A66 Northern Trans-Pennine project

TR010062

4.1 Project Development Overview Report
Appendix 2 A66 Northern Trans-Pennine Project Scheme Assessment Report

APFP Regulations 5(2)(q)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

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Infrastructure Planning

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

A66 Northern Trans-Pennine project Development Consent Order 2022

4.1 Project Development Overview Report

Appendix 2 A66 Northern Trans-Pennine Project Scheme Assessment Report

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A66 Northern Trans-Pennine Project

Scheme Assessment Report

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1.1 Scheme Assessment Report

1.1.1 The Scheme Assessment Report (SAR):

- Reports on the appraisal of the route options for the dualling of the remaining single carriageway sections of the A66 between Penrith and Scotch Corner.
- Reports on the public consultation of route options.
- Presents a Recommended Preferred Route

1.1.2 Highways England is making a recommendation to the Secretary of State (SoS), following consideration and analysis of the consultation feedback, on which route option should be selected as the Preferred Route. The SoS will consider the recommendation and then decide which route option will form the Preferred Route. That decision will be published in a 'preferred route announcement'. The Preferred Route will then be developed in more detail, with further consultation, before an application is made for a Development Consent Order (DCO).

1.2 Structure of Document

1.2.1 The structure of this document is as follows:

- Section 2 sets out the scheme background and gives an overview of the previous studies.
- Section 3 describes the surrounding highway network, an overview of existing performance and the existing physical conditions.
- Section 4 sets out the Planning Factors and policy context.
- Section 5 sets out what will happen if nothing is done (the Without Scheme scenario).
- Section 6 describes the Do-Something scheme options considered.
- Section 7 summarises the appraisal of the Do-Something options during PCF Stage 1.
- Section 8 summarises the views and comments emerging from the public consultation.
- Section 9 summarises the appraisal of the Do-Something options during PCF Stage 2
- Section 10 provides a summary of the options selected for validation
- Section 11 provides a statement as to whether the options considered had implications on the safe and economic operation and maintenance of the completed scheme.
- Section 12 provides a statement as to whether the options considered had implications on the requirement for additional roadside technology and the ability to maintain said equipment.
- Section 13 provides a statement as to whether the options considered had potential to affect the environment significantly or achieve the schemes Environmental Objectives.
- Section 14 provides a summary of the Traffic and Economical Appraisal carried out on the options considered
- Section 15 gives a firm recommendation citing the reasons for the conclusion, drawing on the comparisons, views, etc, discussed above

2 SCHEME BACKGROUND

2.1 Scheme Overview

Figure 2-1: Study Area

2.1.1 The A66 Northern Trans-Pennine Project involves the improvement of the A66 between the M6 at Penrith and the A1(M) at Scotch Corner. The A66 is a key national and regional strategic link for a range of traffic movements; it carries high levels of freight traffic, as well as being an important route for tourism. There are no direct rail alternatives for passenger or freight movements along the corridor. Despite the strategic importance of the A66, the route between the A1 at Scotch Corner and the M6 at Penrith is only intermittently dualled, and still has six separate sections of single carriageway over a length of around 50 miles. The route also carries local slow moving agricultural traffic making short journeys which can have an impact on other users, especially on the single carriageway sections. The mix of road standards, together with lack of diversionary routes available when incidents occur, affects road safety, reliability, resilience, and attractiveness of the route, with the result that it is underutilised as a strategic east-west link.

2.1.2 If the A66 route is not improved the performance will inhibit improvements to national and regional connectivity, and threaten the transformational growth envisaged by the Northern Powerhouse agenda.

2.1.3 The A66 is the most direct route between the Tees Valley, north, south and west Yorkshire, the East Midlands, eastern England, north Cumbria, and the central belt of Scotland and Cairnryan (for access to Ireland). The improvements to bring the A1 carriageway to motorway standards between Leeming Bar and the A66 (M) is likely to increase the attractiveness of south-to-north movements along the A66.

2.1.4 During periods of snow or high winds, the elevated and exposed nature of parts of the A66

between A1 (M) and the M6 can necessitate the closure of the route to high sided vehicles, or infrequently, to all vehicles. This can be especially detrimental to the movements of heavy goods vehicles (HGVs), which can account for more than 30% of A66 traffic in certain periods. Due to the nature of the surrounding road network, suitable alternative routes result in lengthy diversions

2.1.5 The A66 continues from Penrith to the north of the Lake District to Workington; the route provides links to Workington, including its port, and to the south along the A595 to Whitehaven and Sellafield. The A590 links the M6 from junction 36 through Ulverston to Barrow-in-Furness and is a mix of single and dual carriageway. To the east of Scotch Corner, the A66 links Darlington, Middlesbrough and Teesport, the largest exporting port in the country.

2.2 Background

Northern Trans-Pennine Routes Strategic Study

2.2.1 In 2014 the Northern Trans-Pennine Routes Strategic Study was announced as part of the first Roads Investment Strategy. The study formed one of six national strategic studies located in the North of England.

2.2.2 The study concentrated on two trans-Pennine routes, the A69 between Carlisle and Newcastle, and the A66 between Penrith and Scotch Corner with aims to improve connectivity and deliver transformational economic growth across the Northern Region.

2.2.3 A number of major route improvements were identified in the vicinity of the A66/A685 and A69 corridors that would aim to improve the attractiveness of the routes. Evidence suggested the routes are underutilised due to factors such as poor journey time reliability, high collision rates, a high proportion of heavy goods vehicles and a lack of alternative diversion routes.

2.2.4 The outcome of the Study was published in the Northern Trans-Pennine Routes Strategic Study Stage 3 Report, and the HM Treasury Autumn Statement 2016 announced that following the strategic study the A66 would be dualled.

2.2.5 The A66 project was identified by the Department of Transport as a Nationally Significant Infrastructure Project (NSIP) and is to be delivered under the Highways England's Collaborative Design Framework.

PCF Stage 1

2.2.6 In 2017, Highways England commissioned Arcadis to act as Technical Consultant PCF Stage 1 of the A66 NTPP with a brief to identify viable dualling options for consideration.

2.2.7 Stage 1 culminated with the Technical Appraisal Report which summarised the selection of options recommended to be taken forward to Public Consultation.

2.2.8 A draft Outline Business Case was prepared and presented to BICC in 2018 and was subsequently given permission to proceed to PCF Stage 2 – Option Selection

2.3 Scheme Objectives

2.3.1 The transport objectives for the project are to:

- improve journey times, reliability and resilience on the A66 between the junctions with the A1(M) and M6
- improve strategic, regional and national connectivity, particularly for HGVs.
- provide a more attractive alternative route to the M62 for some east-west crossing movements
- reduce collisions on the A66 between the junctions with the A1(M) and M6
- reduce junction delays at the A66/A6 Junction
- reduce severance and improve air quality and noise for Kirkby Thore residents
- improve connectivity between key employment areas of Cumbria, Tees Valley and Tyne and Wear areas
- improve access to key tourist destinations such as the North Pennines and the Lake District
- contribute positively to the future economic growth of the North of England.

2.3.2 As well as the above objectives all considered options should align with the areas of improvement that Highways England are focusing on through measurement of Key Performance Indicators:

- making the network safer by continuing to reduce the number of people killed or seriously injured on the network
- improving user satisfaction including satisfaction with the management of roadworks
- supporting the smooth flow of traffic to minimise delay and inconvenience to road users
- encourage economic growth by working to minimise delay on the network
- delivering better environmental outcomes including: mitigation of Noise Important Areas to help improve the quality of life
- aiming to deliver no net loss of biodiversity
- helping cyclists, walkers and other vulnerable users of the network.
- achieving real efficiency and making savings on capital expenditure
- keeping the network in good condition.

Table 2-1: A66 Scheme Objectives

Theme	Project Objectives
Economic	Support the economic growth objectives of the Northern Powerhouse agenda
	Improve national connectivity including freight
	Maintain and improve access for tourism served by the A66
	Improve access to local services and jobs
Transport	Improve road safety, during construction, operation and maintenance for all, including: Road Users, NMU's, Road workers and Local Residents
	Improve journey time reliability for road users

	Improve and promote the A66 as a strategic connection for all traffic
	Improve the resilience of the route to the impact of events such as incidents, roadworks and severe weather events
	Seek to improve NMU provision along the route
Community	Reduce the impact of the route on severance for local communities
Environment	Minimise adverse impacts on the environment and where possible optimise environmental improvement opportunities
Deliver	Delivery efficiency objective to be set

3 EXISTING CONDITIONS

3.1 Existing Highway Network

General

3.1.1 The North Pennines region of England is located between Darlington to the east and Carlisle to the west. It is bounded by the Tyne Valley to the north and the Stainmore Gap to the south. The A66 represents one of the primary east-west corridors which cross the North Pennines region between Workington in the West and Middlesbrough in the East.

3.1.2 The A66 is part of the national Primary Route Network (PRN) which is composed of “roads between places of traffic importance across the UK, with the aim of providing easily identifiable routes to access the whole of the country” (as defined by the Department for Transport (DfT)). This corridor is also part of a subset of the PRN, referred to as the Strategic Road Network (SRN).

3.1.3 As shown in Figure 3-1,the A66 interfaces with the A1M to the east at Scotch Corner and the M6 Junction 40 to the west at Penrith, with the connecting intersections considered to be of significant regional importance as a result of these corridors facilitating principal freight access routes connecting with wider economic regions of the United Kingdom.

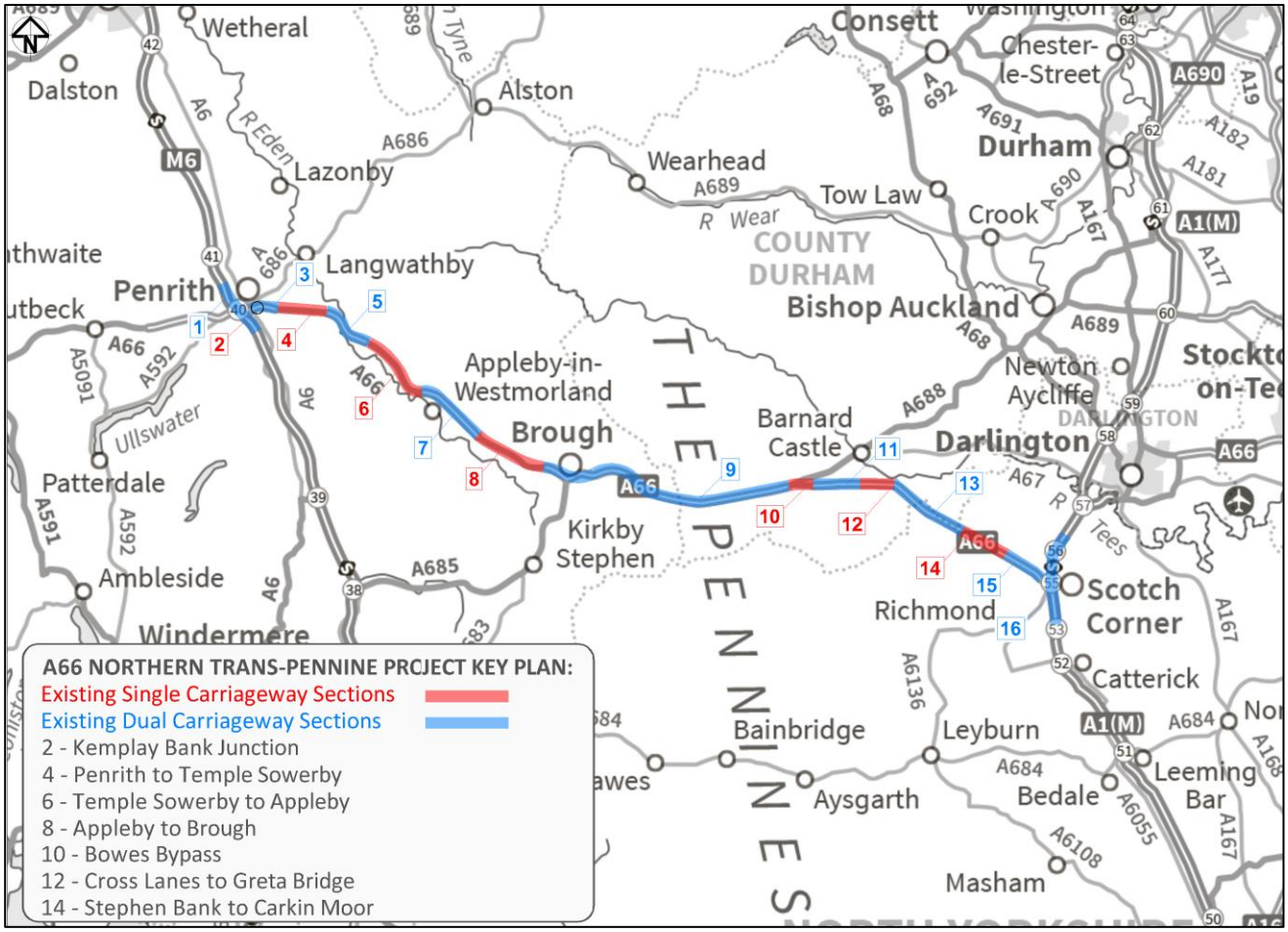
3.1.4 The rural nature of the North Pennines severely limits the availability of viable alternative north-south and east-west route options in the event that a section of the strategic road network should become unavailable due to operational incidents, maintenance/improvement works or severe weather events.

3.1.5 The route is regularly used by slow moving agricultural vehicles. These can have a significant affect on journey times and reliability, particularly on the substandard S2 Sections.

3.1.6 The A66 corridor is also affected by increases in seasonal traffic demand with high volumes of visitors to attractions within the study corridor/surrounding region and the Lake District National Park.

3.2 Description of Locality

Figure 3-1: Route Overview



3.2.1 Between the M6 and Scotch Corner (A1), the A66 carries a high volume of heavy goods vehicles (HGVs), which can contribute greater than 30% of the Annual Average Daily Traffic (AADT). The route is split over three Counties, Cumbria (Network Management Area 13) in the West and Durham and North Yorkshire (Network Management Area 14) in the East.

Cumbria

3.2.2 The Cumbria section is approximately 28 miles long, comprising of 16 miles of dual carriageway and 11 miles of single two-lane carriageway. A speed limit of 40mph is in place through Kirkby Thore village, 50mph through Warcop with the national speed limit applying to the remaining sections.

3.2.3 The single carriageway sections to the east of the M6 generally consist of a lower standard than desirable. Although the initial section east of Brougham is close to S2 standards, beyond Whinfell junction the hardstrips are no longer provided and the cross-section becomes less forgiving with narrower verges and horizontal and vertical alignments which do not meet the minimum requirements of the Design Manual for Roads & Bridges (DMRB). There are numerous field access and private means of access along the route with a similar frequency of side road accesses, all of which are ‘at-grade’ on the single carriageway sections.

3.2.4 There are four sections of dual carriageway east of the M6 within Cumbria with the Temple Sowerby bypass is the most recent. The section between the M6 J40 grade separated junction and Brougham includes the signalised Kemplay Bank roundabout.

Durham & North Yorkshire

3.2.5 The Area 14 section of the route is similar in nature to the Penrith to the County border length and is a mixture of single and dual carriageways. The section is 21 miles in total, 16 miles are to dual standard with the remainder single carriageway. The entirety of this part of the route is under the national speed limit with the exception of Ravensworth where a temporary speed limit of 50 mph is in operation.

Study Area

3.2.6 The study area covers the A66 from the M6 Junction 40 (Penrith) in the West to the A1(M) Scotch Corner in the West. Approximately 49 miles long, there are currently 6 remaining sections that remain single carriageway (approximately 16.5 miles). It is within these sections that the option identification has taken place.

- Section 2: Kemplay Bank Junction
- Section 4: Penrith to Temple Sowerby
- Section 6: Temple Sowerby to Appleby
- Section 8: Appleby to Brough
- Section 10: Bowes Bypass
- Section 12: Cross Lanes to Greta Bridge
- Section 14: Stephen Bank to Carkin Moor

3.2.7 In addition to the above the existing M6 Junction 40 (Section 1) and A1(M) Scotch Corner (Section 16) grade separated junctions, are also within the study area.

Section 1 M6 Junction 40

3.2.8 M6 J40 is an existing grade-separated junction on the M6 Motorway to the southwest of Penrith. The signalised roundabout junction serves access and egress to/from the M6 and the A66 with an additional 5th arm (A592) serving Penrith.

Section 2 Kemplay Bank Junction

3.2.9 Kemplay Bank roundabout is an at-grade 5 arm roundabout immediately south of Penrith. Two arms serve the A66 with 2 lane entries/exits towards the M6 at the west and Scotch Corner at the east. Two arms serve the A6 with single carriageway flared entries/exits towards Shap at the south and Penrith to the North. A fifth arm serves the A686 at the northeast quadrant of the junction. The roundabout operates under full signal control.

3.2.10 The roundabout is constrained to the north by Penrith Hospital and to the south by the Police Constabulary and Fire Station. The Fire Station has a direct access onto the circulatory to allow emergency vehicle egress.

Section 4 Penrith to Temple Sowerby

3.2.11 The A66 between its junction with B6262 at Brougham and the Temple Sowerby Bypass is single carriageway and follows the route of the old Roman Road. The existing carriageway is approximately 9.3m wide (7.3m wide with 1m hardstrips) between Brougham and the Center Parc junction, beyond Centre Parcs the carriageway is approximately 7.3m wide as far as Temple Sowerby bypass.

3.2.12 Between Brougham and the Center Parc junction the existing horizontal and vertical alignment appears to be compliant to the standards set out in DMRB for a design speed of 120kph. Beyond Center Parc up to the Temple Sowerby bypass, both the horizontal and vertical alignment is

poor and unlikely to be suitable for incorporation into the permanent works.

Section 6 Temple Sowerby to Appleby

3.2.13 The A66 between Temple Sowerby bypass and Appleby bypass is of single carriageway and varies in width but generally sub-standard without the provision of hardstrips.

3.2.14 The junctions along this section have no facilities for turning vehicles with the exception of the junction with Kirkby Thore which has a deceleration lane, although this is utilised as a bus layby. This Junction is the primary access to the gypsum works to the north of the village.

3.2.15 The route is largely located within agricultural pastureland and follows the route of the original Roman road heading in a south-easterly direction. The route diverges from the Roman road and passes through the Roman camp located directly on the A66 north of Redlands Bank Farm and continues to pass the hamlet of Crackenthorpe to the south before connecting to the Appleby Bypass.

3.2.16 The existing route corridor contains the village of Kirkby Thore and the Hamlet of Crackenthorpe. Kirkby Thore village is generally to the north of the A66 with a number of properties adjacent to the south with direct access to the A66. There is a large gypsum works to the north of Kirkby Thore whose access to the A66 is through the village

Section 8 Appleby to Brough

3.2.17 The A66 between Appleby and Brough follows the alignment of the Roman Road and is of single carriageway configuration, varying in width between approximately 9.3m and 7.3m. Ordnance surveys and site inspections reveal the route to be relatively good between Appleby Bypass and B6259. Beyond B6259 the existing alignment becomes very poor and unlikely to be acceptable to modern standards.

3.2.18 The junctions along this length vary in layout and comprise ghost islands for both the Sandford and Warcop junctions whilst there are no specific facilities provided at the Moor House, Toddygill, Filthhome and Langrigg junctions. The route is located within agricultural land bounded by the Ministry of Defence (MOD) training camp and firing range to the north. The MOD also retains its headquarters in the village of Warcop and requires frequent access across the A66 between the sites.

3.2.19 A P-Loop on the A66 assists with MOD access to the site for westbound articulated vehicles accessing the firing range access at Fell Lane.

Section 10 Bowes Bypass

3.2.20 Bowes Bypass comprises approximately 1km of single lane dualling and 2km of single carriageway. Adjacent to Bowes the eastbound carriageway has 2 lanes with the nearside lane configured as a lane drop for traffic leaving the A66 to join the A67. The offside lane is for A66 through traffic. The westbound carriageway is a single lane with a taper merge from the A67 merging just before Clint Lane overbridge.

3.2.21 Between the A67 and the Stone Bridge Farm the A66 is S2 single carriageway comprising 3.65m lanes and a 1.0m hardstrip in each direction. A short system of double white lines exist to prohibit overtaking through the length of Bowes Interchange where the carriageway alignment curves to the right and the cross-section is constrained in width by vehicle Restraint Systems/parapet fences in either verge. Elsewhere, the carriageway generally has narrow through lanes, to accommodate broken, central hatched markings of constant width through to the dual carriageway section.

Section 12 Cross Lanes to Greta Bridge

3.2.22 This section consists of a single, two-lane (S2), carriageway standard throughout, although short sections of single lane dual carriageway exist at either end to facilitate smooth transitioning from/to the existing adjoining dual carriageway sections. The carriageway alignment is relatively straight throughout with the exception of the right-hand curve at eastern extents, where the link transitions into the dual carriageway section at Abbey Lane Junction.

3.2.23 The carriageway generally has narrow lanes to accommodate the broken, central hatched markings, of constant width, extending from the nosing of the single lane dualling (associated with Cross Lanes Junction) for approximately 850m to a point 500m east of Street Side Farm, where a system of double white lines commences.

3.2.24 The system of double white lines, extending eastwards throughout the remaining length of the link (1,250m), has been installed to prevent vehicles over-taking through an existing vertical crest curve, where forward visibility falls below the minimum recommended distance for overtaking.

Section 14 Stephen Bank to Carkin Moor

3.2.25 This section is approximately 4.36 km in length and extends from Browson Bank Farm in the west to Carkin Moor in the east where the next length of dual carriageway is introduced. The carriageway closely follows the alignment of the former Roman Road, Dere Street resulting in it having a generally straight alignment but having notable crests and sags which affects forward sightlines.

3.2.26 This single carriageway length of the A66 has five major/minor junctions provided and seven private residential or commercial accesses. Two of the major/minor junctions have been provided with ghost island right turns to improve the safety for vehicles leaving the A66. These highway features result in frequent vehicle manoeuvres to and from the A66, thereby increasing accident risk. A feature of this single carriageway road is the generally narrow cross section of the road. Only narrow edge strips are provided, and the verge is also narrow, resulting in insufficient run-off areas should a vehicle leave the carriageway. Furthermore, the verge contains trees, shrubs, wooden telegraph poles and dry stone walls, which all act as potential collision hazards should a vehicle leave the carriageway.

Section 16 Scotch Corner

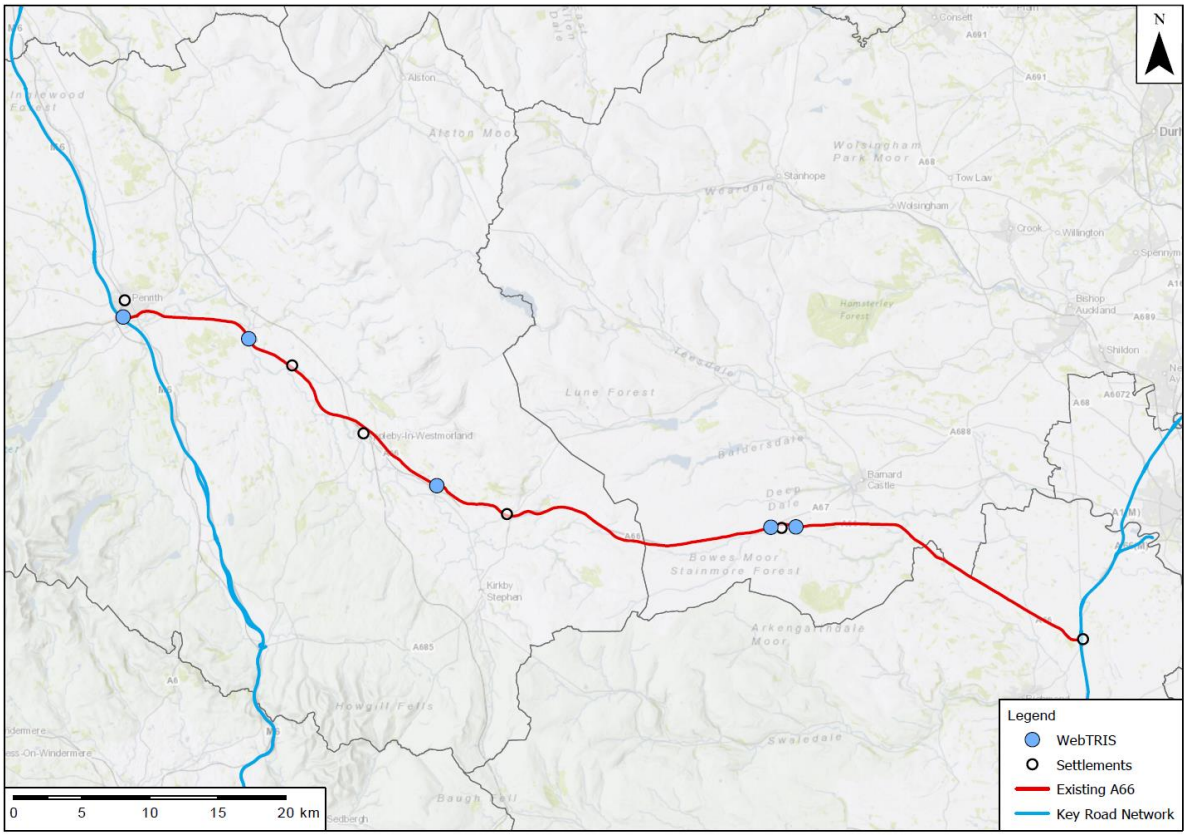
3.2.27 A1(M) J53 (Scotch Corner) is an existing grade-separated junction on the A1(M) to the south of Darlington. The signalised roundabout junction serves the A1(M), the A66, the A6055 and also provides access to Scotch Corner Motorway Service Area.

3.3 Traffic

3.3.1 Highways England WebTRIS data has been used to determine existing traffic flows for the A66 between the A1(M) at Scotch Corner in the east and the M6 junction 40 in the west. Data has been analysed from five two-way survey sites on the A66 as shown in

3.3.2 Figure 3-2, reflecting the different section of the A66(T). At four of these sites the traffic count data represents 2015. The WebTRIS site between the A66/A6 Kemplay Bank junction and M6 Junction 40 was not operational during 2015, so 2016 data has been used. As the year to year variation is limited this data provides a suitable comparison with the 2015 data on other sections of the route.

Figure 3-2: Location of WebTRIS count sites used



3.3.3 The WebTRIS data has been interrogated to understand traffic composition and variations in traffic flow. The following information has been calculated by sections of the A66:

- Average traffic flows and proportions of Heavy Goods Vehicles (HGVs)
- Variation in traffic flow by month of the year and day of the week
- Daily traffic flow profiles

3.3.4 Average traffic flows and proportions of heavy goods vehicles (hgvs) Table 3-1 provides a summary of the Annual Average Weekday Traffic (AAWT) and Annual Average Daily Traffic (AADT) at each of these sites together with the percentage of HGVS.

3.3.5 The figures below highlight the greater proportion of HGVs in comparison the national average of 12% on UK trunk roads. This reaffirms that the A66 is strategically important for freight traffic, specifically for connections between the east of England and the north west of England & Scotland.

Table 3-1: A66 Average Monthly 2015 Traffic Flows (Vehicles)

Site Number	A66 Section	Average Annual Weekday Traffic (%HGVs)	Average Neutral Month Weekday Traffic (%HGVs)	Average Annual Daily Traffic, AADT(%HGVs)
1	M6 Junction 40 and A6 Kemplay Bank	28,723 (20%)	29,577 (18%)	26,499 (20%)
2	A6 Kemplay Bank – Temple Sowerby	16,827 (25%)	17,160 (22%)	15,941 (26%)
3	Appleby and Brough	15,111 (30%)	15,425 (26%)	14,158 (30%)
4	Brough and Bowes	16,802 (27%)	17,085 (24%)	14,875 (27%)

Site Number	A66 Section	Average Annual Weekday Traffic (%HGVs)	Average Neutral Month Weekday Traffic (%HGVs)	Average Annual Daily Traffic, AADT(%HGVs)
5	Bowes and Scotch Corner	15,286 (29%)	15,541 (26%)	14,396 (30%)

3.3.6 The short section of the A66 between the A66/A6 Kemplay Bank junction and M6 Junction 40 at Penrith is observed to have much higher traffic flows than for the A66 east of the Kemplay Bank Junction.

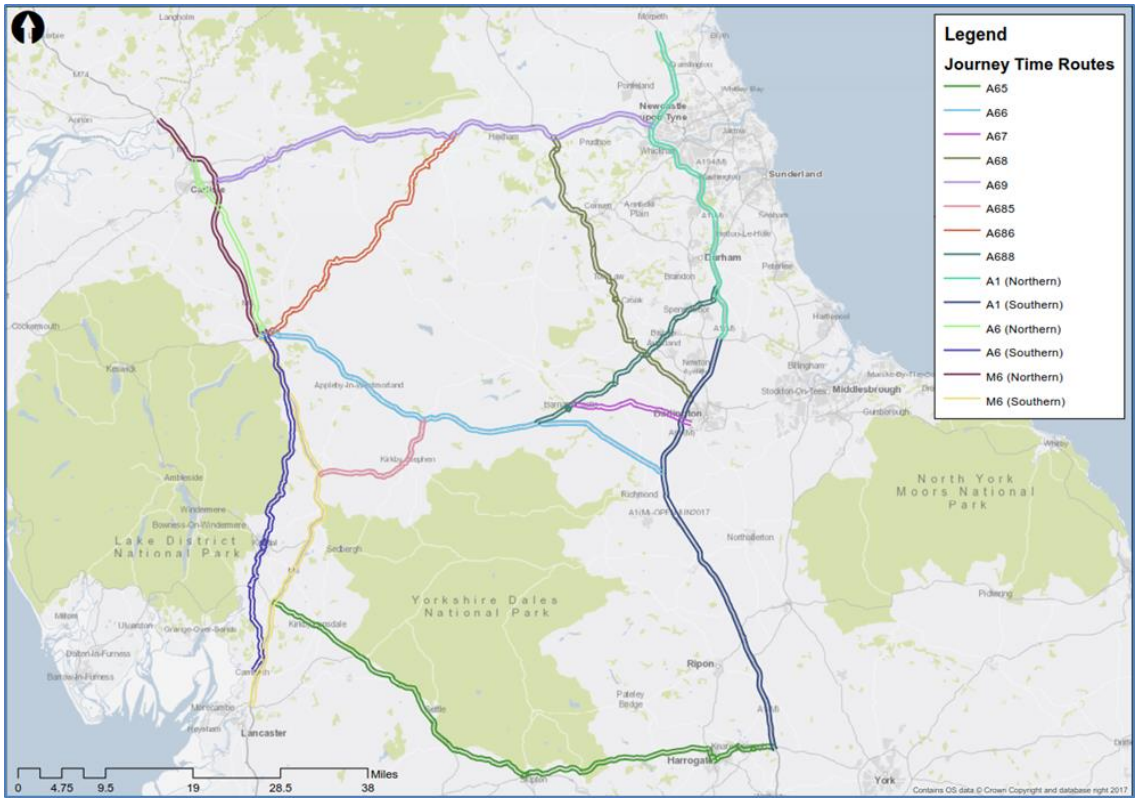
3.4 Journey Time Reliability

Observed Journey Times

3.4.1 Observed journey time data has been sourced from Trafficmaster data and was used to define journey time routes in the strategic traffic model. The model journey time routes are shown in Figure 3-3. And the observed journey time and speed along these routes is shown in Table 3-2.

3.4.2 For the A66 the average speeds are very similar in both directions for all 3 modelled time periods, ranging between 90km/h and 93km/h.

Figure 3-3: A66 -Journey Time Routes



Source: Trafficmaster

Table 3-2: A66TM Observed Journey Times by Route

Route Description	Dir.	Length (km)	AM		IP		PM	
			Time (min)	Speed (km/h)	Time (min)	Speed (km/h)	Time (min)	Speed (km/h)
A66								
A66: M6 J40 - A1(M) J53 Scotch Corner	EB	80	52	93	52	92	51	93
	WB	80	52	92	53	90	52	92

Route Description	Dir.	Length (km)	AM		IP		PM	
			Time (min)	Speed (km/h)	Time (min)	Speed (km/h)	Time (min)	Speed (km/h)
A66 Core Area Western Section								
A686: Penrith - A69/A686	EB	58	56	62	55	64	53	66
	WB	58	54	65	56	62	52	68
A6 North: Penrith - Carnforth	NB	67	63	64	66	61	63	64
	SB	67	60	67	62	64	62	64
A6 South: Penrith - M6 J44	NB	35	39	53	41	51	41	51
	SB	34	37	55	40	51	41	50
A685: M6 J38 - A66	EB	25	20	75	21	72	20	75
	WB	25	20	75	21	74	21	74
A66 Core Area Eastern Section								
A67: Barnard Castle - Darlington	EB	22	18	73	18	73	18	75
	WB	22	18	73	19	71	18	72
A688: A66 - A1(M) J61	EB	44	43	61	43	61	43	61
	WB	43	41	64	42	62	42	62
A68: A68/A1(M) - A69	NB	59	50	71	50	71	48	73
	SB	64	52	74	53	72	52	74
A69 & A65								
A69: M6 J43 - A1/A69	EB	85	60	85	61	84	59	87
	WB	84	59	86	60	85	58	88
A65: M6/A65 - A1(M)/A59	EB	106	100	64	104	61	101	63
	WB	106	101	63	104	61	102	62
M6 & A1(M)								
M6 South: J34 (A683) - J40 (A66)	NB	72	38	114	38	114	37	117
	SB	73	38	114	38	114	38	116
M6 North: J40 (A66) - A74(M)	NB	45	24	113	24	112	23	114
	SB	45	24	112	24	111	24	113
A1(M) South: J60 (A689) - J47 (A59)	NB	80	48	100	48	99	47	101
	SB	80	49	98	49	98	48	101
A1(M) North: J60 (A689) - A697 Morpeth	NB	64	48	80	45	86	47	81
	SB	63	45	83	45	85	48	79

Source: WebTRIS

3.5 Road Safety

3.5.1 This section describes road safety along the current A66 corridor between Penrith and Scotch Corner. Records of personal injury accidents along the route were obtained from the Department for Transport's (DfT) website which contains Personal Injury Accident (PIA) data for the latest available complete five-year period (2013-2017). In total, 197 collisions occurred along the route, which equates to an average of 40 collisions per year.

Table 3-3: No. of Collisions and Severity by Year

Year	No. of Collisions			
	Fatal	Serious	Slight	Grand Total
2013	0	11	28	39
2014	0	7	36	43
2015	5	10	30	45
2016	1	5	26	32
2017	3	9	26	38
Grand Total	**9**	**42**	**146**	**197**

Table 3-4: Casualties by Year

Year	No. of Casualties			
	Fatal	Serious	Slight	Grand Total
2013	0	27	39	66
2014	0	11	66	77
2015	12	22	51	85
2016	1	16	37	54
2017	5	17	36	58
Grand Total	**18**	**93**	**229**	**340**

3.5.2 Following investigations of sections of single carriageway with a poor safety record, a number of safety improvements have been introduced along the route, some of which have involved reductions in the speed limit, as described below:

- The speed limit through Kirkby Thore village is 40mph, with average speed enforcement cameras installed in 2016;
- A 50mph speed limit was introduced between Appleby and Brough in 2016;
- A scheme to provide a right turn lane at Llama Karma Kafe was completed in 2016, following a number of incidents involving eastbound vehicles waiting to turn right into the cafe.

3.5.3 A safety improvement scheme is also being developed at Ravensworth, which will involve reducing the speed limit to 50mph.

3.5.4 For the accident analysis, the study route was split into fifteen Sections, as shown in **Error! R eference source not found.**

3.5.5 As mentioned above, five fatal collisions occurred in 2015. Three of these collisions occurred on single carriageway sections; one in the eastbound direction of Section 5 between B6412 and B6542 near Appleby-in-Westmorland, and two in the eastbound direction in Section 7 between B6542 near Appleby-in-Westmoreland and A685. The other two fatal collisions occurred on dual carriageway sections; one in the eastbound direction in Section 9 between the A685 and A67 near Bowes, and one in the eastbound direction of Section 11 between A67 near Bowes and the A1.

3.5.6 Additionally, one fatal collision occurred in 2016. This was in Section 9 which is a dual

carriageway section, as described above.

3.5.7 It is apparent that there is a strong relationship between the accident rate and the type of carriageway on the A66, as shown in Table 3-5. The local accident rate for single carriageways (Modern S2 Road) is 0.150, compared to 0.076 for dual carriageways (Modern D2 Road), showing that the single carriageway sections are more prone to accidents. In addition, the accident rate on single carriageway sections of the A66 is higher than the standard accident rate for this type of carriageway in the UK, showing that the amount and severity of accidents are higher than average on the A66.

3.5.8 It should also be noted that incidents involving HGVs are above the national Investigatory Level. A Road Safety Report in 2016 identified that 39% of PIAs east of Penrith in Cumbria involved at least 1 HGV. Dominant locations are at Kirkby Thore, Warcop Bends and Stainmore.

Table 3-5: Local Accident Rates

Adjusted Accident Rates – Taking 2015 as Median Year				
Road Type	Road	Speed	Local Accident Rate	National Average Accident Rate
4	Modern S2 Road	>40	0.150	0.143
10	Modern D2 Road	>40	0.076	0.077

Table 3-6: Collision Analysis Rates

Section Reference	Rank	Section Type	PIC	Rate PIC 10^8 veh-m	+/- National Average*
1	3	Roundabout (D2AP)	7	39.16	+
2	9	Roundabout + Modern D2AP	9	15.11	-
3	10	Modern D2AP	3	13.64	-
4	7	S2	20	21.29	+
5	16	Modern D2AP	4	4.85	-
6	6	S2	32	22.08	+
7	12	Modern D2AP	6	6.91	-
8	5	S2	35	27.38	+
9	11	D2AP	34	8.27	-
10	14	S2	3	6.17	-
11	13	D2AP	4	6.89	-
12	15	S2	3	5.02	-
13	8	D2AP	14	15.77	-
14	1	S2	32	39.46	+
15	4	D2AP	30	30.30	+
16	1	Roundabout (D2AP)	8	78.10	+
All Sections	N/A	D2AP & S2 & Roundabout	244	16.09	-
*National A-road average	N/A	All A-road	5,473	17.49	N/A
**National Single A-road average	N/A	All Single A-road	1,388	23.56	N/A
***National Dual A-road average	N/A	All Dual A-road	4,085	16.08	N/A

3.6 Technology

Existing Technology Overview

3.6.1 The A66 route has limited technology in place to monitor, control and inform the motorist. Technology delivery is constrained as there is currently no local National Roads Telecommunications Service (NRTS) transmission infrastructure in place with existing communications being provided via 3rd party arrangements such as British Telecom (BT) circuits or mobile operator services. The existing technology includes:

- Traffic signal control
- Variable Message Signs (VMS)
- Closed Circuit Television (CCTV)
- Enforcement/traffic calming
- Automatic Number Plate Recognition (ANPR)
- Emergency Roadside Telephones (ERTs)
- Traffic counting sites
- Weather monitoring stations
- Snow gates

3.6.2 Traffic signals exist at major roundabouts along the route.

3.6.3 The VMS which are currently in place on the route only provide motorists with information regarding the status of the snow gates at Brough and Bowes. There appears to be extensive use of mobile VMS particularly for special events such as the Appleby horse fair.

3.6.4 CCTV across the route is limited to coverage at the snow gates and Scotch Corner.

3.6.5 There is one fixed ANPR enforcement section through Kirkby Thore. Mobile speed enforcement was seen to be in operation during our initial site visit.

3.6.6 National Traffic Information Centre (NTIC) information helps to ascertain the traffic conditions in the area by monitoring vehicle movement using ANPR cameras along the route. The data gathered is used to calculate journey times across the Highways England network and enables the NTIC to communicate this to the travelling public through services such as Traffic England.

3.6.7 Traffic counting sites are present along the route to classify and count vehicles for Annual Average Daily Traffic (AADT) data.

3.6.8 The ERTs are connected to the Integrated Communications Control System (ICCS) at the respective Regional Control Centres (RCCs) via third party arrangements e.g. BT /GSM circuits.

3.6.9 Weather monitoring stations provide a range of weather data from locations typical to the area, to feed into forecasting at both local and national levels to inform severe weather planning.

3.6.10 The snow gates at Brough and Bowes have limited technology for operational purposes.

3.6.11 Technology maintenance is split between Balfour Beatty Mott MacDonald (BBMM) for the Cumbria section and Amey for the Durham section.

3.6.12 The A66 route is also split operationally with the Cumbria section monitored by the Area 13 Operations Control Centre (OCR) at Penrith and the Durham section by the Area 14 OCR at Darlington

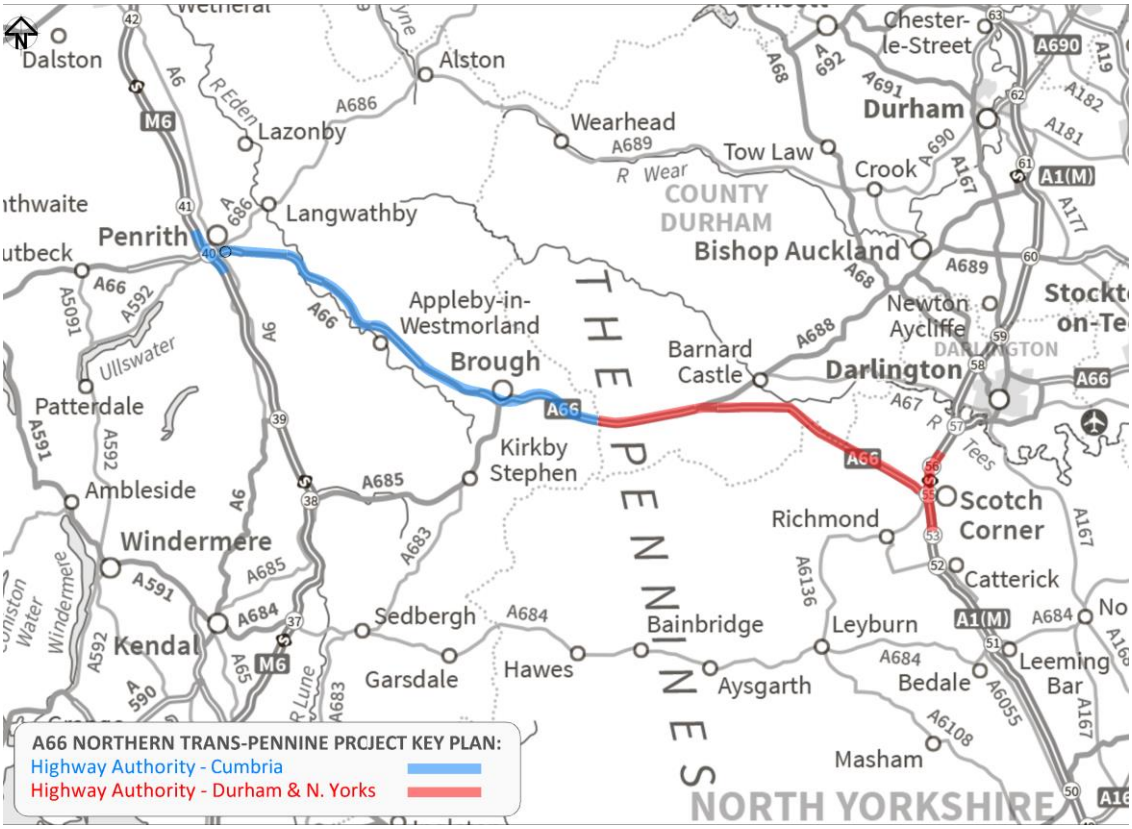
3.7 Operation and Maintenance

Operation & Maintenance Introduction

3.7.1 Highways England implemented Asset Delivery model contracts in 2017 for the maintenance of

trunk roads and motorways of Area 13 across Cumbria and North Lancashire and Area 14 in the North East. The Asset Delivery model has been developed to help Highways England gain greater control over maintenance to build the organisation's knowledge of the true costs of work carried out on the Strategic Road Network. The model, first introduced in Area 7 in the East Midlands, sees Highways England assume management of routine maintenance and capital renewal and improvements schemes, with a greater number of contracts awarded to suppliers directly for carrying out works, design and specialist services.

Figure 3-4: A66 HE Area 13 (Cumbria) and Area 14 (Durham & N. Yorks)



3.7.2 The Highways England boundary between Area 13 and Area 14 is the Durham / Cumbria border.

3.7.3 The Asset Maintenance and Operational Requirements (AMOR) for each Area sets out requirements in relation to the carrying out of maintenance and operational services on the Area Network.

3.7.4 Highways England has a number of key objectives:

- Improved road user and road worker safety
- High quality customer service
- Best value and improved efficiency
- Reduced congestion and improved reliability
- Asset capability preserved and maintained
- Sustainable operations

3.7.5 Effective maintenance and operation of the Area Network is essential in achieving these key objectives.

3.7.6 Highway authorities have an obligation to maintain public highways to reasonable standards.

The current provisions are incorporated in the Highways Act 1980, Section 41 (duty to maintain) and Section 58 (special defence in actions for damages for non-repair). The importance of Section 58 is that it provides the defence "that the Authority had taken such care as in all the circumstances was reasonably required to secure that the part of the highway to which that action related was not dangerous for traffic".

3.7.7 The Technical Appraisal Report [HE565627-ARC-HGN-A66-RP-ZM-1082] produced in Stage 1 should be referenced for greater details on the following;

- Frameworks
- Maintenance Activities
- Winter Service & Adverse Weather Conditions
- Incident Management

3.8 Key Constraints

3.8.1 There are a number of key internal and external constraints which have been identified with the delivery of the project, as set out below.

Environmental, Geotechnical and other Physical Constraints

3.8.2 Significant environmental constraints in the vicinity of the A66 include:

- The North Pennines Area of Outstanding Natural Beauty (AONB) between Brough and Bowes.
- The Lake District National Park, which is located two kilometres south west of Penrith, which is designated as a World Heritage Site.
- The Yorkshire Dales National Park which is located 3.5 kilometres south of the A66.
- Archaeological and historic constraints including scheduled ancient monuments, conservation areas, registered parks and gardens, and listed buildings.
- The North Pennine Moors Special Protection Area (SPA) and Special Area of Conservation (SAC) are encompassed within the North Pennines AONB. The River Eden SAC and its tributaries run adjacent to and underneath the existing A66. These sites are all important at European level.
- A number of Sites of Special Scientific Interest (SSSI).
- Flood Zones 2 and 3 associated with the River Eden, its tributaries and other watercourses are located along the route.

3.8.3 Other key physical constraints include existing settlements, properties and businesses, geotechnical and geological constraints including abandoned mine workings, utility apparatus including high voltage power lines and high-pressure pipelines.

Requirements for Planning Consent

3.8.4 In view of the scale of the project and the project options being considered, the project is a Nationally Significant Infrastructure Project (NSIP) requiring a Development Consent Order (DCO). Therefore, the future Environmental Statement will be prepared in accordance with European Community Directive 2014/52/EU and the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. The National Networks National Policy Statement (NNNPS) (Department for Transport (DfT), 2015) is also of relevance to this project as it provides planning guidance for promoters of NSIPs on the road network and is the basis for the examination process by the Examining Authority for DCO applications and the basis for decisions by the Secretary of State (SoS).

4 PLANNING FACTORS

4.1 Introduction

4.1.1 This section presents a summary of the relevant policies identified at PCF Stage 2. For detail, reference should be made to the Environmental Assessment Report (EAR) (HE565627-ARC-EGN-A66-RP-ZM-1055) and National Policy Accordance Statement (HE565627-ARC-GEN-A66-RP-ZM-1069).

4.2 Policy Constraints

4.2.1 The following provides the key planning policy constraints which apply to the current proposed route options. The relevant national policies, and local planning policies are contained within:

- National Planning Policy Framework (NPPF) 2019
- Planning Practice Guidance (PPG)
- National Networks National Policy Statement (NN NPS)

National Planning Policy Framework

4.2.2 Chapter 4 of the NPPF (Promoting sustainable transport) outlines how the transport system needs to encourage travel patterns which support reductions in greenhouse gas emissions and reduce congestion.

4.2.3 Chapter 10 (Meeting the challenge of climate change, flooding and coastal change) requires development to be brought forward in areas at the lowest risk of flooding, but stipulates where development is to be brought forward in areas which are vulnerable, care should be taken to ensure risks are managed and mitigation measures incorporated.

4.2.4 Chapter 11 (Conserving and enhancing the natural environment) requires the planning system to contribute to and enhance the natural and local environment, by protecting and enhancing landscapes, geological assets and soils.

4.2.5 Chapter 12 (Conserving and enhancing the historic environment) requires great weight to be given to the conservation of historic assets, stating the more important the asset, the greater the weight should be.

Planning Practice Guidance

4.2.6 Planning Practice Guidance provides additional policy guidance to support the implementation of the NPPF. It should be read alongside the relevant chapters of the NPPF.

National Networks National Policy Statement (NN NPS)

4.2.7 The NN NPS sets out policies for the delivery of nationally significant infrastructure projects on the national road network. Chapter 5 (Generic impacts) outlines policy considerations which form the primary basis for decision making by the Secretary of State. Impacts that are relevant to the project include air quality, biodiversity, dust, flood risk, the historic environment, landscape, land use, noise, vibration and water quality.

5 DO-MINIMUM CONSEQUENCES

5.1 Introduction

5.1.1 The A66 is a key national and regional strategic link for a range of traffic movements; it carries high levels of freight traffic, as well as being an important route for tourism. At present, the route between the M6 at Penrith (J40) and A1 at Scotch Corner is only intermittently dualled, and still has six separate sections of single carriageway over a length of around 50 miles.

5.1.2 The Annual Average Daily Traffic (AADT) in 2015 along most of the A66 corridor is between 15,000 and 17,500 vehicles per day, although this increases to 30,500 vehicles per day on the much busier section between M6 J40 and Kemplay Bank, immediately South of Penrith. There is a high proportion of HGV's, between 20% and 30% along the route. Traffic patterns from count data on the A66 shows a relatively flat profile throughout the day, with Monday and Friday peaks during the week, and seasonal higher monthly flows during May, July, August and October. Annual Average Daily Flows from the DfT Traffic Count 2018 dataset indicates an average annual daily flow of approximately 20,000 vehicles on all major roads (motorways and A roads), and a 6% HGV proportion.

5.1.3 At a midpoint along the route (between Appleby and Brough) the AADT is predicted to rise from 15,000 in the base year 2015 to 22,000 in 2046 (15 years after opening), a rise in AADT of almost 50%. The increase in traffic in the forecast years is due to assumptions around forecast growth in trips. Specific housing and employment developments planned for nearby local authorities have also been represented in the forecasts, including Scotch Corner Retail Park, and housing developments and employment sites in Penrith. The impact of infrastructure schemes which are expected to be completed and which could be expected to be influential on traffic flow associated with the scheme have been taken account of, this includes transport schemes in the vicinity of the A66 corridor as well as those further afield.

5.1.4 The end to end journey time between the A1(M) Scotch Corner and M6 J40 along the A66 route is between 53 and 54 minutes. Congestion is primarily concentrated at the M6 end of the corridor; at the M6 J40 and Kemplay Bank junctions. The A1(M) end of the corridor at Scotch Corner also generates some delay but to a lesser extent. Scotch Corner was improved recently as part of the A1 Leeming to Barton upgrade, increasing capacity to support future trip demand, and this forms part of the Do-Nothing scenario. Journey times are predicted to deteriorate in the future as traffic flow increases putting more pressure on the network. Without intervention this is forecast to increase in the future, from the base year 2015 to 2046, by between 4 and 5 minutes (an 8 to 10% journey time increase). For comparison, using equivalent 2018 Road Traffic Forecast predicted speeds, 2015 to 2045, for all Trunk A, Principal A, and Motorways would give journey time increases of 3 to 9% depending on road type.

5.1.5 Journey time reliability refers to variation in journey times that individuals are unable to predict from recurring variability in the form of day to day variability or non-recurring events such as incidents. Guidance is provided in TAG unit A1.3 (Section 6). Journey time reliability will be assessed using a bespoke approach developed in line with TAG, and following an approach accepted by the DfT on another scheme.

5.1.6 Section 3.5 of this report shows there were a total of 197 collisions along the route over a five-year period (2013 – 2017), and of these 42 resulted in series injuries and 9 fatalities. This represents a collision severity ratio of 26%, compared with 15.5% recorded for all A roads over the same period and therefore the collision severity ratio on the A66 is worse than the national average. The AADT is predicted to rise from 18,600 in the base year 2015 to 27,700 in 2046 (15 years after opening), a rise in AADT of almost 50%. It is anticipated that, without the proposed scheme, the number of accidents would rise in proportion to the predicted growth in traffic.

6 DO-SOMETHING OPTIONS

6.1 Introduction

6.1.1 The study area for the purposes of this report is the A66 between Penrith (M6 J40) in the west and Scotch Corner (A1M) in the east. As the route is currently a mix of both single and dual carriageway standards, the route has been split into relevant sections.

6.1.2 Plans of the proposed Shortlist Options are Available in APPENDIX A

Figure 6-1: A66 Section Locations

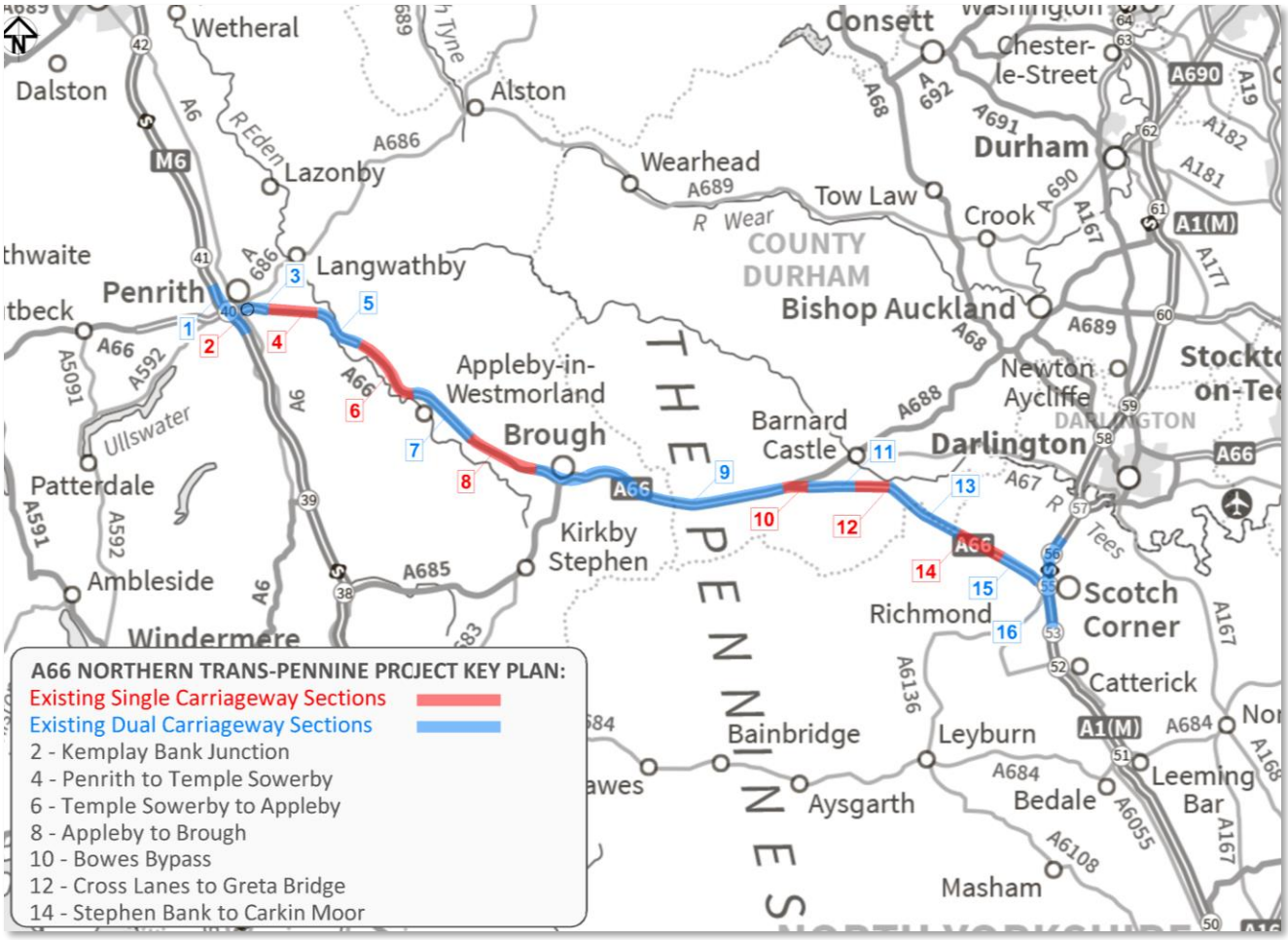


Table 6-1: A66 Section References

Section Number	Location	Description
1	M6 Junction 40	Grade separated roundabout
2	A66/A6 Kemplay Bank Junction	At-grade roundabout
3	Kemplay Bank to Penrith	Dual Carriageway
4	Penrith to Temple Sowerby	Single Carriageway
5	Temple Sowerby Bypass	Dual Carriageway
6	Temple Sowerby to Appleby – Kirkby Thore	Single Carriageway
	Temple Sowerby to Appleby – Crackenthorpe	Single Carriageway

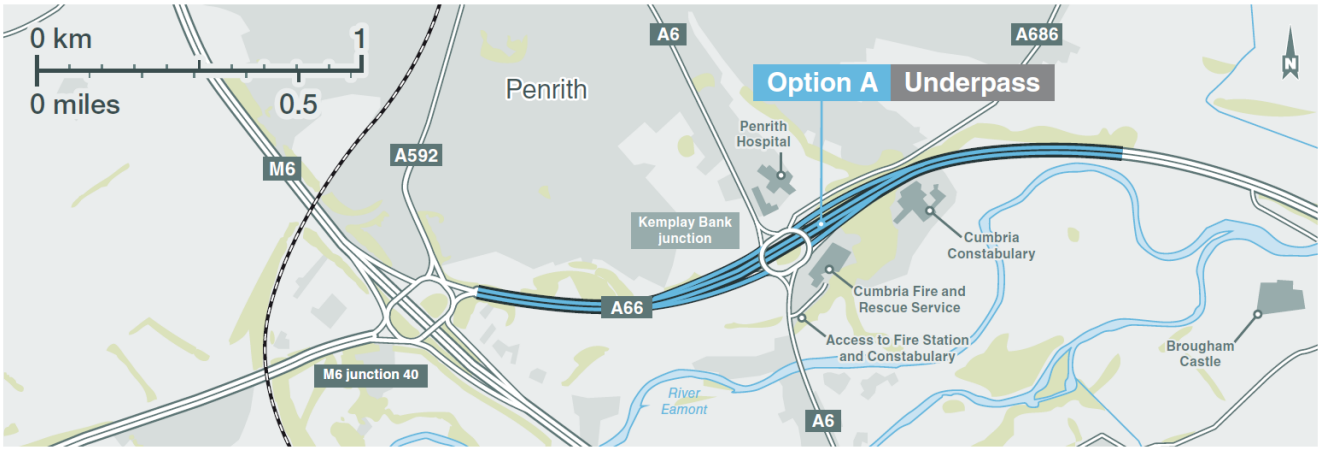
Section Number	Location	Description
7	Appleby Bypass	Dual Carriageway
8	Appleby to Brough	Single Carriageway
9	Brough to Bowes	Dual Carriageway
10	Bowes Bypass	Single Carriageway
11	Bowes to Cross Lanes	Dual Carriageway
12	Cross Lanes to Rokeby	Single Carriageway
13	Greta Bridge to Stephens Bank	Dual Carriageway
14	Stephens Bank to Carkin Moor	Single Carriageway
15	Carkin Moor to Scotch Corner	Dual Carriageway
16	A1M Scotch Corner	Grade separated roundabout

6.2 M6 junction 40 to Kemplay Bank roundabout

6.2.1 The approach roads and junctions need to be improved and the two options we are proposing will either introduce a new underpass or overpass through the Kemplay Bank roundabout.

Option A (underpass)

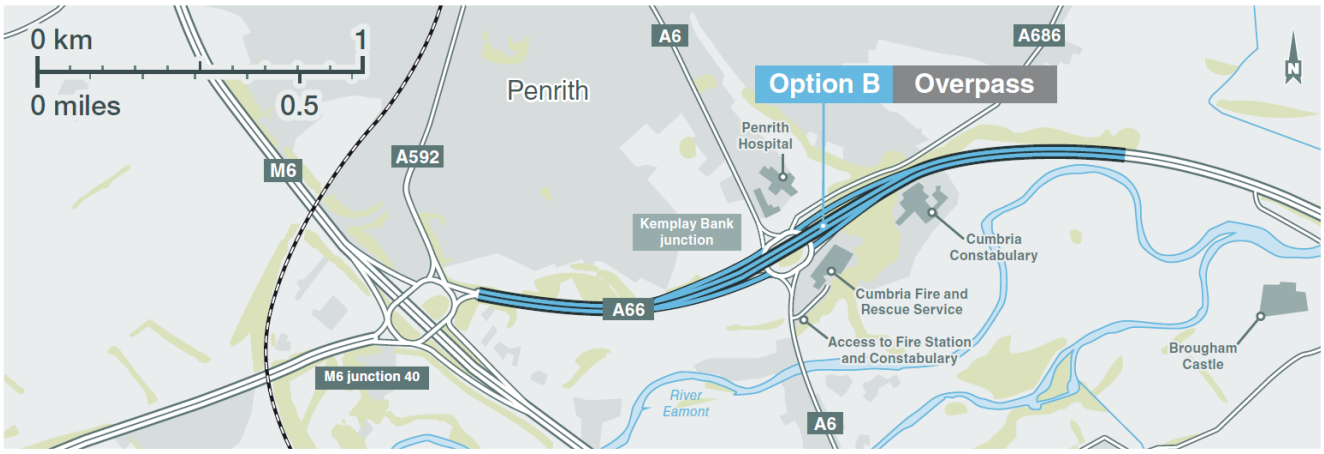
Figure 6-2: Option A



6.2.2 A new dual carriageway under Kemplay Bank roundabout providing an un-interrupted route for the A66 east and westbound. This option would require significant work on each of the arms of the roundabout, new retaining wall and bridge installations and the reconstruction of the roundabout itself. The underpass serving the police and fire services would need to be removed and an alternative new access road constructed that would link into The Green, providing access to all the facilities in the south east of the junction.

Option B (overpass)

Figure 6-3: Option B

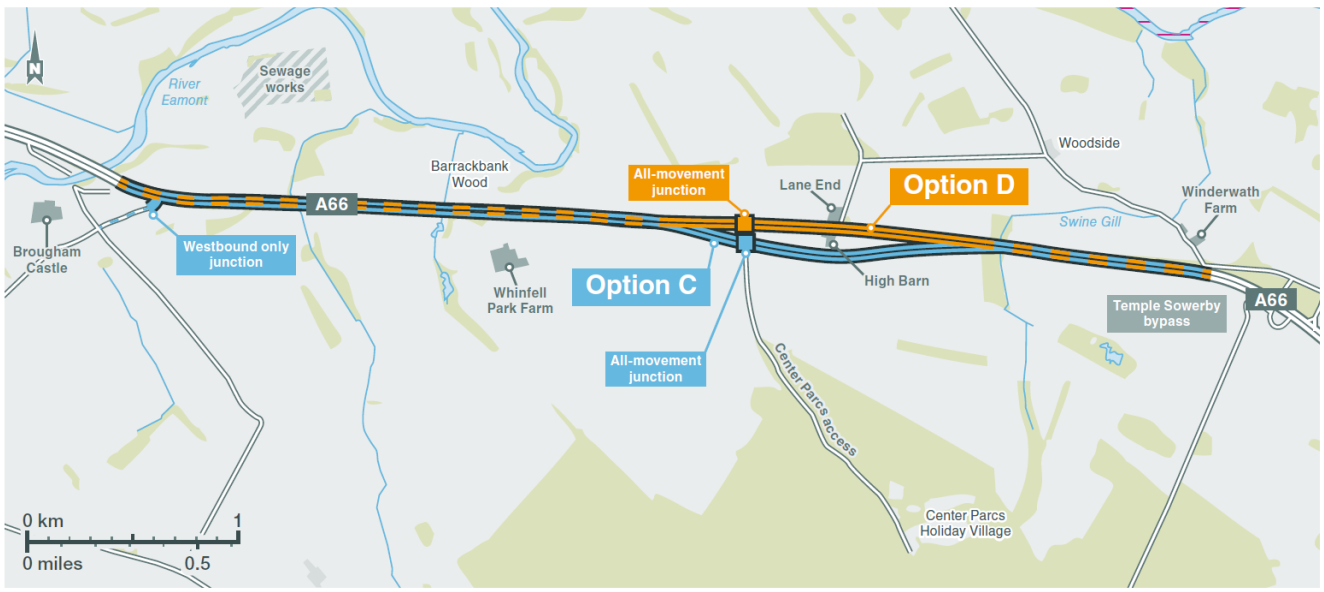


6.2.3 A new dual carriageway over the existing Kemplay Bank roundabout providing an uninterrupted route for the A66 eastbound and westbound. All other elements of this option would be the same as Option A.

6.3 Penrith to Temple Sowerby

6.3.1 We are proposing two options to introduce a dual carriageway on this section. Due to limited space at this location both options require the construction of a new road which is re-routed around the village of High Barn. A new junction will also be constructed at Center Parcs, providing access to the holiday park and local roads. Between Brougham Castle and Whinfell Park Farm, both options follow the line of the existing A66, utilising the existing carriageway where possible. Both the options below would involve the realignment of some local roads and alternative routes would be provided to nearby junctions where required, improving ease of access for local road users and safety.

Figure 6-4: Options C & D



Option C

6.3.2 From Whinfell Park Farm the road will divert to the south to avoid the hamlet of Lane End. The road will then re-join the A66 at Swine Gill before continuing to the Temple Sowerby Bypass.

Option D

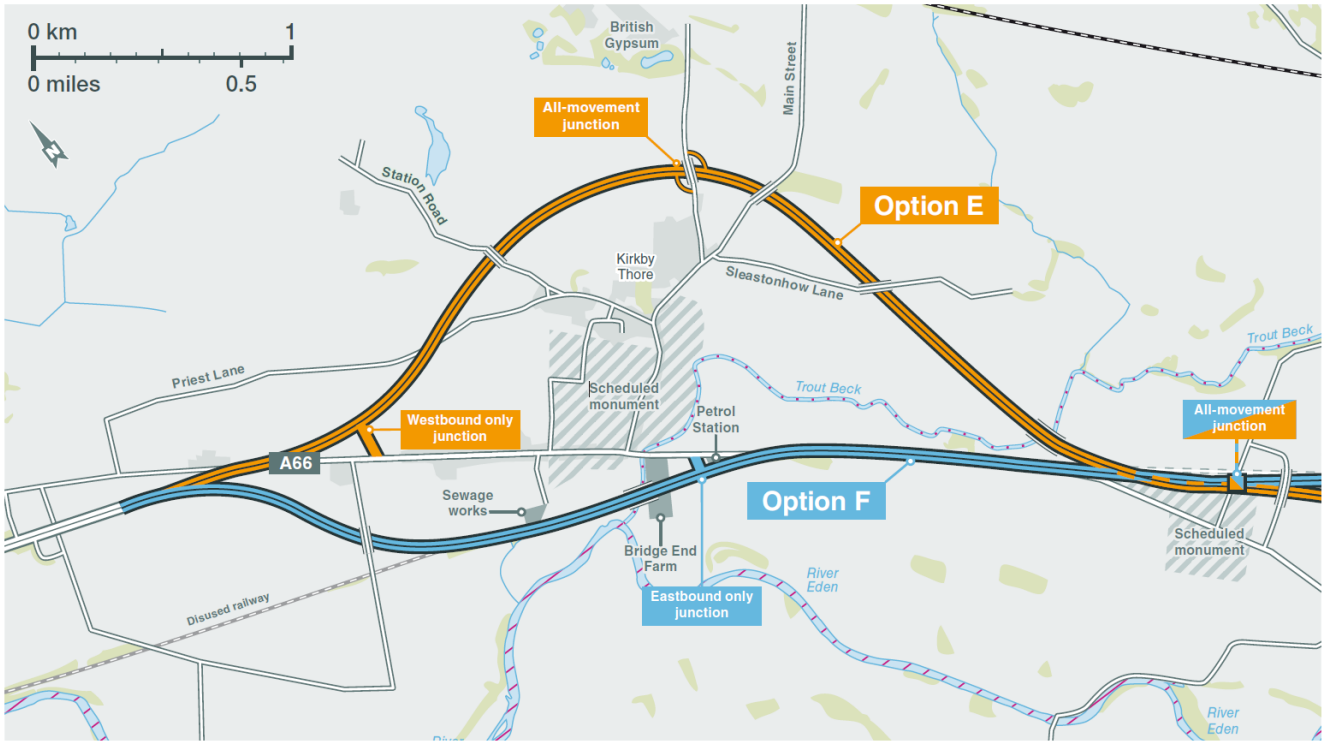
6.3.3 This option is the same as option C but will not divert the current road away from High Barn and

will therefore require the demolition of some buildings.

6.4 Temple Sowerby to Appleby – Kirkby Thore

6.4.1 There are two upgrade options which will divert the A66 away from Kirkby Thore either to the north or the south of the village

Figure 6-5: Options E & F



Option E (northern bypass)

6.4.2 A new dual carriageway bypass to the north of Kirkby Thore as an extension of the current Temple Sowerby Bypass. It will pass through several fields to the west and then travel away from the village to the north and east. It will mostly be built along a route which is lower than the surrounding land which will help preserve the visual outlook of properties in the north of the village.

6.4.3 An additional junction will be created to allow direct access to and from the British Gypsum site which will reduce the level of heavy goods vehicles moving through the village.

6.4.4 Four new bridges will be required over the existing road network at:

- a new Kirkby Thore junction, north of the village
- Station Road
- Main Street
- Sleastonhow Lane

6.4.5 It would also require a new bridge over Trout Beck just before the new road returns to the original alignment.

Option F (southern bypass)

6.4.6 A new dual carriageway would be constructed towards the south of Kirkby Thore as a continuation of the Temple Sowerby Bypass. It would cross several fi elds and follow the path of an old railway line until it re-joins the current A66 just after the BP petrol station near Spitals Farm.

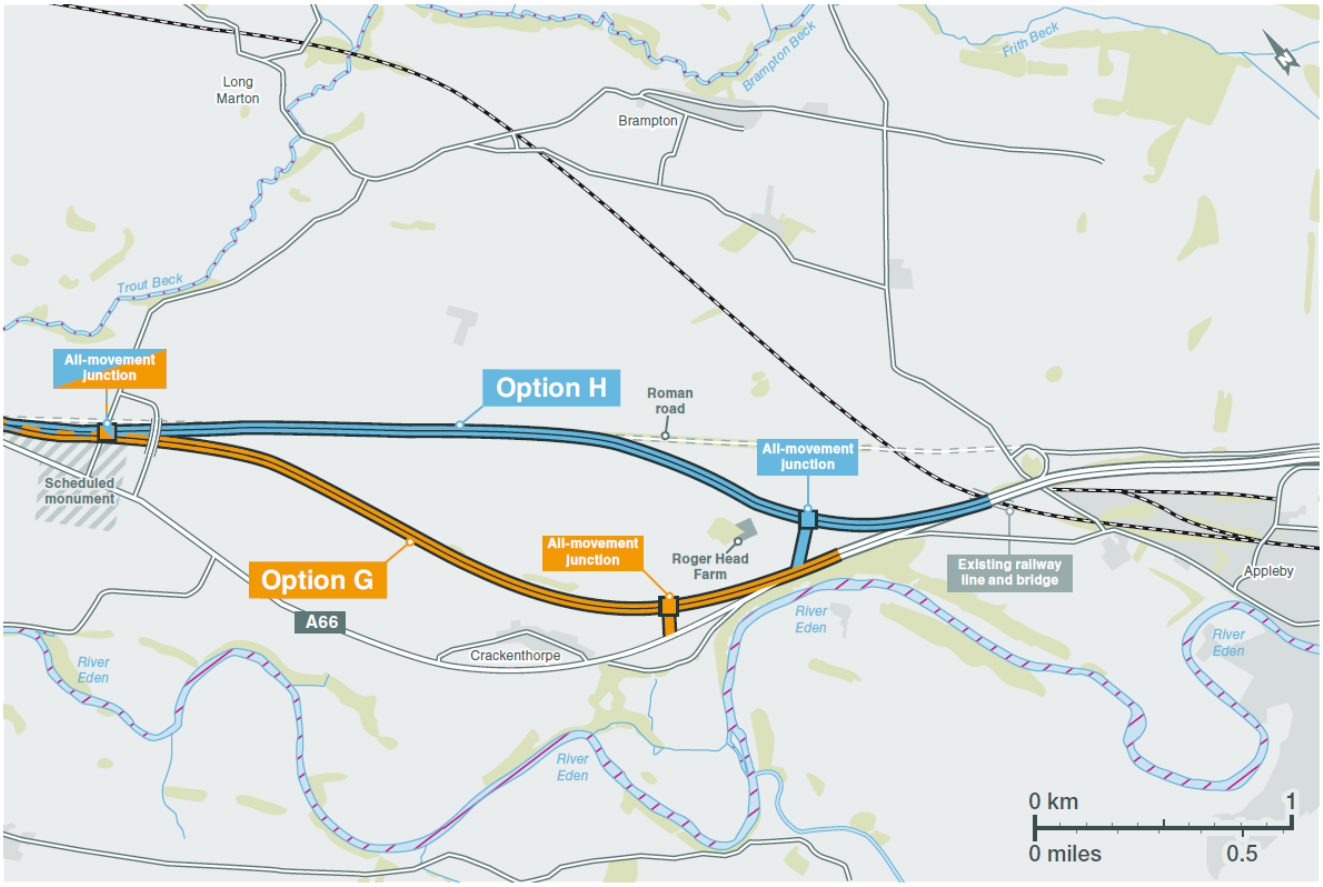
6.4.7 Additional underpasses would be required to provide access for local farms and pedestrians, walkers, cyclists and horse riders. A new junction would allow access to the former A66 and the village.

6.4.8 This option would require the demolition of several buildings.

6.5 Temple Sowerby to Appleby – Crackenthorpe

6.5.1 There are two upgrade options which will divert the A66 away from Crackenthorpe to the north.

Figure 6-6: Options G & H



Option G

6.5.2 The route follows the path of the old railway line to the north of Crackenthorpe and two new junctions would be created to serve the villages of Bolton, Crackenthorpe and Long Marton.

6.5.3 It is proposed that the new road will re-join the current A66 just to the west of the Settle-to-Carlisle railway line.

Option H

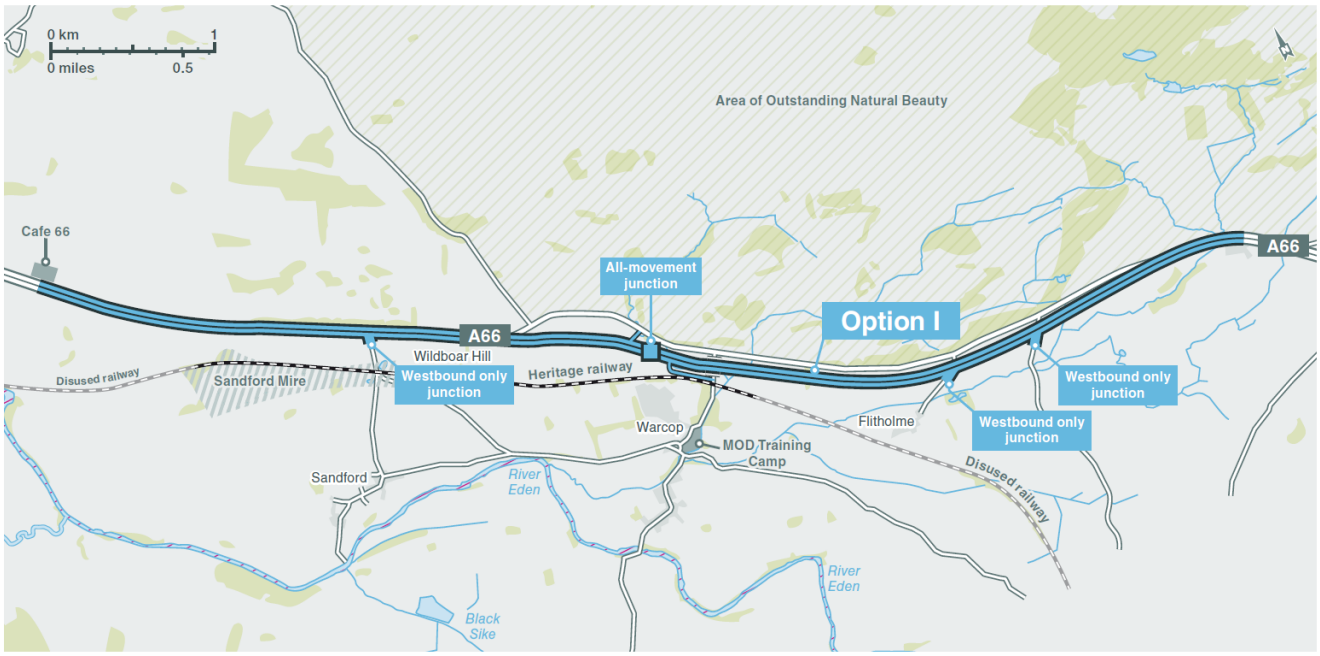
6.5.4 This option proposes a new bypass following the route of the original Roman road to the north of Crackenthorpe and Roger Head Farm.

6.5.5 Two new junctions would be created to serve the villages of Bolton, Crackenthorpe and Long Marton.

6.5.6 It is proposed that the new road will re-join the current A66 just to the west of the Settle-to-Carlisle railway line.

6.6 Appleby to Brough

Figure 6-7: Option I



Option I

6.6.1 The current carriageway between Café 66 and Wildboar Hill will be widened and utilised as the eastbound carriageway and a new westbound carriageway will be constructed directly to the south of the current A66.

6.6.2 Between Wildboar Hill and the Brough Bypass, a completely new dual carriageway will be constructed directly to the south of the current A66. The existing road will then be used for local access and pedestrians, walkers, cyclists and horse riders.

6.6.3 New culverts will divert streams under the road at Moor Beck and Lowgill Beck. A new junction and bridge will provide access from the new road to Warcop.

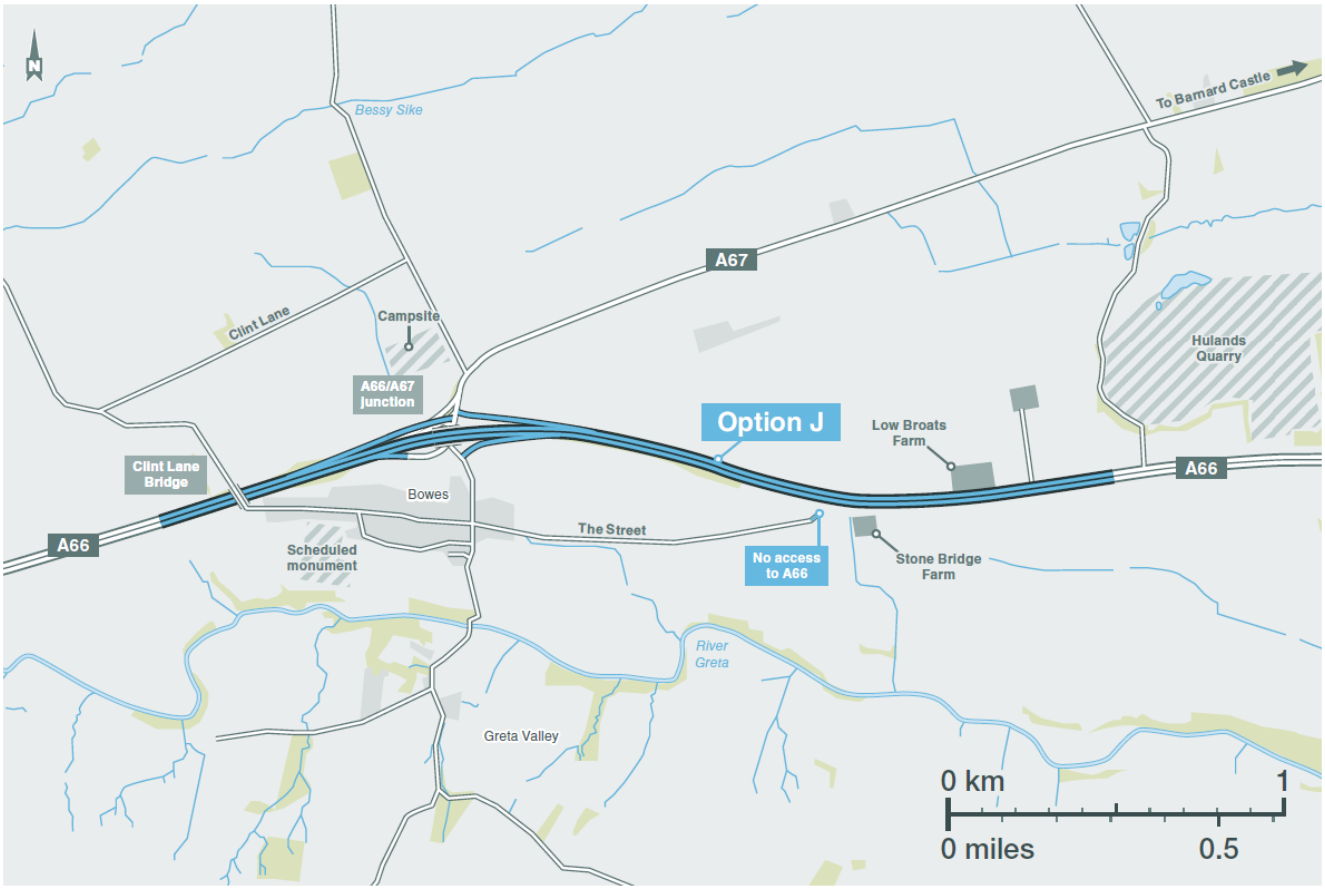
6.6.4 Access to the proposed route from local roads is to be limited to junctions at Flitholme, Langrigg, Sandford and Warcop which will make this section much less accident-prone. The existing A66 between Moor House and Turks Head will become part of the county road network for safer local access to nearby villages, especially for pedestrians, walkers, cyclists and equestrians.

6.6.5 This option minimises the impact on the area of outstanding natural beauty (AONB) to the north of the current A66 and provides continued access for local communities during construction.

6.6.6 The new dual carriageway will connect back into the existing A66 at Brough bypass.

6.7 Bowes Bypass

Figure 6-8: Option J



Option J

6.7.1 We are proposing to widen the carriageway to the north of Bowes village and between Clint Lane Bridge and the junction for the A67 where a new eastbound slip road junction is being considered.

6.7.2 After the A67 junction we are proposing to use the existing carriageway for westbound traffic and construct a new eastbound carriageway north of the current road. This will require new or extended bridges to be built.

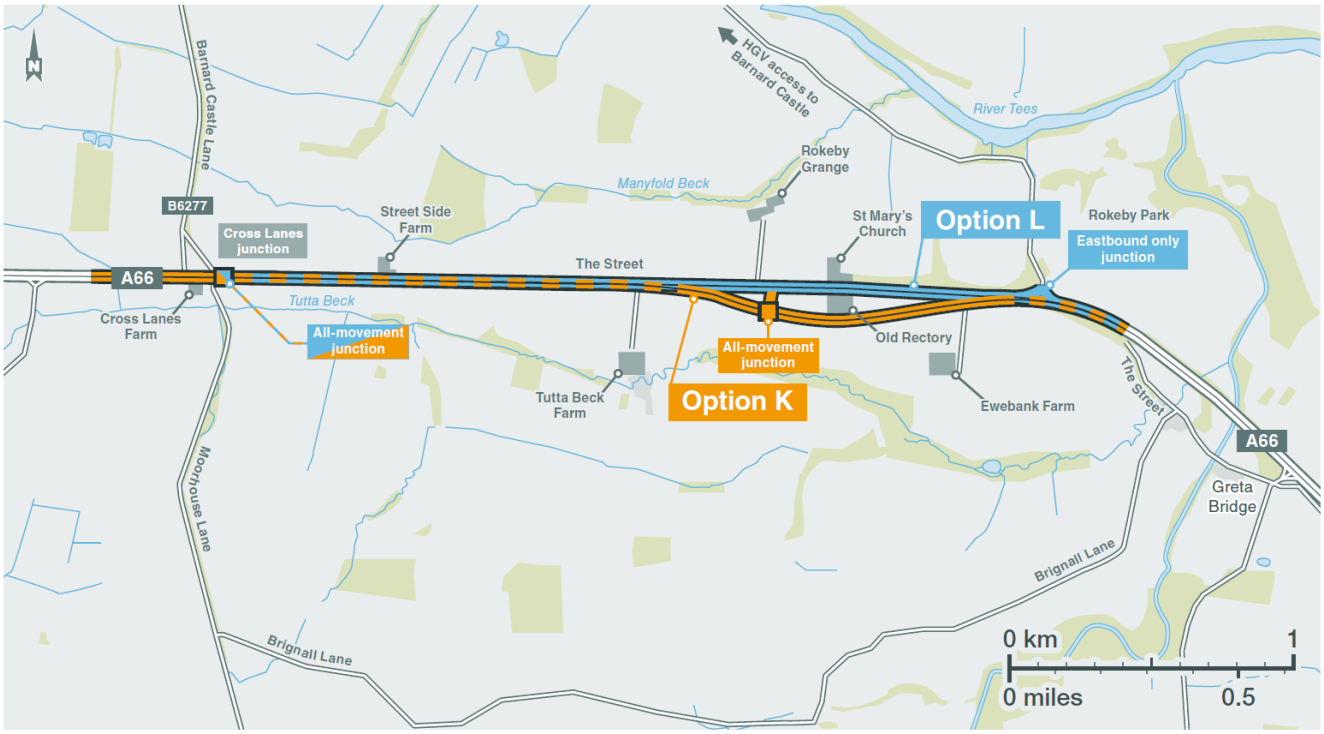
6.7.3 Two new eastbound slip roads will be built, providing access to and from the A67 and the village of Bowes. This would require the demolition of some derelict buildings and neighbouring barn structure.

6.7.4 The Roman road known as The Street will be closed and access between Bowes village and the A66 instead provided by the upgraded Bowes junction, making access to the A66 safer for local traffic.

6.8 Cross Lanes to Rokeby

6.8.1 A new westbound carriageway to the south of the current A66 between the B6277 junction at Cross Lanes and Rokeby, after which two options exist around the St. Mary's Church buildings.

Figure 6-9: Option K & L



Option K

6.8.2 This option diverts both carriageways to the south of The Old Rectory and St Mary's Church before re-joining the existing road at Rokeby.

6.8.3 A new junction will be provided for access to Moorhouse Lane, B6277 for Barnard Castle, Cross Lanes Organic Farm and the listed building Cross Lanes, making access safer and easier.

6.8.4 A new junction west of St Mary's Church is proposed to allow access to the original A66 and Rokeby.

6.8.5 Two new culverts will be constructed to accommodate Tutta Beck.

Option L

6.8.6 This option is similar to Option K but the new westbound carriageway will be constructed next to the current carriageway. This will mean that some buildings to the south of the current A66 will need to be demolished.

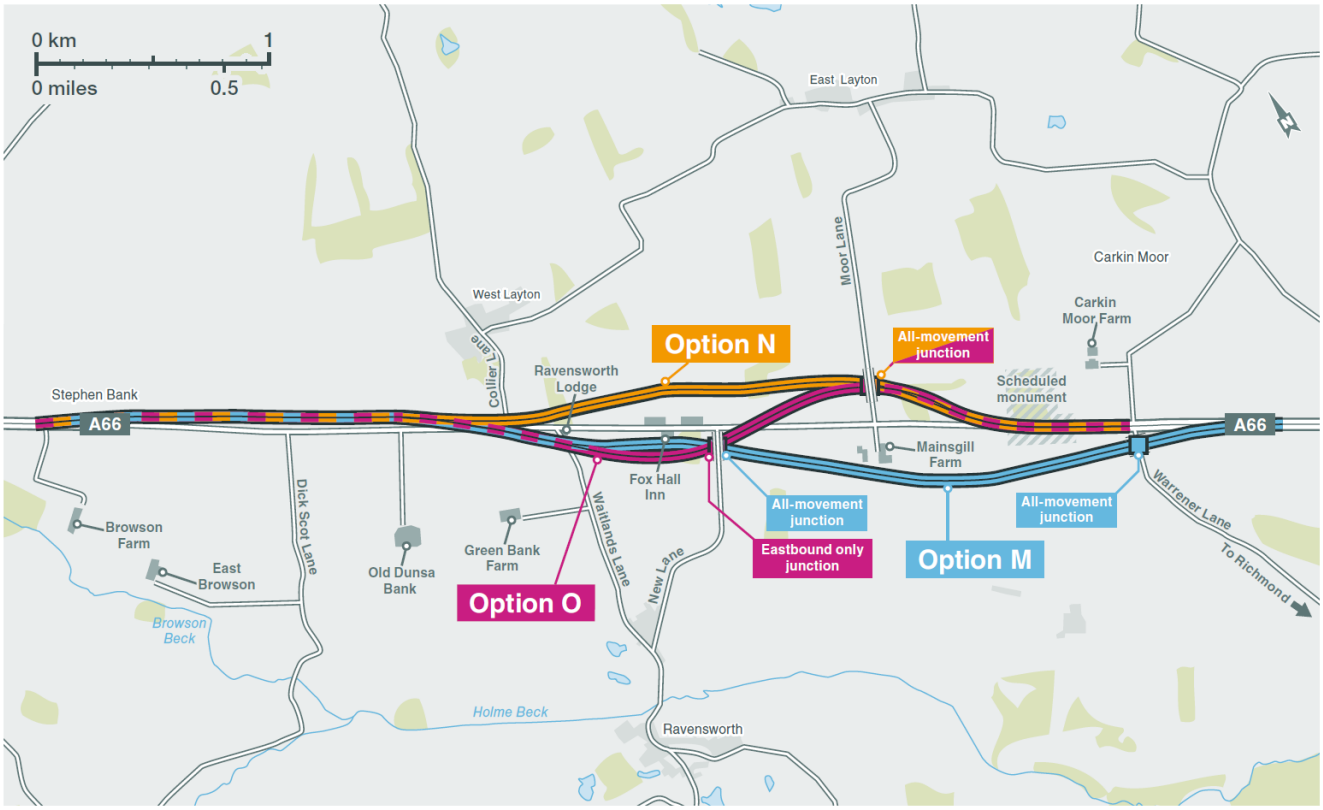
6.8.7 This option would retain local access at Rokeby junction for eastbound traffic. Westbound traffic would be required to utilise Cross Lanes junction and the B6277 for access to Barnard Castle.

6.9 Stephen Bank to Carkin Moor

6.9.1 A new dual carriageway at Stephen Bank, followed by three different options that consider the impact on Foxhall, Mainsgill Farm and the Carkin Moor scheduled monument.

6.9.2 All the options below will incorporate the dualling of the current A66 between Stephen Bank and West Layton broadly following the line of the existing road.

Figure 6-10: Option N, M & O



Option M

6.9.3 After West Layton, we propose a new dual carriageway to the south of the existing A66 and the properties at Foxhall and Mainsgill Farm. It will re-join with the A66 at Carkin Moor Farm beyond the scheduled monument.

6.9.4 A new junction and bridge at New Lane to provide access to the new A66 for several properties

6.9.5 and the villages of East and West Layton and Ravensworth. Several underpasses will be created to maintain land access and public rights of way.

Option N

6.9.6 After West Layton, we propose a new dual carriageway to the north of the existing A66 and the properties at Foxhall and Mainsgill Farm, before re- joining the A66 at Carkin Moor Farm.

6.9.7 A new junction and bridge on Moor Lane will provide safe and easy access to the old A66, the villages of East and West Layton and Ravensworth and the Mainsgill Farm Shop.

6.9.8 The new dual carriageway is expected to re-join the A66 just after Mainsgill Farm and therefore requires the widening of the road through the scheduled monument.

Option O

6.9.9 This option follows the same route as option M as far as New Lane where it diverts north avoiding Mainsgill Farm shop.

6.9.10 A new eastbound junction at Foxhall to provide local access to the old A66 and West Layton.

New Lane will be realigned to connect with the new A66 to provide access for Ravensworth.

6.9.11 The proposed route will continue in a northerly direction to a new junction at Moor Lane which will provide access from Mainsgill Farm and the former A66.

6.9.12 The new dual carriageway is expected to re-join the A66 just after Mainsgill Farm and therefore requires the widening of the road through the scheduled monument.

7 APPRAISAL OF DO-SOMETHING OPTIONS (PCF STAGE 1)

7.1 Stage 1 Appraisal Summary

7.1.1 The following tables summarise the appraisals carried out in Stage 1 and can be viewed in full in the Technical Appraisal Report [HE565627-ARC-HGN-A66-RP-ZM-1082]

Section 2 – Kemplay Bank Junction

Table 7-1: Kemplay Bank Appraisal Summary

	Scheme Objective	A/B
Transport	Improve journey time	A66 through traffic would bypass the junction via a free-flow link thus greatly increasing journey time benefits
	Improve resilience	Provision of grade separated junction would separate the A66 through traffic from any potential issues on the local road network.
	Improve safety	Although some departures from standard would be required, these have been discussed with the Safe Roads Team and are considered to be acceptable with mitigation.
	Minimise disruption during construction	39 months estimated construction programme
Economic	Be affordable to Government and users	**Stage 1 Capital Cost Most Likely (Nominal Cost)**
		[redacted]
	Value for money	
Environment and Community	Minimise adverse impacts on health and the environment	**Air Quality** Option 2B/2E would result in an exceedance of the AQS objectives for NO2 & PM10 though impacts are not considered to be significant, based on the currently available information. As exceedances of the AQS objective for the protection of vegetation have been predicted the impact of the project on nitrogen deposition have been calculated. The impact of the project on nitrogen deposition is not considered significant. An overpass (Option 2E) would potentially have a greater adverse impact
		Biodiversity Option 2B has the potential to disturb suitable riparian habitat for otter species.
		Cultural Heritage Option 2B is expected to result in permanent, negative impacts on the settings of several Archaeological Remains; Historic Buildings and Landscapes potentially decreasing their significance. Following mitigation three assets will experience change which results in significant effects for Options 2B.
		Landscape The dominance of the existing roundabout junction in this part of Penrith means that the project would not notably alter the character of the townscape for both project options although an overpass (Option 2E) would likely have a greater impact.
		Geology and Soils Following the implementation of mitigation no likely significant effects have been identified

Scheme Objective		A/B
		Noise It is expected that the Option 2B/2E would increase road traffic noise at Penrith A6 Junction with A66 due to the new junction layout. The development of the proposed option would include mitigation measures to reduce the number of properties affected by day and night time noise. An overpass (Option 2E) would potentially have a greater adverse impact
		People and Communities Option 2B/2E would lead to land-take of public open space (recreation ground) which is found to the north of the project and the severance of two PRoW.
		Road Drainage and Water Environment Option 2B/2E may have potential impacts on rates of runoff and pollution risk and the floodplains and wider catchments of the Thacka Beck and River Eamont. The impact will depend on the extent of the works within the floodplain and the nature of any works to these watercourses.
	Minimise Severance	Option 2B would have little impact on severance as the proposal lies within the existing highway corridor.
	Non Motorised Users	Easier for NMU's to navigate Kemplay Bank Junction as the A66 through traffic will be segregated.

Section 4 – Penrith to Temple Sowerby

Table 7-2: Penrith to Temple Sowerby Appraisal Summary

	Scheme Objective	C	D
Transport	Improve journey time	Similar journey times predicted for both options, no preference	
	Improve resilience	D2AP cross section would reduce cross over accidents limiting incidents to a single carriageway.	
	Improve safety	Option would be designed to high standards of safety for road users.	
	Minimise disruption during construction	27 months construction duration	29.5 months construction duration
Economic	Be affordable to Government and users	**Stage 1 Capital Cost Most Likely (Nominal Cost)**	
		[redacted]	[redacted]
	Value for money		
Environment and Community	Minimise adverse impacts on health and the environment	**Air Quality** Neither Option 4A or 4B would result in an exceedance of the AQS objectives for NO2 and PM10 and impacts are not considered to be significant, based on the currently available information. As exceedances of the AQS objective for the protection of vegetation have been predicted the impact of the project on nitrogen deposition have been calculated. For both options the impact of the project on nitrogen deposition is not considered significant.	
		Biodiversity The significance of effects on biodiversity receptors will be largely the same for Options 4A and 4B..	
		Cultural Heritage Both Options 4A and 4B could directly impact the Countess Pillar and the settlement to the east-north-east of Brougham Castle. Both Options are expected to result in permanent, negative impacts on the settings of several Archaeological Remains; Historic Buildings and Landscapes potentially decreasing their significance.	
		Landscape Neither Options 4A or 4B would significantly alter the character of the townscape and landscape.	
		Geology and Soils Following the implementation of mitigation no likely significant effects have been identified for either Option 4A or4B.	
		Noise Option 4A will increase road traffic noise between Brougham and Sowerby due to the introduction of the new alignment and reductions at Lane End/High Barn where the existing A66 is bypassed.	**Noise** Option 4B will increase road traffic noise between Brougham and Sowerby due to the introduction of the new alignment
		People and Communities Option 4A would lead to the loss of agricultural land, which may	**People and Communities** Option 4B would lead to the loss of agricultural land and require

Scheme Objective		C	D
		impact upon agricultural businesses.	the demolition of High Barn Farm, which may impact upon businesses.
		Road Drainage and Water Environment Both Options 4A and 4B are likely to have potential impacts on the culverted section of the LightWater as well as the upstream reaches and its floodplain. The potential impacts would need to be assessed fully once details of the project design are available and suitable mitigation adopted to ensure no significant detriment.	
	Minimise Severance		
	Non Motorised Users		

Section 6 – Temple Sowerby to Appleby (Kirkby Thore)

Table 7-3: Temple Sowerby to Appleby (Kirkby Thore) Appraisal Summary

Scheme Objective		6E1	E	F
Transport	Improve journey time			Shortest route between Temple Sowerby and Appleby
	Improve resilience	Both routes would bypass the village of Kirkby Thore providing multiple turn-around points. D2AP cross section would reduce cross over accidents limiting incidents to a single carriageway.		Both routes would bypass the village of Kirkby Thore providing multiple turn-around points. D2AP cross section would reduce cross over accidents limiting incidents to a single carriageway. Option 6H1 would provide de-trunked access to adjacent village available for diversions during A66 incidents
	Improve safety	Both routes would be designed to high standards of safety for road users. Northern by-passes of Kirkby Thore would remove British Gypsum HGV traffic from the village		Would be designed to high standards of safety for road users
	Minimise disruption during construction	Northern option avoids use of re-use of existing carriageway minimising impact to customers during construction.		Shortest construction duration
Economic	Be affordable to Government and users	**Stage 1 Capital Cost Most Likely (Nominal Cost)**		
				Lowest capital cost option
	Value for money			
Environment and Community	Minimise adverse impacts on health and the environment	**Air Quality** None of the options in Section 6 would result in an exceedance of the AQS objectives for NO2 and PM10 and impacts are not considered to be significant, based on the currently available information. As exceedances of the AQS objective for the protection of vegetation have been predicted the impact of the project on nitrogen deposition have been calculated. For all options the impact of the project on nitrogen deposition is not considered significant.		
		Biodiversity There are designated sites of international and national importance located within 200m of both options (River Eden SAC and River Eden & Tributaries SSSI). Option 6E1 would result in loss of small number of broadleaved trees and permanent shading of c.80m stretch of riparian habitat and c.40m		**Biodiversity** There are designated sites of international and national importance located within 200m of both options (River Eden

Scheme Objective	6E1	E	F
	stretch of the River Eden.		SAC and River Eden & Tributaries SSSI). Option 6H1 would result in loss of small number of broadleaved trees and permanent shading of c.80m stretch of riparian habitat and c.40m stretch of the River Eden.
	Cultural Heritage The options in Sections 6 are expected to result in permanent, negative impacts on the settings of several Archaeological Remains; Historic Buildings and Landscapes potentially decreasing their significance. Following mitigation the Roman Camp is considered to experience physical change that will result in significant effect at Section 6.		
	Landscape Option 6E1/6J1 would bring the A66 closer to the North Pennines AONB than its current alignment, thereby potentially increasing its perceived influence on local landscape character and tranquility.		**Landscape** Option not located within a National Park or Area of Outstanding Natural Beauty.
	Geology and Soils Option 6E1 should be classed as high risk from historical mining. Sinkholes that can occur at the surface because gypsum is a soluble rock, therefore remaining pillars in the mine are soluble. The significance of effect could be up to large adverse for Option 6E1	**Geology and Soils** Option 6J1 should be classed as medium risk from historical mining. Sinkholes that can occur at the surface because gypsum is a soluble rock, therefore remaining pillars in the mine are soluble.	**Geology and Soils** Following the implementation of mitigation no likely significant effects have been identified for either Option 6H1.
	Noise Option 6E1/6J1 would lead to an increase in road traffic noise for receptors to the north of Temple Sowerby and reductions in road traffic noise between Sowerby and Appleby West Morland as a result of the implementation of bypassing the existing A66.		**Noise** Option 6H1 would increase road traffic noise between Temple Sowerby and Appleby West Morland due to the introduction of the new alignment and reduce traffic noise for receptors close to the existing alignment.
	People and Communities		**People and Communities**

Scheme Objective		6E1	E	F
		Both options would lead to the loss of agricultural land, which may impact upon agricultural businesses. Both northern options would require greater land take outside of the current trunk road boundary		Option 6H1 would lead to the loss of agricultural land and the demolition of farm buildings found at Bridge End Farm, which may impact upon agricultural businesses.
		Road Drainage and Water Environment Option 6E1/6J1 has a direct impact on the Trout Beck and its floodplains (mainly Flood Zone 3). The long term impact will depend on the extent of the affected area within the floodplain and the proposals for watercourse modifications and the new crossing of the Trout Beck and its floodplain.		**Road Drainage and Water Environment** Option 6H1 has a direct impact on both the River Eden and Trout Beck and their floodplains (both Flood Zone 2 and Flood Zone 3). The impact will depend on the extent of the affected area within the floodplain and the final design for any works to the watercourses and the new crossing of the Trout Beck and its floodplain.
	Minimise Severance	All options improve and reduce the impact of severance by diverting the A66 away from it current central position within the village		
	Non Motorised Users	Increased opportunity for grade separated NMU facilities crossing the A66		Increased opportunity for grade separated NMU facilities crossing the A66. Greater NMU access between villages available with Option 6H1 by the utilisation of the de-trunked A66

Section 6 – Temple Sowerby to Appleby (Crackenthorpe)

Table 7-4: Temple Sowerby to Appleby (Crackenthorpe) Appraisal Summary

	Scheme Objective	G	H
Transport	Improve journey time	Similar journey times predicted for both options, no preference	
	Improve resilience	Both routes would bypass the village of Crackenthorpe providing multiple turn-around points. D2AP cross section would reduce cross over accidents limiting incidents to a single carriageway.	Both routes would bypass the village of Crackenthorpe providing multiple turn-around points. D2AP cross section would reduce cross over accidents limiting incidents to a single carriageway. Option 6G2 would provide de-trunked access to adjacent village, available for diversions during A66 incidents
	Improve safety	Both routes would be designed to high standards of safety for road users.	
	Minimise disruption during construction		
Economic	Be affordable to Government and users	**Stage 1 Capital Cost Most Likely (Nominal Cost)**	
	Value for money		
Environment and Community	Minimise adverse impacts on health and the environment	**Air Quality** None of the options in Section 6 would result in an exceedance of the AQS objectives for NO2 and PM10 and impacts are not considered to be significant, based on the currently available information. As exceedances of the AQS objective for the protection of vegetation have been predicted the impact of the project on nitrogen deposition have been calculated. For all options the impact of the project on nitrogen deposition is not considered significant.	
		Biodiversity There are designated sites of international and national importance located within 200m of both options (River Eden SAC and River Eden & Tributaries SSSI). Option 6F2 is separated from these sites by Chapel Wood and minimum distance of c.30m, which attenuates potential disturbance impacts of noise/vibration and light.	**Biodiversity** There are designated sites of international and national importance located within 200m of both options (River Eden SAC and River Eden & Tributaries SSSI). Option 6G2 is separated from these sites by Chapel Wood and minimum distance of c.30m, which attenuates potential disturbance impacts of noise/vibration and light.
		Cultural Heritage The options in Sections 6 are expected to result in permanent, negative impacts on the settings of several Archaeological Remains; Historic Buildings and Landscapes potentially decreasing their significance. Following mitigation the Roman Camp is considered to experience change that will result in significant effect at Section 6.	

Scheme Objective		G	H
		Landscape Neither options are located within a National Park or Area of Outstanding Natural Beauty.	
		Geology and Soils There is a recorded landslip at Crackenthorpe along the edge of the River Eden within the proposed alignment. This area of mass movement has undergone stabilisation works by Highways England in February 2009, which included bored piles and soil nailing. The impacts of the landslide and associated stabilisation works has not been assessed at this stage, although, this feature is considered to represent a constraint towards the proposed route alignment.	**Geology and Soils** No significant effects have been identified
		Noise Option 6F2 would increase road traffic noise for receptors at Powis House and Roman Vale and reduce road traffic noise for receptors located in Crackenthorpe.	**Noise** Option 6G2 would increase road traffic noise for receptors at Powis House and Roman Vale although this would be below the Significantly Observed Adverse Effect Level (SOAEL). Would reduce road traffic noise for receptors located in Crackenthorpe.
		People and Communities Both options would lead to the loss of agricultural land, which may impact upon agricultural businesses.	
		Road Drainage and Water Environment For a short reach, Option 6F2 runs close to the River Eden and its floodplain. Depending on the final design of Option 6F2 there may be some impact on the watercourse.	**Road Drainage and Water Environment** Located away from local watercourses and their associated floodplains.
	Minimise Severance	Both options improve and reduce the impact of severance by diverting the A66 away from it.	
	Non Motorised Users	Increased opportunity for grade separated NMU facilities crossing the A66	Increased opportunity for grade separated NMU facilities crossing the A66. Greater NMU access between villages available with Option 6G2 by the utilisation of the de-trunked A66

Section 8 – Appleby to Brough

Table 7-5: Appleby to Brough Appraisal Summary

	Scheme Objective	I
Transport	Improve journey time	Benefit over existing 50mph restricted carriageway
	Improve resilience	D2AP cross section would reduce cross over accidents limiting incidents to a single carriageway. De-trunked section of existing A66 provides diversion route opportunities during incidents and maintenance.
	Improve safety	Option would be designed to high standards of safety for road users.
	Minimise disruption during construction	24 Months construction period. Large sections of proposals offline thus minimizing disruption.
Economic	Be affordable to Government and users	**Stage 1 Capital Cost Most Likely (Nominal Cost)**
		[redacted]
	Value for money	
Environment and Community	Minimise adverse impacts on health and the environment	**Air Quality** Neither Option 8C1 or 8A2 would result in an exceedance of the AQS objectives for NO2 and PM10 and impacts are not considered to be significant, based on the currently available information. As exceedances of the AQS objective for the protection of vegetation have been predicted the impact of the project on nitrogen deposition have been calculated. For both options the impact of the project on nitrogen deposition is not considered significant.
		Biodiversity There are designated sites of international and national importance located within 200m of this Option (River Eden SAC and River Eden & Tributaries SSSI). Possible changes in the noise environment during construction will (in the absence of mitigation) have significant impact on qualifying species (if present locally). Temporary land take for construction could also require land that is functionally linked with the North Pennine Moors SPA.
		Cultural Heritage Option could have a physical and settings impact on Warcop roman camp. The development of this option is expected to result in permanent, negative impacts on the settings of several Archaeological Remains; Historic Buildings and Landscapes potentially decreasing their significance.
		Landscape The construction phase would result in notable changes to the landscape character of the area immediately surrounding the project, though the change to the overall landscape would be less as the existing A66 is already a feature. This Option would not result in notable changes to the perceived character of the North Pennines AONB
		Geology and Soils

Scheme Objective		I
	Minimise adverse impacts on health and the environment	Following the implementation of mitigation no likely significant effects have been identified for either Option 8C1 or 8A2.
		Noise Option would increase road traffic noise for receptors between Sandforth and Brough and Great Ormside and Brough. Outlying dwellings in Warcop would experience a reduction in road traffic noise.
		People and Communities Option would lead to the loss of agricultural land, which may impact upon agricultural businesses.
		Road Drainage and Water Environment Option 8C1 will have potential impacts on the floodplains and wider catchment of the Hayber Beck. The impact will depend on the extent of the works within the floodplain and the nature of any works to the watercourse including the design of the new crossing and how this spans the floodplain. Option 8A2 may have an impact on the existing crossing of the Lowgill Beck/Woodend Sike/Yosgill Sike. The impact will depend on the extent of the affected area within the floodplain and the nature of any works to the watercourses or the crossing itself.
	Minimise Severance	Both options improve and reduce the impact of severance by diverting the A66 away from it.
	Non Motorised Users	Increased opportunity for grade separated NMU facilities crossing the A66. Greater NMU access between villages available by the utilisation of the de-trunked A66

Section 10 – Bowes Bypass

Table 7-6: Bowes Bypass Appraisal Summary

Scheme Objective		J
Transport	Improve journey time	
	Improve resilience	Greater diversion/turn-around facilities due to the addition of east facing slip roads at Bowes Junction
	Improve safety	Option would be designed to high standards of safety for road users. At-grade major/minor junction at east of scheme to be removed and replaced with grade separated slip roads at Bowes Junction.
	Minimise disruption during construction	30 Months construction period. Large sections of proposals offline thus minimising disruption.
Economic	Be affordable to Government and users	**Stage 1 Capital Cost Most Likely (Nominal Cost)**
		[redacted]
	Value for money	
Environment and Community	Minimise adverse impacts on health and the environment	**Air Quality** Option 10A would not result in an exceedance of the AQS objectives for NO2 and PM10 and impacts are not considered to be significant, based on the currently available information. As exceedances of the AQS objective for the protection of vegetation have been predicted the impact of the project on nitrogen deposition have been calculated. For both options the impact of the project on nitrogen deposition is not considered significant.
		Biodiversity There are designated sites of international and national importance located within 200m of the proposed option (Bowers Moor SSSI; North Pennine Moors SAC and North Pennine Moors SPA) Possible changes in the noise environment during construction will (in the absence of mitigation) have significant impact on qualifying species (if present locally). Temporary land take for construction could also require land that is functionally linked with the North Pennine Moors SPA.
		Cultural Heritage The development of this option is expected to result in permanent, negative impacts on the settings of several Archaeological Remains; Historic Buildings and Landscapes potentially decreasing their significance.
		Landscape The western end of this section (where the road is already dualled) clips the boundary with the North Pennines AONB. The construction phase would result in notable changes to the landscape character of the area immediately surrounding the project, though the overall change would be less as the existing A66 is already a feature.
		Geology and Soils

Scheme Objective		J
		Following the implementation of mitigation no likely significant effects have been identified for Option 10A.
		Noise Option 10A would lead to an increase in road traffic noise in Bowes.
		People and Communities Option 10A would lead to the loss of agricultural land and require the demolition of properties, the disused Bowes Train Station and Low Broats Farm, which may impact upon businesses.
		Road Drainage and Water Environment Option 10A will not directly impact on any watercourses or floodplains.
	Minimise Severance	
	Non Motorised Users	

Section 12 – Cross Lanes to Rokeby

Table 7-7: Cross Lanes to Rokeby Appraisal Summary

	Scheme Objective	K	L
Transport	Improve journey time	Similar journey times predicted for both options, no preference	
	Improve resilience	D2AP cross section would reduce cross over accidents limiting incidents to a single carriageway.	
	Improve safety	Option would be designed to high standards of safety for road users.	
	Minimise disruption during construction	22 Months construction period.	21 Month construction period.
Economic	Be affordable to Government and users	**Stage 1 Capital Cost Most Likely (Nominal Cost)**	
		[redacted]	[redacted]
	Value for money		
Environment and Community	Minimise adverse impacts on health and the environment	**Air Quality** Neither Option 12A or 12B would result in an exceedance of the AQS objectives for NO2 and PM10 and impacts are not considered to be significant, based on the currently available information. As exceedances of the AQS objective for the protection of vegetation have been predicted the impact of the project on nitrogen deposition have been calculated. For both options the impact of the project on nitrogen deposition is not considered significant.	
		Biodiversity There are no designated sites of international and national importance (SSSI & SAC) located within 200m of either Option 12A or 12B	
		Cultural Heritage Option 12A could have a settings impact on the Greta Bridge Roman Fort and Rokeby Park.	**Cultural Heritage** Three assets are considered to experience change that will result in significant effects as a result of construction of Option 12B. These assets comprise the Church of St Mary and two milestones. Option 12B could have a settings impact on the Greta Bridge Roman Fort and Rokeby Park
		Landscape For both Options 12A and 12B existing roadside trees between the existing A66 and Rokeby Park would restrict perceptual effects on the Park. The construction phase would however still result in notable adverse perceptual effects on the southern part of the Park.	
		Geology and Soils Following the implementation of mitigation no likely significant effects have been identified for Options 12A and 12B.	
		Noise Option 12A would lead to an increase in road traffic noise for receptors at Greta Bridge.	**Noise** Option 12B would not result in a perceptible increase in road traffic noise for receptors at Greta Bridge.

Scheme Objective		K	L
	Minimise adverse impacts on health and the environment	**People and Communities** Option 12A would lead to the loss of agricultural land, which may impact upon businesses.	**People and Communities** Option 12B would lead to the loss of agricultural land and require the demolition of a residential property (The Old Rectory), which may impact upon businesses.
		Road Drainage and Water Environment Both Options 12A and 12B may have a direct impact on the Tutta Beck and River Greta and their associated floodplains. The impact will depend on the extent of the works area to the eastern end of the Section and whether this extends into the floodplain or affects the existing crossings of the Tutta Beck and River Greta	
	Minimise Severance		
	Non Motorised Users	Increased opportunity for grade separated NMU facilities crossing the A66.	Increased opportunity for grade separated NMU facilities crossing the A66.

Section 14 – Stephen Bank to Carkin Moor

Table 7-8: Stephen Bank to Carkin Moor Appraisal Summary

Scheme Objective		M	N	O
Transport	Improve journey time	Similar journey times predicted for both options, no preference		
	Improve resilience	Provides turn-around points. D2AP cross section would reduce cross over accidents limiting incidents to a single carriageway. De-trunked A66 available for diversions during A66 incidents	Provides turn-around points. D2AP cross section would reduce cross over accidents limiting incidents to a single carriageway.	Provides turn-around points. D2AP cross section would reduce cross over accidents limiting incidents to a single carriageway.
	Improve safety	Option would be designed to high standards of safety for road users		
	Minimise disruption during construction	34 months construction programme	33 months construction programme	35 months construction programme
Economic	Be affordable to Government and users	**Stage 1 Capital Cost Most Likely (Nominal Cost)**		
		[redacted]	[redacted]	
	Value for money			
Environment and Community	Minimise adverse impacts on health and the environment	**Air Quality** Options 14A, 14F and 14G would not result in an exceedance of the AQS objectives for NO2 and PM10 and impacts are not considered to be significant, based on the currently available information. As exceedances of the AQS objective for the protection of vegetation have been predicted the impact of the project on nitrogen deposition have been calculated. For both options the impact of the project on nitrogen deposition is not considered significant.		
		Biodiversity There are no designated sites of international and national importance (SSSI & SAC) located within 200m of Option 14A. Will affect 'important hedgerow' and rivers and streams S41 priority habitat.	**Biodiversity** There are no designated sites of international and national importance (SSSI & SAC) located within 200m of Option 14F. Will affect 'important hedgerow', rivers and streams S41 priority habitat and deciduous woodland S41 priority habitat.	**Biodiversity** There are no designated sites of international and national importance (SSSI & SAC) located within 200m of Option 14G. Will affect 'important hedgerow', rivers and streams S41 priority habitat and deciduous woodland S41 priority habitat.
		Cultural Heritage Option 14A will not impact the Roman Fort and Prehistoric settlement.	**Cultural Heritage** Option 14F will result in physical impacts to the Roman Fort and Prehistoric settlement.	**Cultural Heritage** Option 14G will result in physical impacts to the Roman Fort and Prehistoric settlement.

Scheme Objective		M	N	O
		Landscape For all options in Section 14**,** the new road alignment would begin to become assimilated into the local landscape once construction is completed and new roadside planting becomes established and develops. None of the options are located within a National Park or Area of Outstanding Natural Beauty.		
		Geology and Soils Following the implementation of mitigation, no likely significant effects have been identified for Options 14A, 14F and 14G.		
		Noise Option 14A would increase road traffic noise at noise sensitive receptors in Dalton, Gilling West and Ravensworth.	**Noise** Option 14F would result in increased road traffic noise between Greta Bridge and Gilling West and perceptible decreases at Ravensworth, where traffic flow is reduced on the existing road network.	**Noise** Option 14F would result in increased road traffic noise between Greta Bridge and Gilling West and perceptible decreases at Ravensworth, where traffic flow is reduced on the existing road network.
		People and Communities All options in Section 14 would lead to the loss of agricultural land, which may impact upon agricultural business.		
		Road Drainage and Water Environment All options in Section 14 are located in Flood Zones 2 and 3. Further assessment will be required in later stages of design and environmental assessment to ensure all effects on the flood zone are mitigated.		
	Minimise Severance	Option improves and reduces the impact of severance by diverting the A66 away from its current central position	Option improves and reduces the impact of severance by diverting the A66 away from its current central position Option to the north maintains access to Ravensworth via de-trunked A66.	
	Non Motorised Users	Increased opportunity for grade separated NMU facilities crossing the A66.	Increased opportunity for grade separated NMU facilities crossing the A66. Greater NMU access between Ravensworth and Fox Hall available by the utilisation of the de-trunked A66	Increased opportunity for grade separated NMU facilities crossing the A66.

8 PUBLIC CONSULTATION

8.1 Introduction

8.1.1 This section summarises the views and comments emerging from the public consultation.

8.2 Approach to Engagement

8.2.1 The project undertook early engagement starting for Stage Two in March 2019 to better understand the issues relating to the programme and to determine constraints and priorities around the proposed options for potential dualling.

8.2.2 A planned and focused approach to engagement has been adopted to ensure high quality and meaningful engagement. This provided opportunities for sharing complex and technical information and facilitated relationship building with opportunities for further engagement. Key stakeholders for this purpose were local authorities, statutory and environmental bodies, statutory undertakers (utilities) and selected special interest groups.

8.2.3 Businesses and landowners who might be impacted by the plans were subject to a separate strand of engagement activity and the public and stakeholders had the opportunity to share their views on the options through the public consultation that took place in May/June 2019.

8.2.4 This consultation activity is summarised later in this chapter

Stakeholder Reference Group

8.2.5 The Stakeholder Reference Group (SRG) was originally convened to help Highways England draw upon local knowledge and understand stakeholders' needs, priorities and opinions with respect to the options for dualling the remaining single carriageway sections of the A66.

8.2.6 The panel meets at key stages in the project and is designed to be a consultative and advisory group, currently comprising representatives of the organisations listed in the table below.

8.2.7 The Stakeholder Reference Group membership also formed the basis for a series of Focus Groups which were held at the Holiday Inn Scotch Corner in March 2019. The Focus Groups gave the project team the opportunity to outline the proposed options and explore the local constraints and the issues raised by special interest groups.

8.2.8 The Focus Groups were also used as an opportunity to test the materials which would be used at public consultation.

Statutory and Environmental Bodies

8.2.9 Throughout this stage, the project has engaged with statutory environmental bodies (SEB) to share the emerging options and explore the environmental appraisal of the routes. These bodies comprise the Environment Agency (EA), Historic England and Natural England who have been engaged through bilateral meetings.

8.2.10 Through this engagement the project has gained a detailed understanding of the environmental constraints associated with each of the route options. In particular the project has worked collaboratively with the SEBs to gather additional information on the River Eden Special Area of Conservation (SAC), flood risk and the Roman Fort Scheduled Monument at Carkin Moor which has informed the option selection.

Industry and Utilities

8.2.11 Key major industry stakeholders have been identified to seek important technical information including constraints associated with existing assets and future development plans. Organisations approached included National Grid, United Utilities, Openreach & Electricity Northwest. Preliminary enquiries have been made to utility companies about the locations of their assets to assist with understanding the impact of these assets on the proposed route options

8.2.12 The project has also engaged with wider industry stakeholders comprising prominent local businesses from the Business, Freight and Ports sectors, along with membership organisations such as the Chambers of Commerce and the Federation of Small Businesses. These organisations were part of the Business, Freight and Ports workstream which conducted face-to-face, telephone and online interviews in September and October 2019.

8.2.13 The findings of this engagement exercise will also be used as part of the Business Case for the A66 programme.

Pre-Consultation Awareness Raising

8.2.14 Due to the size of the consultation area, and the timing of the consultation events (shortly after purdah), the consultation was widely advertised along the route corridor well in advance of the consultation events.

8.2.15 In March 2019 a period of early awareness was launched to alert local people to the forthcoming consultation events. This activity took the form of advertisements in local newspapers The Northern Echo, Teeside Gazette and Cumberland and Westmorland Herald and flyers distributed through deposit points in publicly accessible buildings along the route. The adverts and the flyers detailed the events programme and directed people to the project webpage for further details.

Landowner Engagement

8.2.16 Engagement with key landowners who may be impacted by one of the options put forward for consultation was obviously of the highest priority. Due to the timing of consultation (shortly after purdah) it was not possible to share the route options in advance of the consultation period. However, to mitigate this issue, letters were sent in May 2019 to all 224 landowners along each of the route options inviting them to book a one-to-one session with Highways England representatives during the consultation period.

8.2.17 A follow up letter was issued in June 2019 to remind landowners of the opportunity to meet with Highways England during consultation.

8.2.18 A number of meetings were held with landowners throughout the consultation period.

8.3 Public Consultation Process and Summary of Findings

Route Consultation May/June 2019

8.3.1 The public consultation ran for eight weeks, from 16 May to 11 July 2019. The consultation brochure was distributed with a covering letter to 1823 homes within 250m of the entire route. Residents within 2.5km of the route (14,076 homes) received a flyer promoting the consultation events.

8.3.2 The catchment area was agreed with the local authorities of Cumbria County Council, Durham County Council and North Yorkshire County Council prior to publication as part of the approach to public consultation document.

8.3.3 A full brochure was produced to support the consultation and was distributed through a variety of means to reach a wide range of stakeholders.

8.3.4 The brochure included background information and an outline of the benefits of the project along with details of how to respond to the consultation, outline of all the times and venues for all consultation events, maps to show each single carriageway section of the route and the proposed options, a benefits and impacts tables for each option, a pull-out consultation response form and details of the next steps for the programme.

8.3.5 Information was also made available on the scheme webpage: www.highwaysengland.co.uk/projects/a66-northern-trans-pennine/ which linked through to a Citizen Space page where respondents could complete the feedback form.

8.3.6 The consultation was advertised in the local press, by direct mail and though posters in deposit

points. In total, 22 consultation events were held during the consultation period to allow interested parties to speak with the project team. 20 of these events were open to the public, one was held for invited senior stakeholders and one was held at the holiday destination, Center Parcs, for members of staff.

8.3.7 Consultation responses were accepted through the following channels:

- Online, using the online response form
- Submitting a paper copy of the response form
- at public consultation events
- by post using a freepost address printed on the paper response forms
- Email to the dedicated scheme email address: A66NTP@highwaysengland.co.uk

What was consulted on

8.3.8 This consultation specifically invited views on the preferences for respondents around options for certain route sections.

8.3.9 There are eight sections of single carriageway where it is proposed to introduce dualling. Of these, there are six sections with options and two were there is a single proposed route. In total there are 15 different options for respondents to comment on. Maps of the sections can be seen in Section 6 of this document.

8.3.10 Although not part of this consultation, the document also invited comments on the major junctions at each end of the consultation area – M6 junction 40 and the A1(M) at Scotch Corner. A separate junctions consultation will be held in 2020 around these major junctions and the smaller local access junctions along the route.

Methods and Materials used in Consultation

8.3.11 A variety of material was made available, digitally and in hard copy form, to ensure the public had access to the information needed to consider the options presented and respond to the consultation accordingly.

- **Online** - all the consultation material was available online via the Citizen Space consultation platform, linked from the Highways England A66 project page.
- **Hard copies of consultation materials** - Consultation brochure and feedback forms, along with Freepost envelopes, were made available at a series of 19 deposit locations along the route. These materials were restocked throughout the consultation period.
- **Public drop-in sessions** - Highways England held a total of 20 public drop in events over a six-week period at locations along the route. More than 2,000 people attended the events.
- **Advertising** - Local media was used to advertise the consultation process and the events.
- **Posters** - Posters were displayed in all deposit points locations and venue-specific posters were produced for each consultation location with details of the events which were to be held there. These were displayed in the venues in the run up to the consultation events.
- **Leaflets** - Leaflets were distributed to all households and businesses in post codes within 2.5km of the proposed routes. In total the leaflet distribution comprised over 14,000 targeted door-drop distributions to residential and business properties.
- **Letters to Landowners -** A total of 224 letters were sent to landowners or businesses potentially directly affected by any of the proposed routes.
- **Social media -** Highways England utilised its social media to promote the scheme and tweets were sent during the consultation.

Process for Capturing Consultation Responses

8.3.12 Highways England appointed Ipsos MORI Social Research Institute, a wholly independent research and analysis organisation, to undertake analysis of responses. As part of their independent assurance, the consultation questionnaire was reviewed by Ipsos MORI to ensure questions were impartial and not leading.

8.3.13 In line with the Government Digital Strategy, Highways England directed respondents to the Citizen Space online consultation platform. This platform contained links to the consultation material and a link to the secure online survey.

8.3.14 Due to the population profile many respondents could not, or chose not to, respond via Citizen Space. In this situation, a hard copy version of the questionnaire and accompanying freepost envelope were made available.

8.3.15 Respondents were not limited to using the questionnaire. People responding to the consultation were also able to send their own written response via the freepost address or by email directly to the A66 inbox managed by Highways England. These responses were forwarded to Ipsos MORI for inclusion in the analysis.

8.3.16 The ways in which people could respond to the consultation were heavily publicised and made clear in the consultation material as was the deadline for submission. Any responses delivered outside the consultation period have not been included by Ipsos MORI in the analysis.

8.4 Response to Consultation

8.4.1 857 people and organisations responded to the A66 Northern Trans-Pennine consultation. The number of responses to the consultation received through each channel are set out below:

Paper response forms	394
Online responses	357
Emails through A66 inbox	84
Other mail	4

8.4.2 764 responses were received from people who classified themselves as members of the public and 90 responses from those who classified themselves as an organisation or group.

8.4.3 Organisations or groups who responded to the consultation include elected representatives, action groups, transport groups, community groups, local authorities, public bodies and businesses. These respondents have particular relevant specialist knowledge (such as local authorities or environmental organisations), represent the interests of a large group of people or represent organisations for whom the continuous smooth functioning of the road network is important to the operation of their business. A full list of these stakeholders is provided in the *Analysis of Findings Report*

Summary of Consultation Responses and Findings

8.4.4 Extensive analysis of the responses to consultation has been undertaken to consider the responses received and to identify the comments and issues raised that have emerged from the consultation.

8.4.5 Ipsos MORI undertook an independent analysis of the consultation responses. Closed question responses from members of the public and groups and organisations using the questionnaire (e.g. multiple choice “tick box” format) were counted up and totalled. The open question responses

8.4.6 (which contained the free text comments) were each analysed to identify the themes emerging from the consultation.

8.4.7 Highways England worked alongside Ipsos MORI to consider the large number of responses received. A code frame was developed to capture free-text comments, answers and responses and to match these against standard codes. This allowed systematic statistical and tabular

analysis of the responses.

8.4.8 The consultation themes identified from the analysis described above were considered by the team in the development of a Preferred Route which will be taken forward to the design stage and recommended to Government on the preferred route. They will also be considered during the further development of the scheme.

How the Consultation Responses have been used

8.4.9 The over-riding aim of the consultation was to engage with all those affected by the proposals, to inform them of the options and give them an opportunity to have their say and contribute to the route selection process.

8.4.10 Highways England has carefully evaluated the consultation feedback which has been very helpful in providing new information on the social, economic and environmental effects of each of the options, including constraints associated with existing assets and conditions and information on the local effects of the proposed scheme at consultation.

8.4.11 Many of the comments received will help inform detailed design refinements as the scheme is developed in more detail in the next stages.

8.4.12 The consultation also offered respondents the opportunity to choose their preferred option on six sections of route where more than one route was out forward. These preferences have been reviewed and verified and will form part of the decision making process for the preferred route.

8.5 Feedback from Consultation

8.5.1 Almost all participants to the consultation were in favour of dualling the remaining single carriageway sections of the A66.

8.5.2 More than nine in ten (492 out of 532) residents were in favour of dualling, although, with landowners, this support reduced to four in five (59 out of 73), a similar proportion to local businesses (97 out of 119). Local road users were most positive when asked about the principle of upgrading the single carriageway sections (381 out of 407 agreed).

8.5.3 Of the 48 organisations which submitted a response, 42 were in favour of dualling, whilst only three organisations did not agree with it. Three organisations did not know and a further three did not record a response.

Table of Responses

8.5.4 The following table outlines the preferences of respondents to each of the options put forward at consultation. This represents the total number of respondents who stated ‘strongly agree’ or ‘tend to agree’ with the option.

Route section	Route option	Number of respondents in favour
Kemplay Bank	A	312
	B	80
Penrith to Temple Sowerby	C	215
	D	88
Temple Sowerby to Appleby Kirkby Thore	E	275
	F	151
Temple Sowerby to Appleby Crackenthorpe	G	83
	H	254
Appleby to Brough	I	217

Route section	Route option	Number of respondents in favour
Bowes Bypass	J	190
Cross Lanes to Rokeby	K	154
	L	76
Stephen Bank to Carkin Moor	M	116
	N	164
	O	39

8.5.5 Full analysis of the consultation responses and the themes which emerged through the code frames can be seen in the document HE565627-ARC-GEN-A66-RP-ZH-2033 Consultation Analysis Report.

8.6 Post-Consultation Design Changes

8.6.1 This section will describe the changes made to the do-something options based on the feedback from the public during consultation

M6 Junction 40 to Kemplay Bank

8.6.2 There are no proposed changes to these options

Penrith to Temple Sowerby

8.6.3 There are no proposed changes to these options

Temple Sowerby to Appleby – Kirkby Thore

8.6.4 Following feedback from consultation, it was agreed that the junction to the north of Kirkby Thore on Option E would be relocated to Main Street with a private access road linking British Gypsum with Main Street.

8.6.5 This provided safety benefits in the village by completely removing non access related HGV movements from needing to enter the north of the village, and economic/sustainability benefits by allowing the removal of an overbridge from the design.

Temple Sowerby to Appleby – Crackenthorpe

8.6.6 Following feedback from consultation, we investigated the possibility of shifting the alignment of Option H to the north as it passes Roger Head Farm to minimise the impact on the viability of this business. In addition, it was agreed that for both options, the eastbound arm of the junction at Crackenthorpe should be removed from the scheme, and replaced with an upgraded junction at the Appleby Bypass making greater use of the existing infrastructure.

Appleby to Brough

8.6.7 Following feedback from consultation, we were advised of concerns from the public regarding additional traffic to local side roads specifically from Warcop Primary School, as such we proposed to upgrade the proposed westbound only junction at Sandford to an all-movement junction thus minimising the pressure on local roads.

Bowes Bypass

8.6.8 There are no proposed changes to these options

Cross Lanes to Rokeby

8.6.9 There are no proposed changes to these options

Stephen Bank to Carkin Moor

8.6.10 Following feedback from the public, it was agreed that access to West Layton on option N would be problematic, as such, we proposed to add an additional structure to connect Collier lane to the de-trunked A66 network, thus maintaining access provisions.

9 APPRAISAL OF DO-SOMETHING OPTIONS (PCF STAGE 2)

9.1 Pre-Consultation Appraisal

Traffic

9.1.1 Microsimulation models were developed for the operational assessment at the following two locations:

- M6 J40 and Kemplay Bank; and
- Scotch Corner.

M6 Junction 40 and Kemplay Bank

9.1.2 The M6 Junction 40, which is a grade separated roundabout, and Kemplay Bank, a large at-grade roundabout, are both signal controlled and positioned towards the southern edge of Penrith, with strategic and local significance.

9.1.3 The Base models were deemed to be validated to acceptable standards and suitable for operational assessment. The A686 was not considered critical in the overall assessment.

9.1.4 Forecast models were derived from the Base year models and future year traffic growth from the Stage 1 strategic model (A66 TM) for the future years 2028 and 2043, for the Do Minimum (DM) and Do Something (DS) scenarios.

9.1.5 The DM scenario consists of background traffic growth only with no infrastructure changes. The DS scenario consists of background traffic growth and also growth as a result of the proposed infrastructure changes to the A66 (full dualling). In addition, the DS scenario includes proposed junction improvements to the M6 Junction 40 and Kemplay Bank roundabouts.

9.1.6 Details of the Do Something networks are as follows.

M6 Junction 40

9.1.7 Initial testing focussed on assuming Junction 40 based on an Option 1A outline design developed by Arcadis and illustrated in Figure 9-1.

9.1.8 Option 1A (M6 Junction 40) proposals include:

- A dedicated left-turn lane from the M6 Southbound off-slip to the A592;
- A dedicated left-turn lane from the A592 to the A66 Eastbound;
- Three lanes on the A66 Eastbound approach from Kemplay Bank; and
- Three lanes on northern circulatory section (A592 approach).

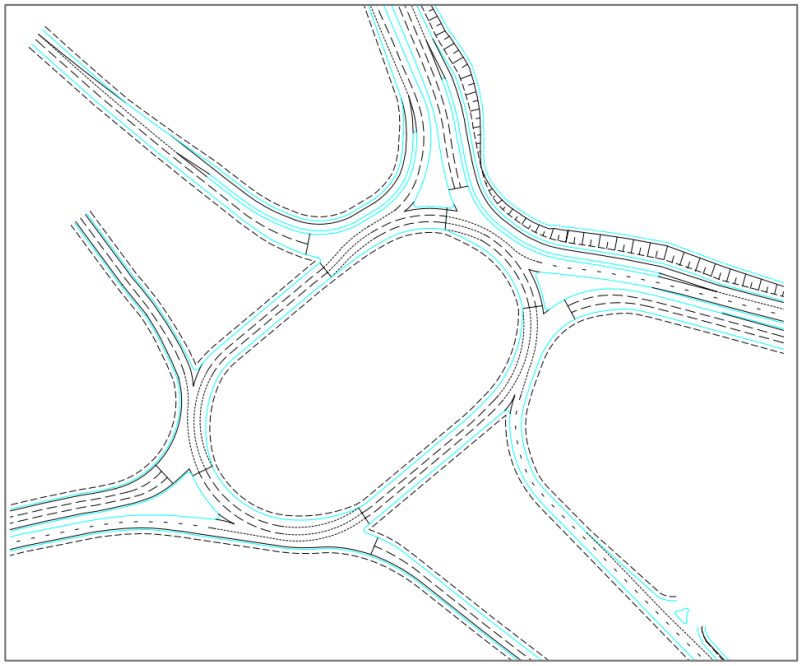


Figure 9-1: Option 1A – proposed improvements to M6 Junction 40

Kemplay Bank

9.1.9 Kemplay Bank was based on an Option 2B outline design developed by Arcadis and illustrated in Figure 9-2.

9.1.10 Option 2B (Kemplay Bank) proposals include:

- Grade separation of the A66 east to west movement;
- On and off-slip roads to/from the A66;
- Priority control roundabout (removal of signals); and
- Modified alignment of the A686 approach arm.

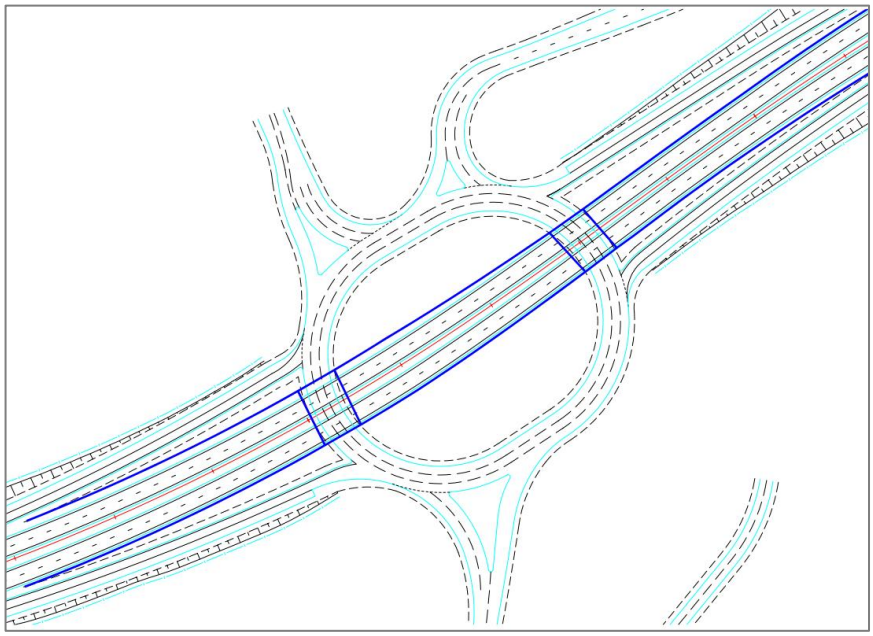


Figure 9-2: Option 2B – proposed improvements to Kemplay Bank

9.1.11 The outcome of the operational assessment concluded that in the Do Minimum scenario the M6 Junction 40 (without improvement) would be operating over capacity in the future year 2043 as

it currently is today. In the Do Something scenario (with proposed layout improvements, Option 1A at M6 J40 and Option 2B at Kemplay Bank) the junction is also forecast to operate over capacity in the future year 2043.

9.1.12 As such, we further developed and tested the J40 proposal to offer additional capacity improvements. This included a 4-lane circulatory and reduced flow on A592 (shown below in Figure 9-3).

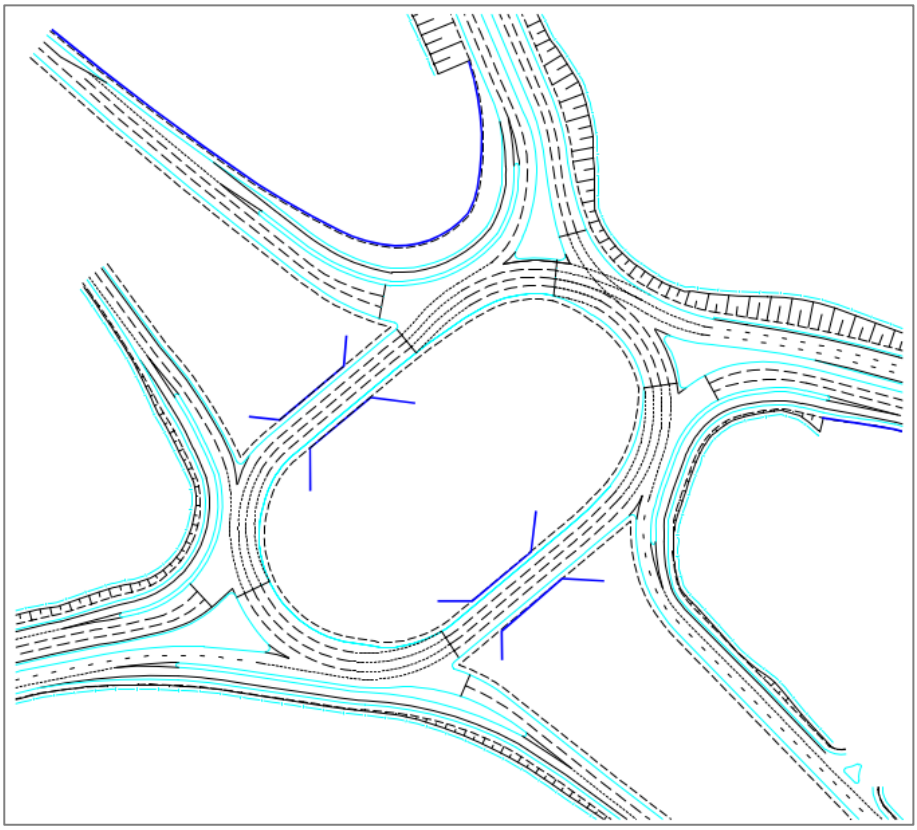


Figure 9-3: Limited 4-lane circulatory + reduced flow on A592

- The above was modelled with two adjusted traffic flow scenarios, which include a reduction of traffic on the A592 (on approach to Jct 40) by 37% and 49%, assuming that reduced traffic flows could be achieved through traffic management measures in Penrith and drivers taking alternative routes when faced with delay along the A592; trips originating in Penrith and travelling north via Jct 40 transferring to Jct 41, and trips travelling east via Jct 40 transferring to the A6 (via Kemplay Bank).

9.1.13 The performance of the Junction 40 proposal is summarised below:

- "limited" improvements, with a 37% reduction in traffic to the A592 approach the junction is forecast to operate within capacity in the 2043 DS scenario in the AM, but marginally over capacity in the PM. With a 49% reduction to the A592 approach the junction is forecast to operate within capacity in the 2043 DS scenario for both the AM and PM. Kemplay Bank roundabout continues to operate within capacity, even with the increased traffic along the A6 as a result of trips transferring from the A592.

9.1.14 In conclusion it was determined that the above "limited" improvements at Jct 40 should be included within the cost estimate for the project and developed further during Stage 3. Meetings have been held with CCC and EDC to outline the opportunity and all parties have supported the need to work collaboratively to develop an integrated solution.

Scotch Corner

9.1.15 The Scotch Corner model includes the Scotch Corner roundabout, the A6055/A1(M) roundabout (north of Scotch Corner), the Barracks Bank roundabout (south of Scotch Corner) and the access road leading to the Scotch Corner Services. It includes the junction improvement changes made as part of the A1 Leeming to Barton scheme.

9.1.16 The Base model was developed using a similar approach to the M6 J40 and Kemplay Bank model development, and consistent model time periods.

9.1.17 Survey data, collected in March 2019, was used to inform the construction, calibration and validation of the model. Data collected included classified turning counts, TrafficMaster GPS, and Automatic Number Plate Recognition (ANPR) data.

9.1.18 The model was calibrated against the turning movement counts, which correlate well against the observed flows, and with the GEH criteria being met in both the AM and PM peaks. In conclusion the model provided a suitable representation of the operation of Scotch Corner, including the interaction between the peripheral roundabouts and Scotch Corner Services.

9.1.19 Do Minimum (DM) and Do Something (DS) future year 2028 and 2043 models were prepared. The DM and DS scenarios consist of background traffic growth, with no infrastructure changes. The DS scenario also includes traffic growth associated with the proposed infrastructure changes to the A66 route (full dualling).

9.1.20 A comparison of junction performance between the DM and DS scenario indicates the following:

- Similar travel time patterns in both the AM and PM, with journey times generally increasing in the DS compared to the DM; and
- DM and DS performance is comparable, with average network speeds within 1 mph of each other in 2028 and 3-7mph in 2043, and total network delays slightly higher in the DS than the DM.

9.1.21 In summary, the key junctions included in the modelled network (Scotch Corner Roundabout; the A6055/A1(M) Roundabout; and the Barracks Bank Roundabout) are forecast to operate within capacity for both the DM and DS scenario. The Middleton Tyas junction is forecast to operate over capacity in 2043 but there is limited information available on use of the Services in the future. In conclusion the existing layout is forecast to have sufficient capacity to accommodate forecast traffic growth beyond the design year 2046.

Environment
Phase 1 Habitat and River Corridor Surveys

9.1.22 At PCF Stage 2, the walkover survey undertaken at Stage 1 remained valid; however, a bespoke survey approach was undertaken for Section 6: Temple Sowerby to Appleby. The Section was selected for more specific and detailed surveys as Options 6J1 and 6H1 could directly impact the River Eden SAC/SSSI. This is at proposed crossing points on the Trout Beck which is a tributary of the River Eden. This approach was agreed with the statutory consultees at a meeting on 21 January 2019 (please refer to meeting minutes, document reference HE565627-ARC-GEN-A66-MI-ZM-2005).

9.1.23 The bespoke survey approach included:

- A stand-alone extended Phase 1 habitat survey to provide an overview of the habitats present.
- A combined River Habitat Survey (RHS), River Corridor Survey (RCS) and Geomorphological survey (collectively referred to as River Eden SAC Survey). This survey provides detailed information in relation to the River Eden SAC and its tributaries.

9.1.24 The full methodology and survey results of the bespoke surveys are within Appendix 7.1 of the EAR.

Flood Risk Analysis

9.1.25 Preliminary numerical modelling of baseline flood risk has been undertaken and the impacts of Options 6H1 and 6J1 have been modelled. The assumptions and limitations applicable to the modelling is detailed in Appendix 15.1 of the EAR. This model, once reviewed and accepted by the EA, would inform a Flood Risk Assessment at PCF Stage 3. Further, quantitative assessments and field surveys will be undertaken as required at PCF Stage 3, guided by the outcome of detailed ongoing consultation with the EA and Lead Local Flood Authorities.

Consultation with Historic England

9.1.1 Historic England were consulted on the options at Section 14: Stephen Bank to Carkin Moor, with particular focus on potential impacts on the scheduled Roman fort and prehistoric enclosed settlement (SM6). This is evidenced in a letter dated 1 April 2019 (see Appendix 9.4 of EAR) which provides the following position:

'Given the potential density and character of unknown archaeology in the wider landscape, Historic England are comfortable with Highways England making public options to stay on-line at Carkin Moor by reducing impact through engineered solutions to protect the monument. By doing so, this may reduce impacts on currently unknown archaeological remains in the wider landscape and thus ensure a continuity of the relationship between the fort and the road.'

9.3 Post-Consultation Appraisal

Preferred Route Appraisal

9.3.1 One of the key activities of Stage 2 is the selection of a Proposed Route which will form part of the recommendation for Preferred Route once validated. This was done though a formal workshop which was held on Wednesday 17 July 2019 at the DoubleTree by Hilton Hotel, Manchester. The purpose of the workshop was to review the appraisal the options along with the public consultation responses at each section using an agreed appraisal methodology and to subsequently identify the better performing options to be selected as the Preferred Options for recommendation.

9.3.2 The appraisal methodology used, was based on a similar methodology used to refine the *long list* options during the PCF Stage 1, that was summarised in the Technical Appraisal Report (TAR). The methodology, also used on other high-profile Tier 1 Highways England projects such as Lower Thames Crossing (LTC), takes each section of the route and assesses the options against one another in several specialist project objectives.

9.3.3 An Appraisal Summary Schedule was produced summarising the results of the consultation and appraisal of all options can be found in Appendix B

9.3.4 The workshop had 33 attendees and was facilitated by an independent facilitator. The key outcome of the workshop was the identification of the Preferred Route. This was identified by selecting the best overall performing option for sections where a number of options applied and combining them with the single option solutions on the remaining sections. For each of the sections, the following were reviewed at the workshop:

- the results of the consultation responses
- the appraisal of the route options as reported in the Stage 1 Technical Appraisal Report (TAR) that was pre-populated for each of the section using the Consultation and Appraisal Summary Schedule
- updated stakeholder engagement feedback and appraisal work undertaken in Stage 2, including:
- feedback from Statutory Environmental Bodies
- results and assessment of walkover environmental surveys of sensitive areas.

9.3.5 The facilitator summarised key action points throughout the day which were recorded and summarised in this report. The decisions made during this workshop are summarised below in the following Section.

10 PREFERRED ROUTE OPTION SELECTION

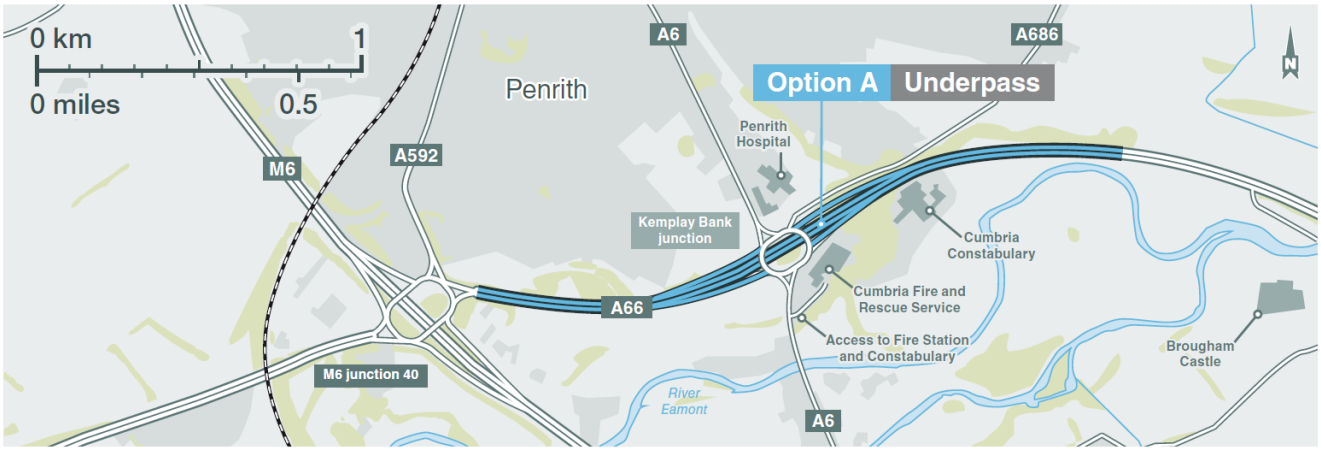
10.1.1 This section confirms the options selected which will ultimately form part of the Recommended Preferred Route once validated in the following sections.

Project Section	Preferred Route Option
M6 J40 to Kemplay Bank Roundabout	Option A
Penrith to Temple Sowerby	Option C
Temple Sowerby to Appleby (Kirkby Thore)	Option E
Temple Sowerby to Appleby (Crackenthorpe)	Option H
Appleby to Brough	Option I
Bowes Bypass	Option J
Cross Lanes to Rokeby	Option K
Stephen Bank to Carkin Moor	Option N

Section 2 – M6 J40 to Kemplay Bank Roundabout

10.1.2 The options considered and presented to the public for consultation already formed part of the preferred route. It was therefore agreed that the discussion be centred around the decision to progress with the underpass or overpass structure at Kemplay Bank Roundabout. The underpass option (Option A) received significant support from the public and had less environmental impact, hence it was recommended that this option be taken forward as the preferred option for further analysis.

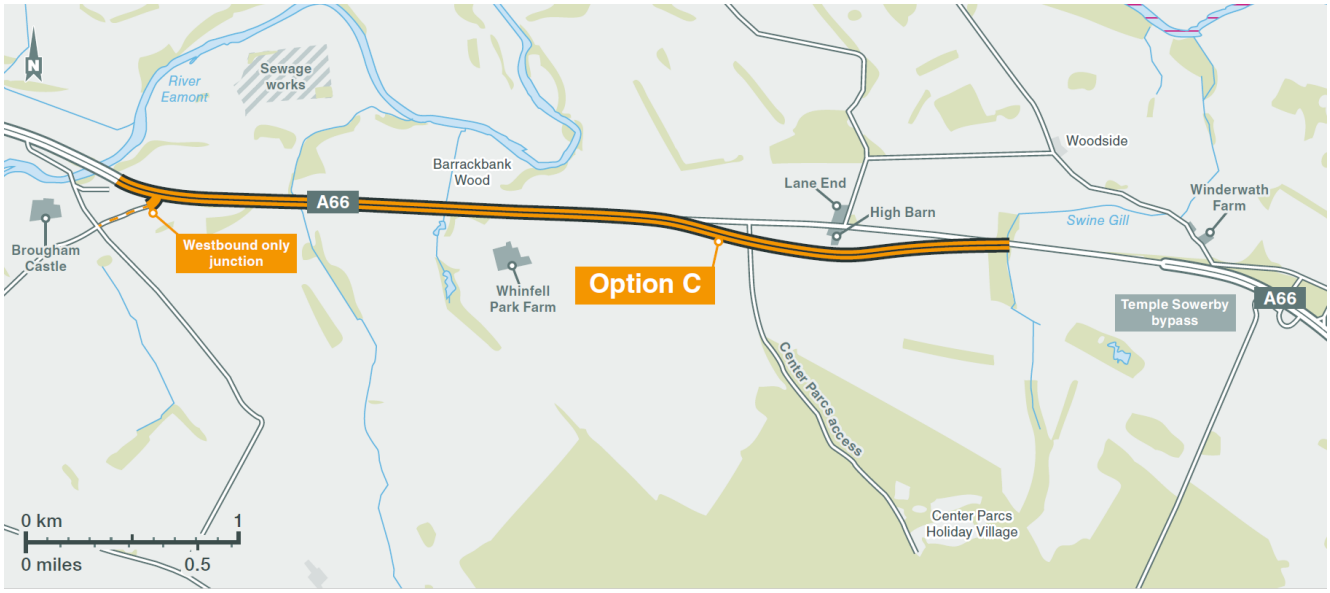
Figure 10-1: Section 2 Preferred Route Recommendation



Section 4 – Penrith to Temple Sowerby

10.1.3 Of the two options, the option that bypasses the property, High Barn, received greater support from the public. This option (Option C) was considered to have the least impact on High Barn. Moreover, the noise and visual instruction on the properties at Lane End would be less with this option. Option C was therefore recommended to form part of the preferred route.

Figure 10-2: Section 4 Preferred Route Recommendation



Section 6.1 - Temple Sowerby to Appleby (Kirkby Thore)

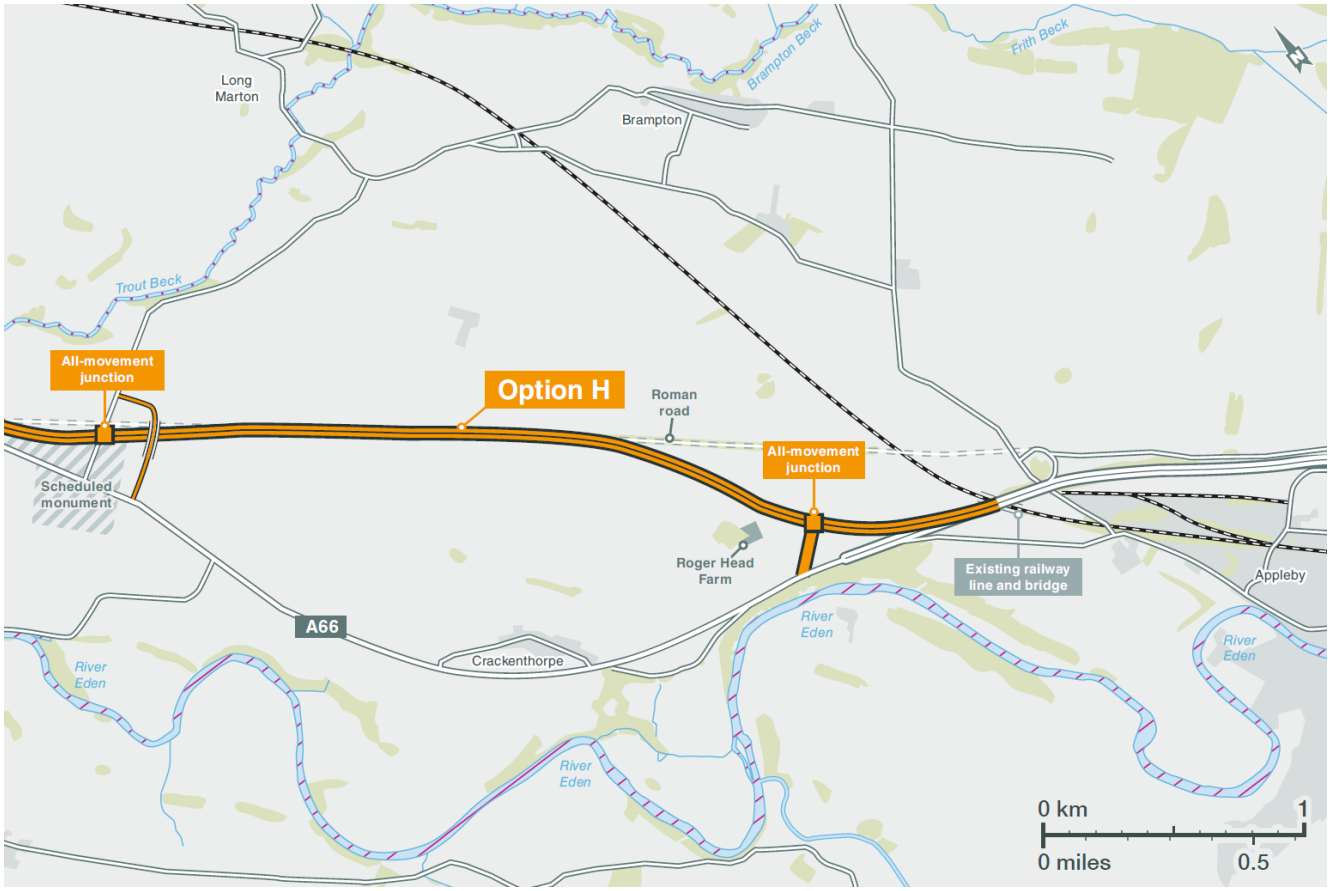
10.1.4 The northern and southern bypass options received large number of responses from the public. The public preferred the northern option highlighting its ability to divert heavy good vehicles to and from British Gypsum works away from the village. The northern option would require demolition of a single property and have less overall impact on properties when compared to the southern option. The southern option had greater impact on biodiversity and water (flood plain). It was agreed to recommend the northern option (Option E) to form part of preferred route.

Figure 10-3: Section 6 Preferred Route Recommendation

Section 6.2 – Temple Sowerby to Appleby (Crackenthorpe)

10.1.5 Of the two northern bypasses, the public preferred the option that followed the historic roman road highlighting greater access for NMU to adjacent villages by-way of retention of part of the existing A66 as link to Appleby. This option (Option H) would have minimal impact on landowners as it follows natural property boundary. Option H was therefore recommended at the preferred route.

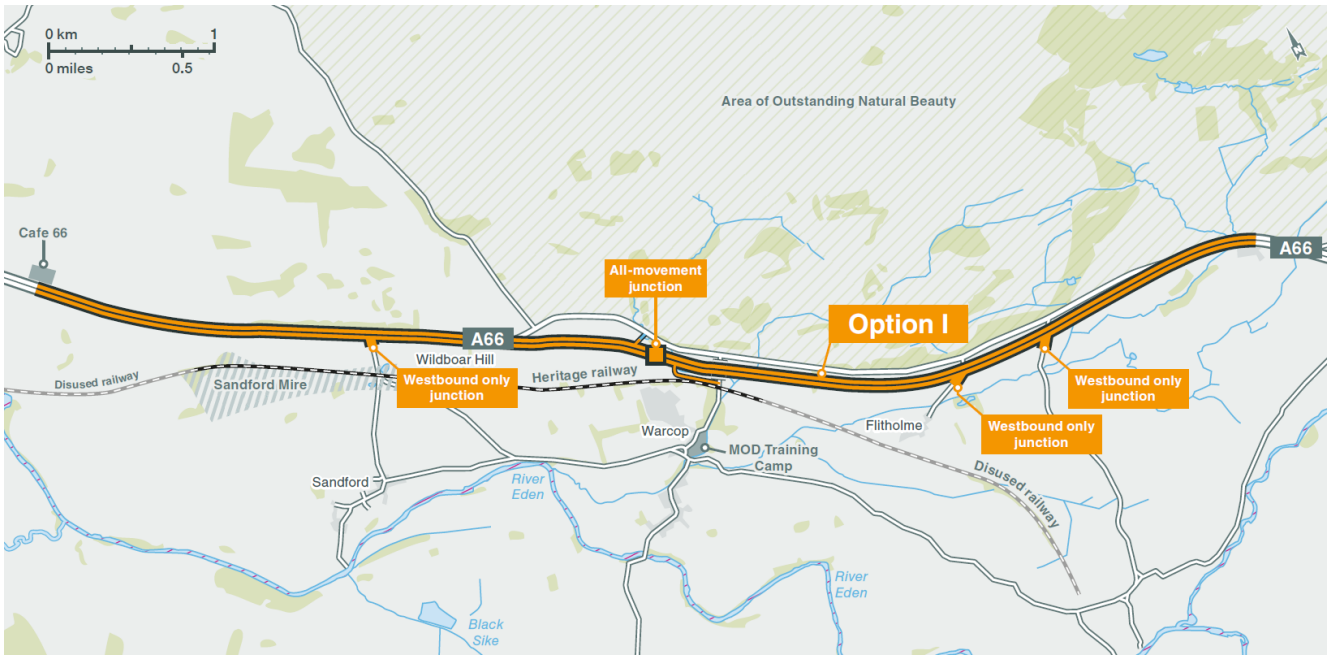
Figure 10-4: Section 6 Preferred Route Recommendation



Section 8 – Appleby to Brough

10.1.6 A single option (Option I) was proposed on the Appleby to Brough section which received significant support from the public. It was agreed that the option should be adopted as part of the Preferred Route.

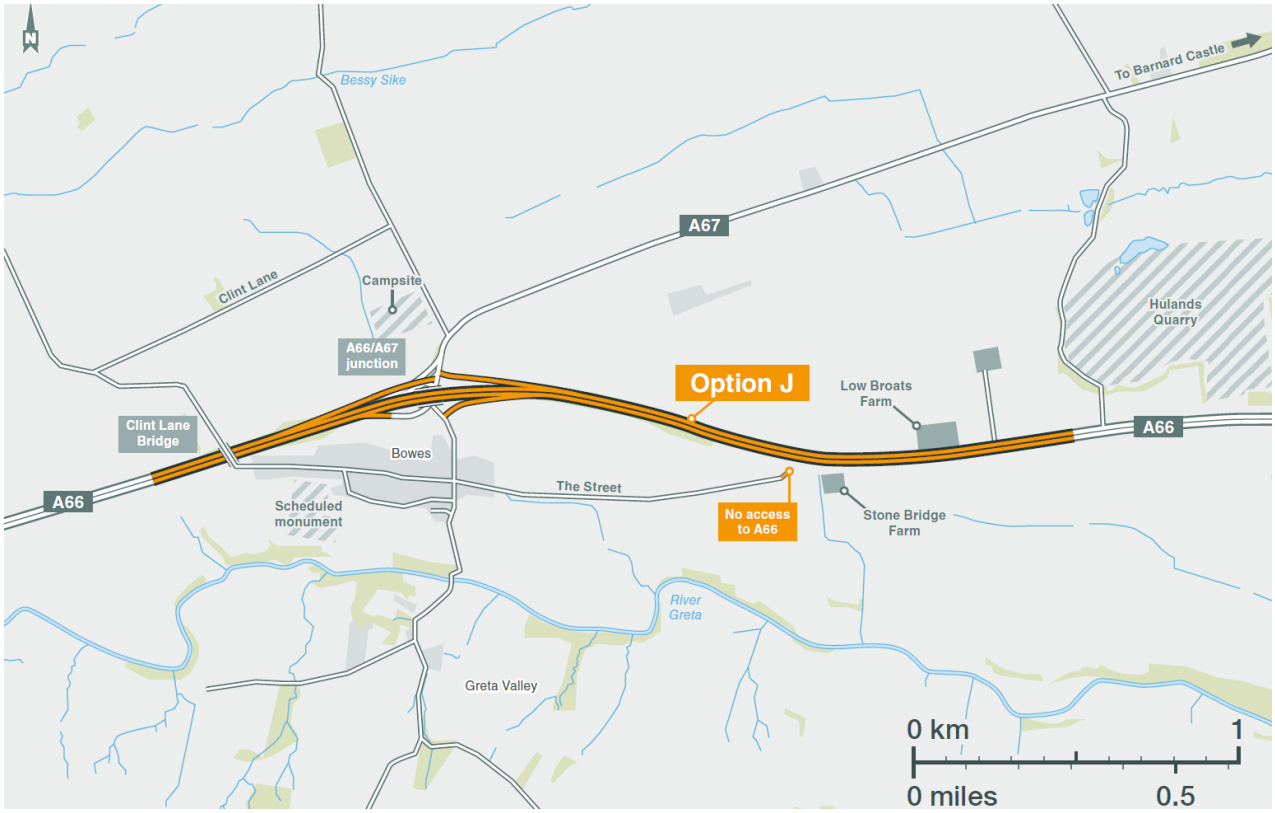
Figure 10-5: Section 8 Preferred Route Recommendation



Section 10 – Bowes Bypass

10.1.7 A single option (Option J) was proposed on the Bowes section and the proposed interventions received significant support from the public. It was agreed that the option should be adopted as part of the preferred route.

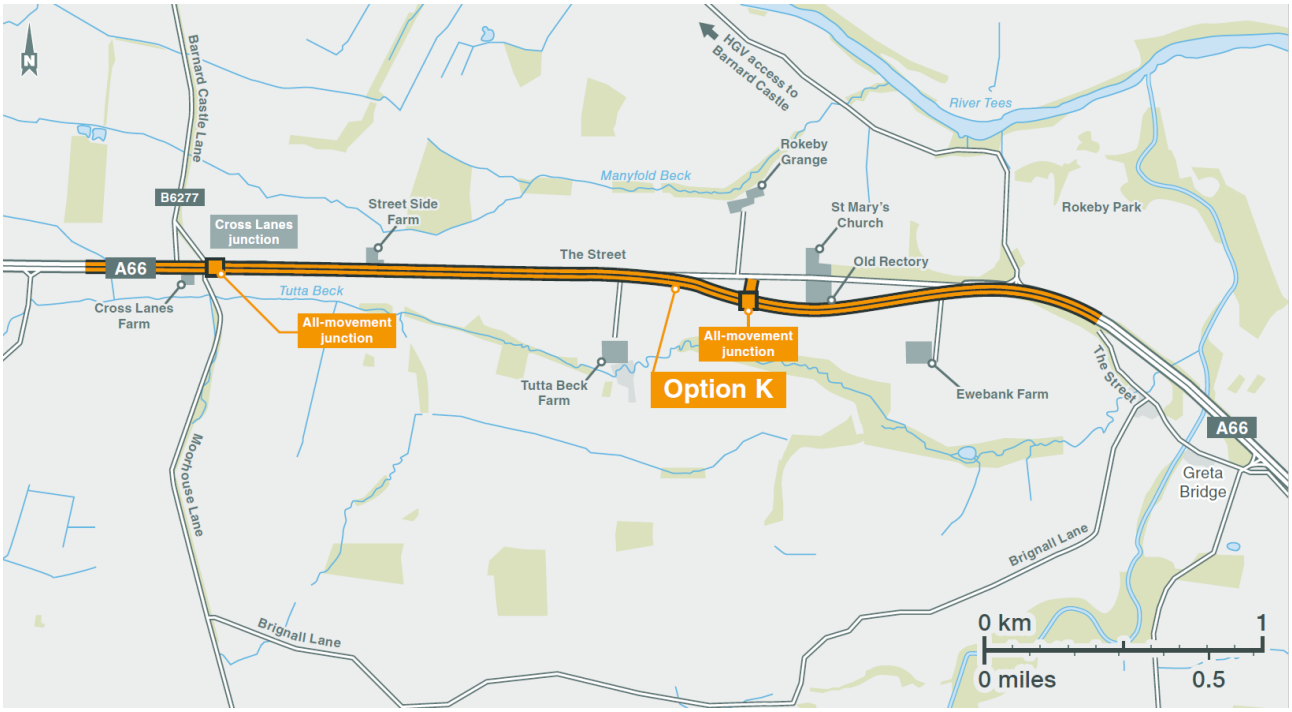
Figure 10-6: Section 10 Preferred Route Recommendation



Section 12 – Cross Lanes to Rokeby

10.1.8 Of the two options, the option that bypasses the Old Rectory property received greater support from the public. This option (Option K) was considered to have the least impact on Old Rectory buildings and improve access to the listed church. Option K was therefore recommended to form part of the preferred route.

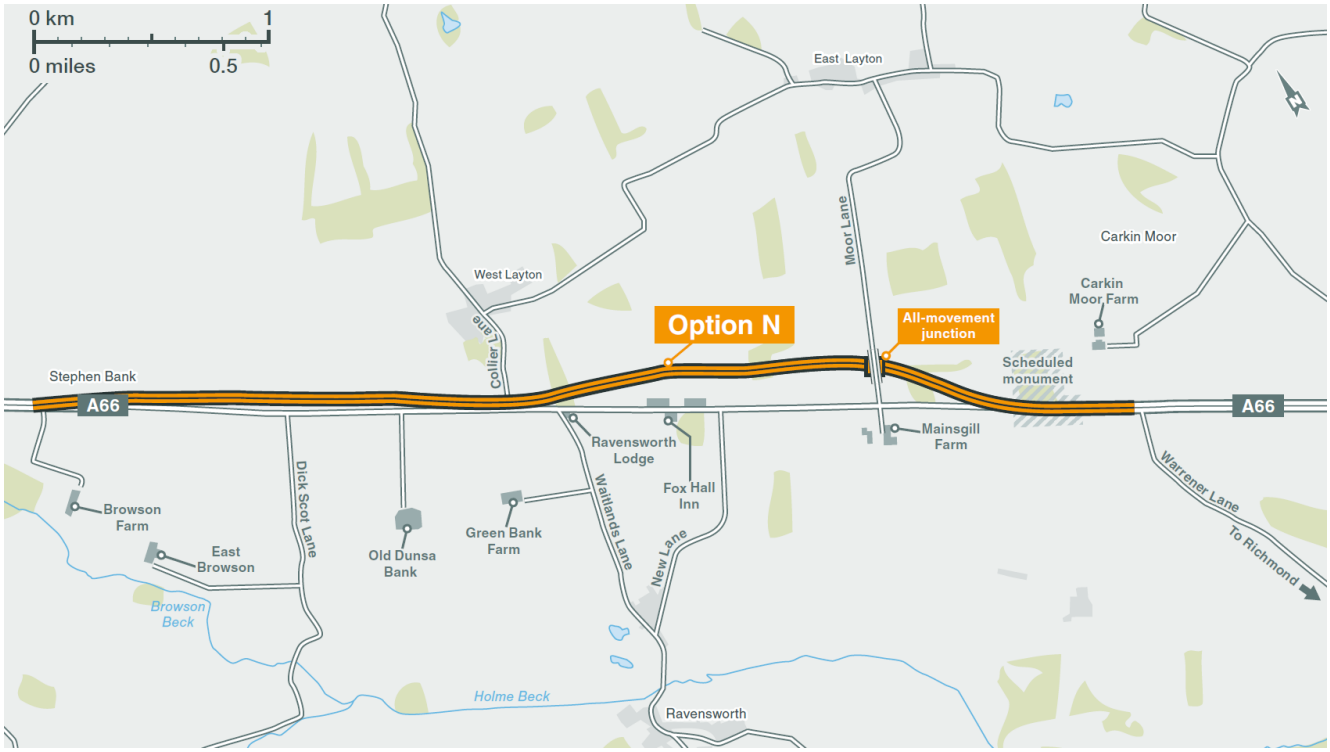
Figure 10-7: Section 12 Preferred Route Recommendation



Section 14 – Stephen Bank to Carkin Moor

10.1.9 The northern option (Option N) received the greatest support of the three options from the public. It follows the current alignment at Carkin Moor scheduled monument, which Historic England confirmed as their preference to minimise impact on the monument. This option would provide an opportunity to provide safer routes for non-motorised users and access to Ravensworth and Fox Hall Inn by the utilising the de-trunked section of A66. Option N was therefore recommended to form part of the preferred route.

Figure 10-8: Section 14 Preferred Route Recommendation



Terminal Junctions

10.1.10 The two terminal junctions, M6 Junction 40 and Scotch Corner Roundabout were not discussed in detail as they already form part of the route and not part of option selection process.

11 OPERATIONAL ASSESSMENT

11.1 Highways Infrastructure Operation & Maintenance

11.1.1 Day-to-day operations of the SRN comes under the authority of Highways England Operations Directorate. The network is to be operated to provide safe passage of all road users on a daily basis in all weather conditions, 24 hours a day. Daily operations would involve traffic management, accident assistance and planning inspections and routine maintenance. This work is carried out by agents working on behalf of Highways England Operations Directorate

11.1.2 The operation and maintenance of the A66 would continue to be carried out so as to meet Highways England's performance target of ensuring lane availability does not fall below 97% in anyone rolling year1.

11.1.3 Highway maintenance requirements include activities such as surface renewals, drainage maintenance and full depth pavement reconstruction.

11.1.4 During maintenance temporary speed limits would be generally 20mph less than the permanent speed limits. Maintenance activities carried out commonly on a 5 year cycle include activities such as resurfacing, road markings, lighting, vegetation clearance, barriers and signage. Major maintenance would be carried out approximately every 20 years and includes activities such as pavement strengthening/ reconstruction and maintenance of structures. Operational plans would also include allowance for unplanned/ unforeseen maintenance (e.g. to make emergency repairs) when needed.

11.1.5 The following general principles have been assumed for the appraisal of future routine maintenance requirements:

- Maintenance periods based on opening of scheme in 2031.
- Lane closures for carriageways with at least 2 lanes.
- There may be opportunities to optimise closures by carrying out multiple maintenance activities simultaneously

11.2 Design for Maintenance

11.2.1 The design shall conform to:

- Design Manual for Roads and Bridges (DMRB);
- Manual Contract Documents for Highway Works (MCHW);
- Routine Winter and Service Code including all relevant guidance and Advise Notes; and
- Construction (Design and Management) Regulations (CDM) 2015 shall apply and any subsequent revisions / amendments shall be incorporated as the scheme progresses.

11.2.2 The scheme shall be designed to minimise maintenance impacts or eliminate maintenance activities so far as is reasonably practicable in accordance with Interim Advice Note 169/15. Refer to the Scheme Hazard Elimination Schedule contained in APPENDIX C

11.2.3 for further details.

11.2.4 The scheme has been assessed and determined as a Class 'A' scheme in accordance with GG104 Standard for Safety Risk Assessment.

11.3 Urgent and Emergency Works

11.3.1 Due to the requirement for TTM for almost all maintenance activities, the ability to conduct reactive maintenance will be constrained to the use of TTM.

11.3.2 Road traffic collision damage repairs are carried out as they occur, and future schemes will be

co-ordinated with other assets where possible.

11.3.3 The Service Providers should utilise existing procedures for conducting emergency maintenance when defects occur in live lanes (e.g. mobile lane closure with Impact Protection Vehicles (IPV's) and rolling blocks (in accordance with Chapter 8)).

11.3.4 Safety defects should be made safe in line with the Service Providers obligations, then fully resolved outside of peak times under TTM to minimise network disruption and the level of risk exposure to maintenance operatives. There may be occasions that require TTM to be left on the carriageway until there is a safe time to return and undertake a full repair – e.g. repair to a parapet which is close to the edge of carriageway, surfacing damage.

11.3.5 Non-urgent reactive activities (category 2 defects) should be rationalised along with other activities within a planned TTM closure.

11.4 Response and Repair Times

11.4.1 Specifically, in relation to technology faults, it is assumed at this stage the A66 Road Closure Gates and associated systems will be considered 'critical' equipment and therefore it is assumed that failure of this system will be classed as Performance Category 1 Defects.

11.4.2 Impacts on contractual key performance indicators (KPIs) will need to be considered. Category 1 defects may occur to highway, structure assets and electrical hazards associated with technology equipment.

11.4.3 For emergency maintenance to deal with category 1 defects, TTM lane closures will need to be installed and at times normally with assistance from the Police.

12 TECHNOLOGY ASSESSMENT

12.1 Stakeholder Technology Aspirations

12.1.1 There is common consensus from all the stakeholder participation and feedback that the route would benefit from additional technology in particular:

- Greater CCTV coverage – for greater operational efficiency during severe weather events and incident response time
- Enforcement – to improve safety
- Additional VMS – for better journey time reliability
- Queue protection/stopped vehicle detection – to improve safety

12.2 Constraints

12.2.1 Whilst there is a need for more extensive technology, no communications network currently exists on the A66 and this existing gap has always limited technology delivery along the route.

12.2.2 There are no plans for further rollouts of the NRTS transmission network and any such decision would need to be taken by regional or Major Project schemes based on their design requirements and technology provision.

12.2.3 As the scheme construction is not contiguous through the route, it is not an option to install end to end communications infrastructure along the project limits, but it could be part of a NRTS improvement along the route.

12.2.4 There are environmental constraints to be considered regarding the installation of technology assets.

12.3 Highways England Technology Strategies

12.3.1 In the Highways England publication “Connecting the country – Planning for the long term”, the main themes that are relevant to a technology strategy for the A66 include:

- Connected vehicle provision
- Expressway status
- Operations

12.3.2 The Digital Roads Strategy (in development) sets out how Highways England can start moving into a more technology driven and evolving SRN. The recommendations will need to be considered when it is published.

12.4 Connected Vehicle Provision

12.4.1 As the A66 is part of the SRN, infrastructure will be needed for connected vehicle provision. Work is ongoing to determine the detailed requirements for connected vehicles but will typically entail ducts, chambers, cabinets, power and communications infrastructure (fixed and wireless).

12.4.2 The presence of early adopters of connected vehicle technology on the network is likely to be from Road Period 2 onwards. At some point it is realistic to assume that connectivity on the SRN will be mandatory for all vehicles where it will be possible to communicate all safety related traffic information via Vehicle to Infrastructure (V2I) connectivity.

12.4.3 Based on the current programme the start of works will coincide with the Road Period 3.

12.4.4 As the vehicle fleet become more connected this would enable a change in the design of roads and the way Highways England interacts with customers. For example, gantries and VMS may

no longer be required, migrating from on-road signage to in-vehicle intelligent messaging and possibly control.

12.5 Expressway Status

12.5.1 Therefore, there is no current requirement for the technology requirements of GD 300 to inform the future design other than possibly for part of future NRTS transmission infrastructure.

12.6 Operations

12.6.1 Operations will evolve as the road network becomes increasingly linked through telecoms networks and connected assets. For example, use of CCTV for incident and severe weather response.

12.6.2 As CAV roll-out picks up pace, Highways England may introduce routine digital communications directly to vehicles, communicating safety-related and routing information directly to the fleet. These factors should combine to provide much greater journey reliability and safety.

12.7 Technology Maintenance

12.7.1 There are a number of future technologies that, as they become more widely available, would assist in providing a cohesive maintenance strategy. These technologies would help to minimise maintenance intervention and include:

- **IP enabled equipment** – reduces the need for equipment outstations and technology infrastructure required for the scheme, meaning less infrastructure to maintain. In addition, IP enabled equipment allows easier remote monitoring and diagnostics, reducing maintenance visits to the roadside equipment that is installed.
- **Materials technology** – Developments in this area include self-healing display screens and self-cleaning surfaces.
- **Higher specification of equipment** – higher grade equipment could extend equipment life and increase durability. Examples include longer back-up battery lives in equipment such as emergency light fittings, or uninterruptable power supplies. Consequently, this would mean less need to access equipment for maintenance.
- **Infrastructure Inspections** – With the increased use of drone technology, it is likely that more maintenance work would be carried out remotely, for example bridge pier inspections via CCTV.
- **In-vehicle technology** – as communication technology speeds increase, it is highly likely that next generation telecommunications will provide road users with more information via mobile phone and in-car systems. This is currently being trialed around the world, and may reduce the amount of roadside infrastructure required, thus reducing maintenance and improving workforce safety.

12.8 Summary

12.8.1 While it is clear that there is a current aspiration for more technology on the route it has been historically hindered by the lack of a communications backbone. This may be now be less of a constraint with the availability of wireless NRTS solutions.

12.8.2 Highways England has a long-term objective to optimise roadside technologies across the strategic road network. Optimisation could include a more proportionate approach to technology deployment that reduces the capital and operational costs and minimises the environmental impact. As connected vehicle penetration increases this will entail migrating from on-road signage to in-vehicle intelligent messaging.

12.8.3 This objective will expect to become more realistic when construction is due to commence on

the A66 around 2025.

13 ENVIRONMENTAL ASSESSMENT

13.1 Introduction

13.1.1 This chapter provides an overview of the environmental assessment undertaken for the assessment of the Recommended Preferred Route. The full assessment and assessment of the longest and shortest routes is provided in the Environmental Assessment Report (EAR) (ref. HE565627-ARC-EGN-A66-RP-ZM-1055).

13.2 Cultural Heritage

13.2.1 The proposed route will result in 26 assets experiencing change which is likely to result in significant effects.

Construction

13.2.2 Following mitigation, large adverse significance of effects have been identified on the following receptors:

- Roman camp, 350m east of Redlands Bank

13.2.3 Following mitigation, moderate adverse significance of effects have been identified on the following receptors:

- Bowes Conservation Area
- Church of St. Mary
- Alms table at Countess Pillar
- Countess Pillar
- Settlement 1/3 mile (540m) ENE of Brougham Castle
- Roman marching camp 450yds (410m) NE of Brovacum
- Roman fortlet, 200m SSE of Castrigg
- Warcop Roman camp and length of Roman road, 285m south west of Moor House
- Milestone to the east of Whinfell Park
- Two milestones
- Cross Lanes farmhouse
- Rokeby Park
- Sandford Moor barrows
- Brougham Castle Bridge
- Kirkby Thore Hall
- Church of St. Michael
- Bowes railway station

Operation

13.2.4 Following mitigation, large adverse significance of effects have been identified on the following receptors:

- Roman fort and prehistoric enclosed settlement 400m west of Carkin Moor Farm
- Roman camp, 350m east of Redlands Bank

13.2.5 Following mitigation, moderate adverse significance of effects have been identified on the

following receptors:

- Bowes Conservation Area
- Church of St. Mary
- Alms table at Countess Pillar
- Countess Pillar
- Settlement 1/3 mile (540m) ENE of Brougham Castle
- Roman fortlet, 200m SSE of Castrigg
- Warcop Roman camp and length of Roman road, 285m south west of Moor House
- Milestone to the east of Whinfell Park
- Two milestones
- Rokeby Grove
- Stable to west of Rokeby Grove
- Cross Lanes farmhouse
- Sundial at Rokeby Grove
- Ravensworth Lodge and attached outbuildings
- Rokeby Park
- Kirkby Thore Hall
- Church of St. Michael

13.2.6 Based on advice from Historic England, a retaining structure will be built for Carkin Moor Scheduled Monument to reduce the amount of land-take required and therefore reduce impact on the Monument.

13.3 Landscape

Construction

13.3.1 The construction of the proposed route would result in localised changes of a large adverse significance of effects, to landscape character in LCTs 8b-Broad Valleys, Gritstone Vale and Rokeby Registered Park and Gardens; and result in localised changes of a moderate adverse significance of effects to 6-Intermediate Farmlands, 10-Sandstone Ridge, 11a-Foothills, Gritstone Upland Fringe and Lower Dale. Options C, E, H, K and N would have a greater impact on local landscape character due to the loss of existing countryside and introduction of new highway to areas further away from the influence of the existing A66. Although outside the AONB boundary, options E, H, and I, have potential to impact it's setting, in particular where the option alignments E and H would result in the loss of existing countryside within LCT 6 and 8b. The construction activities associated with Option K would lead an adverse effect on the setting and visual amenity of the to the Grade II* listed registered parks and Gardens of Rokeby Park.

13.3.2 There would also be a deterioration of visual amenity at representative viewpoints.

Operation

13.3.3 The proposed route would result in localised changes of a moderate adverse significance of effect, to landscape character in LCTs 00-Urban Areas, 6-Intermediate Farmlands, 8b-Broad Valleys, 10-Sandstone Ridge, 11a-Foothills, Gritstone Upland Fringe, Gritstone Vale, Rokeby Registered Park and Gardens and Lower Dale. Options C, E, H, K and N would have a greater impact on local landscape character due to the loss of existing countryside and introduction of new highway to areas further away from the influence of the existing A66. Although outside the

AONB boundary, options E, H, and I, have potential to impact it's setting, in particular where the proposed route would result in the loss of existing countryside within LCT 6 and 8b. The construction activities associated with Option K would lead an adverse effect on the setting and visual amenity of the to the Grade II* listed registered parks and Gardens of Rokeby Park.

13.3.4 There would remain a deterioration of visual amenity at the representative viewpoints during year 1 of the proposed route's operation.

13.3.5 It is anticipated that at Design year 15, the proposed route's embedded landscape and visual mitigation measures will have sufficiently matured to reduce the operational effects on the majority of landscape and visual receptors to non-significant levels.

13.4 Biodiversity

13.4.1 The proposed route is likely to result in 31 significant impacts during construction of which 9 are expected to be large, and during construction 15 significant impacts of which 2 are expected to be large.

Construction

13.4.2 Following mitigation, large adverse significance of effects have been identified on the following receptors (including value):

- River Eden SAC (very high).
- River Eden and Tributaries SSSI (very high).
- Rivers and Streams S41 Priority Habitat (very high).
- White Clawed Crayfish (very high).
- Aquatic Invertebrates (medium-high).
- North Pennine Moors SPA (very high).

13.4.3 Following mitigation, moderate adverse significance of effects have been identified on the following receptors (including value):

- River Eden SAC (very high).
- River Eden and Tributaries SSSI (very high).
- Rivers and Streams S41 Priority Habitat (very high).
- White Clawed Crayfish (very high).
- Birds (medium).
- Fish (medium-high).
- 'Important Hedgerows' and Hedgerows S41 Habitat (medium).
- Aquatic Invertebrates (medium).

Operation

13.4.4 Following mitigation, large adverse significance of effects have been identified on the following receptors (including value):

- North Pennine Moors SPA (very high).

13.4.5 Following mitigation, moderate adverse significance of effects have been identified on the following receptors (including value):

- Rivers and streams S41 priority Habitat (very high).
- White Clawed Crayfish (very high).

- River Eden SAC (very high).
- River Eden and Tributaries SSSI (very high).
- Rivers and Streams S41 Priority Habitat (very high).
- Birds (medium).
- Fish (medium-high).
- 'Important Hedgerows' and Hedgerows S41 Habitat (medium).

13.4.6 The project is at the early stages of design. However, the following design measures have been assumed in the assessment should be considered:

- Post-construction planting will aim to enhance the ecological value of the Highways England soft estate in the vicinity of the proposed route. This will be measured by applying the metric calculation published by Highways England in April 2018 within Chief Highway Engineer Memorandum 422/18 (Highways England, 2018). Where possible, this will include reinstating and re-linking severed linear wildlife corridors with new planting. Consideration will be given to the inclusion of locally sourced native plant species within planting proposals and the application of sensitive management and monitoring regimes.
- To avoid loss of riparian habitat, fragmentation of riparian wildlife corridors and impacts to riverbed, it is recommended that new bridges are designed as clear span structures with abutments set well back from the river's edge.
- To avoid entrapment of animals and to protect water quality in adjacent watercourses and wetland habitats, a suitable drainage design should be implemented.

13.5 Materials

Construction

13.5.1 Based on the information available for this stage, there are no likely significant effects on material resource and waste receptors.

Operation

13.5.2 During the operation of the project, material resource use and waste generation are expected to be very limited. Therefore, no likely significant effects are anticipated.

13.6 Geology and Soils

Construction

13.6.1 Following the implementation of mitigation, no likely significant effects have been identified.

Operation

13.6.2 There would be no likely significant effects during operation, as permanent mitigation would have been applied during construction.

13.7 Road drainage and Water environment

Construction

13.7.1 The proposed route would have a Moderate Adverse effect on Trout Beck (and flood plains) only during construction. All other likely significant effects associated with groundwater and water supply; watercourses and floodplains; and surface water quality were all identified as 'slight'.

Operation

13.7.2 Following the implementation of mitigation, no likely significant effects have been identified.

13.7.3 An FRA would be undertaken at PCF Stage 3, focusing in particular on Sections 6 and 8, where the proposed route interacts most with watercourses and floodplains. Any works impacting the floodplain (areas of Flood Zones 2 and 3) will be accompanied by a suitable floodplain compensation strategy to include measures to manage the impacts of loss of floodplain storage or conveyance.

13.8 Climate

Construction

13.8.1 Owing to the temporary nature of the construction works the effects on climate are not anticipated to be significant.

Operation

13.8.2 During operation it is estimated that the recommended preferred route will cause an increase of 2,322,495 tonnes of CO_2e emissions over 60 years.

13.8.3 The estimated Green House Gas (GHG) emissions would be well below the 5th UK carbon budget (2028-2032). The effect of the proposed route would therefore be negligible and would not be significant.

13.9 Air Quality

Construction

13.9.1 Following the implementation of mitigation, no likely significant effects have been identified.

Operation

13.9.2 The recommended preferred route would not result in an exceedance of the Air Quality Strategy (AQS) objectives for NO_2 and PM_{10} and therefore impacts are not considered to be significant, based on the currently available information.

13.9.3 Two out of the five ecological receptors modelled predicted exceedances of the AQS objective as such, nitrogen deposition was calculated for the two sites. The impact of the proposed route on nitrogen deposition for both ecological receptor locations is not considered significant.

13.10 Noise

Construction

13.10.1 The qualitative assessment of construction impacts during the construction phase of Route 3 – 'recommended preferred route' indicates that there would be 280 dwellings which could potentially experience a potential for significant effect due to construction noise.

Operation

13.10.2 From the assessment of operational road traffic noise impacts for Route 3 - 'recommended preferred route' the following is concluded:

- In the short term
- 1330 dwellings would experience a perceptible increase in road traffic noise level of greater than 1dB(A). Of these 100 dwellings would experience this increase above a daytime Significant Observed Adverse Effect Level (SOAEL).
- 364 dwellings would experience a perceptible decrease in road traffic noise level of greater than 1dB(A). Of these 40 dwellings would experience this decrease above a daytime SOAEL.

- In the long term
- 443 dwellings would experience a perceptible increase in road traffic noise level of greater than 3dB(A). Of these 16 dwellings would experience e this increase above a daytime SOAEL.
- 177 dwellings would experience a perceptible decrease in road traffic noise level of greater than 1dB(A). Of these 39 dwellings would experience this decrease above a daytime SOAEL.
- During the night-time no dwellings above a night-time SOAEL would experience a perceptible increase in road traffic noise level of greater than 3dB(A).
- During the night-time 12 dwellings above a night-time SOAEL would experience a perceptible decrease in road traffic noise level of greater than 3dB(A).

13.10.3 In summary up to 260 receptors could experience a significant adverse noise effect and up to 160 receptors could experience a significant beneficial noise effect.

13.11 Population & Health

Construction

13.11.1 The route is likely to result in the permanent acquisition of 10 private assets and permanent land take (0-50%) of multiple private assets. It is also likely to result in the loss of development land in Section 2: A6/A66 Interchange, which is assessed as having a slight impact.

13.11.2 The route would result in a significant impact to agricultural land with the permanent loss of Grade 2 and Grade 3 agricultural land estimated at 147.64ha.

13.11.3 There is likely to be a moderate level of severance to 31 PRoW during construction – it should be noted that due to construction phasing these impacts are unlikely to occur simultaneously.

13.11.4 Throughout the construction of the proposed route there will likely be some negative health impacts on the most vulnerable receptors arising from several factors: the magnitude of noise and vibration created by the on-site machinery, dust and air pollution created by the on-site machinery, obstruction of roads and public access by site works etc. However these effects would be temporary for the duration of the construction activities.

Operation

13.11.5 No significant effects are anticipated during operation.

13.12 Summary of Environmental Impacts

13.12.1 Based upon the findings of this EAR it has been determined that the Recommended Preferred Route would result in some likely significant effects during operation however mitigation measures would be fully defined at PCF Stage 3. It is worth noting that the assessment has assumed a worse case scenario based upon currently available information. Additional information would be available at PCF Stage 3 following the completion of surveys and further consultation with statutory and non-statutory bodies. Therefore, the assessment of likely significant effects is likely to be revised at PCF Stage 3.

13.12.2 The selected option alignments have, in most cases, equal or lesser impacts than the alternative option alignments. Where this is not the case, justifications for the selection of the Recommended Preferred Route are provided in the EAR.

13.12.3 The alternative option alignments are also not considered to have significant potential to achieve the scheme's Environmental Objectives in comparison with the Recommended Preferred Route.

13.13Enhancement Opportunities

13.13.1 In line with national policy consideration should be given to ensuring the soft estate is landscaped in such a way as to provide habitats of more ecological value than those that are lost and to enhance connectivity e.g. by altered management of retained habitat and/or planting treelines/hedgerows to provide safe commuting routes for wildlife. This could also include enhancement of areas required for temporary land-take during construction e.g. compound areas and access tracks and retro-fitting of culverts. Improved environmental outcomes, including a net gain in biodiversity from the Highway England's activities are also a target with Highways England's Biodiversity Plan (Highways England, 2015), which aims to halt the decline in the vitality of habitats and plant and animal populations on and around their network. Detailed and species-specific enhancement measures should be considered at future PCF stages once ecological surveys have been undertaken. Based on current understanding the following enhancement opportunities have been identified:

- Enhancement habitat within water courses to be more suited to species for which the River Eden SAC is designated (i.e. white-clawed crayfish/Atlantic salmon etc.). This would involve planting of vegetation/increasing the depth/shallowing, reinforcement of the banks.
- Stream enhancements for otter, water vole and/or white-clawed crayfish, this could include deepening of stream/shallowing etc.

13.13.2 The following Population and Health opportunities have been identified and the feasibility will be investigated further at PCF Stage 3:

- Opportunities for enhancing access and connectivity for WCH through the provision of a footpath/cycleway along the route which could be partially achieved through improving provisions along the de-trunked sections of the A66 (for example upgrade to cycle path, more separation from traffic, improved landscaping, wider pathways).
- New and improved crossing facilities across the route to improve connectivity and safety and enhance the permeability of the area.
- Returning non-operational highway estate to community use/ownership (in agreement with relevant land owners) following completion of construction.
- Investment in community initiatives such as tree planting on community land/open space as a means of enhancing the local landscape amenity.

13.13.3 Other enhancement opportunities identified include:

- Where practicable, any surpluses or permanently displaced soils would be reinstated to provide thicker profiles which would improve resilience to intense rainfall.
- Any structures within the watercourses can be designed to improve flow conveyance and drainage systems can be designed to provide wider benefits and potentially reduce runoff into the receiving system where this may alleviate flooding downstream.

13.14Policy Compliance

13.14.1 A full review of the each of the option alignments against national policy undertaken at PCF Stage 1 is presented in a National Policy Accordance Statement (HE565627-ARC-GEN-A66-RP-ZM-1069) and still relevant at PCF Stage 2. A summary of the key policy risks associated with the Recommended Preferred Route is presented below.

Topic	Relevant text from NNNPS	Option Alignment	Policy Risk
Internationally designated sites	Where a proposed development on	**A**	There are designated sites of international and

and Sites of Special Scientific Interest (Includes National Nature Reserves)	land within or outside [an internationally designated site and/or] a SSSI is likely to have an adverse effect on an [internationally designated site and/or a] SSSI (either individually or in combination with other developments), development consent should not normally be granted.	**C**	national importance located within 200m of the option alignment
		E	New crossing over Trout Beck (tributary of River Eden SAC and River Eden & Tributaries SSS) could result in loss of small number of broadleaved trees and permanent shading of c.80m stretch of riparian habitat and c.40m stretch of river.
		H	There are designated sites of international and national importance located within 200m of the option alignment
		I	There are designated sites of international and national importance located within 1km of the option alignment
		J	There are designated sites of international and national importance located within 500m of the option alignment
Watercourses and Flood risk	When determining an application the Secretary of State should be satisfied that flood risk will not be increased elsewhere	**A**	Elements of the proposed option are located in Flood Zones 2 and 3. Option A may have potential impacts on rates of runoff and pollution risk and the floodplains and

			wider catchments of the Thacka Beck and River Eamont. The impact will depend on the extent of the works within the floodplain and the nature of any works to these watercourses.
		C	Option C is likely to have potential impacts on the culverted section of the LightWater as well as the upstream reaches and its floodplain.
		E	Elements of the option alignments are located in Flood Zones 2 and 3.
		I	Elements of the proposed option alignments are located in Flood Zones 2 and 3. .
The historic environment (designated heritage assets)	Where the proposed development will lead to substantial harm to or total loss of significance of a designated heritage asset, the Secretary of State should refuse consent unless it can be demonstrated that the substantial harm or loss of significance is necessary in order to deliver substantial public benefits that outweigh that loss or harm	**A**	The development of this option could result in permanent, negative impacts on the settings of several Archaeological Remains; Historic Buildings and Landscapes potentially decreasing their significance.
		C	The development of this option could result in permanent, negative impacts on the settings of several Archaeological Remains; Historic Buildings and Landscapes potentially decreasing their significance. Option C could directly impact the Countess Pillar (listed building).
		E	The development of these option alignments is

		H	expected to result in permanent, negative impacts on the settings of several Archaeological Remains; Historic Buildings and Landscapes potentially decreasing their significance.
		I	The development of this option alignment is expected to result in permanent, negative impacts on the settings of several Archaeological Remains; Historic Buildings and Landscapes potentially decreasing their significance.
		J	The development of this option alignment is expected to result in permanent, negative impacts on the settings of several Archaeological Remains; Historic Buildings and Landscapes potentially decreasing their significance.
		K	The development of this option alignment is expected to result in permanent, negative impacts on the settings of several Archaeological Remains; Historic Buildings and Landscapes potentially decreasing their significance.
		N	The development of this option alignment is expected to result in permanent, negative impacts on the settings of several Archaeological Remains; Historic Buildings and Landscapes potentially decreasing their significance. This option alignment would have a physical impact to the Roman Fort

			and Prehistoric settlement (scheduled monument).
Land use: open space/sports and recreational buildings and land and agricultural land	The Secretary of State should not grant consent for development on existing open space, sports and recreational buildings and land, including playing fields, unless it is determined that the benefits of the project (including need) outweigh the potential loss of such facilities, taking into account any positive proposals made by the applicant to provide new, improved or compensatory land or facilities.	**A**	This option alignment would lead to permanent land-take of public open space (recreation ground) which is found to the north of the proposed route.
Landscape & Visual Impact	Projects need to be designed carefully, taking account of the potential impact on the landscape. Having regard to siting, operational and other relevant constraints, the aim should be to avoid or minimise harm to the landscape, providing reasonable mitigation where possible and appropriate.	**C**	Both construction activities and the operational phase of the proposed route would be clearly visible from sensitive viewpoints (to north of Whinfell Forest Centre Parcs, looking north), seen in the context of the existing main road.
		E	Both construction activities and the operational phase of the proposed route would be clearly visible from sensitive viewpoints.
		H	The construction phase would result in notable changes to the landscape character of the area immediately surrounding the proposed route (particularly levels of tree cover along the old Roman road).

		I	The construction phase would result in notable changes to the landscape character of the area immediately surrounding the proposed route. Both construction activities and the operational phase of the proposed route would be clearly visible from sensitive viewpoints.
		J	Limited parts of the proposed route may be visible from sensitive viewpoints.
		K	Existing roadside trees between the existing A66 and Rokeby Park would restrict perceptual effects on the Park. The construction phase would however still result in notable adverse perceptual effects on the southern part of the Park. Construction works associated with the widening would be clearly visible from sensitive viewpoints.
Noise and vibration	The Secretary of State should not grant development consent unless satisfied that the proposals will	**A**	It is expected that Option A would increase road traffic noise at Penrith A6 Junction with A66 due to the new junction layout.

	meet, the following aims, within the context of Government policy on sustainable development: □ avoid significant adverse impacts on health and quality of life from noise as a result of the new development; □ mitigate and minimise other adverse impacts on health and quality of life from noise from the new development; and □ contribute to improvements to health and quality of life through the effective management and control of noise, where possible.	**C**	Option C will increase road traffic noise between Sowerby and Appleby West Morland due to the introduction of the new alignment and reductions at Brougham where the existing A66 is bypassed.
		E	Option E would lead to an increase in road traffic noise for receptors to the north of Temple Sowerby and reductions in road traffic noise between Sowerby and Appleby West Morland as a result of the implementation of bypassing the existing A66.
		H	Option H would increase road traffic noise for receptors at Powis House and Roman Vale and reduce road traffic noise for receptors located in Crackenthorpe.
		I	Option I would increase road traffic noise due to reductions in the areas the new alignment would bypass.
		J	Option J would lead to an increase in road traffic noise in Bowes.
		K	Option K would lead to an increase in road traffic noise for receptors at Greta Bridge.
		N	Option N would lead to increases in road traffic noise between Greta Bridge and Gilling West and perceptible decreases

			at Ravensworth, where traffic flow is reduced on the existing road network
Nationally designated areas: National Parks, the Broads & Areas of Outstanding Natural Beauty	The Secretary of State should refuse development consent in these areas except in exceptional circumstances and where it can be demonstrated that it is in the public interest.	**E**	The route would bring the A66 closer to the North Pennines AONB than its current alignment, thereby potentially increasing its perceived influence on local landscape character and tranquillity.
		I	There may be some limited visibility of the proposed dualling and re-alignment, but the proposed route would be seen in the context of the existing A66 and would not result in notable changes to the perceived character of the North Pennine Moors AONB.
		J	The western end of this section (where the road is already dualled) clips the boundary with the North Pennines AONB.
Civil and military aviation and defence interests	Where, after reasonable mitigation, operational changes and planning obligations and requirements have been proposed, development consent should not be granted if the Secretary of State considers that: □ a development would prevent a licensed aerodrome from maintaining its licence;	**I**	Option I passes adjacent to the Warcop MOD Training Ground. Access to the site from the A66 may be temporarily restricted during construction. Engagement is on-going with the MoD site to keep them informed about the design/option.

	□ the benefits of the proposed development are outweighed by the harm to aerodromes serving business, training or emergency service needs; or □ the development would significantly impede or compromise the safe and effective use of defence assets or significantly limit military training.		

14 TRAFFIC & ECONOMICS ASSESSMENT

14.1 Introduction

14.1.1 This chapter provides an overview of the modelling and economic appraisal work undertaken for the assessment of the Recommended Preferred Route.

14.2 Traffic Assessment

14.2.1 The scheme has been assessed using the A66 transport model (A66TM) which was developed at PCF Stage 1 and updated at PCF Stage 2. The A66TM uses the North Regional Transport Model (NRTM) as a basis, with the key elements of the model structure retained, and the networks, representation of demand and validation refined along the A66 corridor.

14.2.2 The A66TM model development and forecast follow TAG guidelines, in particular:

- TAG unit M2 variable demand modelling;
- TAG unit M3-1 highway assignment modelling; and
- TAG unit M4 forecasting and uncertainty.

14.2.3 The NRTM covers the whole of the North-East Region, the County of Cumbria from the North-West region and northern districts of North Yorkshire. The A66 sits entirely within the NRTM area, with the Strategic Road Network (SRN) in the model area shown in **Figure 14-1**.

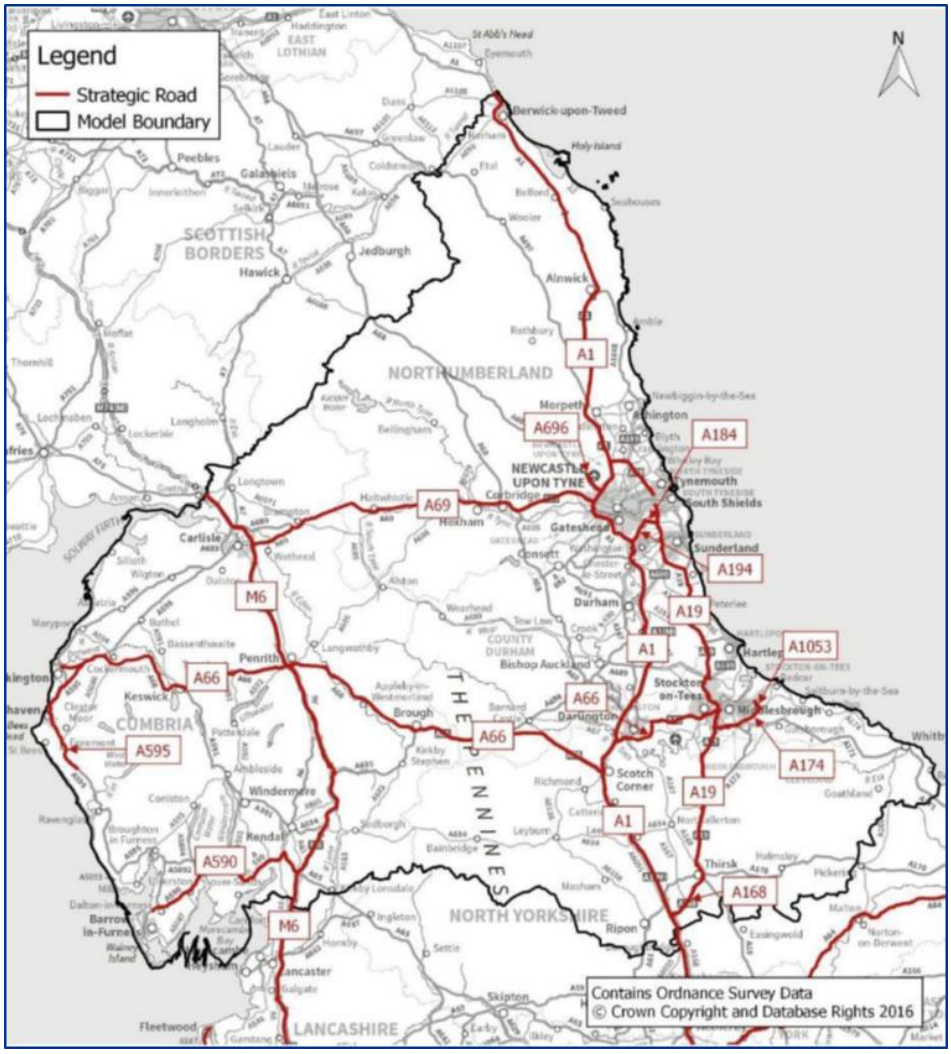


Figure 14-1: Strategic Road Network in NRTM area

14.2.4 The extent of both the A66TM model simulation and buffer areas have been retained from NRTM, however the A66TM simulation area is further subdivided to include a fully modelled area containing a more detailed level of coding enhancing the network detail along the A66 corridor.

14.2.5 The A66TM keeps the same model structure as the NRTM, with a highway SATURN supply model and a variable demand model system using DIADEM.

14.2.6 A review of existing models and data was carried out, and subsequently additional volumetric traffic data was collected along the A66 corridor. A comprehensive set of existing data was available from the development of the NRTM, including information on travel patterns, traffic volumes and network performance. The combination of existing and new data provided a comprehensive, up to date dataset, suitable for the development of a traffic model of the A66 corridor.

14.2.7 The geographical extent of the network is based on the NRTM. There has been some refinement to the level of detail included in the network, with increased network definition in the A66 corridor where needed and reduced definition in areas remote from the scheme. The highway element of the A66TM includes both, junction simulation and link-based capacity restraint

14.2.8 The time periods modelled represent an average AM peak period hour (07:00-10:00), an average hour in the inter-peak (10:00–16:00) and an average PM peak period hour (16:00–19:00). The time periods match those used in the NRTM. The base year model represents an average March weekday in 2015. This is consistent with NRTM and reflects that the origin destination (OD) dataset, traffic count dataset and journey time dataset are being adopted for the A66TM. The model represents cars for commute, other and employers' business journey purposes, light goods vehicles and heavy goods vehicles.

14.2.9 The results of the matrix calibration and validation in terms of flows across screen lines, and assignment validation in terms of traffic flow validation and journey time validation indicate that the model performs well overall and in the fully modelled area. Overall, the design of the modelling framework and performance are considered appropriate to assess highway schemes along the A66 corridor.

14.2.10 The variable demand model represents mode choice, destination choice and macro time of day choice demand responses. The demand model considers highway and rail modes.

14.2.11 Forecast year models have been developed for 2031, representing the scheme opening year; 2046 the scheme design year; and 2051.

14.2.12 An uncertainty log prepared in line with TAG Unit M4 has been produced, taking account of local sources of demand supply uncertainty concerning future developments and schemes in the model simulation area.

14.2.13 The National Trip End Model version 7.2 (NTEM 7.2) provides forecast trip end growth factors for car and rail. Light goods and heavy goods vehicle forecasts have been derived using Department for Transport Road Traffic Forecasts (2018).

14.2.14 Using the full variable demand modelling framework, Core Do Minimum and Do Something forecasts for the Recommended Preferred Route scheme have been produced. The key impacts both in the Do Minimum and Do Something scenarios are a change in the trip distribution in response to change in travel costs. The Do-Something demand change is driven by the scheme travel time improvements along the A66 and impact on assignment model re-routing and demand model re-distribution in response to the cost changes.

14.2.15 Using these VDM traffic forecasts for each forecast year, in conjunction with Highways England long term traffic count data (WebTRIS), Annual Average Daily Traffic Flows (AADT) have been calculated for the Do Minimum and Do Something Scenarios for the A66. Average forecast traffic flows across all section of the A66 between M6 J40 and Scotch Corner are shown in **Table 14-1**.

Scenario		Year		
		2031	2046	2051
Do Minimum	Total Flows (Vehs)	23,959	27,668	28,638
Do Something	Total Flows (Vehs)	31,164	37,176	39,101
	% Diff between Do-Min	30%	34%	37%

Source: Mott MacDonald

Table 14-1: Do Minimum and Do-Something A66 AADT Two-Way Flow (vehicles)

14.2.16 Comparing the Do Minimum and Do Something travel times along the A66 scheme corridor generate time savings of 10-15 minutes across the different modelled time periods and years.

14.2.17 The requirement for alternative growth scenarios is set out in TAG Unit M4. Using an approach agreed with the Department for Transport Low and High growth scenarios were produced based on rates taken from the 2018 Road Traffic Forecasts (Scenarios 6 and 2 respectively).

14.3 Economic Assessment

14.3.1 The economic appraisal, which allows Benefit to Cost Ratios (BCRs) to be estimated, is based primarily on calculations of user benefits in terms of time savings, changes in fuel and vehicle operating costs, and reduced road accidents.

14.3.2 The economic assessment of a scheme focuses on determining the costs and benefits of the scheme. By comparing the costs and benefits of the scheme over a 60-year assessment period from the proposed opening year, a Benefit Cost Ratio (BCR) can be calculated. The BCR, along with other impacts that can only be assessed qualitatively, are combined to determine the value for money of the scheme. The results are then used to allow decision makers to make informed decisions by comparing the different options under consideration, and to help prioritise schemes across the country.

14.3.3 Benefits appraised for the A66 scheme have been categorised as established monetised impacts, evolving monetised impacts, indicative impacts and non-monetised impacts, as per the Department for Transport's (DfT) Value for Money Framework[1] (see Table 14-2).

Established Monetised Impacts	Evolving Monetised Impacts	Indicative Monetised Impacts	Non-monetised Impacts
Level 1	Level 2	Level 3	
• Journey time savings • Vehicle operating costs • Accidents • Noise • Air quality • Construction delays • Greenhouse gases • Indirect taxes	• Journey Time Reliability / Resilience • Output in imperfectly competitive markets (10% of business benefits)	• Landscape monetisation	• Distributional impacts assessment • Biodiversity • Cultural Heritage • Water Environment

Table 14-2: Monetised and Non-Monetised Benefits Assessed for the A66

14.3.4 The overall appraisal is based on a comparison between the "With Scheme" and "Without

[1] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/630704/value-for-money-framework.pdf

Scheme" scenarios, referred as the 'Do-Something' and 'Do-Minimum' respectively in the Stage 2 Combined Modelling and Appraisal Report.

14.3.5 Established monetised impacts are based on well-researched methods, and their monetary value is used to generate the initial Benefit to Cost Ratio (BCR). Hence for A66, road user benefits (journey times, vehicle operating cost, user charge), safety benefits, noise, air quality, greenhouse gases and indirect tax revenues are included in the initial BCR.

14.3.6 The evolving monetised impacts have less evidence to support the estimation of the monetary value and are included to generate the adjusted Benefit to cost Ratio. For A66, that includes journey time reliability, resilience and wider impacts, which are added to the established monetised impacts to estimate the adjusted BCR.

14.3.7 Monetisation methodologies of Indicative monetised impacts are not considered sufficiently widely-accepted and have a high degree of uncertainty in the magnitude of the impacts.

14.3.8 Non-monetised benefits are qualitative assessments, based on a seven-point scale. For A66 scheme, non-monetised impacts comprise of distributional impacts assessment, landscape, biodiversity, cultural heritage and water environment.

14.3.9 Economic assumptions for PCF Stage 2 are based on the TAG Databook issued in May 2019, V1.12.

14.3.10 Costs are defined as the total amount of money spent on constructing and maintaining the scheme, as follows:

- Scheme costs are construction costs, land costs and preparation costs (planning and designing the scheme), as well as supervision costs during its construction.
- Traffic-related maintenance costs, such as non-routine reconstruction, resurfacing, surface dressing attributable to the investment (such traffic-related costs may be applicable to rail and public transport schemes, as well as highways investments) stated in TAG Unit A1.2.

14.3.11 The Present Value of Benefits (PVBs) for the Proposed Route option is substantial, with an estimated £665.88 million (discounted to 2010). The greatest portion of monetised benefits is expected to arise for business users. It is seen that benefits for business users of the A66 Northern Trans-Pennine Project account for nearly £578m (86%), followed by £56m (8.5%) for commute, and £39m (5.8%) for other users.

14.3.12 Over the 60-year appraisal period, the scheme is forecast to generate the initial BCR of 1.28 . With adjusted present value of benefits of £907m, adjusted BCR of 1.74 is expected.

14.3.13 To address safety concerns arising from these accidents, a speed limit of 40/50 mph was adopted on a number of the single-lane carriageway sections, compared to a speed limit of 60/70 mph elsewhere across the route. Dualling these sections to a modern design standard will increase capacity and address current safety concerns resulting in the removal of the lower average speed limits on the A66 especially. For this reason, the scheme is expected to result in journey time savings and potentially a slight increase in journey time reliability.

14.3.14 Increased road capacity and quality are expected to result in increased average speeds. This is expected to lead to increased vehicle operating costs. While this represents a dis-benefit to road users, there is expected to be a corresponding benefit to the exchequer from increased indirect tax revenue.

14.3.15 Due to increased average speeds, the scheme would also be expected to have adverse impacts on greenhouse gas emissions. According to current assessments this is not considered to be significant.

14.3.16 Due to the single carriageway sections across the A66 and the lack of alternative roads, it is expected that any construction could lead to increased delays, especially for online improvements.

14.3.17 During construction, the scheme is expected to lead to reduced access to services and increased severance due to lack of alternative roads for local communities. These adverse impacts can be mitigated through appropriate mitigation measures and efficient delivery and will be appraised as part of the social and distributional impact appraisal.

14.3.18 As the scheme is not within or very close to densely clustered urban centres (such as functional urban areas) the agglomeration benefits are not expected to be significant. Also, with the surrounding areas being both scarcely populated and no indications that transport is a barrier to local employment, there are no expected impacts on labour supply or movement to more/less productive jobs.

14.3.19 Any improvements across this route could potentially facilitate and support planned future developments in the study area, however as no site-specific impacts are expected and the scheme is in a non-urban area, dependent developments are not expected to be significant.

14.3.20 The scheme is unlikely to significantly change driver security. Also, a number of impacts such as affordability, accessibility, option and non-use values are not expected to be relevant as they are primarily relevant for public transport schemes involving changes to travel fares. Local evidence does not suggest that the scheme is expected to have significant townscape impacts. Also, due to the scheme scope there are no expected physical activity or journey quality impacts.

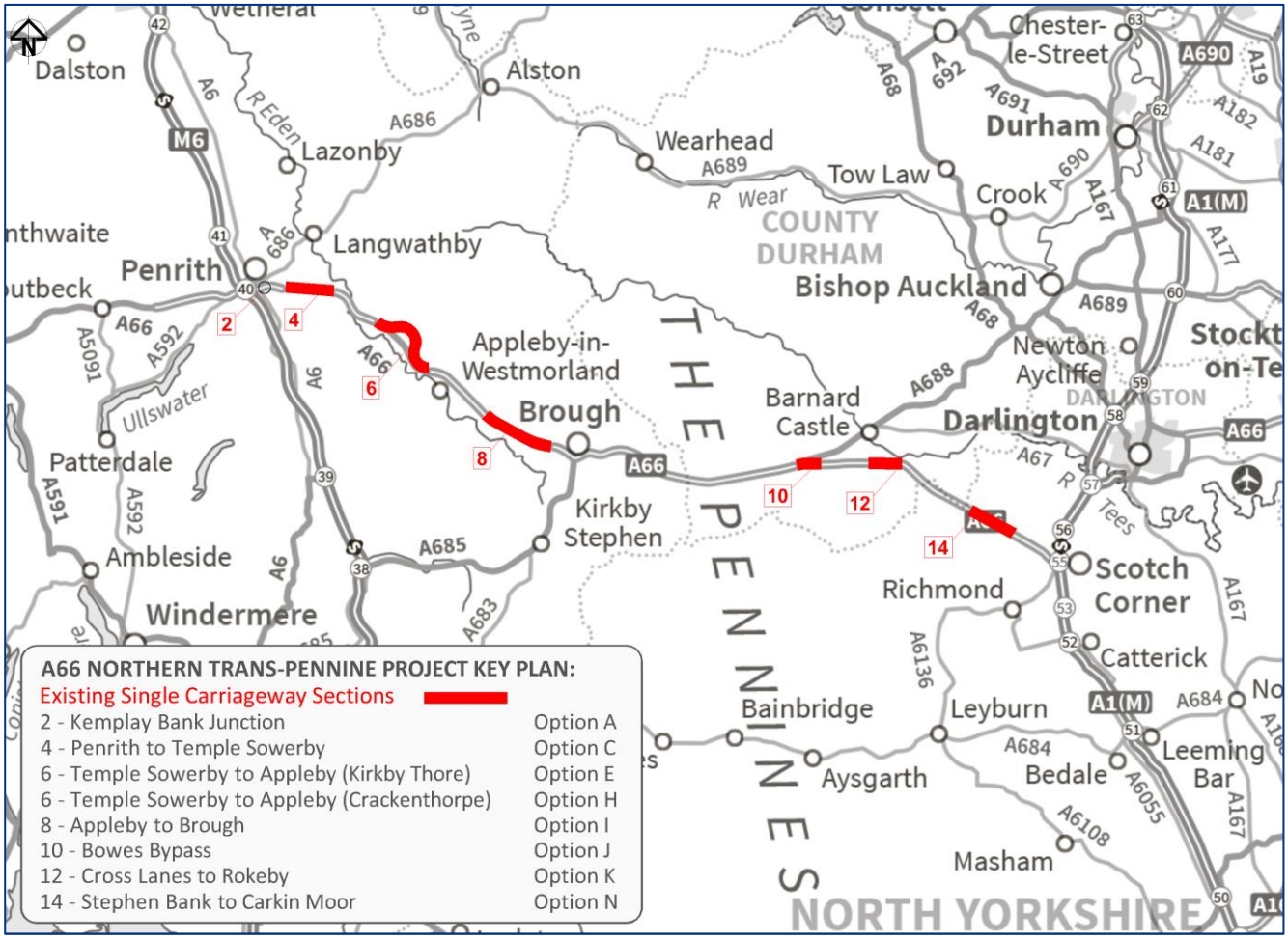
15 THE RECOMMENDED PREFERRED ROUTE

15.1 Description of the Recommended Preferred Route

15.1.1 The Recommended Preferred Route, as shown in Figure 15-1 encompasses the following options:

Project Section	Preferred Route Option
M6 J40 to Kemplay Bank Roundabout	Option A
Penrith to Temple Sowerby	Option C
Temple Sowerby to Appleby (Kirkby Thore)	Option E
Temple Sowerby to Appleby (Crackenthorpe)	Option H
Appleby to Brough	Option I
Bowes Bypass	Option J
Cross Lanes to Rokeby	Option K
Stephen Bank to Carkin Moor	Option N

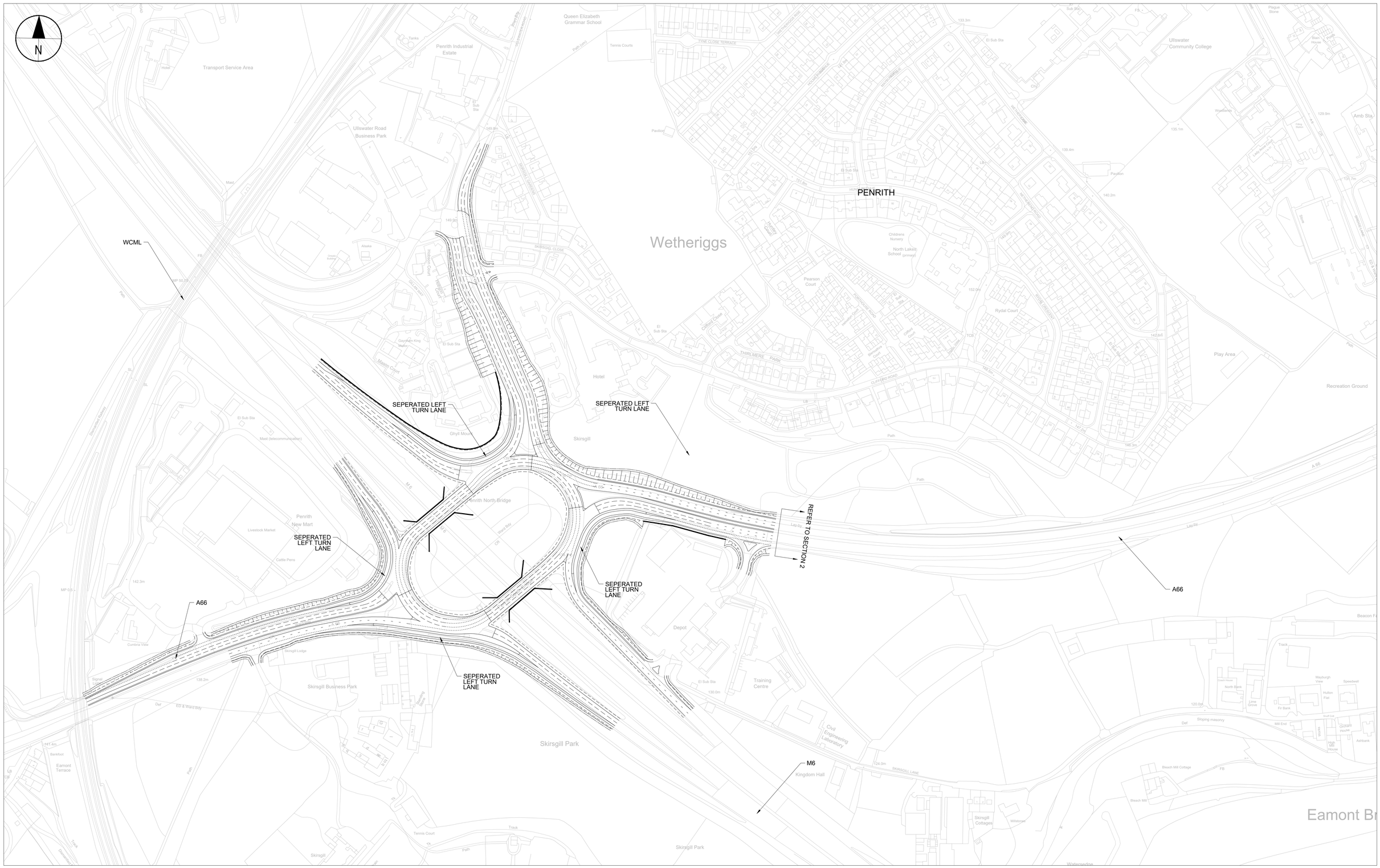
Figure 15-1: A66 Complete Preferred Route Recommendation



15.1.2 It is proposed that all interventions will be dual two lane carriageways utilising compact grade separated junctions

APPENDIX A

Shortlist Option Plans



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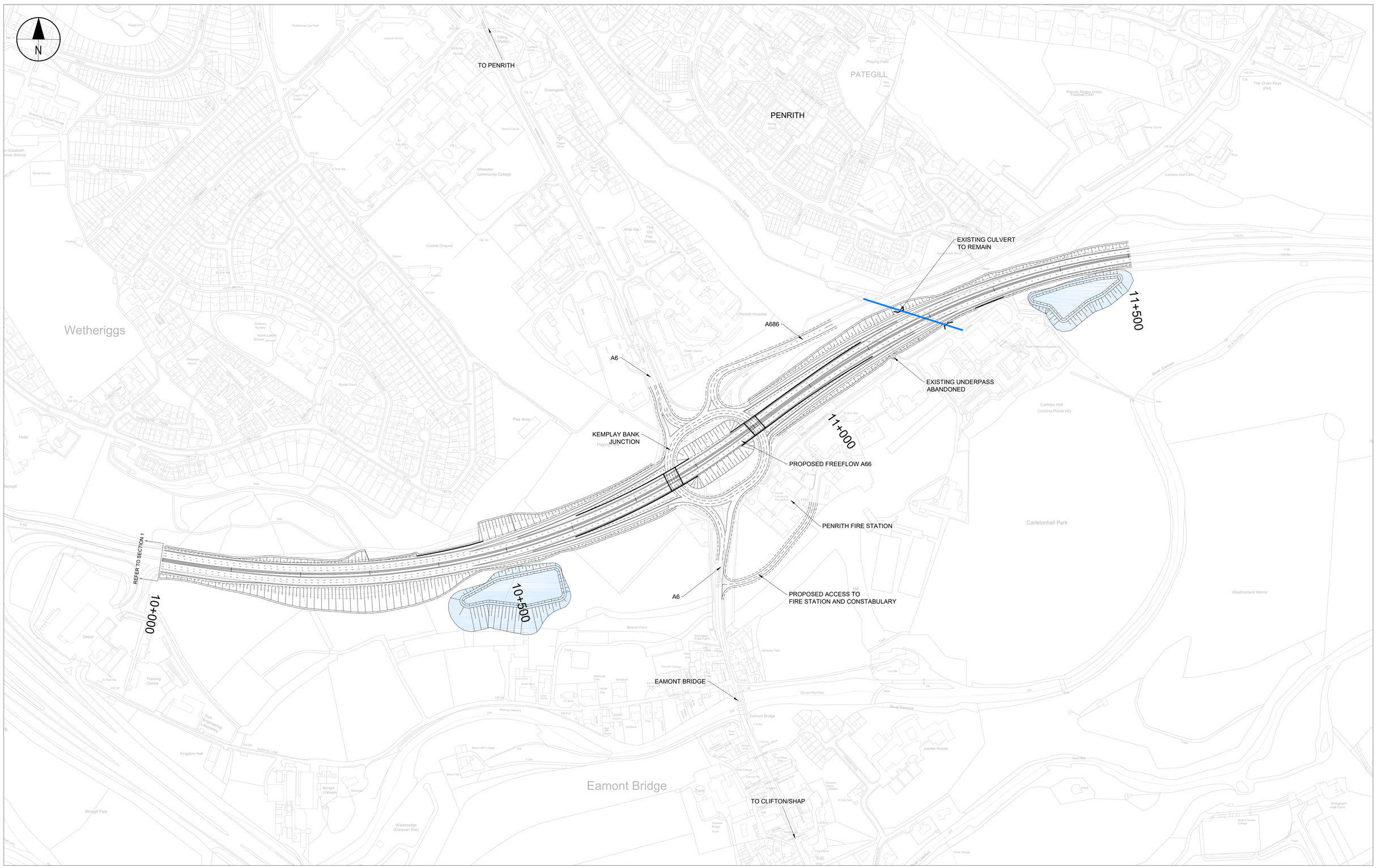

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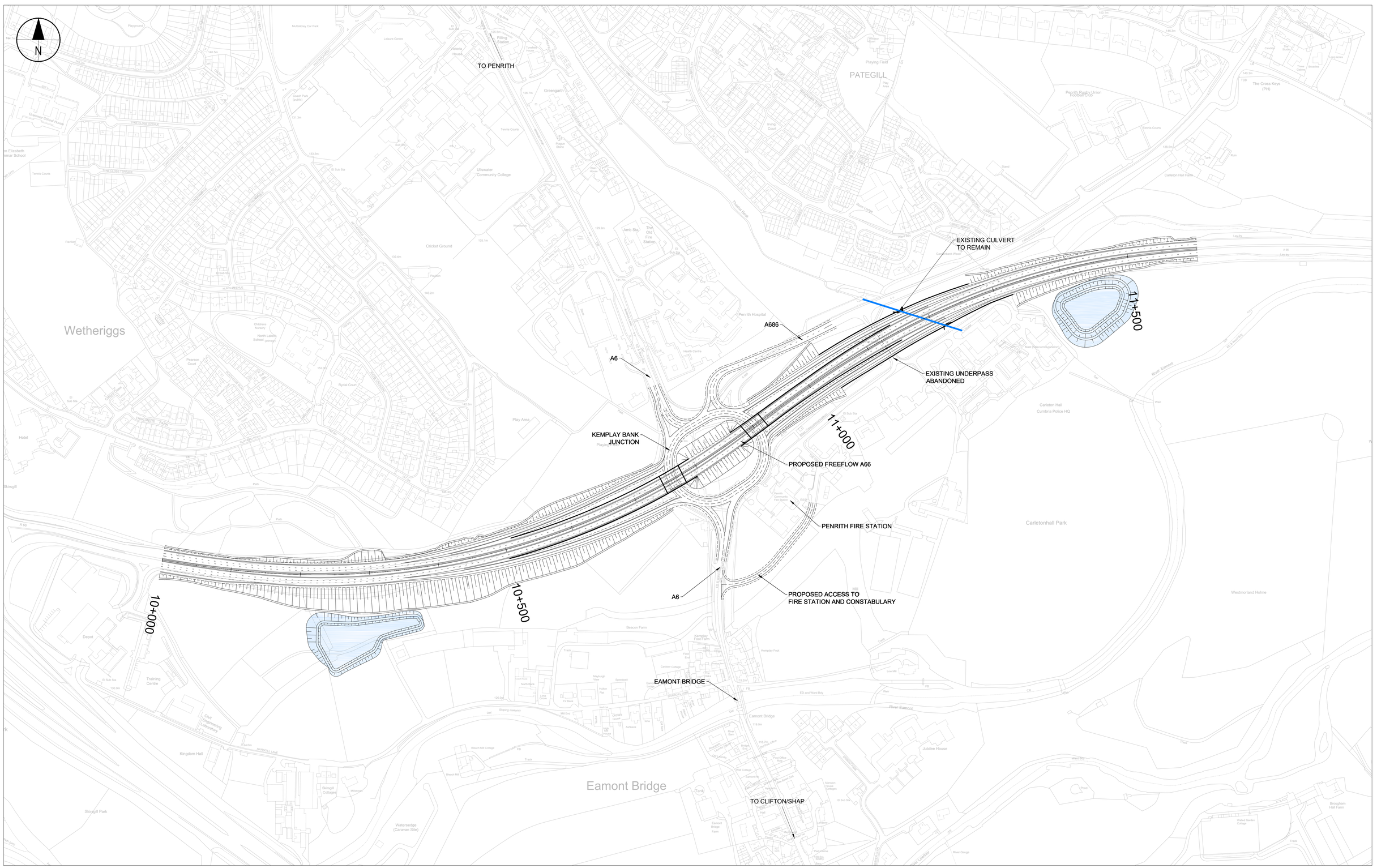

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Construction

A66.OH.S4.001, A66.BS.S4.001, A66.BS.S4.002, A66.BS.S4.005

Maintenance/Cleaning

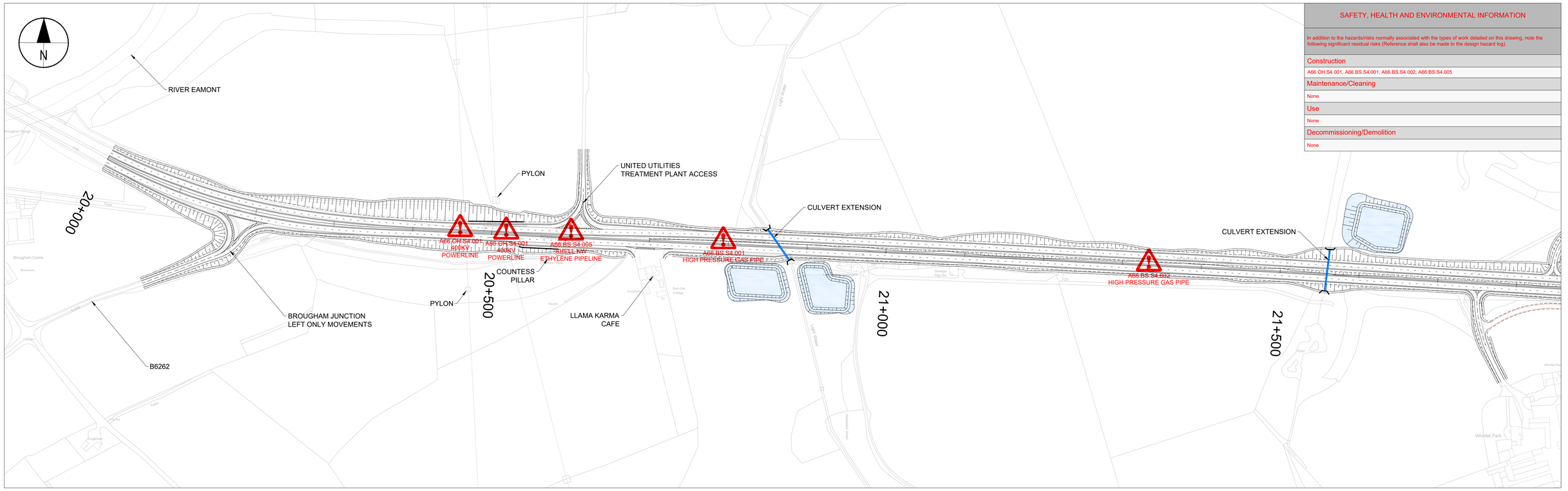
None

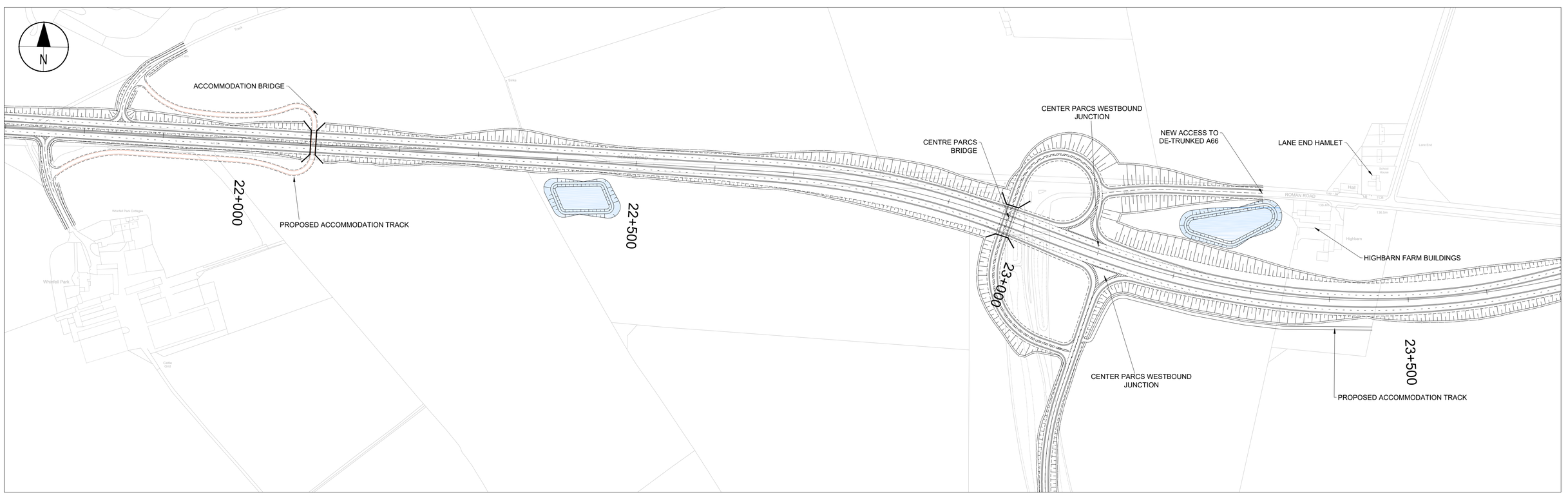
Use

None

Decommissioning/Demolition

None





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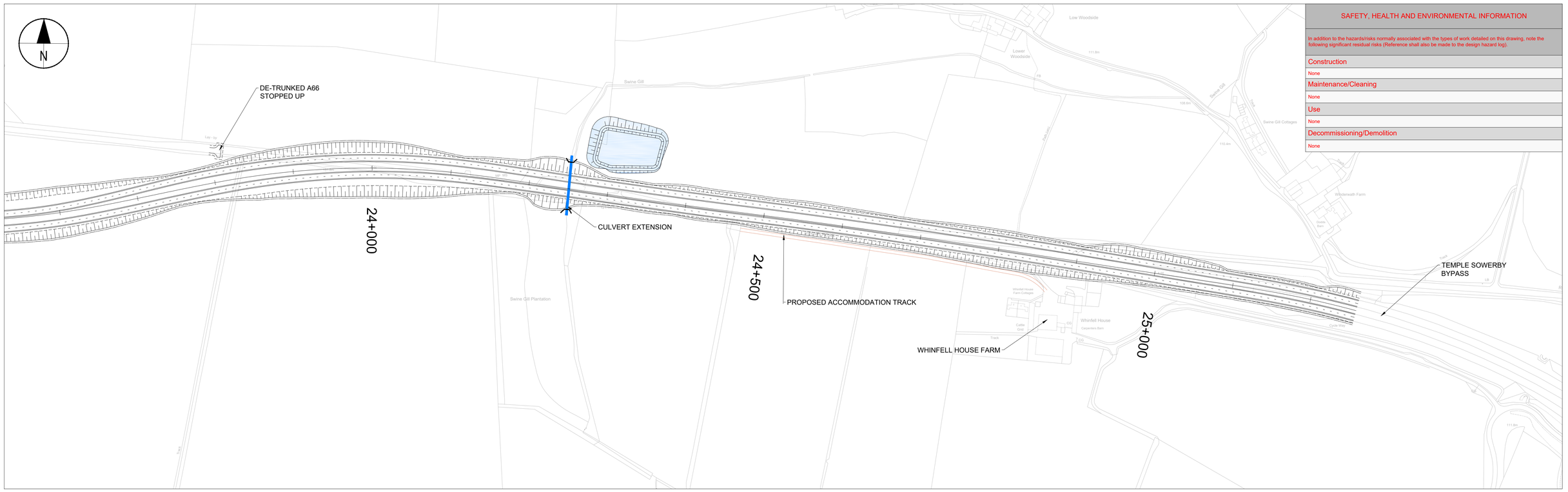

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None

Maintenance/Cleaning

None

Use

None

Decommissioning/Demolition

None

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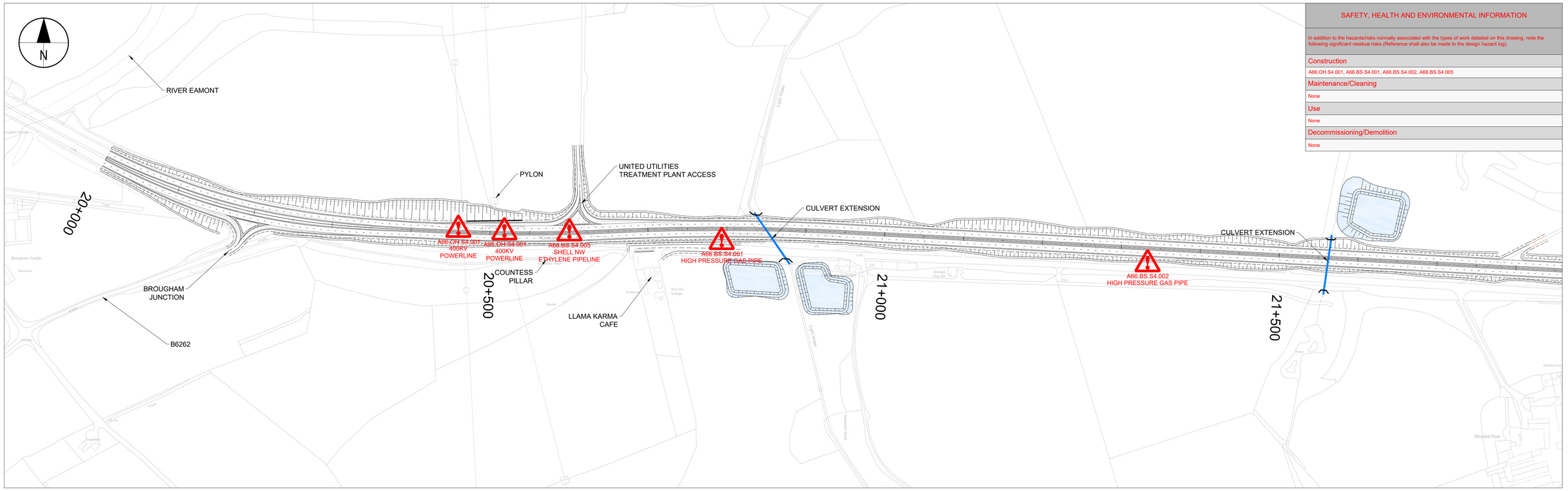
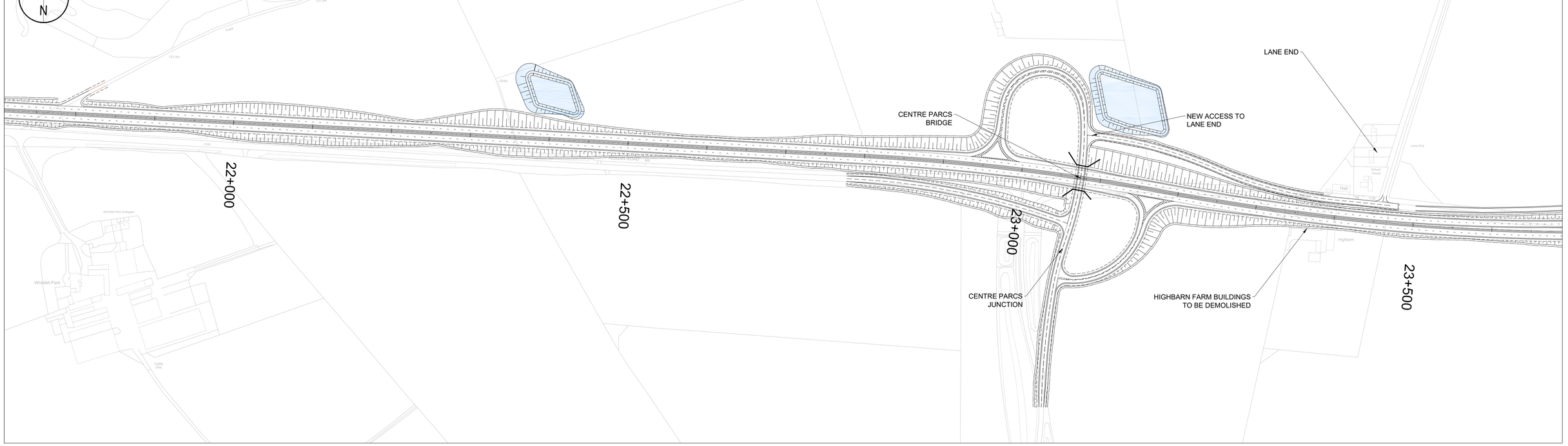


SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).
Construction
A66.OH.S4.001, A66.BS.S4.001, A66.BS.S4.002, A66.BS.S4.005
Maintenance/Cleaning
None
Use
None
Decommissioning/Demolition
None



Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
P06	S2	16 SEPT 19	ISSUED FOR INFORMATION	DA	PAW	RC

NOTES:
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3. ALL DIMENSIONS IN METERS UNLESS OTHERWISE STATED.

KEY:
HIGHWAY STRUCTURE
CULVERT

Client: highways england

ARCADIS Design & Consultancy for natural and built assets
Registered office: Arcadis House, 34 York Way, London, N1 9AB
Coordinating office: 5th Floor, 401 Faraday Street, Birchwood, Warrington, WA3 6GA, Tel: 44 (0)1925 800700

Project: A66 NORTHERN TRANS-PENNINE PROJECT

Drawing title: GENERAL ARRANGEMENT SECTION 4 OPTION D SHEET 1 OF 2

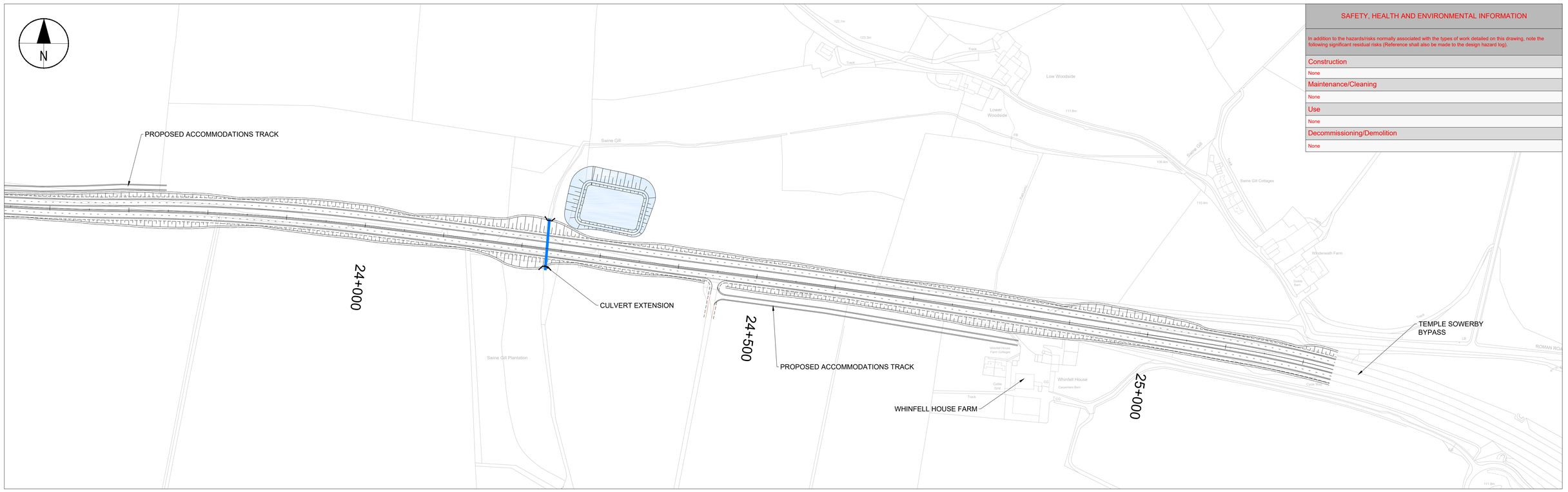
Status	S2 - FOR INFORMATION
Revision	P06
Scale	1:2500
Date	16 SEPT 19
Drawn By	DA
Checked By	PAW
Approved By	RC
Original Size	A1

UA009880

Drawing number: HA | PIN | Originator | Volume | Location | Type | Role | Number
HE565627-ARC-HML-S4_ZZ000-DR-D-1011

Print Date: 2019-09-17 09:19:21

File Path: C:\Sharepoint\ARCADIS\10018057 A66 Northern Trans-Pennine Project - Dig_Eng_Hiw_Str\WIP - Drawings\TEMP\HE565627-ARC-HML-S4_ZZ000-DR-D-1011.dwg Filename



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).

Construction

None

Maintenance/Cleaning

None

Use

None

Decommissioning/Demolition

None

Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
P06	S2	16 SEPT 19	ISSUED FOR INFORMATION	DA	PAW	RC

NOTES:
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KEY:
- HIGHWAY STRUCTURE
- CULVERT
- PROVISIONAL ATTENUATION POND

Client: highways england

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Registered office: Arcadis House, 34 York Way, London, N1 9AB
Coordinating office: 5th Floor, 401 Faraday Street, Birchwood, Warrington, WA3 6GA, Tel: 44 (0)1925 800700

Project: A66 NORTHERN TRANS-PENNINE PROJECT

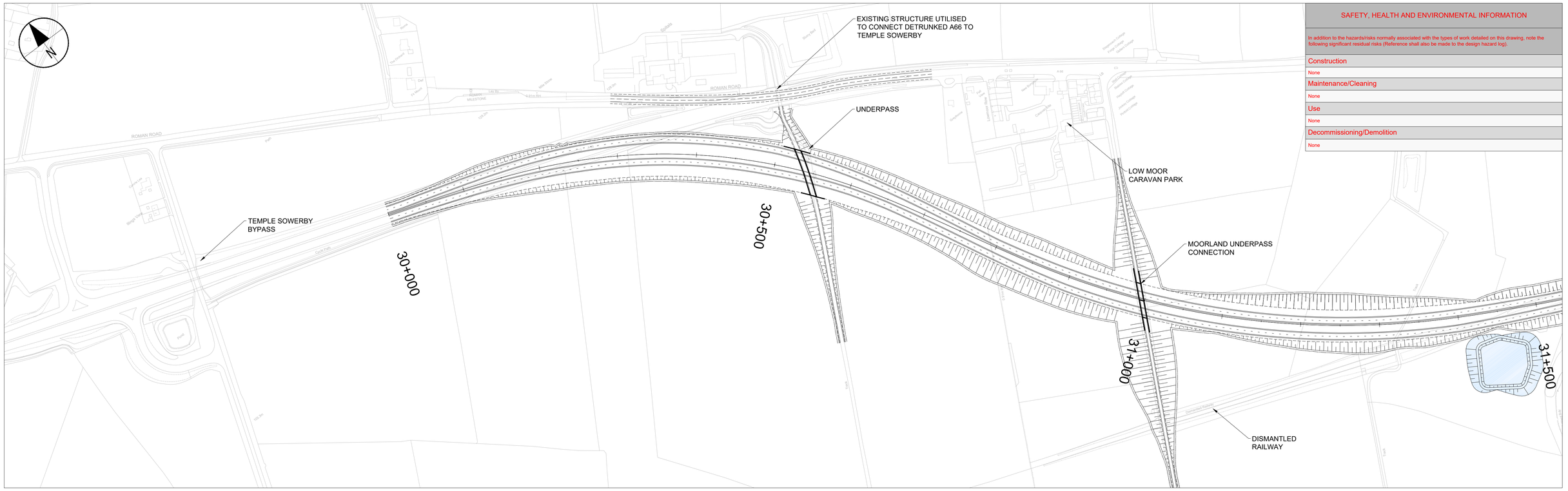
Drawing title: GENERAL ARRANGEMENT SECTION 4 OPTION D SHEET 2 OF 2

Status	S2 - FOR INFORMATION
Revision	P06
Scale	1:2500
Date -	16 SEPT 19
Drawn By	DA
Checked By	PAW
Approved By	RC
Original Size	A1

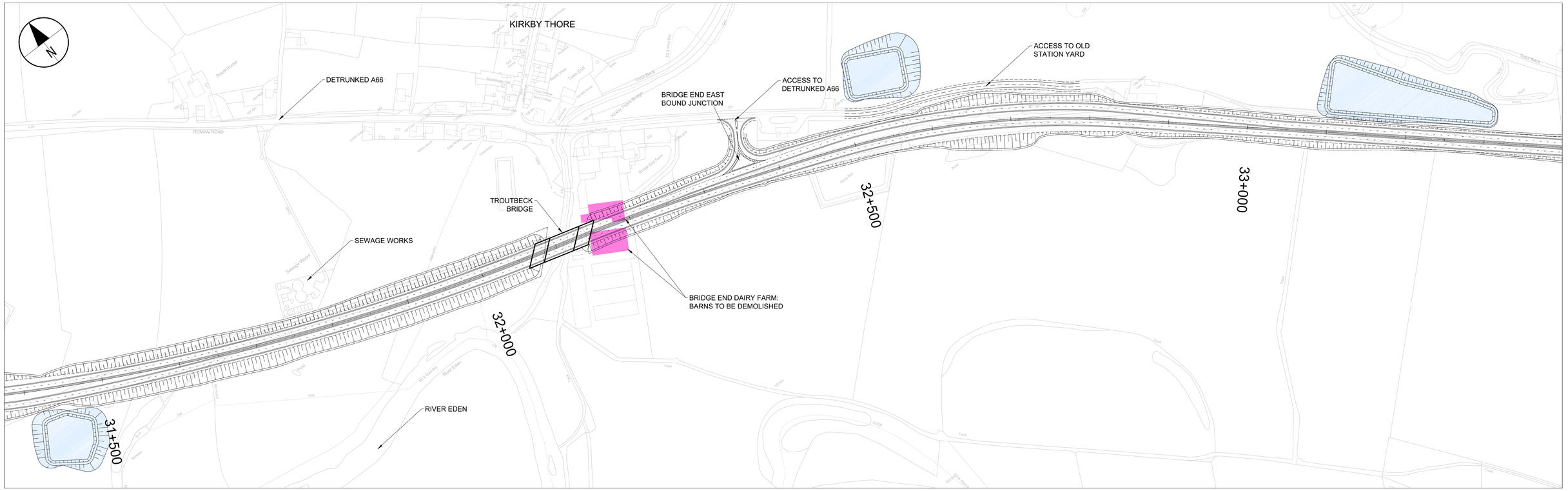
UA009880

Drawing number: HA | PIN | Originator | Volume | Location | Type | Role | Number
HE565627-ARC-HML-S4_ZZ000-DR-D-1012

Print Date: 2019-09-17 09:19:41 File Path: C:\Sharepoint\ARCADIS\10018057 A66 Northern Trans-Pennine Project - Dig_Eng_Hiw_Str\WIP - Drawings\TEMP\HE565627-ARC-HML-S4_ZZ000-DR-D-1012.dwg Filename



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).
Construction
None
Maintenance/Cleaning
None
Use
None
Decommissioning/Demolition
None



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KEY:
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- CULVERT
- PROVISIONAL ATTENUATION POND

Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
P06	S2	16 SEPT 19	ISSUED FOR INFORMATION	DA	PAW	RC

Client: highways england

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Registered office: Arcadis House, 34 York Way, London, N1 9AB
Coordinating office: 5th Floor, 401 Faraday Street, Birchwood, Warrington, WA3 6GA
Tel: 44 (0)1925 800700

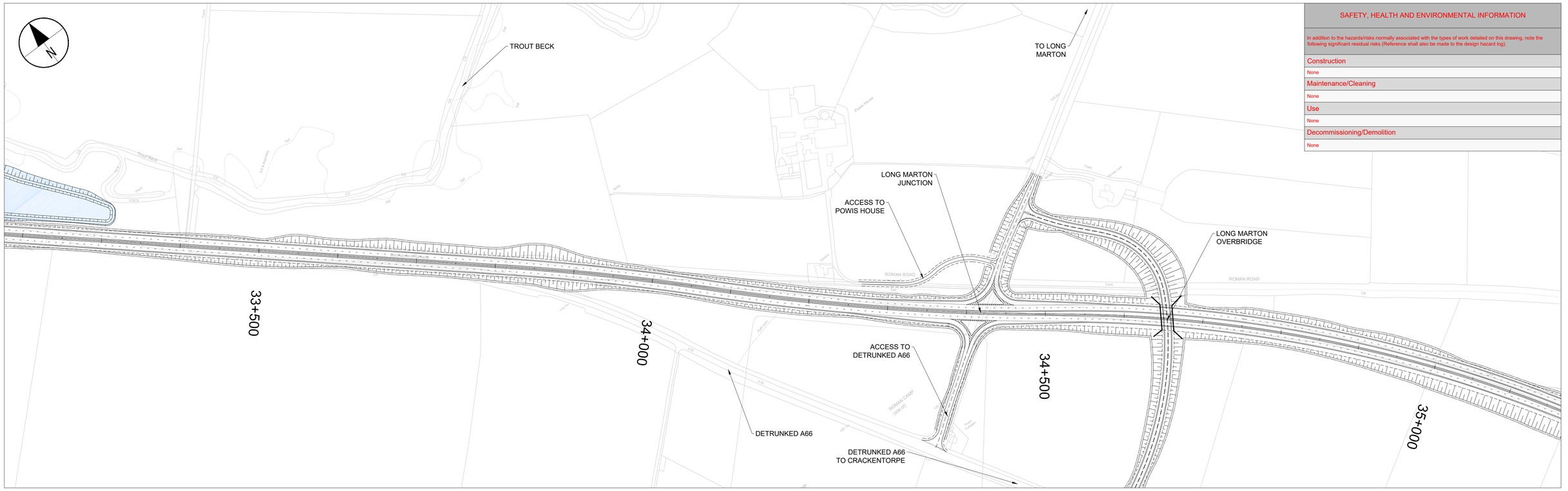
Project: A66 NORTHERN TRANS-PENNINE PROJECT

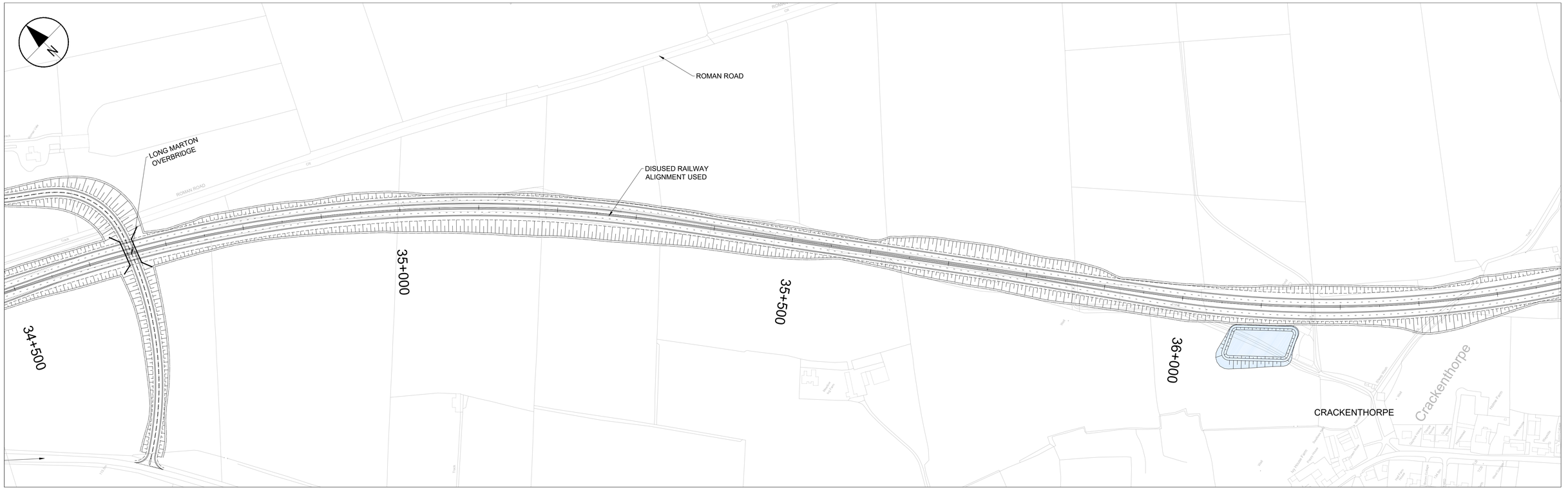
Drawing title: GENERAL ARRANGEMENT SECTION 6 OPTION F & G SHEET 1 OF 3

Status	S2 - FOR INFORMATION	Revision P06
Scale	1:2500	Date - 16 SEPT 19
Drawn By	DA	
Checked By	PAW	
Approved By	RC	
UA009880	Original Size	A1

Drawing number: HA | PIN | Originator | Volume | Location | Type | Role | Number
HE565627-ARC-HML-S6_ZZ000-DR-D-1011

Print Date: 2019-09-17 09:20:08 File Path: C:\Sharepoint\ARCADIS\10018057 A66 Northern Trans-Pennine Project - Dig_Eng_Hiw_Str\WIP - Drawings\TEMP\HE565627-ARC-HML-S6_ZZ000-DR-D-1011.dwg Filename





SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).

Construction

None

Maintenance/Cleaning

None

Use

None

Decommissioning/Demolition

None

NOTES:
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KEY:
- HIGHWAY STRUCTURE
- CULVERT
- PROVISIONAL ATTENUATION POND

Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
P06	S2	16 SEPT 19	ISSUED FOR INFORMATION	DA	PAW	RC

Client: highways england

ARCADIS Design & Consultancy for natural and built assets
Registered office: Arcadis House, 34 York Way, London, N1 9AB
Coordinating office: 5th Floor, 401 Faraday Street, Birchwood, Warrington, WA3 6GA, Tel: 44 (0)1925 800700

Project: A66 NORTHERN TRANS-PENNINE PROJECT

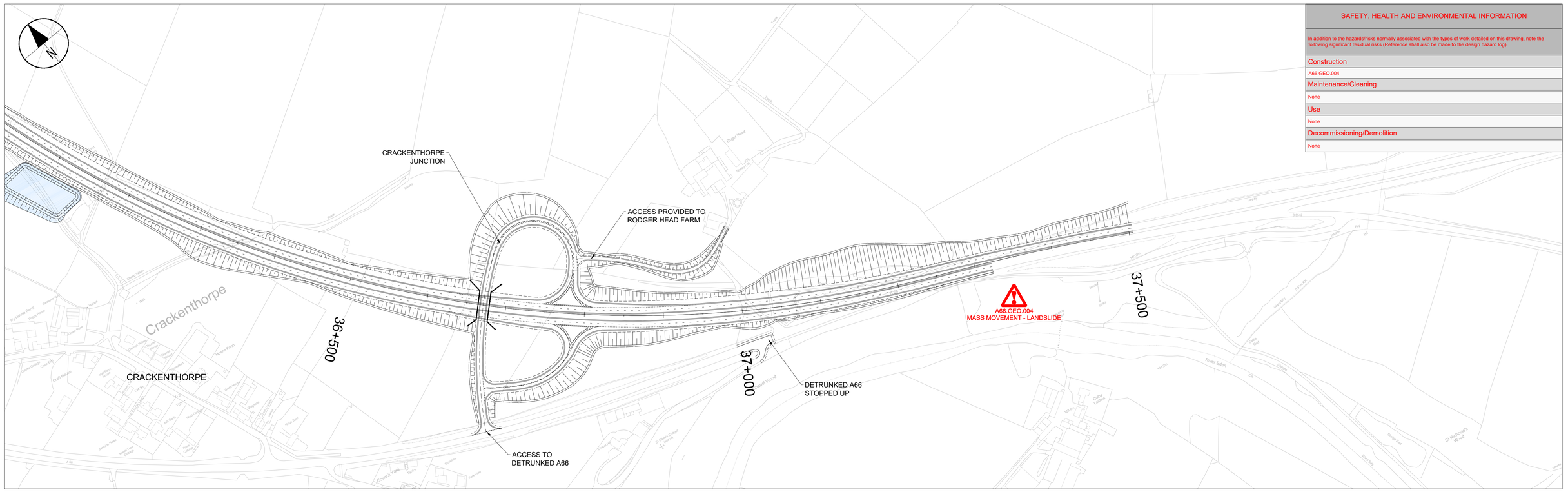
Drawing title: GENERAL ARRANGEMENT SECTION 6 OPTION F & G SHEET 2 OF 3

	Status: S2 - FOR INFORMATION	Revision: P06
Scale	1:2500	Date - 16 SEPT 19
Drawn By	DA	
Checked By	PAW	
Approved By	RC	
UA009880	Original Size	A1

Drawing number: HA | PIN | Originator | Volume | Location | Type | Role | Number
HE565627-ARC-HML-S6_ZZ000-DR-D-1012

Print Date: 2019-09-17 09:20:32 File Path: C:\Sharepoint\ARCADIS\10018057 A66 Northern Trans-Pennine Project - Dig_Eng_Hiw_Str\WIP - Drawings\TEMP\HE565627-ARC-HML-S6_ZZ000-DR-D-1012.dwg Filename

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).
Construction
A66.GEO.004
Maintenance/Cleaning
None
Use
None
Decommissioning/Demolition
None



P06	S2	16 SEPT 19	ISSUED FOR INFORMATION	DA	PAW	RC
Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd

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KEY:

—	HIGHWAY STRUCTURE
—	CULVERT
▨	PROVISIONAL ATTENUATION POND

Client

highways england

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Registered office:
Arcadis House
34 York Way
London
N1 9AB

Coordinating office:
5th Floor, 401 Faraday Street
Birchwood
Warrington, WA3 6GA
Tel: 44 (0)1925 800700

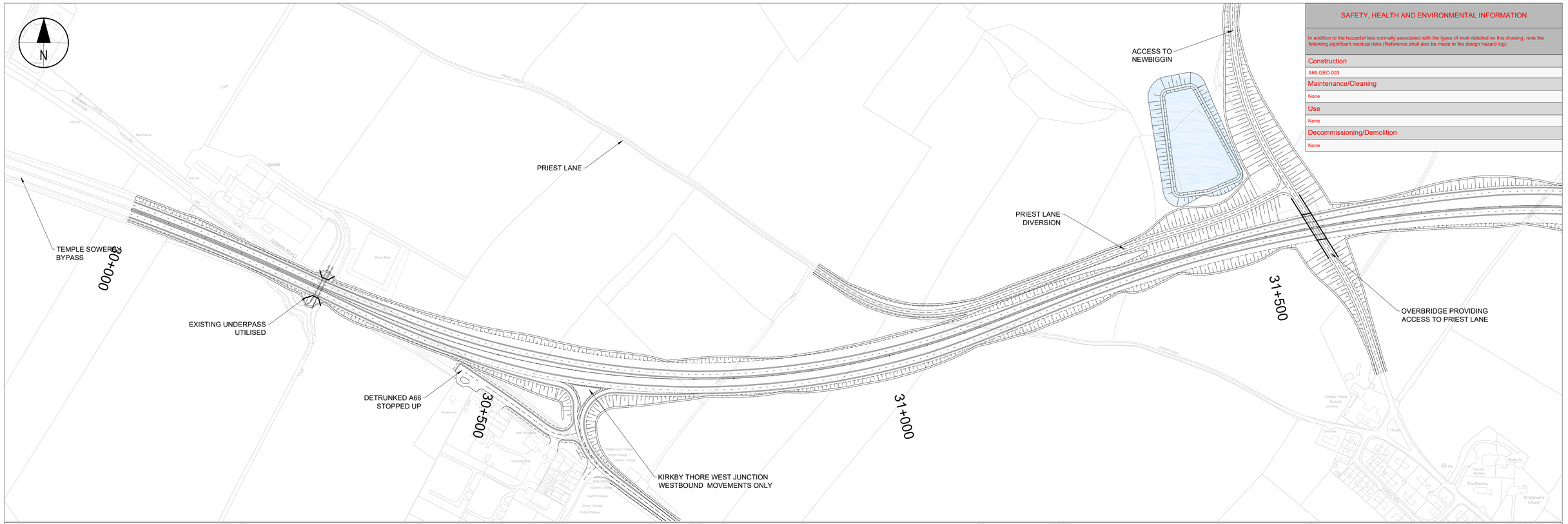
Project
A66 NORTHERN
TRANS-PENNINE PROJECT

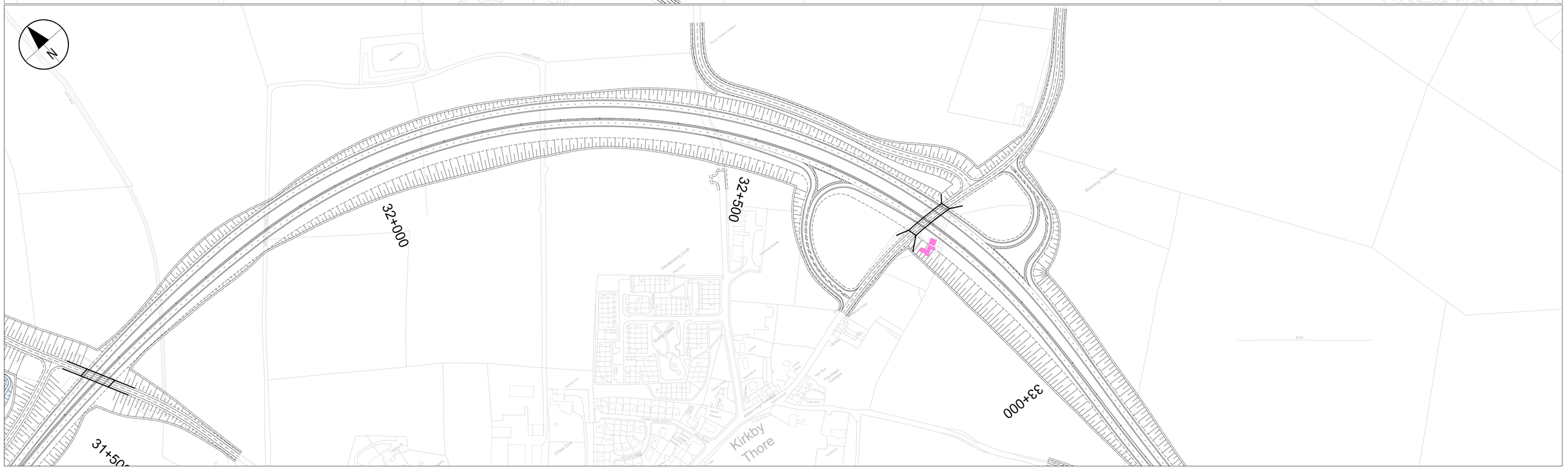
Drawing title
GENERAL ARRANGEMENT
SECTION 6
OPTION F & G
SHEET 3 OF 3

	Status S2 - FOR INFORMATION	Revision P06	
Scale	1:2500	Date - 16 SEPT 19	
Drawn By	DA		
Checked By	PAW		
Approved By	RC		
	UA009880	Original Size	A1

Drawing number HA PIN | Originator | Volume | Location | Type | Role | Number
HE565627-ARC-HML-S6_ZZ000-DR-D-1013

Print Date: 2019-09-17 09:20:52 File Path: C:\Sharepoint\ARCADIS\10018057 A66 Northern Trans-Pennine Project - Dig_Eng_Hiw_Str\WIP - Drawings\TEMP\HE565627-ARC-HML-S6_ZZ000-DR-D-1013.dwg Filename





SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).

Construction

A66.GEO.003

Maintenance/Cleaning

None

Use

None

Decommissioning/Demolition

None

Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
P04	S2	16 SEPT 19	ISSUED FOR INFORMATION	DA	PAW	RC

NOTES:
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KEY:
- HIGHWAY STRUCTURE
- CULVERT
- PROVISIONAL ATTENUATION POND

Client: highways england

ARCADIS Design & Consultancy for natural and built assets
Registered office: Arcadis House, 34 York Way, London, N1 9AB
Coordinating office: 5th Floor, 401 Faraday Street, Birchwood, Warrington, WA3 6GA
Tel: 44 (0)1925 800700

Project: A66 NORTHERN TRANS-PENNINE PROJECT

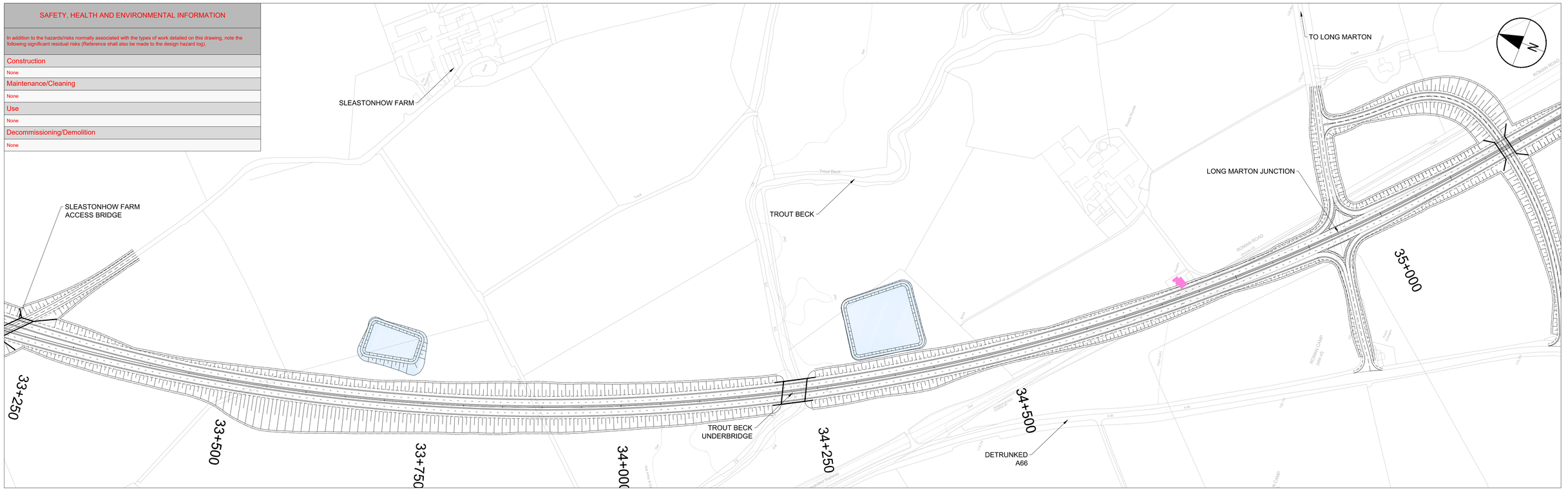
Drawing title: GENERAL ARRANGEMENT SECTION 6 OPTION E & H SHEET 1 OF 3

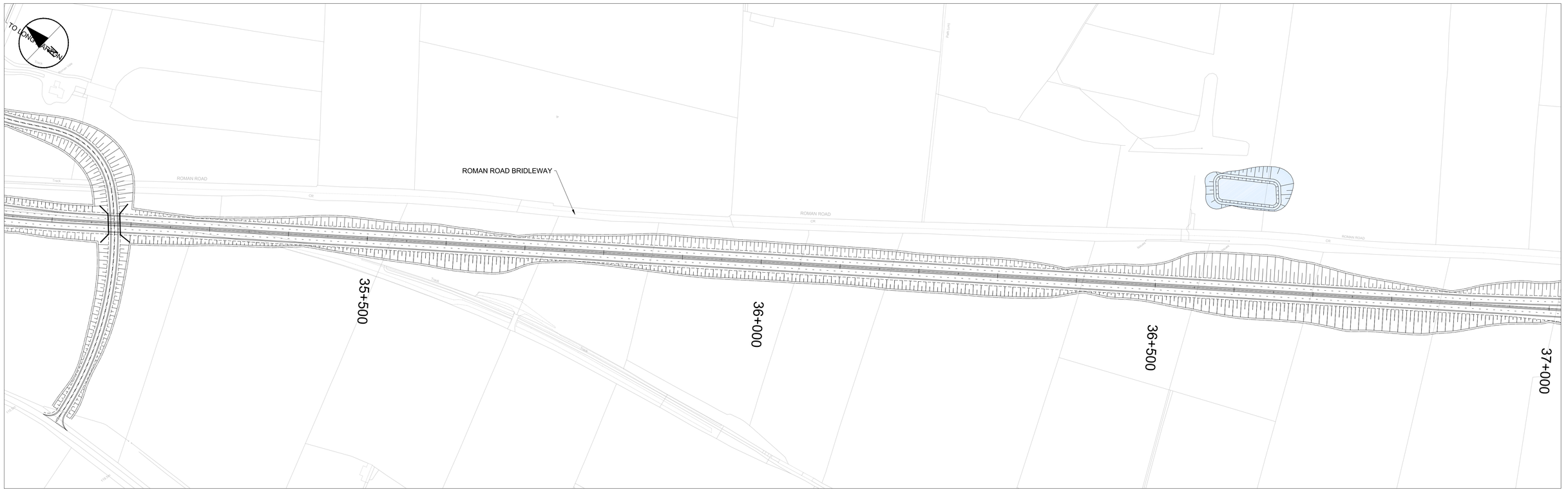
Status	S2 - FOR INFORMATION	Revision P04
Scale	1:2500	Date - 16 SEPT 19
Drawn By	DA	
Checked By	PAW	
Approved By	RC	
UA009880	Original Size	A1

Drawing number: HA | PIN | Originator | Volume | Location | Type | Role | Number
HE565627-ARC-HML-S6_ZZ000-DR-D-1031

Print Date: 2019-09-17 09:21:20 File Path: C:\Sharepoint\ARCADIS\10018057 A66 Northern Trans-Pennine Project - Dig_Eng_Hiw_Str\WIP - Drawings\TEMP\HE565627-ARC-HML-S6_ZZ000-DR-D-1031.dwg Filename

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).
Construction
None
Maintenance/Cleaning
None
Use
None
Decommissioning/Demolition
None





Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
P04	S2	16 SEPT 19	ISSUED FOR INFORMATION	DA	PAW	RC

NOTES:
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KEY:
HIGHWAY STRUCTURE
CULVERT
PROVISIONAL ATTENUATION POND

Client: highways england

ARCADIS Design & Consultancy for natural and built assets
Registered office: Arcadis House, 34 York Way, London, N1 9AB
Coordinating office: 5th Floor, 401 Faraday Street, Birchwood, Warrington, WA3 6GA, Tel: 44 (0)1925 800700

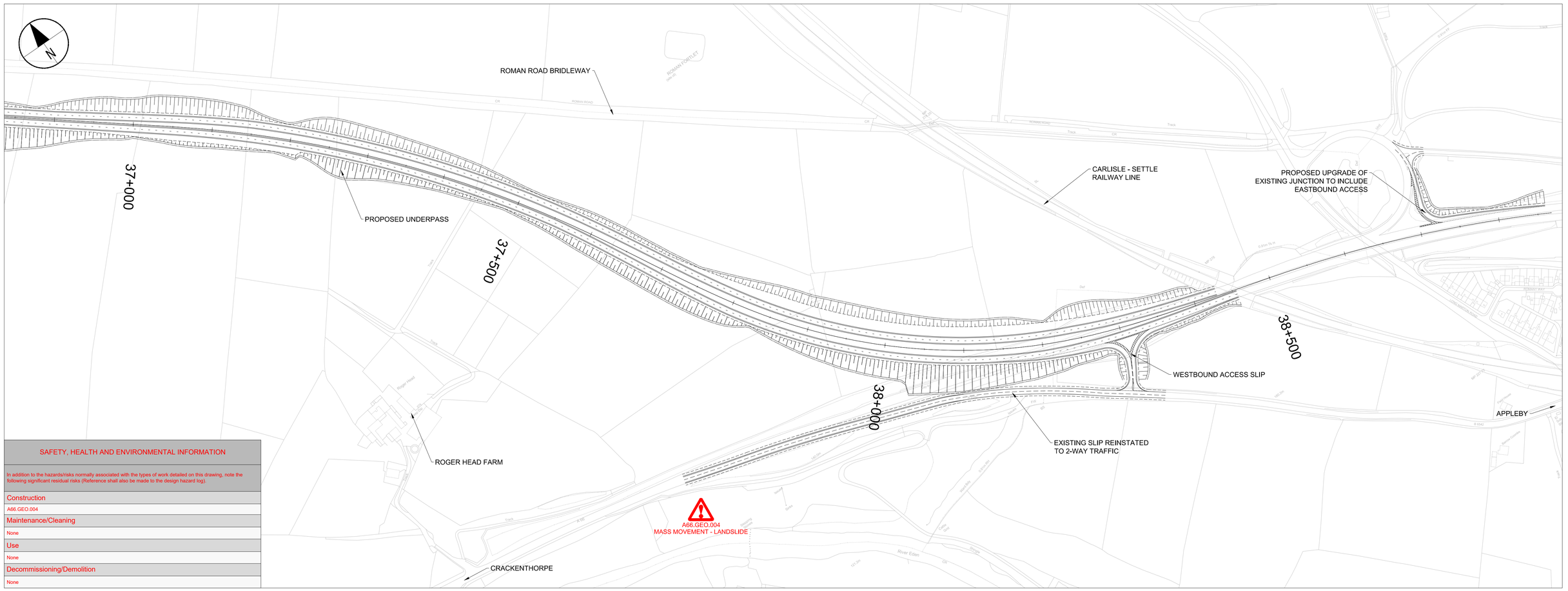
Project: A66 NORTHERN TRANS-PENNINE PROJECT

Drawing title: GENERAL ARRANGEMENT SECTION 6 OPTION E & H SHEET 2 OF 3

Status	S2 - FOR INFORMATION	Revision P04
Scale	1:2500	Date - 16 SEPT 19
Drawn By	DA	
Checked By	PAW	
Approved By	JG	
UA009880	Original Size	A1

Drawing number: HA | PIN | Originator | Volume | Location | Type | Role | Number
HE565627-ARC-HML-S6_ZZ000-DR-D-1032

Print Date: 2019-09-17 09:21:46 File Path: C:\Sharepoint\ARCADIS\10018057 A66 Northern Trans-Pennine Project - Dig_Eng_Hiw_Str\WIP - Drawings\TEMP\HE565627-ARC-HML-S6_ZZ000-DR-D-1032.dwg Filename



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).
Construction
A66.GEO.004
Maintenance/Cleaning
None
Use
None
Decommissioning/Demolition
None

Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
P04	S2	16 SEPT 19	ISSUED FOR INFORMATION	DA	PAW	RC

NOTES:
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KEY:
- HIGHWAY STRUCTURE
- CULVERT
- PROVISIONAL ATTENUATION POND

Client: highways england

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Registered office: Arcadis House, 34 York Way, London, N1 9AB
Coordinating office: 5th Floor, 401 Faraday Street, Birchwood, Warrington, WA3 6GA
Tel: 44 (0)1925 800700

Project: A66 NORTHERN TRANS-PENNINE PROJECT

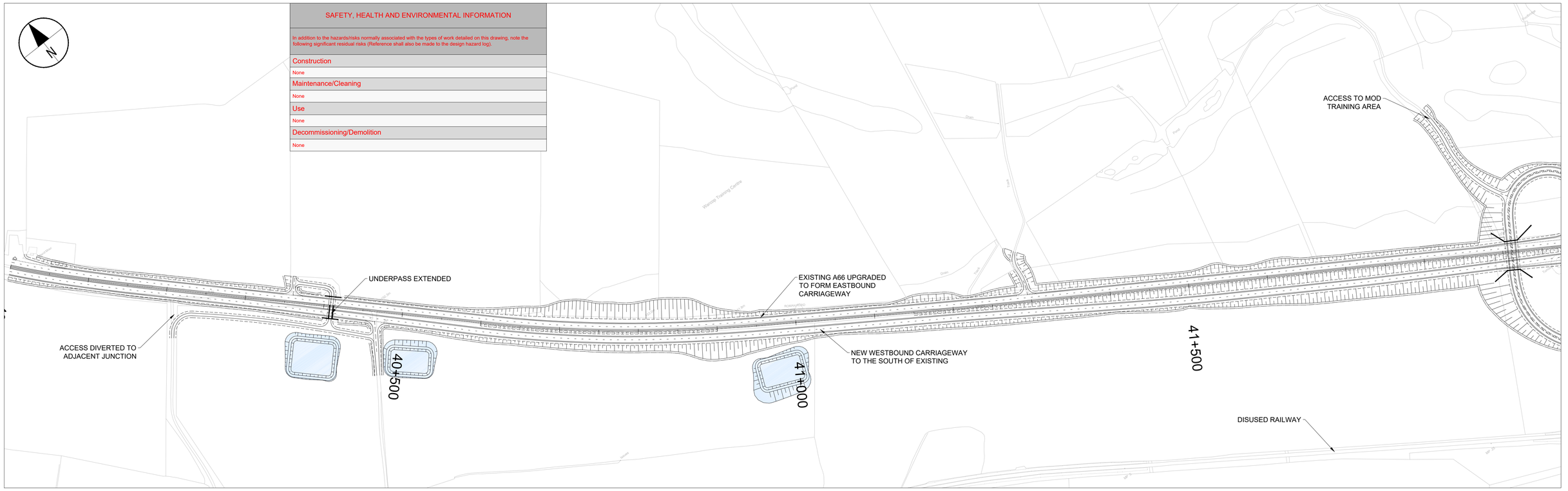
Drawing title: GENERAL ARRANGEMENT SECTION 6 OPTION E & H SHEET 3 OF 3

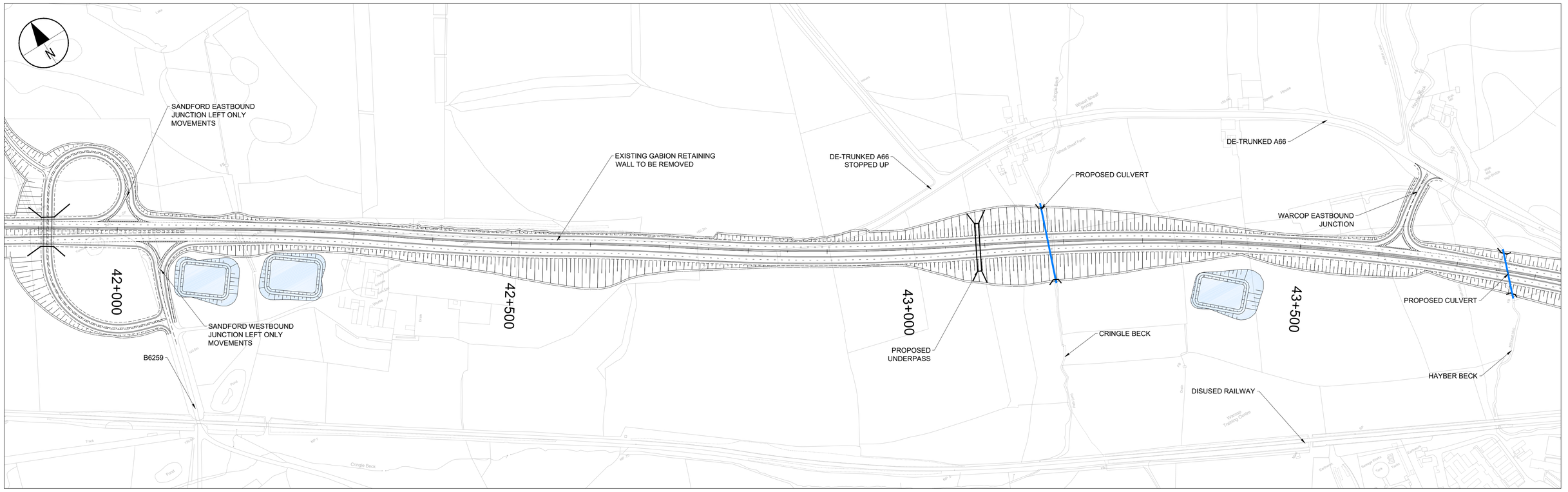
	Status: S2 - FOR INFORMATION	Revision: P03
Scale	1:2500	Date - 16 SEPT 19
Drawn By	DA	
Checked By	PAW	
Approved By	JG	
UA009880	Original Size	A1

Drawing number: HA | PIN | Originator | Volume | Location | Type | Role | Number
HE565627-ARC-HML-S6_ZZ000-DR-D-1033

Print Date: 2019-09-17 09:22:09
File Path: C:\Sharepoint\ARCADIS\10018057 A66 Northern Trans-Pennine Project - Dig_Eng_Hiw_Str\WIP - Drawings\TEMP\HE565627-ARC-HML-S6_ZZ000-DR-D-1033.dwg Filename

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).
Construction
None
Maintenance/Cleaning
None
Use
None
Decommissioning/Demolition
None





Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
P06	S2	16 SEPT 19	ISSUED FOR INFORMATION	DA	PAW	RC

NOTES:
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KEY:
- HIGHWAY STRUCTURE
- CULVERT
- PROVISIONAL ATTENUATION POND

Client: highways england

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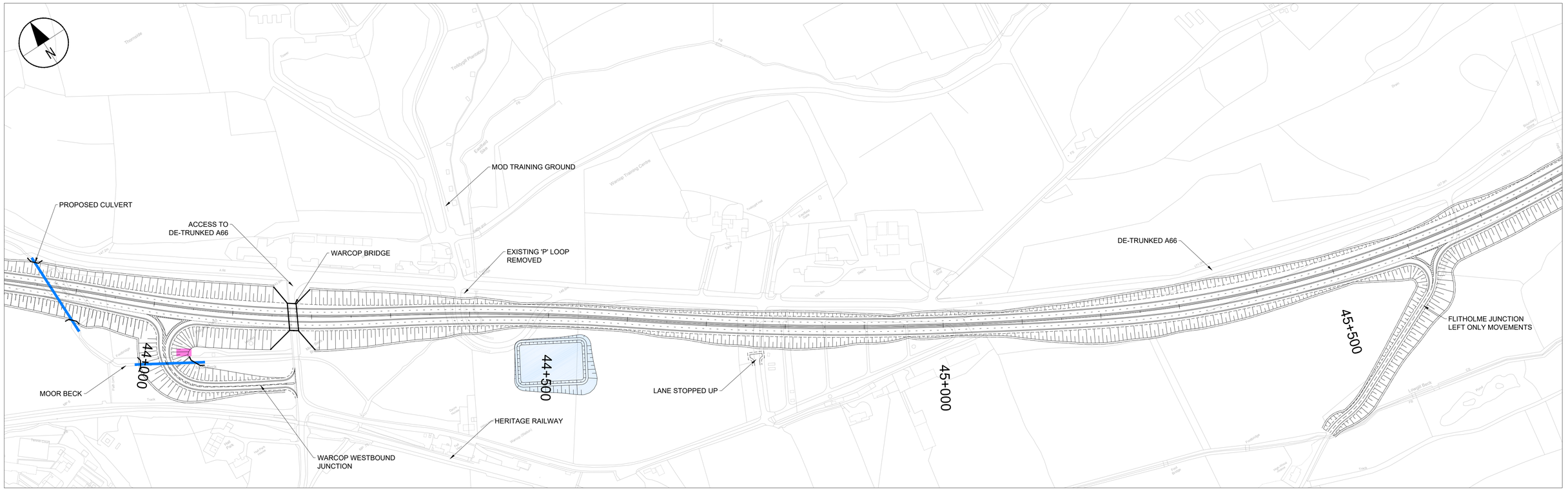
Project: A66 NORTHERN TRANS-PENNINE PROJECT

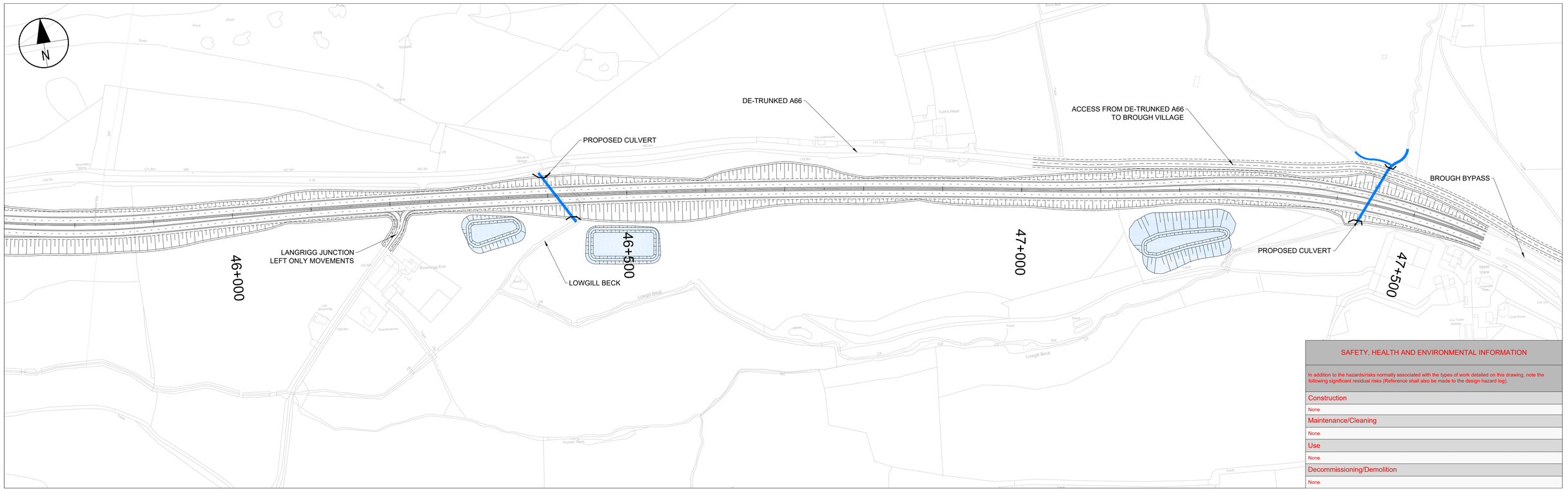
Drawing title: GENERAL ARRANGEMENT SECTION 8 OPTION I SHEET 1 OF 2

Status	S2 - FOR INFORMATION
Revision	P06
Scale	1:2500
Date	23 JUL 19
Drawn By	DA
Checked By	PAW
Approved By	RC
	UA009880
Original Size	A1

Drawing number: HA | PIN | Originator | Volume | Location | Type | Role | Number
HE565627-ARC-HML-S8_ZZ-000-DR-D-1001

Print Date: 2019-09-17 09:22:33
File Path: C:\Sharepoint\ARCADIS\10018057 A66 Northern Trans-Pennine Project - Dig_Eng_Hiw_Str\WIP - Drawings\TEMP\HE565627-ARC-HML-S8_ZZ000-DR-D-1001.dwg Filename





SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

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Construction
None

Maintenance/Cleaning
None

Use
None

Decommissioning/Demolition
None

Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
P06	S2	16 SEPT 19	ISSUED FOR INFORMATION	DA	PAW	RC

NOTES:
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KEY:
HIGHWAY STRUCTURE
CULVERT
PROVISIONAL ATTENUATION POND

Client: highways england

ARCADIS Design & Consultancy for natural and built assets
Registered office: Arcadis House, 34 York Way, London, N1 9AB
Coordinating office: 5th Floor, 401 Faraday Street, Birchwood, Warrington, WA3 6GA, Tel: 44 (0)1925 800700

Project: A66 NORTHERN TRANS-PENNINE PROJECT

Drawing title: GENERAL ARRANGEMENT SECTION 8 OPTION I SHEET 2 OF 2

Status	S2 - FOR INFORMATION
Revision	P06
Scale	1:2500
Date	16 SEPT 19
Drawn By	DA
Checked By	PAW
Approved By	RC
Original Size	A1

UA009880

Drawing number: HA | PIN | Originator | Volume | Location | Type | Role | Number
HE565627-ARC-HML-S8_ZZ000-DR-D-1002

Print Date: 2019-09-17 09:22:57
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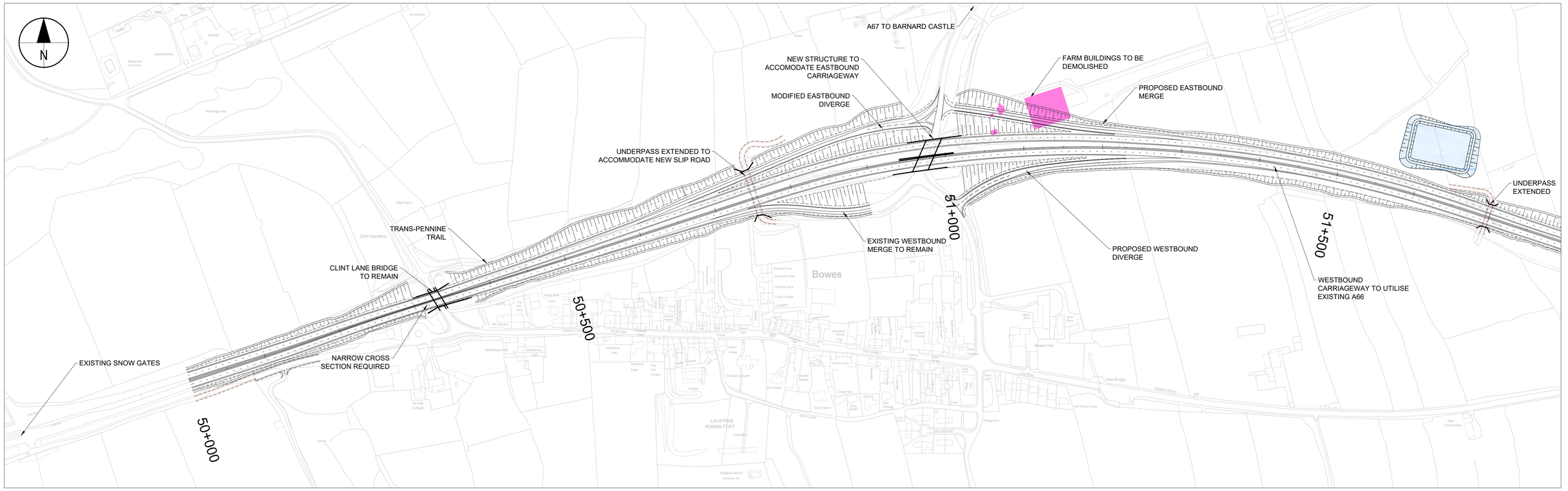

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).

Construction

None

Maintenance/Cleaning

None

Use

None

Decommissioning/Demolition

None

Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
P06	S2	16 SEPT 19	ISSUED FOR INFORMATION	DA	PAW	RC

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KEY:
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- CULVERT
- PROVISIONAL ATTENUATION POND

Client: highways england

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Registered office: Arcadis House, 34 York Way, London, N1 9AB
Coordinating office: 5th Floor, 401 Faraday Street, Birchwood, Warrington, WA3 6GA, Tel: 44 (0)1925 800700

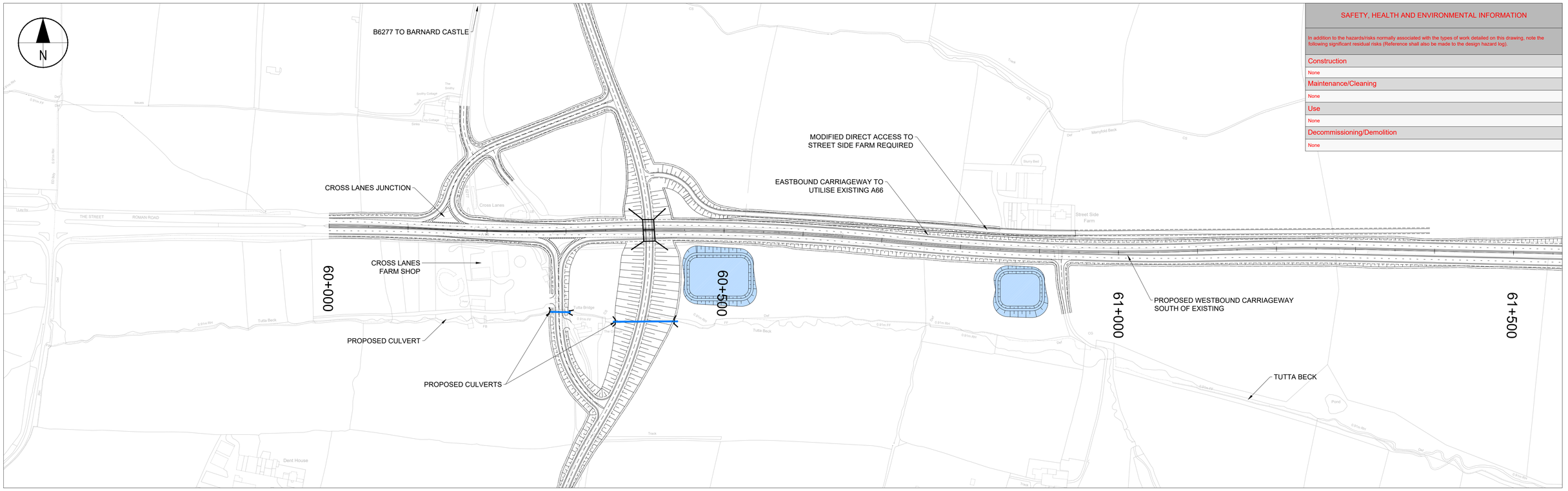
Project: A66 NORTHERN TRANS-PENNINE PROJECT

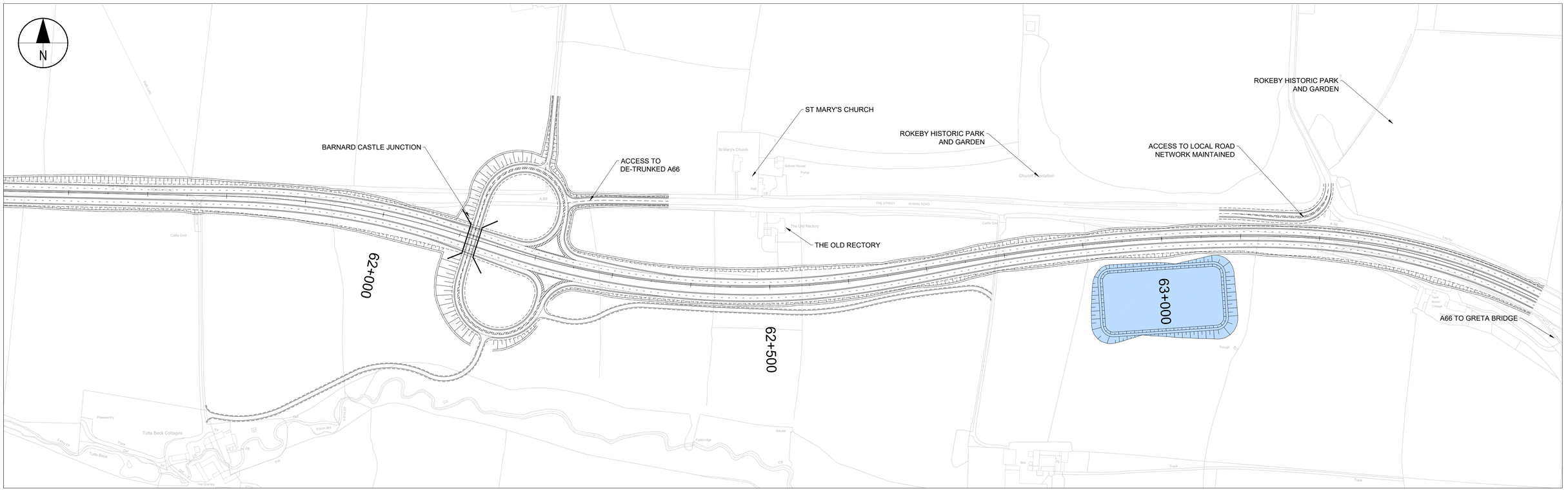
Drawing title: GENERAL ARRANGEMENT SECTION 10 OPTION J SHEET 1 OF 1

Status	S2 - FOR INFORMATION
Revision	P06
Scale	1:2500
Date	23 JUL 19
Drawn By	DA
Checked By	PAW
Approved By	RC
UA009880	Original Size A1

Drawing number: HA | PIN | Originator | Volume | Location | Type | Role | Number
HE565627-ARC-HML-S10_ZZ000-DR-D-1001

Print Date: 2019-09-17 09:23:24 File Path: C:\Sharepoint\ARCADIS\10018057 A66 Northern Trans-Pennine Project - Dig_Eng_Hiw_Str\WIP - Drawings\TEMP\HE565627-ARC-HML-S10_ZZ000-DR-D-1001.dwg Filename





SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).

Construction
None

Maintenance/Cleaning
None

Use
None

Decommissioning/Demolition
None

Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
P06	S2	16 SEPT 19	ISSUED FOR INFORMATION	DA	PAW	RC

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KEY:
- HIGHWAY STRUCTURE
- CULVERT
- PROVISIONAL ATTENUATION POND

Client: highways england

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Registered office: Arcadis House, 34 York Way, London, N1 9AB
Coordinating office: 5th Floor, 401 Faraday Street, Birchwood, Warrington, WA3 6GA, Tel: 44 (0)1925 800700

Project: A66 NORTHERN TRANS-PENNINE PROJECT

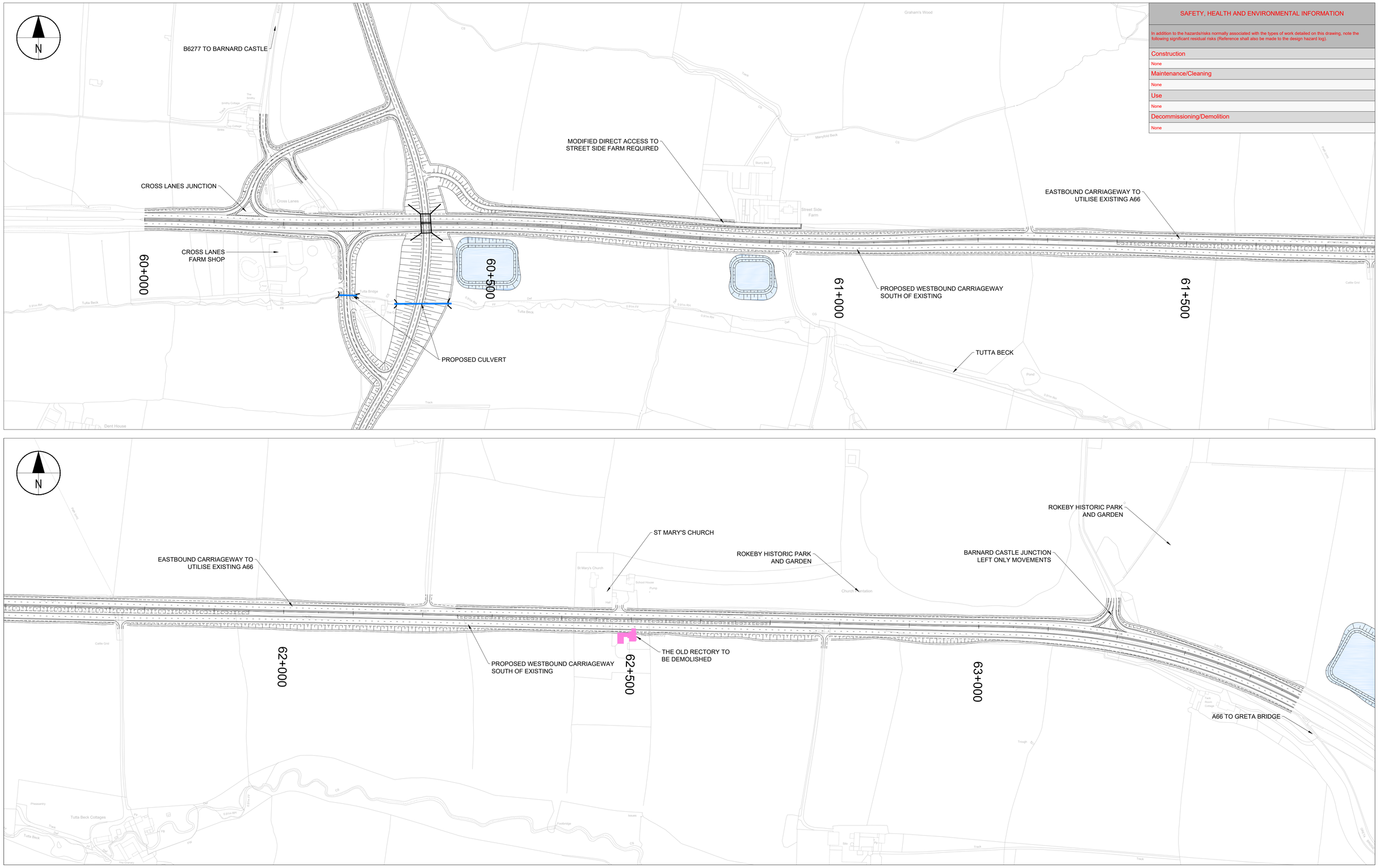
Drawing title: GENERAL ARRANGEMENT SECTION 12 OPTION K SHEET 1 OF 1

Status	S2 - FOR INFORMATION	Revision P06
Scale	1:2500	Date - 16 SEPT 19
Drawn By	DA	
Checked By	PAW	
Approved By	RC	
UA009880	Original Size	A1

Drawing number: HA | PIN | Originator | Volume | Location | Type | Role | Number
HE565627-ARC-HML-S12_ZZ000-DR-D-1001

Print Date: 2019-09-17 09:23:49

File Path: C:\Sharepoint\ARCADIS\10018057 A66 Northern Trans-Pennine Project - Dig_Eng_Hiw_Str\WIP - Drawings\TEMP\HE565627-ARC-HML-S12_ZZ000-DR-D-1001.dwg Filename



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).

Construction
None

Maintenance/Cleaning
None

Use
None

Decommissioning/Demolition
None

Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
P06	S2	16 SEPT 19	ISSUED FOR INFORMATION	DA	PAW	RC

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- CULVERT
- PROVISIONAL ATTENUATION POND

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Coordinating office: 5th Floor, 401 Faraday Street, Birchwood, Warrington, WA3 6GA, Tel: 44 (0)1925 800700

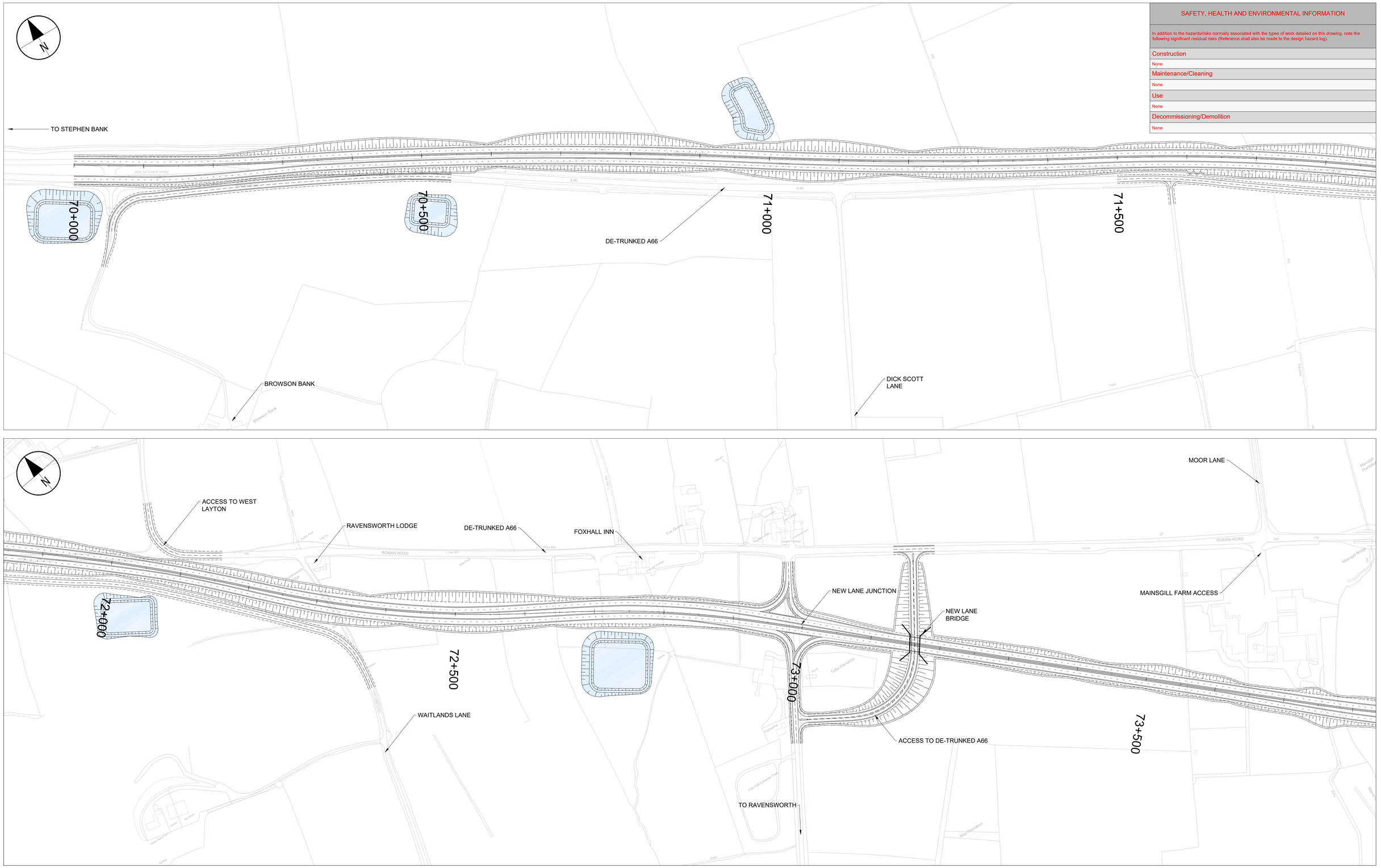
Project: A66 NORTHERN TRANS-PENNINE PROJECT

Drawing title: GENERAL ARRANGEMENT SECTION 12 OPTION L SHEET 1 OF 1

Status	S2 - FOR INFORMATION
Revision	P06
Scale	1:2500
Date	16 SEPT 19
Drawn By	DA
Checked By	PAW
Approved By	RC
	UA009880
Original Size	A1

Drawing number: HA PIN | Originator | Volume | Location | Type | Role | Number
HE565627-ARC-HML-S12_ZZ000-DR-D-1011

Print Date: 2019-09-17 09:24:14 File Path: C:\Sharepoint\ARCADIS\10018057 A66 Northern Trans-Pennine Project - Dig_Eng_Hiw_Str\WIP - Drawings\TEMP\HE565627-ARC-HML-S12_ZZ000-DR-D-1011.dwg Filename



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

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Construction

None

Maintenance/Cleaning

None

Use

None

Decommissioning/Demolition

None

Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
P06	S2	16 SEPT 19	ISSUED FOR INFORMATION	DA	PAW	RC

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KEY:
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- PROVISIONAL ATTENUATION POND

Client: highways england

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Coordinating office: 5th Floor, 401 Faraday Street, Birchwood, Warrington, WA3 6GA, Tel: 44 (0)1925 800700

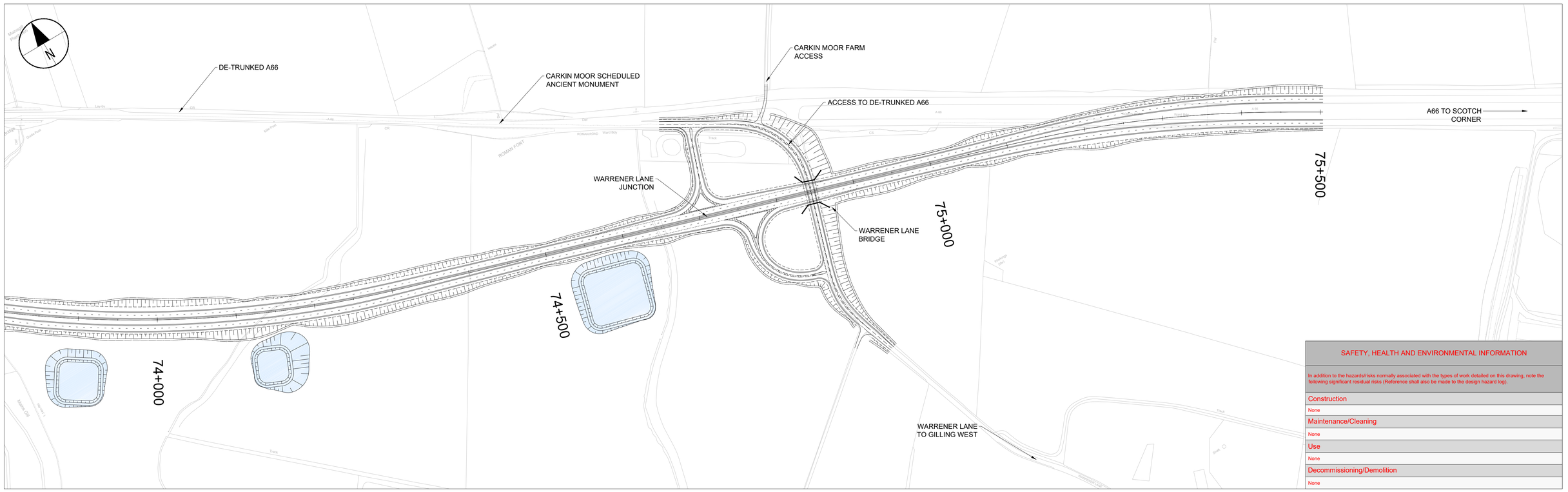
Project: A66 NORTHERN TRANS-PENNINE PROJECT

Drawing title: GENERAL ARRANGEMENT SECTION 14 OPTION M SHEET 1 OF 2

Status	S2 - FOR INFORMATION
Revision	P06
Scale	1:2500
Date	16 SEPT 19
Drawn By	DA
Checked By	PAW
Approved By	RC
	UA009880
Original Size	A1

Drawing number: HA | PIN | Originator | Volume | Location | Type | Role | Number
HE565627-ARC-HML-S14_ZZ000-DR-D-1001

Print Date: 2019-09-17 09:24:38 File Path: C:\Sharepoint\ARCADIS\10018057 A66 Northern Trans-Pennine Project - Dig_Eng_Hiw_Str\WIP - Drawings\TEMP\HE565627-ARC-HML-S14_ZZ000-DR-D-1001.dwg Filename



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

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Construction

None

Maintenance/Cleaning

None

Use

None

Decommissioning/Demolition

None

P06	S2	16 SEPT 19	ISSUED FOR INFORMATION	DA	PAW	RC
Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd

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KEY:
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— CULVERT
PROVISIONAL ATTENUATION POND

Client
highways england

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London
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Birchwood
Warrington, WA3 6GA
Tel: 44 (0)1925 800700

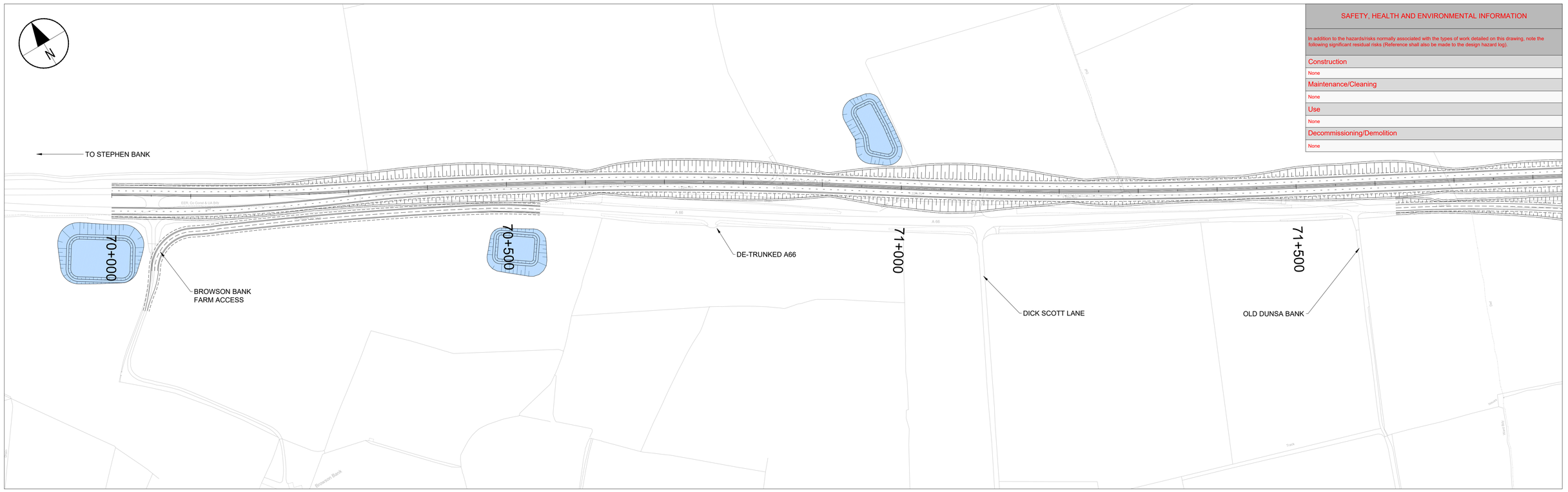
Project
A66 NORTHERN
TRANS-PENNINE PROJECT

Drawing title
GENERAL ARRANGEMENT
SECTION 14
OPTION M
SHEET 2 OF 2

Status: S2 - FOR INFORMATION
Revision: P06
Scale: 1:2500
Date - 16 SEPT 19
Drawn By: DA
Checked By: PW
Approved By: RC
UA009880
Original Size: A1
Drawing number: HA | PIN | Originator | Volume | Location | Type | Role | Number
HE565627-ARC-HML-S14_ZZ000-DR-D-1002

Print Date: 2019-09-17 09:24:57

File Path: C:\Sharepoint\ARCADIS\10018057 A66 Northern Trans-Pennine Project - Dig_Eng_Hiw_Str\WIP - Drawings\TEMP\HE565627-ARC-HML-S14_ZZ000-DR-D-1002.dwg Filename



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

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Construction
None

Maintenance/Cleaning
None

Use
None

Decommissioning/Demolition
None

Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
P06	S2	16 SEPT 19	ISSUED FOR INFORMATION	DA	PAW	RC

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KEY:
- HIGHWAY STRUCTURE
- CULVERT
- PROVISIONAL ATTENUATION POND

Client: highways england

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Coordinating office: 5th Floor, 401 Faraday Street, Birchwood, Warrington, WA3 6GA, Tel: 44 (0)1925 800700

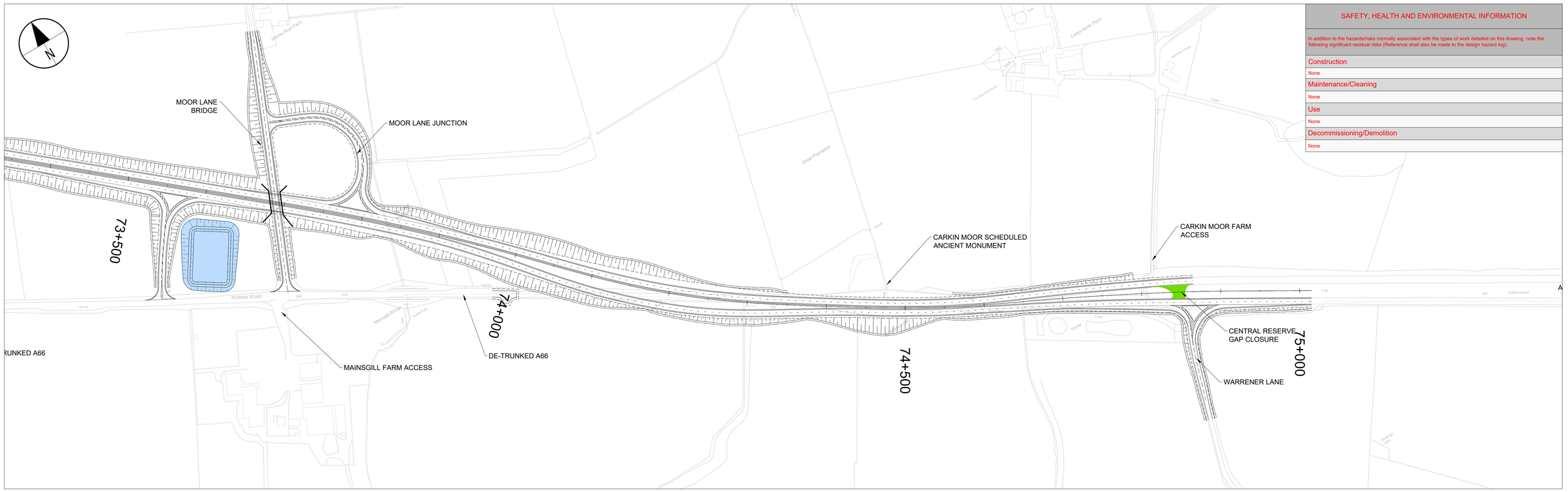
Project: A66 NORTHERN TRANS-PENNINE PROJECT

Drawing title: GENERAL ARRANGEMENT SECTION 14 OPTION N SHEET 1 OF 2

Status	S2 - FOR INFORMATION	Revision	P06
Scale	1:2500	Date -	16 SEPT 19
Drawn By	DA		
Checked By	PAW		
Approved By	RC		
UA009880		Original Size	A1

Drawing number: HA | PIN | Originator | Volume | Location | Type | Role | Number
HE565627-ARC-HML-S14_ZZ000-DR-D-1011

Print Date: 2019-09-17 09:25:23 File Path: C:\Sharepoint\ARCADIS\10018057 A66 Northern Trans-Pennine Project - Dig_Eng_Hiw_Str\WIP - Drawings\TEMP\HE565627-ARC-HML-S14_ZZ000-DR-D-1011.dwg Filename



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
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Construction
None
Maintenance/Cleaning
None
Use
None
Decommissioning/Demolition
None

Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
P06	S2	16 SEPT 19	ISSUED FOR INFORMATION	DA	PAW	RC

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KEY:
HIGHWAY STRUCTURE
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PROVISIONAL ATTENUATION POND

Client: highways england

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Project: A66 NORTHERN TRANS-PENNINE PROJECT

Drawing title: GENERAL ARRANGEMENT SECTION 14 OPTION N SHEET 2 OF 2

	Status: S2 - FOR INFORMATION	Revision: P06
Scale	1:2500	Date - 16 SEPT 19
Drawn By	DA	
Checked By	PAW	
Approved By	RC	
UA009880	Original Size	A1

Drawing number: HA | PIN | Originator | Volume | Location | Type | Role | Number
HE565627-ARC-HML-S14_ZZ000-DR-D-1012

Print Date: 2019-09-17 09:25:42 File Path: C:\Sharepoint\ARCADIS\10018057 A66 Northern Trans-Pennine Project - Dig_Eng_Hiw_Str\WIP - Drawings\TEMP\HE565627-ARC-HML-S14_ZZ000-DR-D-1012.dwg Filename

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

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Construction

None

Maintenance/Cleaning

None

Use

None

Decommissioning/Demolition

None

Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
P06	S2	16 SEPT 19	ISSUED FOR INFORMATION	DA	PAW	RC

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KEY:
- HIGHWAY STRUCTURE
- CULVERT
- PROVISIONAL ATTENUATION POND

Client: highways england

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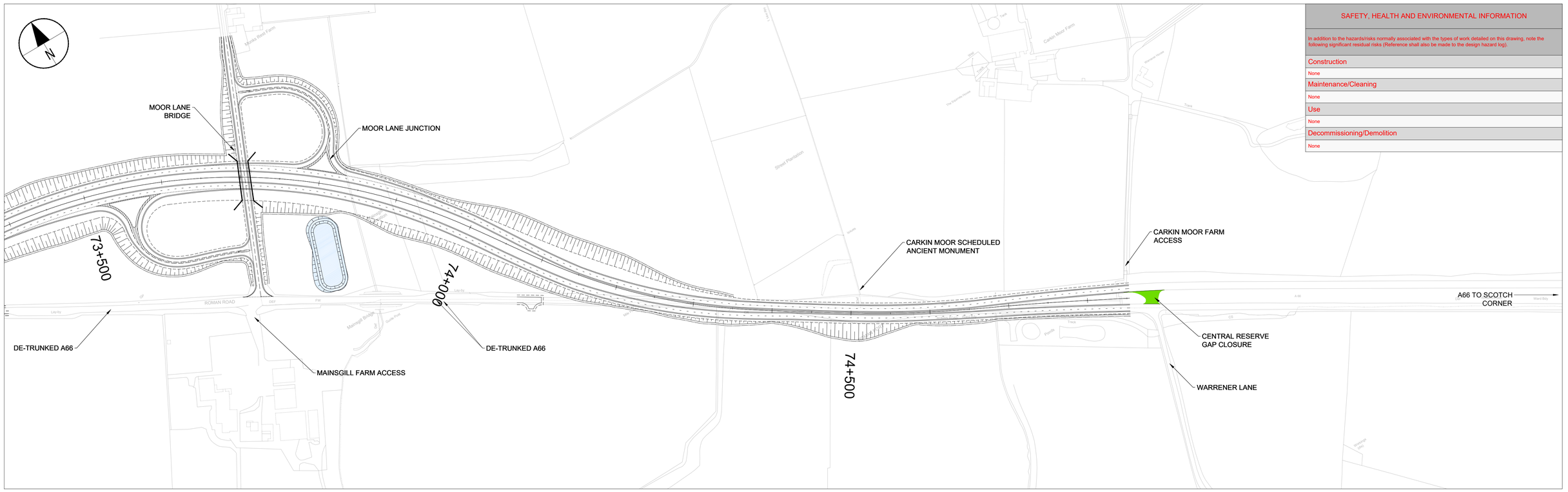
Project: A66 NORTHERN TRANS-PENNINE PROJECT

Drawing title: GENERAL ARRANGEMENT SECTION 14 OPTION O SHEET 1 OF 2

	Status: S2 - FOR INFORMATION	Revision: P06
Scale	1:2500	Date - 16 SEPT 19
Drawn By	DA	
Checked By	PAW	
Approved By	RC	
UA009880	Original Size	A1

Drawing number: HA | PIN | Originator | Volume | Location | Type | Role | Number
HE565627-ARC-HML-S14_ZZ000-DR-D-1021

Print Date: 2019-09-17 09:26:07 File Path: C:\Sharepoint\ARCADIS\10018057 A66 Northern Trans-Pennine Project - Dig_Eng_Hiw_Str\WIP - Drawings\TEMP\HE565627-ARC-HML-S14_ZZ000-DR-D-1021.dwg Filename



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

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Construction

None

Maintenance/Cleaning

None

Use

None

Decommissioning/Demolition

None

Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
P06	S2	16 SEPT 19	ISSUED FOR INFORMATION	DA	PAW	RC

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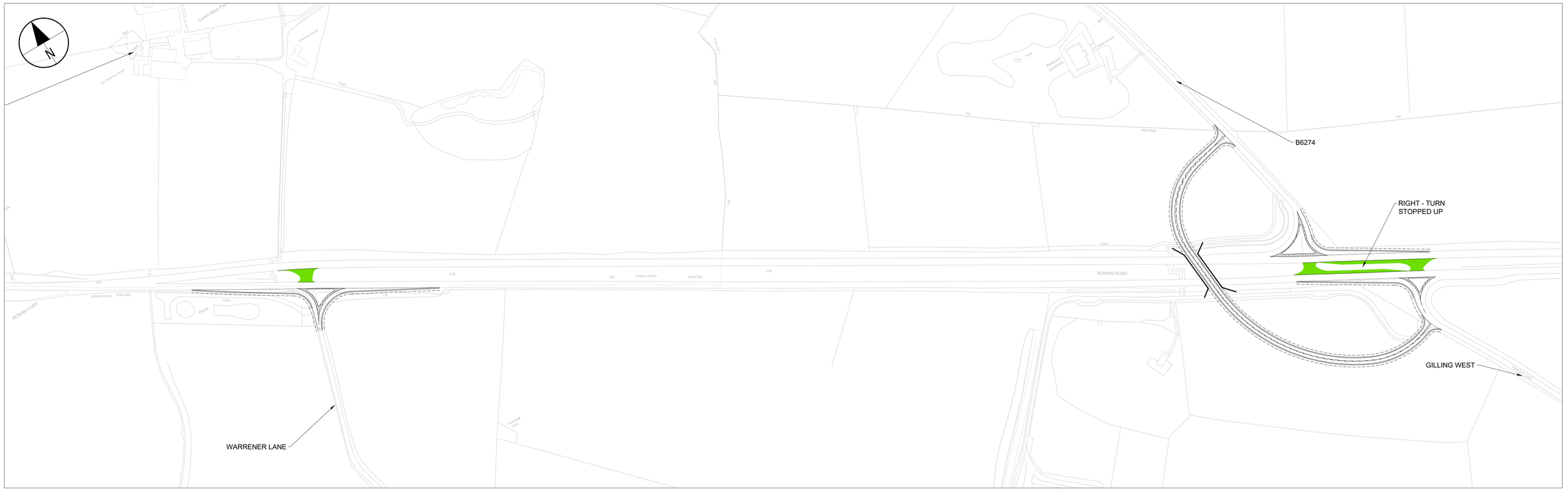
Project: A66 NORTHERN TRANS-PENNINE PROJECT

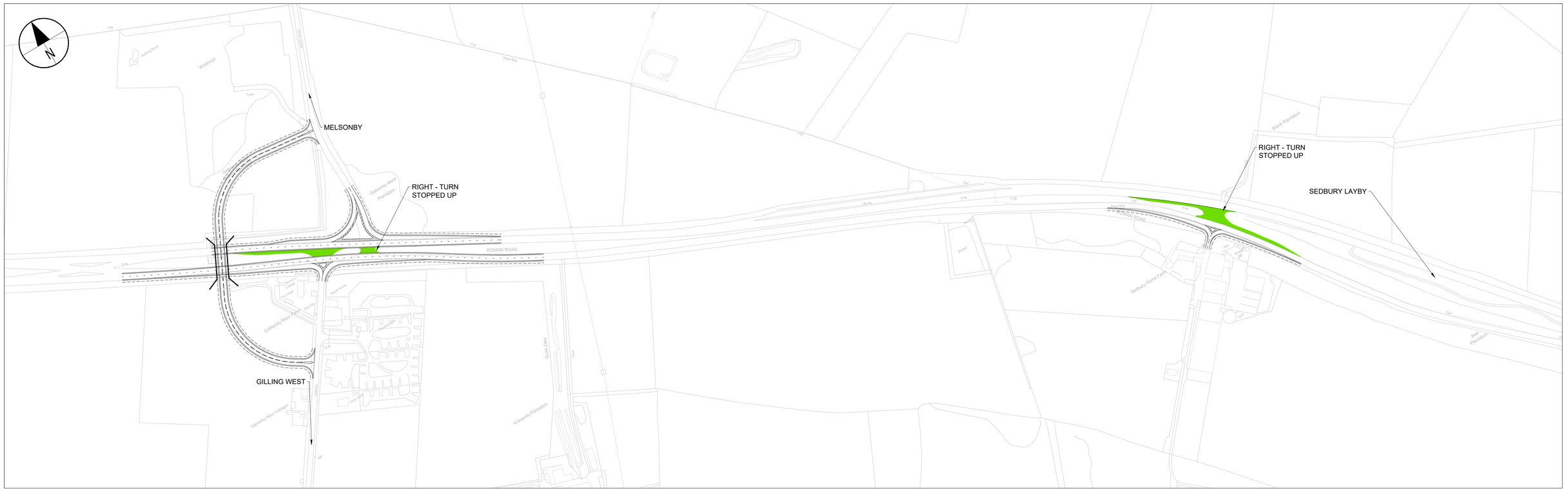
Drawing title: GENERAL ARRANGEMENT SECTION 14 OPTION O SHEET 2 OF 2

Status	S2 - FOR INFORMATION
Revision	P06
Scale	1:2500
Date -	16 SEPT 19
Drawn By	DA
Checked By	PAW
Approved By	RC
	UA009880
Original Size	A1

Drawing number: HA PIN | Originator | Volume | Location | Type | Role | Number
HE565627-ARC-HML-S14_ZZ000-DR-D-1022

Print Date: 2019-09-17 09:26:27 File Path: C:\Sharepoint\ARCADIS\10018057 A66 Northern Trans-Pennine Project - Dig_Eng_Hiw_Str\WIP - Drawings\TEMP\HE565627-ARC-HML-S14_ZZ000-DR-D-1022.dwg Filename





Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
P03	S2	16 SEPT 19	ISSUED FOR INFORMATION	DA	PAW	RC
P02	S2	07 MAR 19	UPDATED DESIGN	JA	PW	JG
P01	S2	12 JUL 18	ISSUED FOR INFORMATION	DA	PW	JG

NOTES:
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KEY:
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Tel: 44 (0)1925 800700

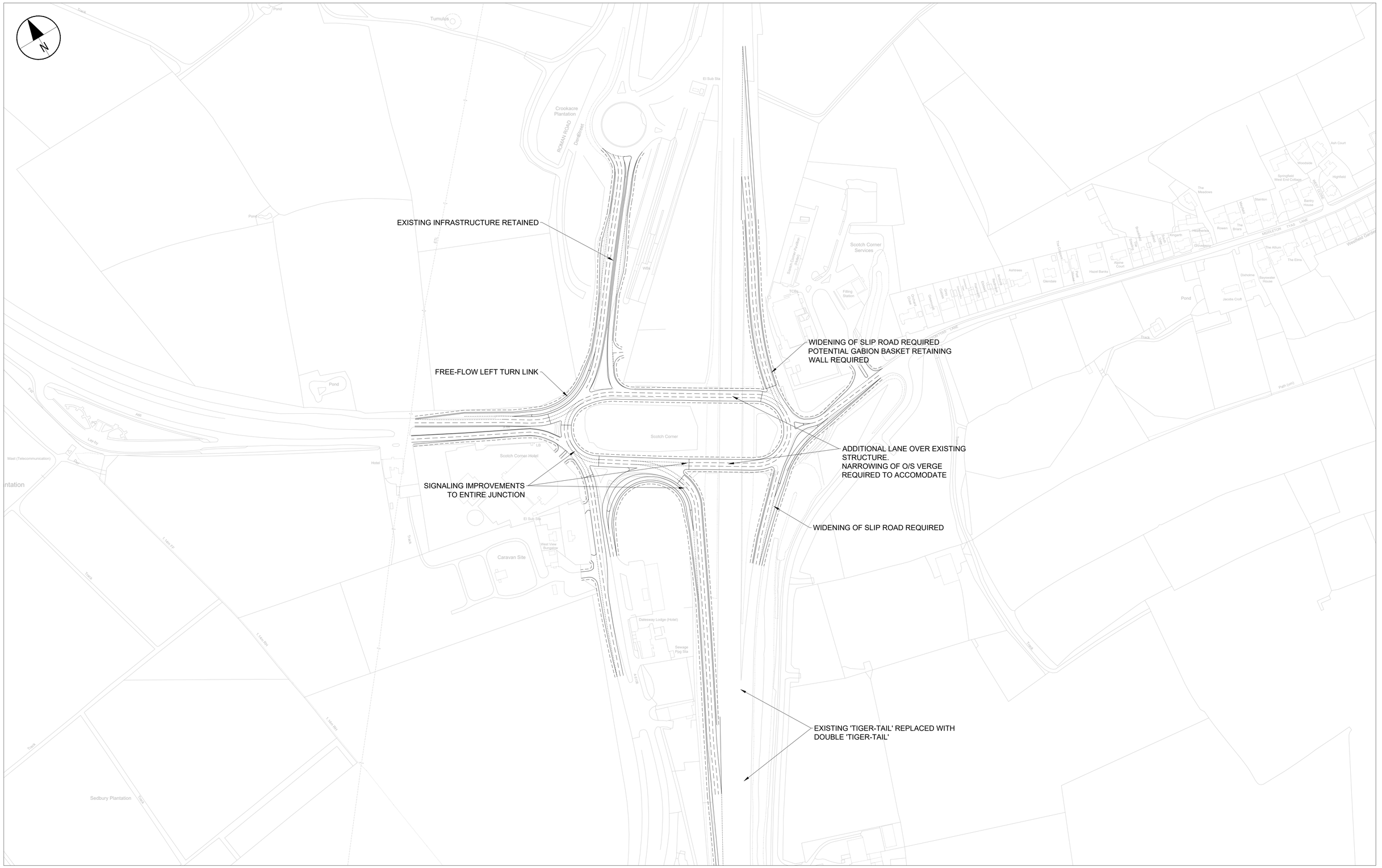
Project: A66 NORTHERN TRANS-PENNINE PROJECT

Drawing title: GENERAL ARRANGEMENT SECTION 15 OPTION 15A SHEET 1 OF 1

Status	S2 - FOR INFORMATION
Revision	P03
Scale	1:2500
Date -	15 SEPT 19
Drawn By	JA
Checked By	PAW
Approved By	RC
UA009880	
Original Size	A1

Drawing number HA | PIN | Originator | Volume | Location | Type | Role | Number
HE565627-ARC-HML-S15_ZZ000-DR-D-1001

Print Date: 2019-09-17 09:26:53 File Path: C:\Sharepoint\ARCADIS\10018057 A66 Northern Trans-Pennine Project - Dig_Eng_Hiw_Str\WIP - Drawings\TEMP\HE565627-ARC-HML-S15_ZZ000-DR-D-1001.dwg Filename



P03	S2	16 SEPT 19	ISSUED FOR INFORMATION	DA	PAW	RC
P02	S2	07 MAR 19	UPDATED DESIGN	JA	PW	JG
P01	S2	12 JUL 18	ISSUED FOR INFORMATION	DA	PW	JG
Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd

NOTES:
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS.
2. ANY DISCREPANCIES, ERRORS OR OMISSIONS TO BE BROUGHT TO THE ATTENTION OF ARCADIS.
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KEY:
- HIGHWAY STRUCTURE
- CULVERT
- PROVISIONAL ATTENUATION POND

Client: highways england

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Project: A66 NORTHERN TRANS-PENNINE PROJECT

Drawing title: GENERAL ARRANGEMENT SECTION 16 OPTION 16B SHEET 1 OF 1

	Status: S2 - FOR INFORMATION	Revision: P03	
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APPENDIX B

PRA Workshop Appraisal Tables

Kemplay Bank Roundabout

Consultation Responses [Note 1]		Kemplay Bank Roundabout- Underpass Option A (2B)		Kemplay Bank Roundabout- Overpass Option B (2E)	
No of members of public who strongly agree or tend to agree with option relative to total No. of responses		295/392		77/80.	
No. of members of public who strongly disagree or tend to disagree with option relative to total No. of responses		30/392		187/197	
No. of organisations and groups who strongly agree or tend to agree with option relative to total No. of responses		12/392		2/197	
No. of organisations and groups who strongly disagree or tend to disagree with option relative to total No. of responses		0/392		7/197	
Positive key themes raised regarding option		An underpass will cause minimal visual intrusion	152	An overpass will be better value for money / cheaper / cost less	6
		An underpass will be quieter / reduce traffic noise	68	An overpass will cause less disruption / fewer delays - to traffic flow during construction	6
		An underpass is my preferred option / the best / sensible option / logical choice	44	An overpass is my preferred option / the best / sensible option / logical choice	5
Negative key themes raised regarding option		An underpass will be more expensive / cost considerably more	9	An overpass will be visually intrusive	38
		An underpass will cause disruption / delays - to traffic flow during construction	6	An overpass will be noisy / increase traffic noise	31
		An underpass will be more complicated / take longer to deliver	5	An overpass will be visually intrusive - spoil the landscape / view	17
Project Objective	**Appraisal Criteria**	**Stage 1**	**Stage 2**	**Stage 1**	**Stage 2**
· economic growth	· length of option	1.5km		1.6km	
	· reduction in journey time (compared to Do Minimum)[Note 2]			reduction in JT - 0.2 mins	
· improve connectivity	· economic benefits (compared to Do Minimum)[Note 2]	No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve access for tourism and local services/jobs		No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve road safety	· safety in operation · safety in construction	No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve journey time reliability	· improvement in JTR compared to Do Minimum	No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve A66 as strategic connection	· improvement in resilience compared to Do Minimum	No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve resilience		No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve NMU provision	· opportunities to improve NMU provision	Easier for NMU's to navigate Kemplay Bank Junction as the A66 through traffic will be segregated		Easier for NMU's to navigate Kemplay Bank Junction as the A66 through traffic will be segregated	
· reduce community severance	· reduction in severance	No differentiator between the options at this stage		No differentiator between the options at this stage	
· minimise environmental impacts and optimise environmental improvement opportunities	· Landscape	The dominance of the existing roundabout junction in this part of Penrith means that the option would not notably alter the character of the townscape		The dominance of the existing roundabout junction in this part of Penrith means that the project would not notably alter the character of the townscape although an overpass option would likely have a greater impact than an underpass	
	· Biodiversity	No likely significant effects identified		No likely significant effects identified	
	· Water environment and drainage	May have potential impacts on rates of runoff and pollution risk and the floodplains and wider catchments of the Thacka Beck and River Eamont.		May have potential impacts on rates of runoff and pollution risk and the floodplains and wider catchments of the Thacka Beck and River Eamont.	
	· Cultural Heritage	Following mitigation three assets will experience change which would result in significant effects		Following mitigation three assets will experience change which would result in significant effects	
	· Air quality	Option would result in an exceedance of the AQS objectives for NO2 & PM10 though impacts are not considered to be significant		Option would result in an exceedance of the AQS objectives for NO2 & PM10 though impacts are not considered to be significant. There would potentially be a greater adverse impact than the underpass option	
	· Noise	It is expected that the option would increase road traffic noise at Penrith A6 Junction with A66 due to the new junction layout.		It is expected that the option would increase road traffic noise at Penrith A6 Junction with A66 due to the new junction layout. An overpass option would potentially have a greater adverse impact	
	· Planning – compliance with NPS	No differentiator between the options at this stage		No differentiator between the options at this stage	
	· Population and Health	Would lead to land-take of public open space (recreation ground) which is found to the north of the project and the severance of two PRoW.		Would lead to land-take of public open space (recreation ground) which is found to the north of the project and the severance of two PRoW.	
	· Geology and Soils	No likely significant effects identified		No likely significant effects identified	
	· Climate	No likely significant effects identified		No likely significant effects identified	
	· Materials	No likely significant effects identified		No likely significant effects identified	
Other criteria	Cost of option	£76M		£76M	
	Land take outside highway boundary	Minimal landtake requied		Minimal landtake required	
	Property demolition	None		None	
	Impact on property	Minimal		Minimal	
	Construction impacts	1180 days	1268 days	1101 days	1232 days
	Significant risks				

Penrith to Temple Sowerby

Consultation Responses [Note 1]		Online – Option D (4B)		Southern bypass – Option C (4A)	
No of members of public who strongly agree or tend to agree with option relative to total No. of responses		82/297		206/325	
No. of members of public who strongly disagree or tend to disagree with option relative to total No. of responses		112/297		30/325	
No. of organisations and groups who strongly agree or tend to agree with option relative to total No. of responses		4/297		7/325	
No. of organisations and groups who strongly disagree or tend to disagree with option relative to total No. of responses		3/297		4/325	
Positive key themes raised regarding option		Northern diversion will align better with existing roads / conditions / minimal re-alignment	11	Southern diversion will minimise impact on nearby buildings - demolition	62
		Northern diversion is my preferred option / the best / sensible option / logical choice	7	Southern diversion will pass further from / route traffic from - Lane End	32
		Northern diversion will minimise impact on nearby buildings - demolition	5	Southern diversion is my preferred option / the best / sensible option / logical choice	15
Negative key themes raised regarding option		Northern diversion will impact on nearby buildings - demolition	16	Southern diversion will result in land grab - fields / farms / farm land	4
		Northern diversion will be noisy / increase traffic noise - in Lane End	2	Southern diversion will be more expensive / cost considerably more	2
		Northern diversion will impact on nearby people / communities - in Lane End	2	Southern diversion is unacceptable / strongly oppose	1
Project Objective	**Appraisal Criteria**	**Stage 1**	**Stage 2**	**Stage 1**	**Stage 2**
· economic growth	· length of option	5.2km		5.2km	
	· reduction in journey time (compared to Do Minimum)[Note 2]	reduction in JT - 1.0 mins		reduction in JT - 1.1 mins	
· improve connectivity	· economic benefits (compared to Do Minimum)[Note 2]	No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve access for tourism and local services/jobs		No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve road safety	· safety in operation · safety in construction	No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve journey time reliability	· improvement in JTR compared to Do Minimum	No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve A66 as strategic connection	· improvement in resilience compared to Do Minimum	No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve resilience		No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve NMU provision	· opportunities to improve NMU provision	potential to provide NMU access between Penrith & Temple Sowerby		potential to provide NMU access between Penrith & Temple Sowerby	
· reduce community severance	· reduction in severance	No notable preference between either option		No notable preference between either option	
· minimise environmental impacts and optimise environmental improvement opportunities	· Landscape	No significant impacts identified.		No significant effects identified.	
	· Biodiversity	Potential impacts on biodiversity receptors (rivers and streams, Section 41 priority habitat, protected birds, 'important hedgerow', amphibians (including great crested newt), bats, otter and red squirrel)		Potential impacts on biodiversity receptors (rivers and streams, Section 41 priority habitat, protected birds, 'important hedgerow', amphibians (including great crested newt), bats, otter and red squirrel)	
	· Water environment and drainage	Likely to have potential impacts on the culverted section of the LightWater as well as the upstream reaches and its floodplain.		Likely to have potential impacts on the culverted section of the LightWater as well as the upstream reaches and its floodplain.	
	· Cultural Heritage	Could directly impact the Countess Pillar and the settlement to the east-north-east of Brougham Castle. Expected to result in permanent, negative impacts on the settings of several Archaeological Remains; Historic Buildings and Landscapes potentially decreasing their significance.		Could directly impact the Countess Pillar and the settlement to the east-north-east of Brougham Castle. Expected to result in permanent, negative impacts on the settings of several Archaeological Remains; Historic Buildings and Landscapes potentially decreasing their significance.	
	· Air quality	Option would not result in an exceedance of the AQS objectives for NO2 and PM10 and impacts are not considered to be significant, based on the currently available information.		Option would not result in an exceedance of the AQS objectives for NO2 and PM10 and impacts are not considered to be significant, based on the currently available information.	
	· Noise	Option would increase road traffic noise between Brougham and Temple Sowerby due to the introduction of the new alignment		Option would increase road traffic noise between Brougham and Temple Sowerby due to the introduction of the new alignment and reductions at Lane End/High Barn where the existing A66 is bypassed	
	· Planning – compliance with NPS	No differentiator between the options at this stage		No differentiator between the options at this stage	
	· Population and Health	Option would lead to the loss of agricultural land and require the demolition of High Barn Farm, which may impact upon businesses.		Option would lead to the loss of agricultural land, which may impact upon agricultural businesses	
	· Geology and Soils	No likely significant effects have been identified		No likely significant effects have been identified	
	· Climate	No likely significant effects have been identified		No likely significant effects have been identified	
	· Materials	No likely significant effects have been identified		No likely significant effects have been identified	
Other criteria	Cost of option	£93M		£93M	
	Land take outside highway boundary	Less land take required		Greater land take required	
	Property demolition	Loss of High Barn buildings			
	Impact on property	Loss of High Barn buildings		Route further away from residential properties at Lane End	
	Construction impacts	917 days	811 days	841 days	686 days
	Significant risks	significant stats applicable to both options	significant stats applicable to both options	significant stats applicable to both options	significant stats applicable to both options

Temple Sowerby to Appleby – Kirkby Thore

Consultation Responses [Note 1]		Northern Bypass – Option E (6J1)		Southern bypass – Option F (6H1)	
No of members of public who strongly agree or tend to agree with option relative to total No. of responses		263/420		146/375	
No. of members of public who strongly disagree or tend to disagree with option relative to total No. of responses		101/420		174/375	
No. of organisations and groups who strongly agree or tend to agree with option relative to total No. of responses		8/420		4/375	
No. of organisations and groups who strongly disagree or tend to disagree with option relative to total No. of responses		3/420		7/375	
Positive key themes raised regarding option		Northern bypass will remove / reduce HGVs / lorries / larger vehicles - Kirkby Thore	156	Southern bypass will be a more direct / shorter route	57
		Northern bypass will be a more direct / shorter route - to British Gypsum	48	Southern bypass will be better value for money / cheaper / cost less	19
		Northern bypass is my preferred option / the best / sensible option / logical choice	38	Southern bypass is my preferred option / the best / sensible option / logical choice	11
Negative key themes raised regarding option		Northern bypass will be a longer / slower route	22	Southern bypass will not remove / reduce HGVs / lorries / larger vehicles - Kirkby Thore	26
		Northern bypass will be noisy / increase traffic noise	13	Southern bypass will impact on the environment / cause great environmental damage - flood plains / flooding	23
		Northern bypass will be more expensive / cost considerably more	12	Southern bypass will impact on nearby buildings - demolition - Bridge End Farm	17

Project Objective	Appraisal Criteria	Stage 1	Stage 2	Stage 1	Stage 2
· economic growth	· length of option	4.7km		4.2km	
	· reduction in journey time (compared to Do Minimum)[Note 2]	reduction in JT - 1.4 mins		reduction in JT - 1.3 mins	
· improve connectivity	· economic benefits (compared to Do Minimum)[Note 2]	No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve access for tourism and local services/jobs		No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve road safety	· safety in operation · safety in construction	No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve journey time reliability	· improvement in JTR compared to Do Minimum	No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve A66 as strategic connection	· improvement in resilience compared to Do Minimum	No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve resilience		No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve NMU provision	· opportunities to improve NMU provision	opportunity for grade separated NMU facilities crossing the A66 greater access to adjacent villages		opportunity for grade separated NMU facilities crossing the A66 greater access to adjacent villages	
· reduce community severance	· reduction in severance	All options improve and reduce the impact of severance by diverting the A66 away from it current central position within the village		All options improve and reduce the impact of severance by diverting the A66 away from it current central position within the village	
· minimise environmental impacts and optimise environmental improvement opportunities	· Landscape	Would bring the A66 closer to the North Pennines AONB than its current alignment, thereby potentially increasing its perceived influence on local landscape character and tranquillity.		No likely significant effects have been identified	
	· Biodiversity	Potential impact on designated sites of international and national importance located within 200m of both options (River Eden SAC and River Eden & Tributaries SSSI).	Crosses Trout Beck where extensive channel realignment is evidenced through historic maps. Channel has migrated south by approximately 20m in recent years, giving an indication of the direction in which the watercourse is eroding. Design would need to incorporate any future movement.	Potential impact on designated sites of international and national importance located within 200m of both options (River Eden SAC and River Eden & Tributaries SSSI).	Extends across a disused railway line that provides a wildlife corridor for potentially multiple species groups and a feature that is locally rare. Whilst there will has been little recent movement of the watercourse due to the railway and farm buildings and reinforcement for the river, these current constraints/revetments would need to be reviewed. The lateral movement of the River Eden will also need to be considered in this location.
	· Water environment and drainage	Has a direct impact on the Trout Beck and its floodplains (mainly Flood Zone 3).	Placement of the embankment across the floodplain of the Trout Beck causes flood water to build up on the upstream side of the embankment. No properties fall within the zone of increased flood depths.	Has a direct impact on both the River Eden and Trout Beck and their floodplains (both Flood Zone 2 and Flood Zone 3)..	Placement of the embankment across the floodplain of the Trout Beck causes flood water to build up on the upstream (north east) side of the embankment. It would also be expected that flood water from the River Eden would be constrained on the south west side of the embankment. Residential and commercial properties, as well as existing roads in Kirkby Thore, fall within the zone of increased flood depths.
	· Cultural Heritage	Expected to result in permanent, negative impacts on the settings of several Archaeological Remains; Historic Buildings and Landscapes potentially decreasing their significance.		Expected to result in permanent, negative impacts on the settings of several Archaeological Remains; Historic Buildings and Landscapes potentially decreasing their significance.	
	· Air quality	Would not result in an exceedance of the AQS objectives for NO2 and PM10 and impacts are not considered to be significant, based on the currently available information.		Would not result in an exceedance of the AQS objectives for NO2 and PM10 and impacts are not considered to be significant, based on the currently available information.	
	· Noise	Would lead to an increase in road traffic noise for receptors to the north of Temple Sowerby and reductions in road traffic noise along the existing A66 which is bypassed		Would increase road traffic noise between Temple Sowerby and Appleby West Morland due to the introduction of the new alignment and reduce traffic noise for receptors close to the existing alignment.	
	· Planning – compliance with NPS	No differentiator between the options at this stage		No differentiator between the options at this stage	
	· Population and Health	Lead to the loss of agricultural land, which may impact upon agricultural businesses.		Lead to the loss of agricultural land, which may impact upon agricultural businesses. Also lead to the loss of agricultural land and the demolition of farm buildings found at Bridge End Farm, which may impact upon agricultural businesses.	
	· Geology and Soils	No likely significant effects have been identified		No likely significant effects have been identified	
	· Climate	No likely significant effects have been identified		No likely significant effects have been identified	

	· Materials	No likely significant effects have been identified		No likely significant effects have been identified	
Other criteria	Cost of option	£130M		£95M	
	Land take outside highway boundary	Both northern options would require greater land take outside of the current trunk road boundary		Both northern options would require greater land take outside of the current trunk road boundary	
	Property demolition	No demolition identified	1 No. residential property required	Demolition of Bridge End Farm buildings	Demolition of Bridge End Farm buildings
	Impact on property	Minimal		Minimal	
	Construction impacts	No notable preference between either option		No notable preference between either option	
	Significant risks	Abandoned mine workings		River Eden flood plain	

Temple Sowerby to Appleby – Crackenthorpe

Consultation Responses [Note 1]		Northern Bypass closest to Crackenthorpe – Option G (F2)		Northern Bypass furthest away from Crackenthorpe – Option H (G2)	
No of members of public who strongly agree or tend to agree with option relative to total No. of responses		79/303		243/350	
No. of members of public who strongly disagree or tend to disagree with option relative to total No. of responses		144/303		39/350	
No. of organisations and groups who strongly agree or tend to agree with option relative to total No. of responses		4/303		6/350	
No. of organisations and groups who strongly disagree or tend to disagree with option relative to total No. of responses		4/303		3/350	
Positive key themes raised regarding option		By-pass closest to Crackenthorpe will align better with existing roads / conditions / minimal re-alignment	7	By-pass furthest from Crackenthorpe will avoid unsuitable land - landslips - River Eden	52
		By-pass closest to Crackenthorpe will utilise / align with disused rail tracks	7	By-pass furthest from Crackenthorpe is my preferred option / the best / sensible option / logical choice	39
		Is my preferred option / the best / sensible option / logical choice	5	By-pass furthest from Crackenthorpe will pass further from / route traffic from - Crackenthorpe	28
Negative key themes raised regarding option		By-pass closest to Crackenthorpe will use unsuitable land - landslips - River Eden	45	By-pass furthest from Crackenthorpe will impact on heritage site - original Roman road	13
		By-pass closest to Crackenthorpe will pass too close to the River Eden	17	By-pass furthest from Crackenthorpe will impact on biodiversity / wildlife / habitats	6
		By-pass closest to Crackenthorpe will use unsuitable land - flood plains / flooding	10	By-pass furthest from Crackenthorpe will impact on existing public rights of way	4
Project Objective	**Appraisal Criteria**	**Stage 1**	**Stage 2**	**Stage 1**	**Stage 2**
· economic growth	· length of option	3.25km		3.7km	
	· reduction in journey time (compared to Do Minimum) [Note 2]	reduction in JT - 1.0 mins		reduction in JT - 0.9 mins	
· improve connectivity	· economic benefits (compared to Do Minimum) [Note 2]	No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve access for tourism and local services/jobs		No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve road safety	· safety in operation · safety in construction	No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve journey time reliability	· improvement in JTR compared to Do Minimum	No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve A66 as strategic connection	· improvement in resilience compared to Do Minimum	No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve resilience		No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve NMU provision	· opportunities to improve NMU provision	opportunity for grade separated NMU facilities crossing the A66		opportunity for grade separated NMU facilities crossing the A66 greater access to adjacent villages	
· reduce community severance	· reduction in severance	Both options improve and reduce the impact of severance by diverting the A66 away from it.		Both options improve and reduce the impact of severance by diverting the A66 away from it.	
· minimise environmental impacts and optimise environmental improvement opportunities	· Landscape	No likely significant impacts.		No likely significant impacts.	
	· Biodiversity	There are designated sites of international and national importance located within 200m of both options (River Eden SAC and River Eden & Tributaries SSSI).	Extends across a disused railway line, but this section of habitat is more defunct and considered to be of lower value (albeit it does contain old bridges/walls that may support bat roosts). Is close to the River Eden SAC, in an area where there are issues with bank/road stability.	There are designated sites of international and national importance located within 200m of both options (River Eden SAC and River Eden & Tributaries SSSI).	Crosses area that supports mature/established grasslands and thus may include important habitats (in their own right) and interesting invertebrate communities. However it would be possible to recreate species rich grasslands and habitat networks in alternative locations.
	· Water environment and drainage	No likely significant impacts.		No likely significant impacts.	
	· Cultural Heritage	Expected to result in permanent, negative impacts on the settings of several Archaeological Remains; Historic Buildings and Landscapes potentially decreasing their significance.		Expected to result in permanent, negative impacts on the settings of several Archaeological Remains; Historic Buildings and Landscapes potentially decreasing their significance.	
	· Air quality	No exceedance of the AQS objectives for NO2 and PM10 and impacts are not considered to be significant, based on the currently available information.		No exceedance of the AQS objectives for NO2 and PM10 and impacts are not considered to be significant, based on the currently available information.	
	· Noise	Would increase road traffic noise for receptors at Powis House and Roman Vale and reduce road traffic noise for receptors located in Crackenthorpe.		Would increase road traffic noise for receptors at Powis House and Roman Vale and reduce road traffic noise for receptors located in Crackenthorpe.	
	· Planning – compliance with NPS	No differentiator between the options at this stage		No differentiator between the options at this stage	
	· Population and Health	Would lead to the loss of agricultural land, which may impact upon agricultural businesses.		Would lead to the loss of agricultural land, which may impact upon agricultural businesses.	
	· Geology and Soils	No likely significant impacts.		No likely significant impacts.	
	· Climate	No likely significant impacts.		No likely significant impacts.	
	· Materials	No likely significant impacts.		No likely significant impacts.	
Other criteria	Cost of option	£70M		£80M	
	Land take outside highway boundary	Both northern options would require greater land take outside of the current trunk road boundary		Both northern options would require greater land take outside of the current trunk road boundary	
	Property demolition	none		none	
	Impact on property	greater chance of impact on land owners		minimal impact of land owners as route follows the natural boundary	
	Construction impacts	Potentially shorter construction period		potentially longer construction period	
	Significant risks	Historical land slip issues		No significant risks identified	

Appleby to Brough

Consultation Responses [Note 1]	Option I (8C1 & 8A2)	
No of members of public who strongly agree or tend to agree with option relative to total No. of responses	205/283	
No. of members of public who strongly disagree or tend to disagree with option relative to total No. of responses	20/283	
No. of organisations and groups who strongly agree or tend to agree with option relative to total No. of responses	8/283	
No. of organisations and groups who strongly disagree or tend to disagree with option relative to total No. of responses	1/283	
Positive key themes raised regarding option	Is my preferred option / the best / sensible option / logical choice	30
	Will be safer / improve safety conditions	27
	Is necessary - the only possible / available option	18
Negative key themes raised regarding option	Will be noisy / increase traffic noise	6
	Will result in land grab - fields / farms / farm land	5
	Will provide poor access / connections - local roads / towns / villages	5

Project Objective	Appraisal Criteria	Stage 1	Stage 2
· economic growth	· length of option	7.6km	
	· reduction in journey time (compared to Do Minimum)[Note 2]	reduction in JT - 1.7 mins	
· improve connectivity	· economic benefits (compared to Do Minimum)[Note 2]	Option to improve connectivity, though magnitude of impact is unavailable at this stage	
· improve access for tourism and local services/jobs		Option to improve access, though magnitude of impact is unavailable at this stage	
· improve road safety	· safety in operation · safety in construction	Option to improve safety in operation, though magnitude of impact is unavailable at this stage	
· improve journey time reliability	· improvement in JTR compared to Do Minimum	Option to improve JTR, though magnitude of impact is unavailable at this stage	
· improve A66 as strategic connection	· improvement in resilience compared to Do Minimum	Option to improve resilience, though magnitude of impact is unavailable at this stage	
· improve resilience		Option to improve resilience, though magnitude of impact is unavailable at this stage	
· improve NMU provision	· opportunities to improve NMU provision	Increased opportunity for grade separated NMU facilities crossing the A66. Greater NMU access between villages available by the utilisation of the de-trunked A66	

· reduce community severance	· reduction in severance	Option improves and reduces the impact of severance by diverting the A66 away from the existing trunk road	
· minimise environmental impacts and optimise environmental improvement opportunities	· Landscape	Notable changes to the landscape character of the area immediately surrounding the project	
	· Biodiversity	No likely significant impacts.	
	· Water environment and drainage	Potential impacts on the floodplains and wider catchment of the Hayber Beck.	
	· Cultural Heritage	Potential physical and settings impact on Warcop roman camp. Expected to result in permanent, negative impacts on the settings of several Archaeological Remains; Historic Buildings and Landscapes potentially decreasing their significance.	
	· Air quality	Would not result in an exceedance of the AQS objectives for NO2 and PM10 and impacts are not considered to be significant, based on the currently available information.	
	· Noise	Would increase road traffic noise for receptors between Sandforth and Brough and Great Ormside and Brough.	
	· Planning – compliance with NPS		
	· Population and Health	Loss of agricultural land, which may impact upon agricultural businesses.	
	· Geology and Soils	No likely significant impacts.	
	· Climate	No likely significant impacts.	
	· Materials	No likely significant impacts.	
Other criteria	Cost of option	£144M	
	Land take outside highway boundary	land take required outside of existing boundary	
	Property demolition	none	
	Impact on property	minimal	
	Construction impacts	714 days	
	Significant risks		

Bowes Bypass

Consultation Responses [Note 1]	Option J (10A)	
No of members of public who strongly agree or tend to agree with option relative to total No. of responses	177/250	
No. of members of public who strongly disagree or tend to disagree with option relative to total No. of responses	7/250	
No. of organisations and groups who strongly agree or tend to agree with option relative to total No. of responses	9/250	
No. of organisations and groups who strongly disagree or tend to disagree with option relative to total No. of responses	1/250	
Positive key themes raised regarding option	Is my preferred option / the best / sensible option / logical choice	46
	Will be safer / improve safety conditions	12
	Will provide an improved junction - A66 / A67	10
	Is necessary - the only possible / available option	5
Negative key themes raised regarding option	Will be noisy / increase traffic noise	5
	Will provide poor access / connections - the Street	5
	Will provide poor access / connections - fields / farms / farm land	4

Project Objective	Appraisal Criteria	Stage 1	Stage 2
· economic growth	· length of option	2.85km	
	· reduction in journey time (compared to Do Minimum)[Note 2]	reduction in JT - 0.3 mins	
· improve connectivity	· economic benefits (compared to Do Minimum)[Note 2]	Option to improve connectivity, though magnitude of impact is unavailable at this stage	
· improve access for tourism and local services/jobs		Option to improve access, though magnitude of impact is unavailable at this stage	
· improve road safety	· safety in operation · safety in construction	Option to improve safety in operation, though magnitude of impact is unavailable at this stage	
· improve journey time reliability	· improvement in JTR compared to Do Minimum	Option to improve JTR, though magnitude of impact is unavailable at this stage	
· improve A66 as strategic connection	· improvement in resilience compared to Do Minimum	Option to improve resilience, though magnitude of impact is unavailable at this stage	
· improve resilience		Option to improve resilience, though magnitude of impact is unavailable at this stage	
· improve NMU provision	· opportunities to improve NMU provision	All current grade separated crossings maintained	

· reduce community severance	· reduction in severance	All movements catered for at Bowes Junction	
· minimise environmental impacts and optimise environmental improvement opportunities	· Landscape	The western end of this section (where the road is already dualled) clips the boundary with the North Pennines AONB. The construction phase would result in notable changes to the landscape character of the area immediately surrounding the project	
	· Biodiversity	There are designated sites of international and national importance located within 200m of the proposed option (Bowes Moor SSSI)	
	· Water environment and drainage	No likely significant impacts.	
	· Cultural Heritage	The development of this option is expected to result in permanent, negative impacts on the settings of several Archaeological Remains; Historic Buildings and Landscapes potentially decreasing their significance.	
	· Air quality	Option would not result in an exceedance of the AQS objectives for NO2 and PM10 and impacts are not considered to be significant, based on the currently available information.	
	· Noise	Option would lead to an increase in road traffic noise in Bowes	
	· Planning – compliance with NPS		
	· Population and Health	Option would lead to the loss of agricultural land and require the demolition of properties, the disused Bowes Train Station and Low Broats Farm, which may impact upon businesses.	
	· Geology and Soils	No likely significant impacts.	
	· Climate	No likely significant impacts.	
	· Materials	No likely significant impacts.	
Other criteria	Cost of option	£64M	
	Land take outside highway boundary	land take required	
	Property demolition	Option would lead to the loss of agricultural land and require the demolition of properties, the disused Bowes Train Station and Low Broats Farm	
	Impact on property	as above	
	Construction impacts	889 days	
	Significant risks		

Cross Lanes to Rokeby

Consultation Responses [Note 1]		Southern Bypass – Option K (12A)		Online – Option L (12B)	
No of members of public who strongly agree or tend to agree with option relative to total No. of responses		148/277		70/263	
No. of members of public who strongly disagree or tend to disagree with option relative to total No. of responses		29/277		89/263	
No. of organisations and groups who strongly agree or tend to agree with option relative to total No. of responses		29/277		6/263	
No. of organisations and groups who strongly disagree or tend to disagree with option relative to total No. of responses		4/277		3/263	
Positive key themes raised regarding option		Route South of Old Rectory is my preferred option / the best / sensible option / logical choice	20	Route North of Old Rectory is my preferred option / the best / sensible option / logical choice	9
		Route South of Old Rectory will minimise impact on nearby buildings - demolition	40	Route North of Old Rectory will be a straighter road / fewer bends	9
		Route South of Old Rectory will cause less damage to heritage site - Church of St Mary	12	Route North of Old Rectory will reduce traffic / ease congestion - Barnard Castle - HGVs / lorries / larger vehicles	9
Negative key themes raised regarding option		Route South of Old Rectory will provide poor access / connections - Barnard Castle	6	Route North of Old Rectory will provide Eastbound movement junction only - Rokeby	9
		Route South of Old Rectory will provide too many / superfluous all movement junctions	2	Route North of Old Rectory will provide poor access / connections - for HGVs / lorries / larger vehicles - unsuitable / inadequate bridge	8
		Route South of Old Rectory will be noisy / increase traffic noise	1	Route North of Old Rectory will provide poor access / connections - for HGVs / lorries / larger vehicles - unsuitable / inadequate bridge	7

Project Objective	Appraisal Criteria	Stage 1	Stage 2	Stage 1	Stage 2
· economic growth	· length of option	3.45km		3.45km	
	· reduction in journey time (compared to Do Minimum)[Note 2]	reduction in JT - 0.6 mins		reduction in JT - 0.5 mins	
· improve connectivity	· economic benefits (compared to Do Minimum)[Note 2]	No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve access for tourism and local services/jobs		No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve road safety	· safety in operation · safety in construction	No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve journey time reliability	· improvement in JTR compared to Do Minimum	No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve A66 as strategic connection	· improvement in resilience compared to Do Minimum	No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve resilience		No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve NMU provision	· opportunities to improve NMU provision	Increased opportunity for grade separated NMU facilities crossing the A66		Increased opportunity for grade separated NMU facilities crossing the A66	
· reduce community severance	· reduction in severance	No notable preference between either option		No notable preference between either option	
· minimise environmental impacts and optimise environmental improvement opportunities	· Landscape	No likely significant impacts.		No likely significant impacts.	
	· Biodiversity	No likely significant impacts.		No likely significant impacts.	
	· Water environment and drainage	May have a direct impact on the Tutta Beck and River Greta and their associated floodplains.		May have a direct impact on the Tutta Beck and River Greta and their associated floodplains.	
	· Cultural Heritage	Could have a settings impact on the Greta Bridge Roman Fort and Rokeby Park.		Could have a settings impact on the Greta Bridge Roman Fort and Rokeby Park. Potential significant impacts on Church of St Mary and two milestones.	
	· Air quality	Would not result in an exceedance of the AQS objectives for NO2 and PM10 and impacts are not considered to be significant, based on the currently available information.		Would not result in an exceedance of the AQS objectives for NO2 and PM10 and impacts are not considered to be significant, based on the currently available information.	
	· Noise	Increase in road traffic noise for receptors along the existing A66.		Increase in road traffic noise for receptors along the existing A66.	
	· Planning – compliance with NPS	No differentiator between the options at this stage		No differentiator between the options at this stage	
	· Population and Health	Would lead to the loss of agricultural land and require the demolition of a residential property (The Old Rectory)		Would lead to the loss of agricultural land, which may impact upon businesses.	
	· Geology and Soils	No likely significant impacts.		No likely significant impacts.	
	· Climate	No likely significant impacts.		No likely significant impacts.	
	· Materials	No likely significant impacts.		No likely significant impacts.	
Other criteria	Cost of option	£71M		£60M	
	Land take outside highway boundary	Greater land take required		less land take required	
	Property demolition	none		Old rectory	
	Impact on property	No notable preference between either option		No notable preference between either option	
	Construction impacts	662 days		641 days	
	Significant risks	No significant risks identified		Potential issue for HGVs needing to travel WB when egressing from Barnard Castle junction	

Stephen Bank to Carkin Moor

Consultation Responses [Note 1]	Southern Bypass – Option M (14A)		Northern Bypass – Option N (14F)		Hybrid – Option O (14G)	
No of members of public who strongly agree or tend to agree with option relative to total No. of responses	112/301		150/306		32/278	
No. of members of public who strongly disagree or tend to disagree with option relative to total No. of responses	78/301		56/306.		132/278	
No. of organisations and groups who strongly agree or tend to agree with option relative to total No. of responses	3/301		13/306		6/278	
No. of organisations and groups who strongly disagree or tend to disagree with option relative to total No. of responses	12/301		2/306		11/278	
Positive key themes raised regarding option	Will cause less damage to heritage site - scheduled monument - Roman Fort / prehistoric settlement	41	Is my preferred option / the best / sensible option / logical choice	28	Is my preferred option / the best / sensible option / logical choice	4
	Is my preferred option / the best / sensible option / logical choice	16	Will be quieter / reduce traffic noise	15	Will be quieter / reduce traffic noise - in Ravensworth	1
	Will provide better access / connections - Mainsgill Farm Shop	7	Will provide better access / connections - local roads / towns / villages	13	Will minimise impact on nearby people / communities - Gilling West	1
	Will cause less disruption / fewer delays - to traffic flow during construction	6	Will provide better access / connections - Mainsgill Farm Shop	13		
Negative key themes raised regarding option	Will be noisy / increase traffic noise	9	Will cause damage to heritage site - scheduled monument - Roman Fort / prehistoric settlement	7	Will not be a straight road / too many bends	8
	Will impact on local business / jobs - Mainsgill Farm Shop	4	Will not be a straight road / too many bends	2	Will be noisy / increase traffic noise	8
	Will impact on existing public rights of way - bridleways / equestrian provision / crossing points - Mainsgill Farm	3	Will be more complicated / take longer to deliver	1	Will provide too many junctions / cross too many local roads in close proximity	6

Project Objective	Appraisal Criteria	Stage 1	Stage 2	Stage 1	Stage 2	Stage 3	Stage 4
· economic growth	· length of option	5.5km		4.8km		4.85km	
	· reduction in journey time (compared to Do Minimum)[Note 2]	reduction in JT - 1.3 mins		reduction in JT - 1.4 mins			
· improve connectivity	· economic benefits (compared to Do Minimum)[Note 2]	No differentiator between the options at this stage		No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve access for tourism and local services/jobs		No differentiator between the options at this stage		No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve road safety	· safety in operation · safety in construction	No differentiator between the options at this stage		No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve journey time reliability	· improvement in JTR compared to Do Minimum	No differentiator between the options at this stage		No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve A66 as strategic connection	· improvement in resilience compared to Do Minimum	No differentiator between the options at this stage		No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve resilience		No differentiator between the options at this stage		No differentiator between the options at this stage		No differentiator between the options at this stage	
· improve NMU provision	· opportunities to improve NMU provision	Increased opportunity for grade separated NMU facilities crossing the A66		Increased opportunity for grade separated NMU facilities crossing the A66. Greater NMU access between Ravensworth and Fox Hall available by the utilisation of the de-trunked A66		Increased opportunity for grade separated NMU facilities crossing the A66.	
· reduce community severance	· reduction in severance	Option improves and reduces the impact of severance by diverting the A66 away from its current central position		Option improves and reduces the impact of severance by diverting the A66 away from its current central position Option to the north maintains access to Ravensworth via de-trunked A66.		Option improves and reduces the impact of severance by diverting the A66 away from its current central position	
· minimise environmental impacts and optimise environmental improvement opportunities	· Landscape	No likely significant impacts.		No likely significant impacts.		No likely significant impacts.	
	· Biodiversity	There are no designated sites of international and national importance (SSSI & SAC) located within 200m of Option		There are no designated sites of international and national importance (SSSI & SAC) located within 200m of Option		There are no designated sites of international and national importance (SSSI & SAC) located within 200m of Option	
	· Water environment and drainage	No likely significant impacts.		No likely significant impacts.		No likely significant impacts.	
	· Cultural Heritage	Would not impact the Roman Fort and Prehistoric settlement.		Could result in physical impacts to the Roman Fort and Prehistoric settlement.	Would maintain the historic alignment of the Roman	Could result in physical impacts to the Roman Fort and Prehistoric settlement.	
	· Air quality	Would not result in an exceedance of the AQS objectives for NO2 and PM10 and impacts are not considered to be significant, based on the currently available information.		Would not result in an exceedance of the AQS objectives for NO2 and PM10 and impacts are not considered to be significant, based on the currently available information.		Would not result in an exceedance of the AQS objectives for NO2 and PM10 and impacts are not considered to be significant, based on the currently available information.	
	· Noise	Would increase road traffic noise at noise sensitive receptors in Dalton, Gilling West and Ravensworth.		Would result in increased road traffic noise at West Layton and perceptible decreases at Ravensworth		Would increase road traffic noise at noise sensitive receptors in Ravensworth.	
	· Planning – compliance with NPS	No differentiator between the options at this stage		No differentiator between the options at this stage		No differentiator between the options at this stage	
	· Population and Health	Would lead to the loss of agricultural land, which may impact upon agricultural business.		Would lead to the loss of agricultural land, which may impact upon agricultural business.		Would lead to the loss of agricultural land, which may impact upon agricultural business.	
	· Geology and Soils	No likely significant impacts.		No likely significant impacts.		No likely significant impacts.	
	· Climate	No likely significant impacts.		No likely significant impacts.		No likely significant impacts.	
	· Materials	No likely significant impacts.		No likely significant impacts.		No likely significant impacts.	
Other criteria	Cost of option	£110M		£114M			
	Land take outside highway boundary	Land take required		Land take required		Land take required	
	Property demolition	none		none		none	
	Impact on property	benefits to properties currently fronting onto A66		benefits to properties currently fronting onto A66		benefits to properties currently fronting onto A66	
	Construction impacts	1009 days		981 days		1044 days	
	Significant risks	none		none		none	

APPENDIX C

Hazard Elimination Schedule

Scheme Title **A66 Northern Trans-Pennine - Stage 2 Optioneering**

CDM Hazard Elimination & Constraint Schedule Review Tracker

Review Date	Version Track	Update By: Provide phase &	Category	Activity or Element if appropriate	Location Name (Please be	Summary of Key Changes or Update	Comments
04/01/2017	1	Arcadis (Stage 1)	General	Southern Options	A66 Northern Trans-Pennine	Initial population based on hazards identified during Hazard Identification Workshop on 04/01/17 - e.g.	
13/11/17	2	Arcadis (Stage 1)	General	Options	A66 Northern Trans-Pennine	General update	
21/02/2018	**3**	**Arcadis (Stage 1)**	**General**	Options	A66 Northern Trans-Pennine	Split into General Long - Short List option Risks	
14/03/2018	3	**Arcadis (Stage 1)**	**General**	Options	A66 Northern Trans-Pennine	Design Hazard Review Meeting	
25/04/2018	3	**Arcadis (Stage 1)**	**General**	Options	A66 Northern Trans-Pennine	Design Hazard Review Meeting	
07/06/2018	3.1	**Arcadis (Stage 1)**	**General**	Options	A66 Northern Trans-Pennine	Design Hazard Review Meeting and Stats input	
11/07/2018	3.1	**Arcadis (Stage 1)**	**General**	Prep For TAR	A66 Northern Trans-Pennine	Design Hazard Review Meeting	
03/10/2018	4	**Arcadis (Stage 1)**	**General**	Post TAR Review	A66 Northern Trans-Pennine	Design Hazard Review Meeting - Post TAR Actions	
15/10/2018	4.1	**Arcadis (Stage 1)**	**General**	Post TAR Review	A66 Northern Trans-Pennine	Design Hazard Review Meeting	
24/03/2019	**4.2**	**Arcadis (Stage 2)**	**General**	Version to be transferred to GIS	A66 Northern Trans-Pennine	Design Hazard Review Meeting - update - GIS Transitional	
24/04/2019	**4.3**	**Arcadis (Stage 2)**	**General**	Version to be transferred to GIS	A66 Northern Trans-Pennine	Design Hazard Review Meeting - update - GIS Transitional	
20/09/2019	**5**	**Arcadis (Stage 2)**	**General**	CSV copy from GIS	A66 Northern Trans-Pennine	Interim HES for Stage 3-5 Preparation	

INSTRUCTIONS

1.0 Introduction

1.1 The CDM Hazard Elimination Schedule (HES) assists the Principal Designer, Principal Contractors, Designers and

1.2 The HES should not be confused with the 'Hazard Log' & 'Hazard Log Report' which are a PCF Product produced and

1.3 The HES should not include general or generic hazards that a reasonably competent contractor would be expected to

1.4 The HES provides a record of actions taken by Designers to apply the principles of prevention and protection during design,

1.5 This information will assist duty holders in ensuring that throughout the design stage residual risks are highlighted and

Designers:
Hazard elimination / reduction construction sequence, materials section, notes on drawings and specifications.

Principal Contractor:
Use of information received, management of H&S and residual risks, construction methodology, inform contractors.

Principal Designer:
Ensuring hazard and constraint identification and residual risks are transferred to Principal Contractor, Specialist Contractors and

Operators:
Use of information by those who need it

2.0 Hazard Checklist

2.1 The checklist is an aid to the designer when considering hazards. *The list is not exhaustive.*

3.0 CDM HES

3.1 the CDM Schedule is split vertically into three parts

- Design Stage hazard and constraint identification, elimination or reduction
- Construction Stage management and Control of residual hazards
- Client / Principal Designer Closeout for Operation & Maintenance

3.2 The CDM HES is also split into separate worksheets as appropriate to the scheme, typically:

- Instructions
- Design Hazard Checklist
- Project Specific Hazards and Constraints
- Dashboard

4.0 Ownership & Responsibility

4.1 the CDM HES will be controlled and reviewed by the Designer on a monthly basis (or other agreed period).

Principal Designer

- Ensuring the CDM HES is completed and all parties contribute
- Coordinating the transfer of information between parties:
  - Designer to Principal Contractor (Pre-Construction Information)
  - Principal Contractor to Maintainer & Operator (Health & Safety File, O&M Manual)
- Reporting any deficiencies to the Scheme Client Project Manager

Designer

- Identifying Hazards and constraints
- Eliminating & Reducing hazards through the design stage
- Updating & maintaining the CDM Schedule
- Communicating information on residual hazards to the Principal Contractor

In addition we request Designers to undertake the following as part of their designs:

Principal Contractor

- Contributing to the reduction or elimination of hazards through the detailed design stage (buildability reviews)
- Updating the CDM Schedule to consider hazards identified during any Contractor design (eg temporary
- Distribution of the CDM Schedule, following input and updating, to those concerned within the contractor's

4.2 The above is an aid to manage the CDM Schedule, all parties should be aware of their duties under the CDM Regulations, http://www.hse.gov.uk/construction/cdm.htm

5.0 Design Risk Ratings

5.1 Hazard and constraint identification should be undertaken prior to commencement of the design and then throughout the life

5.2 An assessment matrix is used to define the Risk Rating (Risk Rating = Likelihood x Severity)

5.3 The assessment is carried out in several stages:

- Initial Hazard or constraint Rating prior to design measures to eliminate or reduce
- Residual Hazard or Constraint Rating post design measures
- Residual Hazard or Constraint Rating post construction measures

5.4 Likelihood is a function of frequency of exposure and number people involved

LIKELIHOOD	Remote	Occasional	Average	Frequent	Probable
SCALE	1	2	3	4	5

5.5 Severity in relation to the likely personal injury to result from the hazard occurring

HAZARD SEVERITY	DESCRIPTION	SCALE
Very Low	First aid on site	1
Low	Treatment on site	2
Moderate	Up to 3 days off work	3
High	Major Injury	4
Very High	Death	5

CONSTRAINT RATING	DESCRIPTION	SCALE
Very Low	As set out in PSSR or EAR	1
Low		2
Moderate		3
High		4
Very High		5

5.6 Assessment Matrix

	SEVERITY				
LIKELIHOOD	1 Very Low	2 Low	3 Moderate	4 Major Injury	5 Very High
1 Remote	1	2	3	4	5
2 Occasional	2	4	6	8	10
3 Average	3	6	9	12	15
4 High	4	8	12	16	20
5 Very High	5	10	15	20	25

= Unacceptable (score 10 – 25)

= Control Measures Required (score 6 – 9)

= Acceptability low (score 1 – 5)

6.0 Information to be provided on the Drawings

6.1 The designer has a duty to provide information on residual risks to the principal contractor. Where appropriate this

7.0 Pre-Construction Information

7.1 The Pre-Construction Information (PCF Product) is produced at design stage to provide project specific health and safety

Category Owners			
Category Owners		Owner	Organisation
Drainage	D		
Environment	E		
Geotechnical	G		
Highway	H		
Structures	S		
Lighting	L		
Technology	T		
Temporary Works Structures	TW		

Principal Contractor to confirm

8.0 Background Information

8.1 The following table shows examples of Hazard and Risks

HAZARD	RISK
Height	Falling
Falling objects	Being hit
Moving vehicles	Entrapment or crushing
Electricity	Electrocution
Water	Drowning
Trip Hazards	Slips Trips and Falls (ST
Poor Lighting	ST&F, Sight loss
Collapsing ground	Engulfment, asphyxiation
Fire & explosion	Burns or asphyxiation
Collapsing ground	Engulfment, asphyxiation
Fire & explosion	Burns or asphyxiation
Hazardous substances	Sickness, skin complaint
Pressure Systems	Several, according to
Noise	Hearing loss
Dust	Sickness
Confined Space	Asphyxiation
Irrespirable atmosphere	Asphyxiation
Inundation	Drowning
Ionising radiation	Sickness

Volume codes

Code	Description
G	**GENERAL**
GEN	Scheme wide generic information
GHS	Health and Safety
H	**HIGHWAYS**
HAC	Highway Approvals & Consents
HAW	Accommodation Works
HDG	Drainage
HEL	Power / Electrical
HFE	Fencing
HGT	Geotechnical
HGN	General
HKF	Kerbs, Footways and Paved Areas
HLG	Road Lighting
HMC	Motorway Communications
HMK	Road Markings
HML	Mainline Geometric Layout
HPV	Road Pavements
HRR	Road Restraint System (Vehicle and Pedestrian)
HSC	Site Clearance
HSN	Traffic Signs
HSR	Side Roads Geometric Layout
S	**STRUCTURES**
SBR	Bridges and Major Culverts
SGN	General
SGT	Geotechnical
SGY	Gantries
SMA	Masts
SMN	Minor Structures and Culverts
SRW	Retaining Walls
SSP	Special structures
STU	Tunnels
E	**ENVIRONMENT**
EAC	Environmental Approvals & Consents
EAQ	Air Quality
EBD	Biodiversity
EGN	General
EGT	Geology and Soils
EHR	Heritage/Historic resources
ELS	Landscape
ENM	Non-Motorised Users
ENV	Noise & Vibration
ETS	Townscape
EWE	Water Environment
V	**SURVEY**
VAB	Asbestos survey
VAS	Accident Statistics
VDS	Drainage Survey
VES	Environmental Survey
VGN	Survey General
VGT	Geotechnical Investigation
VNR	National Road Telecommunications Services (NRTS)
VPS	Pavement Systems
VSM	Structures management
VSS	Stakeholder Surveys
VTO	Topographical
VTR	Traffic Survey
VUT	Utilities
L	**LEGAL**
LSI	Statutory Instruments
LLO	Land Ownership Boundaries
T	**TEMPORARY**
TTM	Traffic management
TTW	Temporary works

Category	General	Highways	Structures	Environme	Survey	Legal	Temporan	Traffic	Economic	Stakeholder Engagement
General	GEN	HAC	SBR	EAC	VAB	LSI	TTM			
Highways	GHS	HAW	SGN	EAQ	VAS	LLO	TTW			
Structures		HDG	SGT	EBD	VDS					
Environment		HEL	SGY	EGN	VES					
Survey		HFE	SMA	EGT	VGN					
Legal		HGT	SMN	EHR	VGT					
Temporary		HGN	SRW	ELS	VNR					
		HKF	SSP	ENM	VPS					
		HLG	STU	ENV	VSM					
		HMC		ETS	VSS					
		HMK		EWE	VTO					
		HML			VTR					
		HPV			VUT					
		HRR								
		HSC								
		HSN								
		HSR								

Sections	Sub-Scheme	Status
All	A66 NTPP	Open
Section 1		Closed
Section 2		
Section 3		
Section 4		
Section 5		
Section 6		
Section 7		
Section 8		
Section 9		
Section 10		
Section 11		
Section 12		
Section 13		
Section 14		
Section 15		

Hazard Elimination and Residual Risk Register

Designer's Hazard Checklist

Notes:

1. The following Designers Hazard Checklist allows identification of a number of potential hazards that may be present in a generic Highways setting. Each discipline is required to develop and maintain the Designers Hazard Checklist that reflects potential hazards likely to be encountered in the setting or industries in which the scheme will be delivered.

2. The list of potential hazards is not exhaustive. For each new project the entire checklist should be reviewed by competent staff as part of a mini workshop or brainstorming exercise to help prompt the identification of hazards in addition to those listed or already considered during an earlier review.

3 An individual hazard or an entire section may be marked as not applicable. This records that the hazard area has been considered and judged it to be not applicable.

4. All hazards that may result in a medium to high risk rating **must** be thoroughly assessed and recorded in the Project Specific Hazard and Residual Risk Register Tab.

5 Low risk hazards are those that should they occur/be realised may result in at worst first aid treatment only or no damage to assets. Low risk hazards therefore potentially generate Occupational Health Issues which should be considered during the design development process. Key elements are highlighted in brown. Designs teams should evidence below which work activities will generate OHH's, what has been considered and their impact will be managed and reduced during project delivery.

Potential Hazards Arising From:	Comments
Regulation 12(2) - Work involving particular risks (Schedule 3 CDM 2015 / Schedule 4 CDM (NI) 2016) 1. Work which puts workers at risk of burial under earthfalls, engulfment in swampland or falling from a height, where the risk is particularly aggravated by the nature of the work or processes used or by the environment at the place of work or site. 2. Work which puts workers at risk from chemical or biological substances constituting a particular danger to the health or safety of workers or involving a legal requirement for health monitoring. 3. Work with ionising radiation requiring the designation of controlled or supervised areas under regulation 16 of the Ionising Radiations Regulations . 4. Work near high voltage power lines. 5. Work exposing workers to the risk of drowning. 6. Work on wells, underground earthworks and tunnels. 7. Work carried out by divers having a system of air supply. 8. Work carried out by workers in caissons with a compressed air atmosphere. 9. Work involving the use of explosives. 10. Work involving the assembly or dismantling of heavy prefabricated components.	

		Risk (without designer's elimination / management measures)				
Ref:		**N / A**	**Low- explain in comments.**	**Med/High - transfer to Project Specific Hazard and Residual Risk Register**	**Designer OHH Action**	**Comments**
1	**Existing Constraints**					
1.1	Existing buildings / adjacent walls / structures			Yes		Residential and agricultural properties may require demolishion
1.2	Adjacent Land uses / property types			Yes		Residential, agricultural and industrial properties
1.3	Verges / hedges / ditches / overhanging trees		Yes			Present along all new alignments
1.4	Adjacent roads / junctions / rdbts etc.			Yes		Existing junctions / carriageways to be modified and incorporated within new alignment
1.5	Levels of illumination (street lighting)		Yes			Existing carriageway lighting is present in some location
1.6	Impaired visibility (geometry / furniture etc.)			Yes		Potentially at some locations
1.7	Cellars / basements / subways etc.			Yes		Limited - check via survey
1.8	Traffic					
	• Volume (tidal / shift orientated)	No				
	• Type (buses / HGVs etc.)			Yes		This will be an issue to high volumes of HGV and plant movements required as a result of the works
	• Speeds			Yes		Speed on existing sections vary from 40-70mph
	• Bus Route / wide load route / EDR			Yes		Liaison taking place with LA's and Bus operators
	• Accident 'hot-spots'			Yes		Review figures
1.9	Pedestrians					
	• Crossing points (type of crossing)			Yes		Confirm all locations
	• School crossing patrol	NA				Check
	• Footway availability			Yes		Check
	• Disabled facilities / access arrangements			Yes		Check
1.10	Access restrictions					
	• One way / Prohibited movements	No				Check
	• Weight / width / height	No				Check - diversion route only
	• Geometry / Layout restrictions			Yes		Captured in DSR
	• On-street Parking / driveways		Yes			Potential access issues
	• Deliveries			Yes		Delveries to local residents, forms, industry. Location of site compound and storage areas to be considered
1.11	Railways (level crossings / bridges etc.)	NA				
1.12	Bridleways / Public Rights of way			Yes		Suitable diversions to be put in place
1.13	Lakes, Rivers and Streams etc.			Yes		Proximity to works, depth of water, risk of flooding to be considered
1.14	Ground conditions:					
	• Contamination			Yes	Yes	Propose carriageway alignment passes through brown field sites which may contain hazardous residue
	• Ground water			Yes	Yes	Localised issues to consider
	• Instability			Yes	Yes	
	• Archaeology / SSSI / reserve			Yes		Archaeology sites identified and subject to further investigation - may form constraint to works
	• Mineral / mine workings			Yes		Mineworking's are an issue at .....
	• Previous land uses			Yes		Captured in PCI
1.15	Working with others (i.e. sharing site)			Yes	Yes	Extensive stats diversions required - particularly adjacent Underpass
1.16	Hazardous / Fragile materials			Yes	Yes	Asbestos likely to be present in demolition properties and existing highway infrastructure - Testing Required - SAMP to be produced
1.17	Restricted working hours (nights etc.)		Yes		Yes	Potentially in areas close to residential areas
1.18	Occupied Properties			Yes		Work will come close to existing properties
1.19	Topography			Yes		Site exposed, hilly and crosses many water features

2	**Existing Services**					
2.1	Underground					Trial holes required, stats plans, inclusion in PIM
	• Electrical (SU & private)			Yes		C2, C3 and C4 process to be followed
	• Gas (low and medium pressure)			Yes		C2, C3 and C4 process to be followed
	• Fuel Pipelines / High pressure Gas Mains			Yes?		
	• Water			Yes		C2, C3 and C4 process to be followed
	• Telecommunications			Yes		C2, C3 and C4 process to be followed
	• Other	NA				
2.2	Overhead Services					Headroom's to be considered
	• Electrical			Yes		C2, C3 and C4 process to be followed
	• Telecommunications			Yes		C2, C3 and C4 process to be followed
3	**Excavations (Highway /Geotech / Landscaping Team)**					
3.1	Deep excavations			Yes	Yes	Balance of cut and fill to be considered Excavation in deep cutting - dust issues
3.2	Interface with services / drainage			Yes	Yes	
3.3	Slope / ground stability			Yes	Yes	Working on steep slopes. Limiting OHH exposure issues to be considered during design process - At PC handover PC to demonstrate residual issues captured within generic / Site specific procedures
3.4	Ground water / water courses			Yes	Yes	Working adjacent deep water. Limiting OHH exposure issues to be considered during design process - At PC handover PC to demonstrate residual issues captured within generic / Site specific procedures
3.5	Plant movements			Yes	Yes	Bulk excavation required - considerable plant movements. Limiting OHH exposure issues to be considered during design process - At PC handover PC to demonstrate residual issues captured within generic / Site specific procedures
3.6	Storage / disposal of material		Yes			Storage areas and security to be considered across the extended working areas
3.7	Vibration though compaction					
	• Adjacent buildings / cellars / walls etc.				Yes	
	• Buried services (refer 2.1)			Yes	Yes	Ref 2.1
3.8	Unplanned settlement		Yes			Provide monitoring on affected premises
3.9	Contamination (ground / water) (refer 1.14)				Yes	Ref 1.14
3.10	Tree roots		Yes			Limited
3.11	Adjacent structures (refer 1.8)		Yes			Ref 1.8
3.12	Confined Space Conditions			Yes		See Drainage, Structures and demolition section

4	**Surfacing Operations (Highways / Pavement Team)**					Limiting OHH exposure issues to be considered during design process - At PC handover PC to demonstrate residual issues captured
4.1	Adequate safety zones (centre line working)	**NA**				
4.2	Coal Tar			**Yes**	**Yes**	Testing required - See 184
4.3	Surfacing Materials (hot materials)		**Yes**		**Yes**	PC to provide evidence of operational procedures
4.4	Dust / noise / vibration		**Yes**		**Yes**	PC to provide evidence of operational procedures
4.5	Hot Materials (bitmac / thermo / tack coat)		**Yes**		**Yes**	PC to provide evidence of operational procedures
4.6	Temporary road surfaces		**Yes**		**Yes**	PC to provide evidence of operational procedures
4.7	Haul routes			**Yes**		Careful planning will be required. Balance of cut and fill to be considered
4.8	Holding / storing of lorries on site		**Yes**			Designers to consider within DCO land boundaries PC to provide evidence of operational procedures
4.9	Delivery / storage of plant / offices on site etc.		**Yes**			Designers to consider within DCO land boundaries PC to provide evidence of operational proceduresPC to provide evidence of operational procedures
4.10	Separating Public from the works		**Yes**			Designers to consider with builability contractor PC to provide evidence of operational procedures
4.11	Impeding visibility (plant / stores / offices etc.)		**Yes**			PC to provide evidence of operational procedures
4.12	Joints / vertical level differences		**Yes**			PC to provide evidence of operational procedures
4.13	Removal of road markings / studs / A.skid		**Yes**			PC to provide evidence of operational procedures
4.14	Raised ironwork / increased kerb up-stands		**Yes**			PC to provide evidence of operational procedures
4.15	Planing out signal / detector loops		**Yes**			PC to provide evidence of operational procedures
4.16	Skid resistance of new surfaces		**Yes**			Design to consider
5	**Kerbing / Footways (Highways Team)**					
5.1	Manual handling		**Yes**		**Yes**	Designer to consider access arrangements for plant. Placement of Kerbing, Flagging etc. PC to provide evidence of operational procedures
5.2	Excavation (refer to 3)		**Yes**			PC to provide evidence of operational procedures
5.3	Services (refer to 2)		**Yes**			PC to provide evidence of operational procedures
5.4	Cutting operations / noise / dust		**Yes**		**Yes**	Can pre-fabricated units be constructed and brought to site to minimise exposure? Cutting of concrete projects. PC to provide evidence of operational procedures
5.5	Maintaining access			**Yes**		To be considered during design development
5.6	Pedestrian management (refer to 8)			**Yes**		To be considered during design development
5.7	Existing constraints (refer to 1)		**Yes**			PC to provide evidence of operational procedures
5.8	Temporary surfaces / raised ironwork etc.		**Yes**			PC to provide evidence of operational procedures
5.9	New / altered geometry		**Yes**			PC to provide evidence of operational procedures
5.10	Location of storage areas		**Yes**			PC to provide evidence of operational procedures
5.11	Materials		**Yes**			PC to provide evidence of operational procedures
6	**Drainage and Ducting Works (Drainage/Highways Team)**					
6.1	Excavations / Ground conditions / Instability			**Yes**	**Yes**	Working adjacent aqueduct, overheads
6.2	Confined spaces		**Yes**		**Yes**	Can pre-fabricated units be constructed and brought to site to minimise exposure? PC to provide evidence of operational procedures
6.3	Leptospirosis / Hepatitis B / Tetanus etc.		**Yes**		**Yes**	PC to provide evidence of operational procedures
6.4	Existing services		**Yes**		**Yes**	PC to provide evidence of operational procedures
6.5	Manual handling		**Yes**		**Yes**	PC to provide evidence of operational procedures
6.6	Lifting operations		**Yes**		**Yes**	PC to provide evidence of operational procedures
6.7	Cutting Operations		**Yes**		**Yes**	Can pre-fabricated units be constructed and brought to site to minimise exposure? PC to provide evidence of operational procedures
6.8	Future Maintenance		**Yes**		**Yes**	Designers to consider future maintenance arrangements
6.9	Sewage		**Yes**		**Yes**	PC to provide evidence of operational procedures
6.10	Traffic					PC to provide evidence of operational procedures
6.11	Contamination (ground / water / sewage)		**Yes**		**Yes**	PC to provide evidence of operational procedures
6.12	Removal of contaminated materials		**Yes**		**Yes**	Testing required. PC to provide evidence of operational procedures
6.13	Hazardous gases		**Yes**		**Yes**	PC to provide evidence of operational procedures
6.14	Testing operations					
6.15	Adjacent structures/activities					

7	**Technology / Street Lighting / Mechanical / Electrical Installation (Technology/Street Lighting Team)**					
7.1	Positioning of columns					
	• Buried services (refer 2.1)		Yes			Columns to be located away from underground service identified from utilise drawing, residual risk of unrecorded and miss-recorded service contractor to scan and hand dig
	· Overhead / adjacent obstructions (refer to 7.8 and 2.2)	No				Street lighting column will not be located within the vicinity zone of OH line, all columns within the proximity zone are fold down.
	• Excavations (refer 3)		Yes			
	• Reducing footway widths / clearances		Yes			Columns to be located at the back of footways where present
	• Impeding access / visibility		Yes			Columns are located away from carriageway access points and back away from the kerb line as much as possible to reduce impeding visibility. See PIM model
	• Nuisance / obtrusive lighting		Yes			Ensure columns are located away from residential properties
	· Future Maintenance access to columns	No				Columns located at least 1m from slopes and drops reducing risk of falls
	Future Maintenance exposure to live traffic		Yes			Confirm
7.2	Column erection / removal			Yes		Potential presence of overheads
7.3	Cable installation		Yes	Yes		Sufficient spare duct capacity, minimal duct lengths (no more than 100m) and sufficiently sized chambers to facilitate safe cable installation.
7.4	Electrical works - working with, on or near to live equipment		Yes			PC to provide evidence of operational procedures - competent Electrician
7.5	Levels of illumination			Yes		Lighting levels shall be kept as close to the minimum requirements for the required lighting class to reduce obtrusive light and light pollution
7.6	Testing operations			Yes		Street lighting feeder pillars are to be located behind VRS reducing the risk of collision from an errant vehicle
7.7	Type of equipment specified	No				Luminaires specified will be full cut off and a glare rating of at least G4 (BS EN 13201-2 2015) to minimise obtrusive light and light pollution.
7.8	Working at height (location? Fold downs?) (refer 2.2)		Yes		Yes	If required - Columns no taller than 12m have been specified, adjacent to OH live fold down columns have been specified. Limiting OHH exposure issues to be considered during design process - At PC handover PC to demonstrate residual issues captured within generic / Site specific procedures
7.9	Chemicals / COSHH / Jointing materials		Yes		Yes	Removal for existing lamps will need to be undertaken by competent persons as the lamps contain sodium and mercury, a competent contractor will know this as it is common to all lighting installations over 10 years old.
7.10	Animal excretions		Yes		Yes	Potentially
7.11	Insect / rodent infestations		Yes		Yes	Potentially
7.12	Traffic Management (refer 8)		Yes			PC to provide evidence of operational procedures
7.13	Access		Yes			PC to provide evidence of operational procedures
7.14	Manual handling		Yes		Yes	Can pre-fabricated units be constructed and brought to site to minimise exposure? PC to provide evidence of operational procedures
7.15	Materials/substances		Yes		Yes	PC to provide evidence of operational procedures
7.16	Confined spaces		Yes		Yes	Can pre-fabricated units be constructed and brought to site to minimise exposure - chambers?
7.17	Pressure systems	NA				
7.18	Fixings		Yes			PC to provide evidence of operational procedures
8	**Traffic Management (All Teams / Highways Team)**					Designer to consider:-
8.1	Maintaining access (i.e. programme works)			Yes		Works pass through heavily trafficked area
8.2	Controlling access (gatemen etc.)		Yes			May be required at certain access points
8.3	Safety Zones available		Yes			If required
8.4	Barrier types / positioning of signs etc.		Yes			PC to provide evidence of operational procedures
8.5	Setting up equipment / signs etc.		Yes		Yes	PC to provide evidence of operational procedures
8.6	Maintenance of equipment / signs etc.		Yes		Yes	PC to provide evidence of operational procedures
8.7	Separating pedestrians from works (refer 1.9)		Yes			Constructability consideration
8.8	Separating vehicles from the works		Yes			Constructability consideration
8.9	Site generated traffic (also see 1.8)			Yes		As 8.1
8.10	Temporary restrictions (one-way, speeds, signals etc.)		Yes			Constructability consideration
8.11	Road closures (diversion routes)		Yes			Constructability consideration
8.12	Site generated local congestion		Yes			Constructability consideration
8.13	Emergency vehicle access		Yes			Constructability consideration
8.14	Altering existing signals / road layouts		Yes			Constructability consideration
8.15	Phasing / amending traffic management		Yes			Constructability consideration
8.16	Level crossings	NA				
9	**Welfare (All Teams)**	TBC				Locations to be confirmed - populate at later Stage
9.1	Location / suitability of office / welfare facilities					
	• Buried services					
	• Overhead obstructions					
	• Parking for workforces					
	• Power supply / temporary services					
	• Security of compound / barrier type					
	• Delivery access					
9.2	TM for establishment / removal of compound					

10	**Foundations - (Structures Team)**					Bridges, retaining walls, culvert and gantry?
10.1	Adjacent buildings / structures			Yes		Can we locate at sufficient distance as to eliminate the risk? Monitoring required if not
10.2	Deep excavations			Yes	Yes	Monitoring required
10.3	Plant movements			Yes	Yes	Buildability, adjacent underpass
10.5	Interface with services			Yes	Yes	See Stats section
10.6	Ground contamination		Yes		Yes	Testing required
10.7	Groundwater			Yes	Yes	
10.8	Confined spaces			Yes	Yes	
10.9	Piling					
	- Noise			Yes	Yes	Considered within construction sequencing
	- Vibration			Yes	Yes	Considered within construction sequencing
	- Plant			Yes	Yes	Considered within construction sequencing
	- Pile Cutting Requirements			Yes	Yes	Considered within construction sequencing
10.10	Grouting					Geotech to confirm
	- Drilling works		Yes		Yes	
	- Dust		Yes		Yes	
	- Pollution		Yes		Yes	
10.11	Others (insert as necessary)					
10.12	Underpinning; requirements					
11.0	**Masonry Construction**					
		NA				
12.0	**Timber Construction**					
		NA				
13.0	**Roofing and Cladding**					
		NA				
14.0	**Glazing**					
15.0	**Structures - Steel Erection (Structures Team)**					
15.1	Working at height		Yes			Bridge Works?? Is concrete a better option?
15.2	Lifting operations		Yes			PC to provide evidence of operational procedures
15.3	Temporary stability / bracing		Yes			PC to provide evidence of operational procedures
15.4	Connections		Yes			PC to provide evidence of operational procedures
15.5	Unusual sequence or methods	No				
15.6	Materials, e.g. paints		Yes			PC to provide evidence of operational procedures
15.7	Provisions for temporary access scaffolding supports		Yes			PC to provide evidence of operational procedures
16.0	**Highways -**					
16.1	Adjacent traffic		Yes			PC to provide evidence of operational procedures
16.2	Construction materials		Yes			PC to provide evidence of operational procedures
16.3	Structural works		Yes			PC to provide evidence of operational procedures
16.4	Adjacent structures		Yes			PC to provide evidence of operational procedures
16.4	Noise		Yes		Yes	Generic hazard to be passed to PC - PC to confirm processes and procedures in place.
16.6	Vibration		Yes		Yes	Generic hazard to be passed to PC - PC to confirm processes and procedures in place
17.0	**Structures - Concrete Construction (Structures Team)**					Insitu or pre-cast?
17.1	Working at height		Yes		Yes	Working on overbridges, working adjacent stats, underground/over ground
17.2	Plant restrictions		Yes			Working on underpass, working adjacent stats, underground/over ground
17.3	Lifting operations			Yes	Yes	Access
17.4	Noise			Yes	Yes	Can we prefab?
17.5	Vibration			Yes	Yes	Can we prefab?
17.6	Temporary instability			Yes	Yes	Must consider temporary works
17.7	Pre/post tensioning					??
17.8	Materials		Yes			
17.9	Maintenance		Yes			
17.10	Pre-cast concrete installation requirements / restrictions		Yes			As above
18.0	**Railway Activities**					
		NA				
19.0	**Demolition of Existing Structures**					
19.1	Services			Yes		
19.2	Adjacent/adjoining structures			Yes		
19.3	Materials					
	- Hazardous			Yes	Yes	**Asbestos - Demolition Specialist to be appointed if required- DMP**
	- Fragile		Yes		Yes	**Specialist procedures to be put in place if required**
19.4	Working at height		Yes		Yes	**Specialist procedures to be put in place if required**
19.5	Temporary stability			Yes	Yes	**Specialist procedures to be put in place if required**
19.9	Pre/post tensioning					??
19.7	Noise		Yes		Yes	**Specialist procedures to be put in place if required**
19.8	Vibration		Yes		Yes	**Specialist procedures to be put in place if required**
19.9	Others (insert as necessary)					
20.0	**Future Maintenance and Operation of Facility / Structure, etc.**					**Whole life design considerations must be captured**
20.1	Access		Yes			Considered
20.2	Safety equipment		Yes			Records and training
20.3	Testing/inspection		Yes			Records to be captured
20.4	Procedures		Yes			See MRSS
20.5	Final Construction Drawings		Yes			Will be produced - together with AIM
20.6	Health and Safety File		Yes			In development
20.7	Others (insert as necessary)					
21.0	**Future demolition or decommission of structure**					**Whole life design considerations must be captured**
21.1	Unusual sequence		Yes			
21.2	Pre/post tensioned elements	NA				
21.3	Materials	NA				
21.4	Adjacent/adjoining structure			Yes		
21.5	Temporary stability					
21.6	Imposed Load Restrictions	NA				
21.7	Stability Concept	NA				
21.8	Others (insert as necessary)					
22.0	**Use of the structure as a workplace**					
		NA				
23.0	**Maintenance and Operation of Facility / Structure etc.**					
24.0	**Water related aspects**					

Scheme Title: - A66 Northern Trans-Pennine Option Selection CDM Hazard Elimination & Constraint Schedule

Overall number of Hazards	281	Rev	5	Date	27th September 2019

Pre-Construction Hazards and Constraints

OBJECT ID	Hazard Triangle Reference	Display In Models	Identified By	Stage Identified	Discipline	Date Added	Design Activity or Element	Location Name	Section Name	Eastings Start	Northings Start	Eastings End	Northings End	Chainage Start Easting	Chainage Start Northing	Chainage End Easting	Chainage End Northing	Phase Affected	Hazard Or Constraint
6	A66.HML.S8.001	yes	ARCADIS	Stage 1	Highways - Alignment	March 15, 2018	Live firing range	Option I (formerly Section 8) - North of carriageway	Appleby to Brough	375163	516893							Construction operation and maintenance	Hazard and Potential Constraint
7	A66.GEN.001	Yes	ARCADIS	Stage 1	Highways - General Pavement	November 13, 2017	Tar bound materials may be present in existing sections of carriageway	All existing single carriageway sections	All									Construction	Hazard
10	A66.GEN.004	Yes	ARCADIS	Stage 1	Highways - General Safety Barrier	February 21, 2018	A decision needs to be made with respect to the central reserve vehicle restraint system, to assess the cost benefit of providing concrete barriers or alternative flexible barriers.	Scheme wide	All									Operation and Maintenance	Hazard
11	A66.GEN.005	Yes	ARCADIS	Stage 1	Highways - General Safety Barrier	February 21, 2018	Assuming a central reserve barrier would take up the space to one side of the centre of the central reservation, the central reserve would need to be widened for carriageways with radii less than 2700m would require widening to achieve 295m SSD and radii less than 1400m for an SSD of 215m. Samples of widening widths are given below: SSD 295m Radius 2700m no widening Radius 2040m - 1.3m widening Radius 1440m - 3.5m widening Radius 1020m - 6.7m widening Radius 720m - 11.2m widening SSD 215m Radius 2880m - no widening Radius 2040m - 1.7m widening Radius 1440m - 4.0m widening	Scheme wide	All									Operation and Maintenance	Potential constraint
12	A66.GEN.007	Yes	ARCADIS	Stage 1	Highways - General Alignment	February 21, 2018	The re-use of the existing carriageway will depend upon the acceptable number of steps below the desirable vertical crest curve that is considered safe to maximise the use of the existing A66 carriageway and reduce costs. At present a K value of 55 has been considered at the minimum.	Scheme wide	All									Operation and maintenance	Hazard and Constraint
13	A66.GEN.008	Yes	ARCADIS	Stage 1	Highways - General Alignment	February 21, 2018	It is proposed to review the existing field accesses to determine if access can be made from an alternative location other than the proposed A66 dual carriageway. Either by the provision from an alternative side/local road or whether access requires an additional farm access track or as a last resort whether it is required to retain or match existing the field access points that will be adjacent to the proposed dual carriageway.	Scheme wide	All									Use, Operation and Maintenance	Hazard and Potential Constraint
14	A66.GEN.009	Yes	ARCADIS	Stage 1	Highways - General Alignment	February 21, 2018	Offline construction from the existing A66 crest curves to a minimum K value of 100 have been considered as the acceptable minimum to minimise earthworks. Although this is an acceptable minimum radius when in combination with the associated reduced SSD relaxation this becomes a departure with respect to TD 9/93 para's 1.24 (combinations of relaxations) and also 1.26 (relaxations on the approach to junctions).	Scheme wide	All									Operation and Maintenance	Hazard and Constraint
15	A66.GEN.010	Yes	ARCADIS	Stage 1	Highways - General Alignment	February 21, 2018	Generally as a starting point minor access minor roads/tracks and other residential buildings have been provided with the same direct access layout as the existing	Scheme wide	All									Operation and Maintenance	Hazard and potential constraint
16	A66.GEN.011	Yes	ARCADIS	Stage 1	Highways - General Alignment	February 21, 2018	No central reserve crossings are proposed as part of the new dual carriageway proposals.	Scheme wide	All									Operation and Maintenance	Hazard
17	A66.GEN.012	Yes	ARCADIS	Stage 1	Highways - General Safety Barrier	February 21, 2018	It is proposed that a review of the existing central reserve crossings is carried out (using in particular accident data, traffic data and other constraints) to assess the need for grade separated junctions.	Scheme wide	All									Operation and Maintenance	Hazard
18	A66.GEN.013	Yes	ARCADIS	Stage 1	Highways - General Alignment	February 21, 2018	Some sections of the existing single lane carriageway do not currently have 1m hard strips, hence in order to comply with standards if the existing carriageway is to be reused. It is currently proposed to widen these sections by 2m as appropriate to comply with standards.	Existing Carriageway Scheme wide	All									Construction, operation and maintenance	Hazard and Constraint
19	A66.GEN.014	Yes	ARCADIS	Stage 1	Highways - General Alignment	February 21, 2018	Some existing minor roads are very narrow, it is necessary to discuss and agree what road widths to provide when providing new carriageway sections (especially for over/underbridges) for these roads as this will not comply with TD 27.	Scheme wide	All									Construction, operation and maintenance	Hazard and Potential Constraint
20	A66.GEN.015	Yes	ARCADIS	Stage 1	Highways - General Operation and Maintenance	February 21, 2018	Whole Life Design Existing Issues - Operations Meet with MSP's / Emergency Services / RCU / LA to better understand existing issues which impact on the H&S operating regime for the A66 - can the following issues have measures incorporated which addressed the problem or designed out - Snow - fencing/tree planting- High Wind - known problem sections?- Rain - flooding problems- Visibility / Fog / Low sun- locational - isolated sections- Emergency Services - access etc- Technology - requirements Service Areas - requirements	Scheme wide	All									Construction, Use, Operation and Maintenance	Potential Hazard or Constraint
21	A66.GEN.016	Yes	ARCADIS	Stage 1	Highways - General Temp Works	February 21, 2018	Diversion / Alternative Routes Limited options to divert traffic in the event of accident, congestion, closure or traffic restrictions required during the works or future maintenance works.	Scheme wide	All									Construction, operation and maintenance	Potential Hazard or Constraint
22	A66.GEN.017	Yes	ARCADIS	Stage 1	Highways - General	February 21, 2018	Existing and potential Issues - Maintenance - Meet with MSP's to better understand existing and potential future issues which impact on the maintenance regimes currently used on the A66. Including- Winter Maintenance- Service Areas- Diversion Routes- Remote messaging	Scheme wide	All									Construction, use, operation and maintenance	Potential Hazard or Constraint
23	A66.GEN.018	Yes	ARCADIS	Stage 1	Stakeholder - General	February 21, 2018	Stakeholder Engagement - Obtain better understanding of H&S issues and concerns from other bodies:- Industry- Farmers- Residents- Bus operators- Etc	Scheme wide	All									Construction, operation and maintenance	Potential Hazard or Constraint
24	A66.GEN.019	Yes	ARCADIS	Stage 1	Highways - General	February 21, 2018	Public Rights of Way- Pennine Way- Pennine Bridleway- Footpaths- Bridleways- Other	Scheme wide	All									Construction operation and maintenance	Potential Hazard or Constraint
25	A66.GEN.020	Yes	ARCADIS	Stage 1	Highways - General Services	June 7, 2018	C2, C3, C4 Statutory Undertaker process will be followed to determine approximate location of all above and below ground services. Consultation process will determine extents of diversion works required	Scheme wide	All									Construction, operation and maintenance	Hazard and constraint
26	A66.Gen.021	Yes	ARCADIS	Stage 1	Environment - General	July 11, 2018	Presence of Asbestos within the scheme boundary which may be disturbed as a result of the proposals	Scheme wide	All									Construction, Maintenance	Hazard and potential constraint
27	A66.Gen.022	Yes	ARCADIS	Stage 1	Environment - General	July 11, 2018	Foot and Mouth / Anthrax Pits	Scheme wide	All									Construction and Maintenance	Hazard
28	A66.GEN.023	Yes	ARCADIS	Stage 1	Highways - General Alignment	July 11, 2018	Cut/Fill Earthworks Balance - potential use of software	Scheme wide	All									Construction	Hazard - Constraint
31	A66.GEN.026	Yes	ARCADIS	Stage 1	Highways - General Alignment	July 11, 2018	Plant and Delivery Movements	Scheme wide	All									Construction	Hazard - Constraint
32	A66.GEN.027	Yes	ARCADIS	Stage 1	Highways - General Alignment	July 11, 2018	Importation/export of materials- Remote locations leading to long travel distances	Scheme wide	All									Construction	Hazard
33	A66.GEN.028	Yes	ARCADIS	Stage 1	Highways - General	July 11, 2018	Sequencing of works	Scheme wide	All									Construction	Hazard and Constraint
34	A66.GEN.029	Yes	ARCADIS	Stage 1	Highways - General	July 11, 2018	Constructability	Scheme wide	All									Construction	Hazard and Constraint
35	A66.GEN.030	Yes	ARCADIS	Stage 1	Highways - General Drainage	October 3, 2018	Balancing Ponds	Scheme wide	All									Construction, Operation and Maintenance	Hazard and Constraint
36	A66.GEN.031	Yes	ARCADIS	Stage 1	Stakeholder - General	October 3, 2018	Early consideration at Stage 1 and Stage 2 Prefabrication of materials- Chambers- Manholes- Culverts	Scheme wide	All									Construction	Hazard
37	A66.GEN.002	Yes	ARCADIS	Stage 1	Highways - General	November 13, 2017	Maintenance/Construction Operations - working adjacent to high speed road National speed limit will increase from 60 to 70mph	Scheme wide	All									Construction, operation and maintenance	Hazard

OBJECT ID	Hazard or Constraint Description	Consequence of Design Activity	Design Initial Risk Likelihood	Design Initial Risk Severity	Design Initial Risk Rating	Risk Owner Designer Name	Actions To Eliminate Risk	Risk Still Live	Action By	Design Residual Risk Likelihood	Design Residual Risk Severity	Design Residual Risk Rating	Residual Hazards Information	Designer Comments	Status At Transferred
6	Clear arrangements need to be put in place to ensure safe working in this area.	Risk of serious injury or death due to stray ammunition	3	5	15	Paul Williams	190320 Stage 2 - Review and capture as hazard triangle E - Don't work around the area R - Liaise with MOD with regard to day to day operationsl I - SHE triangle on all plans C -	Yes	Designer	2	5	10	Wont be working within the known area of firing range.	190820 Ensure discussions are ongoing with MOD with regard to their site boundary and access requirements during the works. Consider further at Stage 3 and ensure PC captures within SSW and CPP at Stage 6	Live
7	Hazardous substance	Long term health risk leading to potential early death	4	5	20	Paul Williams	190521 No change 190320 Stage 2 - Testing at tie ins will be required at later stages E - Divert new Link offline line or avoiding the requirements to excavate existing carriageway R- Test sections that need to be incorporated within permanent works	Yes	Designer	2	5	10	None at this stage	190805 Added to GIS DB - testing will be required at appropriate time - treatment may be different on each section Testing to be implemented at Stage 3?	Live
10	Concrete barrier require less maintenance in the event of accidents, resulting in - less exposure to MSP - reduced TM, reduced congestion, reduced chance of further accidents / cross over incursions Cost/safety	Reduced chance of RTA leading to improved accident statistics	3	5	15	Richard Walker	190521 PW to confirm latest position - See General A & D Log Entry 1 190320 Stage 2 - Key design criteria. PW to discuss with SES and issue captured in A&D Log E - R - Installation of concrete barrier will reduce exposure to road workers and members of the public I - C -	Yes	Client	2	5	10	There will always be a residual risk when dealing with live traffic, this item is specifically related to RTA's which involve the central barrier	190905 This is is still with the Client for discussion with the MSP - potential hazards due to build up of snow - and limited areas of narrow central reserve - consider further at stage 3 190521 Client to confirm	Live
11	Increase in land acquisition and wider central reservation/verges - leading to improve highway alignment giving improved drive quality.	Reduced risk of RTA due to improved highway alignment	3	5	15	Richard Walker	190521 PW to confirm latest position - See general A&D Log Entry 2 190320 Stage 2- Key design criteria. PW to discuss with SES and issue captured in A&D Log E - R - Greater land take provides improved highway alignment which will reduce potential for RTA thereby reducing exposure to all road users. I - C -	Yes	Designer/Maintainer	2	5	NA	There will always be a residual risk when dealing with live traffic.	190909 Current level of design detail has been developed at Stage 2 - and requirements have been encorporated - no longer an issue - issue eliminated 190521 Client to confirm	Closed
12	Re-use of substandard existing carriageway may lead to increased numbers of RTA due to increased numbers of vehicles and driver perceptions - needs to be reviewed against accident stats and traffic modelling Cost/safety implications.	Serious injury or death	3	5	15	Richard Walker	190521 PW to confirm latest position - See general A&D Log Entry 4 190320 Stage 2- Key design criteria. PW to discuss with SES and issue captured in A&D Log E - R - Modification of existing sections of sub-standard carriageway will reduce potential for RTA thereby reducing exposure to all road users. I - C -	Yes	Designer	2	5	10	This assumes all crossings are removed or suitable measures are put in place at all locations	190820 Designer to capture issues and inform client to confirm provision	Live
13	Risk of slow moving farm vehicles or local traffic entering onto high speed road which may/will increase the risk of RTA's. This has to be considered against the proposed increase in traffic speeds and vehicle numbers. Potential to provide parallel farm tracks or alternative field access points. Undertake a Junction Strategy review to assess the problems.	Serious injury or death	4	5	20	Richard Walker	190521 PW to confirm latest position - See general A&D Log Entry 5 190320 Stage 2- Key design criteria. PW to discuss with SES and issue captured in A&D Log E - Remove all field access locations R - Limit number of access locations to absolute minimum via risk assessment which considers - modification of retained entry points, with consideration of location, frequency of use, topography, sight lines etc I - C -	Yes	Designer	3	5	15	190805 Capture locational specific residual hazards. 190607 Highway design team have reviewed the issues in the Junction Strategy Report with SES	190805 Design Fix D completed - capture locational specific hazards on plan and link with A&D Log. Client to confirm	Live
14	All carriageway alignment departures wil be discussed with SES and approved before adoption Cost/safety.	Adoption of reduced standard which is within acceptable limits	3	5	15	Richard Walker	190521 PW to confirm latest position - See general A&D Log Entry 6 190320 Stage 2- Key design criteria. PW to discuss with SES and issue captured in A&D Log E- R - Modification of existing sections of sub-standard carriageway will reduce potential for RTA thereby reducing exposure to all road users. I - C -	Yes	Designer	2	5	10	This assumes all crossings are removed or suitable measures are put in place at all locations	190820 Vertical curviture will be re-used where possible - any sections above 100K will be re-used - any section s below 100k will not be subject to online improvement	Live
15	Existing alignment is likely to be sub-standard and will require potential merge and diverge access improvements. This will require additional land take and may impact on adjacent properties and businesses. This will have significant cost implications	Serious injury or death	4	5	20	Richard Walker	190521 PW to confirm latest position - See general A&D Log Entry 7 190320 Stage 2- Key design criteria. PW to discuss with SES and issue captured in A&D Log E - Remove all / as many (ALARP) minor road junctions and provide grade separated arrangements where possible. R - Reduce number of remaining minor road junctions to absolute minimum via risk assessment which considers - modification of retained entry points, with consideration of location, usage, topography, sight lines etc Improve remaining junction layouts at grade I - C -	Yes	Designer	1	2	2	Risk of serious injury or death in the event of an RTA	190820 This has been superseded as all junctions now proposed to be either removed or upgraded in accord with TD41 standards	Live
16	Central reserve crossings provide cross over RTA issues Potential merge and diverge access improvements. Central reserve crossings give rise to accident risks - this will potentially increase if traffic volumes increase and speed limits are increased from 60 to 70 mph - will also impact on O & M.	Serious injury or death	4	5	20	Richard Walker	190521 PW to confirm latest position - See general A&D Log Entry 8 190320 Stage 2 - Criteria adopted. PW to ensure captured in A&D Log E - All crossings removed R - I - C -	Yes	Designer/Maintainer	2	4	0	This assumes all crossings are not maintained within the new alignment or suitable measures are put in place at all locations	190820 No right turn crossings are to be included on new sections	Live
17	Potential merge and diverge access improvements. Central reserve crossings give rise to accident risks - this will potentially increase if traffic volumes increase and speed limits are increased from 60 to 70 mph - will also impact on O & M.	Serious injury or death	3	5	15	Richard Walker	190521 PW to confirm latest position - accident data layer now added to GIS - See general A&D Log Entry 9 - See also GIS Accident data layer 190320 Stage 2 - Existing Criteria adopted E - All crossings removed - this is not within current budget R - Remove those with poor accident record I - Improve those that are retained C - Improve signing for those that no alignment work is proposed	Yes	Designer/Maintainer	3	5	10	This assumes all crossings are removed from existing sections or suitable measures are put in place at all locations - see GIS Accident data layer	190820 Opps TLG confirm that whole of route should be safety reviewed during Stage 3 190521 GIS Accident data layer now available	Live
18	Substandard Carriageway width if not implemented Potential cost saving if the existing carriageway is deemed to be acceptable and no widening is required.	Serious injury or death	4	5	20	Richard Walker	190521 PW to confirm latest position - See general A&D Log Entry 10 190320 Stage 2 - Key design criteria. PW to discuss with SES and issue captured in A&D Log E - Comply with Standards R - Risk Assess and improve those sections deemed to be a problem I - Improve signage? C - Locally reduce speed?	Yes	Designer	2	5	10	Risk of serious injury or death reduced if suitable measures are put in place at all locations	190820 Carriageway extents to be confirmed at Stage 3. 190520 Client to confirm	Live
19	Roads which are substandard will result in the potential for a greater frequency of accident - This should be considered against current accident records, proposed changes and potential increases in usage. Cost implications especially for over / underbridges. - details to be added.	Risk of Serious injury or death - this will be location specific	3	5	15	Richard Walker	190521 PW to confirm latest position - See general A&D Log Entry 11 190320 Stage 2 - Client to confirm requirements here. PW to discuss with SES and issue captured in A&D Log	Yes	Designer	2	5	10	Risk of serious injury or death reduced if suitable measures are put in place at all locations	190820 Extent of works to existing network to be confirmed at Stage 3 190521 Client to confirm	Live
20	This may generate many hazards/constraints which will be captured in discussion with the MSP's / Emergency Services / RCU / LA's etc - resultant hazards/constraints identified will be recorded under separate entries. Meetings with MSP's took place on :- RW to provide further details.	To be captured under separate entries following discussions with Stakeholders	NA	NA	NA	Paul Williams	190521 RW is developing MRSS linked to Concept of operation/Human Factors and O&M Layer 190320 Stage 2 - MRSS in development	Yes	Designer/Maintainer	NA	NA	NA	O&M Layer to be developed further to capture these issues - classed as high until actions can be evidenced at Stage 3	190805 Passed to O&M Layer. This form parts of the MRSS which is developed at stage 2 - Detail will be captured under separate entries following discussions with Stakeholders and expanded at Stage 3	NA
21	This may generate many hazards/constraints which will be captured in discussion with the MSP's etc resultant hazards/constraints identified will be recorded under separate entries. Meetings with MSP's took place on :- RW to provide further details.	To be captured under separate entries following discussions with MSP's etc - see also buildability reports produced by Costain	3	5	15	Paul Williams	190521 RW is developing MRSS linked to Concept of operation/Human Factors and O&M Layer 190320 Stage 2 - Link with development of Safety Plan, Combined H&S Log and MRSS which is in development. Link to O&M tab and GIS link when functional	Yes	Designer/Maintainer	2	3	10	Capture on Maintenance GIS Layer. This will form part of the MRSS being developed at stage 2. To be captured under separate entries following discussions with MSP's etc	190820 To be considered further at Stage 3 - to be reviewed in conjunction with Stage 2 Programme Production Report	Live
22	This may generate many hazards/constraints which will be captured in discussion with the MSP's etc resultant hazards/constraints identified will be recorded under separate entries. Meetings with MSP's took place on :- RW to provide further details.	To be captured under separate entries following discussions with MSP's etc	NA	NA	NA	Paul Williams	190521 RW is developing MRSS linked to Concept of operation/Human Factors and O&M Layer 190320 Stage 2 - Linked with development of MRSS see O&M Tab - and GIS link when functional	Yes	Designer/Maintainer	NA	NA	NA	Capture on Maintenance GIS Layer To be confirmed under separate entries	190805 MRSS in development. This will form part of the MRSS which is being developed at stage 2 To be captured under separate entries following discussions with MSP's at Stage 3 etc	NA
23	This may generate many hazards/constraints which will be captured in discussion with the Stakeholders etc - resultant hazards/constraints identified will be recorded under separate entries	To be captured under separate entries following discussions with Stakeholders.	NA	NA	NA	Rachel Smith	190521 Consultation commenced on 20/5 details to be captured 190320 Stage 2 - Link with development of GIS Layer	Yes	Designer	NA	NA	NA	Issues to be confirmed	190820 Capture on Maintenance GIS Layer. 190521 Will form part of the MRSS which is being developed at stage 2. To be captured under separate entries following discussions with Stakeholders.	Live
24	Public rights of way which cross new or existing sections of carriageway - including pedestrians, animals, farm vehicles or other off road activities.	Serious injury or death due to RTA if existing at grade route retained	4	5	20	Paul Williams	190521 PW to advise 190320 Stage 2 Key design criteria - Eliminate - provide on-line footbridge or underpass where possible. R - Reduce - provide alternative diversion route as close to the current line as possible - either using existing crossing feature or new feature I - not considered an optionC - not considered an option	Yes	Designer	2	5	10	This assumes suitable measures are put in place at all locations	190820 PROW are now available on GIS which is linked to HES which should help mitigate any issues. Confirm at Stage 3	Live
25	Risk of serious injury or death for certain services (Gas and electricity)	Injury or death if service hit	4	5	20	Paul Williams	190521 Collection of C2/C3 data ongoing and this will be captured in Sectionally within GIS layer 190320 Stage 2 C3's being requested as part of Stage 2 delivery See individual Section Tabs	Yes	Designer	2	5	10	Risk of serious injury or death - risk reduced as details become clearer	190820 C3 details now being provided see individual entries. 190521 See individual entries - Major crossings captured in GIS - further services to be captured in Stage 3	Live
26	Asbestos may be present within existing:- - highway infrastructure; - made ground or landfill. Properties requiring demolition including: - residential properties; - agricultural properties; - military properties; - or industrial / mining facilities. A Scheme Asbestos Management Plan will be required at a later Stage.	Health Risk	4	5	20	Dave Avery	190320 Stage 2 Extensive testing will be required once the SAMP is developed at Stage 3 E - Eliminate - See SAMP. R - Develop SAMP and undertake testing as appropriate during future stage of the design development to determine course of action. I - Isolate - See SAMPC - Control - See SAMP	Yes	Designer	2	5	10	R. This assumes suitable measures are put in place at all locations after creation of SAMP which usually occurs at Stage 3	190805 Testing to be proposed at Stage 3 within SAMP. List of affected properties provided in PCI and H&SF	Live
27	Exposure to biological hazards if disturbed - within field areas.	Health Risk	2	5	10	Lewis Jenkins	190805 Update required 190320 Stage 2 - Liaison with Environment Agency at Stage 3E - Obtain all records and avoid/removeR - I - Isolate if necessaryC - Specialist removal	Yes	Designer	2	5	10	Potential risk to health resulting in death or serious health issues	190805 EAR being developed at Stage 2. Consider in more detail at Stage 3	Live
28	RTA leading to serious injury or death due to:- Movement of materials. Cut / fill balance will depend on highway alignment throughout. This will potentially lead to significant movement of arisings - Consideration will be required of- suitability of excavated material for processing and re-use;- landscaping- importation/exportation of suitable/unsuitable materials- balance of materials between different sites along the route etc.	Could generate excessive plant movements leading to significant increases in traffic on the local highway network leading to increased number of RTA - resulting in serious injury or death	3	5	15	Paul Williams	190320 Stage 2 - Potential Lean Initiative with John Moors University using their software E - R - Limit number of plant movements by re-use of majority of material after treating. Use software to work out cut/fill balance to optimise carriageway profile within each site and across sites. Use ECI techniques to capture best practice. I - C -	Yes	Designer/Contractor	2	5	10	Risk of RTA is reduced if plant movements can be limited by co-ordinated approach to cut and fill operations adopted.	190820 Considered as part of Report and to be considered in more detail at Stage 3	Live
31	Minimising plant / delivery movements within the site, between sites and off site. Movement of materials, cut / fill balance will depend on highway alignment throughout. This will potentially lead to significant movement of arisings - Consideration will be required of: - suitability of excavated material for processing and re-use; - landscaping; - importation/exportation of suitable/unsuitable materials; - balance of materials between different sites along the route etc - supply of construction materials over extended transportation routes from suppliers.	Increased risk of RTA due to considerable plant / delivery movements envisaged on site, between sites, off site and from suppliers resulting in increased chance Injury or death if service hit	3	5	15	Paul Williams	190320 Stage 2 - Consider as part of the buildability programming. Consider as part of any advance Stage2/3 GI / survey works E - R - Reduce plant/delivery movements by minimising import/export of materials from all sites - phasing of works to minimise journey times etc I - C -	Yes	Designer/Contractor	2	5	10	Risk reduced as planning undertaken to identify how plant and public may be separated	190820 Buildability Report has been produced which looks at methods of separating plant/person interfaces. This exercise should be reviewed and expanded at Stage 3	Live
32	Accident leading to serious injury due to extensive number of wagon trips	Design leads to extensive import/export of materials on unsuitable local road network due to vertical alignment	4	5	20	Paul Williams	190805 Design to limit extents of importation and exportation of bulk materials to minimise transportation distances	Yes	Designer	3	5	15	Vertical alignment not yet fixed	190805 Vertical design alignment yet to be fixed - Consider at Stage 3 looking to maximise re-use of materials where possible	Live
33	Ill health or serious injury leading to death. Consider constructability of proposals within the constraints imposed of maintaining through traffic, local traffic and access to adjacent stakeholders, whilst also minimising noise, vibration, dust etc	Health and wellbeing risk to road users, maintainers, local residents and workforce	3	5	15	Paul Williams	190603 Costain have developed Phasing plans for review 90320 Stage 2 - Consider as part of the constructability exercise at Stage 2 E -R - Engage constructability contractor at an early date to review sequencing of works to minimise impact on all categories ALARP.I - C -	Yes	Designer/Contractor	2	5	10	Risk reduced if adequate planning in place	190820 A Buildability Report as been produced which considers sequencing of the works. This has demonstrated at high level how the various sections can be delivered.	Live
34	Consider constructability of proposals within the constraints imposed of maintaining through traffic, local traffic and access to adjacent stakeholders, whilst also minimising noise, vibration, dust etc	Health and wellbeing risk to road users, maintainers, local residents and workforce	3	5	15	Paul Williams	E - All internal works crossings removed R - Limit number of crossing points and ensure adequate TM provided - I - C	Yes	Designer/Contractor	2	5	10	Risk is still live - TM to be considered	190820 Buildability Report now produced which should be reviewed and built on at Stage 3. 190720 Review as part of constructability exercise	Live
35	Increased maintenance duties adjacent open water and associated risk of drowning	Due to increased carriageway surface areas it is highly likely that balancing ponds will be required to capture increased volumes of run off. These will have to be sited at us	2	5	10	Paul Williams	190320 Stage 2 - Considered as part of the Stage 2 Drainage Design development proposals to influence location, access and land take requirements E - R - Provide parking and maintenance access and adequately fence I - C -	Yes	Designer	1	5	5	Risk of drowning significantly reduced if adequate access and barriers provided	190910 Consider further at prelim design. 190820 Consider OMU as part of preliminary design - ensure adequate land take provided and provision of access and barriers etc	Live
36	Construction work involves use of plant, heavy materials and hazardous materials which come under the COSHH Regulations. Use of pre-fabrication techniques either off site or on-site will reduce exposure levels to the workforce and should be considered at all times.	Improved levels of health, safety and wellbeing by reducing exposure - DFMA considerations required	3	5	15	Paul Williams	190320 Stage 2 - Part of Constructability Review - Designers to consider at all times E - Remove hazardous operation by constructing in safer more controllable environment. R - Reduce exposure to noise, vibration, height, materials, manual handling, plant movements etc I - Isolate workforce from hazard C - Work in more controlled environment	Yes	Designer/Contractor	2	5	10	Stage 2 - Designer to promote use of pre-fabrication techniques in discussion with Constructability contractor	190820 DFMA practices to be promoted during Preliminary design	Live
37	Higher Speed Road - leading to greater severity of injury in the event of an RTA - during O&M	Serious injury or death	5	5	25	Paul Williams	190320 Stage 2 - Key design philosophy R - Many of the link options have been aligned so that construction can be carried out offline away from existing highways. Safe methods of working can be implemented during construction to minimise the severity (reduced speeds etc...)	Yes	Designer	2	5	10	RTA leading to serious injury or death	190820 Many of the alignments are off line so will reduce the possibility of accidents. TM will be to Chapter 8 at interfaces with existing sections of carriageway. For O&M MSP's should adopt standard SMW	Live

Construction / **Handover**

OBJECT ID	Designer Contractor Discussion Comments	Designer Contractor Discussion Date	Principal Contractor Manager Responsible	Control Measures Required During Construction Phase	Control Measures Implemented	Construction Current Risk Likelihood	Construction Current Risk Severity	Status At Handover	Status At Handover Date	Contractor Client Discussion Comments	Contractor Client Discussion Date	Principal Designer Close Out Comments	Principal Designer Close Out Comments Date	Client Rep Responsible	Residual Risk Details	Control Measures Required	Add to Health and Safety File	Operation Maintenance Manual	Included Within MRSS	Project Action Owner	Client Residual Risk Likelihood	Client Residual Risk Severity	Client Residual Risk Rating	SHE Box Required	Drawings Required	SHE BOX TEXT	Handover Owner	As Built Completed	Status End Of Project	Date End Of Project
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Categorisations

OBJECT ID	Design Initial Risk Rating Category	Design Residual Risk Rating Category	Client Residual Risk Rating Category	Construction Current Risk Rating Category	Type	Construction Current Risk Rating	x	y
6	High	High	High	High	Specific	10	-265579.662	7276769.252
7	High	High	High	High	General	10	-249491.162	7281074.803
10	High	High	High	High	General	10	-247665.849	7281080.654
11	High	Not Applicable	Not Applicable	Not Applicable	General	0	-247027.304	7281054.295
12	High	High	High	High	General	10	-245830.925	7281012.805
13	High	High	High	High	General	15	-245267.988	7281011.701
14	High	High	High	High	General	10	-244640.205	7281009.857
15	High	Low	Low	Low	General	2	-249490.833	7280466.598
16	High	Not Applicable	Not Applicable	Not Applicable	General	0	-248869.879	7280460.548
17	High	High	High	High	General	10	-248274.73	7280461.47
18	High	High	High	High	General	10	-247643.539	7280465.174
19	High	High	High	High	General	10	-247048.831	7280467.752
20	Not Applicable	Not Applicable	Not Applicable	Not Applicable	General	NA	-246450.938	7280456.344
21	High	High	High	High	General	10	-245829.988	7280469.089
22	Not Applicable	Not Applicable	Not Applicable	Not Applicable	General	NA	-245250.638	7280445.522
23	Not Applicable	Not Applicable	Not Applicable	Not Applicable	General	NA	-244603.976	7280458.738
24	High	High	High	High	General	10	-249487.388	7279866.816
25	High	High	High	High	General	10	-248870.19	7279860.754
26	High	High	High	High	General	10	-248264.659	7279835.018
27	High	High	High	High	General	10	-247652.571	7279854.524
28	High	High	High	High	General	10	-247046.103	7279857.403
31	High	High	High	High	General	10	-245201.546	7279851.464
32	High	High	High	High	General	15	-244595.267	7279856.897
33	High	High	High	High	General	10	-249491.608	7279243.596
34	Not Applicable	High	High	High	General	10	-248878.262	7279224.269
35	High	Low	Low	Low	Specific	5	-248236.677	7279230.34
36	Not Applicable	High	High	High	General	10	-247656.364	7279230.001
37	High	High	High	High	General	10	-248879.393	7281084.975

OBJECT ID	Hazard Triangle Reference	Display In Models	Identified By	Stage Identified	Discipline	Date Added	Design Activity or Element	Location Name	Section Name	Eastings Start	Northings Start	Eastings End	Northings End	Chainage Start Easting	Chainage Start Northing	Chainage End Easting	Chainage End Northing	Phase Affected	Hazard Or Constraint	Hazard or Constraint Description	Consequence of Design Activity	Design Initial Risk Likelihood	Design Initial Risk Severity	Design Initial Risk Rating	Risk Owner Designer Name	Actions To Eliminate Risk	Risk Still Live	Action By	Design Residual Risk Likelihood	Design Residual Risk Severity	Design Residual Risk Rating	Residual Hazards Information	Designer Comments	Status At Transferred	Designer Contractor Discussion Comments	Designer Contractor Discussion Date	Principal Contractor Manager Responsible	Control Measures Required During Construction Phase	Control Measures Implemented	Construction Current Risk Likelihood	Construction Current Risk Severity	Status At Handover	Status At Handover Date	Contractor Client Discussion Comments	Contractor Client Discussion Date	Principal Designer Close Out Comments	Principal Designer Close Out Comments Date	Client Rep Responsible	Residual Risk Details	Control Measures Required	Add to Health and Safety File	Operation Maintenance Manual	Included Within MRSS	Project Action Owner	Client Residual Risk Likelihood	Client Residual Risk Severity	Client Residual Risk Rating	SHE Box Required	Drawings Required	SHE BOX TEXT	Handover Owner	As Built Completed	Status End Of Project	Date End Of Project	Design Initial Risk Rating Category	Design Residual Risk Rating Category	Client Residual Risk Rating Category	Construction Current Risk Rating Category	Type	Construction Current Risk Rating	x	y
38	A66.GEN.003	Yes	ARCADIS	Stage 1	Highways - General	November 13, 2017	Increase of traffic volume and speeds through residential areas. Increased risk of RTA. Especially relevant if scheme only partially delivered	Scheme wide	All									Construction	Hazard	Higher Speed Roads - leading to greater severity of injury	Serious injury or death	4	5	20	Paul Williams	190320 Stage 2 - Key design philosophy - design to adopt wherever possible E - Divert links away from built up areas R - Identify where this is not possible and develop alternative arrangements I - C -	Yes	Designer	2	5	10	There will always be a residual risk when dealing with live traffic, this item is specifically related to traffic/speed increases in the existing villages	190820 Review diversion routes considered as part of Buildability proposals this should be expanded at Stage 3. Confirmed at Opps TLG 8/8/19	Live																															High	High	High	High	General	10	-248265.102	7281078.402
63	A66.OH.S2.002	Yes	ARCADIS	Stage 1	Highways - Services	June 5, 2018	Telecom lines	Option A&B (formerly Sections 2a, 2b, 2c)	M6 J40 to Kemplay Bank Roundabout	352188	529097							Construction	Minor Hazard and Potential Constraint	Minor service strike leading to injury. Discussions with SU required - C3 Process May impact Construction and O&M - diversion may be required	H&S risk resulting from disturbance of existing service in the event of a strike leading to injury if not addressed - review case by case	3	3	9	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owner I - SHE triangle on all plans C -	Yes	Designer	2	3	6	Early discussions with Stats owner to determine protection measures Location to be confirmed and Safe method of working to be implemented by the Contractor	190820 C3's applied for - risk level may reduce further once further details available and proposals agreed	Live																															Medium	Medium	Medium	Medium	Specific	6	-305295.601	7297925.386
70	A66.HML.S8.002	yes	ARCADIS	Stage 1	Highways - Alignment	March 15, 2018	Potential for live charges/shells buried underground	Option I (formerly Section 8) - North of carriageway	Appleby to Brough	375296	516909							Construction operation and maintenance	Hazard and Potential Constraint	Consultation with Army required to understand extents of live firing range in this area. Suitable UXO precautions may need to be put in place.	H&S risk may exist if Army records are not made available or incomplete. Known firing range is some distance from the proposed scheme	3	5	15	Paul Williams	190320 Stage 2 - Review and capture as hazard triangle E - Don't work around the area R - Discuss with MOD I - SHE triangle on all plans C -	Yes	Designer	2	5	10	Wont be working within the area. Upon contact with M.O.D we may be able to learn roughly where any live shells are buried.	190820 Enter further dialogue with MOD in respect to the records and their accuracy at Stage 3. It is felt this risk could be reduced to a 1 following discussions	Live																															High	High	High	High	Specific	10	-264839.309	7276728.756
74	A66.ENV.S12.001	Yes	ARCADIS	Stage 2	Environment	May 14, 2019	Listed Building: St Mary's Church	Option K	Cross Lanes to Rokeby	407257	513808							Construction	Constraint	Significant impact on the listed building.	Impacts to the setting of the listed building. Option 12B requires the demolition of the associated old rectory.	3	3	9	Lewis Jenkins	Mitigation required during construction would comprise erecting temporary screening (where appropriate) and ensuring that the dust is limited by dampening down the construction area	Yes	Designer/Contractor	2	3	6	17/09/2019 Option K reduces constraint. Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live																															Medium	Medium	Medium	Medium	Specific	6	-210328.448	7269168.82
75	A66.ENV.S4.001	Yes	ARCADIS	Stage 2	Environment	May 14, 2019	Scheduled Monument: Brougham Roman fort (Brocavum) and civil settlement and Brougham Castle	Option C and D	Penrith to Temple Sowerby	353774	528619							Construction	Constraint	Significant impact upon the Scheduled Monument	Impacts to the setting of the Scheduled Monument	4	4	16	Lewis Jenkins	Mitigation required during construction would comprise erecting temporary screening (where appropriate) and ensuring that the dust is limited by dampening down the construction area	Yes	Contractor	2	4	8	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live																															High	Medium	Medium	Medium	Specific	8	-302289.958	7294765.61
76	A66.ENV.S4.002	Yes	ARCADIS	Stage 2	Environment	May 14, 2019	Scheduled Monument: Roman marching camp 450yds (410m) north-east of Brocavum	Option C and D	Penrith to Temple Sowerby	354227	529172							Construction	Constraint	Significant impact upon the Scheduled Monument	Impacts to the setting of the Scheduled Monument	4	4	16	Lewis Jenkins	Mitigation required during construction would comprise erecting temporary screening (where appropriate) and ensuring that the dust is limited by dampening down the construction area	Yes	Contractor	2	4	8	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live																															High	Medium	Medium	Medium	Specific	8	-301788.656	7295302.186
77	A66.ENV.S4.003	Yes	ARCADIS	Stage 2	Environment	May 14, 2019	Scheduled Monument: Settlement 0.3 miles (540m) east-north-east of Brougham Castle	Option C and D	Penrith to Temple Sowerby	354305	529108							Construction and Operation	Constraint	Significant impact upon the Scheduled Monument - SM is within design footprint.	Impacts to the setting of the Scheduled Monument and permeant physical impact/loss due to SM being within the project footprint.	4	5	20	Lewis Jenkins	Avoidance of physical impact. Strip, map and sample excavation and recording would be used to mitigate physical impacts and improve understanding of the nature and extent of heritage assets. Mitigation required for setting would comprise erecting screening (where appropriate) and ensuring that the dust is limited by dampening down the construction area	Yes	Designer	2	5	10	17/09/2019 The design of the options should avoid physical impact to the scheduled or undeveloped area of either monument if possible. Contractor to adhere to detailed mitigation strategies developed at Stage 3.	It is uncertain whether physical impacts to these assets can be completely avoided and further assessment would be required at PCF Stage 3 to determine appropriate mitigation.	Live																															High	High	High	High	Specific	10	-301651.2	7295192.885
78	A66.ENV.S8.001	Yes	ARCADIS	Stage 2	Environment	May 14, 2019	Scheduled Monument: Warcop Roman camp and length of Roman road, 285m south west of Moor House	Option I	Appleby to Brough	374105	516748							Construction and Operation	Constraint	Significant impact to a Scheduled Monument	Impacts to the setting of the Scheduled Monument	3	4	12	Lewis Jenkins	Mitigation required during construction would comprise erecting temporary screening (where appropriate) and ensuring that the dust is limited by dampening down the construction area	Yes	Designer/Contractor	2	3	6	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live																															High	Medium	Medium	Medium	Specific	6	-267367.294	7274119.104
79	A66.ENV.S14.001	Yes	ARCADIS	Stage 2	Environment	April 9, 2018	Carkin Moor Roman Fort Scheduled Monument	Option N and O	Stephen Bank to Carkin Moor	416138	508365							Construction and Operation	Constraint	Significant impact upon the Scheduled Monument– SM is within project footprint.	Potential loss/damage to scheduled monument which poses a significant DCO risk. Options would pass through Carkin Moor and would necessitate archaeological mitigation strategy carried out with Scheduled Monument Consent	4	5	20	Lewis Jenkins	16/09/2019 - Permanent screening and archaeological mitigation strategy carried out with Scheduled Monument Consent	Yes	Designer/Contractor	2	5	10	16/09/19 - Development of a detailed archaeological mitigation strategy carried out with Scheduled Monument Consent. Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Further investigation would be required at PCF Stage 3 to determine appropriate mitigation.	Live																															High	High	High	High	Specific	10	-195088.938	7259754.285
80	A66.ENV.S6.002	Yes	ARCADIS	Stage 2	Environment	April 9, 2018	Crossing of River Eden SAC/PSA/SSSI	Option E	Temple Sowerby to Appleby	364899	524410							Construction	Hazard and Constraint	Water	Working adjacent water could cause injury or death due to drowning or ill health due to leptospirosis	3	5	15	Lewis Jenkins	Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures. Surface water run off would be managed using SuDs and a Flood Warning and Evacuation Plan would be developed, in collaboration with the EA. For further mitigation requirements see Chapter 15 of the EAR	Yes	Designer	2	5	10	17/09/2019 Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures.	Further refinement of flood risk modelling and development of detailed mitigation strategies at Stage 3.	Live																															High	Low	Low	Low	Specific	10	-283310.357	7287236.918
81	A66.ENV.S6.003	Yes	ARCADIS	Stage 2	Environment	April 9, 2018	Crossing of River Eden SAC/PSA/SSSI	Option F	Temple Sowerby to Appleby	364899	524410							Construction, Maintenance	Hazard and Constraint	Potential for flooding, deep water, Leptospirosis and SSSI	Option cross a European designated site which poses a significant DCO risk	4	5	20	Lewis Jenkins	Constraint rather than hazard	Yes	Designer	2	5	10	17/09/2019 Potential for flooding, deep water, Leptospirosis and SSSI	Further refinement of flood risk modelling and development of detailed mitigation strategies at Stage 3	Live																															High	High	High	High	Specific	10	-283310.357	7287236.918
82	A66.ENV.S6.001	Yes	ARCADIS	Stage 2	Environment	April 9, 2018	Potential flood risk from River Eden	Option F	Temple Sowerby to Appleby	363461	525198							Construction	Hazard	Water	Working adjacent water could cause injury. Works are likely to increase peak flood level and increase to maximum flood extents. or death due to drowning or ill health due to leptospirosis	3	5	15	Lewis Jenkins	E - R -flood modelling being undertaken at Stage 2 to understand the risk I - SHE triangle on all plans C - good design	Yes	Designer	2	5	10	17/09/2019 Contractor to adhere to detailed safety and mitigation strategies developed at Stage 3.	190904 Not an currently an option to be taken forward	Live																															High	High	High	High	Specific	10	-285799.833	7288578.602
84	A66.SGN.S2.003	Yes	ARCADIS	Stage 2	Structures - Proposed	April 24, 2019	Overbridge Construction - Option A only	Option A&B (Formerly section 2)	M6 J40 to Kemplay Bank Roundabout	352833	529412							Construction, Operation and Maintenance	Hazard	Height	Working at height could cause injury or death in the event of a fall	3	5	15	Chris Short	190424 Stage 2 - Added Construction of new underbridge flyover E - Minimise On site working R - Early involvement of contractor - modular construction I - SHE triangle on all plans C -	Yes	Designer	2	5	0	Not on emerging preferred route	180820 Not part of EPR currently - Only consider designs which mitigate working at height during stage 3 if required	Live																															High	Not Applicable	Not Applicable	Not Applicable	Specific	0	-304196.216	7295692.401
85	A66.SGN.S2.002	Yes	ARCADIS	Stage 2	Structures - Existing	April 24, 2019	Existing Underbridge	Option A & B (Formerly Section 2)	M6 J40 to Kemplay Bank Roundabout	352434	529261							Construction	Hazard and constraint	Carleton Hall Underbridge - Impacts on traffic management arrangements	Retention and extension of existing structures increases complexity of TM	3	5	15	Chris Short	190424 Stage 2 - Added Extension of existing underbridge E - Abandon bridge and grout up and create new access from roundabout R - NA C -	No	Designer	0	5	0	Structure removed to improve buildability of adjacent roundabout?	Grout structure up	Closed																															High	Not Applicable	Not Applicable	Not Applicable	Specific	0	-304881.887	7295424.057
86	A66.SGN.S4.004	Yes	ARCADIS	Stage 2	Structures - Proposed	April 24, 2019	Centre Parks Access - Overbridge Construction	Option C and D (formerly Section 4)	Penrith to Temple Sowerby	356771	528814							Construction, Operation and Maintenance	Hazard	Height	Working at height could cause injury or death in the event of a fall	3	5	15	Chris Short	190424 Stage 2 - Added - Construction of a new overbridge E - Minimise On site working R - Early involvement of contractor - modular construction I - SHE triangle on all plans C -	Yes	Designer	2	5	10	Review off site construction techniques / modular construction our counter casting to minimise working from height and over live road?	190912 Option C is on EPR 190820 Risk is reduced significantly if Option C is chosen over Option D as structure can be constructed off line. See Programme Production Report	Live																															High	High	High	High	Specific	10	-297072.561	7294686.344
87	A66.SGN.S8.002	Yes	ARCADIS	Stage 2	Structures - Existing	April 24, 2019	River/culvert - Lowgill Beck Bridge	Option I (formerly Section 8)	Appleby to Brough	378344	515150							Construction, Operation and Maintenance	Hazard	Height and Water	Working adjacent water could cause injury or death due to drowning or ill health due to leptospirosis	3	5	15	Chris Short	190424 Stage 2 - Added Modification of existing river overbridge E - Minimise On site working R - Early involvement of contractor - modular construction I - SHE triangle on all plans C -	Yes	Designer	2	5	10	Review off site construction techniques / modular construction our counter casting to minimise working from height and over live road?	190820 See Programme Production Report Determine how much of existing structure can be retained at Stage 3	Live																															High	High	High	High	Specific	10	-260059.979	7271402.01
88	A66.SGN.S2.001	Yes	ARCADIS	Stage 2	Structures - Proposed	April 24, 2019	Underpass Construction - Option B Only	Option B (Formerly Section 2)	M6 J40 to Kemplay Bank Roundabout	352189	529104							Construction, Operation and Maintenance	Hazard	Height and noise	Working at height could cause injury or death in the event of a fall	3	5	15	Chris Short	190424 Stage 2 - Added - Construction of 2 new overbridges E - Minimise On site working R - Early involvement of contractor - modular construction - SHE triangle on all plans C -	Yes	Designer	2	5	10	190820 Review options which promote modular construction to minimise exposure	190726 Emerging Preferred option is to go with an Underpass with smaller side bridges thereby reducing the exposure to working at height and noise generated for local residents. Review top down construction and off site construction techniques / modular construction our counter casting to minimise working from height and over live road?	Live																															High	High	High	High	Specific	10	-305301.719	7295148.109
89	A66.SGN.S4.001	Yes	ARCADIS	Stage 2	Structures - Proposed	April 24, 2019	Culvert Construction	Option C (Formerly Section 4)	Penrith to Temple Sowerby	354711	529019							Construction, Operation and maintenance	Hazard	Working at height and adjacent River and tie in to existing structure	New structure adjacent existing structure Working adjacent water could cause injury or death due to drowning or ill health due to leptospirosis	2	5	10	Chris Short	190424 Stage 2 - Added - Construction of new culvert E - Minimise On site working R - Early involvement of contractor - modular construction I - SHE triangle on all plans C -	Yes	Designer	1	5	5	Review off site construction techniques / modular construction to minimise on site working	180820 It is recognised that a competent contractor should be aware of associated risks. However, designs should mitigate working at height during stage 3	Live																															High	Low	Low	Low	Specific	5	-300599.911	7294968.286
90	A66.SGN.S8.001	Yes	ARCADIS	Stage 2	Structures - Proposed	April 24, 2019	Culvert - Moor Beck River Bridge	Option I (formerly Section 8)	Appleby to Brough	377316	515229							Construction, Operation and maintenance	Hazard	Height and water	Working adjacent water could cause injury or death due to drowning or ill health due to leptospirosis	3	5	15	Chris Short	190424 Stage 2 - Added Construction of new river overbridge E - Minimise On site working R - Early involvement of contractor - modular construction I - SHE triangle on all plans C -	Yes	Designer	1	5	5	Review off site construction techniques / modular construction our counter casting to minimise working from height and over live road?	180820 It is recognised that a competent contractor should be aware of associated risks. However, designs should mitigate working at height during stage 3	Live																															High	Low	Low	Low	Specific	5	-261828.952	7271529.533
91	A66.BS.S10.003	Yes	ARCADIS	Stage 1	Highways - Services	June 5, 2018	Telecom lines	Option J (formerly Section 10)	Bowes Bypass	398845	513688							Construction	Hazard and Potential Constraint	Discussion with SU required C3 Process May impact Construction and O&M - diversion may be required.	H&S risk which may result in injury if not addressed - review case by case	3	3	9	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owner I - SHE triangle on all plans C -	Yes	Designer	2	3	6	Early discussions with Stats owner to determine protection measures Location to be confirmed and Safe method of working to be implemented by the Contractor	190820 C3's applied for - risk level may reduce further once further details available and proposals agreed	Live																															Medium	Medium	Medium	Medium	Specific	6	-224794.299	7268971.299
92	A66.OH.S10.002	Yes	ARCADIS	Stage 1	Highways - Services	June 5, 2018	Telecom lines	Option J (formerly Section 10)	Bowes Bypass	399010	513566							Construction	Hazard and Potential Constraint	Discussion with SU required C3 Process May impact Construction and O&M - diversion may be required.	H&S risk which may result in injury or death if not addressed - review case by case	3	3	9	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owner I - SHE triangle on all plans C -	Yes	Designer	2	3	6	Early discussions with Stats owner to determine protection measures Location to be confirmed and Safe method of working to be implemented by the Contractor	190820 C3's applied for - risk level may reduce further once further details available and proposals agreed	Live																															Medium	Medium	Medium	Medium	Specific	6	-224510.511	7268761.105
93	A66.OH.S10.003	Yes	ARCADIS	Stage 1	Highways - Services	June 7, 2018	Power Lines	Option J (formerly Section 10)	Bowes Bypass	399759	513827							Construction, operation and maintenance	Hazard and Potential Constraint	Discussion with SU required C3 Process May impact Construction and O&M - diversion may be required.	H&S risk which may result in injury or death if not addressed - review case by case	3	5	20	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owner I - SHE triangle on all plans C -	Yes	Designer	2	5	10	Early discussions with Stats owner to determine protection measures Location to be confirmed and Safe method of working to be implemented by the Contractor	190820 C3's applied for - risk level may reduce further once further details available and proposals agreed	Live																															High	High	High	High	Specific	10	-223222.59	7269211.156
94	A66.BS.S10.004	Yes	ARCADIS	Stage 1	Highways - Services	June 7, 2018	Water/sewage mains	Option J (formerly Section 10)	Bowes Bypass	399055	513553							Construction	Hazard and Potential Constraint	Discussion with SU required C3 Process May impact Construction and O&M - diversion may be required.	H&S risk which may result in injury if not addressed - review case by case	3	3	9	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owner I - SHE triangle on all plans C -	Yes	Designer	2	3	6	Early discussions with Stats owner to determine protection measures Location to be confirmed and Safe method of working to be implemented by the Contractor	190820 C3's applied for - risk level may reduce further once further details available and proposals agreed	Live																															Medium	Medium	Medium	Medium	Specific	6	-224433.125	7268738.719
95	A66.SGN.S10.001	Yes	ARCADIS	Stage 1	Structures - Existing	June 6, 2019	Modification of Overbridge	Option J (formerly Section 10)	Bowes Bypass	399323	513797							Construction operation and maintenance	Hazard	Working at height and close to live traffic above and below	Serious injury or death	3	5	15	Chris Short	190320 Modification of existing overbridge Review buildability and phasing E - Not possible to eliminate R - Early involvement of contractor to review phasing I - SHE triangle on all plans C -	Yes	Designer	2	5	10	Retention of through traffic whilst modification of bridge	180820 Costain buildability report has considered phasing of works to allow safe construction - review further at Stage 3 - see Programme Production Report	Live																															High	High	High	High	Specific	10	-224010.165	7269031.804
97	A66.SGN.S8.003	Yes	ARCADIS	Stage 1	Structures - Proposed	June 6, 2019	New Overbridge - B6253 Warcop	Option I (formerly Section 8)	Appleby to Brough	375075	515939							Construction	Hazard	Working at height and close to live traffic	Serious injury or death	2	5	10	Chris Short	190424 Stage 2 - Added - Construction of new overbridge E - Minimise On site working R - Early involvement of contractor - modular construction I - SHE triangle on all plans C -	Yes	Designer	1	5	5	Risk reduced	180820 Consider designs which mitigate working at height during stage 3. Close to Warcop Training so will be subject to many vehicular movements	Live																															High	High	High	High	Specific	10	-222414.348	7268980.222
98	A66.OH.S10.002	Yes	ARCADIS	Stage 1	Highways - Services	November 15, 2017	Overhead cable	Option J (formerly Section 10)	Bowes Bypass	401263	513620			2600				Construction, operation and maintenance	Hazard and Potential Constraint	Overhead cables	Risk of electrocution leading to serious injury or death	4	5	20	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owner I - SHE triangle on all plansC -	Yes	Designer	2	5	10	Risk reduced	190820 C3's applied for - risk level may reduce further once further details available and proposals agreed	Live																															High	High	High	High	Specific	10	-220636.279	7268854.162
102	A66.BS.S12.003	Yes	ARCADIS	Stage 1	Highways - Services	June 5, 2018	Telecom lines	Option K & L (formerly Section 12)	Cross Lanes to Rokeby	404966	513805							Construction	Hazard and Potential Constraint	Discussions with SU required C3 Process May impact Construction and O&M - diversion may be required.	H&S risk which may result in injury if not addressed - review case by case	3	3	9	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owner I - SHE triangle on all plansC -	Yes	Designer	2	3	6	Risk reduced	180520 C3's applied for. Early discussions with Stats owner to determine protection measures Location to be confirmed and Safe method of working to be implemented by the Contractor	Live																															Medium	Medium	Medium	Medium	Specific	6	-214268.234	7269168.834
103	A66.OH.S12.002	Yes	ARCADIS	Stage 1	Highways - Services	June 5, 2018	Telecom lines	Option K & L (formerly Section 12)	Cross Lanes to Rokeby	405640	513793							Construction	Hazard and Potential Constraint	Discussions with SU required C3 Process May impact Construction and O&M - diversion may be required.	H&S risk which may result in injury if not addressed - review case by case	3	3	9	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owner I - SHE triangle on all plansC -	Yes	Designer	2	3	6	Risk reduced	190820 C3's applied for. Early discussions with Stats owner to determine protection measures Location to be confirmed and Safe method of working to be implemented by the Contractor	Live																															Medium	Medium	Medium	Medium	Specific	6	-213109.196	7269146.832
104	A66.OH.S12.003	Yes	ARCADIS	Stage 1	Highways - Services	June 7, 2018	Power Lines	Option K (formerly Section 12)	Cross Lanes to Rokeby (Not EPR)	407219	513765							Construction, operation and maintenance	Hazard and Potential Constraint	Discussions with SU required C3 Process May impact Construction and O&M - diversion may be required.	H&S risk which may result in injury or death if not addressed - review case by case	4	5	20	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owner I - SHE triangle on all plansC -	Yes	Designer	2	5	0	Risk removed - not preferred route	190820 Not EPR) 190720 C3's applied for. Early discussions with Stats owner to determine protection measures. Location to be confirmed and Safe method of working to be implemented by the Contractor	Closed																															High	Not Applicable	Not Applicable	Not Applicable	Specific	0	-210393.91	7269094.809
105	A66.BS.S12.004	Yes	ARCADIS	Stage 1	Highways - Services	June 7, 2018	Water/sewage mains	Option K & L (formerly Section 12)	Cross Lanes to Rokeby	407854	513750							Construction	Minor Hazard and Potential Constraint	Discussions with SU required C3 Process May impact Construction and O&M - diversion may be required.	H&S risk which may result in injury or death if not addressed - review case by case	3	3	9	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owner I - SHE triangle on all plans C - Foul water (opposite another source of Foul water)	Yes	Designer	2	3	6	Early discussions with Stats owner to determine protection measures Location to be confirmed and Safe method of working to be implemented by the Contractor	190820 C3's applied for - risk level may reduce further once further details available and proposals agreed	Live																															High	High	High	High	Specific	6	-209301.971	7269067.176
106	A66.SGN.S12.001	Yes	ARCADIS	Stage 1	Structures - Proposed	June 6, 2019	Culvert - off current line	Option K & L (formerly Section 12)	Cross Lanes to Rokeby	405088	513699							Construction	Hazard	Collapsing ground	Serious injury or death	2	5	10	Chris Short	190424 Stage 2 - Added - Construction of new culvert E - Minimise On site working R - Early involvement of contractor - modular construction I - SHE triangle on all plans C -	Yes	Designer	1	5	5	Risks reduced	180820 It is recognised that a competent contractor should be aware of associated risks. However, designs should mitigate working at height during stage 3	Live																															High	Low	Low	Low	Specific	5	-213854.267	7268968.218
107	A66.SGN.S12.002	Yes	ARCADIS	Stage 1	Structures - Proposed	June 6, 2019	Culvert -off current line	Option K & L (formerly Section 12)	Cross Lanes to Rokeby	404967	513692							Construction	Hazard	Collapsing ground	Serious injury or death	2	5	10	Chris Short	190424 Stage 2 - Added - Construction of new culvert E - Minimise On site working R - Early involvement of contractor - modular construction I - SHE triangle on all plans C -	Yes	Designer	1	5	5	Risk reduced	180820 It is recognised that a competent contractor should be aware of associated risks. However, designs should mitigate working at height during stage 3	Live																															High	Low	Low	Low	Specific	5	-214036.699	7268987.342
108	A66.SGN.S12.003	Yes	ARCADIS	Stage 1	Structures - Proposed	June 6, 2019	Overbridge - over existing line of A66	Option K & L (formerly Section 12)	Cross Lanes to Rokeby	404963	513805							Construction	Hazard	Height	Serious injury or death	2	5	10	Chris Short	190424 Stage 2 - Added - Construction of new overbridge E - Minimise On site working R - Early involvement of contractor - modular construction I - SHE triangle on all plans C -	Yes	Designer	1	5	5	Risk reduced	180820 See Programme Production Report for Phasing Consider designs which mitigate working at height during stage 3	Live																															High	Low	Low	Low	Specific	5	-213836.357	7269164.416
109	A66.BS.S14.001	Yes	ARCADIS	Stage 1	Highways - Services	June 5, 2018	Telecom lines	Option N (formerly Section 14)	Stephen Bank to Carkin Moor	413331	509959							Construction	Hazard and Potential Constraint	Discussions with SU required C3 Process May impact Construction and O&M - diversion may be required.	H&S risk which may result in injury if not addressed - review case by case	3	3	9	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owner I - SHE triangle on all plansC -	Yes	Designer	2	3	6	Early discussions with Stats owner to determine protection measures Location to be confirmed and Safe method of working to be implemented by the Contractor	190820 C3's applied for - risk level may reduce further once further details available and proposals agreed	Live																															Medium	Medium	Medium	Medium	Specific	6	-199902.326	7262514.314
110	A66.OH.S14.001	Yes	ARCADIS	Stage 1	Highways - Services	June 5, 2018	Telecom lines	Option N (formerly Section 14)	Stephen Bank to Carkin Moor	413745	509727							Construction	Potential Constraint	Discussions with SU required C3 Process May impact Construction and O&M - diversion may be required.	H&S risk which may result in injury if not addressed - review case by case	3	3	9	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owner I - SHE triangle on all plansC -	Yes	Designer	2	3	6	Early discussions with Stats owner to determine protection measures Location to be confirmed and Safe method of working to be implemented by the Contractor	190820 C3's applied for - risk level may reduce further once further details available and proposals agreed	Live																															Medium	Medium	Medium	Medium	Specific	6	-199192.181	7262112.705
111	A66.BS.S14.002	Yes	ARCADIS	Stage 1	Highways - Services	June 7, 2018	Water/sewage mains	Option N (formerly Section 14)	Stephen Bank to Carkin Moor	416521	508103							Construction	Hazard and Potential Constraint	Discussions with SU required C3 Process May impact Construction and O&M - diversion may be required.	H&S risk which may result in injury if not addressed - review case by case	3	3	9	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owner I - SHE triangle on all plansC -	Yes	Designer	2	3	6	Early discussions with Stats owner to determine protection measures Location to be confirmed and Safe method of working to be implemented by the Contractor	190820 C3's applied for - risk level may reduce further once further details available and proposals agreed	Live																															Medium	Medium	Medium	Medium	Specific	6	-194432.713	7259300.92
112	A66.SGN.S14.003	Yes	ARCADIS	Stage 1	Structures - Proposed	June 6, 2019	Overbridge - not emerging preferred route	Option M (formerly Section 14)	Stephen Bank to Carkin Moor	415040	508807							Construction	Hazard	Falling objects	Serious injury or death	2	5	10	Chris Short	190424 Stage 2 - Construction of new overbridge E - Minimise on site working R - Early involvement of contractor to look at traffic diversions - modular construction I - SHE triangle on all drawings C -	No	Designer	0	5	0	Structure not on current emerging preferered route	Not currently on preferred route	Closed																															Not Applicable	Not Applicable	Not Applicable	Not Applicable	Specific	0	-196972.387	7260521.651
113	A66.SGN.S14.004	Yes	ARCADIS	Stage 1	Structures - Proposed	June 6, 2019	Overbridge - not Emerging preferred route	Option N (formerly Section 14)	Stephen Bank to Carkin Moor	416483	508020							Construction	Hazard	Falling objects	Serious injury or death	2	5	10	Chris Short	190424 Stage 2 - Construction of new overbridge E - Minimise on site working R - Early involvement of contractor to look at traffic diversions - modular construction I - SHE triangle on all drawings C -	Yes	Designer	0	5	0		Not currently on preferred route	Closed																															Not Applicable	Not Applicable	Not Applicable	Not Applicable	Specific	0	-194498.485	7259158.279
114	A66.SGN.S14.001	Yes	ARCADIS	Stage 1	Structures - Proposed	June 6, 2019	New Underbridge - Moor Lane	Option N (formerly Section 14)	Stephen Bank to Carkin Moor	415607	508831							Construction	Hazard	Working at height and retention of access	Serious injury or death	2	5	10	Chris Short	190424 Stage 2 - Construction of new overbridge E - Minimise on site working R - Early involvement of contractor to look at traffic diversions - modular construction I - SHE triangle on all drawings C -	Yes	Designer	1	5	5	Risk will be reduced by adoption of modular construction and minimising working at height	190820 See Programme Production Report for retention of access Consider designs which mitigate working at height during stage 3	Live																															High	Low	Low	low	Specific	5	-195998.278	7260559.713

OBJECT ID	Hazard Triangle Reference	Display In Models	Identified By	Stage Identified	Discipline	Date Added	Design Activity or Element	Location Name	Section Name	Eastings Start	Northings Start	Eastings End	Northings End	Chainage Start Easting	Chainage Start Northing	Chainage End Easting	Chainage End Northing
115	A66.OH.S14.002	Yes	ARCADIS	Stage 1	Highways - Services	June 7, 2018	Power Lines	Option N (formerly Section 14)	Stephen Bank to Carkin Moor	414353	509433						
118	A66.BS.S2.004	Yes	ARCADIS	Stage 1	Highways - Services	April 24, 2019	Fibre optic service	Option A & B (Formerly Section 2)	M6 J40 to Kemplay Bank Roundabout	350240	529031						
121	A66.BS.S4.001	Yes	ARCADIS	Stage 1	Highways - Services	June 5, 2018	Telecom lines	Option C (formerly Section 4)	Penrith to Temple Sowerby	354557	528993						
123	A66.OH.S2.002	Yes	ARCADIS	Stage 1	Highways - Services	June 7, 2018	Power Lines	Option A & B (Formerly Section 2)	M6 J40 to Kemplay Bank Rbt Option A and B	352430	529267						
124	A66.BS.S2.004	Yes	ARCADIS	Stage 1	Highways - Services	June 7, 2018	Water/sewage mains	Option A & B (formerly Section 2)	M6 J40 to Kemplay Bank Roundabout	351627	528915						
125	A66.BS.S2.003	Yes	ARCADIS	Stage 1	Highways - Services	June 5, 2018	Telecom cables	Option A & B (Formerly Section 2)	M6 J40 to Kemplay Bank Rbt Option A and B	352611	529325						
126	A66.OH.S2.003	Yes	ARCADIS	Stage 1	Highways - Services	June 7, 2018	Power Lines	Option A & B (Formerly Section 2)	M6 J40 to Kemplay Bank Roundabout	352332	529189						
127	A66.BS.S2.004	Yes	ARCADIS	Stage 1	Highways - Services	June 7, 2018	Water/sewage mains	Option A & B (Formerly Section 2)	M6 J40 to Kemplay Bank Roundabout	352672	529362						
128	A66.OH.S2.004	Yes	ARCADIS	Stage 1	Highways - Services	June 6, 2019	Power Lines	Option A&B (formerly Section 2 (E/B))	M6 J40 to Kemplay Bank Roundabout	352288	529259						
129	A66.BS.S4.002	Yes	ARCADIS	Stage 1	Highways - Services	December 5, 2017	High pressure gas pipe	Option C (formerly Section 4)	Penrith to Temple Sowerby	355376	528940						
130	A66.BS.S4.006	Yes	ARCADIS	Stage 1	Highways - Services	April 24, 2019	Fibre optic service	Option C (formerly Section 4)	Penrith to Temple Sowerby	355018	528944						
133	A66.BS.S4.001	Yes	ARCADIS	Stage 1	Highways - Services	December 5, 2017	High pressure gas pipe	Option C (formerly Section 4)	Penrith to Temple Sowerby	354839	528967						
134	A66.BS.S4.003	Yes	ARCADIS	Stage 1	Highways - Services	June 5, 2018	Telecom lines	Option C (formerly Section 4)	Penrith to Temple Sowerby	354161	529007						
135	A66.OH.S4.002	Yes	ARCADIS	Stage 1	Highways - Services	June 5, 2018	Telecom lines	Option C (formerly Section 4)	Penrith to Temple Sowerby	354647	528973						
136	A66.OH.S4.003	Yes	ARCADIS	Stage 1	Highways - Services	June 7, 2018	11KV Overhead Power Lines	Option C (formerly Section 4)	Penrith to Temple Sowerby	354925	528970						
137	A66.BS.S4.004	Yes	ARCADIS	Stage 1	Highways - Services	June 7, 2018	Water main	Option C (formerly Section 4)	Penrith to Temple Sowerby	354659	528984						
138	A66.BS.S4.005	Yes	ARCADIS	Stage 1	Highways - Services	June 7, 2018	Shell NW Ethylene Pipeline	Option C (Section 4)	Penrith to Temple Sowerby	354659	528984						
139	A66.OH.S4.001	Yes	ARCADIS	Stage 1	Highways - Services	November 13, 2017	High Voltage Overhead Power Line	Option C (formerly Section 4)	Penrith to Temple Sowerby	354554	528983			100			
142	A66.BS.S6.003	Yes	ARCADIS	Stage 1	Highways - Services	June 5, 2018	Telecom lines	Option E (Formerly Section 6)	Temple Sowerby to Appleby - Kirkby Thore	362169	526276						
143	A66.OH.S6.002	Yes	ARCADIS	Stage 1	Highways - Services	June 5, 2018	Telecom lines	Option E and F (formerly Sections 6a1, 6c1, 6e1)	Temple Sowerby to Appleby - Kirkby Thore	363506	525348						
144	A66.SGN.S6.002	Yes	ARCADIS	Stage 2	Structures - Proposed	June 6, 2019	New Overbridge - Main Street	Option E (formerly Section 6 (E))	Temple Sowerby to Appleby - Kirkby Thore	364322	525850						
145	A66.SGN.S6.001	Yes	ARCADIS	Stage 2	Structures - Proposed	June 6, 2019	New Overbridge - Roger Head Farm	Option H (Formerly Section 6 (G))	Temple Sowerby to Appleby - Crackenthorpe	367260	521862						
146	A66.OH.S6.003	Yes	ARCADIS	Stage 1	Highways - Services	June 7, 2018	Power Lines	Option E (Formerly Section 6 (H))	Temple Sowerby to Appleby - Kirkby Thore	365266	523824						
147	A66.BS.S6.004	Yes	ARCADIS	Stage 1	Highways - Services	June 7, 2018	Water/sewage mains	Option F (formerly Section 6 (H))	Temple Sowerby to Appleby - Kirkby Thore	363815	525120						
148	A66.SGN.S6.003	Yes	ARCADIS	Stage 2	Structures - Proposed	June 6, 2019	New Overbridge	Option G (Formerly Section 6 (H))	Temple Sowerby to Appleby - Kirkby Thore	366372	522028						
149	A66.BS.S8.003	Yes	ARCADIS	Stage 1	Highways - Services	June 5, 2018	Telecom lines	Option I (formerly Section 8)	Appleby to Brough	378562	515038						
150	A66.OH.S8.002	Yes	ARCADIS	Stage 1	Highways - Services	June 5, 2018	Telecom lines	Option I (formerly Section 8)	Appleby to Brough	377766	515243						
152	A66.BS.S8.004	Yes	ARCADIS	Stage 1	Highways - Services	June 7, 2018	Water/sewage mains	Option I (formerly Section 8)	Appleby to Brough	377152	515243						
153	A66.SGN.S6.004	Yes	ARCADIS	Stage 2	Structures - Proposed	June 6, 2019	New Overbridge - Trout Beck	Option G (Formerly Section 6 (H))	Temple Sowerby to Appleby - Kirkby Thore	363256	525204						
168	A66.SGN.S4.003	Yes	ARCADIS	Stage 2	Structures - Existing	April 24, 2019	Swine Gill - Culvert Construction	Option C (formerly Section 4)	Penrith to Temple Sowerby	358239	528728						
169	A66.SGN.S4.002	Yes	ARCADIS	Stage 2	Structures - Proposed	April 24, 2019	Culvert Construction - Whinfell Brook	Option C (formerly Section 4)	Penrith to Temple Sowerby	355601	528933						

OBJECT ID	Phase Affected	Hazard Or Constraint	Hazard or Constraint Description	Consequence of Design Activity	Design Initial Risk Likelihood	Design Initial Risk Severity	Design Initial Risk Rating	Risk Owner Designer Name	Actions To Eliminate Risk	Risk Still Live	Action By	Design Residual Risk Likelihood	Design Residual Risk Severity	Design Residual Risk Rating	Residual Hazards Information	Designer Comments	Status At Transferred
115	Construction, operation and maintenance	Hazard and Potential Constraint	Discussions with SU required C3 Process May impact Construction and O&M - diversion may be required.	H&S risk which may result in injury or death if not addressed - review case by case	4	5	20	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owner I - SHE triangle on all plansC -	Yes	Designer	2	5	10	Risk reduced	190820 Early discussions with Stats owner to determine protection measures Location to be confirmed and Safe method of working to be implemented by the Contractor	Live
118	Construction	Minor Hazard and Potential Constraint	Minor service strike leading to injury. Discussions with SU required - C3 Process May impact Construction and O&M - diversion may be required	H&S risk resulting from disturbance of existing service in the event of a strike leading to injury if not addressed - review case by case	3	3	9	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owner I - SHE triangle on all plans C -	Yes	Designer	2	3	6	Review off site construction techniques / modular construction our counter casting to minimise working from height and over live road?	190820 C3's applied for - risk level may reduce further once further details available and proposals agreed	Live
121	Construction, Operation and Maintenance	Minor Hazard and Potential Constraint	Minor service strike leading to injury. Discussions with SU required - C3 Process May impact Construction and O&M - diversion may be required	H&S risk resulting from disturbance of existing service in the event of a strike leading to injury if not addressed - review case by case	3	3	9	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owner I - SHE triangle on all plans C -	Yes	Designer	2	3	6	Early discussions with Stats owner to determine protection measures Location to be confirmed and Safe method of working to be implemented by the Contractor	190820 C3's applied for - risk level may reduce further once further details available and proposals agreed	Live
123	Construction	Hazard and Potential Constraint	Discussions with SU required - C3 Process May impact Construction and O&M - diversion may be required	H&S risk which may result in injury or death if not addressed - review case by case	4	5	20	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owner I - SHE triangle on all plansC - 11 kv wire	Yes	Designer	2	5	10	Early discussions with Stats owner to determine protection measures Location to be confirmed and Safe method of working to be implemented by the Contractor	190820 C3's applied for - risk level may reduce further once further details available and proposals agreed	Live
124	Construction and Maintenance	Minor Hazard and Potential Constraint	Minor service strike leading to injury. Discussions with SU required - C3 Process May impact Construction and O&M - diversion may be required	H&S risk resulting from disturbance of existing service in the event of a strike leading to injury if not addressed - review case by case	3	3	9	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owner I - SHE triangle on all plans C -	Yes	Designer	2	3	6	Early discussions with Stats owner to determine protection measures Location to be confirmed and Safe method of working to be implemented by the Contractor	190820 C3's applied for - risk level may reduce further once further details available and proposals agreed	Live
125	Construction	Minor Hazard and Potential Constraint	Minor service strike leading to injury. Discussions with SU required - C3 Process May impact Construction and O&M - diversion may be required	H&S risk resulting from disturbance of existing service in the event of a strike leading to injury if not addressed - review case by case	3	3	9	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owner I - SHE triangle on all plansC -	Yes	Designer	2	3	6	Early discussions with Stats owner to determine protection measures Location to be confirmed and Safe method of working to be implemented by the Contractor	190912 C3's have been applied for	Live
126	Construction	Hazard and Potential Constraint	Discussions with SU required - C3 Process May impact Construction and O&M - diversion may be required	H&S risk which may result in injury or death if not addressed - review case by case	4	5	20	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owned rI - SHE triangle on all plansC -	Yes	Designer	2	5	10	Early discussions with Stats owner to determine protection measures Location to be confirmed and Safe method of working to be implemented by the Contractor	190820 C3's applied for - risk level may reduce further once further details available and proposals agreed	Live
127	Construction	Minor Hazard and Potential Constraint	Minor service strike leading to injury. Discussions with SU required - C3 Process May impact Construction and O&M - diversion may be required	H&S risk resulting from disturbance of existing service in the event of a strike leading to injury if not addressed - review case by case	3	3	9	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owner I - SHE triangle on all plans C -	Yes	Designer	2	3	6	Early discussions with Stats owner to determine protection measures Location to be confirmed and Safe method of working to be implemented by the Contractor.	190820 C3's applied for - risk level may reduce further once further details available and proposals agreed	Live
128	Construction	Hazard and Potential Constraint	discussions with SU required - C3 Process May impact Construction and O&M - diversion may be required	H&S risk which may result in injury or death if not addressed - review case by case	3	5	15	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owned rI - SHE triangle on all plansC - 33 kv wire	Yes	Designer	2	5	10	Early discussions with Stats owner to determine protection measures Location to be confirmed and Safe method of working to be implemented by the Contractor	190820 C3's applied for - risk level may reduce further once further details available and proposals agreed	Live
129	Construction, Operation and Maintenance	Hazard and Potential Constraint	Discussions with SU required - C3 Process May impact Construction and O&M - diversion may be required	H&S risk which may result in injury or death if not addressed - review case by case	4	5	20	Paul Williams	190320 Stage 2 - C3 Applications E - Review if required R - Early involvement of stats owner I - SHE triangle on all plans C -	Yes	Designer	2	5	10	Early discussions with Stats owner to determine protection measures Location to be confirmed and Safe method of working to be implemented by the Contractor	190820 C3's applied for - risk level may reduce further once further details available and proposals agreed	Live
130	Construction, Operation and Maintenance	Minor Hazard and Potential Constraint	Minor service strike leading to injury. Discussions with SU required - C3 Process May impact Construction and O&M - diversion may be required	H&S risk resulting from disturbance of existing service in the event of a strike leading to injury if not addressed - review case by case	3	3	9	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owner I - SHE triangle on all plans C -	Yes	Designer	2	3	6	Early discussions with Stats owner to determine protection measures - Location to be confirmed and Safe method of working to be implemented by the Contractor.	190820 C3's applied for - risk level may reduce further once further details available and proposals agreed	Live
133	Construction, Operation and Maintenance	Hazard and Potential Constraint	Discussions with SU required - C3 Process May impact Construction and O&M - diversion may be required	H&S risk which may result in injury or death if not addressed - review case by case	5	5	25	Paul Williams	190320 Stage 2 - C3 Applications E - Review if required R - Early involvement of stats owner I - SHE triangle on all plans C -	Yes	Designer	2	5	10	Early discussions with Stats owner to determine protection measures Location to be confirmed and Safe method of working to be implemented by the Contractor	190820 C3's applied for - risk level may reduce further once further details available and proposals agreed	Live
134	Construction, Operation and Maintenance	Minor Hazard and Potential Constraint	Minor service strike leading to injury. Discussions with SU required - C3 Process May impact Construction and O&M - diversion may be required	H&S risk resulting from disturbance of existing service in the event of a strike leading to injury if not addressed - review case by case	3	3	9	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owner I - SHE triangle on all plans C -	Yes	Designer	2	3	6	Early discussions with Stats owner to determine protection measures Location to be confirmed and Safe method of working to be implemented by the Contractor	190820 C3's applied for - risk level may reduce further once further details available and proposals agreed	Live
135	Construction, Operation and Maintenance	Minor Hazard and Potential Constraint	Minor service strike leading to injury. Discussions with SU required - C3 Process May impact Construction and O&M - diversion may be required	H&S risk resulting from disturbance of existing service in the event of a strike leading to injury if not addressed - review case by case	3	3	9	Paul Williams	190320 Stage 2 - C3 Applications E - Is diversion possible R - Early involvement of stats owner I - SHE triangle on all plans C -	Yes	Designer	2	3	6	Early discussions with Stats owner to determine protection measures - Location to be confirmed and Safe method of working to be implemented by the Contractor	190820 C3's applied for - risk level may reduce further once further details available and proposals agreed	Live
136	Construction, Operation and Maintenance	Hazard and Potential Constraint	Discussions with SU required - C3 Process May impact Construction and O&M - diversion may be required	H&S risk which may result in injury or death if not addressed - review case by case	4	5	20	Paul Williams	190320 Stage 2 - C3 Applications E - Is a diversion required R - Early involvement of stats owner I - SHE triangle on all plans C - 11 kv Wire	Yes	Designer	3	5	15	Early discussions with Stats owner to determine protection measures Location to be confirmed and Safe method of working to be implemented by the Contractor	190820 C3's applied for - risk level may reduce further once further details available and proposals agreed	Live
137	Construction, Operation and Maintenance	Minor Hazard and Potential Constraint	Minor service strike leading to injury. Discussions with SU required - C3 Process May impact Construction and O&M - diversion may be required	H&S risk resulting from disturbance of existing service in the event of a strike leading to injury if not addressed - review case by case	3	3	9	Paul Williams	190320 Stage 2 - C3 Applications E - Review if required R - Early involvement of stats owner I - SHE triangle on all plans C - 125 pipe of clean water	Yes	Designer	2	3	6	Early discussions with Stats owner to determine protection measures Location to be confirmed and Safe method of working to be implemented by the Contractor	190820 C3's applied for - risk level may reduce further once further details available and proposals agreed	Live
138	Construction, Operation and Maintenance	Hazard and Constraint	Discussions with SU required - C3 Process May impact Construction and O&M - diversion may be required	H&S risk which may result in injury or death if not addressed - review case by case	5	5	25	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owner I - SHE triangle on all plans C -	Yes	Designer	3	5	15	Early discussions with Stats owner to determine protection measures Location to be confirmed and Safe method of working to be implemented by the Contractor	190820 C3's applied for - risk level may reduce further once further details available and proposals agreed	Live
139	Construction, Operation and Maintenance	Hazard and Potential Constraint	Discussions with SU required - C3 Process May impact Construction and O&M - diversion may be required	H&S risk which may result in injury or death if not addressed - review case by case	5	5	25	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owner I - SHE triangle on all plansC -	Yes	Designer	2	5	10	Early discussions with stats owner - Safe method of working to be implemented by the Contractor	190820 C3's have been made available and proposals are being developed. Designer to confirm if diversion is required?	Live
142	Construction	Minor Hazard or Potential Constraint	Minor service strike leading to injury. Discussions with SU required - C3 Process May impact Construction and O&M - diversion may be required	H&S risk resulting from disturbance of existing service in the event of a strike leading to injury if not addressed - review case by case	3	3	9	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owner I - SHE triangle on all plans C -	Yes	Designer	2	3	6	Early discussions with Stats owner to determine protection measures Location to be confirmed and Safe method of working to be implemented by the Contractor	190820 C3's applied for - risk level may reduce further once further details available and proposals agreed	Live
143	Construction	Minor Hazard or Potential Constraint	Minor service strike leading to injury. Discussions with SU required - C3 Process May impact Construction and O&M - diversion may be required	H&S risk resulting from disturbance of existing service in the event of a strike leading to injury if not addressed - review case by case	3	3	9	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owner I - SHE triangle on all plans C -	Yes	Designer	2	3	0	Early discussions with Stats owner to determine protection measures Location to be confirmed and Safe method of working to be implemented by the Contractor	190904 This would be on a Detrunked section of A66 so would only become an issue if extensive remediation works required as part of proposals	Closed
144	Construction	Hazard	Construction of bridge along alignment of existing local road - maintaining access to mine during construction and O & M	Serious injury or death	3	5	15	Chris Short	190424 Stage 2 - Construction of new overbridge E - Minimise on site working R - Early involvement of contractor to look at traffic diversions - modular construction I - SHE triangle on all drawings C -	Yes	Designer	2	5	10	Review off site construction techniques / modular construction our counter casting to minimise working from height and over live road?	190825 Buildability contractor has looked at phasing of works to minimise interaction between construction and local traffic - develop further at Prelim Design	Live
145	Construction, Operation and Maintenance	Hazard	Collapsing ground - During construction and potential O & M	Serious injury or death	3	5	15	Angela Hills	190424 Stage 2 - Added - Construction of new overbridge E - Minimise On site working R - Early involvement of contractor - modular construction I - SHE triangle on all plans C -	Yes	Designer	2	5	10	Review off site construction techniques / modular construction our counter casting to minimise working from height and over live road?	190904 - Add	Live
146	Construction, Operation and Maintenance	Hazard and Potential Constraint	Discussions with SU required - C3 Process May impact Construction and O&M - diversion may be required	H&S risk which may result in injury or death if not addressed - review case by case	5	5	25	Paul Williams	190320 Stage 2 - C3 Applications E - Review potential for diversion R - Early involvement of stats owner I - SHE triangle on all plans C -	Yes	Designer	2	5	10	Early discussions with Stats owner to determine protection measures - location to be confirmed and Safe method of working to be implemented by the Contractor	190820 C3's applied for - risk level may reduce further once further details available and proposals agreed	Live
147	Construction	Minor Hazard or Potential Constraint	Minor service strike leading to injury. Discussions with SU required - C3 Process May impact Construction and O&M - diversion may be required	H&S risk resulting from disturbance of existing service in the event of a strike leading to injury if not addressed - review case by case	3	3	9	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owner I - SHE triangle on all plans C -	Yes	Designer	2	3	0	Early discussions with Stats owner to determine protection measures - Location to be confirmed and Safe method of working to be implemented by the Contractor	190904 This would be on a Detrunked section of A66 so would only become an issue if extensive remediation works required as part of proposals	Closed
148	Construction	Hazard	Height and water	Working at height adjacent water could cause injury or death due to fall from height	3	5	15	Chris Short	190424 Stage 2 - Added - Construction of new river overbridge E - Minimise On site working R - Early involvement of contractor - modular construction I - SHE triangle on all plansC -	Yes	Designer	2	5	0	Review off site construction techniques / modular construction our counter casting to minimise working from height and over live road?	190820 Not a preferred option - but risks much reduced if modular construction considered	Closed
149	Construction and O&M	Hazard and Potential Constraint	Discussions with SU required - C3 Process May impact Construction and O&M - diversion may be required	H&S risk which may result in injury if not addressed - review case by case	3	3	9	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owner I - SHE triangle on all plansC -	Yes	Designer	2	3	6	Early discussions with Stats owner to determine protection measures Location to be confirmed and Safe method of working to be implemented by the Contractor	190820 C3's applied for - risk level may reduce further once further details available and proposals agreed	Live
150	Construction	Hazard and Potential Constraint	Discussions with SU required - C3 Process May impact Construction - diversion may be required	H&S risk which may result in injury if not addressed - review case by case	3	3	9	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owner I - SHE triangle on all plansC -	Yes	Designer	2	3	6	Early discussions with Stats owner to determine protection measures Location to be confirmed and Safe method of working to be implemented by the Contractor	190820 C3's applied for - risk level may reduce further once further details available and proposals agreed	Live
152	Construction	Hazard and Potential Constraint	Discussions with SU required - C3 Process May impact Construction and O&M - diversion may be required	H&S risk which may result in serious injury if not addressed - review case by case	3	3	9	Paul Williams	190320 Stage 2 - C3 Applications E - Not possible R - Early involvement of stats owner I - SHE triangle on all plansC - 63 MDPE Clean water pipe	Yes	Designer	2	3	6	Early discussions with Stats owner to determine protection measures Location to be confirmed and Safe method of working to be implemented by the Contractor	190820 C3's applied for - risk level may reduce further once further details available and proposals agreed	Live
153	Construction	Hazard	Collapsing ground	Serious injury or death or ill health due to leptospirosis	3	5	15	Chris Short	190424 Stage 2 - Added Construction of new river overbridge E - Minimise On site working R - Early involvement of contractor - modular construction I - SHE triangle on all plans C -	Yes	Designer	2	5	0	Review off site construction techniques / modular construction our counter casting to minimise working from height and over live road?	190820 Not a preferred option - but risks much reduced if modular construction considered	Closed
168	Construction and Maintenance	Hazard	Working adjacent Water	Working adjacent water could cause injury or death due to drowning or ill health due to leptospirosis	2	5	10	Chris Short	190424 Stage 2 - Added Extension of existing or new culvert E - Minimise On site working R - Early involvement of contractor - modular construction I - SHE triangle on all plans C -	Yes	Designer	2	5	10	Review off site construction techniques / modular construction to minimise on site working	190820 Extension of existing culvert to reviewed as part of preliminary design	Live
169	Construction and Maintenance	Hazard	Height and Water	New structure adjacent existing structure Working adjacent water could cause injury or death due to drowning or ill health due to leptospirosis	2	5	10	Chris Short	190424 Stage 2 - Added Construction of new culvert E - Minimise On site working R - Early involvement of contractor - modular construction I - SHE triangle on all plans C -	Yes	Designer	1	5	5	Review off site construction techniques / modular construction to minimise on site working	180820 It is recognised that a competent contractor should be aware of associated risks. However, designs should mitigate working at height during stage 3	Live

OBJECT ID	Designer Contractor Discussion Comments	Designer Contractor Discussion Date	Principal Contractor Manager Responsible	Control Measures Required During Construction Phase	Control Measures Implemented	Construction Current Risk Likelihood	Construction Current Risk Severity	Status At Handover	Status At Handover Date	Contractor Client Discussion Comments	Contractor Client Discussion Date	Principal Designer Close Out Comments	Principal Designer Close Out Comments Date	Client Rep Responsible	Residual Risk Details	Control Measures Required	Add to Health and Safety File	Operation Maintenance Manual	Included Within MRSS	Project Action Owner	Client Residual Risk Likelihood	Client Residual Risk Severity	Client Residual Risk Rating	SHE Box Required	Drawings Required	SHE BOX TEXT	Handover Owner	As Built Completed	Status End Of Project	Date End Of Project	Design Initial Risk Rating Category	Design Residual Risk Rating Category	Client Residual Risk Rating Category	Construction Current Risk Rating Category	Type	Construction Current Risk Rating	x	y
115																															High	High	High	High	Specific	10	-198149.145	7261603.26
118																															Medium	Medium	Medium	Medium	Specific	6	-308662.769	7294985.504
121																															Medium	Medium	Medium	Medium	Specific	6	-301214.445	7294998.43
123																															High	High	High	High	Specific	10	-304888.897	7295434.359
124																															Medium	Medium	Medium	Medium	Specific	6	-306267.805	7294810.971
125																															Medium	Medium	Medium	Medium	Specific	6	-304577.669	7295537.942
126																															High	High	High	High	Specific	10	-305056.557	7295297.698
127																															Medium	Medium	Medium	Medium	Specific	6	-304473.093	7295603.028
128																															High	High	High	High	Specific	10	-305133.742	7295417.937
129																															High	High	High	High	Specific	10	-299800.599	7294920.903
130																															Medium	Medium	Medium	Medium	Specific	6	-300418.285	7294921.681
133																															High	High	High	High	Specific	10	-300727.49	7294958.362
134																															Medium	Medium	Medium	Medium	Specific	6	-301897.869	7295015.721
135																															Medium	Medium	Medium	Medium	Specific	6	-301058.831	7294965.412
136																															High	High	High	High	Specific	10	-300579.175	7294965.035
137																															Medium	Medium	Medium	Medium	Specific	6	-301038.319	7294984.64
138																															High	High	High	High	Specific	15	-301038.319	7294984.64
139																															High	High	High	High	Specific	10	-301219.447	7294981.087
142																															Medium	Medium	Medium	Medium	Specific	6	-288042.616	7290422.975
143																															Medium	Not Applicable	Not Applicable	Not Applicable	Specific	0	-285724.347	7288838.395
144																															High	High	High	High	Specific	10	-284279.091	7290087.223
145																															High	High	High	High	Specific	10	-279209.176	7282867.12
146																															High	High	High	High	Specific	10	-282670.044	7286229.585
147																															Medium	Not Applicable	Not Applicable	Not Applicable	Specific	0	-285188.507	7288448.754
148																															High	Not Applicable	Not Applicable	Not Applicable	Specific	0	-285828.831	7288540.355
149																															High	Medium	Medium	Medium	Specific	6	-259684.078	7271210.709
150																															High	Medium	Medium	Medium	Specific	6	-261055	7271557.517
152																															High	Medium	Medium	Medium	Specific	6	-262111.18	7271552.249
153																															High	Not Applicable	Not Applicable	Not Applicable	Specific	0	-280198.648	7282953.126
168																															High	High	High	High	Specific	10	-294857.961	7294601.668
169																															High	Low	Low	Low	Specific	5	-299412.313	7294912.632

OBJECT ID	Hazard Triangle Reference	Display In Models	Identified By	Stage Identified	Discipline	Date Added	Design Activity or Element	Location Name	Section Name	Eastings Start	Northings Start	Eastings End	Northings End	Chainage Start Easting	Chainage Start Northing	Chainage End Easting	Chainage End Northing	Phase Affected	Hazard Or Constraint
2972	A66.ENV.S2.001	Yes	Arcadis	Stage 2	Environment	September 6, 2019	River Eden SAC & River Eden and Tributaries SSSI	Option A and B	M6 J40 to Kemplay Bank Roundabout	352596	529229							Construction	Constraint
3372	A66.ENV.S2.002	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Rivers and streams S41 priority habitat	Option A and B	M6 J40 to Kemplay Bank Roundabout	352592	529216							Construction	Constraint
3373	A66.ENV.S2.003	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Birds	Option A and B	M6 J40 to Kemplay Bank Roundabout	currently unknown	currently unknown							Construction	Constraint
3374	A66.ENV.S2.004	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Listed building - Toll Bar Cottage	Option B	M6 J40 to Kemplay Bank Roundabout	352173	529002							Construction	Constraint
3375	A66.ENV.S2.005	Yes	Arcadis	Stage 2	Environment	September 9, 2019	RVP 1 - PRoW users	Option B	M6 J40 to Kemplay Bank Roundabout	351888	529131							Construction	Constraint
3376	A66.ENV.S4.004	Yes	Arcadis	Stage 2	Environment	September 2, 2019	Scheduled Monument and Listed building: Countess Pillar	Option C and D	Penrith to Temple Sowerby	354615	528956							Construction and Operation	Constraint
3377	A66.ENV.S4.005	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Listed building: Milestone to the east of Whinfell Park	Option C and D	Penrith to Temple Sowerby	356564	528880							Construction and Operation	Constraint
3378	A66.ENV.S4.006	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Listed building: Alms Table beside Countess Pillar	Option C and D	Penrith to Temple Sowerby	354619	528958							Construction	Constraint
3379	A66.ENV.S4.007	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Listed building: Brougham Castle Bridge	Option C and D	Penrith to Temple Sowerby	353835	529097							Construction	Constraint
3380	A66.ENV.S4.009	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Rivers and streams S41 priority habitat	Option C and D	Penrith to Temple Sowerby	354725	528997							Construction and Operation	Constraint
3381	A66.ENV.S4.011	Yes	Arcadis	Stage 2	Environment	September 9, 2019	White-clawed crayfish	Option C and D	Penrith to Temple Sowerby	354721	528999							Construction and Operation	Constraint
3382	A66.ENV.S4.012	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Representative viewpoint 2 - PRoW users	Option C and D	Penrith to Temple Sowerby	357981	527858							Construction	Constraint
3772	A66.ENV.S4.008	Yes	Arcadis	Stage 2	Environment	September 9, 2019	River Eden SAC & River Eden and Tributaries SSSI	Option C and D	Penrith to Temple Sowerby	354725	528996							Construction	Constraint
3773	A66.ENV.S4.010	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Birds	Option C and D	Penrith to Temple Sowerby	currently unknown	currently unknown							Construction	Constraint
3774	A66.LDS.S4.001	Yes	Arcadis	Stage 2	Lands	September 9, 2019	Demolition of existing structure	Option C (Section 4) - 1-2 Lightwater Cottages	Penrith to Temple Sowerby	354990	528947							Construction	Hazard
3775	A66.ENV.S6.005	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Rivers and streams S41 priority habitat	Option E and F	Temple Sowerby to Appleby	364899	524410							Construction and operation	Constraint
3776	A66.ENV.S6.007	Yes	Arcadis	Stage 2	Environment	September 9, 2019	White-clawed crayfish	Option E and F	Temple Sowerby to Appleby	currently unknown	currently unknown							Construction	Constraint
3777	A66.ENV.S6.012	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Scheduled Monument: Roman camp, 350m east of Redlands Bank	Option G and H	Temple Sowerby to Appleby	365048	523767							Construction and operation	Constraint
3778	A66.ENV.S6.017	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Listed building: Church of St. Michael	Option E	Temple Sowerby to Appleby	363804	525945							Construction	Constraint
3779	A66.LDS.S4.003	Yes	Arcadis	Stage 2	Lands	September 9, 2019	Demolition of existing structure	Option C - (Section 4) High Barnes	Penrith to Temple Sowerby	357394	528818							Construction	Hazard
3780	A66.ENV.S6.022	Yes	Arcadis	Stage 2	Environment	September 9, 2019	VP5 - PRoW users	Option G	Temple Sowerby to Appleby	365857	522328							Construction and operation	Constraint
3781	A66.LDS.S6.001	Yes	Arcadis	Stage 2	Lands	September 9, 2019	Demolition of existing structure	Option F (Section 6) - Bridge End Farm	Temple Sowerby to Appleby - Kirkby Thore	363855	525077							Construction	Hazard
3782	A66.ENV.S6.023	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Trout Beck and floodplain (Flood zone 2)	Option E and F	Temple Sowerby to Appleby	363921	525174							Construction	Constraint
3783	A66.ENV.S8.002	Yes	Arcadis	Stage 2	Environment	September 9, 2019	North Pennine Moors SPA	Option I	Appleby to Brough	374617	516528							Construction and operation	Constraint
3784	A66.ENV.S8.004	Yes	Arcadis	Stage 2	Environment	September 9, 2019	‘Important Hedgerows’ and Hedgerows S41 Habitat	Option I	Appleby to Brough	373133	517184							Construction	Constraint
3785	A66.ENV.S8.005	Yes	Arcadis	Stage 2	Environment	September 9, 2019	White-clawed crayfish	Option I	Appleby to Brough	currently unknown	currently unknown							Construction	Constraint
3786	A66.ENV.S8.011	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Representative viewpoint 6 - PRoW users	Option I	Appleby to Brough	371872	517978							Construction	Constraint
3787	A66.ENV.S8.012	Yes	Arcadis	Stage 2	Environment	September 9, 2019	VP 7- PRoW users/Passengers on the EVSR	Option I	Appleby to Brough	374813	515967							Construction and operation	Constraint

OBJECT ID	Hazard or Constraint Description	Consequence of Design Activity	Design Initial Risk Likelihood	Design Initial Risk Severity	Design Initial Risk Rating	Risk Owner Designer Name	Actions To Eliminate Risk	Risk Still Live	Action By	Design Residual Risk Likelihood	Design Residual Risk Severity	Design Residual Risk Rating	Residual Hazards Information	Designer Comments	Status At Transferred
2972	Both options cross a tributary of the River Eden and could result in moderate impacts (significant) to the European designated sites.	Visual (including light pollution), noise and/or vibration disturbances could result in impacts on the key interests of the designation. Any significant impacts on the designated site could pose a risk to DCO.	4	3	12	Lewis Jenkins	Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures to demonstrate compliance with relevant environmental legislation. For further mitigation requirements see Chapter 7 of the EAR.	Yes	Designer	2	3	6	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Further survey work required at Stage 3 and to inform the development of detailed mitigation strategies to reduce impact to designation.	Live
3372	Both options are within 40m of the River Eamont and cross a tributary of the river. Construction could result in moderate impacts (significant) to the designated habitat.	Potential for pollution impacts due to close proximity.	4	3	12	Lewis Jenkins	Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures to demonstrate compliance with relevant environmental legislation. For further mitigation requirements see Chapter 7 of the EAR.	Yes	Contractor	2	3	6	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Further survey work required at Stage 3 and to inform the development of detailed mitigation strategies to reduce impact to designation.	Live
3373	Significant impacts (direct and indirect) on receptors during construction.	Potential habitat loss/degradation (breeding and foraging) and mortality/injury/disturbance whilst breeding. Increased visual (including light pollution) and/or noise disturbance may result in displacement and changes in behaviour.	2	3	6	Lewis Jenkins	Minimising habitat loss. Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures to demonstrate compliance with relevant environmental legislation. For further mitigation requirements see Chapter 7 of the EAR.	Yes	Designer/Contractor	1	3	3	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Further survey work required at Stage 3 and to inform the development of detailed mitigation strategies to reduce impact to receptors.	Live
3374	Significant impact on the receptor during construction.	Impacts to the setting of a listed building.	4	3	12	Lewis Jenkins	Mitigation required during construction would comprise erecting temporary screening (where appropriate) and ensuring that the dust is limited by dampening down the construction area	Yes	Contractor	2	3	6	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
3375	Significant impact upon visual receptors.	Construction would be clearly visible from this location and form a large part of the scene, with the loss of existing trees and woodland opening views of traffic currently screened from view. There would be a noticeable deterioration in the view	3	4	12	Lewis Jenkins	Mitigation would be required during construction. This is to be set out within the Record of Environment Actions and Commitments. This likely to include measures, such as: earth bunding to compounds, location industrial features away from visual receptors, use of baffles on lighting structures etc.	Yes	Designer	2	4	8	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
3376	Significant impact upon the Scheduled Monument and Listed building– SM/LB is within project footprint.	Impacts to the setting of the Scheduled Monument/Listed Building and permeant physical impact due to SM/LB being within the project footprint.	4	4	16	Lewis Jenkins	Avoidance of physical impact. Strip, map and sample excavation and recording would be used to mitigate physical impacts and improve understanding of the nature and extent of heritage assets. Mitigation required for setting would comprise erecting screening (where appropriate) and ensuring that the dust is limited by dampening down the construction area.	Yes	Designer/Contractor	3	4	12	17/09/2019 The design of the options should avoid physical impact to the scheduled or undeveloped area of either monument if possible. Contractor to adhere to detailed mitigation strategies developed at Stage 3.	It is uncertain whether physical impacts to these assets can be completely avoided and further assessment would be required at PCF Stage 3 to determine appropriate mitigation.	Live
3377	Significant impact upon Listed building - LB is within project footprint.	Impacts to the setting of the Listed Building and permeant physical impact due to LB being within the project footprint.	4	5	20	Lewis Jenkins	The milestone to the east of Whinfell Park this would be removed during construction and replaced post-construction. Strip, map and sample excavation and recording would be used to mitigate physical impacts and improve understanding of the nature and extent of heritage assets.	Yes	Contractor/Designer	3	5	15	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
3378	Significant impact on the listed building.	Impacts to the setting of the listed building.	4	3	12	Lewis Jenkins	Mitigation required during construction would comprise erecting temporary screening (where appropriate) and ensuring that the dust is limited by dampening down the construction area	Yes	Contractor	2	3	6	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
3379	Significant impact to listed building.	Moderate impact on receptor's setting during construction. Mitigation will be required to reduce the impact upon this receptor	3	3	9	Lewis Jenkins	Mitigation required during construction would comprise erecting temporary screening (where appropriate) and ensuring that the dust is limited by dampening down the construction area	Yes	Contractor	1	3	3	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
3380	Both options cross 3 watercourses. Construction could result in moderate impacts (significant) to the designated habitat.	Loss/shading (i.e. within culvert) and fragmentation of three sections of watercourse Light Water, Swine Gill and an unnamed drain .	4	3	12	Lewis Jenkins	Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures to demonstrate compliance with relevant environmental legislation. For further mitigation requirements see Chapter 7 of the EAR.	Yes	Designer/Contractor	2	3	6	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Further survey work required at Stage 3 to inform the development of detailed mitigation strategies to reduce impact to designation.	Live
3381	Significant impact upon designated species - impact on species of key interest to River Eden SAC/SSSI.	Visual (including light pollution), noise and/or vibration disturbances could result in impacts on the key interests of the designation.	3	4	12	Lewis Jenkins	Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures to demonstrate compliance with relevant environmental legislation. For further mitigation requirements see Chapter 7 of the EAR.	Yes	Contractor	2	4	8	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Further survey work required at Stage 3 and to inform the development of detailed mitigation strategies to reduce impact to designation.	Live
3382	Significant impact to visual receptors during construction	Construction would be clearly visible from this location and form a large part of the scene, with the loss of existing trees and woodland opening views of traffic currently screened from view. There would be a noticeable deterioration in the view.	3	3	9	Lewis Jenkins	Mitigation would be required during construction. This is to be set out within the Record of Environment Actions and Commitments. This likely to include measures, such as: earth bunding to compounds, location industrial features away from visual receptors, use of baffles on lighting structures etc.	Yes	Contractor/Designer	2	3	6	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
3772	Both options cross a tributary of the River Eden and could result in moderate impacts (significant) to the European designated sites.	Visual (including light pollution), noise and/or vibration disturbances could result in impacts on the key interests of the designation. Any significant impacts on the designated site could pose a risk to DCO.	4	4	16	Lewis Jenkins	Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures to demonstrate compliance with relevant environmental legislation. For further mitigation requirements see Chapter 7 of the EAR.	Yes	Contractor	2	4	8	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Further survey work required at Stage 3 and to inform the development of detailed mitigation strategies to reduce impact to designation.	Live
3773	Significant impacts (direct and indirect) on receptors during construction.	Potential habitat loss/degradation (breeding and foraging) and mortality/injury/disturbance whilst breeding. Increased visual (including light pollution) and/or noise disturbance may result in displacement and changes in behaviour.	2	3	6	Lewis Jenkins	Minimising habitat loss. Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures to demonstrate compliance with relevant environmental legislation. For further mitigation requirements see Chapter 7 of the EAR.	Yes	Contractor	1	3	3	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Further survey work required at Stage 3 and to inform the development of detailed mitigation strategies to reduce impact to receptors.	Live
3774	Risk of ill health from asbestos, serious injury or death from electrocution etc	The alignment requires the demolition of 2 semi detached cottages. The age of the buildings suggests asbestos is likely to be present. Unidentified services are also expected to be impacted by the alignment.	4	5	20	R Tyrer	120919 Alterations to the alignment to avoid the properties would eliminate the risk, though this is unlikely to be feasible / cost effective.	Yes	Designer	3	5	15	Hazard remains until testing confirms situation	120919 Surveys and further investigation work are required to confirm the presence of Asbestos and location of potential utilities. Capture in SAMP	Live
3775	Option results in a new crossing over Trout Beck and could result in large impacts (significant) to the European designated sites.	Loss of vegetation, additional shading and potential disturbance to the key interests of the designation.	3	4	12	Lewis Jenkins	Wide span bridges. Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures to demonstrate compliance with relevant environmental legislation. For further mitigation requirements see Chapter 7 of the EAR.	Yes	Designer/Contractor	2	4	8	17/09/2019 Inclusion of wide span bridges within project design. Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Development of detailed mitigation strategies to reduce impact to designation at Stage 3.	Live
3776	Significant impact upon designated species - impact on species of key interest to River Eden SAC/SSSI.	Loss of vegetation, additional shading and potential disturbance to the key interests of the designation.	4	4	16	Lewis Jenkins	Wide span bridges. Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures to demonstrate compliance with relevant environmental legislation. For further mitigation requirements see Chapter 7 of the EAR.	Yes	Designer/Contractor	2	4	8	17/09/2019 Inclusion of wide span bridges within project design. Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Development of detailed mitigation strategies to reduce impact to designation at Stage 3.	Live
3777	Significant impact upon the Scheduled Monument– SM is within project footprint.	Impacts to the setting of the Scheduled Monument/Listed Building and permeant physical impact due to SM/LB being within the project footprint	4	4	16	Lewis Jenkins	Avoidance of physical impact. Strip, map and sample excavation and recording would be used to mitigate physical impacts and improve understanding of the nature and extent of heritage assets. Mitigation required for setting would comprise erecting screening (where appropriate) and ensuring that the dust is limited by dampening down the construction area.	Yes	Designer/Contractor	3	4	12	17/09/2019 The design of the options should avoid physical impact to the scheduled or undeveloped area of either monument if possible. Contractor to adhere to detailed mitigation strategies developed at Stage 3.	It is uncertain whether physical impacts to these assets can be completely avoided and further assessment would be required at PCF Stage 3 to determine appropriate mitigation.	Live
3778	Significant impact to a listed building.	Impacts to the setting of the listed building.	3	3	9	Lewis Jenkins	Mitigation required during construction would comprise erecting temporary screening (where appropriate) and ensuring that the dust is limited by dampening down the construction area	Yes	Contractor	2	3	6	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
3779	Risk of ill health from asbestos, serious injury or death from electrocution etc	The alignment requires the demolition of High Barnes cottage and adjoining farm buildings. Property s expected to be at least 100 years old. It is expected that asbestos would be present. Services are also expected to be encountered.	4	5	20	R Tyrer	120919 Should the southern option be chosen as preferred, this may negate the requirement for demolition	Yes	Designer	3	5	0	This will be eliminated if Option C chosen	120919 Closed if Option C chosen. Should demolition be required, surveys and further investigation work are required to confirm the presence of Asbestos and location of potential utilities.	Closed
3780	Significant impact on visual receptors.	1.8.50 Construction activities would be clearly visible in the near distance, result in the loss of existing characteristic landscape feature, introduce new incongruous features and change the overall nature and balance of the scene.	3	3	9	Lewis Jenkins	Mitigation would be required during construction. This is to be set out within the Record of Environment Actions and Commitments. This likely to include measures, such as: earth bunding to compounds, location industrial features away from visual receptors, use of baffles on lighting structures etc.	Yes	Designer/Contractor	2	3	6	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
3781	Risk of ill health from asbestos, serious injury or death from electrocution etc	Alignment Option F required the demolition of agricultural units at Bridge End Farm. The age and construction of these is unknown. It is expected that asbestos may be present.	4	5	20	R Tyrer	120919 If option E is chosen over Option F then the requirement will be eliminated. Should option F be ultimately preferred, this issue will become live.	Yes	Designer	3	5	0	Hazard eliminated if Option E chosen - awaiting confirmation	120912 Closed. Surveys and further investigation work would be required to confirm the presence of Asbestos and location of potential utilities if Option F taken forward.	Closed
3782	Both options cross Trout Beck and could result in moderate impacts (significant) to the water course and its geomorphology.	Impacts on the long term geomorphology of Trout Beck.	3	4	12	Lewis Jenkins	Wide span bridges. Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures.	Yes	Designer/Contractor	2	4	8	17/09/2019 Inclusion of wide span bridges within project design. Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Development of detailed mitigation strategies at Stage 3.	Live
3783	Significant impact to European designated site	Possible changes in the noise environment and temporary land take of functional land.	4	4	16	Lewis Jenkins	Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures to demonstrate compliance with relevant environmental legislation. For further mitigation requirements see Chapter 7 of the EAR.	Yes	Designer/Contactor	2	4	8	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Further survey work required at Stage 3 and to inform the development of detailed mitigation strategies to reduce impact to designation.	Live
3784	Significant impact on designated habitats.	Loss and fragmentation of hedgerow habitat.	4	3	12	Lewis Jenkins	Minimising habitat loss. Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures to demonstrate compliance with relevant environmental legislation. For further mitigation requirements see Chapter 7 of the EAR.	Yes	Designer/Contractor	2	3	6	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Further survey work required at Stage 3 and to inform the development of detailed mitigation strategies to reduce impact to receptors.	Live
3785	Significant impact on a designated species.	Large impact on receptor during construction. Both options would result in the fragmentation of water courses - further mitigation required to reduce impact upon receptor.	3	3	9	Lewis Jenkins	Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures to demonstrate compliance with relevant environmental legislation. For further mitigation requirements see Chapter 7 of the EAR.	Yes	Designer/Contractor	2	3	6	19/09/19 - Contractor to adhere to detailed mitigation strategies developed at Stage 3	Further survey work required at Stage 3 and to inform the development of detailed mitigation strategies to reduce impact to receptors.	Live
3786	Significant impact on visual receptors.	Construction activities would be clearly visible in the close distance.	3	2	6	Lewis Jenkins	Mitigation would be required during construction. This is to be set out within the Record of Environment Actions and Commitments. This likely to include measures, such as: earth bunding to compounds, location industrial features away from visual receptors, use of baffles on lighting structures etc.	Yes	Designer/Contractor	2	2	4	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
3787	Significant impacts on visual receptors.	The construction activities would be visible in the near distance and become the focus of the view. This would result in a noticeable deterioration in the quality of the view and notably change the nature and overall balance of the scene.	3	3	9	Lewis Jenkins	Mitigation would be required during construction. This is to be set out within the Record of Environment Actions and Commitments. This likely to include measures, such as: earth bunding to compounds, location industrial features away from visual receptors, use of baffles on lighting structures etc.	Yes	Designer/Contractor	2	3	6	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live

OBJECT ID	Designer Contractor Discussion Comments	Designer Contractor Discussion Date	Principal Contractor Manager Responsible	Control Measures Required During Construction Phase	Control Measures Implemented	Construction Current Risk Likelihood	Construction Current Risk Severity	Status At Handover	Status At Handover Date	Contractor Client Discussion Comments	Contractor Client Discussion Date	Principal Designer Close Out Comments	Principal Designer Close Out Comments Date	Client Rep Responsible	Residual Risk Details	Control Measures Required	Add to Health and Safety File	Operation Maintenance Manual	Included Within MRSS	Project Action Owner	Client Residual Risk Likelihood	Client Residual Risk Severity	Client Residual Risk Rating	SHE Box Required	Drawings Required	SHE BOX TEXT	Handover Owner	As Built Completed	Status End Of Project	Date End Of Project	Design Initial Risk Rating Category	Design Residual Risk Rating Category	Client Residual Risk Rating Category	Construction Current Risk Rating Category	Type	Construction Current Risk Rating	x	y
2972																															High	Medium	Medium	Medium	Specific	6	-304283.039	7295330.864
3372																															High	Medium	Medium	Medium	Specific	6	-304302.047	7295301.006
3373																															Medium	Low	Low	Low	Specific	3	-305014.663	7297930.917
3374																															High	Medium	Medium	Medium	Specific	6	-305319.615	7294965.399
3375																															High	Medium	Medium	Medium	Specific	8	-305501.044	7295153.352
3376																															High	High	High	High	Specific	12	-301079.043	7294965.246
3377																															High	High	High	High	Specific	15	-297883.645	7294840.265
3378																															High	Medium	Medium	Medium	Specific	6	-301071.746	7294965.466
3379																															Medium	Low	Low	Low	Specific	3	-302448.21	7295145.212
3380																															High	Medium	Medium	Medium	Specific	6	-300607.352	7294965.466
3381																															High	Medium	Medium	Medium	Specific	8	-300614.916	7294970.84
3382																															Medium	Medium	Medium	Medium	Specific	6	-294953.798	7293051.968
3772																															High	Medium	Medium	Medium	Specific	8	-300605.958	7294973.229
3773																															Medium	Low	Low	Low	Specific	3	-297237.354	7298029.929
3774																															High	High	High	High	Specific	15	-300453.076	7294921.984
3775																															High	Medium	Medium	Medium	Specific	8	-281462.522	7290881.115
3776																															High	Medium	Medium	Medium	Specific	8	-281080.337	7290857.759
3777																															High	High	High	High	Specific	12	-282903.856	7286296.309
3778																															Medium	Medium	Medium	Medium	Specific	6	-285328.342	7289900.793
3779																															High	High	Not Applicable	Not Applicable	Specific	0	-296331.892	7294740.327
3780																															Medium	Medium	Medium	Medium	Specific	6	-279260.801	7290781.234
3781																															High	High	Not Applicable	Not Applicable	Specific	0	-285707.145	7288542.956
3782																															High	Medium	Medium	Medium	Specific	8	-284683.405	7288496.262
3783																															High	Medium	Medium	Medium	Specific	8	-264752.45	7276787.065
3784																															High	Medium	Medium	Medium	Specific	6	-265497.711	7276404.88
3785																															Medium	Medium	Medium	Medium	Specific	6	-265201.164	7276392.848
3786																															Medium	Low	Low	Low	Specific	4	-263772.747	7276314.111
3787																															Medium	Medium	Medium	Medium	Specific	6	-263390.207	7276669.579

OBJECT ID	Hazard Triangle Reference	Display In Models	Identified By	Stage Identified	Discipline	Date Added	Design Activity or Element	Location Name	Section Name	Eastings Start	Northings Start	Eastings End	Northings End	Chainage Start Easting	Chainage Start Northing	Chainage End Easting	Chainage End Northing	Phase Affected	Hazard Or Constraint	Hazard or Constraint Description	Consequence of Design Activity
3788	A66.ENV.S10.003	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Bowes Conservation Area	Option J	Bowes Bypass	399304	513659							Construction	Constraint	Significant impact upon a heritage conservation area.	Impacts to the setting of the conservation area
3789	A66.ENV.S10.005	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Gritstone Upland Fringe	Option J	Bowes Bypass	399564	513809							Construction	Constraint	Significant impact to landscape receptor.	The construction phase would result in notable changes to the landscape character of the area immediately surrounding the project
3790	A66.ENV.S12.003	Yes	Arcadis	Stage 2	Environment	September 9, 2019	'Important Hedgerows' and Hedgerows S41 Habitat	Option L	Cross Lanes to Rokeby	407219	513832							Construction	Constraint	Significant impact on designated habitat.	Loss and fragmentation of hedgerow habitat.
3791	A66.ENV.S12.005	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Listed building: Milestone (LB4)	Option K and L	Cross Lanes to Rokeby	406517	513764							Construction and operation	Constraint	Significant impact upon the Listed building–LB is within project footprint.	Impacts to the setting of the Listed Building and permeant physical impact due to LB being within the project footprint.
4172	A66.ENV.S6.003	Yes	Arcadis	Stage 2	Environment	September 9, 2019	River Eden SAC & River Eden and Tributaries SSSI	Option E	Temple Sowerby to Appleby	364711	524455							Construction and operation	Constraint	Option results in a new crossing over Trout Beck and could result in large impacts (significant) to the European designated sites.	Loss of vegetation, additional shading and potential disturbance to the key interests of the SAC/SSSI.
4173	A66.ENV.S6.004	Yes	Arcadis	Stage 2	Environment	September 9, 2019	River Eden SAC & River Eden and Tributaries SSSI	Option F	Temple Sowerby to Appleby	363289	525237							Construction and operation	Constraint	Option results in a new crossing over Trout Beck and could result in large impacts (significant) to the European designated sites	Loss of vegetation, additional shading and potential disturbance to the key interests of the SAC/SSSI.
4174	A66.ENV.S6.006	Yes	Arcadis	Stage 2	Environment	September 9, 2019	'Important Hedgerows' and Hedgerows S41 Habitat	Option E, F, G and H	Temple Sowerby to Appleby	365132	523470							Construction	Constraint	Significant impact to - 'Important Hedgerows' and Hedgerows S41 Habitat	Loss and fragmentation of habitat.
4176	A66.ENV.S6.008	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Aquatic invertebrates	Option E and F	Temple Sowerby to Appleby	currently unknown	currently unknown							Construction and operation	Constraint	Significant impact to species of key interest of the River Eden SAC/SSSI	Loss of vegetation, additional shading and potential disturbance to the key interests of the designation.
4177	A66.ENV.S6.009	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Fish	Option E and F	Temple Sowerby to Appleby	currently unknown	currently unknown							Construction and operation	Constraint	Significant impact upon designated species - impact on species of key interest to River Eden SAC/SSSI.	Loss of vegetation, additional shading and potential disturbance to the key interests of the designation.
4178	A66.ENV.S6.010	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Birds	Option E, F, G and H	Temple Sowerby to Appleby	currently unknown	currently unknown							Construction	Constraint	Significant impact to Birds.	Potential habitat loss/degradation (breeding and foraging) and mortality/injury/disturbance whilst breeding. Increased visual (including light pollution) and/or noise disturbance may result in displacement and changes in behaviour.
4179	A66.ENV.S6.011	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Scheduled Monument: Roman camp, 350m east of Redlands Bank	Option E and F	Temple Sowerby to Appleby	365048	523767							Construction and operation	Constraint	Significant impact upon the Scheduled Monument	Impacts to the setting of the Scheduled Monument
4180	A66.ENV.S6.013	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Scheduled Monument: Roman forlet, 200m SSE of Castrigg	Option E and H	Temple Sowerby to Appleby	367484	522169							Construction	Constraint	Significant impact upon Scheduled Monument.	Impacts to the setting of the Scheduled Monument
4181	A66.ENV.S6.014	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Listed buildings - Coach house, barns, byres and entrance arch to north of Spitals farmhouse; Threshing barn to east of Spitals farmhouse; and Spitals farmhouse with adjoining stables, byre, and gin gang.	Option E	Temple Sowerby to Appleby	362191	526328							Construction and Operation	Constraint	Significant impact upon 3 listed buildings	Impacts to the setting of three listed building
4572	A66.ENV.S6.015	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Listed buildings - Grade II* Listed Crackenthorpe Hall, Coach house to north west of Crackenthorpe Hall, Fountain head in garden to south west of Crackenthorpe Hall, and Summer house to west of Crackenthorpe Hall	Option G	Temple Sowerby to Appleby	366214	521803							Construction	Constraint	Significant impacts to 4 listed building.	Impacts to the setting of four listed buildings.
4573	A66.ENV.S6.016	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Listed building: Kirkby Thore Hall	Option E	Temple Sowerby to Appleby	364154	525624							Construction	Constraint	Significant impact to listed building	Impacts to the setting of the listed building.
4574	A66.LDS.S1.002	Yes	Arcadis	Stage 2	Lands	September 9, 2019	Demolition of existing structure	Option A (formerly Section 1) - Highways England Depot	M6 J40 to Kemplay Bank Roundabout	351265	528934							Construction	Hazard	Risk of ill health from asbestos, serious injury or death from electrocution etc	The alignment will require the demolition of a modern corrugated steel unit used for material storage
4575	A66.LDS.S4.002	Yes	Arcadis	Stage 2	Lands	September 9, 2019	Excavation and demolition of existing structure	Option C (Section 4) - Foxgloves	Penrith to Temple Sowerby	354747	528947							Construction	Hazard	Risk of ill health from asbestos, serious injury or death from electrocution etc	Scheme construction will require the acquisition of a large portion of the Foxgloves parking area.
4972	A66.ENV.S6.018	Yes	Arcadis	Stage 2	Environment	September 9, 2019	LCT 6: Intermediate Farmland	Option H	Temple Sowerby to Appleby	366128	522312							Construction	Constraint	Significant impact to the landscape character.	The proposed route would bring a short length of the A66 just within the boundary of the LCT and increase its influence on local landscape character and tranquillity
4973	A66.ENV.S6.019	Yes	Arcadis	Stage 2	Environment	September 9, 2019	LCT 8b: Broad Valleys	Option E, F, G, and H	Temple Sowerby to Appleby	365166	523485							Construction	Constraint	Significant impact to landscape character.	The construction phase of the project would result in notable changes to the landscape character of the area immediately surrounding the project.
4974	A66.ENV.S6.020	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Representative view point 3 - PRoW users	Option E	Temple Sowerby to Appleby	363535	526053							Construction and operation	Constraint	Significant impact to visual receptors.	The construction activities would be clearly visible, form a large part of the scene and introduce new incongruent features into the scene.
4975	A66.ENV.S6.021	Yes	Arcadis	Stage 2	Environment	September 9, 2019	VP4a and VP4b - PRoW users	Option F	Temple Sowerby to Appleby	363046	525205							Construction and operation	Constraint	Significant impact to visual receptors.	Construction activities would be clearly visible in the near distance, result in the loss of existing characteristic landscape feature and introduce new incongruous features into the scene.
4976	A66.ENV.S6.024	Yes	Arcadis	Stage 2	Environment	September 9, 2019	River Eden and tributaries (and floodplains) (Flood zones 2 and 3)	Option F	Temple Sowerby to Appleby	363289	525237							Construction	Constraint	Option results in a new crossing over Trout Beck and could result in moderate impacts (significant) to flood risk.	Increases in peak flood level, maximum flood extents are also increased.
4977	A66.ENV.S8.003	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Rivers and streams S41 priority habitat	Option I	Appleby to Brough	373227	517156							Construction and Operation	Constraint	Both options would lead to the fragmentation of multiple watercourses. Construction could result in large impacts (significant) to the designated habitat.	Loss, shading and fragmentation of watercourses
4978	A66.ENV.S8.006	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Aquatic invertebrates	Option I	Appleby to Brough	currently unknown	currently unknown							Construction	Constraint	Significant impact to designated species.	Potential habitat loss, fragmentation, degradation and direct mortality from construction. Indirect habitat loss/degradation through pollution possible.
4979	A66.ENV.S8.007	Yes	ARCADIS	Stage 2	Environment - General	September 9, 2019	Fish	Option I	Appleby to Brough	currently unknown	currently unknown							Construction	Constraint	Significant impact to designated species.	Moderate impact on receptor during construction. Both options would result in the fragmentation of water courses - further mitigation required to reduce impact upon receptor.
4980	A66.ENV.S8.008	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Birds	Option I	Appleby to Brough	currently unknown	currently unknown							Construction	Constraint	Significant impacts (direct and indirect) on receptors during construction.	Potential habitat loss/degradation (breeding and foraging) and mortality/injury/disturbance whilst breeding. Increased visual (including light pollution) and/or noise disturbance may result in displacement and changes in behaviour.
4981	A66.ENV.S8.009	Yes	Arcadis	Stage 2	Environment	September 9, 2019	LCT 8b: Broad Valleys	Option I	Appleby to Brough	374740	516709							Construction	Constraint	Significant impact upon landscape character.	The construction phase would result in notable changes to the landscape character of the area immediately surrounding the project
4982	A66.ENV.S8.010	Yes	Arcadis	Stage 2	Environment	September 9, 2019	LCT 11a: Foothills	Option I	Appleby to Brough	405119	513827							Construction	Constraint	Significant impact on landscape character.	1.8.62The project construction phase would result in notable changes to the landscape character of the area immediately surrounding the project
4983	A66.ENV.S8.013	Yes	Arcadis	Stage 2	Environment	September 9, 2019	VP8 - PRoW users	Option I	Appleby to Brough	376107	514956							Construction and operation	Constraint	Significant impact to visual receptors during construction	The construction activities along limited parts of this section of the project would be clearly visible in the middle distance and lead to a deterioration in the quality of the view.
4984	A66.ENV.S10.001	Yes	Arcadis	Stage 2	Environment	September 9, 2019	North Pennine Moors SPA	Option J	Bowes Bypass	374784	516648							Construction and operation	Constraint	Significant impact on a European designated site. site	Changes in the noise environment and temporary land take of land that is functionally linked with the SPA.
4985	A66.LDS.S6.002	Yes	Arcadis	Stage 2	Lands	September 9, 2019	Demolition of existing structure	Option E (Section 6) - Winthorn	Temple Sowerby to Appleby - Kirkby Thore	364490	525822							Construction	Hazard	Risk of ill health from asbestos, serious injury or death from electrocution etc	Alignment of Option E will require the demolition of Winthorn. The age of the property suggests a likelihood of asbestos. Demolition would also require removal of existing services
4986	A66.ENV.S10.002	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Birds	Option J	Bowes Bypass	currently unknown	currently unknown							Construction	Constraint	Significant impacts (direct and indirect) on receptors during construction.	Potential habitat loss/degradation (breeding and foraging) and mortality/injury/disturbance whilst breeding. Increased visual (including light pollution) and/or noise disturbance may result in displacement and changes in behaviour.
4987	A66.ENV.S10.004	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Lower Dale	Option J	Bowes Bypass	400820	513564							Construction	Constraint	Significant impact to landscape receptor.	Notable changes to the landscape character of the area immediately surrounding the project
4988	A66.LDS.S8.001	Yes	Arcadis	Stage 2	Lands	September 9, 2019	Demolition of existing structure	Option I (Section 8) - Warcop MOD Training Pitch	Appleby to Brough	375124	515941							Construction	Hazard	Risk of ill health from asbestos, serious injury or death from electrocution etc	The Option I alignment requires the demolition of the MOD sports pitch changing unit and other outbuildings. The age of the building means there is a likelihood asbestos is present. Other services may be present, but this is not known.
4989	A66.ENV.S10.006	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Representative viewpoint 9 - Users of the Pennine Way	Option J	Bowes Bypass	398898	513675							Construction	Constraint	Significant impacts on visual receptors.	Loss of existing vegetation and presence of construction activities would be clearly visible and result in a noticeable change to the view.
4990	A66.ENV.S12.002	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Rivers and streams S41 priority habitat	Option K and L	Cross Lanes to Rokeby	406694	513533							Construction and operation	Constraint	Significant impact on a designated habitat.	Loss, shading and fragmentation of Tutta Beck.
4991	A66.ENV.S12.004	Yes	Arcadis	Stage 2	Environment	September 9, 2019	Birds	Option K and L	Cross Lanes to Rokeby	currently unknown	currently unknown							Construction	Constraint	Significant impacts (direct and indirect) on receptors during construction.	Potential habitat loss/degradation (breeding and foraging) and mortality/injury/disturbance whilst breeding. Increased visual (including light pollution) and/or noise disturbance may result in displacement and changes in behaviour.
5372	A66.LDS.S8.002	Yes	Arcadis	Stage 2	Lands	September 11, 2019	Demolition of existing structure	Option I (section 8) - Land to the south of Toddy gill Hall	Appleby to Brough	375816	515507							Construction	Hazard	Excavation and demolition of existing structure	Visually, the land appears to have evidence of unidentified agricultural structures beneath the surface. These will require excavation. Potential for hazardous substances to be present
5373	A66.LDS.S10.004	Yes	Arcadis	Stage 2	Lands	September 11, 2019	Demolition of existing structure	Option J (Section 10) - Bowes Cross Farm	Bowes Bypass	401041	513608							Construction	Hazard	Risk of ill health from asbestos, serious injury or death from electrocution etc	The alignment requires the demolition of Bowes Cross Farm and associated agricultural buildings. The age of the buildings suggests asbestos is likely to be present. Unidentified services are also expected to be impacted by the alignment.
5374	A66.LDS.S12.002	Yes	Arcadis	Stage 2	Lands	September 11, 2019	Demolition of existing structure	Option L (Section 12) - The Old Rectory	Cross Lanes to Rokeby (Not EPR)	407228	513739							Construction	Hazard	Risk of ill health from asbestos, serious injury or death from electrocution etc	The alignment requires the demolition of The Old Rectory. The age of the buildings suggests asbestos is likely to be present. Unidentified services are also expected to be impacted by the alignment.
5375	A66.LDS.S12.001	Yes	Arcadis	Stage 2	Lands	September 11, 2019	Demolition of existing structure	Option K (Section 12) - Cross Lanes Organic Farm	Cross Lanes to Rokeby	405051	513823							Construction	Hazard	Risk of ill health from asbestos, serious injury or death from electrocution etc	The alignment requires the demolition of Cross Lanes Organic Farm Building. The age of the building indicates that asbestos is likely present. Existing services may also be present.
5772	A66.LDS.S10.001	Yes	Arcadis	Stage 2	Lands	September 11, 2019	Demolition of existing structure	Option J - West End Garage	Bowes Bypass	398819	513550							Construction	Hazard	Risk of ill health from asbestos, serious injury or death from electrocution etc	The alignment requires the demolition of West End Garage. The age of the buildings suggests asbestos is likely to be present. Unidentified services are also expected to be impacted by the alignment
5773	A66.LDS.S10.002	Yes	Arcadis	Stage 2	Lands	September 11, 2019	Construction of A66 mainline	Option J (Section 10) - Black Lodge Farm Agricultural Barn	Bowes Bypass	399668	513827							Construction	Hazard	Risk of ill health from asbestos, serious injury or death from electrocution etc	The alignment requires the demolition of a large agricultural barn. Age / Condition and potential services are unknown.
5774	A66.LDS.S10.003	Yes	Arcadis	Stage 2	Lands	September 11, 2019	Demolition of existing structure	Option J (Section 10) - Black Lodge Farm	Bowes Bypass	399688	513827							Construction	Hazard	Risk of ill health from asbestos, serious injury or death from electrocution etc	The alignment requires the demolitition associated with an historic barn. Age / Condition of stone wan and potential services are unknown.
5775	A66.LDS.S1.001	Yes	Arcadis	Stage 2	Lands	September 11, 2019	Demolition of existing structure	Option A (Section 1) - Skirsgill Lodge	M6 J40 to Kemplay Bank Roundabout	350816	528812							Construction	Hazard	Risk of ill health from asbestos, serious injury or death from electrocution etc	The alignment requires the demolition of Skirsgill Lodge. The age of the buildings suggests asbestos is likely to be present. Unidentified services are also expected to be impacted by the alignment

OBJECT ID	Design Initial Risk Likelihood	Design Initial Risk Severity	Design Initial Risk Rating	Risk Owner Designer Name	Actions To Eliminate Risk	Risk Still Live	Action By	Design Residual Risk Likelihood	Design Residual Risk Severity	Design Residual Risk Rating	Residual Hazards Information	Designer Comments	Status At Transferred
3788	3	3	9	Lewis Jenkins	Mitigation required during construction would comprise erecting temporary screening (where appropriate) and ensuring that the dust is limited by dampening down the construction area	Yes	Designer/Contractor	2	3	6	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
3789	3	2	6	Lewis Jenkins	Mitigation would be required during construction. This is to be set out within the Record of Environment Actions and Commitments. This likely to include measures, such as: earth bunding to compounds, location industrial features away from visual receptors, use of baffles on lighting structures etc.	Yes	Designer/Contractor	2	2	4	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
3790	4	2	8	Lewis Jenkins	Minimising habitat loss. Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures to demonstrate compliance with relevant environmental legislation. For further mitigation requirements see Chapter 7 of the EAR.	Yes	Designer/Contractor	4	1	4	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Further survey work required at Stage 3 and to inform the development of detailed mitigation strategies to reduce impact to receptors.	Live
3791	4	3	12	Lewis Jenkins	Strip, map and sample excavation and recording would be used to mitigate physical impacts and improve understanding of the nature and extent of heritage assets.	Yes	Designer/Contractor	3	3	9	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
4172	4	5	20	Lewis Jenkins	Wide span bridges. Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures to demonstrate compliance with relevant environmental legislation. For further mitigation requirements see Chapter 7 of the EAR.	Yes	Designer/Contractor	2	5	10	17/09/2019 Inclusion of wide span bridges within project design. Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Development of detailed mitigation strategies to reduce impact to designation at Stage 3.	Live
4173	4	5	20	Lewis Jenkins	Wide span bridges. Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures to demonstrate compliance with relevant environmental legislation. For further mitigation requirements see Chapter 7 of the EAR.	Yes	Designer/Contractor	2	5	10	17/09/2019 Inclusion of wide span bridges within project design. Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Development of detailed mitigation strategies to reduce impact to designation.	Live
4174	5	2	10	Lewis Jenkins	Minimise habitat loss and reinstating lost habitat. Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures to demonstrate compliance with relevant environmental legislation. For further mitigation requirements see Chapter 7 of the EAR.	Yes	Designer/Contractor	1	2	2	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation and enhancement strategies to be developed at Stage 3.	Live
4176	4	3	12	Lewis Jenkins	Wide span bridges. Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures to demonstrate compliance with relevant environmental legislation. For further mitigation requirements see Chapter 7 of the EAR.	Yes	Designer/Contractor	2	3	6	17/09/2019 Inclusion of wide span bridges within project design. Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
4177	4	3	12	Lewis Jenkins	Wide span bridges. Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures to demonstrate compliance with relevant environmental legislation. For further mitigation requirements see Chapter 7 of the EAR.	Yes	Designer/Contractor	2	3	6	17/09/2019 Inclusion of wide span bridges within project design. Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Development of detailed mitigation strategies to reduce impact to designation at Stage 3.	Live
4178	3	3	9	Lewis Jenkins	Minimising habitat loss. Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures to demonstrate compliance with relevant environmental legislation. For further mitigation requirements see Chapter 7 of the EAR.	Yes	Contractor	1	3	3	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Further survey work required at Stage 3 and to inform the development of detailed mitigation strategies to reduce impact to receptors.	Live
4179	3	3	9	Lewis Jenkins	Mitigation required during construction would comprise erecting temporary screening (where appropriate) and ensuring that the dust is limited by dampening down the construction area	Yes	Contractor	2	3	6	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage	Live
4180	3	3	9	Lewis Jenkins	Mitigation required during construction would comprise erecting temporary screening (where appropriate) and ensuring that the dust is limited by dampening down the construction area.	Yes	Contractor	2	3	6	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
4181	3	3	9	Lewis Jenkins	Mitigation required during construction would comprise erecting temporary screening (where appropriate) and ensuring that the dust is limited by dampening down the construction area.	Yes	Contractor	2	3	6	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
4572	3	3	9	Lewis Jenkins	Mitigation required during construction would comprise erecting temporary screening (where appropriate) and ensuring that the dust is limited by dampening down the construction area.	Yes	Contractor	2	3	6	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
4573	3	3	9	Lewis Jenkins	Mitigation required during construction would comprise erecting temporary screening (where appropriate) and ensuring that the dust is limited by dampening down the construction area	Yes	Contractor	2	3	6	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
4574	4	5	20	R Tyrer	120919 It is possible that during Stage 3, the demolition of this property could be avoided	Yes	Designer	3	5	15	Risk reduced but testing will be required (See SAMP)	120919 Surveys and further investigation work are required to confirm the presence of Asbestos and location of potential utilities.	Live
4575	4	5	20	R Tyrer	120919 Action to eliminate would be to amend the proposed alignment, however this will not be feasible and land acquisition will be required.	Yes	Designer	3	5	15	Risk reduced but testing required	120919 Surveys and further investigation work are required to confirm the presence of Asbestos and location of potential utilities. Capture in SAMP	Live
4972	3	2	6	Lewis Jenkins	Mitigation would be required during construction. This is to be set out within the Record of Environment Actions and Commitments. This likely to include measures, such as: earth bunding to compounds, location industrial features away from visual receptors, use of baffles on lighting structures etc.	Yes	Contractor	2	2	4	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
4973	3	2	6	Lewis Jenkins	Mitigation would be required during construction. This is to be set out within the Record of Environment Actions and Commitments. This likely to include measures, such as: earth bunding to compounds, location industrial features away from visual receptors, use of baffles on lighting structures etc.	Yes	Designer/Contractor	2	2	4	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
4974	3	3	9	Lewis Jenkins	Mitigation would be required during construction. This is to be set out within the Record of Environment Actions and Commitments. This likely to include measures, such as: earth bunding to compounds, location industrial features away from visual receptors, use of baffles on lighting structures etc.	Yes	Designer/Contractor	2	3	6	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
4975	3	3	9	Lewis Jenkins	Mitigation would be required during construction. This is to be set out within the Record of Environment Actions and Commitments. This likely to include measures, such as: earth bunding to compounds, location industrial features away from visual receptors, use of baffles on lighting structures etc.	Yes	Designer/Contractor	2	3	6	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
4976	3	4	12	Lewis Jenkins	Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures. Surface water run off would be managed using SuDs and a Flood Warning and Evacuation Plan would be developed, in collaboration with the EA. For further mitigation requirements see Chapter 15 of the EAR.	Yes	Contractor	2	4	8	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Further refinement of flood risk modelling and development of detailed mitigation strategies at Stage 3.	Live
4977	3	4	12	Lewis Jenkins	Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures to demonstrate compliance with relevant environmental legislation. For further mitigation requirements see Chapter 7 of the EAR.	Yes	Designer/Contractor	2	4	8	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Further survey work required at Stage 3 to inform the development of detailed mitigation strategies to reduce impact to designation.	Live
4978	3	3	9	Lewis Jenkins	Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures to demonstrate compliance with relevant environmental legislation. For further mitigation requirements see Chapter 7 of the EAR.	Yes	Contractor	2	3	6	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Further survey work required at Stage 3 and to inform the development of detailed mitigation strategies to reduce impact to receptors.	Live
4979	3	3	9	Lewis Jenkins	Impact on species	Yes	Designer	2	3	6	TBC	TBC	Live
4980	3	3	9	Lewis Jenkins	Minimising habitat loss. Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures to demonstrate compliance with relevant environmental legislation. For further mitigation requirements see Chapter 7 of the EAR.	Yes	Designer/Contractor	1	3	3	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Further survey work required at Stage 3 and to inform the development of detailed mitigation strategies to reduce impact to receptors.	Live
4981	3	2	6	Lewis Jenkins	Mitigation would be required during construction. This is to be set out within the Record of Environment Actions and Commitments. This likely to include measures, such as: earth bunding to compounds, location industrial features away from visual receptors, use of baffles on lighting structures etc.	Yes	Designer/Contractor	2	2	4	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
4982	3	2	6	Lewis Jenkins	Mitigation would be required during construction. This is to be set out within the Record of Environment Actions and Commitments. This likely to include measures, such as: earth bunding to compounds, location industrial features away from visual receptors, use of baffles on lighting structures etc.	Yes	Designer/Contractor	2	2	4	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
4983	3	3	9	Lewis Jenkins	Mitigation would be required during construction. This is to be set out within the Record of Environment Actions and Commitments. This likely to include measures, such as: earth bunding to compounds, location industrial features away from visual receptors, use of baffles on lighting structures etc.	Yes	Designer/Contractor	2	3	6	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
4984	4	4	16	Lewis Jenkins	Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures to demonstrate compliance with relevant environmental legislation. For further mitigation requirements see Chapter 7 of the EAR.	Yes	Designer/Contractor	2	4	8	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Further survey work required at Stage 3 and to inform the development of detailed mitigation strategies to reduce impact to designation.	Live
4985	4	5	20	R Tyrer	120919 If Option F is chosen as preferred, the acquisition of Winthorn will not be required. If this is not the cast then the property will need to be demolished as it sits directly on line of this proposed option.	Yes	Designer	3	5	15	Hazard remains until testing confirms situation	120912 Surveys and further investigation work are required to confirm the presence of Asbestos and location of potential utilities. Capture in SAMP	Live
4986	3	3	9	Lewis Jenkins	Minimising habitat loss and reinstating lost habitat. Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures to demonstrate compliance with relevant environmental legislation. For further mitigation requirements see Chapter 7 of the EAR.	Yes	Designer/Contractor	1	3	3	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Further survey work required at Stage 3 and to inform the development of detailed mitigation strategies to reduce impact to receptors.	Live
4987	3	2	6	Lewis Jenkins	Mitigation would be required – this is to be set out within the Record of Environment Actions and Commitments. This likely to include measures, such as: earth bunding to compounds, location industrial features away from visual receptors, use of baffles on lighting structures etc.	Yes	Designer/Contractor	2	2	4	19/09/19 - Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
4988	4	5	20	R Tyrer	120919 None. The alignment will require the acquisition and demolition of the units.	Yes	Designer	3	5	15	Hazard remains until testing confirms situation	120919 Surveys and further investigation work are required to confirm the presence of Asbestos and location of potential utilities. Capture in SAMP	Live
4989	3	2	6	Lewis Jenkins	Mitigation would be required – this is to be set out within the Record of Environment Actions and Commitments. This likely to include measures, such as: earth bunding to compounds, location industrial features away from visual receptors, use of baffles on lighting structures etc.	Yes	Designer/Contractor	2	2	4	19/09/19 - Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
4990	3	3	9	Lewis Jenkins	Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures to demonstrate compliance with relevant environmental legislation. For further mitigation requirements see Chapter 7 of the EAR.	Yes	Contractor	2	2	4	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Further survey work required at Stage 3 to inform the development of detailed mitigation strategies to reduce impact to designation.	Live
4991	3	3	9	Lewis Jenkins	Minimising habitat loss. Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures to demonstrate compliance with relevant environmental legislation. For further mitigation requirements see Chapter 7 of the EAR.	Yes	Designer/Contractor	2	2	4	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Further survey work required at Stage 3 and to inform the development of detailed mitigation strategies to reduce impact to receptors.	Live
5372	4	5	20	R Tyrer	190911 Alterations to the alignment to avoid the properties would eliminate the risk, though this is unlikely to be feasible / cost effective.	Yes	Designer	3	5	15	Hazard remains until testing confirms situation	120919 Surveys and further investigation work are required. Capture in SAMP	Live
5373	4	5	20	R Tyrer	120919 Changes to alignment may eliminate / reduce the requirement for demolition.	Yes	Designer	3	5	15	Hazard remains until testing confirms situation.	120919 Surveys and further investigation work are required to confirm the presence of Asbestos and location of potential utilities. Capture in SAMP.	Live
5374	4	5	20	R Tyrer	120919 Changes to alignment may eliminate the requirement for demolition.	Yes	Designer	3	5	0	Not emerging preferred route	120919 Surveys and further investigation work are required to confirm the presence of Asbestos and location of potential utilities. Capture in SAMP.	Closed
5375	4	5	20	R Tyrer	120919 It is possible that during Stage 3 alterations to the alignment to avoid the properties would eliminate the risk, though this is unlikely to be feasible / cost effective.	Yes	Designer	3	5	15	Hazard remains until testing confirms situation	120919 Surveys and further investigation work are required to confirm the presence of Asbestos and location of potential utilities	Live
5772	4	5	20	R Tyrer	120911 Alterations to the alignment to avoid the properties would eliminate the risk, though this is unlikely to be feasible / cost effective.	Yes	Designer	3	5	15	Hazard remains until testing confirms situation	120919 Surveys and further investigation work are required to confirm the presence of Asbestos and location of potential utilities. Capture in SAMP.	Live
5773	4	5	20	R Tyrer	120919 Changes to alignment may eliminate the requirement for demolition.	Yes	Designer	3	5	15	Hazard remains until testing confirms situation	120919 Surveys and further investigation work are required to confirm the presence of Asbestos and location of potential utilities. Capture in SAMP.	Live
5774	4	5	20	R Tyrer	120919 Avoidance is not possible.	Yes	Designer	3	5	15	Risk reduced but testing required	120912 Surveys and further investigation work are required to confirm the presence of Asbestos and location of potential utilities.	Live
5775	4	5	20	R Tyrer	190911 It is possible that during Stage 3 alterations to the alignment to avoid the properties would eliminate the risk	Yes	Designer	3	5	15	Risk reduced - testing required	120919 Should elimination not be possible, surveys and further investigation work are required to confirm the presence of Asbestos and location of potential. Capture in SAMP utilities.	Live

OBJECT ID	Designer Contractor Discussion Comments	Designer Contractor Discussion Date	Principal Contractor Manager Responsible	Control Measures Required During Construction Phase	Control Measures Implemented	Construction Current Risk Likelihood	Construction Current Risk Severity	Status At Handover	Status At Handover Date	Contractor Client Discussion Comments	Contractor Client Discussion Date	Principal Designer Close Out Comments	Principal Designer Close Out Comments Date	Client Rep Responsible	Residual Risk Details	Control Measures Required	Add to Health and Safety File	Operation Maintenance Manual	Included Within MRSS	Project Action Owner	Client Residual Risk Likelihood	Client Residual Risk Severity	Client Residual Risk Rating	SHE Box Required	Drawings Required	SHE BOX TEXT	Handover Owner	As Built Completed	Status End Of Project	Date End Of Project	Design Initial Risk Rating Category	Design Residual Risk Rating Category	Client Residual Risk Rating Category	Construction Current Risk Rating Category	Type	Construction Current Risk Rating	x	y
3788																															Medium	Medium	Medium	Medium	Specific	6	-223672.325	7268823.282
3789																															Medium	Low	Low	Low	Specific	4	-222750.834	7272531.186
3790																															Medium	Low	Low	Low	Specific	4	-210774.176	7271135.585
3791																															High	Medium	Medium	Medium	Specific	9	-214404.934	7269176.886
4172																															High	High	High	High	Specific	10	-283314.704	7287304.322
4173																															High	High	High	High	Specific	10	-285801.297	7288625.25
4174																															High	Low	Low	Low	Specific	2	-281457.568	7290203.798
4176																															High	Medium	Medium	Medium	Specific	6	-281074.321	7290212.999
4177																															High	Medium	Medium	Medium	Specific	6	-280627.731	7290840.773
4178																															Medium	Low	Low	Low	Specific	3	-280603.667	7290222.2
4179																															Medium	Medium	Medium	Medium	Specific	6	-282942.074	7286363.192
4180																															Medium	Medium	Medium	Medium	Specific	6	-278671.155	7283171.946
4181																															Medium	Medium	Medium	Medium	Specific	6	-287965.42	7290497.957
4572																															Medium	Medium	Medium	Medium	Specific	6	-281066.978	7282739.599
4573																															Medium	Medium	Medium	Medium	Specific	6	-284731.178	7289442.171
4574																															High	High	High	High	Specific	15	-306876.619	7294846.025
4575																															High	High	High	High	Specific	15	-300889.45	7294948.737
4972																															Medium	Low	Low	Low	Specific	4	-280192.552	7290821.753
4973																															Medium	Low	Low	Low	Specific	4	-280202.108	7290226.889
4974																															Medium	Medium	Medium	Medium	Specific	6	-279661.562	7290814.498
4975																															Medium	Medium	Medium	Medium	Specific	6	-279683.857	7290160.36
4976																															High	Medium	Medium	Medium	Specific	8	-285743.969	7288610.918
4977																															High	Medium	Medium	Medium	Specific	8	-265211.072	7276767.956
4978																															Medium	Medium	Medium	Medium	Specific	6	-264808.362	7276387.894
4979																															Medium	Medium	Medium	Medium	General	6	-264479.081	7276352.153
4980																															Medium	Low	Low	Low	Specific	3	-264114.59	7276689.219
4981																															Medium	Low	Low	Low	Specific	4	-264106.982	7276344.721
4982																															Medium	Low	Low	Low	Specific	4	-263700.379	7276707.443
4983																															Medium	Medium	Medium	Medium	Specific	6	-263374.99	7276354.099
4984																															High	Medium	Medium	Medium	Specific	8	-224058.048	7272469.612
4985																															High	High	High	High	Specific	15	-284019.471	7289620.064
4986																															Medium	Low	Low	Low	Specific	3	-223716.914	7272493.675
4987																															Medium	Low	Low	Low	Specific	4	-223300.047	7272502.876
4988																															High	High	High	High	Specific	15	-265607.702	7272744.201
4989																															Medium	Low	Low	Low	Specific	4	-222281.594	7272578.605
4990																															Medium	Low	Low	Low	Specific	4	-210411.1	7271670.644
4991																															Medium	Low	Low	Low	Specific	4	-210048.024	7271154.694
5372																															High	High	High	High	Specific	15	-264926.733	7272434.144
5373																															High	High	High	High	Specific	15	-221026.523	7268827.03
5374																															High	Not Applicable	Not Applicable	Not Applicable	Specific	0	-210296.078	7269057.834
5375																															High	High	High	High	Specific	15	-214122.37	7269197.839
5772																															High	High	High	High	Specific	15	-224820.22	7268729.692
5773																															High	High	High	High	Specific	15	-223382.248	7269225.936
5774																															High	High	High	High	Specific	15	-223494.005	7269149.499
5775																															High	High	High	High	Specific	15	-307664.206	7294618.573

OBJECT ID	Hazard Triangle Reference	Display In Models	Identified By	Stage Identified	Discipline	Date Added	Design Activity or Element	Location Name	Section Name	Eastings Start	Northings Start	Eastings End	Northings End	Chainage Start Easting	Chainage Start Northing	Chainage End Easting	Chainage End Northing	Phase Affected	Hazard Or Constraint	Hazard or Constraint Description	Consequence of Design Activity
5776	A66.GEN. 06	Yes	Arcadis	Stage 1	Structures - Genera	October 22, 2018	Working at height	Scheme Wide	All Structures									Construction, Operation and Maintenance	Hazard	Working at height leads to greater exposure to risk of falls.	Risk of serious injury or death
6172	A66.HGN.S10.001	Yes	Arcadis	Stage 2	Highways - Temporary Works	August 13, 2019	Temporary Traffic Management -	Option J (formerly Section 10)	Bowes Bypass	399563	513520							Construction	Hazard and Constraint	Diversion of Traffic through Bowes Village	RTA due to increased traffic leading to serious injury or death
6572	A66.HGN.S10.002	Yes	Costain	Stage 2	Highways - Temporary Works	August 13, 2019	Temporary Traffic Management -	Option J (formerly Section 10)	Bowes Bypass	399278	513802							Construction	Hazard and Constraint	RTA leading to serious injury or death	Live traffic passing through the works
6573	A66.HGN.S2.001	Yes	Costain	Stage 2	Highways - Temporary Works	September 12, 2019	Closure of existing access road	Options A & B	M6 J40 to Kemplay Bank Roundabout	352224	529327							Construction	Hazard and Constraint	Access road will clash with temporary works	Risk of RTA due to proximity of road to construction works leading to serious injury or death
6972	A66.HGN.S1.001	Yes	Arcadis	Stage 2	Highways - Earthworks	September 12, 2019	Earthworks - working on steep embankments	Option A&B (formerly section 1)	M6 J40 to Kemplay Bank Roundabout	351509	528925							Construction and Maintenance	Hazard	Injury due to fall	Slips, trips and falls on steep embankment
7372	A66.SGN.S2. 003	Yes	Arcadis	Stage 2	Structures - Proposed	August 5, 2019	New overbridge	Option A (formerly Section 2)	M6 J40 to Kemplay Bank Roundabout	351989	529126							Construction, operation and Maintenance	Hazard	Working at height	Increased risk of a fall from height leading to serious injury or death
8172	A66.ENV.S12.006	Yes	Arcadis	Stage 2	Environment	September 16, 2019	Listed building: Milestone (LB3)	Option K and L	Cross Lanes to Rokeby	404904	513824							Construction	Constraint	Significant impact upon the Listed building–LB is within project footprint.	Impacts to the setting of the Listed Building and permeant physical impact due to LB being within the project footprint.
8572	A66.ENV.S12.007	Yes	Arcadis	Stage 2	Environment	September 16, 2019	Listed buildings: Rokeby Grove, Sundial at Rokeby Grove, The stable to the west of Rokeby Grove	Option K and L	Cross Lanes to Rokeby	408164	513628							Construction	Constraint	Significant impacts on 3 listed building.	Impacts to the setting of 3 listed buildings.
8573	A66.ENV.S12.011	Yes	Arcadis	Stage 2	Environment	September 16, 2019	VP11 - PRoW users	Option K and L	Cross Lanes to Rokeby	406222	513805							Construction	Constraint	Significant impact to visual receptors during construction	Significant impact to visual receptors during construction
8574	A66.ENV.S14.002	Yes	Arcadis	Stage 2	Environment	September 16, 2019	Carkin Moor Roman Fort Scheduled Monument	Option M	Stephen Bank to Carkin Moor	416135	508368							Construction and Operation	Constraint	Significant impact to Scheduled Monument	Impacts to the setting of the Scheduled Monument
8575	A66.ENV.S14.003	Yes	Arcadis	Stage 2	Environment	September 16, 2019	Rivers and streams S41 priority habitat	Option N and O	Stephen Bank to Carkin Moor	413755	509841							Construction and Operation	Constraint	Each option crosses multiple watercourses. Construction could result in moderate impacts (significant) to the designated habitat.	Loss, shading and fragmentation of watercourses.
8576	A66.ENV.S14.004	Yes	Arcadis	Stage 2	Environment	September 16, 2019	'Important Hedgerows' and Hedgerows S41 Habitat	Option N, M and O	Stephen Bank to Carkin Moor	413755	509841							Construction	Constraint	'Important Hedgerows' and Hedgerows S41 Habitat	Loss, partial loss and fragmentation of hedgerow habitat.
8577	A66.ENV.S14.008	Yes	Arcadis	Stage 2	Environment	September 16, 2019	VP12 - PRoW users	Option M	Stephen Bank to Carkin Moor	416242	507830							Construction and operation	Constraint	Significant impact to visual receptors during construction	The proposed realignment would be approximately 185m from viewpoint and clearly visible as a notable new incongruous feature of the landscape, change the balance and overall nature of the view, resulting in a notable change to the nature of the scene.
8578	A66.ENV.S14.009	Yes	Arcadis	Stage 2	Environment	September 16, 2019	VP14 - PRoW users	Option M	Stephen Bank to Carkin Moor	413890	508017							Construction	Constraint	Significant impact to visual receptors during construction	Where visible the highway would be recognised as a new incongruous features of the scene, but not change the overall balance or nature of the scene.
8972	A66.ENV.S12.008	Yes	Arcadis	Stage 2	Environment	September 16, 2019	Listed building: Cross Lanes farmhouse	Option K and L	Cross Lanes to Rokeby	405052	513821							Construction and Operation	Constraint	Significant impact on the listed building	Impacts to the setting of the listed building
8973	A66.ENV.S12.009	Yes	Arcadis	Stage 2	Environment	September 16, 2019	Landscape Character - Gritstone Vale	Option K and L	Cross Lanes to Rokeby	406968	513798							Construction	Constraint	Significant impact to Landscape character.	Notable change to the local landscape character (especially where the route diverts from the existing A66)
8974	A66.ENV.S12.010	Yes	Arcadis	Stage 2	Environment	September 16, 2019	Rokeby Park Registered Park and Garden	Option K and L	Cross Lanes to Rokeby	408386	513908							Construction	Constraint	Significant impact to Rokeby Park Registered Park and Garden	Significant impact to the setting of Rokeby Park Registered Park and Garden
9372	A66.ENV.S14.005	Yes	Arcadis	Stage 2	Environment	September 16, 2019	Birds	Option N and O	Stephen Bank to Carkin Moor	currently unknown	currently unknown							Construction	Constraint	Significant impacts (direct and indirect) on receptors during construction.	Potential habitat loss/degradation (breeding and foraging) and mortality/injury/disturbance whilst breeding. Increased visual (including light pollution) and/or noise disturbance may result in displacement and changes in behaviour.
9373	A66.ENV.S14.007	Yes	Arcadis	Stage 2	Environment	September 16, 2019	LCT 13: Moors Fringe	Options N, M and O	Stephen Bank to Carkin Moor	414716	509081							Construction	Constraint	Significant impact to landscape character during construction	The construction activities would be visible within the parts of the LCT adjacent to the project and result in a substantial but localised change to the landscape character immediately adjacent to the offline sections of the project.
9374	A66.ENV.S14.006	Yes	Arcadis	Stage 2	Environment	September 19, 2019	Ravensworth Lodge and attached outbuildings (LB75)	Option M and O	Stephen Bank to Carkin Moor	414366	509383							Construction and operation	Constraint	Significant impact on the listed building.	Impacts to the setting of the listed building.
9772	A66.BS.S2.005	Yes	Arcadis	Stage 2	Highways - Services	September 19, 2019	11kV underground cable	Option A&B (formerly section 2)	M6 J40 to Kemplay Bank Roundabout	350954	528944							Construction and Maintenance	Hazard and Potential Constraint	11kV underground cable	Death
10572	A66.BS.S1.001	Yes	Arcadis	Stage 2	Highways - Services	September 19, 2019	11kV underground cable	Option A&B (formerly section 1)	M6 J40 to Kemplay Bank Roundabout	350997	528977							Construction and Maintenance	Hazard and Potential Constraint	11kV underground cable	Risk of serious injury or death
11372	A66.GEN.032	Yes	Arcadis	Stage 2	Highways - General Services	September 19, 2019	LV underground cables	Scheme Wide	All									Construction and Maintenance	Hazard and Potential Constraint	LV underground cable	Electrical burns
11373	A66.BS.S2.006	Yes	Arcadis	Stage 2	Highways - Services	September 19, 2019	11kV underground cable	Option A&B (formerly section 2)	M6 J40 to Kemplay Bank Roundabout	351124	529044							Construction and Maintenance	Hazard and Potential Constraint	11kV underground cable	Death
11374	A66.ENV.GEN.001	Yes	Arcadis	Stage 2	Environment - General	September 19, 2019	Contamination of land and waterways	Scheme Wide	All									Construction and Maintenance	Hazard and Constraint	Contamination of land waterways through construction and maintenance activities.	Impacts to human and environmental health.
11375	A66.BS.S16.001	Yes	Arcadis	Stage 2	Highways - Services	September 19, 2019	20kV	Section 16	Scotch Corner	421478	505332							Construction and Maintenance	Hazard and Potential Constraint	20kV underground cable	Death
11376	A66.OH.S16.001	Yes	Arcadis	Stage 2	Highways - Services	September 19, 2019	33kV OH lines	Section 16	Scotch Corner	421300	505268							Construction and Maintenance	Hazard and Potential Constraint	33kV OH line	Death
11772	A66.GEN.033	Yes	Arcadis	Stage 2	Highways - General Services	September 20, 2019	LV underground cables	Scheme Wide	All									Construction and Maintenance	Hazard and Potential Constraint	LV underground cables	Injury, electrical burns
	A66.SGN.S8.004	Yes	Arcadis	Stage 2	Structures - Proposed	September 20, 2019	New Overbridge Structure - Link to Langrigg	Option I (Section 8)	Appleby to Brough	376946	515248							Construction operation and maintenance	Hazard	Working at height leads to greater exposure to risk of falls.	Injury from fall
	A66.SGN.S8.005	Yes	Arcadis	Stage 2	Structures - Proposed	September 20, 2019	New Overbridge Structure - Link to Flitholme	Option I (Section 8)	Appleby to Brough	376384	515252							Construction operation and maintenance	Hazard	Working at height leads to greater exposure to risk of falls.	Injury from fall
	A66.SGN.S8.006	Yes	Arcadis	Stage 2	Structures - Proposed	September 20, 2019	New Structure - Hayber Beck	Option I (Section 8)	Appleby to Brough	374850	516123							Construction operation and maintenance	Hazard	Working close to water and at height leads to greater exposure to risk of falls.	Injury from fall or drowning
	A66.SGN.S8.007	Yes	Arcadis	Stage 2	Structures - Proposed	September 20, 2019	New Structure - Mire Sike Beck	Option I (Section 8)	Appleby to Brough	374263	516503							Construction operation and maintenance	Hazard	Working close to water and at height leads to greater exposure to risk of falls.	Injury from fall or drowning
	A66.SGN.S6.005	Yes	ARCADIS	Stage 2	Structures - Proposed	June 6, 2019	Overbridge - Priest Lane	Option E (formerly Section 6 (E))	Temple Sowerby to Appleby - Kirkby Thore	362952	526177							Construction operation and maintenance	Hazard	Working at height leads to greater exposure to risk of falls.	Injury from fall
	A66.SGN.S6.006	Yes	ARCADIS	Stage 2	Structures - Proposed	June 6, 2019	Overbridge - Station Road	Option E (formerly Section 6 (E))	Temple Sowerby to Appleby - Kirkby Thore	363370	526308							Construction operation and maintenance	Hazard	Working at height leads to greater exposure to risk of falls.	Injury from fall
	A66.SGN.S6.007	Yes	ARCADIS	Stage 2	Structures - Proposed	June 6, 2019	Overbridge - Sleastonhow Lane	Option E (formerly Section 6 (E))	Temple Sowerby to Appleby - Kirkby Thore	364389	525347							Construction operation and maintenance	Hazard	Working at height leads to greater exposure to risk of falls.	Injury from fall
	A66.SGN.S6.008	Yes	ARCADIS	Stage 2	Structures - Proposed	June 6, 2019	River Overbridge - Trout Beck	Option E (formerly Section 6 (E))	Temple Sowerby to Appleby - Kirkby Thore	364651	524414							Construction operation and maintenance	Hazard	Working near water or at height leads to greater exposure to risk.	Injury from fall or drowning
	A66.SGN.S12.004	Yes	ARCADIS	Stage 1	Structures - Proposed	June 6, 2019	Overbridge - off current line	Option K (formerly Section 12)	Cross Lanes to Rokeby	406772	513742							Construction operation and maintenance	Hazard	Height	Serious injury or death
	A66.SGN.S14.002	Yes	ARCADIS	Stage 1	Structures - Proposed	June 6, 2019	New Overbridge - Collier Lane	Option N (formerly Section 14)	Stephen Bank to Carkin Moor	413986	509573							Construction operation and maintenance	Hazard	Working at height and retention of access	Serious injury or death

OBJECT ID	Hazard Triangle Reference	Design Initial Risk Likelihood	Design Initial Risk Severity	Design Initial Risk Rating	Risk Owner Designer Name	Actions To Eliminate Risk	Risk Still Live	Action By	Design Residual Risk Likelihood	Design Residual Risk Severity	Design Residual Risk Rating	Residual Hazards Information	Designer Comments	Status At Transferred
5776	A66.GEN. 06	3	5	15	Chris Short	E - remove need to work at height. - e.g. Top down construction. R - Promote modular construction reducing exposure. I - develop safe systems of work. C - PPE including fall arrest equipment	Yes	Designer	2	5	10	Risk of serious injury or death	181122 This is an issue that a competent contractor will be aware of - however designers should look to mitigate working at height at all times	Live
6172	A66.HGN.S10.001	3	5	15	Simon Maxwell	Reviewing phasing of works to find alternative TM arrangements	Yes	Designer	2	5	10	Risk reduced	190820 Alternative TM arrangements identified as part of the Stage 2 Programme Production Report - This anticipated that no through traffic movements will be allowed through Bowes Village - TTM to facilitate this	Live
6572	A66.HGN.S10.002	3	5	15	Simon Maxwell	190813 Review phasing of works to enable safe working	Yes	Designer	2	4	8	Reduction in potential for RTA	190813 Review design options and working areas to minimise potential for RTA - see phasing in Programme Production Report at Stage 3	Live
6573	A66.HGN.S2.001	3	5	15	Simon Maxwell	E- close road	Yes	Designer	2	5	0	Eliminated road to be closed and new access to be constructed to the south	190820 - Design Fix D	Closed
6972	A66.HGN.S1.001	3	3	9	Paul Williams	E - Not possible. R- Ensure PC provides safe egress	Yes	Designer/Contractor	2	3	6	Risk will be reduced by provision of SSW	190920 Ensure PC informed of access issues	Live
7372	A66.SGN.S2. 003	3	5	15	Chris Short	E - remove need to work at height. R - Promote modular construction reducing exposure. I - develop safe systems of work. C - PPE including fall arrest equipment	Yes	Designer	2	5	0	Review off site construction techniques / modular construction our counter casting to minimise working from height and over live road?	190820 This is currently not the EPRO with Option B the underpass being suggested, which would reduce the extents of working at height although not eliminate. Close at this time	Closed
8172	A66.ENV.S12.006	4	3	12	Lewis Jenkins	Strip, map and sample excavation and recording would be used to mitigate physical impacts and improve understanding of the nature and extent of heritage assets.	Yes	Designer/Contractor	3	3	9	17/09/2019 Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
8572	A66.ENV.S12.007	3	3	9	Lewis Jenkins	Mitigation required during construction would comprise erecting temporary screening (where appropriate) and ensuring that the dust is limited by dampening down the construction area.	Yes	Contractor	2	3	6	16/09/19 - Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
8573	A66.ENV.S12.011	3	3	9	Lewis Jenkins	Mitigation would be required during construction. This is to be set out within the Record of Environment Actions and Commitments. This likely to include measures, such as: earth bunding to compounds, location industrial features away from visual receptors, use of baffles on lighting structures etc.	Yes	Contractors	2	3	6	16/09/19 - Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
8574	A66.ENV.S14.002	4	3	12	Lewis Jenkins	Mitigation required during construction would comprise erecting temporary screening (where appropriate) and ensuring that the dust is limited by dampening down the construction area	Yes	Contractor	2	3	6	16/09/19 -Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
8575	A66.ENV.S14.003	3	4	12	Lewis Jenkins	Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures to demonstrate compliance with relevant environmental legislation. For further mitigation requirements see Chapter 7 of the EAR.	Yes	Designer/Contractor	2	4	8	16/09/19 - Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Further survey work required at Stage 3 to inform the development of detailed mitigation strategies to reduce impact to designation.	Live
8576	A66.ENV.S14.004	5	3	15	Lewis Jenkins	Minimising habitat loss and reinstating lost habitat. Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures to demonstrate compliance with relevant environmental legislation. For further mitigation requirements see Chapter 7 of the EAR.	Yes	Designer/Contractor	2	3	6	16/09/19 - Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Further survey work required at Stage 3 and to inform the development of detailed mitigation strategies to reduce impact to receptors.	Live
8577	A66.ENV.S14.008	3	3	9	Lewis Jenkins	Mitigation would be required during construction and operation. This is to be set out within the Record of Environment Actions and Commitments. This likely to include measures, such as: earth bunding to compounds, location industrial features away from visual receptors, use of baffles on lighting structures etc.	Yes	Designer/Contractor	2	3	6	16/09/19 - Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
8578	A66.ENV.S14.009	3	3	9	Lewis Jenkins	Mitigation would be required during construction and operation. This is to be set out within the Record of Environment Actions and Commitments. This likely to include measures, such as: earth bunding to compounds, location industrial features away from visual receptors, use of baffles on lighting structures etc.	Yes	Designer/Contractor	2	3	6	16/09/19 - 16/09/19 - Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
8972	A66.ENV.S12.008	3	3	9	Lewis Jenkins	Mitigation required during construction would comprise erecting temporary screening (where appropriate) and ensuring that the dust is limited by dampening down the construction area.	Yes	Contractor	2	3	6	16/09/19 - Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
8973	A66.ENV.S12.009	3	3	9	Lewis Jenkins	Mitigation would be required during construction. This is to be set out within the Record of Environment Actions and Commitments. This likely to include measures, such as: earth bunding to compounds, location industrial features away from visual receptors, use of baffles on lighting structures etc.	Yes	Designer/Contractor	2	3	6	16/09/19 - Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
8974	A66.ENV.S12.010	3	3	9	Lewis Jenkins	Mitigation would be required during construction. This is to be set out within the Record of Environment Actions and Commitments. This likely to include measures, such as: earth bunding to compounds, location industrial features away from visual receptors, use of baffles on lighting structures etc.	Yes	Contractors	2	3	6	16/09/19 - Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
9372	A66.ENV.S14.005	3	3	9	Lewis Jenkins	Minimising habitat loss and reinstating lost habitat. Development of mitigation, including a CEMP that would include best practice techniques and a suite of bespoke control measures to demonstrate compliance with relevant environmental legislation. For further mitigation requirements see Chapter 7 of the EAR.	Yes	Designer/Contractor	1	3	3	16/09/19 - Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Further survey work required at Stage 3 and to inform the development of detailed mitigation strategies to reduce impact to receptors.	Live
9373	A66.ENV.S14.007	3	3	9	Lewis Jenkins	Mitigation would be required during construction. This is to be set out within the Record of Environment Actions and Commitments. This likely to include measures, such as: earth bunding to compounds, location industrial features away from visual receptors, use of baffles on lighting structures etc.	Yes	Designer/Contractor	2	3	6	16/09/19 - Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
9374	A66.ENV.S14.006	3	3	9	Lewis Jenkins	Mitigation required during would comprise erecting screening (where appropriate) and ensuring that the dust is limited by dampening down the construction area.	Yes	Designer/Contractor	2	3	6	16/09/19 - Screening to be implemented. Contractor to adhere to detailed mitigation strategies developed at Stage 3.	Detailed mitigation strategies to be developed at Stage 3.	Live
9772	A66.BS.S2.005	5	5	25	Paul Williams	C3 process ongoing	Yes	Designer	3	5	15	C3 process being followed to mitigate risk	190919 C3's requested - hazard triangle to be shown on drawings	Live
10572	A66.BS.S1.001	5	5	25	Paul Williams	C3 process ongoing	Yes	Designer	3	5	15	C3 process being followed to mitigate risk	190919 C3's requested - hazard triangle to be shown on drawings	Live
11372	A66.GEN.032	4	5	15	Paul Williams	C3 process ongoing	Yes	Designer	2	5	10	C3 process being followed to mitigate risk	190919 C3's requested - hazard triangle to be shown on drawings	Live
11373	A66.BS.S2.006	5	5	25	Paul Williams	C3 process ongoing	Yes	Designer	3	5	15	C3 process being followed to mitigate risk	190919 C3's requested - hazard triangle to be shown on drawings	Live
11374	A66.ENV.GEN.001	3	3	9	Lewis Jenkins	Preparation of a CEMP at Stage 3 (inclusive of the EA's Pollution Prevention Guidelines).	Yes	Contractors	1	3	3	19/09/19 - Contractor to adhere to detailed mitigation strategies developed at Stage 3.	CEMP and detailed mitigation methodologies to be developed at Stage 3.	Live
11375	A66.BS.S16.001	5	5	25	Paul Williams	C3 process ongoing	Yes	Designer	3	5	15	C3 process being followed to mitigate risk	190919 C3's requested - hazard triangle to be shown on drawings	Live
11376	A66.OH.S16.001	5	5	25	Paul Williams	C3 process ongoing	Yes	Designer	3	5	15	C3 process being followed to mitigate risk	190919 C3's requested - hazard triangle to be shown on drawings	Live
11772	A66.GEN.033	3	5	15	Paul Williams	C3 process ongoing	Yes	Designer	2	5	10	C3 process being followed to mitigate risk	190919 C3's requested - hazard triangle to be shown on drawings	Live
	A66.SGN.S8.004	2	5	10	Chris Short	E - remove need to work at height. R - Promote modular construction reducing exposure. I - develop safe systems of work. C - PPE including fall arrest equipment	Yes	Designer	1	5	5	Review off site construction techniques / modular construction to minimise working from height and over live road / river?	190920 Consider buildability at Stage 3 and maintenance of access to properties	Live
	A66.SGN.S8.005	2	5	10	Chris Short	E - remove need to work at height. R - Promote modular construction reducing exposure. I - develop safe systems of work. C - PPE including fall arrest equipment	Yes	Designer	1	5	5	Review off site construction techniques / modular construction to minimise working from height and over live road / river?	190920 Consider buildability at Stage 3 and maintenance of access to properties	Live
	A66.SGN.S8.006	2	5	10	Chris Short	E - remove need to work at height. R - Promote modular construction reducing exposure. I - develop safe systems of work. C - PPE including fall arrest equipment	Yes	Designer	1	5	5	Review off site construction techniques / modular construction to minimise working from height and over live road / river?	190920 Consider buildability at Stage 3 and maintenance of access to properties	Live
	A66.SGN.S8.007	2	5	10	Chris Short	E - remove need to work at height. R - Promote modular construction reducing exposure. I - develop safe systems of work. C - PPE including fall arrest equipment	Yes	Designer	1	5	5	Review off site construction techniques / modular construction to minimise working from height and over live road / river?	190920 Consider buildability at Stage 3 and maintenance of access to properties	Live
	A66.SGN.S6.005	2	5	10	Chris Short	E - remove need to work at height. R - Promote modular construction reducing exposure. I - develop safe systems of work. C - PPE including fall arrest equipment	Yes	Designer	1	5	5	Review off site construction techniques / modular construction to minimise working from height and over live road / river?	190920 Consider buildability at Stage 3 and maintenance of access to properties	Live
	A66.SGN.S6.006	2	5	10	Chris Short	E - remove need to work at height. R - Promote modular construction reducing exposure. I - develop safe systems of work. C - PPE including fall arrest equipment	Yes	Designer	1	5	5	Review off site construction techniques / modular construction to minimise working from height and over live road / river?	190920 Consider buildability at Stage 3 and maintenance of access to properties	Live
	A66.SGN.S6.007	2	5	10	Chris Short	E - remove need to work at height. R - Promote modular construction reducing exposure. I - develop safe systems of work. C - PPE including fall arrest equipment	Yes	Designer	1	5	5	Review off site construction techniques / modular construction to minimise working from height and over live road / river?	190920 Consider buildability at Stage 3 and maintenance of access to properties	Live
	A66.SGN.S6.008	2	5	10	Chris Short	E - remove need to work at height or over water. R - Promote modular construction reducing exposure. I - develop safe systems of work. C - PPE including fall arrest equipment	Yes	Designer	1	5	5	Review off site construction techniques / modular construction to minimise working from height and over live road / river?	190920 Consider buildability at Stage 3 and future maintenance requirements	Live
	A66.SGN.S12.004	2	5	10	Chris Short	190424 Stage 2 - Added - Construction of new overbridge E - Minimise On site working R - Early involvement of contractor - modular construction I - SHE triangle on all plans C -	Yes	Designer	1	5	5	Risk reduced	180820 Bridge can be constructed off-line if option K choosen Consider designs which mitigate working at height during stage 3	Live
	A66.SGN.S14.002	2	5	10	Chris Short	190424 Stage 2 - Construction of new overbridge E - Minimise on site working R - Early involvement of contractor to look at traffic diversions - modular construction I - SHE triangle on all drawings C -	Yes	Designer	1	5	5	Risk will be reduced by adoption of modular construction and minimising working at height	190820 See Programme Production Report for retention of access Consider designs which mitigate working at height during stage 3	Live

OBJECT ID	Hazard Triangle Reference	Designer Contractor Discussion Comments	Designer Contractor Discussion Date	Principal Contractor Manager Responsible	Control Measures Required During Construction Phase	Control Measures Implemented	Construction Current Risk Likelihood	Construction Current Risk Severity	Status At Handover	Status At Handover Date	Contractor Client Discussion Comments	Contractor Client Discussion Date	Principal Designer Close Out Comments	Principal Designer Close Out Comments Date	Client Rep Responsible	Residual Risk Details	Control Measures Required	Add to Health and Safety File	Operation Maintenance Manual	Included Within MRSS	Project Action Owner	Client Residual Risk Likelihood	Client Residual Risk Severity	Client Residual Risk Rating	SHE Box Required	Drawings Required	SHE BOX TEXT	Handover Owner	As Built Completed	Status End Of Project	Date End Of Project	Design Initial Risk Rating Category	Design Residual Risk Rating Category	Client Residual Risk Rating Category	Construction Current Risk Rating Category	Type	Construction Current Risk Rating	x	y
5776	A66.GEN. 06																															High	High	High	High	General	10	-246424.928	7281025.988
6172	A66.HGN.S10.001																															High	High	High	High	Specific	5	-223215.543	7268628
6572	A66.HGN.S10.002																															High	Medium	Medium	Medium	Specific	8	-223707.607	7269115.286
6573	A66.HGN.S2.001																															High	Not Applicable	Not Applicable	Not Applicable	Specific	0	-304924.98	7295491.878
6972	A66.HGN.S1.001																															Medium	Medium	Medium	Medium	Specific	6	-306151.7	7294784.537
7372	A66.SGN.S2. 003																															High	Not Applicable	Not Applicable	Not Applicable	Specific	0	-305416.889	7295081.626
8172	A66.ENV.S12.006																															High	Medium	Medium	Medium	Specific	9	-211638.093	7269116.769
8572	A66.ENV.S12.007																															Medium	Medium	Medium	Medium	Specific	6	-209347.769	7269009.879
8573	A66.ENV.S12.011																															Medium	Medium	Medium	Medium	Specific	6	-211747.772	7269122.146
8574	A66.ENV.S14.002																															High	Medium	Medium	Medium	Specific	6	-194969.845	7259701.282
8575	A66.ENV.S14.003																															High	Medium	Medium	Medium	Specific	8	-196106.845	7264488.151
8576	A66.ENV.S14.004																															High	Medium	Medium	Medium	Specific	6	-195705.551	7264507.261
8577	A66.ENV.S14.008																															Medium	Medium	Medium	Medium	Specific	6	-194570.939	7258767.318
8578	A66.ENV.S14.009																															Medium	Medium	Medium	Medium	Specific	6	-198587.466	7259101.73
8972	A66.ENV.S12.008																															Medium	Medium	Medium	Medium	Specific	6	-214211.672	7269192.612
8973	A66.ENV.S12.009																															Medium	Medium	Medium	Medium	Specific	6	-212039.188	7272279.951
8974	A66.ENV.S12.010																															Medium	Medium	Medium	Medium	Specific	6	-208432.316	7269141.256
9372	A66.ENV.S14.005																															Medium	Low	Low	Low	Specific	3	-195323.366	7264469.042
9373	A66.ENV.S14.007																															Medium	Medium	Medium	Medium	Specific	6	-194979.399	7264430.824
9374	A66.ENV.S14.006																															Medium	Medium	Medium	Medium	Specific	6	-198189.754	7261583.544
9772	A66.BS.S2.005																															High	High	High	High	Specific	15	-306903.706	7294895.927
10572	A66.BS.S1.001																															High	High	High	High	Specific	15	-307341.903	7294905.585
11372	A66.GEN.032																															High	High	High	High	General	10	-305103.247	7298272.154
11373	A66.BS.S2.006																															High	High	High	High	Specific	15	-305192.895	7295097.283
11374	A66.ENV.GEN.001																															Medium	Low	Low	Low	General	3	-247038.472	7279216.187
11375	A66.BS.S16.001																															High	High	High	High	Specific	15	-185969.038	7254355.935
11376	A66.OH.S16.001																															High	High	High	High	Specific	15	-186350.914	7254426.151
11772	A66.GEN.033																															High	High	High	High	General	10	-186423.364	7255838.645
	A66.SGN.S8.004																															High	Low	Low	Low	Specific	5		
	A66.SGN.S8.005																															High	Low	Low	Low	Specific	5		
	A66.SGN.S8.006																															High	Low	Low	Low	Specific	5		
	A66.SGN.S8.007																															High	Low	Low	Low	Specific	5		
	A66.SGN.S6.005																															High	Low	Low	Low	Specific	5		
	A66.SGN.S6.006																															High	Low	Low	Low	Specific	5		
	A66.SGN.S6.007																															High	Low	Low	Low	Specific	5		
	A66.SGN.S6.008																															High	Low	Low	Low	Specific	5		
	A66.SGN.S12.004																															High	Low	Low	Low	Specific	5	-213836.357	7269164.416
	A66.SGN.S14.002																															High	Low	Low	low	Specific	5	-195998.278	7260559.713

OBJECT ID	Hazard Triangle Reference	Display In Models	Identified By	Stage Identified	Discipline	Date Added	Design Activity or Element	Location Name	Section Name	Eastings Start	Northings Start	Eastings End	Northings End	Chainage Start Easting	Chainage Start Northing	Chainage End Easting	Chainage End Northing	Phase Affected	Hazard Or Constraint	Hazard or Constraint Description	Consequence of Design Activity	Design Initial Risk Likelihood	Design Initial Risk Severity	Design Initial Risk Rating	Risk Owner Designer Name	Actions To Eliminate Risk	Risk Still Live	Action By	Design Residual Risk Likelihood	Design Residual Risk Severity	Design Residual Risk Rating	Residual Hazards Information	Designer Comments	Status At Transferred	Designer Contractor Discussion Comments	Designer Contractor Discussion Date	Principal Contractor Manager Responsible	Control Measures Required During Construction Phase	Control Measures Implemented	Construction Current Risk Likelihood	Construction Current Risk Severity	Status At Handover	Status At Handover Date	Contractor Client Discussion Comments	Contractor Client Discussion Date	Principal Designer Close Out Comments	Principal Designer Close Out Comments Date	Client Rep Responsible	Residual Risk Details	Control Measures Required	Add to Health and Safety File	Operation Maintenance Manual	Included Within MRSS	Project Action Owner	Client Residual Risk Likelihood	Client Residual Risk Severity	Client Residual Risk Rating	SHE Box Required	Drawings Required	SHE BOX TEXT	Handover Owner	As Built Completed	Status End Of Project	Date End Of Project	Design Initial Risk Rating Category	Design Residual Risk Rating Category	Client Residual Risk Rating Category	Construction Current Risk Rating Category	Type	Construction Current Risk Rating	x	y
29	A66.GEN.024	Yes	ARCADIS	Stage 1	Geotechnical - General	July 11, 2018	Poor ground conditions	Scheme wide	All									Construction, operation and maintenance	Hazard	Poor ground conditions in exposed locations (subject to heavy rainfall) will lead to potential for mud on adjacent roads and slips, trips and falls by the workforce.	Occupational Health Issues. Injury to the workforce and traveling public due to poor surface conditions	2	4	8	Angela Hills	190603 PSSR in development - Sections 2,4 and 8 complete 190320 Stage 2 - Consider during development of PSSR and advance Stage 3 Survey Gap analysis proposals E - R - Undertake extensive GI to understand potential ground conditions. Promote seasonal working to avoid the worst weather conditions. Ensure good site/off site practices in place , I - C - PC to follow 5S's Lean working practices once on site to maintain good on site and off site working conditions	Yes	Designer/Contractor	2	3	6	Consider in more detail as part of the development of the PSSR	190826 PSSR completed and issued for review. Future GI requirements to be developed	Live																															Medium	Medium	Not Applicable	Not Applicable	General	6	-246433.789	7279861.18
30	A66.GEN.025	Yes	ARCADIS	Stage 1	Geotechnical - General	July 11, 2018	Ground Water	Scheme wide	All									Construction	Hazard and Constraint	High or perched water table may lead to poor ground / working conditions which may lead to potential for unstable ground, mud on adjacent roads and slips, trips and falls by the workforce.	Occupational Health Issues Injury to the workforce and travelling public due to poor surface conditions	2	4	8	Angela Hills	190603 Stage 3 advance GI proposals under development 190320 Stage 2 - Consider during development of PSSR and advance Stage 3 Survey Gap analysis proposals E - R - Undertake adequate GI to better understand the problems - avoid winter working where possible I - Isolate areas during construction period C - Introduce additional drainage measures to dewater ground	Yes	Designer	2	3	6	Risk of serious injury and slips trips and falls	190826 PSSR completed and issued for review	Live																															Medium	Medium	Not Applicable	Not Applicable	General	6	-245811.227	7279855.935
12574	A66.GEN.034	Yes	ARCADIS	Stage 2	Geotechnical - General	September 24, 2019	Damage to existing Drystone Retaining Walls	All Sections	All									Construction	Hazard	Damage to existing Drystone Retaining Walls	Damage of retaining structure. Collapse leading to serious injury or death.	5	3	15	Angela Hills	E - Not possible. R - Mitigation in design to reduce risk of dry-stone wall damage. I - Not applicable. C - Not applicable.	Yes	Designer	1	3	3	The location of the dry-stone walls will be determined, and the appropriate mitigating design undertaken.	Review at Stage 3	Live																															High	Low	Not Applicable	Not Applicable	General	3	-246493.062	7279176.376
12575	A66.GEN.035	Yes	ARCADIS	Stage 2	Geotechnical - General	September 24, 2019	Embankment construction	All Sections	All									Construction	Hazard	Embankment construction	Soft ground at formation level. Occupational Health Issues Injury to the workforce on unstable ground	4	4	16	Angela Hills	E - Not possible. R - Reduce risk with ground investigation to assess current ground conditions and incorporate findings into design. I - Not applicable. C - Not applicable.	Yes	Designer	1	4	4	Appropriate geotechnical ground investigation and embankment design.	Review at Stage 3	Live																															High	Low	Not Applicable	Not Applicable	General	4	-245881.566	7279252.813
12577	A66.GEN.037	Yes	ARCADIS	Stage 2	Geotechnical - General	September 24, 2019	Embankment construction	All Sections	All									Construction	Hazard	Embankment construction	Unacceptable settlement,leading to unstable structures and ground. Occupation heath issue, injury to work force	4	4	16	Angela Hills	E - Not possible. R - Reduce risk with ground investigation to assess current ground conditions and incorporate findings into design. I - Not applicable. C - Not applicable.	Yes	Designer	1	4	4	Appropriate geotechnical ground investigation and embankment design.	Review at Stage 3	Live																															High	Low	Not Applicable	Not Applicable	General	4	-244601.246	7279214.594
12578	A66.GEN.039	Yes	ARCADIS	Stage 2	Geotechnical - General	September 24, 2019	Formation of soil cuttings	All Sections	All									Construction	Hazard	Formation of soil cuttings.	Slope instability requiring reduced slope angles and incurring greater 'land take'.	4	3	12	Angela Hills	E - Not possible. R - Reduce risk with ground investigation to assess current ground conditions and incorporate findings into design. I - Not applicable. C - Not applicable.	Yes	Designer	1	3	3	Appropriate geotechnical ground investigation to inform design of embankment slope angles and the design for retaining structures/ earthwork strengthening.	Review at Stage 3	Live																															High	Low	Not Applicable	Not Applicable	General	3	-248900.829	7278736.863
12579	A66.GEO.S2.002	Yes	ARCADIS	Stage 2	Geotechnical - General	September 24, 2019	Earthwork Defects. Recorded on Hagdms.	Option A formerly Section 2c	M6 J40 to Kemplay Bank Roundabout									Construction	Hazard	Earthwork Defects	Further deterioration of existing defects. Potential risk of earthwork movement leading to injury of workforce.	5	5	25	Angela Hills	E - Not possible. R - Geotechnical Engineer to inspect critical earthworks and earthwork surveys, ascertain remediation measured required in design phase (if required). I - Not applicable. C - Not applicable.	Yes	Designer	1	5	5	Geotechnical Engineer to inspect and investigate critical earthworks and all defects during site surveys, with appropriate mitigation measures to be considered during the design phase. Earthwork defects are presented on Table 4 17 and Table 4 18 in PSSR Appendix A	Review at Stage 3	Live																															High	Medium	Medium	Medium	Section general	5	-307023.211	7298621.096
12580	A66.GEO.S2.003	Yes	ARCADIS	Stage 2	Geotechnical - General	September 24, 2019	Risks associated with the historical development.	Option A formerly Section 2c	M6 J40 to Kemplay Bank Roundabout									Construction	Hazard	Risks associated with the historical development.	Historical land-use leading to potential impact from contamination including potential historical structures e.g. foundations. Workforce contact with contaminated ground or exposed to gases leading to injury or death.	3	3	9	Angela Hills	E - Not possible. R - Reduce risk with ground investigation to assess current ground conditions; assess if environmental risk assessment and if remediation is required. I - Not applicable. C - Not applicable.	Yes	Designer	1	2	3	No historical structures on the line of section. Refer to Table 6 6 for contaminated land assessment and mitigation measures in PSSR Appendix A	Review at stage 3	Closed																															Medium	Low	Not Applicable	Not Applicable	Section general	2	-306690.925	7298601.437
12972	A66.GEN.036	Yes	ARCADIS	Stage 2	Geotechnical - General	September 24, 2019	Embankment Construction.	All Sections	All									Construction	Hazard	Embankment Construction	Shortfall in suitable site-won fill material required for construction. Requirement for additional plant on site, movement of materials, occupational Health Issues, noise, dust etc.	4	4	16	Angela Hills	E - Not possible. R - Reduce risk with ground investigation to advise on material suitability for re-use. I - Not applicable. C - Not applicable.	Yes	Designer	1	4	4	Appropriate geotechnical ground investigation in vicinity of cuttings sufficient to advise on material suitability for re-use as earthwork fill.	Review at Stage 3	Live																															High	Low	Not Applicable	Not Applicable	General	4	-245231.852	7279252.813
12973	A66.GEN.038	Yes	ARCADIS	Stage 2	Geotechnical - General	September 24, 2019	Embankment Construction.	All Sections	All									Construction	Hazard and Constraint	Embankment Construction.	Limited space and so over-steepened slope gradients required to accommodate earthwork within the available land take. Occupation heath issue, injury to work force on steep slopes.	4	3	12	Angela Hills	E - Not possible. R - Reduce risk with ground investigation to assess current ground conditions and incorporate findings into design. I - Not applicable. C - Not applicable.	Yes	Designer	1	3	3	Appropriate geotechnical ground investigation to inform design of embankment slope gradients and the design for retaining structures / strengthened earthworks.	Review at Stage 3	Live																															High	Low	Not Applicable	Not Applicable	General	3	-249493.216	7278717.754
12974	A66.GEN.040	Yes	ARCADIS	Stage 2	Geotechnical - General	September 24, 2019	Shallow or perched groundwater including seepage from granular deposits within the Glacial Till.	All Sections	All									Construction	Hazard	Shallow or perched groundwater including seepage from granular deposits within the Glacial Till.	Flooding over excavations, increase water pressures behind retaining structures, implication for foundation design. Collapse leading to serious injury or death.	4	5	20	Angela Hills	E - Not possible. R - Reduce risk with ground investigation to assess current ground conditions and incorporate findings into design. I - Not applicable. C - Not applicable.	Yes	Designer	4	1	4	Ground investigation required to establish groundwater levels and hydraulic conductivity. Pumps may be required in excavations. Incorporate groundwater into design.	Review at Stage 3	Live																															High	Low	Not Applicable	Not Applicable	General	4	-248308.442	7278717.754
12975	A66.GEO.S2.001	Yes	ARCADIS	Stage 2	Geotechnical	September 24, 2019	Thacka Beck culvert crossing the full width of the highway. This crosses route option 2c at approximate chainage Ch. 11 +250m.	Option A formerly Section 2c	M6 J40 to Kemplay Bank Roundabout	352489	529295							Construction	Hazard	Thacka Beck culvert crossing the full width of the highway. This crosses route option 2c at approximate chainage Ch. 11 +250m.	Collapsing ground, buried structure. Collapse leading to slip, trip, fall or serious injury to workforce.	5	5	25	Angela Hills	E - Not possible. R - Locate existing culverts and/or new culverts to be constructed and undertake appropriate design measures to reduce risk of damage. I - Not applicable. C - Not applicable.	Yes	Designer	2	5	10	The mitigation will be to assess the impact from the culverts and undertake appropriate design measures in the next stages.	Review at Stage 3	Live																															High	High	High	High	Section specific	10	-304783.461	7295483.36
12976	A66.GEO.S6.001	Yes	ARCADIS	Stage 2	Geotechnical	September 24, 2019	Culverted Waterbodies and new culverts crossing the full width of the highway alignment.	Option E and H formerly Section 6j1 and 6g2, respectively	Temple Sowerby to Appleby - Kirkby Thore	364872	524407							Construction	Hazard	Culverted Waterbodies and new culverts crossing the full width of the highway alignment.	Collapsing ground, buried structure. Collapse leading to slip, trip, fall or serious injury to workforce.	5	5	25	Angela Hills	E - Not possible. R - Locate existing culverts and/or new culverts to be constructed and undertake appropriate design measures to reduce risk of damage. I - Not applicable. C - Not applicable.	Yes	Designer	3	5	15	Area cannot be avoided as all shortlist routes past through the chainage where the culvert is located.	Review Stage 3	Live																															High	High	High	High	Section specific	15	-283352.755	7287226.849
12977	A66.GEO.S6.003	Yes	ARCADIS	Stage 2	Geotechnical - General	September 24, 2019	Risks associated with the historical development.	Option E and H formerly Section 6j1 and 6g2, respectively	Temple Sowerby to Appleby - Kirkby Thore									Construction	Hazard	Risks associated with the historical development.	Historical land-use leading to potential impact from contamination including potential historical structures e.g. foundations. Workforce contact with contaminated ground or exposed to gases leading to injury or death.	3	3	9	Angela Hills	E - Not possible. R - Reduce risk with ground investigation to assess current ground conditions; assess if environmental risk assessment and if remediation is required. I - Not applicable. C - Not applicable.	Yes	Designer	1	2	2	No historical structures on the line of section. Refer to Table 6 8 for contaminated land assessment and mitigation measures. PSSR Appendix C.	Review at Stage 3	Live																															Medium	Low	Not Applicable	Not Applicable	Section general	2	-281194.938	7290972.263
12978	A66.GEO.S6.004	Yes	ARCADIS	Stage 2	Geotechnical	September 24, 2019	Potential for historical mining – Gypsum.	Option E and H formerly Section 6j1 and 6g2, respectively	Temple Sowerby to Appleby - Kirkby Thore			364478	525850					Construction	Hazard	Potential for historical mining – Gypsum.	Collapsing ground. Collapse leading to slip, trip, fall or serious injury or death to workforce.	5	5	25	Angela Hills	E - Try to avoid mining area if possible. R - Carry out non-intrusive and intrusive ground investigations to determine the potential risk associated with historical mine workings. I - Not applicable. C - Not applicable.	Yes	Designer	3	5	15	Carry out non-intrusive and intrusive ground investigations to determine the potential risk associated with historical mine workings	Review at Stage 3	Live																															High	High	High	High	Section specific	15	-284112.348	7289720.607
12979	A66.GEO.S6.004	Yes	ARCADIS	Stage 2	Geotechnical	September 24, 2019	Potential for historical mining – Gypsum.	Option E and H formerly Section 6j1 and 6g2, respectively	Temple Sowerby to Appleby - Kirkby Thore	364590	525478							Construction	Hazard	Potential for historical mining – Gypsum.	Collapsing ground. Collapse leading to slip, trip, fall or serious injury or death to workforce.	5	5	25	Angela Hills	E - Try to avoid mining area if possible. R - Carry out non-intrusive and intrusive ground investigations to determine the potential risk associated with historical mine workings. I - Not applicable. C - Not applicable.	Yes	Designer	3	5	15	Carry out non-intrusive and intrusive ground investigations to determine the potential risk associated with historical mine workings.	Review at Stage 3	Live																															High	High	High	High	Section specific	15	-283902.146	7289118.665
12980	A66.GEO.S6.005	Yes	ARCADIS	Stage 2	Geotechnical	September 24, 2019	Mass movement - Landslide, as indicted by the BGS.	Option E and H formerly Section 6j1 and 6g2, respectively	Temple Sowerby to Appleby - Kirkby Thore	366646	521685	367259	521665					Construction	Hazard	Mass movement - Landslide, as indicted by the BGS.	Collapsing ground. Collapse leading to slip, trip, fall or serious injury or death to workforce.	5	5	25	Angela Hills	E - Not possible. R - Reduce risk of landslide reactivation - geotechnical ground investigation, instrumentation and monitoring to inform on the earthwork design. I - Not applicable. C - Not applicable.	Yes	Designer	2	5	10	Appropriate geotechnical ground investigation, instrumentation and monitoring to inform on the earthwork design.	Review at Stage 3.	Live																															High	High	High	High	Section specific	10	-280290.497	7282592.854
12981	A66.GEO.S6.005	Yes	ARCADIS	Stage 2	Geotechnical	September 24, 2019	Mass movement - Landslide, as indicted by the BGS.	Option E and H formerly Section 6j1 and 6g2, respectively	Temple Sowerby to Appleby - Kirkby Thore	366646	521685	367259	521665					Construction	Hazard	Mass movement - Landslide, as indicted by the BGS.	Collapsing ground. Collapse leading to slip, trip, fall or serious injury to workforce.	5	5	25	Angela Hills	E - Not possible. R - Reduce risk of landslide reactivation - geotechnical ground investigation, instrumentation and monitoring to inform on the earthwork design. I - Not applicable. C - Not applicable.	Yes	Designer	2	5	10	Appropriate geotechnical ground investigation, instrumentation and monitoring to inform on the earthwork design.	Review as part of PSSR.	Live																															High	High	High	High	Section specific	10	-279229.933	7282497.307
12983	A66.GEO.S8.001	Yes	ARCADIS	Stage 2	Geotechnical	September 24, 2019	"Damage to existing Drystone Retaining Walls including: Warcop Retaining Wall.	Option I formerly Section 8c1 and 8a2	Appleby to Brough	374201	516621	374426	516608					Construction	Hazard	Damage to existing Drystone Retaining Walls including, Warcop Retaining Wall.	Damage of retaining structure. Collapse leading to serious injury or death.	5	3	15	Angela Hills	E - Not possible. R - Mitigation in design to reduce risk of dry-stone wall damage. I - Not applicable. C - Not applicable.	Yes	Designer	5	3	15	The location of the dry-stone walls will be determined and the appropriate mitigating design undertaken.	Review at Stage 3	Live																															High	High	High	High	Section specific	15	-266924.24	7273875.115
12984	A66.GEO.S8.003	Yes	ARCADIS	Stage 2	Geotechnical	September 24, 2019	Culverted watercourses crossing the full width of the highway alignment: Drainage ditch	Option I formerly Section 8c1 and 8a2	Appleby to Brough	373563	516999							Construction	Hazard	Culverted watercourses crossing the full width of the highway alignment.	Collapsing ground, buried structure. Collapse leading to slip, trip, fall or serious injury to workforce.	5	5	25	Angela Hills	E - Not possible. R - Locate existing culverts and/or new culverts to be constructed and undertake appropriate design measures to reduce risk of damage. I - Not applicable. C - Not applicable.	Yes	Designer	2	5	10	Area cannot be avoided as all shortlist routes intersect the culverts. The mitigation will be to assess the impact from the culverts and undertake appropriate design measures in the next stages.	Review at Stage 3	Live																															High	High	High	High	Section specific	10	-268297.718	7274541.551
12985	A66.GEO.S8.005	Yes	ARCADIS	Stage 2	Geotechnical - General	September 24, 2019	Earthwork Defects, recorded on Hagdms.	Option I formerly Section 8c1 and 8a2	Appleby to Brough									Construction	Hazard	Earthwork Defects.	Further deterioration of existing defects. Potential risk of earthwork movement leading to injury of workforce.	5	5	25	Angela Hills	E - Not possible. R - Geotechnical Engineer to inspect critical earthworks and earthwork surveys, ascertain remediation measured required in design phase (if required). I - Not applicable. C - Not applicable.	Yes	Designer	1	5	5	Geotechnical Engineer to inspect and investigate critical earthworks and all defects during site surveys, with appropriate mitigation measures to be considered during the design phase. Earthwork defects are presented on Table 4 14 and Table 4 15. PSSR Appendix D.	Review at Stage 3	Live																															High	Medium	Medium	Medium	Section general	5	-265294.048	7277005.425
12986	A66.GEO.S8.007	Yes	ARCADIS	Stage 2	Geotechnical	September 24, 2019	Risks associated with the neighbouring MOD maintenance depot.	Option I formerly Section 8c1 and 8a2	Appleby to Brough	375285	515987	375474	515861					Construction	Hazard	Risks associated with the neighbouring MoD maintenance depot.	Historical land-use leading to potential impact form contamination. Workforce contact with contaminated ground or expoosed to gases leading to injury or death.	4	3	12	Angela Hills	E - Not possible. R - Reduce risk with ground investigation to assess current ground conditions; assess if environmental risk assessment and if remediation is required. I - Not applicable. C - Not applicable.	Yes	Designer	2	2	4	Refer to Table 6 5 for contaminated land assessment and mitigation measures. PSSR Appendix D.	Review at Stage 3	Live																															High	Low	Low	Low	Section specific	4	-265182.647	7272728.349
12987	A66.GEO.S10.004	Yes	ARCADIS	Stage 2	Geotechnical - General	September 24, 2019	Historical land-use leading to potential impact from contamination including potential historical structures e.g. foundations. Workforce contact with contaminated ground or exposed to gases leading to injury or death.	Option J formerly Section 10a	Bowes Bypass									Construction	Hazard	Risks associated with the historical building including disused railway line and associated station building.	Historical land-use leading to potential impact form contamination including potential historical structures e.g. foundations. Workforce contact with contaminated ground or expoosed to gases leading to injury or death.	3	3	9	Angela Hills	E - Not possible. R - Reduce risk with ground investigation to assess current ground conditions; assess if environmental risk assessment and if remediation is required. I - Not applicable. C - Not applicable.	Yes	Designer	1	2	2	Refer to Table 6 6 for contaminated land assessment and mitigation measures. PSSR Appendix E.	Review at Stage 3	Live																															Medium	Low	Not Applicable	Not Applicable	Section general	2	-224038.707	7272664.561
12988	A66.GEO.S10.005	Yes	ARCADIS	Stage 2	Geotechnical	September 24, 2019	Formation of soil cuttings.	Option J formerly Section 10a	Bowes Bypass	399130	513657	399238	513703					Construction	Hazard	Formation of soil cuttings.	Excavations between chainage Ch. 50 +500m and Ch. 50 +610m may encounter the Stainmore Formation at shallow depth and between Ch. 51 +200m and Ch. 51 +600m the Great Limestone Member may be encountered. Injury to workforce due to moving plant.	4	3	12	Angela Hills	E - Not possible. R - Reduce risk with ground investigation to assess extent of shallow bedrock and incorporate findings into design. I - Not applicable. C - Not applicable.	Yes	Designer	1	3	3	Appropriate geotechnical ground investigation to identify shallow bedrock and inform design of cutting.	Review at Stage 3	Live																															High	Low	Low	Low	Section specific	3	-224207.562	7268969.523
13372	A66.GEO.S2.004	Yes	ARCADIS	Stage 2	Geotechnical	September 24, 2019	'Blowing' conditions within gravel and sand within exploratory hole 763102, See PSSR.	Option A formerly Section 2c	M6 J40 to Kemplay Bank Roundabout	353586	529331							Construction	Hazard	'Blowing' conditions within gravel and sand within exploratory hole 763102.	Potential confined aquifer which can cause base heave in excavations. Issues may arise for bored cast in-situ pile operations were artesian waters will washout the concrete in the piles before they have time to cure.	3	4	12	Angela Hills	E - Not possible. R - Ground investigation to locate artesian waters (if present) and incorporate into design. I Not applicable. C - Not applicable.	Yes	Designer	1	3	3	Appropriate ground investigation to confirm the likely presence of artesian waters.	Review at Stage 3	Live																															High	Low	Low	Low	Section specific	3	-302895.14	7295557.93
13373	A66.GEO.S4.001	Yes	ARCADIS	Stage 2	Geotechnical	September 24, 2019	Culverted Waterbody crossing the full width of the highway alignment.	Option C formerly Section 4a	Penrith to Temple Sowerby	354915	528968							Construction	Hazard	Culverted Waterbody crossing the full width of the highway alignment.	Collapsing ground, buried structure. Collapse leading to slip, trip, fall or serious injury to workforce.	5	5	25	Angela Hills	E - Not possible. R - Locate existing culverts and/or new culverts to be constructed and undertake appropriate design measures to reduce risk of damage. I - Not applicable. C - Not applicable.	Yes	Designer	2	5	10	Area cannot be avoided as all shortlist routes intersect the watercourses or existing culverts. The mitigation will be to assess the impact from the culverts and undertake appropriate design measures in the next stages.	Review at Stage 3	Live																															High	High	High	High	Section specific	10	-300599.641	7294958.377
13374	A66.GEO.S4.001	Yes	ARCADIS	Stage 2	Geotechnical	September 24, 2019	Culverted Waterbody crossing the full width of the highway alignment.	Option C formerly Section 4a	Penrith to Temple Sowerby	358252	528743							Construction	Hazard	Culverted Waterbody crossing the full width of the highway alignment.	Further deterioration of existing defects. Potential risk of earthwork movement leading to injury of workforce.	5	5	25	Angela Hills	E - Not possible. R - Locate existing culverts and/or new culverts to be constructed and undertake appropriate design measures to reduce risk of damage. I - Not applicable. C - Not applicable.	Yes	Designer	2	5	10	Area cannot be avoided as all shortlist routes intersect the watercourses or existing culverts. The mitigation will be to assess the impact from the culverts and undertake appropriate design measures in the next stages.	Review at Stage 3	Live																															High	High	High	High	Section specific	10	-294825.621	7294631.394
13375	A66.GEO.S4.002	Yes	ARCADIS	Stage 2	Geotechnical - General	September 24, 2019	Earthwork Defects	Option C formerly Section 4a	Penrith to Temple Sowerby									Construction	Hazard	Earthwork Defects.	Further deterioration of existing defects. Potential risk of earthwork movement leading to injury of workforce.	5	5	25	Angela Hills	E - Not possible. R - Geotechnical Engineer to inspect critical earthworks and earthwork surveys, ascertain remediation measured required in design phase (if required). I - Not applicable. C - Not applicable.	Yes	Designer	1	5	5	Geotechnical Engineer to inspect and investigate critical earthworks and all defects during site surveys, with appropriate mitigation measures to be considered during the design phase. Earthwork defects are presented on Table 4 14 and Table 4 15 in PSSR Appendix B	Review at Stage 3	Live																															High	Medium	Medium	Medium	Section general	5	-299082.734	7298774.377
13376	A66.GEO.S4.003	Yes	ARCADIS	Stage 2	Geotechnical - General	September 24, 2019	Risks associated with the historical development.	Option C formerly Section 4a	Penrith to Temple Sowerby									Construction	Hazard	Risks associated with the historical development.	Historical land-use leading to potential impact from contamination including potential historical structures e.g. foundations. Workforce contact with contaminated ground or exposed to gases leading to injury or death.	3	3	9	Angela Hills	E - Not possible. R - Reduce risk with ground investigation to assess current ground conditions; assess if environmental risk assessment and if remediation is required. I - Not applicable. C - Not applicable.	Yes	Designer	1	2	2	No historical structures on the line of section. Refer to Table 6 7 for contaminated land assessment and mitigation measures in the PSSR Appendix B.	Review at Satge 3	Live																															Medium	Low	Not Applicable	Not Applicable	Section general	2	-298798.245	7298786.081
13377	A66.GEO.S4.004	Yes	ARCADIS	Stage 2	Geotechnical	September 24, 2019	Badger crossing/tunnel.	Option C formerly Section 4a	Penrith to Temple Sowerby	359242	528598							Construction	Hazard	Badger crossing/tunnel.	Destroy badger access or causing injury to badgers. Extending tunnel may lead to injury to workforce from moving plant.	3	3	9	Angela Hills	E - Not possible. R - Located existing badger tunnel and extend with the road widening and incorporating into design. I - Not applicable. C - Not applicable.	Yes	Designer	1	3	3	Identified around chainage Section 4a Ch. 25 +192m to Ch. 25 +250m and Section 4b Ch. 25 +158m to 25 +240m. Check in this area and contact HE to help ascertain location of badger tunnel.	Review at Stage 3	Live																															Medium	Low	Low	Low	Section specific	3	-293163.116	7294387.751
13378	A66.GEO.S6.002	Yes	ARCADIS	Stage 2	Geotechnical - General	September 24, 2019	Earthwork Defects, recorded on Hagdms.	Option E and H formerly Section 6j1 and 6g2, respectively	Temple Sowerby to Appleby - Kirkby Thore									Construction	Hazard	Earthwork Defects.	Further deterioration of existing defects. Potential risk of earthwork movement leading to injury of workforce.	5	5	25	Angela Hills	E - Not possible. R - Geotechnical Engineer to inspect critical earthworks and earthwork surveys, ascertain remediation measured required in design phase (if required). I - Not applicable. C - Not applicable.	Yes	Designer	1	5	5	Geotechnical Engineer to inspect and investigate critical earthworks and all defects during site surveys, with appropriate mitigation measures to be considered during the design phase. Earthwork defects are presented on Table 4 20 and Table 4 21 PSSR Appendix C.	Review at Stage 3.	Live																															High	Medium	Medium	Medium	Section general	5	-281544.255	7290985.066
13379	A66.GEO.S6.004	Yes	ARCADIS	Stage 2	Geotechnical	September 24, 2019	Potential for historical mining – Gypsum.	Option E and H formerly Section 6j1 and 6g2, respectively	Temple Sowerby to Appleby - Kirkby Thore	364711	525247							Construction	Hazard	Potential for historical mining – Gypsum.	Collapsing ground. Collapse leading to slip, trip, fall or serious injury or death to workforce.	5	5	25	Angela Hills	E - Try to avoid mining area if possible. R - Carry out non-intrusive and intrusive ground investigations to determine the potential risk associated with historical mine workings. I - Not applicable. C - Not applicable.	Yes	Designer	2	5	10	Carry out non-intrusive and intrusive ground investigations to determine the potential risk associated with historical mine workings	Review at Stage 3	Live																															High	High	High	High	Section specific	10	-283663.281	7288640.934
13380	A66.GEO.S6.006	Yes	ARCADIS	Stage 2	Geotechnical	September 24, 2019	Potential for dissolution features and natural cavities, based on geological description.	Option E and H formerly Section 6j1 and 6g2, respectively	Temple Sowerby to Appleby - Kirkby Thore	364478	525850							Construction	Hazard	Potential for dissolution features and natural cavities, based on geological description.	Collapsing ground. Collapse leading to slip, trip, fall or serious injury or death to workforce.	5	5	25	Angela Hills	E - Try to avoid mining area if possible. R - Carry out non-intrusive and intrusive ground investigations to determine the potential risk associated with dissolution features and natural cavities. I - Not applicable. C - Not applicable.	Yes	Designer	2	5	10	Carry out non-intrusive and intrusive ground investigations to determine the potential risk associated with dissolution features	Review at stage 3	Live																															High	High	High	High	Section specific	10	-284107.571	7289691.943

OBJECT ID	Hazard Triangle Reference	Display In Models	Identified By	Stage Identified	Discipline	Date Added	Design Activity or Element	Location Name	Section Name	Eastings Start	Northings Start	Eastings End	Northings End	Chainage Start Easting	Chainage Start Northing	Chainage End Easting	Chainage End Northing	Phase Affected	Hazard Or Constraint	Hazard or Constraint Description	Consequence of Design Activity	Design Initial Risk Likelihood	Design Initial Risk Severity	Design Initial Risk Rating	Risk Owner Designer Name	Actions To Eliminate Risk	Risk Still Live	Action By	Design Residual Risk Likelihood	Design Residual Risk Severity	Design Residual Risk Rating	Residual Hazards Information	Designer Comments	Status At Transferred	Designer Contractor Discussion Comments	Designer Contractor Discussion Date	Principal Contractor Manager Responsible	Control Measures Required During Construction Phase	Control Measures Implemented	Construction Current Risk Likelihood	Construction Current Risk Severity	Status At Handover	Status At Handover Date	Contractor Client Discussion Comments	Contractor Client Discussion Date	Principal Designer Close Out Comments	Principal Designer Close Out Comments Date	Client Rep Responsible	Residual Risk Details	Control Measures Required	Add to Health and Safety File	Operation Maintenance Manual	Included Within MRSS	Project Action Owner	Client Residual Risk Likelihood	Client Residual Risk Severity	Client Residual Risk Rating	SHE Box Required	Drawings Required	SHE BOX TEXT	Handover Owner	As Built Completed	Status End Of Project	Date End Of Project	Design Initial Risk Rating Category	Design Residual Risk Rating Category	Client Residual Risk Rating Category	Construction Current Risk Rating Category	Type	Construction Current Risk Rating	x	y
13381	A66.GEO.S6.006	Yes	ARCADIS	Stage 2	Geotechnical	September 24, 2019	Potential for dissolution features and natural cavities, based on geological description.	Option E and H formerly Section 6j1 and 6g2, respectively	Temple Sowerby to Appleby - Kirkby Thore	364590	525478							Construction	Hazard	Potential for dissolution features and natural cavities, based on geological description.	Collapsing ground. Collapse leading to slip, trip, fall or serious injury or death to workforce.	5	5	25	Angela Hills	E - Try to avoid mining area if possible. R - Carry out non-intrusive and intrusive ground investigations to determine the potential risk associated with dissolution features and natural cavities. I - Not applicable. C - Not applicable.	Yes	Designer	2	5	10	Carry out non-intrusive and intrusive ground investigations to determine the potential risk associated with dissolution features	Review at Stage 3	Live																															High	High	High	High	Section specific	10	-283873.483	7289109.11
13382	A66.GEO.S6.006	Yes	ARCADIS	Stage 2	Geotechnical	September 24, 2019	Potential for dissolution features and natural cavities, based on geological description.	Option E and H formerly Section 6j1 and 6g2, respectively	Temple Sowerby to Appleby - Kirkby Thore	364711	525247							Construction	Hazard	Potential for dissolution features and natural cavities, based on geological description.	Collapsing ground. Collapse leading to slip, trip, fall or serious injury or death to workforce.	5	5	25	Angela Hills	E - Try to avoid mining area if possible. R - Carry out non-intrusive and intrusive ground investigations to determine the potential risk associated with dissolution features and natural cavities. I - Not applicable. C - Not applicable.	Yes	Designer	2	5	10	Carry out non-intrusive and intrusive ground investigations to determine the potential risk associated with dissolution features	Review at Stage 3	Live																															High	High	High	High	Section specific	10	-283648.949	7288631.379
13383	A66.GEO.S6.007	Yes	ARCADIS	Stage 2	Geotechnical	September 24, 2019	Previous stabilising work and realignment of the road at Crackenthorpe; did not stabilise the deeper slips. Potential to destabilise the area if work undertaken on the slopes to the north of the current alignment	Option E and H formerly Section 6j1 and 6g2, respectively	Temple Sowerby to Appleby - Kirkby Thore	366872	521788	367111	521734					Construction	Hazard	Previous stabilising work and realignment of the road at Crackenthorpe; did not stabilise the deeper slips. Potential to destabilise the area if work undertaken on the slopes to the north of the current alignment.	Collapsing ground. Collapse leading to slip, trip, fall or serious injury to workforce. Failure of soil nails and movement of the bored piles to the south of the road.	5	5	25	Angela Hills	E - Not possible. R - Reduce risk of landslide reactivation - geotechnical ground investigation, instrumentation and monitoring to inform on the earthwork design. I - Not applicable. C - Not applicable.	Yes	Designer	2	5	10	Appropriate geotechnical ground investigation, instrumentation and monitoring to inform on the earthwork design modifications in order not to trigger deep-seated slip circles.	Review at Stage 3.	Live																															High	High	High	High	Section specific	10	-279893.98	7282745.728
13384	A66.GEO.S8.001	Yes	ARCADIS	Stage 2	Geotechnical	September 24, 2019	"Damage to existing Drystone Retaining Walls including: Wheat Sheaf Retaining Wall	Option I formerly Section 8c1 and 8a2	Appleby to Brough	374613	516585	374837	516452					Construction	Hazard	Damage to existing Drystone Retaining Walls including, Wheat Sheaf Retaining Wall	Damage of retaining structure. Collapse leading to serious injury or death.	5	3	15	Angela Hills	E - Not possible. R - Mitigation in design to reduce risk of dry-stone wall damage. I - Not applicable. C - Not applicable.	Yes	Designer	5	3	15	The location of the dry-stone walls will be determined and the appropriate mitigating design undertaken	Review at Stage 3	Live																															High	High	High	High	Section specific	15	-266288.189	7273740.49
13385	A66.GEO.S8.002	Yes	ARCADIS	Stage 2	Geotechnical	September 24, 2019	Damage to existing Sandford Gabion Wall.	Option I formerly Section 8c1 and 8a2	Appleby to Brough	373940	516774	374171	516632					Construction	Hazard	Damage to existing Sandford Gabion Wall.	Damage of retaining structure.	5	3	15	Angela Hills	E - Not possible. R - Mitigation in design to reduce risk of existing retaining wall damage. I - Not applicable. C - Not applicable.	Yes	Designer	2	3	6	Early stage impact will be assessed, and the appropriate mitigating design undertaken.	Review Stage 3	Live																															High	Medium	Medium	Medium	Section specific	6	-267390.028	7274011.269
13386	A66.GEO.S8.003	Yes	ARCADIS	Stage 2	Geotechnical	September 24, 2019	Culverted watercourses crossing the full width of the highway alignment:Cringle Beck/Mire Sike	Option I formerly Section 8c1 and 8a2	Appleby to Brough	374475	516505							Construction	Hazard	Culverted watercourses crossing the full width of the highway alignment.	Collapsing ground, buried structure. Collapse leading to slip, trip, fall or serious injury to workforce.	5	5	25	Angela Hills	E - Not possible. R - Locate existing culverts and/or new culverts to be constructed and undertake appropriate design measures to reduce risk of damage. I - Not applicable. C - Not applicable.	Yes	Designer	2	5	10	Area cannot be avoided as all shortlist routes intersect the culverts. The mitigation will be to assess the impact from the culverts and undertake appropriate design measures in the next stages.	Review at Stage 3	Live																															High	High	High	High	Section specific	10	-266748.483	7273689.672
13387	A66.GEO.S8.003	Yes	ARCADIS	Stage 2	Geotechnical	September 24, 2019	Culverted watercourses crossing the full width of the highway alignment: Hayber Beck	Option I formerly Section 8c1 and 8a2	Appleby to Brough	374950	516193							Construction	Hazard	Culverted watercourses crossing the full width of the highway alignment.	Collapsing ground, buried structure. Collapse leading to slip, trip, fall or serious injury to workforce.	5	5	25	Angela Hills	E - Not possible. R - Locate existing culverts and/or new culverts to be constructed and undertake appropriate design measures to reduce risk of damage. I - Not applicable. C - Not applicable.	Yes	Designer	2	5	10	Area cannot be avoided as all shortlist routes intersect the culverts. The mitigation will be to assess the impact from the culverts and undertake appropriate design measures in the next stages.	Review at Stage 3	Live																															High	High	High	High	Section specific	10	-265904.033	7273168.515
13388	A66.GEO.S8.003	Yes	ARCADIS	Stage 2	Geotechnical	September 24, 2019	Culverted watercourses crossing the full width of the highway alignment: Moor Beck	Option I formerly Section 8c1 and 8a2	Appleby to Brough	375049	516092							Construction	Hazard	Culverted watercourses crossing the full width of the highway alignment.	Collapsing ground, buried structure. Collapse leading to slip, trip, fall or serious injury to workforce.	5	5	25	Angela Hills	E - Not possible. R - Locate existing culverts and/or new culverts to be constructed and undertake appropriate design measures to reduce risk of damage. I - Not applicable. C - Not applicable.	Yes	Designer	2	5	10	Area cannot be avoided as all shortlist routes intersect the culverts. The mitigation will be to assess the impact from the culverts and undertake appropriate design measures in the next stages.	Review at Stage 3	Live																															High	High	High	High	Section specific	10	-265750.908	7273011.676
13389	A66.GEO.S8.003	Yes	ARCADIS	Stage 2	Geotechnical	September 24, 2019	Culverted watercourses crossing the full width of the highway alignment: Eastfield Sike	Option I formerly Section 8c1 and 8a2	Appleby to Brough	375466	515789							Construction	Hazard	Culverted watercourses crossing the full width of the highway alignment.	Collapsing ground, buried structure. Collapse leading to slip, trip, fall or serious injury to workforce.	5	5	25	Angela Hills	E - Not possible. R - Locate existing culverts and/or new culverts to be constructed and undertake appropriate design measures to reduce risk of damage. I - Not applicable. C - Not applicable.	Yes	Designer	2	5	10	Area cannot be avoided as all shortlist routes intersect the culverts. The mitigation will be to assess the impact from the culverts and undertake appropriate design measures in the next stages.	Review at Stage 3	Live																															High	High	High	High	Section specific	10	-265014.198	7272475.601
13390	A66.GEO.S8.003	Yes	ARCADIS	Stage 2	Geotechnical	September 24, 2019	Culverted watercourses crossing the full width of the highway alignment: Drainage ditch.	Option I formerly Section 8c1 and 8a2	Appleby to Brough	377327	515234							Construction	Hazard	Culverted watercourses crossing the full width of the highway alignment.	Collapsing ground, buried structure. Collapse leading to slip, trip, fall or serious injury to workforce.	5	5	25	Angela Hills	E - Not possible. R - Locate existing culverts and/or new culverts to be constructed and undertake appropriate design measures to reduce risk of damage. I - Not applicable. C - Not applicable.	Yes	Designer	2	5	10	Area cannot be avoided as all shortlist routes intersect the culverts. The mitigation will be to assess the impact from the culverts and undertake appropriate design measures in the next stages.	Review at Stage 3	Live																															High	High	High	High	Section specific	10	-261812.394	7271543.213
13391	A66.GEO.S8.003	Yes	ARCADIS	Stage 2	Geotechnical	September 24, 2019	Culverted watercourses crossing the full width of the highway alignment: Drainage ditch (linked to Lowgill Beck).	Option I formerly Section 8c1 and 8a2	Appleby to Brough	378337	515142							Construction	Hazard	Culverted watercourses crossing the full width of the highway alignment.	Collapsing ground, buried structure. Collapse leading to slip, trip, fall or serious injury to workforce.	5	5	25	Angela Hills	E - Not possible. R - Locate existing culverts and/or new culverts to be constructed and undertake appropriate design measures to reduce risk of damage. I - Not applicable. C - Not applicable.	Yes	Designer	2	5	10	Area cannot be avoided as all shortlist routes intersect the culverts. The mitigation will be to assess the impact from the culverts and undertake appropriate design measures in the next stages.	Review at Stage	Live																															High	High	High	High	Section specific	10	-260067.916	7271383.928
13392	A66.GEO.S8.004	Yes	ARCADIS	Stage 2	Geotechnical	September 24, 2019	Proposed water tunnel minimum 1.5m internal diameter with invert level 6.5m below road level. Unclear if this was constructed.	Option I formerly Section 8c1 and 8a2	Appleby to Brough	374200	516600							Construction	Hazard	Proposed water tunnel minimum 1.5m internal diameter with invert level 6.5m below road level. Unclear if this was constructed.	If tunnel is present, there is a potential it may be damaged, it is likely water will be at high pressure and could cause injury to construction workers.	5	2	10	Angela Hills	E - Not possible. R - Locate existing water tunnel (if present) undertake appropriate design measures to reduce risk of damage. I - Not applicable. C - Not applicable.	Yes	Designer	5	2	10	Early discussions with Stats owner and Highways England to ascertain if the tunnel was constructed. If present it will be necessary to determine protection measures and if necessary, utility diversions undertaken.	Review at Stage 3	Live																															High	High	High	High	Section specific	10	-267203.14	7273863.045
13393	A66.GEO.S8.006	Yes	ARCADIS	Stage 2	Geotechnical - General	September 24, 2019	Risks associated with the historical development.	Option I formerly Section 8c1 and 8a2	Appleby to Brough									Construction	Hazard	Risks associated with the historical development.	Historical land-use leading to potential impact from contamination including potential historical structures e.g. foundations. Workforce contact with contaminated ground or exposed to gases leading to injury or death.	3	3	9	Angela Hills	E - Not possible. R - Reduce risk with ground investigation to assess current ground conditions; assess if environmental risk assessment and if remediation is required. I - Not applicable. C - Not applicable.	Yes	Designer	1	2	2	No historical structures on the line of section. Refer to Table 6 5 for contaminated land assessment and mitigation measures. PSSR Appendix D	Review at Stage 3	Live																															Medium	Low	Not Applicable	Not Applicable	Section general	2	-264922.564	7277016.031
13394	A66.GEO.S10.001	Yes	ARCADIS	Stage 2	Geotechnical	September 24, 2019	Landfill located to the north of the site.	Option J formerly Section 10a	Bowes Bypass	401487	513734							Construction	Hazard	Landfill located to the north of the site.	Potential for ground gas migration through the soil matrix to beneath the site into buildings affecting building occupants and/or migrations of ground gas into excavations affecting construction workers.	2	4	8	Angela Hills	E - Not possible. R - Reduce risk with ground investigation to assess current ground conditions; ground gas risk assessment and if remediation is required. I - Not applicable. C - Not applicable.	Yes	Designer	2	1	2	Appropriate ground investigation and monitoring to be carried out investigate the ground gas regime beneath the site and to assess the risk to Human Health receptors. If buildings are to be constructed at the site, depending on the outcome of the gas regime assessment there may be a requirement for gas protection measures such as a gas protection membrane to be installed at the base of the buildi	Review at Stage 3	Live																															Medium	Low	Low	Low	Section specific	2	-219656.573	7269480.648
13395	A66.GEO.S10.002	Yes	ARCADIS	Stage 2	Geotechnical - General	September 24, 2019	Potential for dissolution features and natural cavities based on limestone in the area.	Option J formerly Section 10a	Bowes Bypass									Construction	Hazard	Potential for dissolution features and natural cavities based on limestone in the area.	Collapsing ground. Collapse leading to slip, trip, fall or serious injury to workforce.	5	5	25	Angela Hills	E - Try to avoid mining area if possible. R - Carry out non-intrusive and intrusive ground investigations to determine the potential risk associated with dissolution features and natural cavities. I - Not applicable. C - Not applicable.	Yes	Designer	1	5	5	Carry out non-intrusive and intrusive ground investigations to determine the potential risk associated with dissolution features	Review at Stage 3	Live																															High	Medium	Medium	Medium	Section general	5	-224548.304	7272696.378
13396	A66.GEO.S10.003	Yes	ARCADIS	Stage 2	Geotechnical - General	September 24, 2019	Earthwork Defects, recorded on Hagdms.	Option J formerly Section 10a	Bowes Bypass									Construction	Hazard	Earthwork Defects.	Further deterioration of existing defects. Potential risk of earthwork movement leading to injury of workforce.	5	5	25	Angela Hills	E - Not possible. R - Geotechnical Engineer to inspect critical earthworks and earthwork surveys, ascertain remediation measured required in design phase (if required). I - Not applicable. C - Not applicable.	Yes	Designer	1	5	5	Geotechnical Engineer to inspect and investigate critical earthworks and all defects during site surveys, with appropriate mitigation measures to be considered during the design phase. Earthwork defects are presented on Table 4 15 and Table 4 16. PSSR Appendix E	Review at Stage 3	Live																															High	Medium	Medium	Medium	Section general	5	-224267.015	7272669.864
13397	A66.GEO.S10.005	Yes	ARCADIS	Stage 2	Geotechnical	September 24, 2019	Formation of soil cuttings.	Option J formerly Section 10a	Bowes Bypass	399817	513777	400213	513699					Construction	Hazard	Formation of soil cuttings.	Excavations between chainage Ch. 50 +500m and Ch. 50 +610m may encounter the Stainmore Formation at shallow depth and between Ch. 51 +200m and Ch. 51 +600m the Great Limestone Member may be encountered. Injury to workforce due to moving plant.	4	3	12	Angela Hills	E - Not possible. R - Reduce risk with ground investigation to assess extent of shallow bedrock and incorporate findings into design. I - Not applicable. C - Not applicable.	Yes	Designer	1	3	3	Appropriate geotechnical ground investigation to identify shallow bedrock and inform design of cutting.	Review at Stage 3	Live																															High	Low	Low	Low	Section specific	3	-222944.774	7269113.631
13398	A66.GEO.S10.006	Yes	ARCADIS	Stage 2	Geotechnical	September 24, 2019	Peat was encountered at approximate chainage Ch. 51 +975m between 0.17m and 0.54m bgl.	Option J formerly Section 10a	Bowes Bypass	400569	513600							Construction	Hazard	Peat was encountered at approximate chainage Ch. 51 +975m between 0.17m and 0.54m bgl.	High post construction settlement. Soft ground at formation level. Occupational Health Issues Injury to the workforce on unstable ground.	3	3	9	Angela Hills	E - If possible eliminate risk by over-excavating the Peat. R - Reduce risk with ground investigation to assess extent of peat and incorporate findings into design. I - Not applicable. C - Not applicable.	Yes	Designer	1	3	3	The Peat appears to be very localised, further ground investigation may be required to confirm this. Over excavation may be required to remove the Peat.	Review at Stage 3	Live																															Medium	Low	Low	Low	Section specific	3	-221834.287	7268827.517
13772	A66.GEO.S10.007	Yes	ARCADIS	Stage 2	Geotechnical	September 25, 2019	Existing structures include: An underbridge at approximate chainage Ch. 50 +892m.	Option J formerly Section 10a	Bowes Bypass	399525	513768							Construction	Hazard	Existing structures include: An underbridge at approximate chainage Ch. 50 +892m.	Additional load from online dualling affecting the structure and foundations of the underbridges and underpasses. The overbridge is currently too narrow to accommodate a dual carriageway. Collapse of structure and/or injury from moving plant.	5	4	20	Angela Hills	E - Not possible. R - Reduce risk by redesign of structures and retaining walls to accommodate road widening and changes in load. I - Not applicable. C - Not applicable.	Yes	Designer	1	4	4	To be taken into account during the design phase. Redesign of structures and retaining walls will be required to accommodate road widening and changes in load.	Review at Stage 3	Live																															High	Low	Low	Low	Section specific	4	-223629.649	7269108.186
13773	A66.GEO.S10.007	Yes	ARCADIS	Stage 2	Geotechnical	September 25, 2019	Existing structures include: An overbridge at approximate chainage Ch. 50 +255m.	Option J formerly Section 10a	Bowes Bypass	398900	513594							Construction	Hazard	Existing structures include: An overbridge at approximate chainage Ch. 50 +255m.	Additional load from online dualling affecting the structure and foundations of the underbridges and underpasses. The overbridge is currently too narrow to accommodate a dual carriageway. Collapse of structure and/or injury from moving plant.	5	4	20	Angela Hills	E - Not possible. R - Reduce risk by redesign of structures and retaining walls to accommodate road widening and changes in load. I - Not applicable. C - Not applicable.	Yes	Designer	1	4	4	To be taken into account during the design phase. Redesign of structures and retaining walls will be required to accommodate road widening and changes in load.	Review at Stage 3	Live																															High	Low	Low	Low	Section specific	4	-224693.002	7268813.725
13774	A66.GEO.S10.007	Yes	ARCADIS	Stage 2	Geotechnical	September 25, 2019	Existing structures include: Underpass located at approximate chainages Ch. 50 +665m; and associated retaining walls.	Option J formerly Section 10a	Bowes Bypass	399286	513716							Construction	Hazard	Existing structures include: Underpass located at approximate chainage Ch. 50 +665m; and associated retaining walls.	Additional load from online dualling affecting the structure and foundations of the underbridges and underpasses. The overbridge is currently too narrow to accommodate a dual carriageway. Collapse of structure and/or injury from moving plant.	5	4	20	Angela Hills	E - Not possible. R - Reduce risk by redesign of structures and retaining walls to accommodate road widening and changes in load. I - Not applicable. C - Not applicable.	Yes	Designer	1	4	4	To be taken into account during the design phase. Redesign of structures and retaining walls will be required to accommodate road widening and changes in load.	Review at Stage 3	Live																															High	Low	Low	Low	Section specific	4	-224006.006	7269029.629
13775	A66.GEO.S12.001	Yes	ARCADIS	Stage 2	Geotechnical	September 25, 2019	New culvert proposed for route option 12a and 12b for slip-road to south. Proposed culvert at chainages Ch. 60 +150m.	Option K formerly Section 12a	Cross Lanes to Greta Bridge	404987	513690							Construction	Hazard	New culvert proposed for route option 12a and 12b for slip-road to south. Proposed culvert at chainage Ch. 60 +150m.	Collapsing ground, buried structure. Collapse leading to slip, trip, fall or serious injury to workforce.	5	5	25	Angela Hills	E - Not possible. R - Locate existing culverts and/or new culverts to be constructed and undertake appropriate design measures to reduce risk of damage. I - Not applicable. C - Not applicable.	Yes	Designer	2	5	10	Area cannot be avoided as all shortlist routes intersect the culverts. The mitigation will be to assess the impact from the culverts and undertake appropriate design measures in the next stages.	Review at Stage 3	Live																															High	High	High	High	Section specific	10	-214230.072	7268968.665
13776	A66.GEO.S12.001	Yes	ARCADIS	Stage 2	Geotechnical	September 25, 2019	New culvert proposed for route option 12a and 12b for slip-road to south. Proposed culvert at chainage Ch. 60 +280m.	Option K formerly Section 12a	Cross Lanes to Greta Bridge	405088	513702							Construction	Hazard	New culvert proposed for route option 12a and 12b for slip-road to south. Proposed culvert at chainage Ch. 60 +280m.	Collapsing ground, buried structure. Collapse leading to slip, trip, fall or serious injury to workforce.	5	5	25	Angela Hills	E - Not possible. R - Locate existing culverts and/or new culverts to be constructed and undertake appropriate design measures to reduce risk of damage. I - Not applicable. C - Not applicable.	Yes	Designer	2	5	10	Area cannot be avoided as all shortlist routes intersect the culverts. The mitigation will be to assess the impact from the culverts and undertake appropriate design measures in the next stages.	Review at Stage 3	Live																															High	High	High	High	Section specific	10	-214058.955	7268984.322
13777	A66.GEO.S12.002	Yes	ARCADIS	Stage 2	Geotechnical - General	September 25, 2019	Potential for dissolution features and natural cavities based on limestone in the area.	Option K formerly Section 12a	Cross Lanes to Greta Bridge									Construction	Hazard	Potential for dissolution features and natural cavities based on limestone in the area.	Collapsing ground. Collapse leading to slip, trip, fall or serious injury to workforce.	5	5	25	Angela Hills	E - Try to avoid mining area if possible. R - Carry out non-intrusive and intrusive ground investigations to determine the potential risk associated with dissolution features and natural cavities. I - Not applicable. C - Not applicable.	Yes	Designer	1	5	5	Ground investigation to investigate the ground condition in the vicinity of Section 12 to identify if any voids a present. Geophysical surveys such as a microgravity survey may be required to look for potential voids. Remedial measures may be required for voids if identified. Design works will need to take any voids and remediation into account.	Review at Stage 3	Live																															High	Medium	Medium	Medium	Section general	5	-212127.409	7272177.915

OBJECT ID	Hazard Triangle Reference	Display In Models	Identified By	Stage Identified	Discipline	Date Added	Design Activity or Element	Location Name	Section Name	Eastings Start	Northings Start	Eastings End	Northings End	Chainage Start Easting	Chainage Start Northing	Chainage End Easting	Chainage End Northing	Phase Affected	Hazard Or Constraint	Hazard or Constraint Description	Consequence of Design Activity	Design Initial Risk Likelihood	Design Initial Risk Severity	Design Initial Risk Rating	Risk Owner Designer Name	Actions To Eliminate Risk	Risk Still Live	Action By	Design Residual Risk Likelihood	Design Residual Risk Severity	Design Residual Risk Rating	Residual Hazards Information	Designer Comments	Status At Transferred	Designer Contractor Discussion Comments	Designer Contractor Discussion Date	Principal Contractor Manager Responsible	Control Measures Required During Construction Phase	Control Measures Implemented	Construction Current Risk Likelihood	Construction Current Risk Severity	Status At Handover	Status At Handover Date	Contractor Client Discussion Comments	Contractor Client Discussion Date	Principal Designer Close Out Comments	Principal Designer Close Out Comments Date	Client Rep Responsible	Residual Risk Details	Control Measures Required	Add to Health and Safety File	Operation Maintenance Manual	Included Within MRSS	Project Action Owner	Client Residual Risk Likelihood	Client Residual Risk Severity	Client Residual Risk Rating	SHE Box Required	Drawings Required	SHE BOX TEXT	Handover Owner	As Built Completed	Status End Of Project	Date End Of Project	Design Initial Risk Rating Category	Design Residual Risk Rating Category	Client Residual Risk Rating Category	Construction Current Risk Rating Category	Type	Construction Current Risk Rating	x	y
13778	A66.GEO.S14.002	Yes	ARCADIS	Stage 2	Geotechnical	September 25, 2019	New culverts for route options 14a, 14f and 14g.	Option N formerly Section 14f	Stephen Bank to Carkin Moor	415729	508756							Construction	Hazard	New culverts for route options 14a, 14f and 14g.	Collapsing ground, buried structure. Collapse leading to slip, trip, fall or serious injury to workforce.	5	5	25	Angela Hills	E - Not possible. R - Locate existing culverts and/or new culverts to be constructed and undertake appropriate design measures to reduce risk of damage. I - Not applicable. C - Not applicable.	Yes	Designer	2	5	10	Area cannot be avoided as all shortlist routes intersect the watercourses or existing culverts. The mitigation will be to assess the impact from the culverts and undertake appropriate design measures in the next stages.	Review at Stage 3	Live																															High	High	High	High	Section specific	10	-195801.314	7260431.097
13779	A66.GEO.S14.006	Yes	ARCADIS	Stage 2	Geotechnical	September 25, 2019	Potential for shallow bedrock.	Option N formerly Section 14f	Stephen Bank to Carkin Moor	412914	510253	413491	509885					Construction	Hazard	Potential for shallow bedrock.	Shallow bedrock causing excavation difficulties. Injury or death to workforce due to impact from moving plant.	3	3	9	Angela Hills	E - Not possible. R - Reduce risk with ground investigation to assess extent of shallow bedrock and incorporate findings into design. I - Not applicable. C - Not applicable.	Yes	Designer	3	1	3	Appropriate geotechnical ground investigation to establish location of shallow bedrock and assess suitable excavation method.	Review at Stage 3	Live																															Medium	Low	Low	Low	Section specific	3	-200171.035	7262778.328
13780	A66.GEO.S14.007	Yes	ARCADIS	Stage 2	Geotechnical - General	September 25, 2019	Potential for historical mining - Limestone/Sandstone.	Option N formerly Section 14f	Stephen Bank to Carkin Moor									Construction	Hazard	Potential for historical mining - Limestone/Sandstone.	Potential for mine workings beneath the Section 14 route options leading to collapse. Collapse leading to slip, trip, fall or serious injury to workforce.	3	5	15	Angela Hills	E - Try to avoid mining area if possible. R - Carry out non-intrusive and intrusive ground investigations to determine the potential risk associated with historical mine workings. I - Not applicable. C - Not applicable.	Yes	Designer	1	5	5	Detailed mining study to be undertaken, with a focused ground investigation to assess the potential risk to the project. At the next stage it would be prudent to contact the current landowner to request if they hold any information regarding historical mining and the mine entry that is located on their land.	Review at Stage 3	Live																															High	Medium	Medium	Medium	Section general	5	-195138.899	7264482.205
14172	A66.GEO.S10.007	Yes	ARCADIS	Stage 2	Geotechnical	September 25, 2019	Existing structures include: Underpass located at approximate chainage Ch. 51 +610m; and associated retaining walls.	Option J formerly Section 10a	Bowes Bypass	400228	513694							Construction	Hazard	Existing structures include: Underpass located at approximate chainage Ch. 51 +610m; and associated retaining walls.	Additional load from online dualling affecting the structure and foundations of the underbridges and underpasses. The overbridge is currently too narrow to accommodate a dual carriageway. Collapse of structure and/or injury from moving plant.	5	4	20	Angela Hills	E - Not possible. R - Reduce risk by redesign of structures and retaining walls to accommodate road widening and changes in load. I - Not applicable. C - Not applicable.	Yes	Designer	1	4	4	To be taken into account during the design phase. Redesign of structures and retaining walls will be required to accommodate road widening and changes in load.	Review at Stage 3	Live																															High	Low	Low	Low	Section specific	4	-222411.112	7268980.728
14173	A66.GEO.S12.003	Yes	ARCADIS	Stage 2	Geotechnical - General	September 25, 2019	Earthwork Defects recorded on hagdms	Option K formerly Section 12a	Cross Lanes to Greta Bridge									Construction	Hazard	Earthwork Defects.	Further deterioration of existing defects. Potential risk of earthwork movement leading to injury of workforce.	5	5	25	Angela Hills	E - Not possible. R - Geotechnical Engineer to inspect critical earthworks and earthwork surveys, ascertain remediation measured required in design phase (if required). I - Not applicable. C - Not applicable.	Yes	Designer	1	5	5	Geotechnical Engineer to inspect and investigate critical earthworks and all defects during site surveys, with appropriate mitigation measures to be considered during the design phase. Earthwork defects are presented on Table 4 15 and Table 4 16. PSSR Appendix F	Review at Stage 3	Live																															High	Medium	Medium	Medium	Section general	5	-211848.821	7272132.722
14174	A66.GEO.S12.004	Yes	ARCADIS	Stage 2	Geotechnical - General	September 25, 2019	Risks associated with the historical development.	Option K formerly Section 12a	Cross Lanes to Greta Bridge									Construction	Hazard	Risks associated with the historical development.	Historical land-use leading to potential impact from contamination including potential historical structures e.g. foundations. Workforce contact with contaminated ground or exposed to gases leading to injury or death.	3	3	9	Angela Hills	E - Not possible. R - Reduce risk with ground investigation to assess current ground conditions; assess if environmental risk assessment and if remediation is required. I - Not applicable. C - Not applicable.	Yes	Designer	1	2	2	No historical structures on the line of section. Refer to Table 6 5 for contaminated land assessment and mitigation measures. PSSR Appendix F.	Review at Stage 3	Closed																															Medium	Low	Not Applicable	Not Applicable	Section general	2	-211594.022	7272122.164
14175	A66.GEO.S12.005	Yes	ARCADIS	Stage 2	Geotechnical	September 25, 2019	St. Mary’s Church located 110m north of route option 12b between chainages Ch. 62 +425 and Ch. 62 +479	Option K formerly Section 12a	Cross Lanes to Greta Bridge	407255	513809							Construction	Hazard	St. Mary’s Church located 110m north of route option 12b between chainages Ch. 62 +425 and Ch. 62 +479.	Dualling will encroach onto the graveyard associated with St. Mary’s Church.	5	3	15	Angela Hills	E - Eliminate risk by using Route Option 12a which runs south of St. Mary’s Church avoiding the area. R - Not applicable. I - Not applicable. C - Not applicable.	Yes	Designer	1	4	4	Move dualling in this area further south to avoid the graveyard or adopt proposed route option 12a.	Review at Stage 3	Live																															High	Low	Low	Low	Section specific	4	-210329.085	7269170.882
14176	A66.GEO.S14.001	Yes	ARCADIS	Stage 2	Geotechnical	September 25, 2019	Damage to existing drystone retaining walls including gabion wall – HA GDMS reference 210008.	Option N formerly Section 14f	Stephen Bank to Carkin Moor	414887	509075	414941	509040					Construction	Hazard	Damage to existing drystone retaining walls including gabion wall – HA GDMS reference 210008.	Damage of retaining structure. Collapse leading to serious injury or death.	5	3	15	Angela Hills	E - Not possible. R - Mitigation in design to reduce risk of dry-stone wall damage. I - Not applicable. C - Not applicable.	Yes	Designer	1	3	3	The location of the dry-stone walls will be determined, and the appropriate mitigating design undertaken.	Review at Stage 3	Live																															High	Low	Low	Low	Section specific	3	-197187.285	7260966.944
14177	A66.GEO.S14.002	Yes	ARCADIS	Stage 2	Geotechnical	September 25, 2019	New culverts for route options 14a, 14f and 14g.	Option N formerly Section 14f	Stephen Bank to Carkin Moor	416035	508385							Construction	Hazard	New culverts for route options 14a, 14f and 14g.	Collapsing ground, buried structure. Collapse leading to slip, trip, fall or serious injury to workforce.	5	5	25	Angela Hills	E - Not possible. R - Locate existing culverts and/or new culverts to be constructed and undertake appropriate design measures to reduce risk of damage. I - Not applicable. C - Not applicable.	Yes	Designer	2	5	10	Area cannot be avoided as all shortlist routes intersect the watercourses or existing culverts. The mitigation will be to assess the impact from the culverts and undertake appropriate design measures in the next stages.	Review at Stage 3	Live																															High	High	High	High	Section specific	10	-195261.321	7259785.191
14178	A66.GEO.S14.002	Yes	ARCADIS	Stage 2	Geotechnical	September 25, 2019	New culverts for route options 14a, 14f and 14g.	Option N formerly Section 14f	Stephen Bank to Carkin Moor	416332	508202							Construction	Hazard	New culverts for route options 14a, 14f and 14g.	Collapsing ground, buried structure. Collapse leading to slip, trip, fall or serious injury to workforce.	5	5	25	Angela Hills	E - Not possible. R - Locate existing culverts and/or new culverts to be constructed and undertake appropriate design measures to reduce risk of damage. I - Not applicable. C - Not applicable.	Yes	Designer	2	5	10	Area cannot be avoided as all shortlist routes intersect the watercourses or existing culverts. The mitigation will be to assess the impact from the culverts and undertake appropriate design measures in the next stages.	Review at Stage 3	Live																															High	High	High	High	Section specific	10	-194757.864	7259462.197
14179	A66.GEO.S14.002	Yes	ARCADIS	Stage 2	Geotechnical	September 25, 2019	New culverts for route options 14a, 14f and 14g.	Option N formerly Section 14f	Stephen Bank to Carkin Moor	416353	508197							Construction	Hazard	New culverts for route options 14a, 14f and 14g.	Collapsing ground, buried structure. Collapse leading to slip, trip, fall or serious injury to workforce.	5	5	25	Angela Hills	E - Not possible. R - Locate existing culverts and/or new culverts to be constructed and undertake appropriate design measures to reduce risk of damage. I - Not applicable. C - Not applicable.	Yes	Designer	2	5	10	Area cannot be avoided as all shortlist routes intersect the watercourses or existing culverts. The mitigation will be to assess the impact from the culverts and undertake appropriate design measures in the next stages.	Review at Stage 3	Live																															High	High	High	High	Section specific	10	-194706.102	7259439.361
14180	A66.GEO.S14.003	Yes	ARCADIS	Stage 2	Geotechnical - General	September 25, 2019	Potential for dissolution features and natural cavities based on limestone in the area.	Option N formerly Section 14f	Stephen Bank to Carkin Moor									Construction	Hazard	Potential for dissolution features and natural cavities based on limestone in the area.	Collapsing ground. Collapse leading to slip, trip, fall or serious injury to workforce.	3	5	15	Angela Hills	E - Try to avoid mining area if possible. R - Carry out non-intrusive and intrusive ground investigations to determine the potential risk associated with dissolution features and natural cavities. I - Not applicable. C - Not applicable.	Yes	Designer	1	5	5	Ground investigation to investigate the ground condition in the vicinity of Section 14 to identify if any voids are present. Geophysical surveys such as a microgravity survey may be required to look for potential voids. Remedial measures may be required for voids if identified. Design works will need to take any voids and remediation into account.	Review at Stage 3	Live																															High	Medium	Medium	Medium	Section general	5	-196013.649	7264519.969
14181	A66.GEO.S14.004	Yes	ARCADIS	Stage 2	Geotechnical - General	September 25, 2019	Earthwork Defects recorded on hagdms	Option N formerly Section 14f	Stephen Bank to Carkin Moor									Construction	Hazard	Earthwork Defects.	Further deterioration of existing defects. Potential risk of earthwork movement leading to injury of workforce.	5	5	25	Angela Hills	E - Not possible. R - Geotechnical Engineer to inspect critical earthworks and earthwork surveys, ascertain remediation measured required in design phase (if required). I - Not applicable. C - Not applicable.	Yes	Designer	1	5	5	Geotechnical Engineer to inspect and investigate critical earthworks and all defects during site surveys, with appropriate mitigation measures to be considered during the design phase. Earthwork defects are presented on Table 4 19 and Table 4 20. PSSR Appendix G	Review at Stage 3	Live																															High	Medium	Medium	Medium	Section general	5	-195700.52	7264533.179
14182	A66.GEO.S14.005	Yes	ARCADIS	Stage 2	Geotechnical - General	September 25, 2019	Risks associated with the historical development.	Option N formerly Section 14f	Stephen Bank to Carkin Moor									Construction	Hazard	Risks associated with the historical development.	Historical land-use leading to potential impact from contamination including potential historical structures e.g. foundations. Workforce contact with contaminated ground or exposed to gases leading to injury or death.	3	3	9	Angela Hills	E - Not possible. R - Reduce risk with ground investigation to assess current ground conditions; assess if environmental risk assessment and if remediation is required. I - Not applicable. C - Not applicable.	Yes	Designer	1	2	2	No historical structures on the line of section. Refer to Table 6 7 for contaminated land assessment and mitigation measures. PSSR Appendix G	Review at Stage 3	Live																															Medium	Low	Not Applicable	Not Applicable	Section general	2	-195350.152	7264480.054
14573	A66.GEO.S14.008	Yes	ARCADIS	Stage 2	Geotechnical	September 25, 2019	Potential for historical quarrying - Limestone/Sandstone.	Option N formerly Section 14f	Stephen Bank to Carkin Moor	416831	507357							Construction	Hazard	Potential for historical mining - Limestone/Sandstone.	Potential for mine workings beneath the Section 14 route option leading to collapse. Collapse leading to slip, trip, fall or serious injury to workforce.	3	5	15	Angela Hills	E - Try to avoid mining area if possible. R - Carry out non-intrusive and intrusive ground investigations to determine the potential risk associated with historical mine workings. I - Not applicable. C - Not applicable.	Yes	Designer	1	5	5	Detailed mining study to be undertaken, with a focused ground investigation to assess the potential risk to the project. At the next stage it would be prudent to contact the current landowner to request if they hold any information regarding historical mining and the mine entry that is located on their land.	Review at Stage 3	Live																															High	Low	Low	Low	Section general	5	-193874.445	7257939.199