li>4. Wold House</li> <li>5. Home Farmhouse</li> <li>6. Base of Cross</li> <li>7. Row of 3 headstones</li> <li>8. The Hall</li> </ol>	<ol style="list-style-type: none"> <li>1. Chestnut Farmhouse</li> </ol>
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<p><b>Geotechnical</b></p>				
<p>There are not expected to be significant or abnormal ground related constraints along the majority of the Option 1 EDR route corridor.</p>	<p>Alluvial deposits associated with the floodplain of the River Eye are likely to be soft / compressible and may require special ground engineering measures or precautions to address potential settlement and / or instability.</p>			



## 2.4 Option 2

### 2.4.1 Detailed Description

Option 2 is approximately 7.4km long. The route runs north-east for 1km from A606 Nottingham Road, south of Sysonby Farm and meets Scalford Road, north of John Fernerley College. It continues east until the dismantled railway, north of Melton Country Park for another 0.8km and then runs south-east for 1.7km. From here the proposed route crosses Melton Spinney Road and the existing pipeline to the south of Twinlakes Park.

The route then intersects with the A607 Melton Road north-east of Thorpe Arnold. It runs on the eastern side of Thorpe Arnold, crosses B676 Saxby Road east of Shipman’s Barn Stud and continues south to the railway line. After crossing over the railway line, the route heads south-west for 2km to A606 Burton Road and ties-in to this existing road at the existing access of Sawgate Road. A 3m combined footway/cycleway has been provided on the western side of the scheme.

Option 2 crosses seven watercourses including flood plain of the River Eye and the Leicester to Peterborough railway line. Five culverts will be required at chainages 150, 680, 1810, 3070 and 5470 at crossings of the watercourses. Bridge structures will be required at watercourse crossing at chainage 3770, the River Eye crossing at chainage 6050 and the railway line crossing at chainage 5350. A multi span culvert structure will be also required in order to mitigate flood flow within the River Eye flood plain between chainages 5350 and 6120.

Six at-grade junctions will be required at the intersection with the following roads: A606 Nottingham Road, Scalford Road, Melton Spinney Road, A607 Melton Road, B676 Saxby Road and A606 Burton Road. Furthermore, there is a proposed at grade priority junction with Lag Lane at approximate chainage 6050. The Sawgate Road access to A606 Burton Road will be terminated and the traffic will be diverted through Cross Lane.

Accident data analysis, accommodation works, widening to accommodate visibility requirements, connection to existing public footpaths, drainage etc. were not assessed at this stage of the design.

### 2.4.2 Option 2 Appraisal

A detailed appraisal was carried out and the advantages and constraints for Option 2 are provided below.

Advantages	Constraints
<b>Highways</b>	
<p><b>Alignment</b></p> <p>All horizontal radii are equal to or above the desirable minimum radius of 720m as per Table 3 of DMRB TD9/93 for a design speed of 100kph.</p> <p>There are no horizontal curves which fall in to the Band C category as shown on Figure 24 of DMRB TD9/93.</p> <p>All vertical radii have a K value above the desirable minimum K value (Hog =100, Sag =26) as per Table 3 of DMRB TD9/93 for a design speed of 100kph. The minimum ‘K’ value for a Hog=110 and the minimum for a Sag=37.</p> <p>The maximum gradient along the alignment is 4.5% which is below the desirable maximum of 6% for all-purpose single carriageway roads as per Clause 4.1 of DMRB TD 9/93.</p>	<p><b>Alignment</b></p> <p>The proposed alignment will require six at-grade roundabouts and one at-grade priority junction to tie-in with the roads in the existing highway network.</p> <p><b>Junctions</b></p> <p>Six at grade junctions will be required with the major roads.</p> <p>Lag Lane will require an at-grade priority junction with the proposed route of Option 2.</p> <p>Private Access to Brentingby Lodge will require a new connection to either B676 Saxby Road or the proposed route of Option 2.</p>

Advantages	Constraints
<p>A 'q' value of 0.3 has been used along the entire route for designing transitions.</p> <p>At the proposed structure over the railway the headroom between the railway and the vertical profile is approximately 7.6m which is assumed to be sufficient to accommodate railway infrastructure and maintain clearance.</p> <p><b>Existing Features</b></p> <p>The proposed alignment, associated earthworks and fencing, will not directly impact on any existing buildings.</p> <p>There is at least 50m clearance between the proposed earthworks extent and any existing overhead line pylons.</p> <p>With the exception of one pond that is directly impacted by the proposed alignment, there is at least 15m clearance between the proposed earthworks extent and any other existing pond features.</p> <p><b>Servicing the Developments</b></p> <p>The proposed alignment runs through proposed development areas and consequently gives access to these areas from the main arterial routes that surround Melton Mowbray.</p>	<p><b>Existing Features</b></p> <p>The proposed alignment intersects the Transco National Gas Pipeline. The impact on this pipeline will need to be considered during the next stage of the design.</p> <p>The proposed alignment intersects a pond situated east of Scaffold Road. The impact on this pond may need to be considered during the next stage of the design.</p> <p>The proposed alignment intersects five existing footpaths. The impact on these footpaths may need to be considered during the next stage of the design.</p>
Structures	
<p>It is expected that all proposed bridge and culvert structures can be designed to meet the required road and rail design standards.</p>	<p>Five box culverts are required with a combined span of 21.5 m and width of 155m.</p> <p>770m spanning multi box culvert will be needed to provide flood relief in the flood plain of the River Eye.</p> <p>A further 3 structures will be required with a combined span of 63.5m. One structure will be built at a skew which will add complications in design and construction.</p>
Environmental	
<p><b>Landscape and Visual</b></p> <p>There are no Areas of Outstanding Natural Beauty (AONB) directly affected by, or within 1km of, the proposed EDR route corridor.</p> <p>There are no National Parks (NP) directly affected by, or within 1km of, the proposed EDR route corridor.</p>	<p><b>Constraints On Proposed Route</b></p> <p><b>Landscape and Visual</b></p> <p>The proposed EDR route corridor passes through the northern tip of Melton Country Park for approximately 50m.</p>

Advantages	Constraints
<p>With the exception of Melton Country Park, there are no other Country Parks (CP) within 1km of the proposed EDR route corridor.</p> <p><b>Ecology and Biodiversity</b></p> <p>There are no Ramsar sites directly affected by, or within 1km of, the proposed EDR route corridor.</p> <p>There are no Special Protection Areas (SPA) directly affected by, or within 1km of, the proposed EDR route corridor.</p> <p>There are no Special Areas of Conservation (SAC) directly affected by, or within 1km of, the proposed EDR route corridor.</p> <p>There are no National Nature Reserves (NNR) directly affected by, or within 1km of, the proposed EDR route corridor.</p> <p>There are no Local Nature Reserve (LNR) directly affected by, or within 1km of, the proposed EDR route corridor.</p> <p>There are no Local Wildlife Sites (LWS) directly affected by the proposed EDR route corridor.</p> <p>There are no Ancient Woodlands (AW) directly affected by, or within 1km of, the proposed EDR route corridor.</p> <p>There are no Nature Improvement Areas (NIA) directly affected by, or within 1km of, the proposed EDR route corridor.</p> <p>There are no Royal Society for the Protection of Birds (RSPB) sites directly affected by, or within 1km of, the proposed EDR route corridor.</p> <p><b>Cultural Heritage</b></p> <p>There are no WHS directly affected by, or within 1km of, the proposed EDR route corridor.</p> <p>There are no Conservation Areas (CA) directly affected by, or within 1km of, the proposed EDR route corridor.</p> <p>There are no Scheduled Monuments (SM) directly affected by the proposed EDR route corridor.</p> <p>There are no Listed Buildings (LB) directly affected by the proposed EDR route corridor.</p> <p>There are no Registered Park and Gardens (RPG)</p>	<p><b>Ecology and Biodiversity</b></p> <p>The proposed EDR route corridor passes through a short section of the River Eye Site of Special Scientific Interest (SSSI).</p> <p><b>Cultural Heritage</b></p> <p>None identified.</p> <p><b>Water Resources</b></p> <p>The proposed EDR route corridor passes through a short section of the River Eye, Scalford Brook and Thorpe Brook.</p> <p>The proposed EDR route corridor passes through a section of Flood Zone 2 &amp; 3 for approximately 600m.</p> <p><b>Public Access</b></p> <p>The proposed EDR route corridor passes through a short section of National Cycle Route (NR 64).</p> <p>The proposed EDR route corridor passes through short sections of five footpaths.</p> <p><b>Constraints Within 1km</b></p> <p><b>Landscape and Visual</b></p> <p>None</p> <p><b>Ecology and Biodiversity</b></p> <p>Additional sections of the River Eye Site of Special Scientific Interest (SSSI) are also located within 1km of the proposed EDR route corridor.</p> <p>There is one Local Wildlife Site (LWS) approximately 100m northwest, one LWS approximately 550m east and one LWS approximately 750m west of the proposed EDR route corridor.</p> <p><b>Cultural Heritage</b></p> <p>There is one Scheduled Monument (SM) approximately 250m west (Sysonby Grange), one SM approximately 450m south (St Mary and St Lazarus Hospital) and one SM approximately 600m north (Spinney Farm), of the proposed EDR route corridor.</p> <p>There is one Grade I, two Grade II* and eleven Grade II Listed Buildings within 1km of the proposed EDR route corridor.</p>

Advantages	Constraints												
<p>directly affected by, or within 1km of, the proposed EDR route corridor.</p> <p><b>Water Resources</b></p> <p>There are no Source Protection Zones directly affected by, or within 1km of, the proposed EDR route corridor.</p> <p><b>Public Access</b></p> <p>There are no National Trails directly affected by, or within 1km of, the proposed EDR route corridor.</p> <p>There is no National Trust Inalienable Land (NTIL) directly affected by, or within 1km of, the proposed EDR route corridor.</p> <p>There is no Crown Land (CL) directly affected by, or within 1km of, the proposed EDR route corridor.</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #cccccc;">Listed Status</th> <th style="background-color: #cccccc;">Within 500m</th> <th style="background-color: #cccccc;">Within 1km</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Grade I Listed Building</td> <td></td> <td>1. Church of St James</td> </tr> <tr> <td style="text-align: center;">Grade II* Listed Building</td> <td>1. Church of St Mary the Virgin</td> <td>1. Squires Monument</td> </tr> <tr> <td style="text-align: center;">Grade II Listed Building</td> <td>                     1. St Mary's C of E Infants School                      2. Syonsby Lodge                      3. Milepost                      4. Wold House                      5. Home Farmhouse                      6. Base of Cross                      7. Row of 3 headstones                      8. The Hall                 </td> <td>                     1. Chestnut Farmhouse                      2. Manor Farmhouse                      3. Former Church of St Mary                 </td> </tr> </tbody> </table> <p><b>Water Resources</b></p> <p>There is a large waterbody (Twin Lakes Amusement Park) approximately 100m northeast of the proposed EDR route corridor, and several additional minor waterbodies within 1km of the proposed EDR route corridor.</p> <p>Additional sections of the same Flood Zone 2 &amp; 3 are also located within 1km of the proposed EDR route corridor.</p> <p><b>Public Access</b></p> <p>Additional sections of the same National Cycle Route (NCR) are also located within 1km of the proposed EDR route corridor.</p> <p>There are an additional two footpaths within 1km of the proposed EDR route corridor.</p> <p><b><u>Additional Nearby Constraints</u></b></p> <p>Melton Mowbray Conservation Area (CA) is approximately 2km to the west.</p> <p>There is a Source Protection Zone 1 (Inner Zone), Source Protection Zone 2 (Outer Zone) and Source Protection Zone 3 (Total Catchment) approximately 2km west of the proposed EDR route corridor.</p>	Listed Status	Within 500m	Within 1km	Grade I Listed Building		1. Church of St James	Grade II* Listed Building	1. Church of St Mary the Virgin	1. Squires Monument	Grade II Listed Building	1. St Mary's C of E Infants School 2. Syonsby Lodge 3. Milepost 4. Wold House 5. Home Farmhouse 6. Base of Cross 7. Row of 3 headstones 8. The Hall	1. Chestnut Farmhouse 2. Manor Farmhouse 3. Former Church of St Mary
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Advantages	Constraints
<b>Geotechnical</b>	
There are not expected to be significant or abnormal ground related constraints along the majority of the Option 2 EDR route corridor.	Alluvial deposits associated with the floodplain of the River Eye are likely to be soft / compressible and may require special ground engineering measures or precautions to address potential settlement and / or instability.

## 2.5 Comparison of Options

### 2.5.1 Highways

Option 1 and 2 follow the same route from Ch.0 to Ch.3600 before splitting into two different alignments for the remaining section until the tie-in location at A606 Burton Road. Option 1 runs west of Shipman’s Barn Stud before intersecting B676 Saxby Road at chainage 4650. It then continues over the River Eye at chainage 4730 before it crosses the railway at the same location as the existing Lag Lane. Option 2 runs east of Shipman’s Barn Stud before intersecting B676 Saxby Road at chainage 4700. It then continues over the railway line at chainage 5350 before it crosses the River Eye at chainage 6050.

Impacts of the both routes are similar and both routes conform to the DMRB design standards. However Option 1 is 0.45km shorter than Option 2. Option 1 will require a new access from Lag Lane to the private access to the weir of the River Eye and Option 2 will require a new access to Brentingby Lodge. Therefore considering the total length, Option 1 is favourable.

### 2.5.2 Structures

For Option 1 a total of seven structures will be required in comparison to the eight for Option 2. Option 2 will require an additional culvert. Furthermore, the alignment of Option 1 crosses the River Eye in a location where the width of the flood plain is significantly narrower in comparison to Option 2. The reduction of length of the multi span culvert will be approximately 470m whilst providing adequate flood flow. Therefore considering the impacts Option 1 will be beneficial in comparison to Option 2.

### 2.5.3 Environmental

Option 1 and Option 2 are very similar in terms of potential environmental impact but Option 1 crosses less Flood Zone 2 & 3 than Option 2, which may have a bearing upon the final route option. It may be prudent to consider a minor route realignment to avoid directly impacting upon Melton Country Park, for both Option 1 and Option 2.

### 2.5.4 Geotechnical

Option 1 alignment has a shorter crossing of the floodplain of the River Eye reducing the extent of ground engineering measures possibly required to address the presence of potentially soft / compressible alluvial deposits. Due to a shorter overall length and reduced length of construction required across the floodplain of the River Eye, Option 1 is considered more favourable than Option 2 from a geotechnical perspective.

## 2.6 Conclusion

Based on the aforementioned information, it is concluded that whilst both Option 1 and Option 2 are viable, Option 1 preferable at this stage of the design and could be developed further. The route is subject to further changes during the next stage of the design particularly at the northern and southern ends to ensure that the route ties in to future development and masterplan proposals. Additionally, there may be a number of other feasible route options which could be considered and developed. It is noted, therefore, that a preferred route should be identified during the full optioneering stage of the project.

As Option 1 is preferable and viable, Section 3 below provides more detail of the design.

### 3. Details of Option 1

This section provides details for Option 1 and is divided into sub sections based on design disciplines.

#### 3.1 Highways

##### 3.1.1 Mainline Alignment

Plan and profile drawings were produced to show the vertical alignment along with the horizontal alignment and are shown on drawings B2271700/OP1/GA/PP/001 to B2271700/OP1/GA/PP/007 in Appendix A. The drawings are annotated with chainages, proposed design and existing lidar survey levels, details of proposed horizontal and vertical alignments, location of structures and indicative location of junctions with side roads.

The proposed alignment level varies considerably along the route. The highest point of the vertical profile is at chainage 760 and has a level of 118.7m. The lowest point is at chainage 4700 with a level of 76.0m which is located between B676 Saxby Road and the River Eye. There are five low points along the vertical profile. These low points generally coincide with topographical lows located near the existing watercourses.

Band C curves, as per Figure 24 of DMRB TD 9/93, produce long dubious overtaking conditions for vehicles travelling in the left hand curve direction. Considering a design speed of 100 kph, horizontal radii are not provided between 1020m and 2880m. The specified radii for Option 1 are 720m, 950m and 2950m which are outside the Band C range and above or equal to the desirable minimum radius as per Table 3 of DMRB TD 9/93. Transitions and superelevation are included as necessary in the alignment design. A 'q' value of 0.3 was considered to calculate the length of the transitions.

The minimum 'K' values used for the vertical alignment design are 110 and 37 for Hog and Sag curves respectively. These are above the desirable minimum values for a 100kph design speed as specified in Table 3 of DMRB TD9/93. The maximum gradient along the alignment is 4.7% at chainage 4090.

Small streams and tributaries to the River Eye are to be culverted under the route. The location of potential culverts can be seen on drawings B2271700/OP1/GA/001 to B2271700/OP1/GA/007. A drainage strategy was identified based upon information from a desk study. It is assumed at this stage that use of soakaways will be a viable drainage solution. The drainage strategy will therefore comprise of a combination of soakaways, attenuation ponds, filter trenches and direct discharge to watercourses. The drainage scheme will be split into various drainage catchments. These catchments allow for runoff from the highway and associated earthworks. Highway runoff will be collected by either combined kerb drains or roadside gullies and runoff from associated earthworks cuttings will be collected from "internal" filter trenches. These collection systems will discharge into the main carrier drains.

To limit discharge to watercourses, attenuation ponds will be considered, where appropriate. Open ponds will be used to achieve the required attenuation for the critical duration for a 1 in 100 years design rainfall event plus climate change allowances. Bypass separators will also need to be considered upstream of the ponds to ensure the risk of groundwater contamination is reduced.

The EDR route passes over the River Eye, which is subject to flooding and fall in the following zones as per the Environment Agency Flood Map for planning information.

**Flood Zone 2** is the additional extent of an extreme flood from rivers or the sea. These outlying areas are likely to be affected by a major flood, with up to a 0.1 per cent (1 in 1000) chance of occurring each year.

**Flood Zone 3** is the area that could be affected by flooding, either from rivers or the sea and if there were no flood defences, this area could be flooded.

Environment Agency approval will be required to build through the flood plain of the river. This will include type and size of culverts, flood arch and any flood compensation requirements.

### 3.1.2 Junction Assessment

The proposed EDR route crosses six existing major roads. An assessment was carried out to identify the form of the junctions. Projected traffic data for the existing major roads and proposed EDR route were used to determine the junction type required. The assessment was based on Figure 2.2 of DMRB TD42/95. The junction assessment is shown on the following figure. As per the figure, all six junctions need to be roundabouts. The six roundabouts are detailed in the following sections.

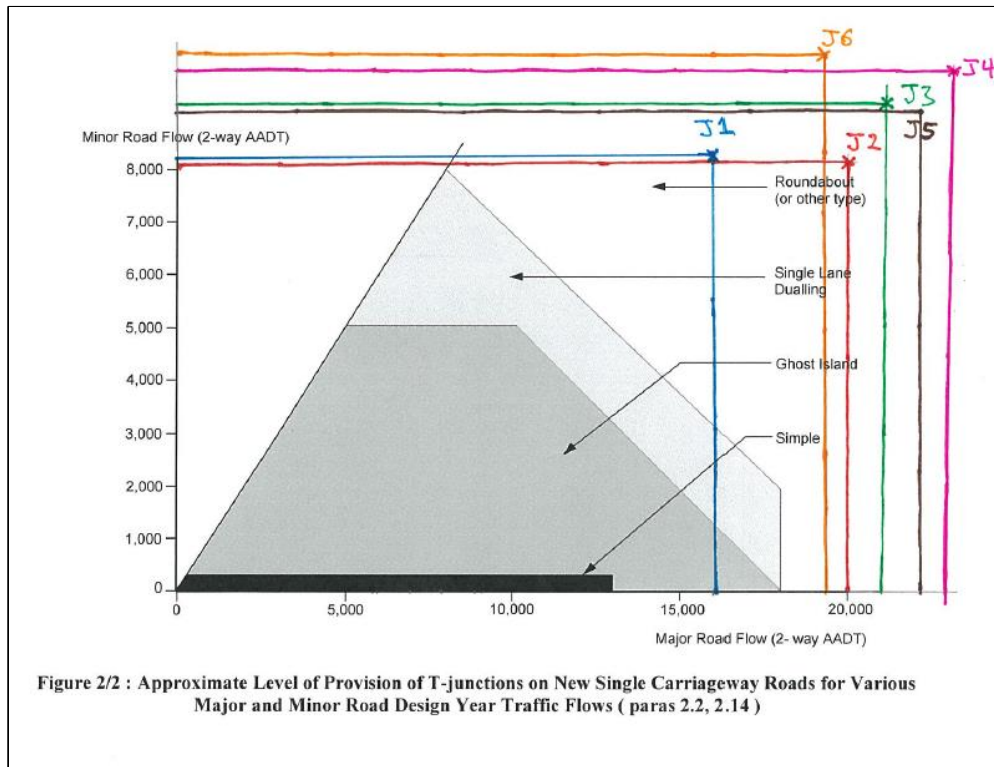


Figure 3: Junction Assessment

### 3.1.3 Roundabout 1 – A606 Nottingham Road Ch.0

The concept design for Proposed Roundabout 1 is shown on drawing B2271700/OP1/GA/002 in Appendix A. There is an existing major/minor priority junction at this location between A606 Nottingham Road and St Bartholomew’s Way. The proposed roundabout was designed as a four-arm roundabout connecting A606 Nottingham Road, proposed EDR route and St Bartholomew’s Way. The existing speed limit on Nottingham Road, to the north of the existing junction, changes from 40mph to 50mph. The existing speed limit on St Bartholomew’s Way is 40mph. Therefore the existing speeds limits need to be reviewed if a roundabout is proposed at this location.

The Inscribed Circle Diameter of the proposed roundabout is 44m. The proposed roundabout has got a minimal impact on the existing surroundings apart from minor realignment of the A606 Nottingham Road. Buildability needs to be considered during the next stage of the design. The tie-ins to the existing carriageway of A606 Nottingham Road are approximately 160m north and 125m south from the proposed roundabout. The existing carriageway edges of St Bartholomew’s Way are proposed to be retained and the tie-in is approximately 22m from the proposed roundabout. At all tie-in locations the width of the existing carriageway is approximately 7.3m. Further consideration will be required for the entrance to Sysonby Farm during the next stage of the design.

### 3.1.4 Roundabout 2 – Scaford Road Ch. 975

The concept design for Proposed Roundabout 2 is shown on drawing B2271700/OP1/GA/003 in Appendix A. The proposed roundabout was designed as a four-arm roundabout at this location. The roundabout sits on Scaford Road to the north of John Fernerley College. The existing speed limit of Scaford Road is 60mph.

The Inscribed Circle Diameter of the proposed roundabout is 60m. The tie-ins to the existing Scaford Road are approximately 100m north and 150m south from the proposed roundabout. At these tie-in locations, the width of the proposed carriageway is 6.0m to the northern side and 6.5m to the southern side. There are no existing buildings in the vicinity of the proposed roundabout.

### 3.1.5 Roundabout 3 – Melton Spinney Road Ch. 2590

The concept design for Proposed Roundabout 3 is shown on drawing B2271700/OP1/GA/004 in Appendix A. The proposed roundabout was designed as a four-arm roundabout at this location. The roundabout sits on Melton Spinney Road just south of the entrance to Twin Lakes Park. The existing speed limit of Melton Spinney Road is 60mph.

The Inscribed Circle Diameter of the proposed roundabout is 60m. There will be minor realignment of the Melton Spinney Road at this location which improves the existing geometry. The tie-ins to the existing Melton Spinney Road are approximately 160m north and 115m south from the proposed roundabout. At the tie-in locations, the width of the proposed carriageway is 5.5m. There are no existing buildings in the vicinity of the proposed roundabout. Entrance to the Twin Lakes Park may be provided from the proposed roundabout. This needs to be considered during the next stage of the design.

### 3.1.6 Roundabout 4 – A607 Melton Road Ch. 3500

The concept design for Proposed Roundabout 4 is shown on drawing B2271700/OP1/GA/005 in Appendix A. The proposed roundabout was designed as a four-arm roundabout at this location. The roundabout sits on A607 Melton Road. The roundabout is sited in between Thorpe Arnold and The Poplars private property. The existing speed limit of A607 Melton Road is 60mph.

The Inscribed Circle Diameter of the proposed roundabout is 60m. There will be minor realignment of the A607 Melton Road at this location which also improves the existing geometry. The tie-ins to the existing A607 Melton Road are approximately 135m northeast and 170m southwest from the proposed roundabout. At the tie-in locations, the width of the proposed carriageway is 6.9m to the north eastern side and 6.2m to the south western side. There are no existing buildings in the vicinity of the proposed roundabout.

### 3.1.7 Roundabout 5 – B676 Saxby Road Ch. 4650

The concept design for Proposed Roundabout 5 is shown on drawing B2271700/OP1/GA/006 in Appendix A. The proposed roundabout was designed as a four-arm roundabout at this location. The roundabout sits to the north of B676 Saxby Road between Lag Lane and the Shipman's Barn Stud. The existing Lag Lane junction with B676 needs to be closed. The existing speed limit of B676 Saxby Road is 60mph. The roundabout is proposed to be raised from the existing B676 Saxby Road level to avoid flooding issues. B676 Saxby Road is probably within the flood plain of the River Eye. The bridge structure proposed at the River Eye will be in the vicinity of the southern arm of the proposed roundabout and may need to be widened further to accommodate entry flaring and visibility on approach to the roundabout. This needs to be considered during the next stage of the design.

The Inscribed Circle Diameter of the proposed roundabout is 64m. There will be minor realignment of the A607 Melton Road at this location which also improves the existing geometry. The tie-ins to the existing A607 Melton Road are approximately 100m east and 120m west from the proposed roundabout. At the tie-in locations, the width of the proposed carriageway is 6.3m to the eastern side and 6.8m to the western side. The existing property Shipman's Barn Stud may be impacted by the proposed scheme design, which will need to be examined further at the next stage.



### 3.1.8 Roundabout 6 – A606 Burton Road Ch. 6940

The concept design for Proposed Roundabout 6 is shown on drawing B2271700/OP1/GA/007 in Appendix A. The proposed roundabout was designed as a three-arm roundabout at this location. The roundabout sits to the north eastern side of A606 Burton Road at the existing junction location of Sawgate Road with A606 Burton Road. The existing speed limit of B676 Saxby Road is 40mph.

The Inscribed Circle Diameter of the proposed roundabout is 50m. There will be realignment of the A606 Burton Road at this location. The tie-ins to the existing A606 Burton Road are approximately 170m north and 175m west from the proposed roundabout. At the tie-in locations, the width of the proposed carriageway is 7.3m. Further consideration needs to be given to the driveways of properties 212-222 Burton Road which will be impacted by the proposed roundabout design. It is proposed to close the Sawgate Road with a turning head as there is an alternative connection via Cross Lane, however the roundabout could be amended to include the Sawgate Road as an additional arm if required. This needs to be considered during the next stage of the design along with any requirements driven by new developments in the area to the South of Melton Mowbray.

## 3.2 Structures

Option 1 crosses six watercourses including flood plain of the River Eye and the Leicester to Peterborough railway line. The span and width of the structures have been assessed using OS Map data. For this preliminary sizing exercise, an initial span limit of 6m has been given to inclusion of culverts and anything in excess of this was considered to require a bridge structure. A brief description of the structures concepts evaluated during the desk study is given below.

### 3.2.1 Culvert at chainage 150

The culvert is required to carry the proposed road over a watercourse. The culvert will span approximately 5m and be 24m wide. Culverts of this size can be precast away from site and brought in segments to site to reduce construction time. Splayed wing walls will be required to retain the earthworks away from the watercourse.

### 3.2.2 Culvert at chainage 680

A culvert will be required to support the proposed road over a watercourse. The culvert will span approximately 4m and be 56m wide. Culverts of this size can be precast away from site and brought in segments to site to reduce construction time. Splayed wing walls will be required to retain the earthworks away from the watercourse.

### 3.2.3 Scafford Brook culvert at chainage 1810

Scafford Brook crosses the proposed road at chainage 1810. The culvert is required to span approximately 4.5m and will be 45m wide. Culverts of this size can be precast away from site and brought in segments to site to reduce construction time. Splayed wing walls will be required to retain the earthworks away from the watercourse.

### 3.2.4 Culvert at chainage 3070

The watercourse at chainage 3070 will pass under the proposed road through a culvert. The culvert will span approximately 5m and be 30m long. Culverts of this size can be precast away from site and brought in segments to site to reduce construction time. Splayed wing walls will be required to retain the earthworks away from the watercourse.

### 3.2.5 Structure at chainage 3770

The proposed road crosses a watercourse at chainage 3760. The span is greater than that commonly available in precast box culverts and therefore a bridge structure will be provided. The road alignment is not perpendicular to the watercourse and therefore the structure will be built with a skew angle of approximately 30° to keep the span to a minimum. The skew span will be 9.5m and the deck width will be 13.8m between the

inside faces of the parapets. The deck construction is likely to be prestressed concrete beams supported on cantilever abutments. Splayed wing walls will be required to retain the earthworks away from the watercourse.

### 3.2.6 River Eye Bridge

The River Eye will pass under the proposed alignment at chainage 4730 at a skew of approximately 30°. The skew span will be 10.5m and the deck width will be 13.8m between inside faces of the parapets. The deck construction is likely to be prestressed concrete beams supported on integral abutments. Splayed wing walls will be required to retain the earthworks away from the watercourse.

### 3.2.7 Flood relief culverts

The proposed alignment passes over the flood plain of the River Eye. To ensure adequate flow of flood water multi span box culverts could be constructed underneath the road for a length of 300m between chainages 4730 and 5030. The estimated maximum width of culvert will be 28m. Culverts of this size can be precast away from site and brought in segments to site to reduce construction time. Splayed wing walls will be required to retain the earthworks away from the watercourse.

### 3.2.8 Leicester to Peterborough railway Bridge

The highway travels over the railway in a location where there is an existing crossing. The concept design span of the structure will be 45m with a width of 13.8m between inside faces of the parapets however this width could be increased if the existing animal crossing is retained in this location. A span of this distance is likely to require a composite deck construction of steel girders with concrete deck slab. The current railway is non electrified and consideration should be given to the possible future electrification of this line. Splayed wing walls will be required to retain the earthworks away from the watercourse. The road crossing is at the location of an existing bridge structure which may be able to be amended to accommodate the new road. However this needs to be considered during the next stage of the design.

## 3.3 Environmental

This proposed EDR route directly affects the following identified features:

- Melton Country Park is crossed for approximately 50m;
- River Eye SSSI is crossed for a short section;
- River Eye, Scalford Brook and Thorpe Brook are crossed for a short section;
- Flood Zone 2 & 3 is crossed for approximately 300m;
- National Cycle Route NR64 is crossed for a short section; and
- Footpaths x5 are crossed for a short section.

There are several other constraints located within 1km of the proposed EDR route:

- River Eye SSSI additional sections;
- Local Wildlife Sites x3;
- Scheduled Monuments x3;
- Listed Buildings (1x Grade I, 2x Grade II\* and 9x Grade II);
- Twin Lakes Amusement Park and several additional smaller waterbodies;
- Flood Zone 2 & 3 additional sections;
- National Cycle Route NR64 additional sections;
- Footpaths x2 additional;
- Melton Mowbray Conservation Area is located approximately 1.5km to the west; and

- SPZ 1, 2 & 3 is located approximately 1.5km to the west.

Therefore careful consideration needs to be given to the above constraints during the next stage of the design to minimise or eliminate the impact.

### **3.4 Geotechnical**

The only significant geotechnical constraint identified is the crossing of the flood plain of the River Eye where the expected presence of alluvial deposits is likely to require special ground engineering measures or precautions for earthworks and structures.

The proposed conventional earthworks slopes of 1 vertical : 2 horizontal are expected to be generally suitable. However, shallower slope gradients may be required for higher embankment sections (assumed >7m high) and embankments if constructed across areas of underlying soft / compressible alluvium.

The proposed alignment may have an earthworks deficit (shortage of fill materials) and therefore may require consideration of borrow pits and / or localised adjustment to achieve an earthworks balance at the next stage of design.

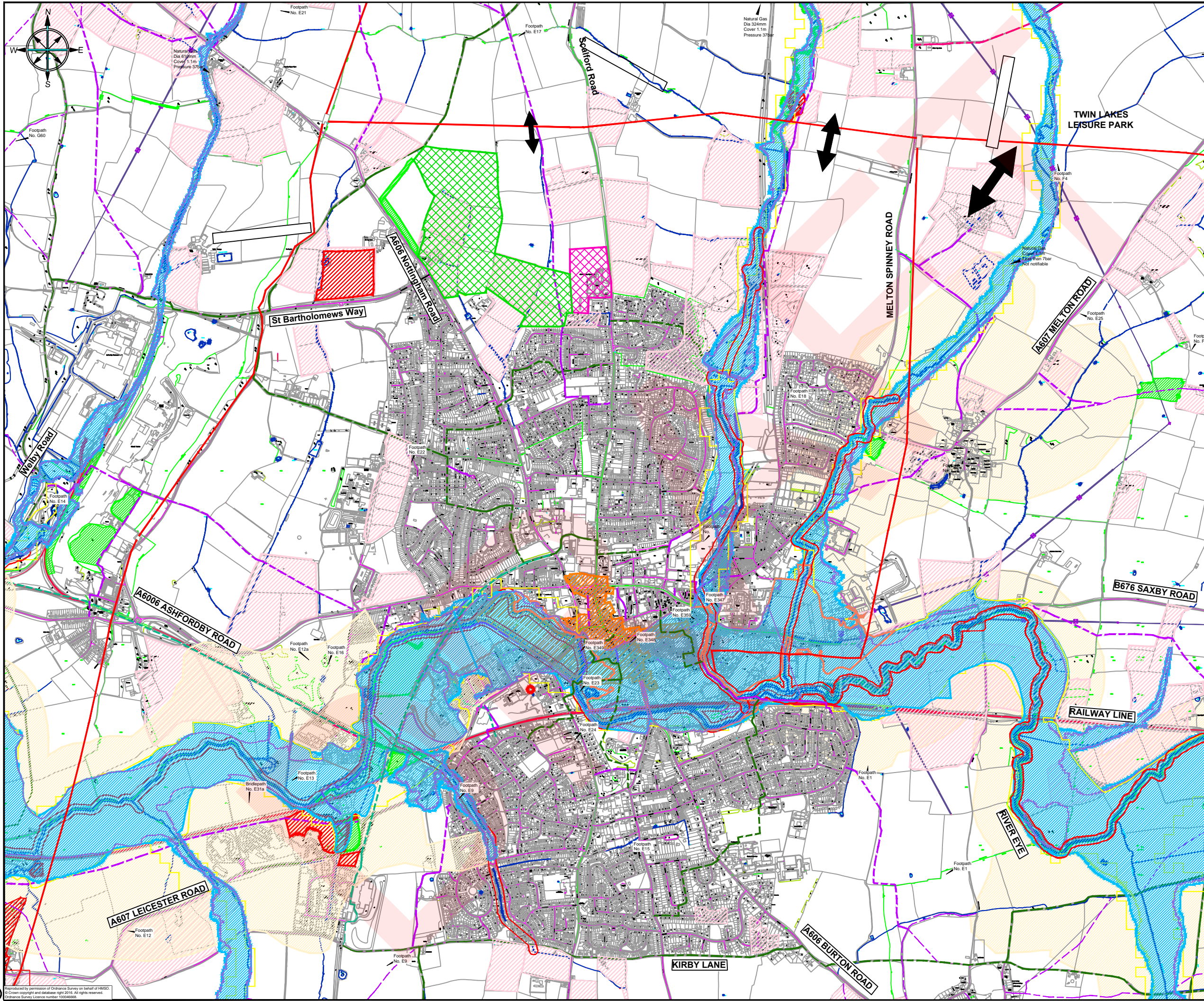
## 4. Assumptions and Risks

The purpose of the concept design is to assess that a deliverable route exists which runs to the eastern side of Melton Mowbray. This design has been developed to support the submission to Department for Transport (DfT) as a part of the DfT Major Local Scheme submission. The route is an initial concept design and subject to change when the design is developed further during the next stages. The limitations, assumptions and risks for the development of the concept design for the EDR to date are given below.

- The options were developed for to ensure viability of a route and for comparison purposes only. The options may require significant amendments as the design is developed to incorporate more detail.
- An initial outline design was developed for the roundabouts associated with Option 1 which may require further changes to conform to the DMRB design standards.
- Lidar Survey and OS data was used as the basis for developing the options and the accuracy of this data is not known. Actual detailed survey data may vary from the Lidar information and the route options may require further amendments.
- The baseline information used for development of the options is listed in Section 1 of this report. Any changes to the baseline information may require change to the proposed options. The base data has come from a variety of sources. All data needs to be verified by fieldwork or other means during the next stages of the design.
- Accident data analysis, accommodation works, widening to accommodate visibility requirements, connection to existing public footpaths, drainage etc. were not assessed at this stage of the design.
- Non-motorised-user (NMU) connections to the existing public footways were not considered at this stage of the design, but should be accommodated during further development for any option.
- Statutory Undertaker's apparatus and equipment were not considered during the development of the alignment options. Any major impact on these may require changes to the alignment options.
- Construction of the new road increases the amount of surface water run-off, potentially increasing the impact of any flooding. Additionally, climate change may increase the likelihood and severity of floods and the Environment Agency will need to review and approve the drainage proposals during the next stages of design.
- It is assumed that the existing ground conditions along the route are as indicated by available geological mapping and the other desk based sources considered as part of the study.
- It is assumed that the ground conditions present and site won earthworks fill materials are suitable for the construction of proposed cut and fill earthworks with side slope gradients of 1v:2h. Should this assumption not be satisfied a reduction in earthworks side slope gradients may be required with an associated increase in the required earthworks footprint and land take requirements.
- Only limited historical ground investigation information is available along the route of the proposed scheme. Ground investigation works and laboratory testing will be required to confirm the ground conditions along the route and to inform further design development.
- A site walkover has not been undertaken to confirm the findings of the preliminary geotechnical desk study exercise undertaken to inform the current study. It is possible that additional ground related constraints may be present along the EDR route.
- A detailed earthworks balance has not been undertaken as part of the current assessment. Both of the current alignment options may have an earthworks materials deficit and therefore may require further refinement and / or the consideration of potential borrow pits to achieve an acceptable earthworks balance.
- The potential acceptability of site won earthworks materials is unknown. A proportion of site won fill materials are likely to be unacceptable for re-use as engineered fill material. An assessment of earthworks materials acceptability will need to be undertaken as part of future studies on the basis of results from a site specific ground investigation.

- The extent of data reviewed for this desk-top study is detailed in this report, so the conclusions presented are based on this information only. As more information is obtained in the next stages of development or existing data is updated, changes may be required.
- Additional environmental constraints may be identified at subsequent stages of the project when additional data sets are obtained from different sources or during environmental surveys and site visits.

## Appendix A. Drawings



Note:  
1. All drawings are in meters unless otherwise specified.

- Key**
- Water Courses
  - - - Existing Cycleway
  - - - Proposed Cycleway
  - Overhead Power Cables
  - Wildlife Sites
  - Ridge & Furrow
  - Scheduled Monuments
  - Conservation Areas
  - Sand & Gravel mca
  - Footpaths
  - Bridleways
  - Flood Zone
  - Areas of Flood Benefit
  - SSSI
  - Transco National Gas Pipe (approx)
  - Land owned by LCC (education)
  - Land owned by LCC (property)
  - ↔ Pedestrian Desire Lines

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EXISTING FEATURES  
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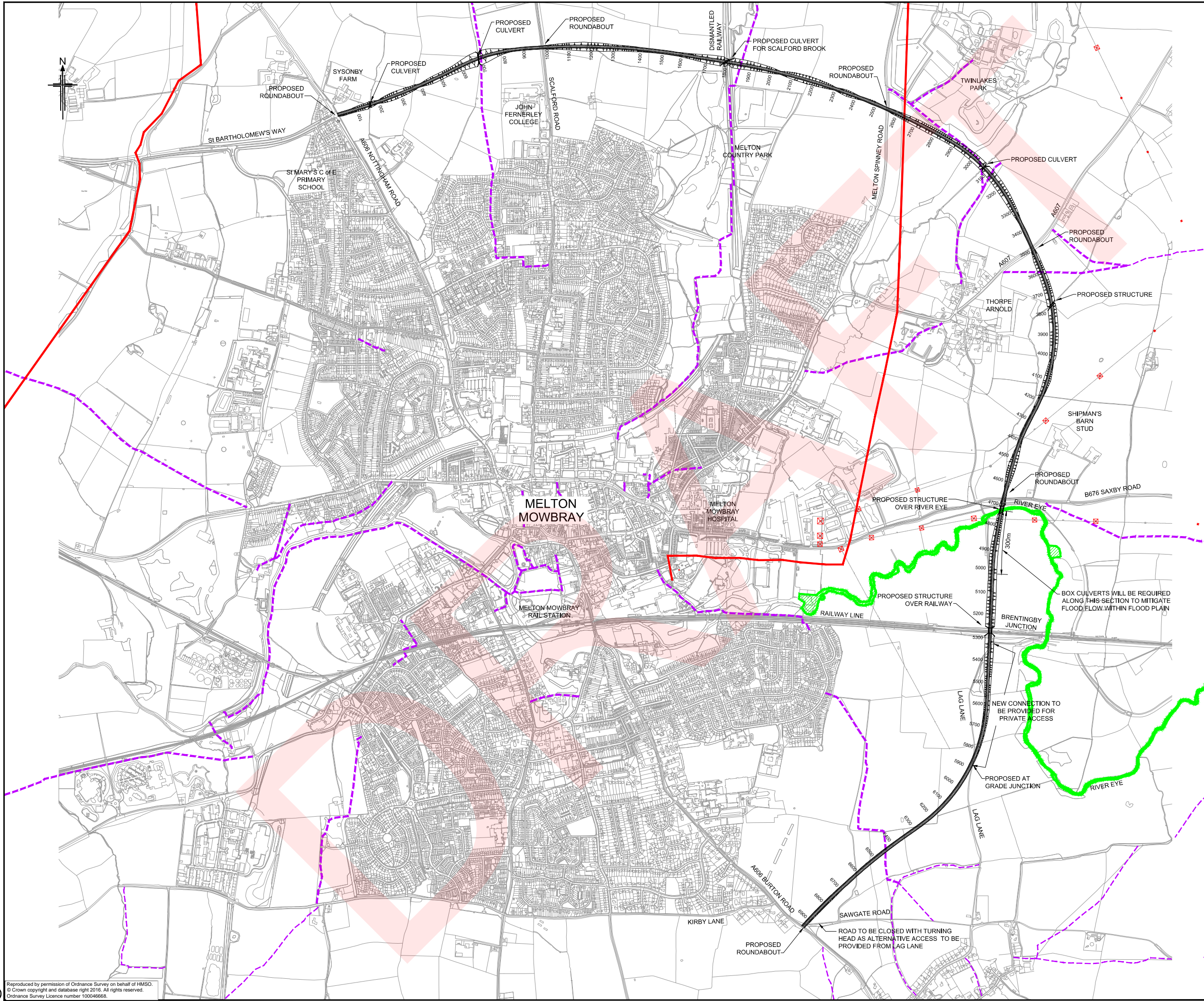
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- Legend:
- Proposed Structure
  - Existing footpath
  - Existing electricity pylon
  - Existing Transco National gas pipeline
  - Site of Special Scientific Interest

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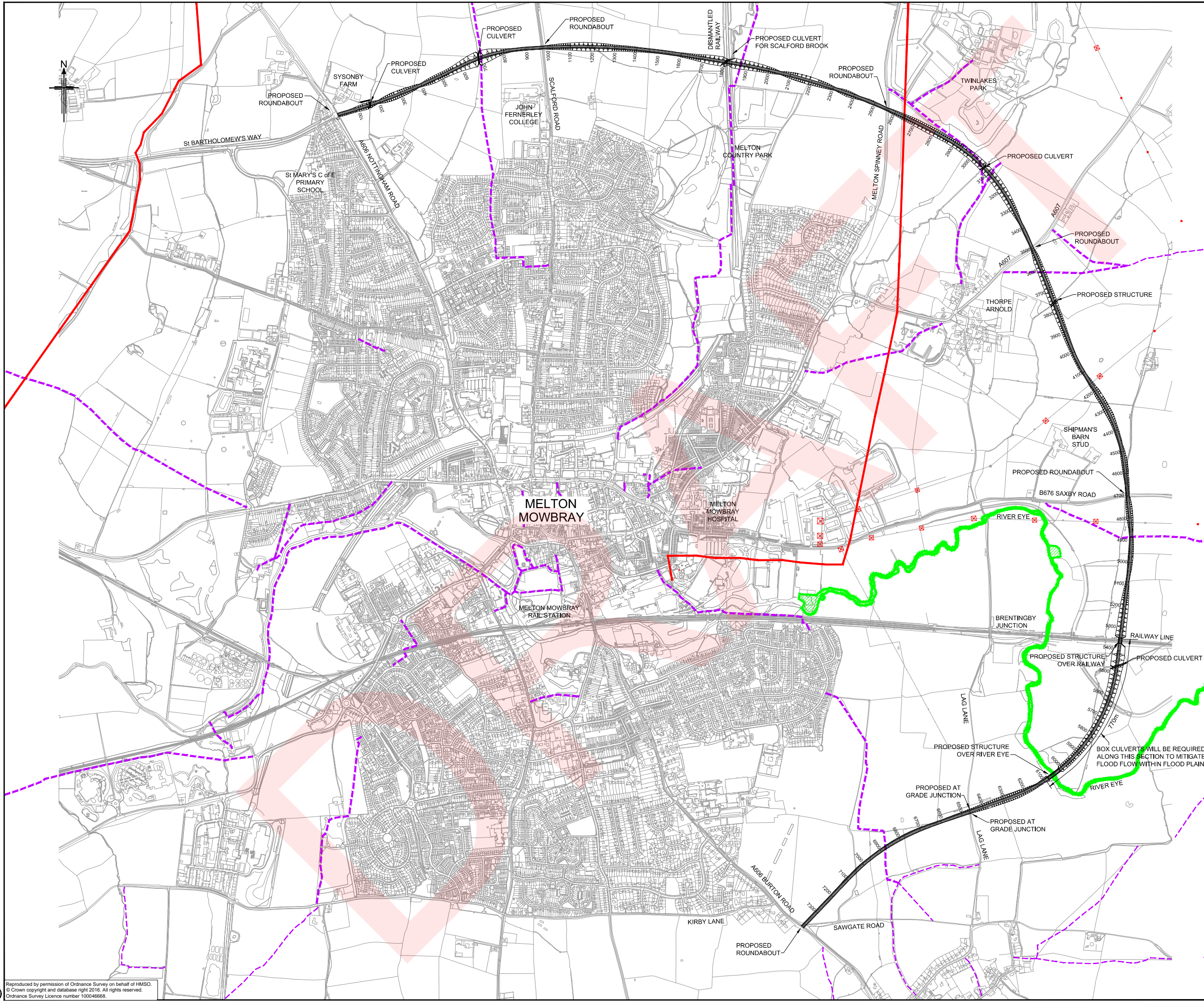
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  - Existing footpath
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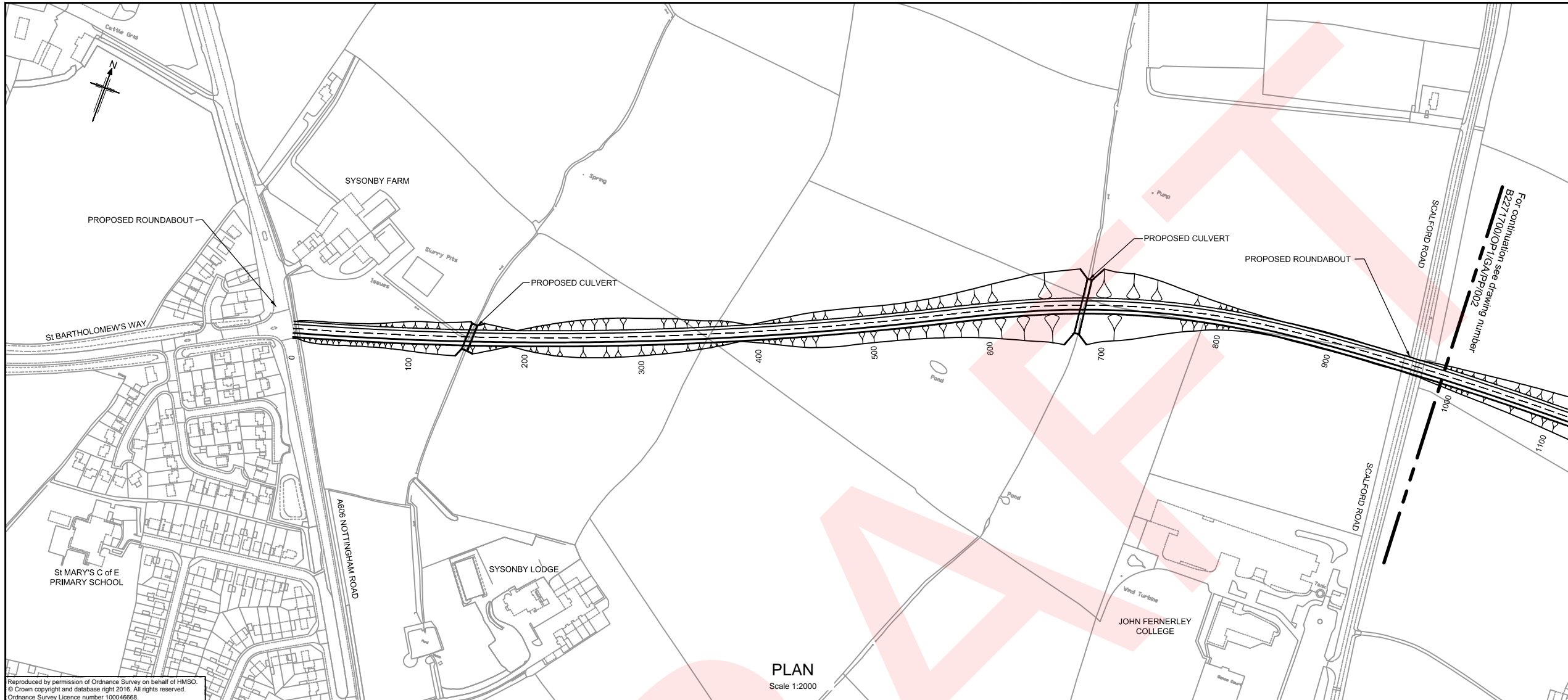
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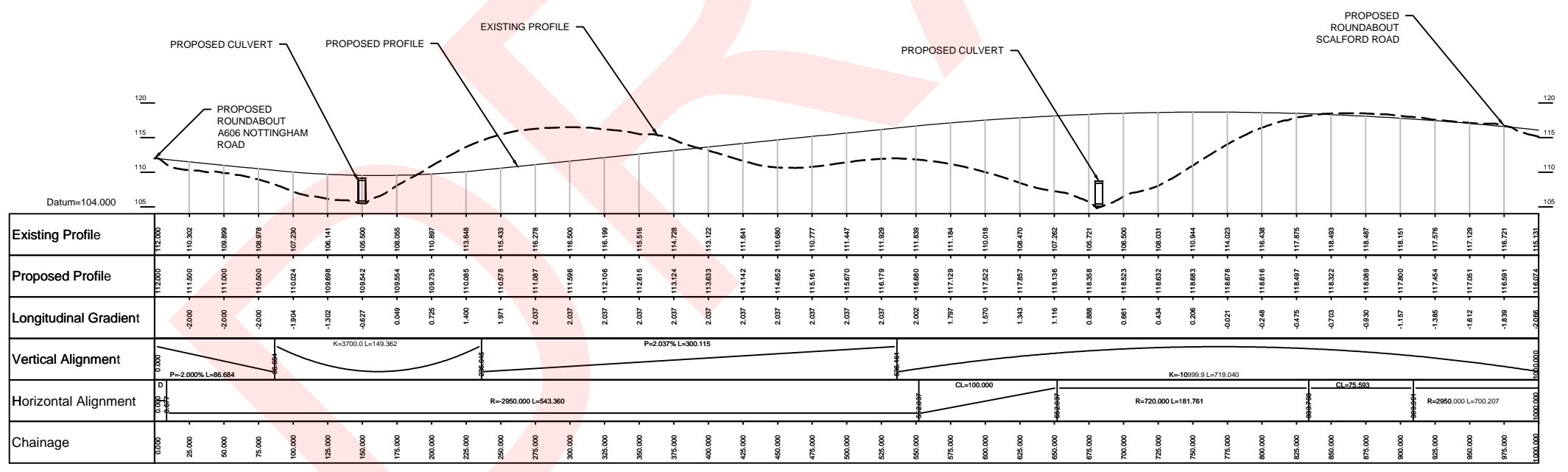
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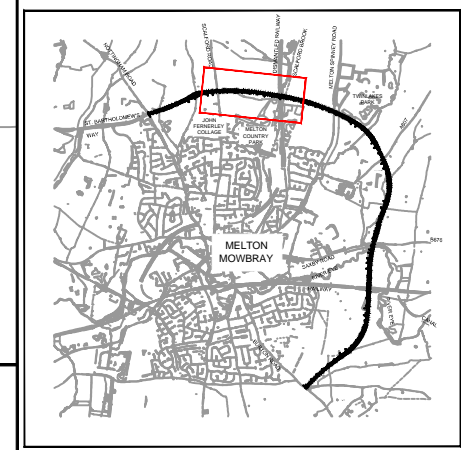


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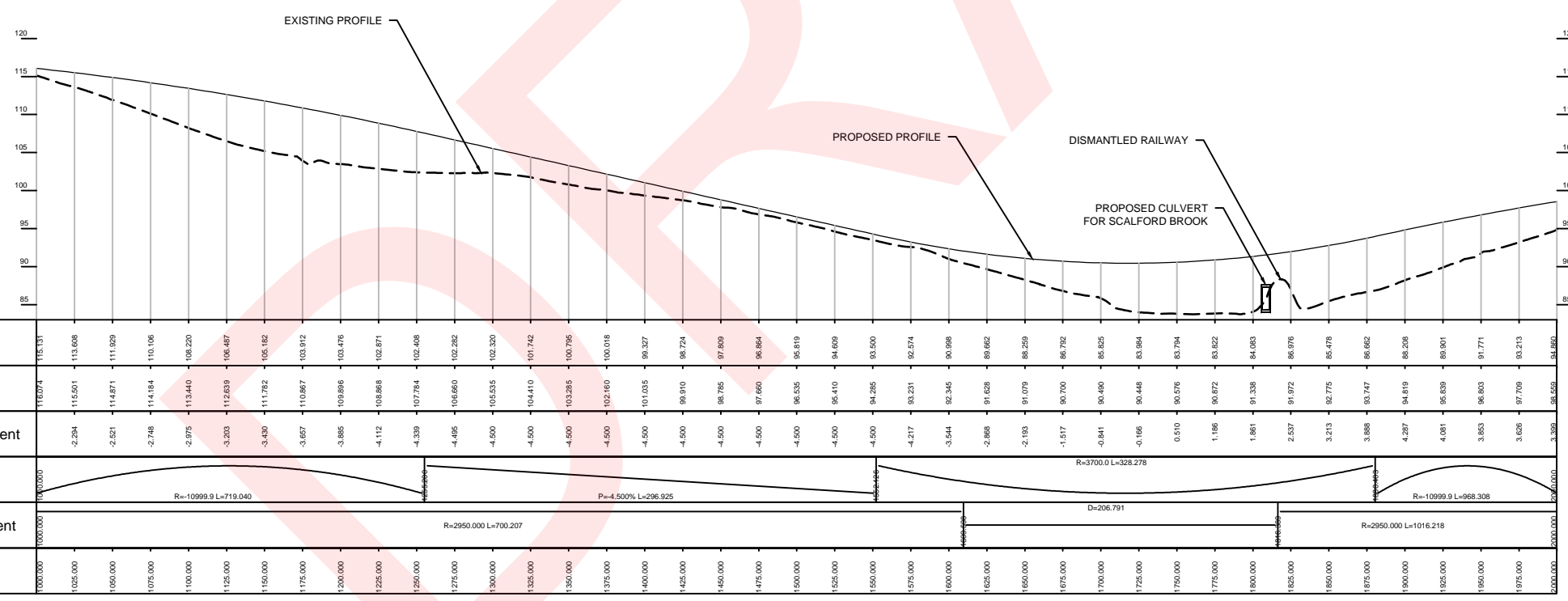
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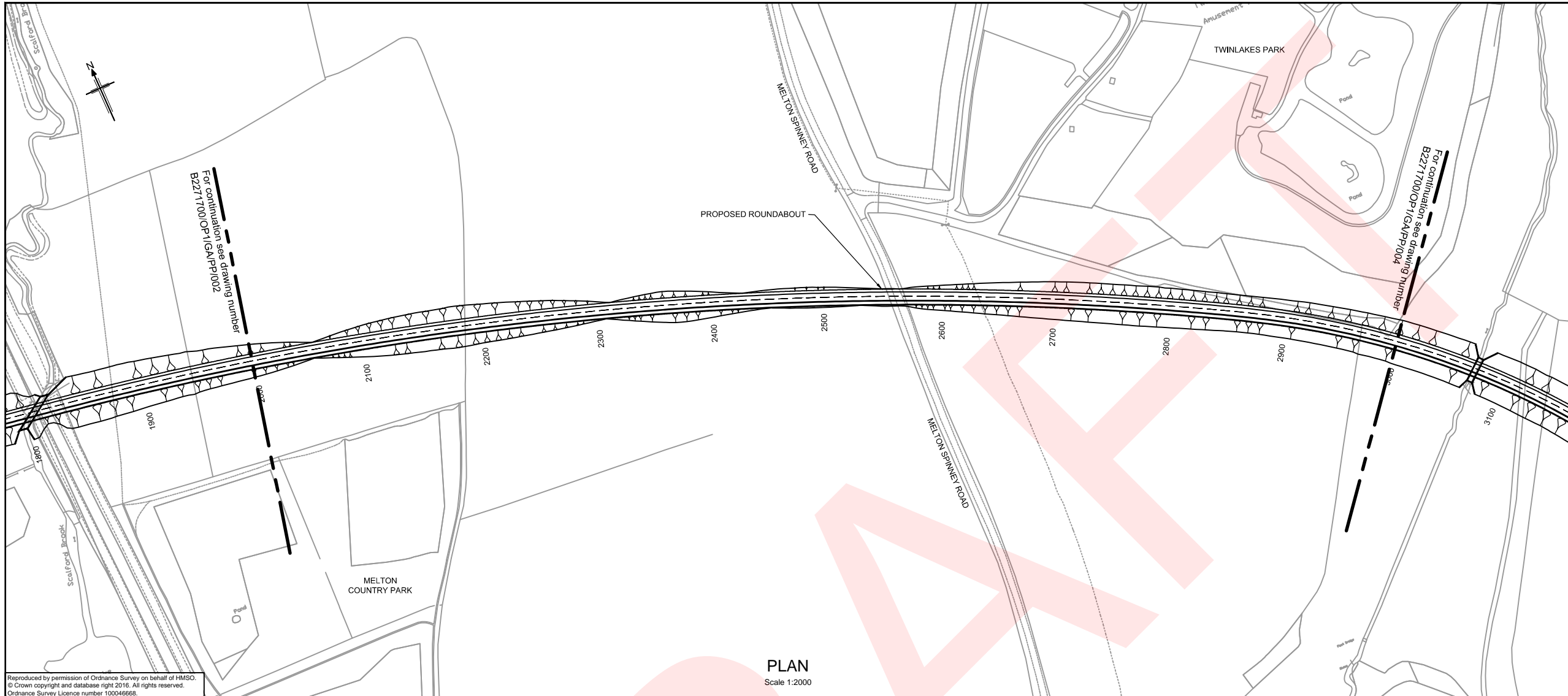
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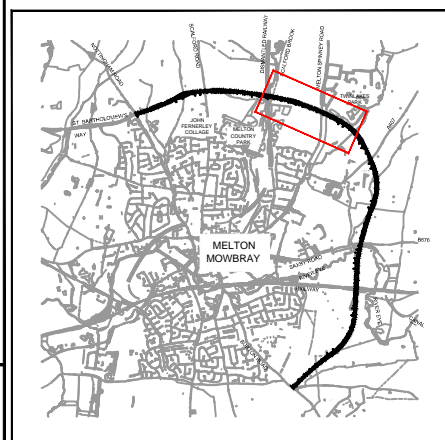


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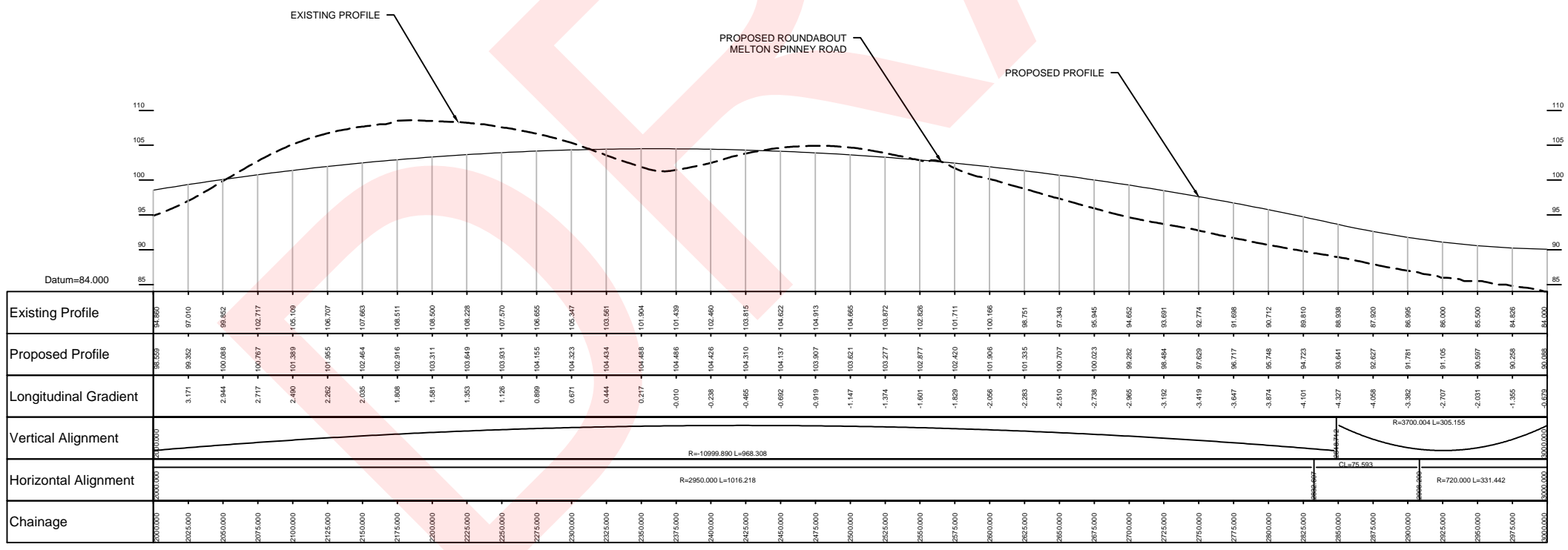
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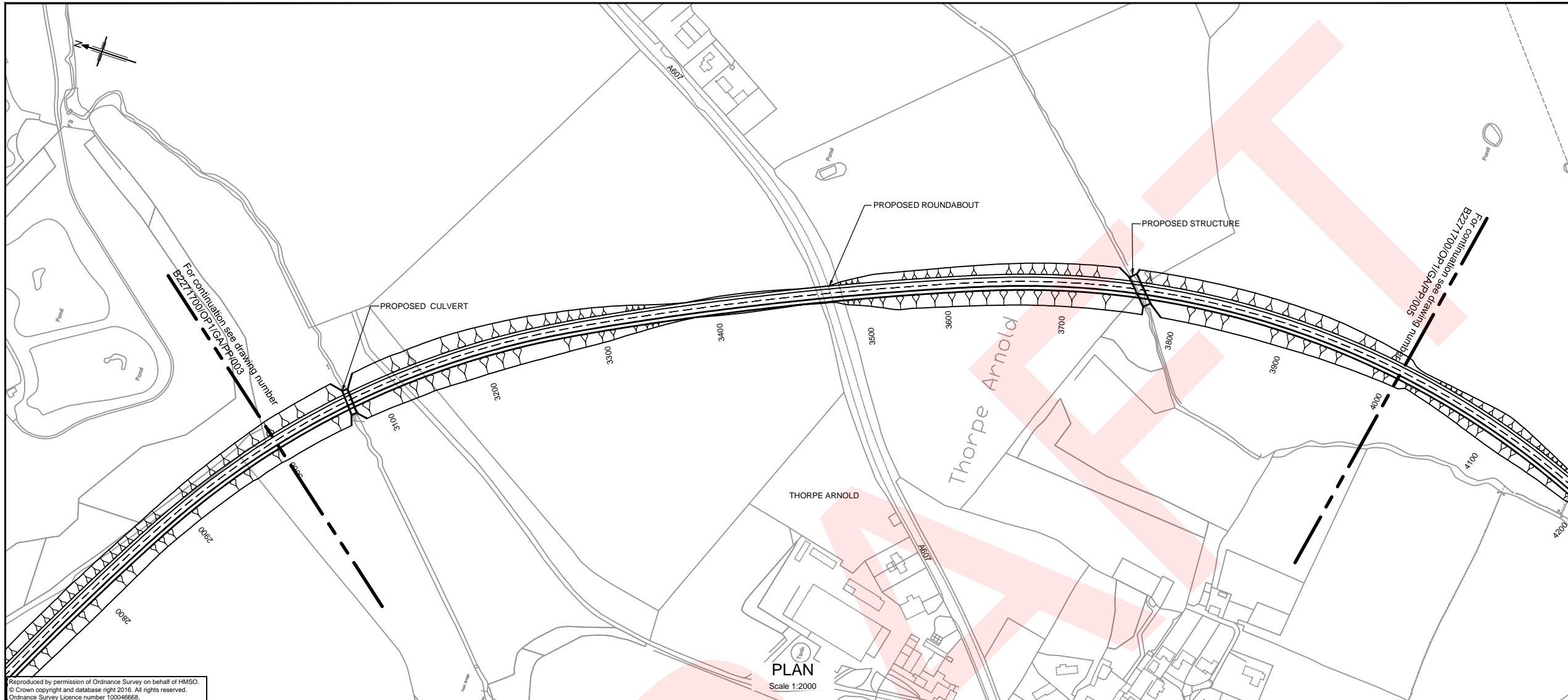
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

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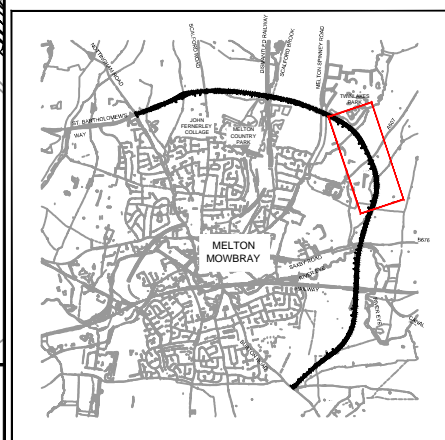


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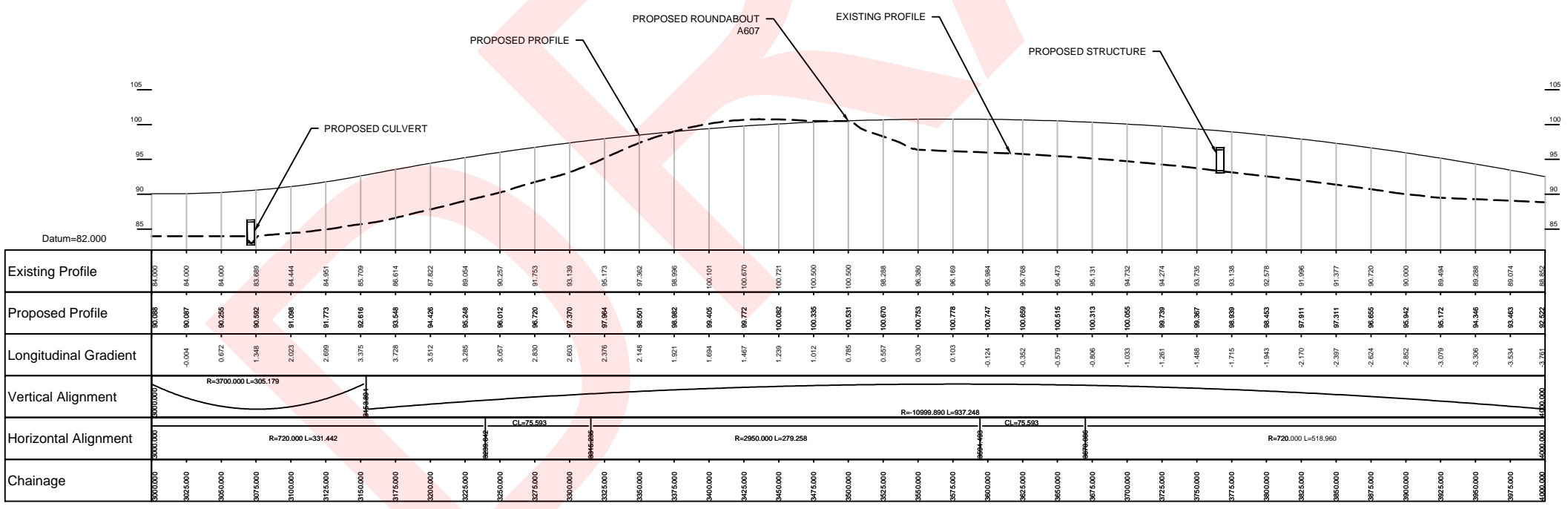
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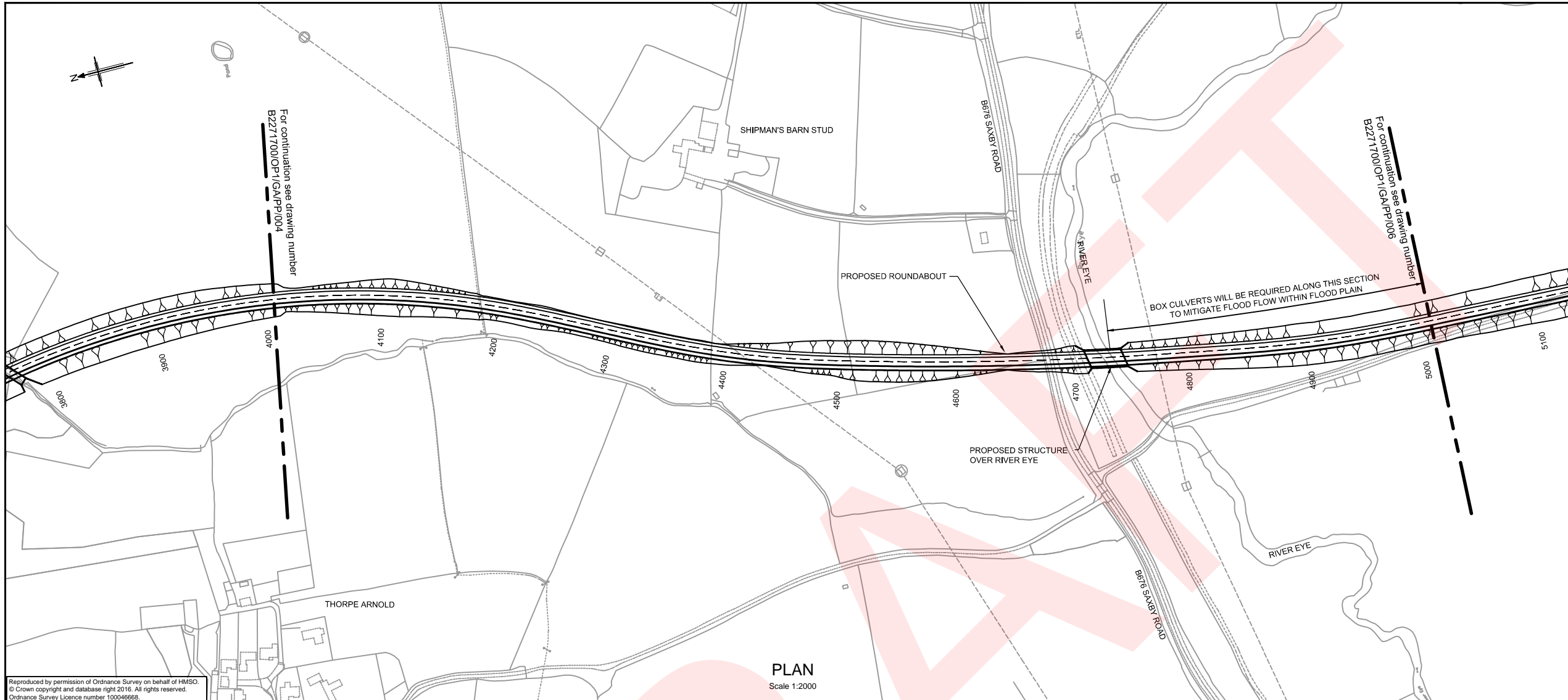
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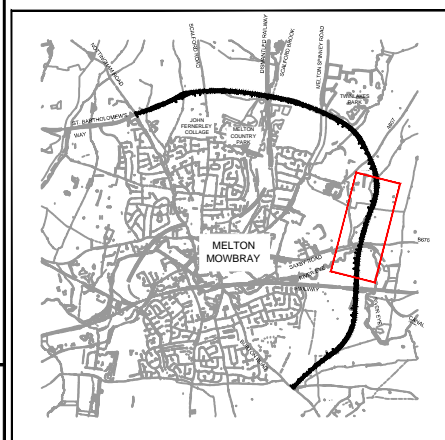


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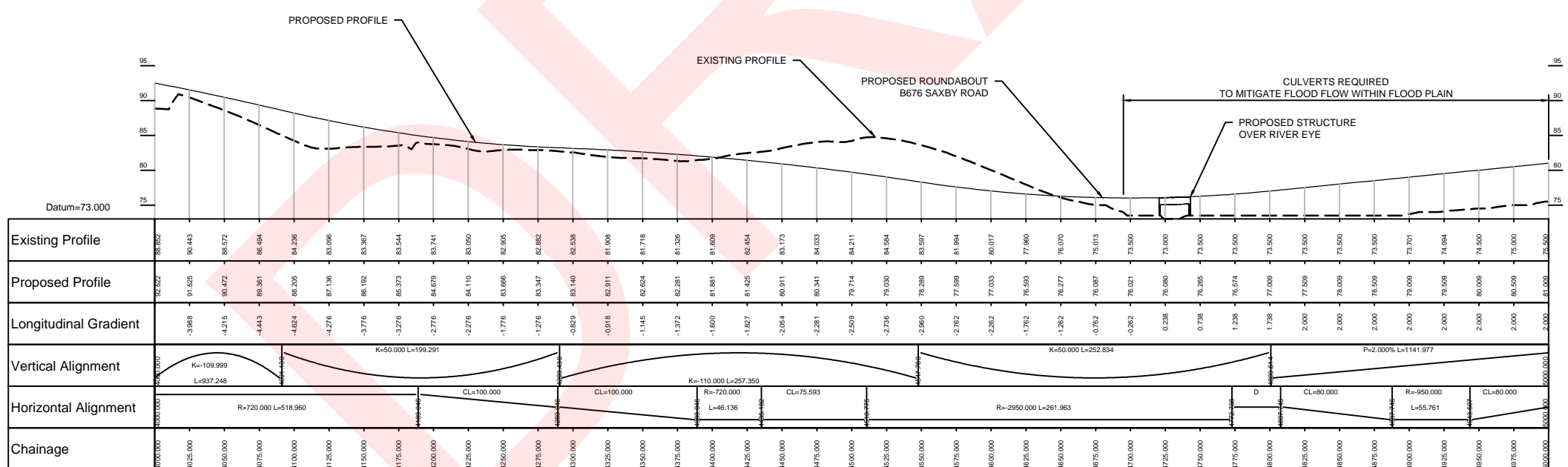
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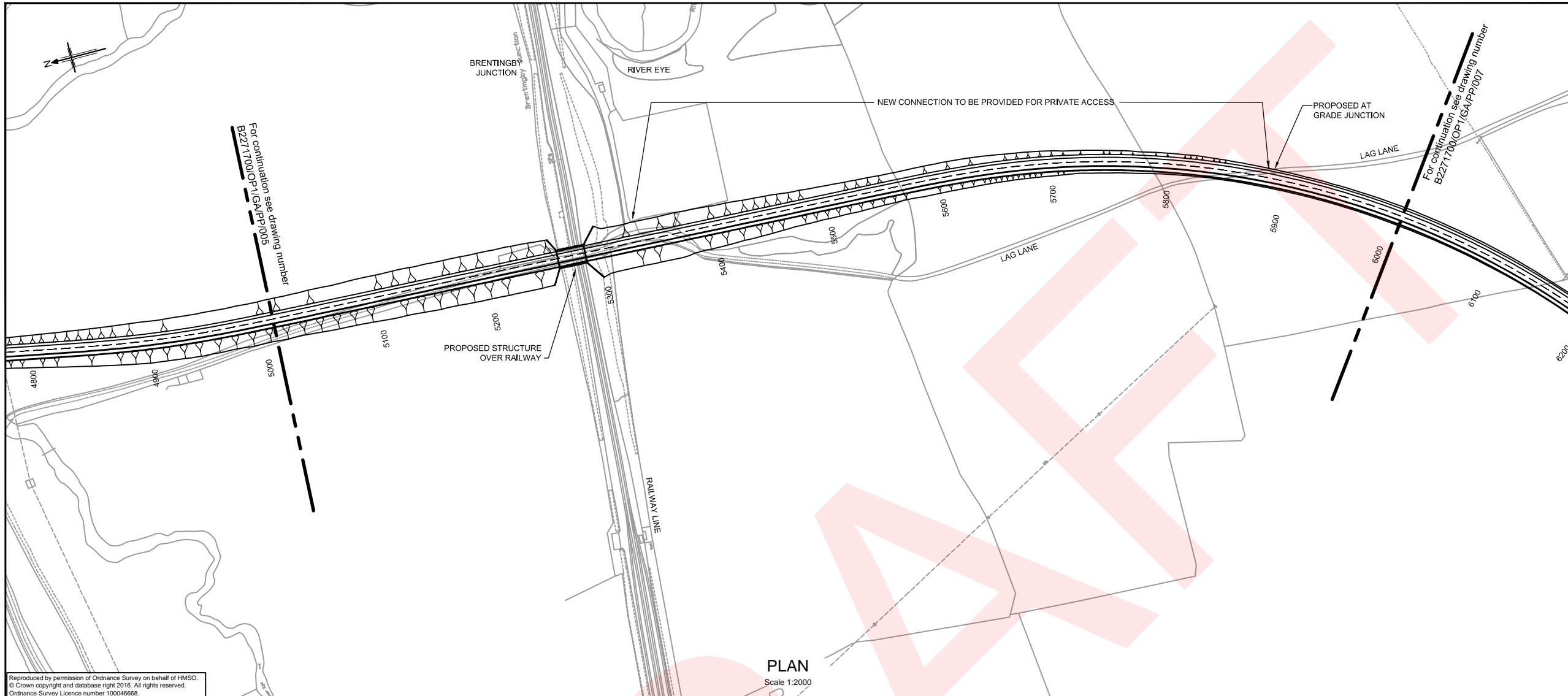
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

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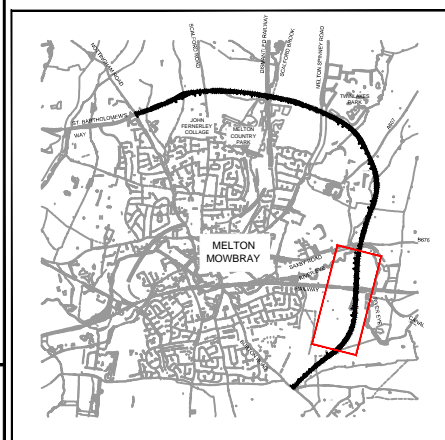


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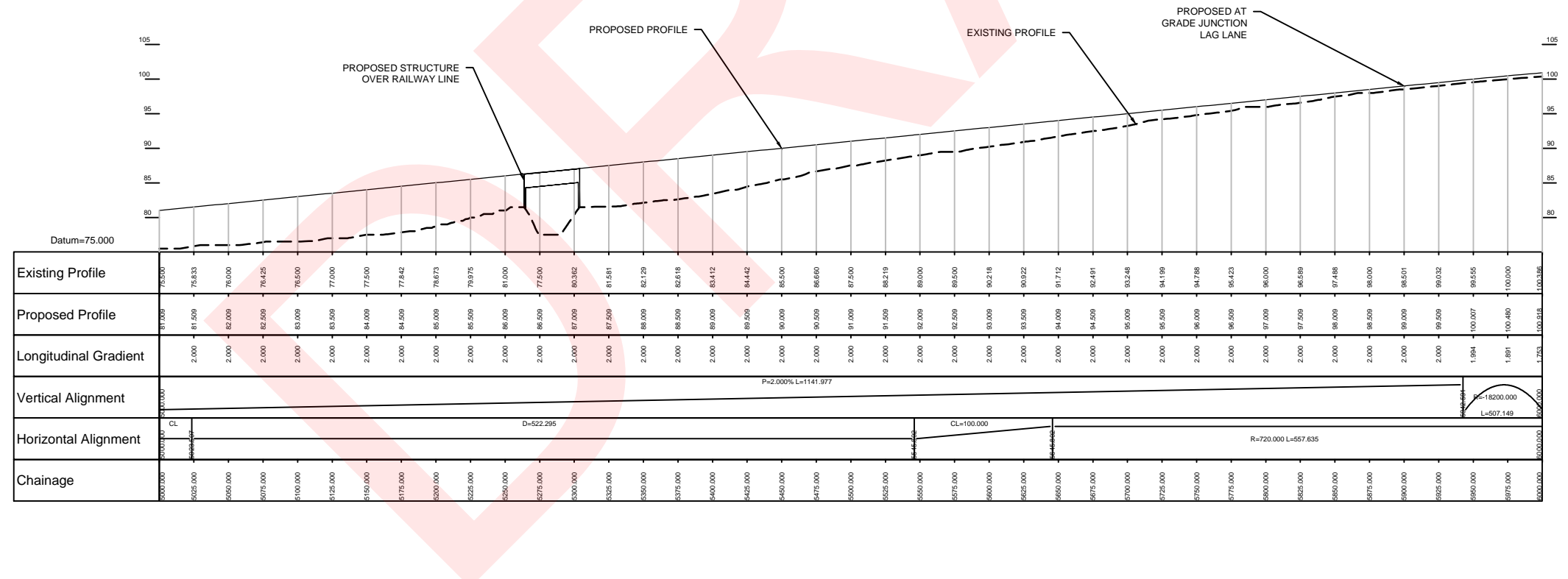
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Drawing number	B2271700/OP1/GA/PP/006	Rev
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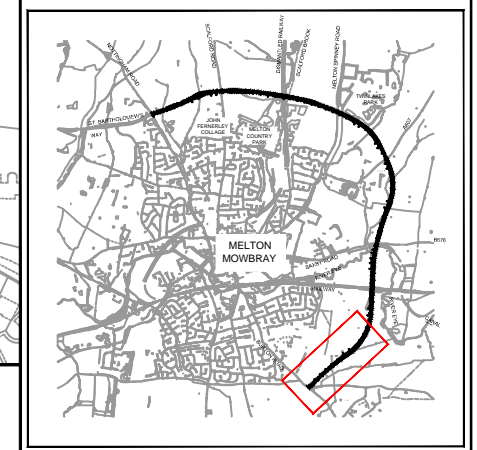


PLAN  
Scale 1:2000

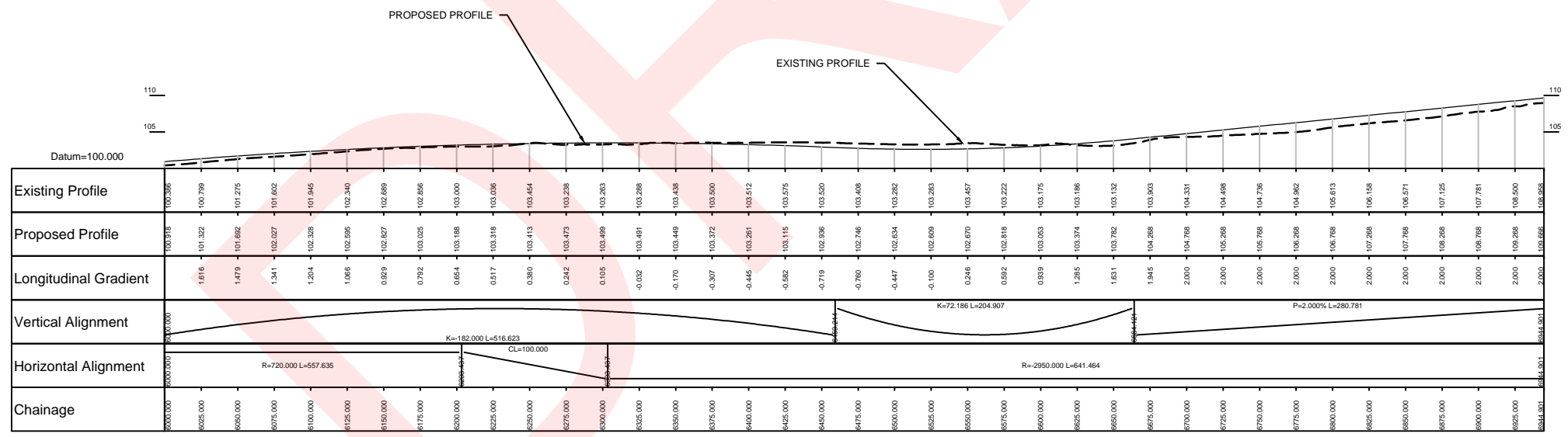
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Note:  
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Legend:  
 Earthwork Slope  
 Proposed Structure



KEY PLAN



PROFILE  
Scale 1:2000 Horizontal, 1:400 Vertical

Rev	Rev. Date	Purpose of revision	Drawn	Checkd	Rev'd	Apprv'd
0	21.07.16	FIRST ISSUE	JMcK	OM	RB	JJ

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Client: **Leicestershire County Council**

Project: MELTON MOWBRAY EDR

Drawing title:  
**PLAN AND PROFILE  
CHAINAGE 6000 - 6935  
OPTION 01  
SHEET 7 of 7**

Drawing status:  
Scale: AS SHOWN @ A1 DO NOT SCALE

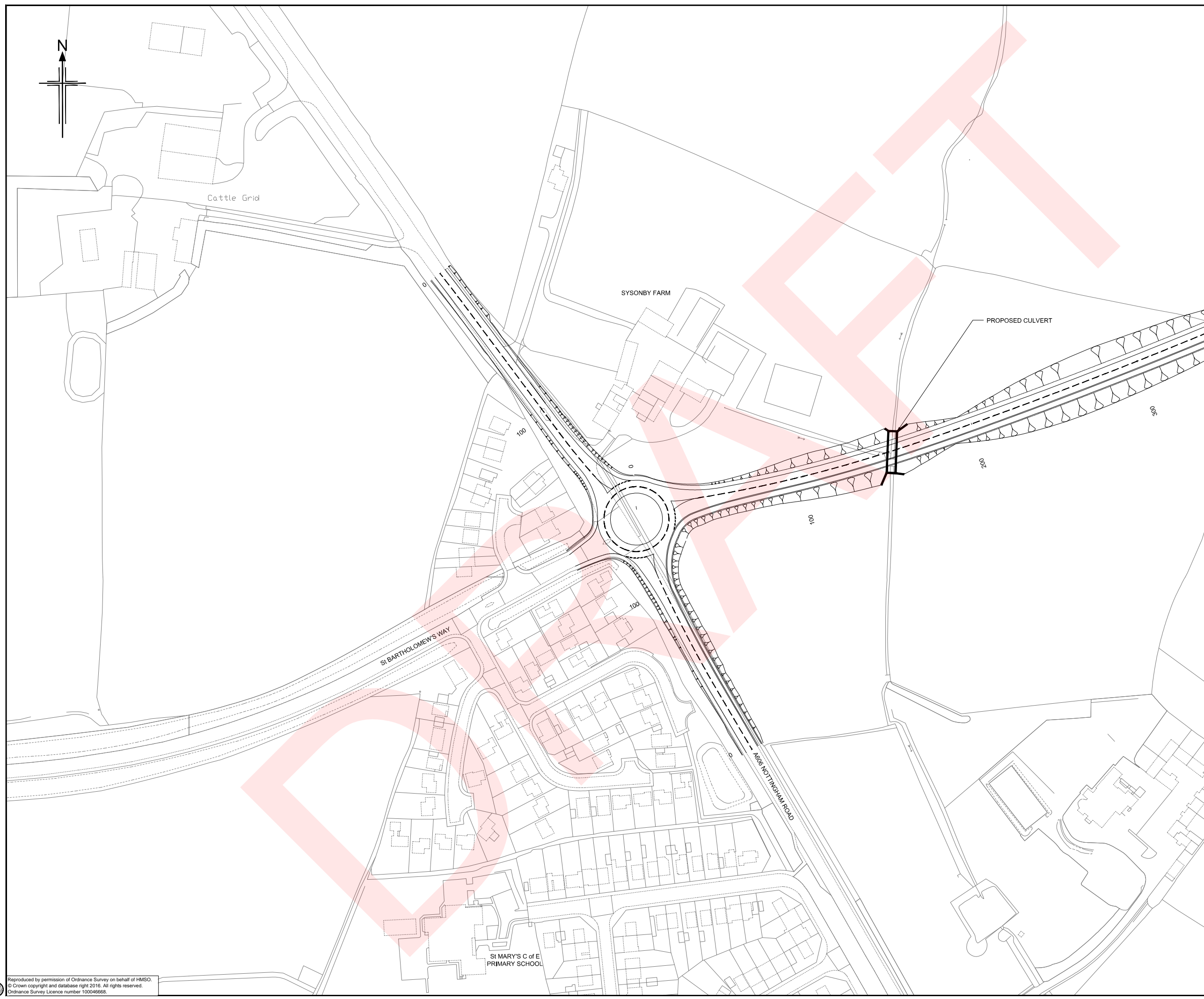
Jacobs No.: B2271700

Drawing number: **B2271700/OP1/GA/PP/007** Rev: 0






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- Legend:
-  Proposed Structure
  -  Existing footpath
  -  Existing electricity pylon
  -  Existing Transco National gas pipeline
  -  Site of Special Scientific Interest

Rev	Rev. Date	Purpose of revision	Drawn	Checked	Rev'd	Appr'd
0	21.07.16	FIRST ISSUE	JMK	OM	RB	JJ

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Client  
MELTON MOWBRAY EDR

Drawing title  
**GENERAL ARRANGEMENT  
PROPOSED ROUNDABOUT  
WITH A606 NOTTINGHAM ROAD  
OPTION 01**

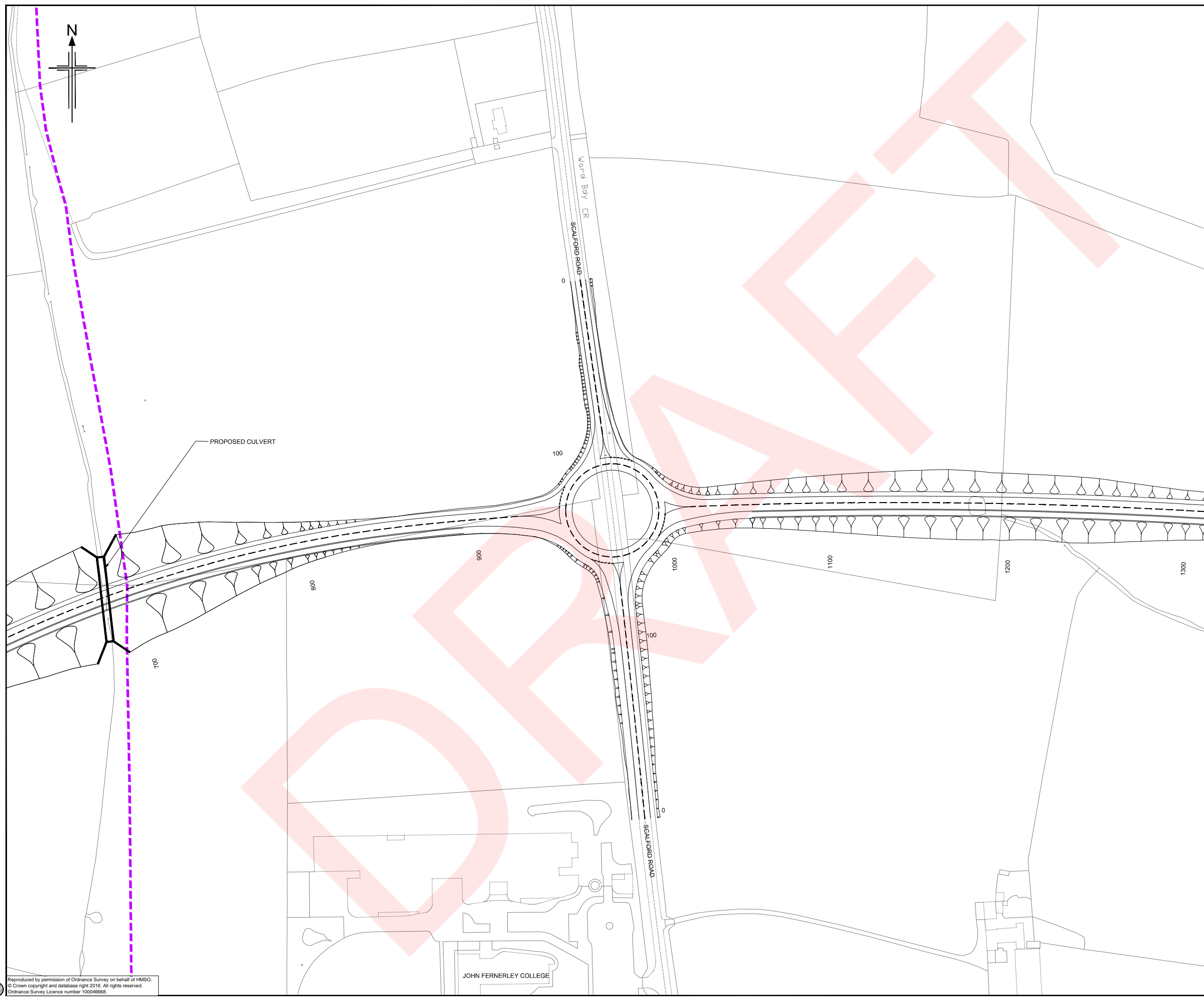
Drawing status  
Scale: 1:1000 @ A1 DO NOT SCALE

Jacobs No. B2271770  
Client no.  
Drawing number **B2271700/OP1/GA/002** Rev 0






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- Legend:
-  Proposed Structure
  -  Existing footpath
  -  Existing electricity pylon
  -  Existing Transco National gas pipeline
  -  Site of Special Scientific Interest

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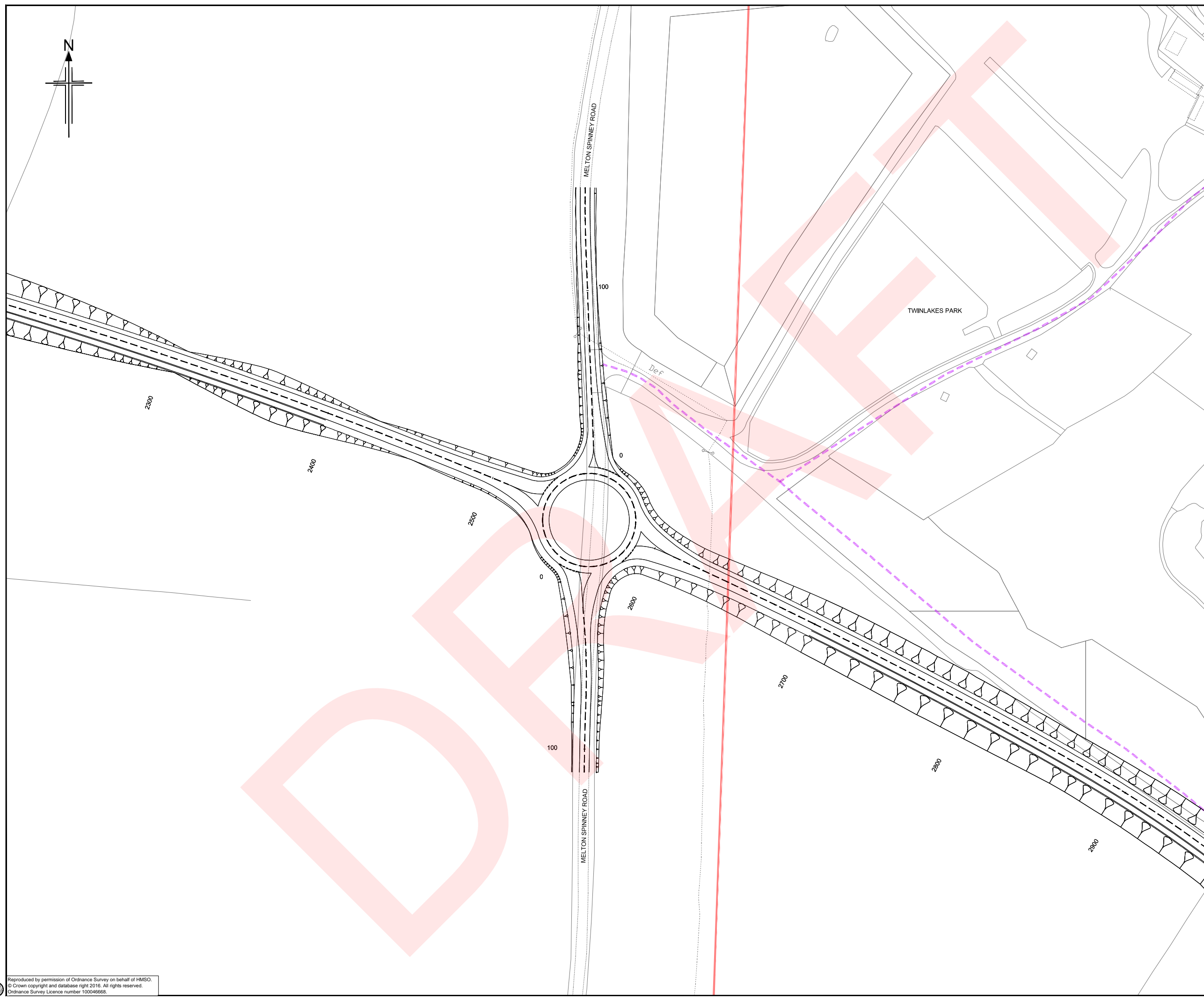
Project  
MELTON MOWBRAY EDR

Drawing title  
**GENERAL ARRANGEMENT  
PROPOSED ROUNDABOUT  
WITH SCALFORD ROAD  
OPTION 01**

Drawing status  
Scale: 1:1000 @ A1 **DO NOT SCALE**

Jacobs No. B2271770  
Client no.  
Drawing number **B2271700/OP1/GA/003**

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- Legend:
- Proposed Structure
  - Existing footpath
  - Existing electricity pylon
  - Existing Transco National gas pipeline
  - Site of Special Scientific Interest

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0	21.07.16	FIRST ISSUE	JMK	OM	RB	JJ

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Project: **MELTON MOWBRAY EDR**

Drawing title: **GENERAL ARRANGEMENT  
 PROPOSED ROUNDABOUT  
 MELTON SPINEY ROAD  
 OPTION 01**

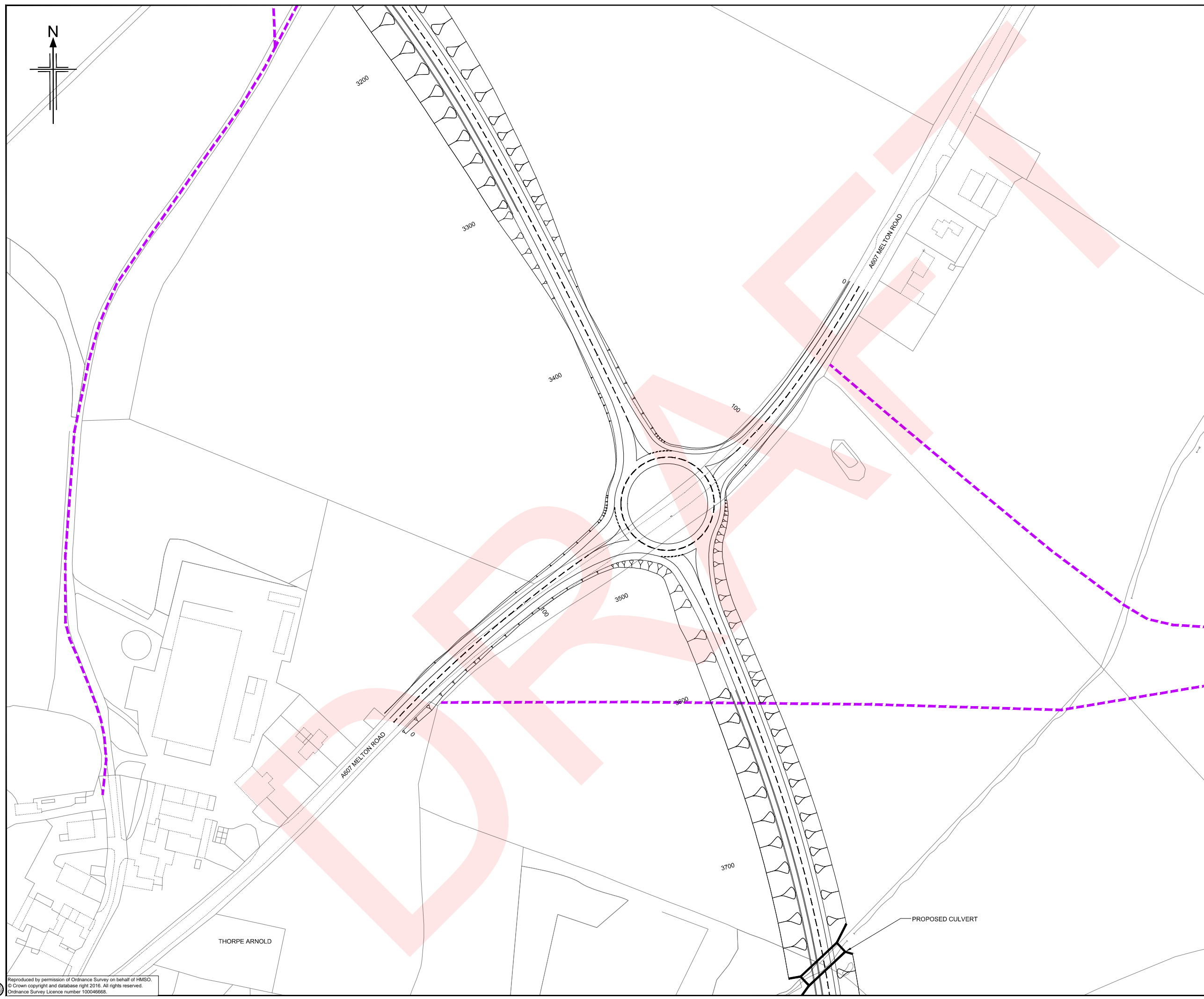
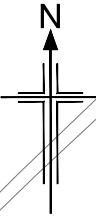
Drawing status: **Scale: 1:1000 @ A1 DO NOT SCALE**

Jacobs No. **B2271770**  
 Client no.   
 Drawing number **B2271700/OP1/GA/004** Rev **0**






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Note:  
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- Legend:
-  Proposed Structure
  -  Existing footpath
  -  Existing electricity pylon
  -  Existing Transco National gas pipeline
  -  Site of Special Scientific Interest

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0	21.07.16	FIRST ISSUE	JMK	OM	RB	JJ

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Client  
  
**Leicestershire County Council**

Project  
**MELTON MOWBRAY EDR**

Drawing title  
**GENERAL ARRANGEMENT  
 PROPOSED ROUNDABOUT  
 WITH A607 MELTON ROAD  
 OPTION 01**

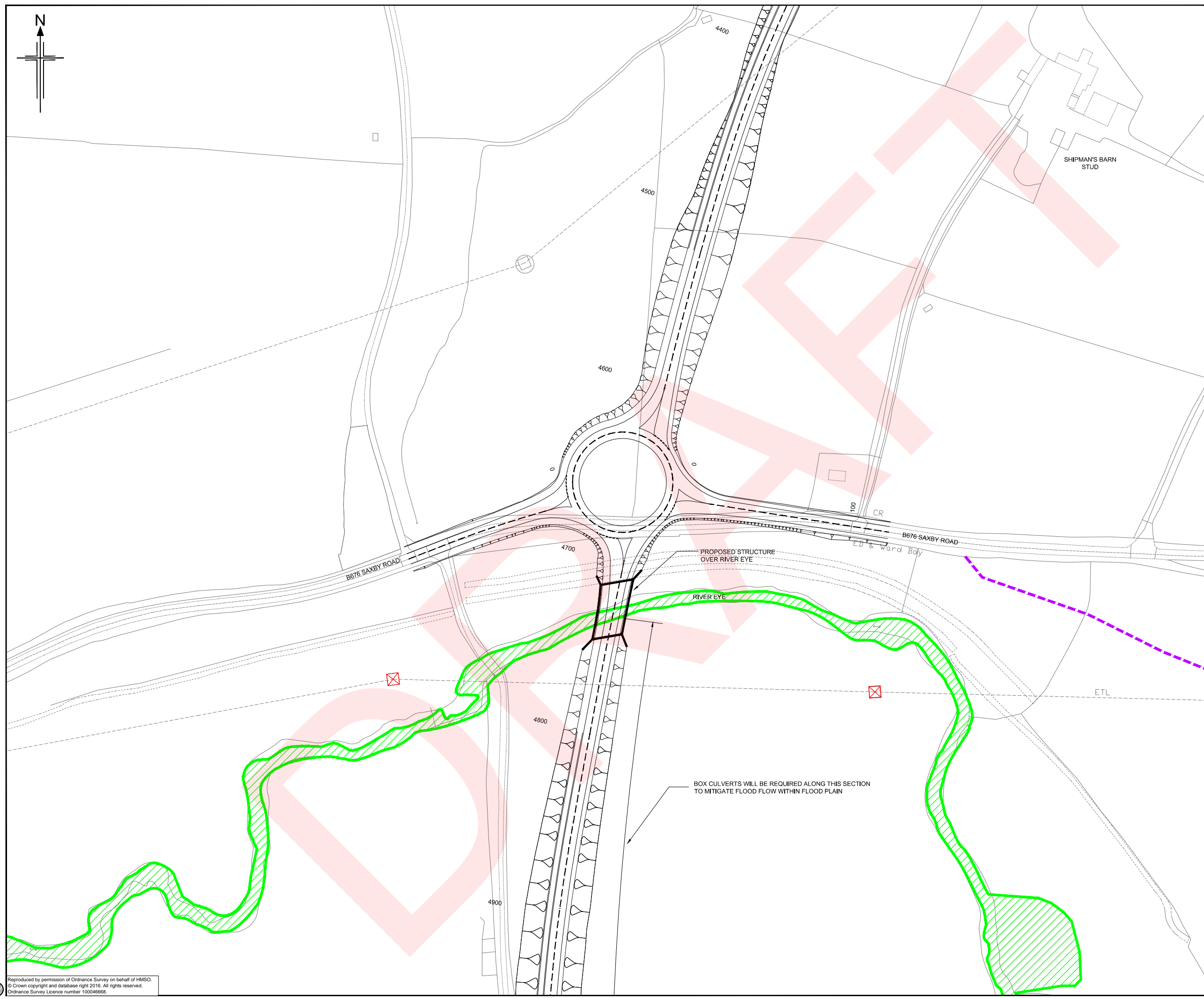
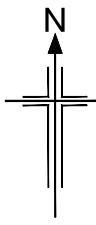
Drawing status  
 Scale: 1:1000 @ A1 **DO NOT SCALE**

Jacobs No. B2271770  
 Client no.  
 Drawing number **B2271700/OP1/GA/005** Rev 0






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  -  Existing footpath
  -  Existing electricity pylon
  -  Existing Transco National gas pipeline
  -  Site of Special Scientific Interest

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MELTON MOWBRAY EDR

**GENERAL ARRANGEMENT  
 PROPOSED ROUNDABOUT  
 WITH B676 SAXBY ROAD  
 OPTION 01**

Scale: 1:1000 @ A1 DO NOT SCALE

Jacobs No. B2271770

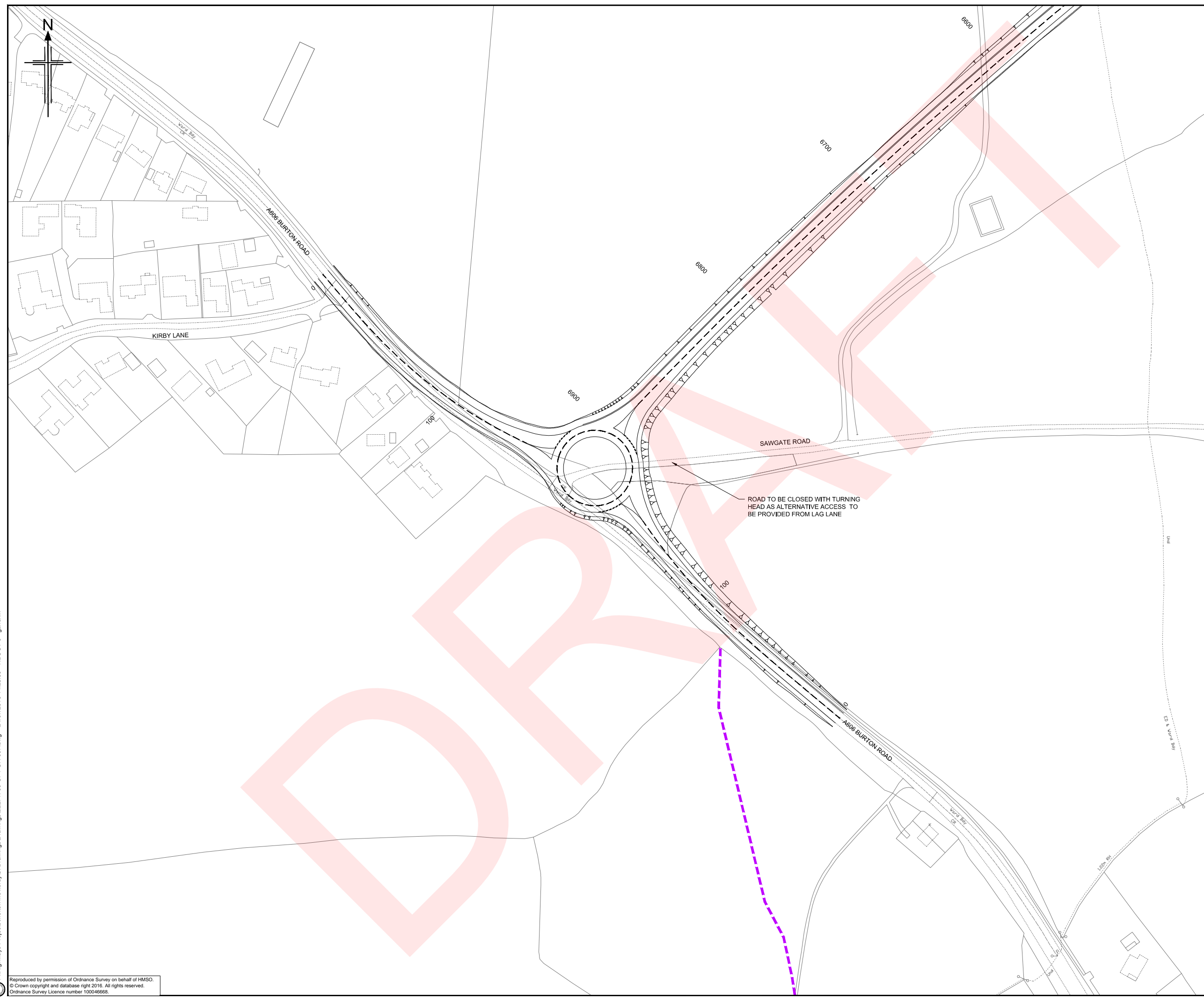
Drawing number B2271700/OP1/GA/006

Rev 0






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  -  Existing footpath
  -  Existing electricity pylon
  -  Existing Transco National gas pipeline
  -  Site of Special Scientific Interest

0	21.07.16	FIRST ISSUE	JMK	OM	RB	JJ
Rev	Rev. Date	Purpose of revision	Drawn	Checked	Rev'd	Apprv'd

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Project  
MELTON MOWBRAY EDR

Drawing title  
**GENERAL ARRANGEMENT  
PROPOSED ROUNDABOUT  
WITH A606 BURTON ROAD  
OPTION 01**

Drawing status

Scale: 1:1000 @ A1 **DO NOT SCALE**

Jacobs No. B2271770  
Client no.  
Drawing number **B2271700/OP1/GA/007** Rev **0**

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