



East Lutterworth SDA

Leicestershire County Council

Major Transport Infrastructure Costs - Order of Magnitude Estimate

| 2

18 September 2017

N/A



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 Client no:
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Document history and status

Revision	Date	Description	By	Review	Approved
0	13 June 2017	Order of Magnitude Estimate	D.Anthony	M.Boulton	A.Wilson
1	10 July 2017	Order of Magnitude Estimate	D.Anthony	M.Boulton	A.Wilson
2	18 September 2017	Order of Magnitude Estimate	D.Anthony	M.Boulton	A.Wilson

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Appendix A. Register of Design Information

Appendix B. Order of Magnitude Estimate

Executive Summary

Jacobs were requested by Leicester County Council to;

- 1.) Validate costs provided by promoters for the land East of Lutterworth SDA Option related to Provision of key transport infrastructure as set out below;
 - a.) 2 number signalised junctions on the A4303
 - b.) Upgrading and signalisation of junction 20 on M1
 - c.) Signalised junction to replace Frank Whittle roundabout including linked roundabout junction nearby
 - d.) New Bridge over the M1
 - e.) Link road from the motorway bridge to and from junction with the A426.
- 2.) Provide alternative high level estimates of costs where the consultants views differ from those of the promoters or costs are not provided.

For the validation of the cost for the schemes listed the following was required; cost breakdowns, estimates, quotes, rates, measures, bill of quantities, defined scope, specifications.

This information was not supplied to use and therefore item 1 could not be undertaken. A CAD drawing was supplied which allowed for 4 number pdf sketches of the areas listed in a.) b.) c.) d.) and e.) to be abstracted, however this format of information was without:

- i.) Quantities;
- ii.) Defined scope;
- iii.) Specifications;
- iv.) Cut boundaries;

This could only allow a very high level Order of Magnitude Estimate to be generated without any comparison against the Clients scope.

Therefore the alternative approach stated in item 2.) has been implemented to generate a high level Order of Magnitude Estimate based on the Sketched layouts as listed in Appendix A with the assumed scope of works for each work section as detailed below:-

- a.) 2 number signalised junctions on the A4303

The Signalisation 2 number Junctions on the A4303, new pavement construction, resurfacing of existing pavement, new footpath construction, new drainage.

- b.) Upgrading and signalisation of junction 20 on M1

The Signalisation of the M1 Junction 20 roundabout, new pavement construction, resurfacing of existing pavement, new footpaths, new drainage.

- c.) Signalised junction to replace Frank Whittle roundabout including linked roundabout junction nearby

The Signalisation of the Frank Whittle Junction, new carriageway / pavement construction, resurfacing of existing carriageway / pavement, new footpaths, new drainage.

- d.) New Bridge over the M1

New construction of a Standard Bridge

- e.) Link road from the motorway bridge to and from junction with the A426.

New Construction of carriageway / pavement, resurfacing of existing carriageway / pavement, new footpaths, new roundabout, new drainage

- f.) Travel Lodge Junction.

New Construction of carriageway / pavement, resurfacing of existing carriageway / pavement, new footpaths, new roundabout, new drainage

- g.) 2 number roundabouts

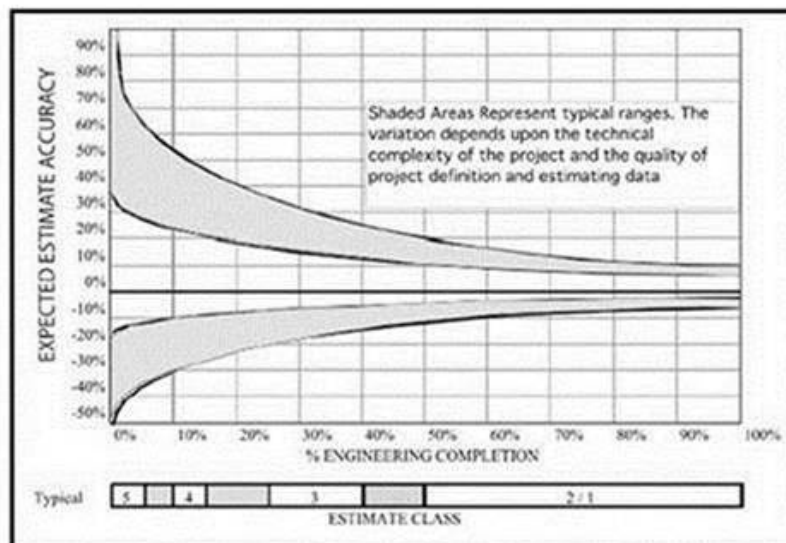
2 number new roundabouts to be constructed to connect proposed link road to existing infrastructure network.

1. Project Summary

The basis of the costs, assumptions and exclusions are listed in this report and a summary of the costs are as follows:

Summary	£
Highway Works	25,819,300
Project / Design Team Fees	Excluded
Other Development / Project Costs	Excluded
Risk	Excluded
Optimism Bias	Excluded
Inflation	Excluded
VAT	Excluded
Total	25,819,300

The above cost estimate has an accuracy level of -40% to +40%. As design progresses and scope of works becomes more fully defined the expected level of accuracy increases. An estimate based on an early outline design will therefore be expected to be less accurate than an estimate based upon a full detailed design.



2. Basis of Cost

2.1 Basis of Construction Costs

This cost estimate has been prepared using an elemental method for the major elements of the Works (Method of Measurement for Highway Works) that reflects our understanding of the proposed scheme.

The “Elemental method” is a standard term used throughout our industry to describe the way by which the costs are broken down. The costs provided for each element and sub-elements as appropriate allow the high level estimate to be broken down into work packages by trade (e.g. in building projects cost estimate are split down into packages such as carpentry, painting, etc).

Where various forms of construction or finish exist within one element the areas and costs for different types of construction are included separately.

An example of this:

ROADWORKS				
<i>Roadworks General</i>				
Roadworks general (based on area of road)	m2	10,700	60.00	642,000.00
<i>Main Carriageway</i>				
Allowance for New Main Carriageway works, (based on area of road)	m2	2,800	110.00	308,000.00
Allowance for Re-surfacing works	m2	7,900	20.00	158,000.00
Allowance for drainage works (based on area of road)	m2	10,700	35.00	374,500.00
Allowance for New Footpaths	m2	400	40.00	16,000.00
<i>Signs, Motorway Communications and Lighting</i>				
Allowance for signs(based on area of Road)	m2	10,700	10.00	107,000.00
Allowance for Signalised junction	item	7	15,000.00	105,000.00
<i>Landscaping and Ecology</i>				
Landscaping and Ecology	m2	10,700	10.00	107,000.00

The rates used reflect construction projects of a similar size and nature and are at current day prices (2st Quarter 2017). All rates are taken from Jacobs own databases of highways and structures projects and reflect the mean rate for the element in question. The accuracy level advised is derived from the typical variance between the mean rates and those in the upper and lower quartiles.

For example, unit rates for bridges have been derived from a database of Road Overbridge costs from a number of major highways schemes and reflect current market rates for structures of similar size and construction.

Category	Description	Average £	Lowest £/m2	Lower Quartiles £/m2	Median £/m2	Upper Quartiles £/m2	Highest £
1	Road Overbridge	2,649	1,638	2,001	2,323	3,243	4,819
2	Rail Overbridge	8,722	8,722	N/A	8,722	N/A	8,722
3	River Overbridge	N/A	N/A	N/A	N/A	N/A	N/A
4	Road Underbridge	3,524	826	3,337	3,746	4,116	4,505
5	Rail Underbridge	10,273	4,702	4,702	7,724	18,393	18,393
6	River Underbridge	2,670	770	774	1,936	3,708	8,194
7	Accommodation Bridge	3,137	1,389	1,937	2,371	4,767	5,392
8	NMU Bridge	6,507	3,476	3,476	4,730	11,314	11,314
9	NMU Underpass	5,570	3,560	3,929	4,689	8,100	8,444

2.2 Project/Design Team Fees

Project/design team fees are excluded from this estimate.

2.3 Other Development/Project Costs

Other development project costs are excluded from this estimate.

2.4 Risk

Risk contingency allowances are excluded from this estimate.

2.5 Optimism Bias

Optimism Bias is excluded from this estimate.

2.6 Inflation

Tender Inflation and Construction Inflation are excluded from this cost estimate.

2.7 Value Added Tax (VAT)

Value Added Tax (VAT) is excluded from this cost estimate.

2.8 Design Information

This cost estimate has been based upon the design information listed in Appendix A.

2.9 Programme

No detailed programme has been established for these works.

2.10 Assumptions

The following assumptions have been made in the preparation of this cost estimate:

- Construction costs only;
- Construction Works will generally be undertaken during normal working hours unless specifically identified as being undertaken out of normal working hours (evenings and weekends).
- Access to the site is unrestricted.
- Existing site conditions, extent of works and level of specification are as set out in the information included in Appendix A.
- The Order of Magnitude cost estimate has an accuracy level of -40% to +40%

2.11 Exclusions

The following items are excluded from this cost estimate:

- Utility Diversion costs
- Toxic/hazardous material removal including removal of toxic or hazardous parts of building fabric and hazardous materials or components from existing services installations;
- Removal and/or treatment of contaminated ground material;
- Eradication of invasive plant growth;
- Ground gas venting measures including gas proof membranes, perforated collection pipes, proprietary gas dispersal fin layers, radon sumps and vent pipes;
- Soil stabilisation measures including cement or chemical grouting, electrochemical stabilisation, sand stowing, soil nailing, ground anchors, compacting, and freezing of groundwater and subsoil;
- Site dewatering and pumping to lower the ground water level of the site, including forming well points, filling, drain tubes and ring mains, sumps, pumps and pumping, off-site disposal of water, running costs and attendance;
- Temporary and permanent diversion works including diversion of statutory undertakers services (e.g. water, electricity, gas and communications);
- Extraordinary site investigation works including archaeological investigation, reptile/wildlife mitigation measures and other site investigation works;
- Charges, rates on temporary accommodation, licences in connection with hoardings, scaffolding, gantries and the like and licences in connection with crossovers, parking permits, parking bay suspension and the like;
- Decanting and relocation costs, temporary relocation costs, temporary accommodation, rents and other running costs;

- Employer Finance costs, costs in connection with funding of project;
- Fixtures, fittings and Equipment;
- Fees, planning fees, building control fees, oversailing fees, fees in connection with party wall awards, fees in connection with rights of light agreements, fees in connection with other agreements between the employer and neighbours to facilitate the project, other fees in connection with licences, permits and agreements;
- Insurance other than main contractors works insurance;
- Land acquisition costs and Part 1 Claim costs;
- Marketing costs, public relations events, site based advertising and public relations literature;
- Planning contributions, direct financial contributions in connection with planning consent, and environmental improvement works;
- Employer's project team and design consultants fees;
- Main contractor's design fees;
- Main contractor's pre-construction fees including management and staff, specialist support services fees, temporary accommodation, services and facilities, charges, overheads and profit;
- Risk;
- Inflation;
- Value Added Tax (VAT).

Note: Items are typically excluded because we may not have the necessary information to provide a cost; we may not have the capability to provide a cost (outside our remit – ie land value is dealt by a specific profession, also utilities are not for us to comment on), or have the relevant insurance to be able to provide answer to which budget can be set. Nevertheless as the estimate progresses the number of exclusions typically decreases as the scope becomes defined.

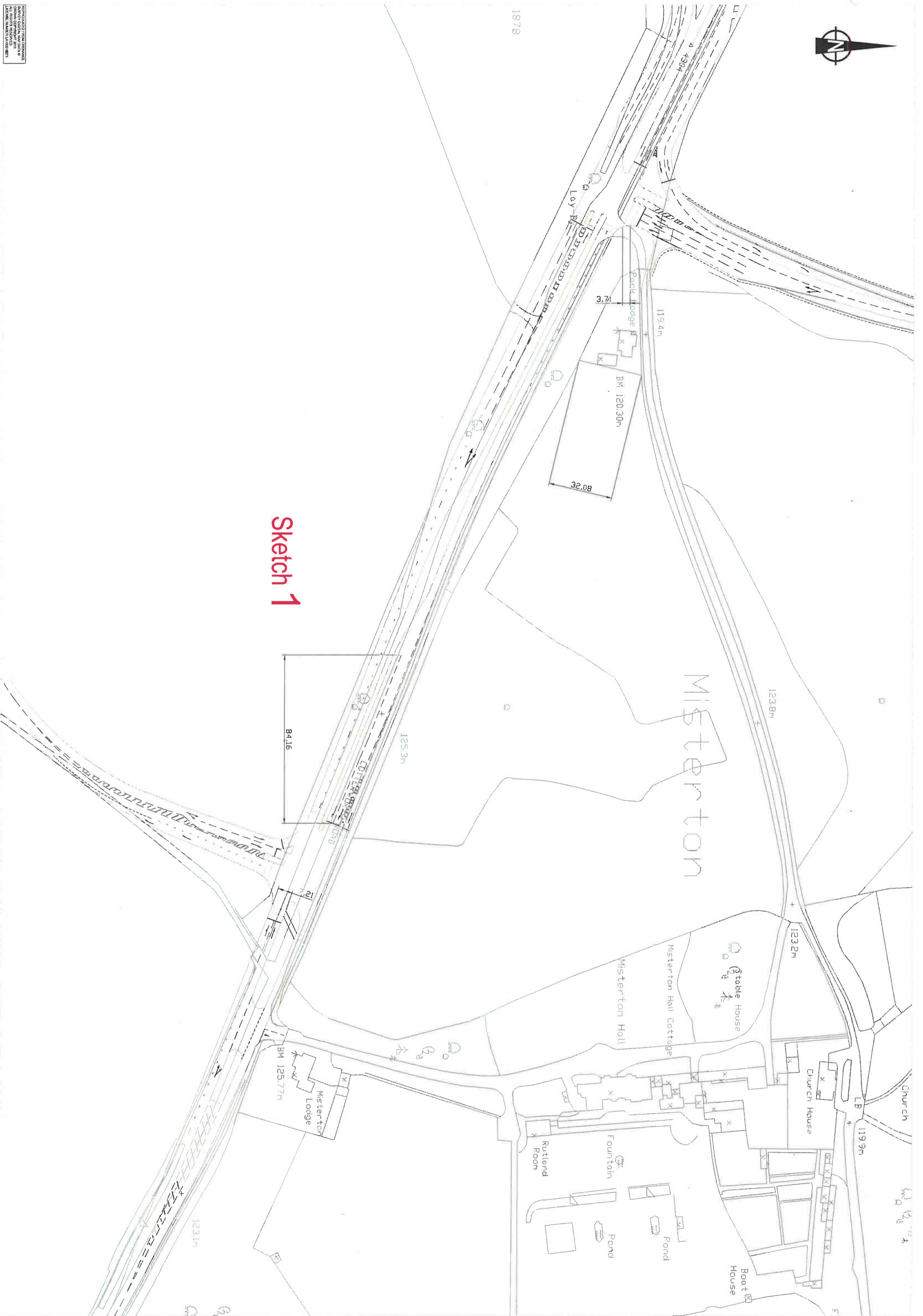
Appendix A. Register of Design Information

Taken from CAD drawing	Title of Sketch	Description
Sketch 1	A4303 Lutterworth Road	EastLutterworth Road and Signalised Junctions Executive Summary item a) Appendix B item a)
Sketch 2	Frank Whittle Junction	Converting Roundabout to signal crossroads Executive Summary item c) Appendix B item c)
Sketch 2	Travel Lodge Junction	New mini roundabout at existing major/minor junction' Executive Summary item f) Appendix B item f)
Sketch 3	Signalised Junction	M1 Junction 20 Signalised Junction Executive Summary item b) Appendix B item b)
Sketch 4	Link Road	Link Road from Mini Roundabout up to and including Bridge structure Executive Summary items d), e) & g) Appendix B items d), e) & g)
Sketch 1a	Link Road	Link Road from Mini Roundabout up to and including Bridge structure Executive Summary items d), e) & g) Appendix B items d), e) & g)
Sketch 2a	Link Road	Link Road from Bridge structure to Mini Roundabout and straight section Executive Summary items e) & g) Appendix B items e) & g)
Sketch 3a	Link Road	Straight Section to Junction A4304 Executive Summary item e) Appendix B item e)
10454-HL-01 Draft	Lutterworth East Misterton	Highways Junction Improvements Overview



1878

Sketch 1

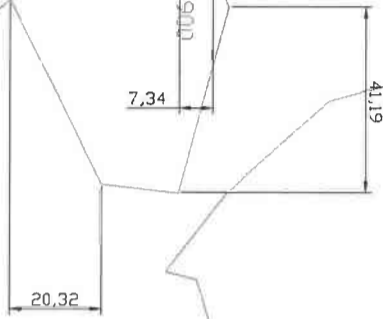


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The Lodge

12,44



6,900

7,700

WORKS

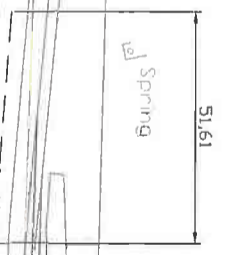
8,100

8,900

8,900

St James Hospital
(Site of)

LUTHERVORTH ROAD



A 4303

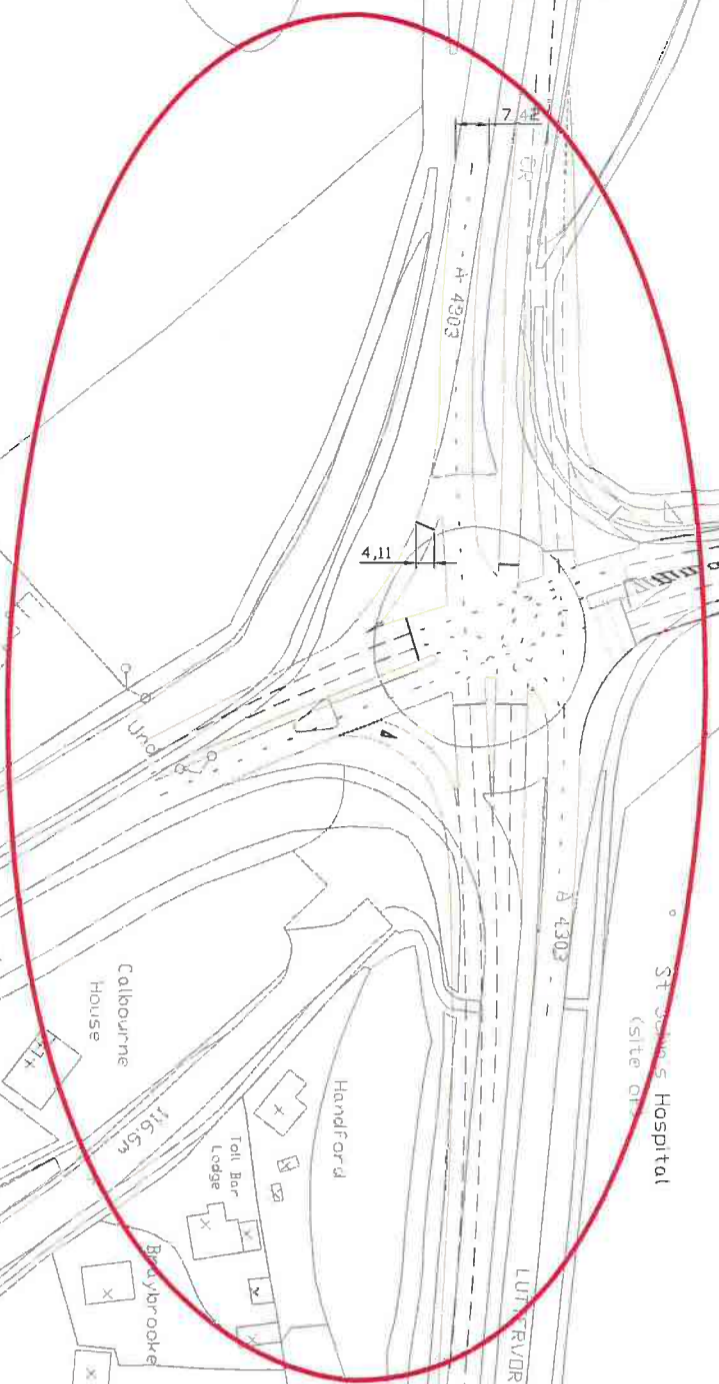
81,64

M1 220

10,61

ED & Ward Bdy
CR

Sketch 2



Club House

Ward Bdy

Calbourne House

Handford

Toll Bar Lodge

Bealbyrooke

Snapethorpe

Cossington

8,876

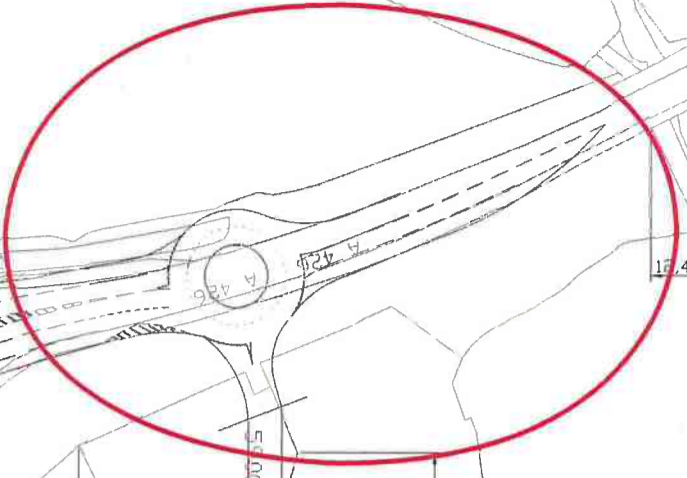
BM 129,40m

126,2m

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The Lodge



17.44

41.19

7.34

20.32

6.900

Sketch 2

7.700

8.100

WORKS

8.900

8.900

Spring

51.61

A 4303

Loy-By

LUTTERWORTH ROAD

St John's Hospital
(site of)

Handford

Calbourne
House

116.5m

Toll Bar
Lodge

Broylrooke

Snapehorpe

Cossington

The Holt

The Sett

Club House

Ward Bdy

BM 129.40m

88.76

126.2m

ED & Ward Bdy
CR

81.64

N1 20

M I T M

CR

PROPOSED ROAD BRIDGE
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Riddesden Farm Cottages

Paddock Cottage

The Woodier Inn

1322h

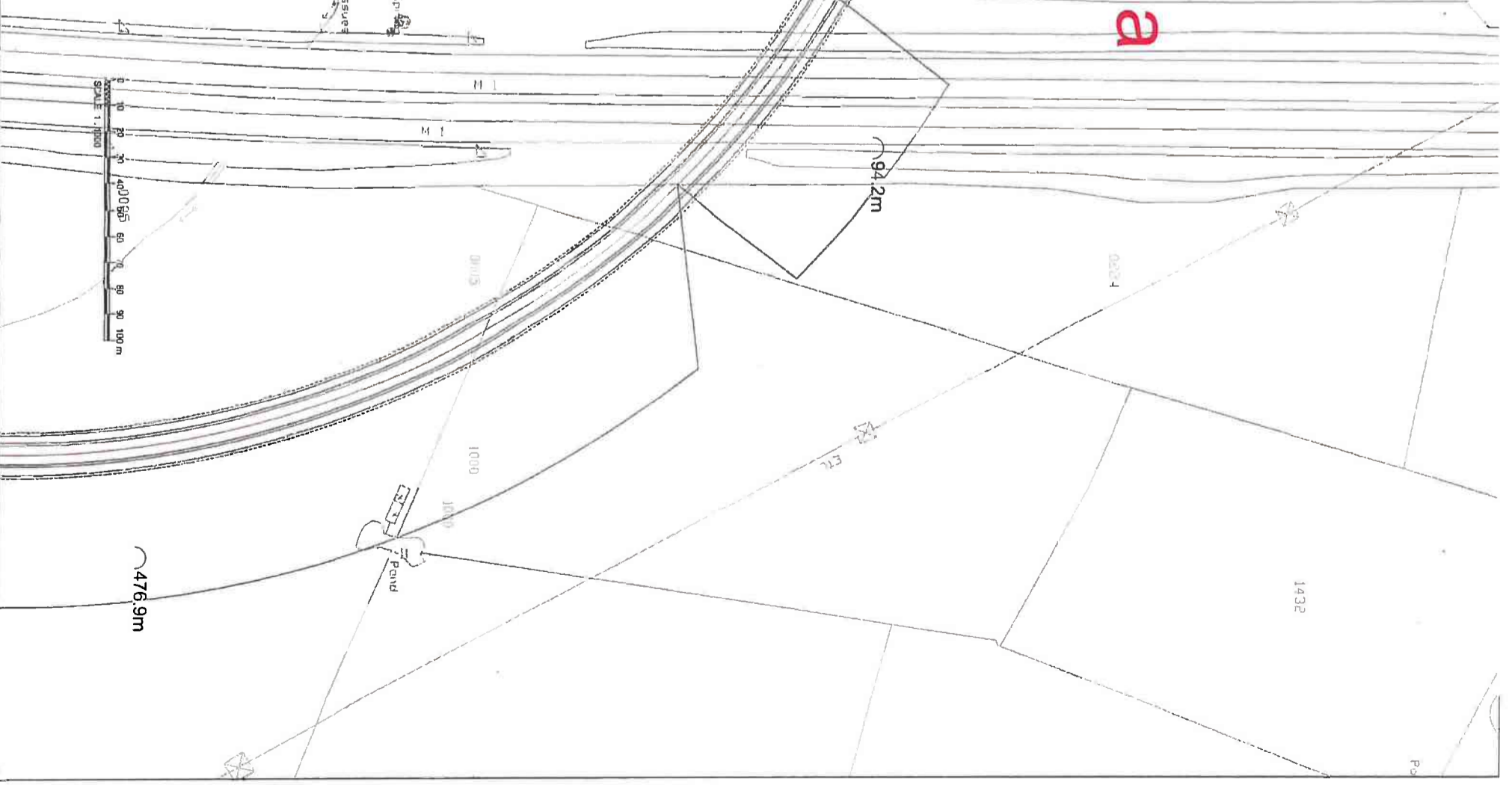
F320

Link Road Sketch 1a

0 10 20 30 40 50 60 70 80 90 100 m
SCALE 1:1000

Ponds

Sketch



94.2m

02124

1432

0 10 20 30 40 50 60 70 80 90 100 m
SCALE 1:1000

476.9m

1000

1000

Pond

0 10 20 30 40 50 60 70 80 90 100 m
SCALE 1:1000

Link Road Sketch 3a

764.2m

2037

M.S. (6.0)

Face Bridge

2. WAPA DUK

63.4m

2410

240.3m

63.4m

River Swire

1528

1544

1540.0m

Lo 7

1540.0m

1540.0m

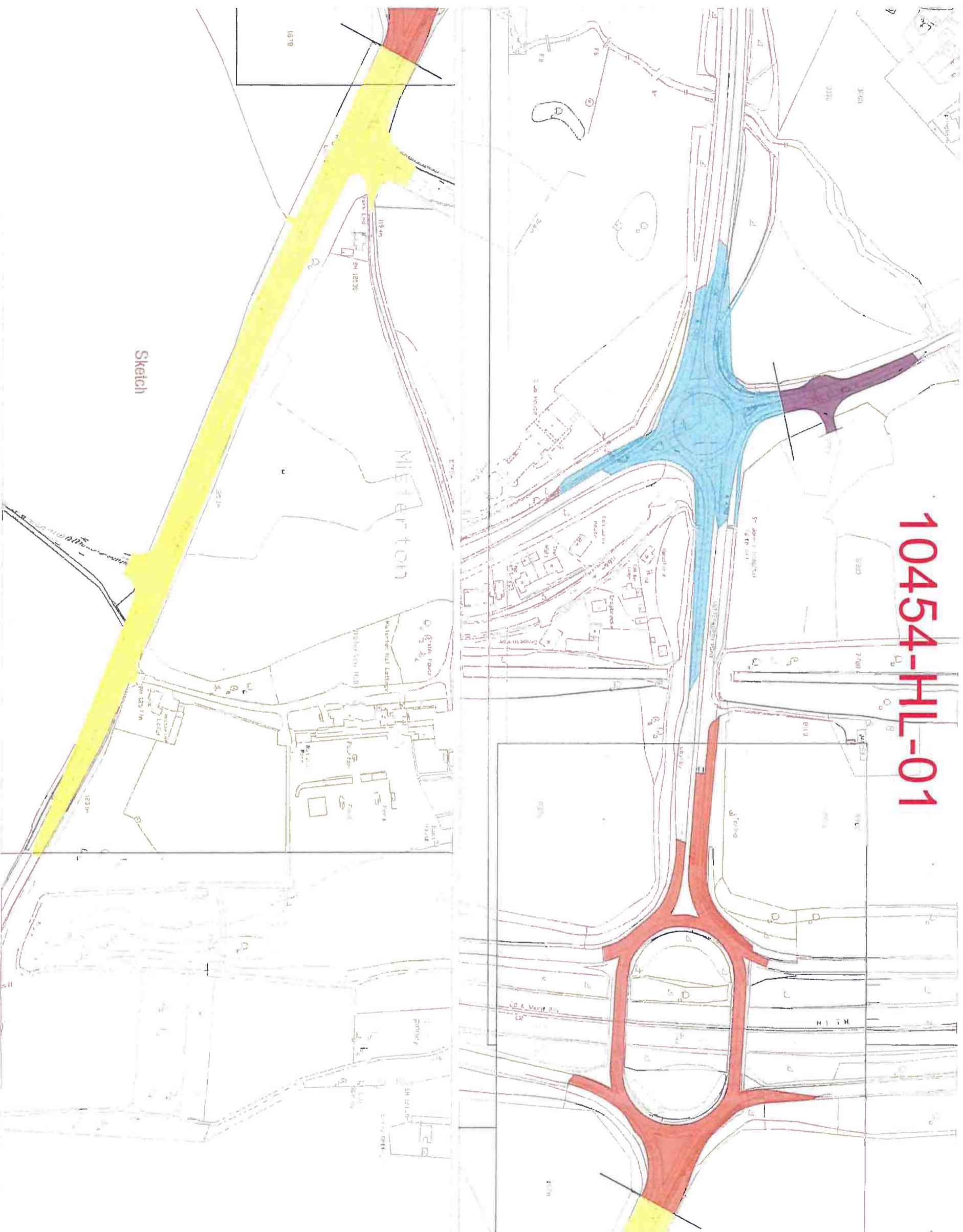
1540.0m

1540.0m

1540.0m

1540.0m

10454-HL-01



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- NOTES**
1. Draw made from the 02-17-17
 2. All dimensions are in metres unless otherwise stated
 3. All dimensions are to the centre of the road unless otherwise stated
 4. All dimensions are to the centre of the road unless otherwise stated

Brookbanks
 Urban Land Management

Luternorth East
Misterion

Highways Junction Improvements
Overview

Drawn: May 2017
 GVV: 18 Dec 2017
 Scale: 1:1000
 Project: 10454-HL-01

Appendix B. Cost Estimate

Summary		East Lutterworth Road	M1 Jnc 20 Signalisation	Frank Whittle Junction	Bridge	Link Road	Travel Lodge Jnc	2 nr Round about	Total
Highway Works		a.)	b.)	c.)	d.)	e.)	f.)	g.)	
		£	£	£	£	£	£	£	£
01	Preliminaries	935,400	545,250	493,950	1,377,000	1,832,550	143,400	630,750	5,958,300
02	Roadworks	3,118,000	1,817,500	1,646,500	0	6,108,500	478,000	2,102,500	15,271,000
03	Structures (Bridges, Viaducts, etc)	0	0	0	4,590,000	0	0	0	4,590,000
04	Structures (Retaining walls, culverts, subways, etc)	0	0	0	0	0	0	0	0
05	Miscellaneous	0	0	0	0	0	0	0	0
06	Accommodation Works	0	0	0	0	0	0	0	0
07	Facilitating Works	0	0	0	0	0	0	0	0
	Sub-Total	4,053,400	2,362,750	2,140,450	5,967,000	7,941,050	621,400	2,733,250	25,819,300
Project / Design Team Fees									
08	Project / design team fees	Excluded	Excluded	Excluded	Excluded	Excluded	Excluded	Excluded	Excluded
Other Development / Project Costs									
09	Other development / project costs	Excluded	Excluded	Excluded	Excluded	Excluded	Excluded	Excluded	Excluded
	Sub-Total	4,053,400	2,362,750	2,140,450	5,967,000	7,941,050	621,400	2,733,250	25,819,300
Risk & Optimism Bias									
10	Risks (Design, Construction & Employer Risk)	Excluded	Excluded	Excluded	Excluded	Excluded	Excluded	Excluded	Excluded
11	Optimism Bias	Excluded	Excluded	Excluded	Excluded	Excluded	Excluded	Excluded	Excluded
	Sub-Total	4,053,400	2,362,750	2,140,450	5,967,000	7,941,050	621,400	2,733,250	25,819,300
Sub-Total Carried forward									
	Sub-Total	4,053,400	2,362,750	2,140,450	5,967,000	7,941,050	621,400	2,733,250	25,819,300

Order of Magnitude Estimate



Sub-Total Brought forward									
	Sub-Total	4,053,400	2,362,750	2,140,450	5,967,000	7,941,050	621,400	2,733,250	25,819,300
Inflation									
12	Inflation	Excluded	Excluded	Excluded	Excluded	Excluded	Excluded	Excluded	Excluded
	Sub-Total	4,053,400	2,362,750	2,140,450	5,967,000	7,941,050	621,400	2,733,250	25,819,300
VAT									
13	VAT Assessment	Excluded	Excluded	Excluded	Excluded	Excluded	Excluded	Excluded	Excluded
	Total	4,053,400	2,362,750	2,140,450	5,967,000	7,941,050	621,400	2,733,250	25,819,300

The above cost estimate has an accuracy level of -40% to +40%

BOQ - Page totals - Gross

Item	Bill description	Unit	Bill quantity	Gross	
				Rate	Amount
	East Lutterworth Road				
	PRELIMINARIES				
	<i>Preliminaries</i>				
A	Preliminaries	%	30		935,400.00
	ROADWORKS				
	<i>Roadworks General</i>				
B	Roadworks general (based on area of road)	m2	14,800	60.00	888,000.00
	<i>Main Carriageway</i>				
C	Allowance for New Main Carriageway works, (based on area of road)	m2	10,200	110.00	1,122,000.00
D	Allowance for Re-surfacing works	m2	4,600	20.00	92,000.00
E	Allowance for drainage works (based on area of road)	m2	14,800	35.00	518,000.00
F	Allowance for New Footpaths	m2	2,800	40.00	112,000.00
	<i>Signs, Motorway Communications and Lighting</i>				
G	Allowance for signs(based on area of Road)	m2	14,800	10.00	148,000.00
H	Allowance for Signalised junction	item	6	15,000.00	90,000.00
	<i>Landscaping and Ecology</i>				
I	Landscaping and Ecology	m2	14,800	10.00	148,000.00
	Page total				4,053,400.00

BOQ - Page totals - Gross

Item	Bill description	Unit	Bill quantity	Gross	
				Rate	Amount
	East Lutterworth Road				4,053,400.00
	M1 Junction 20 Signalisation				2,362,750.00
	Frank Whittle Junction - Converting Roundabout to signal crossroads				2,140,450.00
	Link Road Bridge structure				5,967,000.00
	Link Road excluding roundabouts and Bridge structure				7,941,050.00
	Travel Lodge Junction - New mini roundabout at existing major/minor junction				621,400.00
	Link Road roundabout 1				1,592,500.09
	Link Road roundabout 2				1,140,750.00
	TOTAL				25,819,300.09