



Great Missenden Haul Road Sift Report

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Great Missenden Haul Road Sift Report

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List of acronyms

DP	Delivery Partner
EIR	environmental information request
FOI	freedom of information
PSC	professional services consultant
PSF	professional service framework
TBM	Tunnel Boring Machine
BCC	Buckinghamshire County Council
TWAO	Transport and Works Act Order

References

Title	Reference
HS2 Project dictionary	HS2-HS2-PM-GDE-000-000002
Style guide	HS2-HS2-CO-GDE-000-000001
HS2 – Route Development Appraisal Template	HS2-HS2-SA-TEM-000-000004
HS2 Route Development Procedure	HS2-HS2-SA-PRO-000-000007

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1 Executive summary

1.1.1 This report summarises the optioneering exercise undertaken for the Great Missenden haul road in response to alternative options proposed by Buckinghamshire County Council (BCC). The options have been put forward for consideration under the conditions of the assurance provided to Buckinghamshire County Council (BCC) by the Promoter that states:

'The Secretary of State will require the nominated undertaker to implement an alternative haul road alignment at Great Missenden subject to:

- *Buckinghamshire County Council's alternative proposals being agreed with the nominated undertaker to a timetable consistent with the overall railway construction programme, with that agreement not to be unreasonably withheld;*
- *the alternative proposals not creating new significant adverse environmental effects that cannot be mitigated or reducing the effectiveness of existing mitigation, except by the agreed provision of an alternative;*
- *Buckinghamshire County Council securing all necessary additional powers and permissions to a timetable consistent with the overall railway construction programme; and*
- *the alternative scheme not increasing the cost of the haul road, and not impacting the economic timely and safe construction of the railway'.*

1.1.2 The report provides a summary of the options considered and compares these to the Proposed Scheme. The report provides information to demonstrate whether an option complies with the requirements of the assurance provided to BCC.

1.1.3 The following options were developed for the above locations:

- a. Option A (baseline): the Proposed Scheme at Final Preliminary Design comprising a temporary haul road from the Great Missenden roundabout providing access to the Chiltern tunnel north portal civil engineering and rail systems satellite compounds and an additional length of haul road running along the eastern side of the HS2 alignment;
- b. Option B: comprising a proposed alternative haul road located south of Leather Lane with the Chiltern tunnel north portal civil engineering and rail systems compounds retained as per the Proposed Scheme, with access provided by the proposed haul road from the A413 up to the HS2 alignment and an additional length of haul road running along the west side of the HS2 alignment;
- c. Option C: comprising a proposed alternative haul road located south of Leather Lane with the Chiltern tunnel north portal rail systems compound located at track level within the South Heath cutting, with access provided by the proposed haul road from the A413 up to the HS2 alignment. The Chiltern tunnel north portal civil engineering compound is retained as per

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the proposed scheme with an additional length of haul road running along the west side of the HS2 alignment providing access to the portal (similar to option B); and

- d. Option D: comprising a proposed alternative haul road located south of Leather Lane with the Chiltern tunnel north portal rail systems compound located at existing ground level adjacent to the proposed haul road with access provided by the haul road. This option was discounted following an initial review due to the presence of an overhead electricity line crossing the rail systems compound.

1.1.4 Options A, B and C have been evaluated in accordance with the SIFT criteria as defined in the HS2 – Route Development Appraisal Template (ref. HS2-HS2-SA-TEM-000-000004 rev. P02).

1.1.5 Assessment of the options through the sift process indicates that for:

Option B

- The option would add significant additional costs to the project;
- The construction period for this option would be increased to approximately 10 months compared to the Proposed Scheme period of 6 months, due to the additional highway works required. With land access required by September 2017 for Option A, land access for Option B would thus need to be achieved by May 2017 to ensure an equivalent completion date. The alternative design, assessment and planning process to acquire the necessary land and powers would need to be completed ahead of May 2017; this is considered unlikely to be achievable in the time available and would thus add significant risk to, and likely extend, the overall construction programme;
- Would likely add a new significant effect through the removal of known prehistoric archaeological finds in the area of the A413 junction and proposed Great Missenden Haul Road Satellite compound; and
- Would add additional delays to vehicular users of Leather Lane and to the A413 through the addition of a temporary signalised junction for the haul road access.

Option C

- Would further increase costs as compared to the Proposed Scheme and is thus clearly less desirable than Option B;
- Would have more significant environmental impacts with the need to undertake more extensive works for the rail systems compound affecting the proposed final cutting profile in this area;
- The construction programme would be compatible with Option B;
- Would likely add a new significant effect through the removal of known prehistoric archaeological finds in the area of the A413 junction and proposed Great Missenden Haul Road Satellite compound;

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- Would remove approximately 0.03 hectares (equating to approximately 1%) of Havenfield Wood, an ancient woodland, although the section of woodland is not thought to be of ancient woodland designation but classified as a habitat of principal importance; and
- Would add additional delays to vehicular users of Leather Lane and to the A413 through the addition of a temporary signalised junction for the haul road access.

1.1.6 Along with the additional construction costs noted which would accrue to the Promoter, there would be substantial additional preparation costs incurred in developing the required information for an alternative alignment including design, environmental assessment, identification of new land and property impacts and preparation of planning requirements associated with the development of an alternative option, likely to be in the form of a Transport and Works Act Order (TWAO). Under the assurance provided, these preparation and associated costs would fall to BCC and could be in the order of £1million, a significant sum to be incurred for a temporary access road.

1.1.7 Based on the sift assessment, neither Option B nor Option C would comply with the requirements of the assurance and both would add additional costs and impacts to the project. As such, no change to the Proposed Scheme is proposed.

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2 Introduction

- 2.1.1 This document provides the description and evaluation of options for the Great Missenden haul road in accordance with the HS2 Route Development Procedure (HS2-HS2-SA-PRO-000-000007 rev. P04) and utilising HS2 – Route Development Appraisal Template document (HS2-HS2-SA-TEM-000-000004 rev. P02).
- 2.1.2 The Great Missenden Haul Road is required to provide access from the A413 Aylesbury Road to the HS2 alignment during the construction phase. The haul road will be used for civil engineering vehicle access to construct overbridges and the Chiltern tunnel north portal, remove excavated material from South Heath cutting and remove the Tunnel Boring Machines (TBM) from the north portal. Rail systems also require the haul road to gain access to the Chiltern north portal to undertake the portal building fit out and rail and systems installation.
- 2.1.3 In response to an alternative option for the haul road proposed by Buckinghamshire County Council (BCC), options for the location of the rail systems compound and access to the civil engineering compounds and other work areas have been developed and assessed.
- 2.1.4 The options have been put forward for consideration under the conditions of the assurance provided to Buckinghamshire County Council (BCC) by the Promoter that states:
- ‘The Secretary of State will require the nominated undertaker to implement an alternative haul road alignment at Great Missenden subject to:*
- *Buckinghamshire County Council’s alternative proposals being agreed with the nominated undertaker to a timetable consistent with the overall railway construction programme, with that agreement not to be unreasonably withheld;*
 - *the alternative proposals not creating new significant adverse environmental effects that cannot be mitigated or reducing the effectiveness of existing mitigation, except by the agreed provision of an alternative;*
 - *Buckinghamshire County Council securing all necessary additional powers and permissions to a timetable consistent with the overall railway construction programme; and*
 - *the alternative scheme not increasing the cost of the haul road, and not impacting the economic timely and safe construction of the railway’.*
- 2.1.5 The report provides a summary of the options considered and compares these to the Proposed Scheme. The report provides information to demonstrate whether an option complies with the requirements of the assurance provided to BCC.

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3 Scope of the Sift

- 3.1.1 The scope of this sift was to consider the alternative haul road proposal in conjunction with the requirements for rail systems and civil engineering during the construction phase.
- 3.1.2 The following options were developed for assessment:
- a. Option A (baseline): the Proposed Scheme at Final Preliminary Design;
 - b. Option B: comprising the proposed alternative haul road located south of Leather Lane with the Chiltern tunnel north portal civil engineering and rail systems compounds retained as per the Proposed Scheme;
 - c. Option C: comprising the proposed alternative haul road located south of Leather Lane with the Chiltern tunnel north portal rail systems compound located at track level within the South Heath cutting; and
 - d. Option D; comprising the proposed alternative haul road located south of Leather Lane with the Chiltern tunnel north portal rail systems compound located at existing ground level adjacent to the haul road.
- 3.1.3 The proposal for the alternative haul road proposal will not impact on any operational aspects of the Proposed Scheme.

4 Assumptions

Engineering:

- 4.1.1 The Chiltern tunnel north portal civil engineering satellite compound will be used for construction of the Chiltern tunnel north portal and removal of the TBMs. Access will be required to track level for road vehicles. This compound will be located as per the Proposed Scheme in all options considered in this sift.
- 4.1.2 During the civil engineering works access will also be required for road vehicles and low loaders to construct Footpath GMI/12 overbridge, Footpath GMI/2 Accommodation overbridge and Leather Lane overbridge.
- 4.1.3 The Chiltern tunnel north portal (rail systems) satellite compound will be used to undertake the portal building fit out and rail and systems installation. The compound is required to be approximately 12,000m², be on a flat area and have access to track level for road vehicles to undertake portal building fit out and rail and systems installation.

Environmental:

- 4.1.4 All impacts reported here are potential predicted impacts and would be subject to surveys, assessment and professional interpretation and judgement as part of the EIA process.

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- 4.1.5 Potential impacts have been identified on the basis of an unmitigated scheme.
- 4.1.6 Property demolitions, loss, or direct impacts to designated features and resources are addressed as construction phase impacts.
- 4.1.7 Construction impacts for cultural heritage has assumed that all construction activity within the land required, temporarily or permanently, for the Proposed Scheme, will result in the removal of archaeological assets. Operational impacts for cultural heritage considers the impacts on the setting of heritage assets.

Costs

- 4.1.8 Cost comparisons of the options utilise the same cost rates for similar items. Quantities are based on current draft alignments as suggested by HS2 Ltd. and as shown on the sketches included in Appendix A.
- 4.1.9 It has been assumed for current purposes that the junction required between the haul road near Leather Lane and the A413 (Options B and C) would be a signalised junction and costs have been included on this basis. The junction would be removed on completion of the HS2 works.
- 4.1.10 For the cost comparison, the following assumptions have been made regarding associated junction works:

Option A:

- Improvement of the Great Missenden/Link Road junction in line with Option M1 as submitted to BCC;
- Improvement of the A413/B485 junction in line with Option M1 as submitted to BCC;
- Inclusion of the permanent access road to the tunnel portal from Frith Hill; and
- It is assumed that the improvement works to the A413 junctions would not be removed on completion of HS2 works.

Options B and C:

- Provision of a signalised junction from the temporary access road onto the A413, including subsequent removal and re-instatement of the area;
- Improvement of the A413/B485 junction in line with Option M1 as submitted to BCC;
- Inclusion of the permanent access road to the tunnel portal from Frith Hill; and
- No improvement works to the Great Missenden/Link Road junction have been included under these options as no traffic assessment work has been undertaken to assess the need with altered construction traffic through this junction.

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- 4.1.11 For all options allowance has been included for the removal of temporary access roads and reinstatement of the area on completion.
- 4.1.12 A summary of Option A, B & C costs are included in Appendix B.

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5 Constraints

5.1 Study Area

5.1.1 The study area includes the length of the HS2 alignment between the Chiltern tunnel north portal, Ch47+200 to Leather Lane, Ch48+800.

5.2 Site Constraints

5.2.1 Figure 5.1 shows the Proposed Scheme layout (Option A).

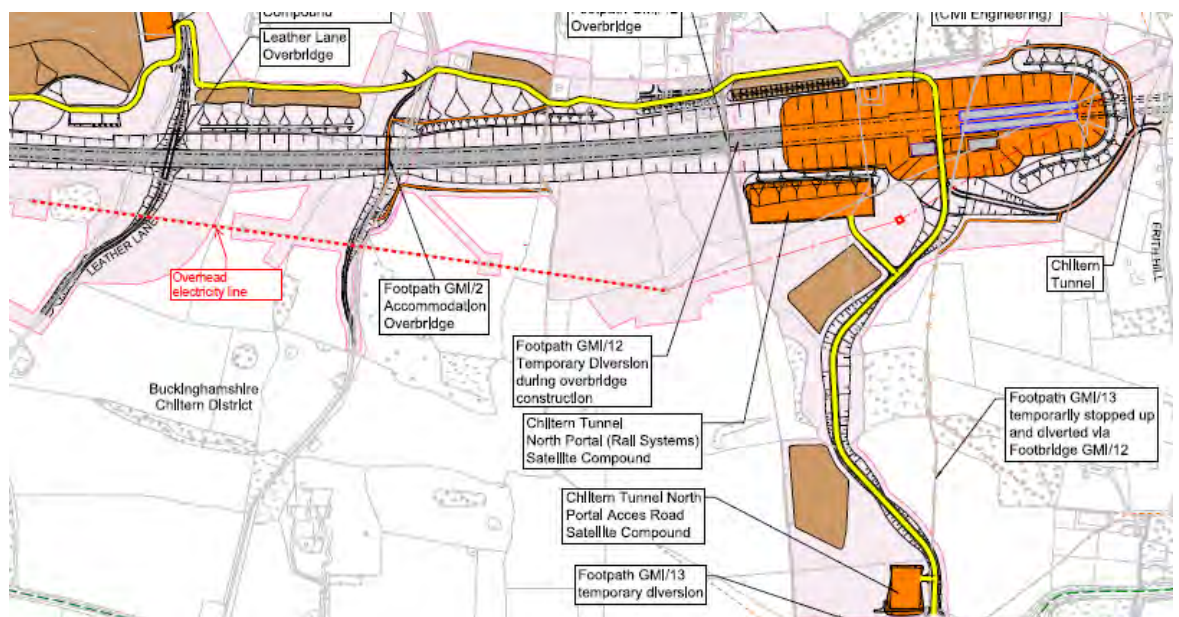


Figure 5-1 Location plan of the Proposed Scheme Layout (Option A)

5.3 Environmental Constraints

5.3.1 The environmental setting is determined by the rural landscape of the Chilterns Area of Outstanding Natural Beauty and the chalk escarpment. The area is predominantly rural in character, consisting of mixed agricultural land use interspersed with areas of woodland, scattered cottages, farmsteads and villages including Great Missenden to the south and South Heath to the south-west. Also of note within the area is the existing overhead electricity line and the existing transport corridor of the A413 and the Marylebone to Aylesbury Line which run in a south-east to north-west direction, broadly following the Misbourne Valley. The remaining road network consists of unclassified roads and tracks for private access such as the sunken lane of Leather Lane.

5.3.2 The main environmental constraints in this area are:

- The loss of agricultural land, predominantly of Grade 3 with some Grade 2 in the Misbourne Valley;

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- The loss of fields and hedgerows in the area;
- Visual intrusion in the landscape;
- Havenfield Wood, partly designated as ancient woodland, the remainder designated as a habitat of principal importance; and
- Known prehistoric archaeological finds adjacent to the A413 and Leather Lane junction.

5.3.3 The following PRoW are located in the area:-

- Footpath GMI/2;
- Footpath GMI/12; and
- Footpath GMI/13.

5.4 Engineering Constraints

5.4.1 As shown in Figure 5-1, a National Grid overhead electricity line is located to the west of the HS2 alignment. There would be significant crane activity at the rail systems compound associated with the off-loading of construction items, the presence of the overhead electricity line and ensuring adequate safety and clearance from the crane operations is a critical constraint.

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6 Option Description

6.1.1 This section provides a description of each option considered as part of the alternative proposal.

6.1.2 For those options not discounted following an initial review and assessment the qualitative assessment against the sift criteria is contained in Section 7.

6.2 Option A (Baseline) – Proposed Scheme (Final Preliminary Design)

6.2.1 The Proposed Scheme comprises the extended Chiltern tunnel with a temporary haul road extending from the A413 Aylesbury Road/Great Missenden roundabout to the Chiltern tunnel north portal. It is assumed that this length of access road from the A413 to the portal site will be constructed as a 6m wide macadam surfaced highway given the level of traffic expected and period of use.

6.2.2 The Chiltern tunnel north portal access road satellite compound, required to construct the temporary haul road, is located to the north-east of the Great Missenden roundabout.

6.2.3 A haul road along the east side of the HS2 alignment will provide access to construct Footpath GMI/12 overbridge, Footpath GMI/2 Accommodation overbridge and Leather Lane overbridge. This section of the haul road is assumed not to require surfacing due to the level of traffic expected and period of use and is thus costed as an unsurfaced type 1 material.

6.2.4 The temporary haul road from the A413 will be used for removing excavated material from South Heath cutting that will be transported on the A413 Aylesbury Road and reused within the HS2 scheme north of Wendover.

6.2.5 The temporary haul road will be used for removing the TBMs from the Chiltern tunnel north portal.

6.2.6 The haul road will provide access to/from the A413 Aylesbury Road and the Chiltern tunnel north portal rail systems satellite compound during the portal building fit out and rail and systems installation.

6.2.7 Footpath GMI/13 will be temporarily stopped up and diverted via Footpath GMI/12 during the construction phase.

6.2.8 Junction improvements will be required at the Great Missenden/Link Road and B485 Chesham Road roundabouts to accommodate construction traffic and mitigate delays.

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- 6.2.9 On completion of construction, the temporary haul road will be removed and land reinstated in accordance with the Proposed Scheme.
- 6.2.10 Refer to drawing no. C222-ATK-EV-DPL-020-250906-PET000000 in Appendix A for details of the Proposed Scheme.

6.3 Option B – Alternative Haul Road (rail systems compound as Proposed Scheme)

- 6.3.1 This option comprises the extended Chiltern tunnel with the proposed alternative temporary haul road from the A413 located south of Leather Lane.
- 6.3.2 The Chiltern tunnel north portal civil engineering and rail systems satellite compounds are retained as per the Proposed Scheme with access provided by the haul road and a section of haul road along the west side of the HS2 alignment. It is assumed that the haul road construction from the A413 to the HS2 alignment and along the west side of the alignment to the portal site will be constructed as a 6m wide macadam surfaced highway given the level of traffic expected and period of use. This is compatible with the highway provision in Option A to the portal site.
- 6.3.3 The Great Missenden haul road satellite compound, required to construct the temporary haul road, is located to the south-east of the new junction with the A413 Aylesbury Road.
- 6.3.4 The haul road along the west side of the HS2 alignment will provide access to construct Footpath GMI/12 overbridge and Footpath GMI/2 Accommodation overbridge. The haul road along the east side of the HS2 alignment in Option A will not be required as part of this option.
- 6.3.5 The temporary haul road will be used for removing excavated material from South Heath cutting that will be transported on the A413 Aylesbury Road and reused within the HS2 scheme north of Wendover.
- 6.3.6 A new temporary traffic junction will be required to provide access from the A413 to the proposed haul road. It is assumed that this would be a signalled junction but at this stage no geometric design or traffic assessment has been undertaken.
- 6.3.7 A short section of Leather Lane and its junction with the A413 Aylesbury Road will be temporarily stopped up with a connection to the haul road to provide access to the A413 for local traffic.
- 6.3.8 Footpath GMI/12 will be temporarily stopped up and diverted via Footpath GMI/13 during the construction phase.

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- 6.3.9 It is considered that junction improvements would still be required at the B485 Chesham Road junction as for Option A and that improvements may still be required at the Great Missenden/Link Road roundabout to accommodate construction traffic and mitigate delays.
- 6.3.10 On completion of construction, the temporary haul road and junction will be removed and land reinstated in accordance with the Proposed Scheme.
- 6.3.11 Refer to drawing no. C222-ATK-EV-DPL-020-251906-PET000000 in Appendix A for details of Option B.

6.4 Option C – Alternative Haul Road (rail systems compound relocated to Ch48+600 at track level)

- 6.4.1 This option comprises the extended Chiltern tunnel with the proposed alternative temporary haul road from the A413 located south of Leather Lane.
- 6.4.2 The Chiltern tunnel north portal civil engineering satellite compound is retained as per the Proposed Scheme with access provided by the haul road and a section of haul road along the west side of the HS2 alignment. It is assumed that the haul road construction from the A413 to the HS2 alignment and along the west side of the alignment to the portal site will be constructed as a 6m wide macadam surfaced highway given the level of traffic expected and period of use. This is compatible with the highway provision in Option A to the portal site.
- 6.4.3 The Chiltern tunnel north portal rail systems satellite compound is located at the bottom of South Heath cutting, at track level, with access provided by the haul road. Significant earthworks would be required to create the compound which would need to be removed and the earthworks reinstated on completion of the rail systems construction activities. This could change the interface strategy between the civil engineering and rail systems construction work packages, as well as increasing the cost of the temporary works
- 6.4.4 The Great Missenden haul road satellite compound, required to construct the temporary haul road, is located to the south-east of the new junction with the A413 Aylesbury Road.
- 6.4.5 The haul road along the west side of the HS2 alignment will provide access to construct Footpath GMI/12 overbridge and Footpath GMI/2 Accommodation overbridge. The haul road along the east side of the HS2 alignment in Option A will not be required as part of this option.
- 6.4.6 The temporary haul road will be used for removing excavated material from South Heath cutting that will be transported on the A413 Aylesbury Road and reused within the HS2 scheme north of Wendover.

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- 6.4.7 A new temporary traffic junction will be required to provide access from the A413 to the proposed haul road. It is assumed that this would be a signalled junction but at this stage no geometric design or traffic assessment has been undertaken.
- 6.4.8 A short section of Leather Lane and its junction with the A413 Aylesbury Road will be temporarily stopped up with a connection to the haul road to provide access to the A413 for local traffic.
- 6.4.9 Footpath GMI/12 will be temporarily stopped up and diverted via Footpath GMI/13 during the construction phase.
- 6.4.10 It is considered that junction improvements would still be required at the B485 Chesham Road junction as for Option A and that improvements may still be required at the Great Missenden/Link Road roundabout to accommodate construction traffic and mitigate delays.
- 6.4.11 On completion of construction, the temporary haul road and junction will be removed and land reinstated in accordance with the Proposed Scheme.
- 6.4.12 Refer to drawing no. C222-ATK-EV-DPL-020-252906-PET000000 in Appendix A for details of Option C.

6.5 Option D – Alternative Haul Road (rail systems compound relocated to Ch48+600 at existing ground level)

- 6.5.1 This option comprises the extended Chiltern tunnel with the proposed alternative temporary haul road from the A413 located south of Leather Lane.
- 6.5.2 The Chiltern tunnel north portal civil engineering satellite compound is retained as per the Proposed Scheme with access provided by the haul road and a section of haul road along the west side of the HS2 alignment. It is assumed that the haul road construction from the A413 to the HS2 alignment and along the west side of the alignment to the portal site will be constructed as a 6m wide macadam surfaced highway given the level of traffic expected and period of use. This is compatible with the highway provision in Option A to the portal site.
- 6.5.3 The Chiltern tunnel north portal rail systems satellite compound is located at the top of South Heath cutting, i.e. existing ground level, with access provided by the haul road.
- 6.5.4 The Great Missenden haul road satellite compound, required to construct the temporary haul road, is located to the south-east of the new junction with the A413 Aylesbury Road.
- 6.5.5 The haul road along the west side of the HS2 alignment will provide access to construct Footpath GMI/12 overbridge, Footpath GMI/2 Accommodation

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overbridge and Leather Lane overbridge. The haul road along the east side of the HS2 alignment in Option A will not be required as part of this option.

- 6.5.6 The temporary haul road will be used for removing excavated material from South Heath cutting that will be transported on the A413 Aylesbury Road and reused within the HS2 scheme north of Wendover.
- 6.5.7 A new temporary traffic junction will be required to provide access from the A413 to the proposed haul road. It is assumed that this would be a signalled junction but at this stage no geometric design or traffic assessment has been undertaken.
- 6.5.8 A short section of Leather Lane and its junction with the A413 Aylesbury Road will be temporarily stopped up with a connection to the haul road to provide access to the A413 for local traffic.
- 6.5.9 Footpath GMI/12 will be temporarily stopped up and diverted via Footpath GMI/13 during the construction phase.
- 6.5.10 It is considered that junction improvements would still be required at the B485 Chesham Road junction as for Option A and that improvements may still be required at the Great Missenden/Link Road roundabout to accommodate construction traffic and mitigate delays.
- 6.5.11 On completion of construction, the temporary haul road and junction will be removed and land reinstated in accordance with the Proposed Scheme.
- 6.5.12 Option D was discounted prior to undertaking the qualitative assessment against the sift criteria due to the impact on safety presented by the presence of the overhead electricity line. There would be significant crane activity at the rail systems compound associated with the off-loading of construction items, the presence of the overhead electricity line and ensuring adequate safety and clearance from the crane operations is a critical constraint.

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6.6 Buckinghamshire County Council Rail Systems Compound Options

6.6.1 Two options for the rail systems compound, Options A and B, were separately proposed by BCC as shown in Figure 6.1.

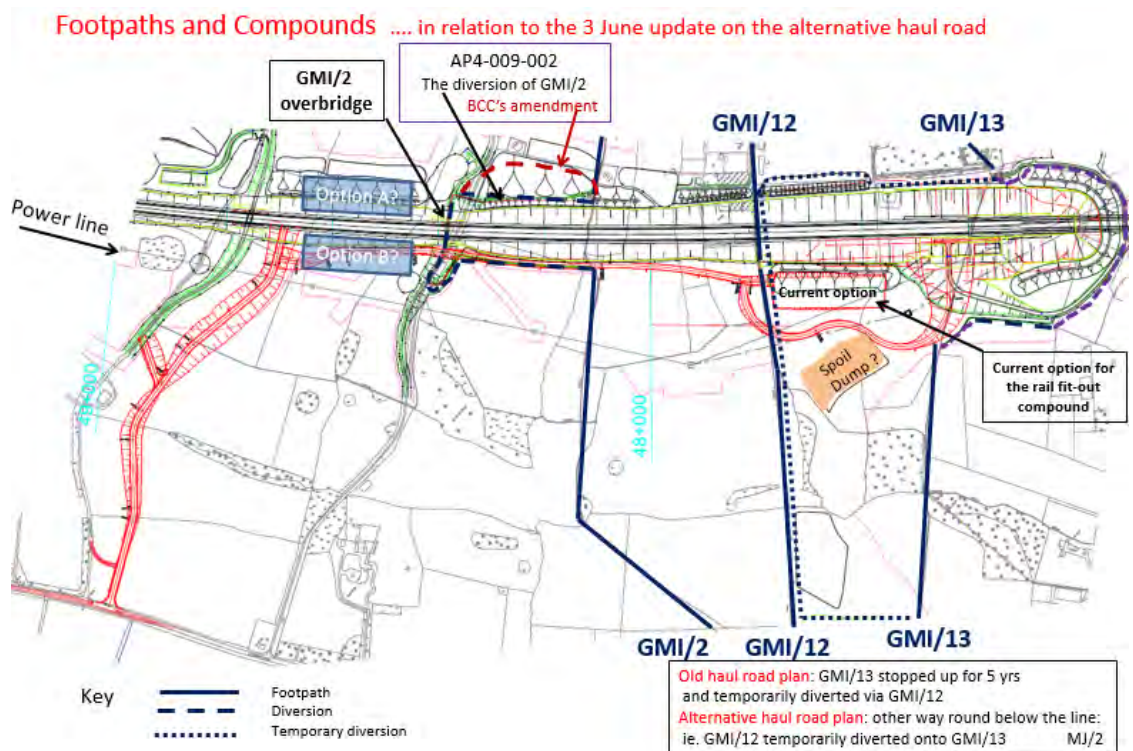


Figure 6-1 BCC Options A & B (extract of BCC PowerPoint slide)

6.6.2 Option A locates the rail systems compound on the east side of the HS2 alignment, it is assumed the intention is for the compound to be at track level. This option was considered but has not been assessed for the following reasons:

- a. Being located on the east side would result in all rail systems construction vehicles having to cross the alignment to access the compound which would not be desirable;
- b. Significant earthworks would be required to create the compound which would need to be removed and the earthworks reinstated on completion of the rail systems construction activities. This could change the interface strategy between the civil engineering and rail systems construction work packages, as well as increasing the cost of the temporary works; and
- c. Access from the rail systems compound is required to the north portal of the Chiltern tunnel to undertake the portal building fit out and rail and systems installation. If it is assumed an access road is provided at track level, in addition to the current railway corridor, this would result in additional earthworks or temporary retaining structures which would need to be

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removed and earthworks reinstated on completion of the rail system construction activities. This would potentially have an impact on cost and programme.

- 6.6.3 Option B locates the rail systems compound on the west side of the HS2 alignment and it is assumed the intention is for the compound to be at track level. This option is therefore similar to Option C which is covered in section 6.4 above and included in the assessment.

6.7 Options A, B & C Earthworks Summary

- 6.7.1 Table 6-1 below summarises the cut and fill earthworks quantities for Options A, B and C. All volumes are approximate and subject to change following further design development.

Item	Option A		Option B		Option C	
	Cut m ³	Fill m ³	Cut m ³	Fill m ³	Cut m ³	Fill m ³
Haul road (from A413)	150,000	7,000	83,000	20,000	83,000	20,000
Haul road (east/west of HS2)	400	1,500	109,000	22,000	130,000	3,000
Rail Systems compound	20,000	100	20,000	100	66,000	100
Total	170,400	8,600	212,000	42,100	279,000	23,100
Surplus excavated material	161,800		169,900		255,900	

Table 6-1 Options A, B & C earthworks summary

6.8 Programme implications

- 6.8.1 The construction programme for the Option A Proposed Scheme haul road is approximately 6 months. Based on the longer length of roadway required under Option B or C and the additional earthworks, it is envisaged that the construction period would increase to approximately 10 months.
- 6.8.2 In addition for Option B or C there would need to be sufficient time for the preparation of a Transport & Works Act order (TWAO) or planning application to gain the additional land required and provide the necessary planning information. It is envisaged that preparation of the TWAO could take around 9 months with additional time to be allowed for any necessary BCC Planning Inquiry.
- 6.8.3 HS2 current assumptions for the Great Missenden haul road is that construction will be undertaken as part of the Enabling Works Contract, with a land access requirement of September 2017 in order to commence construction works. For Option B or C the envisaged longer construction period would mean that land access would be required around May 2017 to ensure completion of

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construction remained compatible with the Proposed Scheme. BCC would thus need to ensure that the necessary planning approvals were complete ahead of this date, however, given the extent of design and assessment work required and subsequent time required to achieve a successful planning application and obtain the land, this would not appear to be feasible.

7 Evaluation against Assessment Criteria

Table 7-1 Great Missenden Haul Road engineering appraisal sift assessment table

Location:		Great Missenden					
Option name and description:		Great Missenden Haul Road					
OPTIONS CONSIDERED:		A (baseline)		B		C	
OPTION DESCRIPTION		Proposed Scheme – Final Preliminary Design		Alternative haul road, systems compound as Proposed Scheme		Alternative haul road, systems compound at track level	
Headings	Appraisal criteria	QUALITATIVE IMPACT DESCRIPTION and/or QUANTITATIVE ASSESSMENT	RATING	QUALITATIVE IMPACT DESCRIPTION and/or QUANTITATIVE ASSESSMENT	RATING	QUALITATIVE IMPACT DESCRIPTION and/or QUANTITATIVE ASSESSMENT	RATING
Strategic Fit	Capture whether an option meets the Project Specification	The solution is in accordance with the project specification and technical requirements.	O	The solution is in accordance with the project specification and technical requirements.	O	The solution is in accordance with the project specification and technical requirements.	O
Construction Feasibility	Assess the relative complexity of construction Assess the relative construction programme	<p><u>Construction complexity:</u></p> <ul style="list-style-type: none"> The haul road to the north portal requires significant excavation earthworks (pprox.. 150,000m³). The section of haul road on the east side of the alignment requires minimal earthworks. The rail systems compound requires excavation earthworks (pprox.. 20,000m³). Temporary surplus excavated material is approx.. 161,800m³. <p><u>Construction programme:</u></p> <ul style="list-style-type: none"> Current assumed access requirement of September 2017 to start haul road works. Approx. 6month construction duration for the haul road envisaged. 	O	<p><u>Construction complexity:</u></p> <ul style="list-style-type: none"> The haul road construction requires significant excavation earthworks (pprox.. 83,000m³). The section of haul road on the west side of the alignment requires significant excavation earthworks (pprox.. 109,000m³). The rail systems compound requires excavation earthworks (pprox.. 20,000m³). Temporary surplus excavated material is approx.. 169,900m³. <p><u>Construction programme:</u></p> <ul style="list-style-type: none"> Approx. 10month construction duration for the haul road envisaged. An assumed access requirement of May 2017 would be required to start haul road works to ensure construction completion as Option A. Alternative design, assessment and planning process to acquire the necessary land and powers would need to be completed ahead of May 2017; this is considered unlikely to be achievable. 	---	<p><u>Construction complexity:</u></p> <ul style="list-style-type: none"> The haul road construction requires significant excavation earthworks (pprox.. 83,000m³). The section of haul road on the west side of the alignment requires significant excavation earthworks (pprox.. 130,000m³). The rail systems compound requires significant excavation earthworks (pprox.. 66,000m³). Temporary surplus excavated material is approx.. 255,900m³. <p><u>Construction programme:</u></p> <ul style="list-style-type: none"> Approx. 10month construction duration for the haul road envisaged. An assumed access requirement of May 2017 would be required to start haul road works to ensure construction completion as Option A. Alternative design, assessment and planning process to acquire the necessary land and powers would need to be completed ahead of May 2017; this is considered unlikely to be achievable. 	---
		Assess the relative disruption to existing infrastructure, e.g. rail, highways etc	<ul style="list-style-type: none"> The haul road will connect to the Great Missenden roundabout, limited temporary traffic management will be required during construction and removal. Junction improvements will be required at the Great Missenden roundabout to accommodate construction traffic and mitigate delays. 	O	<ul style="list-style-type: none"> A new, temporary traffic junction will be required to provide access from the A413 to the proposed haul road. Additional junction improvements may still be required at the Great Missenden roundabout to accommodate construction traffic and mitigate delays. 	--	<ul style="list-style-type: none"> A new, temporary traffic junction will be required to provide access from the A413 to the proposed haul road. Additional junction improvements may still be required at the Great Missenden roundabout to accommodate construction traffic and mitigate delays.
HS2 Operation Feasibility – Trains (HS2 and Network Rail)	Assess the relative flexibility and reliability of the track layout Assess the relative train maintenance and servicing arrangements	N/A – no impact on track layout or maintenance and servicing arrangements.	O	N/A – no impact on track layout or maintenance and servicing arrangements.	O	N/A – no impact on track layout or maintenance and servicing arrangements.	O
HS2 Operation Feasibility – Operations (Stations, Depots etc)	Assess the effectiveness of Location and space for station control Location and space for accommodating staff, catering, transport police and other “back of house” activities Location and space for passenger facilities such as ticket office, travel information, toilets, left luggage etc Location of ticket barriers	N/A – no impact on Operation Feasibility	o	N/A – no impact on Operation Feasibility	o	N/A – no impact on Operation Feasibility	o

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HS2 Operation Feasibility – Passengers	Assess Passenger Dispersal covering road (right of way), rail and public transport Assess the relative Passenger Connectivity at stations between high speed rail, classic rail, bus, coach, car, taxi, bicycle and pedestrians Assess the relative passenger flow characteristics during emergency evacuation and normal operation at stations Assess the relative ‘Way Finding’ of station layouts i.e. logical flow Assess the relative security or perception of security of station layouts	N/A – no impact on Operation Feasibility	o	N/A – no impact on Operation Feasibility	o	N/A – no impact on Operation Feasibility	o
Demand	Likely Relative Passenger Numbers Likely Journey Times Likely Demand	N/A – no impact on demand	o	N/A – no impact on demand	o	N/A – no impact on demand	o
Costs	Estimated whole life cycle costs to give relative assessment	N/A – capital costs include removal of all temporary access roads on completion of construction.	o	N/A – capital costs include removal of all temporary access roads on completion of construction.	o	N/A – capital costs include removal of all temporary access roads on completion of construction.	o
	Estimated initial capital costs to give relative assessment (The capital costs include construction, land and compensation costs)	£9.00M Includes: Construction, A413/A4128 and A413/B485 junction improvement works and permanent access road from Frith Hill. Excludes: Land and property costs. Costs include indirect costs, less ECP/VE	o	£12.49M Includes: Construction, temporary A413/haul road junction, A413/B485 junction improvement works and permanent access road from Frith Hill. Excludes: Any required A413/A4128 junction improvement works. Costs include indirect costs, less ECP/VE	---	£12.91M Includes: Includes: Construction, temporary A413/haul road junction, A413/B485 junction improvement works and permanent access road from Frith Hill. Excludes: Any required A413/A4128 junction improvement works. Costs include indirect costs, less ECP/VE	---
Environment	Input from ENVIRONMENTAL APPRAISAL MATRIX	Refer to environmental appraisal sift assessment table 7-2.	o	Refer to environmental appraisal sift assessment table 7-2.	--	Refer to environmental appraisal sift assessment table 7-2.	--
Safety	Assess the relative safety during construction,	Standard construction of haul road and highways. Interface with general traffic to be considered and appropriate traffic management measures to be put in place.	o	Standard construction of haul road and highways. Interface with general traffic to be considered and appropriate traffic management measures to be put in place.	o	Standard construction of haul road and highways. Interface with general traffic to be considered and appropriate traffic management measures to be put in place.	o
	Assess the relative safety during Operations, maintenance and decommissioning , and Emergency access	Decommissioning - haul road to be removed and land reinstated on completion of construction.	o	Decommissioning - haul road and temporary junction to be removed and land reinstated on completion of construction.	o	Decommissioning - haul road and temporary junction to be removed and land reinstated on completion of construction.	o
	Previous explicit or implicit public assurances or commitments to third parties	Assurance to BCC regarding Great Missenden haul road on 29 January 2016.	o	Assurance to BCC regarding Great Missenden haul road on 29 January 2016.	o	Assurance to BCC regarding Great Missenden haul road on 29 January 2016.	o
Commercial Development	Does the option provide opportunities for development in particular for over station development	N/A	o	N/A	o	N/A	o
			Overall Rating	Overall Rating	Overall Rating	Overall Rating	Overall Rating
Preferred Option:			o	---	---	---	---
Reason:			Option A – Proposed Scheme				
			Options B and C increase the costs (construction and development) and add significant additional programme risk compared to the Proposed Scheme.				
			Works to the A413/A4128 Great Missenden junction can mitigate the effects of the HS2 construction traffic and not introduce new delay.				
			The concerns regarding visual impact of the haul road shown for the Proposed Scheme are based on the potential visibility of the haul road; however the design would include screening and much of the route would lie in cutting as it rises up to the HS2 alignment. The Proposed Scheme will avoid the loss of known prehistoric archaeological finds adjacent to the A413 and Leather Lane junction. The Proposed Scheme will avoid additional delays to vehicular users of Leather Lane accessing and egressing the A413.				
			It is envisaged that the concerns regarding safety at the roundabout with the addition of construction traffic and the haul road addition would be addressed through detailed design and road safety assessments.				

Great Missenden Haul Road Sift Report

---	Major worsening on the Comparator Scheme
--	Minor worsening on Comparator Scheme
o	Neutral / no change to Comparator Scheme
+	Minor improvement on Comparator Scheme
+++	Major improvement on Comparator Scheme
N/A	Not applicable

Great Missenden Haul Road Sift Report

Table 7-2 Great Missenden Haul Road environmental appraisal sift assessment table

Location:				Great Missenden, Buckinghamshire					
Option name and description:				Great Missenden Haul Road					
OPTIONS CONSIDERED:				A		B		C	
OPTION DESCRIPTION				Proposed scheme – haul road from A413 Aylesbury Road / A4128 Link Road roundabout.		Alternative haul road running parallel to Leather Lane with rail systems compound (Chiltern tunnel north portal satellite compound) as per the Proposed Scheme.		Alternative haul road running parallel to Leather Lane with rail systems compound (Chiltern tunnel north portal satellite compound) located at track level near to Leather Lane.	
Key Sustainability Issue	Topic	STAGE: Construction or Operation	Environmental Design Aim considered (incl. Topic and Ref no.) Comment	QUALITATIVE IMPACT DESCRIPTION and/or QUANTITATIVE ASSESSMENT	RATING	QUALITATIVE IMPACT DESCRIPTION and/or QUANTITATIVE ASSESSMENT	RATING	QUALITATIVE IMPACT DESCRIPTION and/or QUANTITATIVE ASSESSMENT	RATING
Greenhouse gas emissions and climate change	Climate adaptability	Const	CC-7 HL-7	N/A – Not assessed		N/A – Not assessed			
		Op		N/A – Not assessed		N/A – Not assessed			
	Greenhouse gas emissions	Const		N/A – Not assessed		N/A – Not assessed			
		Op		N/A – Not assessed		N/A – Not assessed			
	Energy use	Const		N/A – Not assessed		N/A – Not assessed			
		Op		N/A – Not assessed		N/A – Not assessed			
Natural and cultural resource protection and environmental enhancement	Landscape/townscape	Const	HL-10 LV-1 LV-2 LV-3 LV-6	<p>The AP4 ES reported a moderate adverse significant effect on the Misbourne Upper North LCA as a result of the introduction of new features within the rural setting and the disruption of field patterns, altering key characteristics of the landscape and a major adverse significant effect on the Lee and Buckland Common Farmland LCA during construction due to the presence of construction activities and the Leather Lane and Footpath GMI/2 accommodation overbridges, altering key characteristics of the landscape.</p> <p>Significant effects on a number of visual receptors were reported in the AP4 ES relating to the presence of construction activity changing the rural outlook for the following viewpoints to the south and west of the HS2 alignment: Views from Public Right of Way (PRoW) (Footpath GMI/12/1); view from PRoW (Footpath GMI/13/3); and view Bury Field House.</p>	o	<p>The proposed haul road of Option B from the Chiltern tunnel north portal running west parallel to the HS2 alignment will be largely within the land potentially required during construction as set out in the Proposed Scheme. Given the scale of the proposed construction activities in this area the realignment of the haul road would not alter the effects predicted for the Proposed Scheme on landscape character. The omission of the haul road opposite to Bury Field House would remove construction activities from a relatively prominent location on the rising ground. The revised access point off the A413 for the proposed haul road would be a new temporary feature in the landscape with loss of existing A413 highway boundary features. The Great Missenden Haul Road Satellite Compound and temporary material stockpiles would be visible from the A413. Access points to Leather Lane and the A413 would result in some limited loss of mature hedgerow trees.</p> <p>The construction activities would be prominent elements in the views from the footpaths (and their diversion) Viewpoint 091.3.002: view north-east from PRoW (Footpath GMI/12/1) and 091.3.001: view north-east from PRoW (Footpath GMI/13/3) although the Proposed Scheme haul road, Chiltern tunnel north portal access road satellite compound and some temporary material stockpiles would be omitted compared to the Proposed Scheme. The impact on Viewpoint AP4.091.2.003: view north-east from Bury Field House would be reduced. However, views of the proposed haul road, temporary stockpiles and Great Missenden Haul Road Satellite Compound</p>	o	<p>The proposed haul road of Option C from the Chiltern tunnel north portal running west parallel to the HS2 alignment and the Chiltern tunnel North Portal (Rail Systems) Satellite Compound will be largely within the land potentially required during construction as set out in the Proposed Scheme. Given the scale of the proposed construction activities in this area the realignment of the haul road would not alter the effects predicted for the Proposed Scheme on landscape character. The omission of the haul road opposite to Bury Field House would remove construction activities from a relatively prominent location on the rising ground. The revised access point off the A413 for the proposed haul road would be a new temporary feature in the landscape with loss of existing A413 highway boundary features. The Great Missenden Haul Road Satellite compound and temporary material stockpiles would be visible from the A413. Access points to Leather Lane and the A413 would result in some limited loss of mature hedgerow trees.</p> <p>The construction activities would be prominent elements in the views from the footpaths (and their diversion) Viewpoint 091.3.002: view north-east from PRoW (Footpath GMI/12/1) and 091.3.001: view north-east from PRoW (Footpath GMI/13/3) although the haul road, Chiltern tunnel north portal access road satellite compound and some temporary material</p>	o

Great Missenden Haul Road Sift Report

Location:				Great Missenden, Buckinghamshire					
Option name and description:				Great Missenden Haul Road					
OPTIONS CONSIDERED:				A		B		C	
OPTION DESCRIPTION				Proposed scheme – haul road from A413 Aylesbury Road / A4128 Link Road roundabout.		Alternative haul road running parallel to Leather Lane with rail systems compound (Chiltern tunnel north portal satellite compound) as per the Proposed Scheme.		Alternative haul road running parallel to Leather Lane with rail systems compound (Chiltern tunnel north portal satellite compound) located at track level near to Leather Lane.	
						would be possible from Laurel Lodge to the south. Overall impacts relatively similar in magnitude to the Proposed Scheme.		stockpiles would be omitted compared to the Proposed Scheme. The impact on Viewpoint AP4.091.2.003: view north-east from Bury Field House would be reduced. However, views of the proposed haul road, temporary stockpiles and Great Missenden Haul Road Satellite Compound would be possible from Laurel Lodge to the south. Overall impacts relatively similar in magnitude to the Proposed Scheme.	
		Op		The AP4 ES reported that the Misbourne Upper North LCA would not be significantly affected during operation as the majority of temporary work areas would be reinstated. Moderate adverse and significant effects on the Lee and Buckland Common Farmland LCA during operation are reported due to the presence of new infrastructure in the landscape, reducing to non-significant in years 15 and 60 when mitigation planting has established. The AP4 ES reported significant effects on a number of visual receptors to the south and west of the HS2 alignment due to the cutting, the tunnel portal and the Footpath GMI/12 and Footpath GMI/2 accommodation overbridges and the Leather Lane overbridge. These include: Views from PRow (Footpath GMI/12/1); view from PRow (Footpath GMI/13/3); and view Bury Field House.	o	Changes to the haul road and temporary material stockpiles will not change the operational assessment for the Proposed Scheme assuming all temporary works are reinstated to the existing condition.	o	Changes to the haul road and temporary material stockpiles will not change the operational assessment for the Proposed Scheme assuming all temporary works are reinstated to the existing condition.	o
	Cultural heritage	Const	HL-12 CH-1 CH-4 CH-5 CH-7 CH-8	The closest designated heritage asset is the Parsonage Wood Ancient Woodland (CC062). The haul road runs against the edge of the woodland but does not encroach upon it. The setting of the wood is not important to its value and therefore there are no predicted impacts on the woodland. There are no known archaeological remains within the footprint of the scheme, however there have been no specific archaeological surveys done in this area to date and as such there is the potential for archaeological remains from the prehistoric period onwards to be removed by the construction of the scheme.	o	Grim’s Ditch scheduled monument (CC107) and Cottage Farm listed buildings are located c. 300m to the northwest of the proposed haul road. However given that construction activities will take place closer to these assets than the haul road, no additional significant effects are predicted. A milestone (CC096) is located c. 100m to the north-west of the junction of the haul road with the A413, however the milestone won’t be affected by the Proposed Scheme. There are known prehistoric archaeological finds (CC083) in the area of the A413 junction and proposed Great Missenden Haul Road Satellite Compound. The removal of these archaeological remains is likely to cause a new significant effect and therefore a worsening over the Proposed Scheme.	--	Grim’s Ditch scheduled monument (CC107) and Cottage Farm listed buildings are located c. 300m to the northwest of the proposed haul road. However given that construction activities will take place closer to these assets than the haul road, no additional significant effects are predicted. A milestone (CC096) is located c. 100m to the north-west of the junction of the haul road with the A413, however the milestone won’t be affected by the Proposed Scheme. There are known prehistoric archaeological finds (CC083) in the area of the A413 junction and proposed Great Missenden Haul Road Satellite Compound. The removal of these archaeological remains is likely to cause a new significant effect and hence a worsening over the Proposed Scheme.	--

Great Missenden Haul Road Sift Report

Location:				Great Missenden, Buckinghamshire					
Option name and description:				Great Missenden Haul Road					
OPTIONS CONSIDERED:				A		B		C	
OPTION DESCRIPTION				Proposed scheme – haul road from A413 Aylesbury Road / A4128 Link Road roundabout.		Alternative haul road running parallel to Leather Lane with rail systems compound (Chiltern tunnel north portal satellite compound) as per the Proposed Scheme.		Alternative haul road running parallel to Leather Lane with rail systems compound (Chiltern tunnel north portal satellite compound) located at track level near to Leather Lane.	
		Op		As the haul road will be temporary and only used during construction there will be no operational effects.	o	As the haul road will be temporary and only used during construction there will be no operational effects.	o	The new location of the Chiltern tunnel North Portal (Rail Systems) Satellite Compound is within the land required for the Proposed Scheme, and as such there will be no additional significant effect.	o
Biodiversity	Const		HL-10, HL-11, EC-2, EC-3, EC-4, EC-5, EC-7, WR-9	<p>Sites There is no effect on statutory or non-statutory sites designated for nature conservation.</p> <p>Habitats Ancient woodland of Jenkin’s Wood and Stocking’s Wood are both adjacent to the temporary haul route. However, no effects from emissions or dust are likely due to implementation of the Code of Construction Practice (CoCP) and the temporary nature of the construction phase. The temporary haul route crosses hedges likely to be habitats of principal importance (HPI) throughout. Hedges will also be affected by temporary material stockpiles. The haul route passes through scattered trees and semi-improved grassland near Park Farm.</p> <p>Species Bats – the woodland to north of the haul road holds several trees with high roosting potential. A confirmed roost is also found within a building on Potter Row. Construction of the haul road may impact flight lines.</p> <p>Minimal impact on all other known protected species.</p>	o	<p>Sites There is no effect on statutory or non-statutory sites designated for nature conservation.</p> <p>Habitats Ancient woodland of Havenfield Wood is close to the alternative temporary haul road of Option B. However, no effects from emissions or dust are likely due to implementation of the CoCP and the temporary nature of the construction phase. The extent of hedges crossed by Option B is comparable to that in the Proposed Scheme but temporary material stockpiles as indicated would not result in the loss of hedges.</p> <p>Species Bats – Lessened impact of route running to the south of scheme due to diversion away from flight lines linking woodland habitat and known roost site. Badger – Potential for slight increase in impact on badgers found in Havenfield Wood due to the proximity of Option B increasing the impact on foraging areas and possible fragmentation of territory.</p> <p>Assessment of Option B running parallel to Leather Lane and associated compound and temporary material stockpiles limited due to lack of survey data for the area (not previously surveyed as outside of Consolidated Construction Boundary (CCB)).</p> <p>Minimal impact on all other known protected species.</p> <p>Impacts of Option B similar to those of the Proposed Scheme.</p>	o	<p>Sites There is no effect on statutory or non-statutory sites designated for nature conservation.</p> <p>Habitats Ancient woodland of Havenfield Wood is close to the temporary haul road of Option C. It would remove approximately 0.03 hectares of the wood (equating to approximately 1%) which is HPI, but not a part considered to be ancient, however the national data set is not always accurate. The extent of hedges crossed by Option C is comparable to that in the Proposed Scheme but temporary material stockpiles or the satellite compound as indicated would not result in the loss of hedges.</p> <p>Species Bats – Lessened impact of route running to the south of the Proposed Scheme due to diversion away from flight lines linking woodland habitat and known roost site. Badger – Potential for increased impact on badgers found in Havenfield Wood due to the proximity of Option C has increasing the impact on foraging areas and possible fragmentation of territory.</p> <p>Assessment of Option C running parallel to Leather Lane and associated compound and temporary material stockpiles limited due to lack of survey data for the area (not previously surveyed as outside of CCB).</p> <p>Minimal impact on all other known protected species.</p> <p>Impacts of Option C similar to those of the Proposed Scheme</p>	o

Great Missenden Haul Road Sift Report

Location:				Great Missenden, Buckinghamshire					
Option name and description:				Great Missenden Haul Road					
OPTIONS CONSIDERED:				A		B		C	
OPTION DESCRIPTION				Proposed scheme – haul road from A413 Aylesbury Road / A4128 Link Road roundabout.		Alternative haul road running parallel to Leather Lane with rail systems compound (Chiltern tunnel north portal satellite compound) as per the Proposed Scheme.		Alternative haul road running parallel to Leather Lane with rail systems compound (Chiltern tunnel north portal satellite compound) located at track level near to Leather Lane.	
	Water and flood risk	Op		N/A – construction only.	o	N/A – construction only.	o	N/A – construction only.	o
		Const	HL-9, HL-10, WR-1, WR-2, WR-3, WR-4, WR-6, WR-8	No significant temporary adverse effects on surface water resources during the construction period.	o	No change from the Proposed Scheme.	o	No change from the Proposed Scheme.	o
Creating sustainable communities	Air quality	Op		N/A – construction only.	o	N/A – construction only.	o	N/A – construction only.	o
		Const	AQ-1, AQ-3	N/A – Not assessed		N/A – Not assessed		N/A – Not assessed	
	Op		N/A – Not assessed		N/A – Not assessed		N/A – Not assessed		
	Sound and vibration	Const	HL-13, SE-1, SV-1	<p>The nearest noise sensitive receptors to the haul road are dwellings on Frith Hill and on Potter Row, approximately 300m and 80m from the haul road at closest approach respectively.</p> <p>No dwellings in the vicinity of the haul road are forecast to experience noise levels higher than noise insulation trigger levels during construction.</p> <p>No significant construction noise effects on residential communities have been identified in the vicinity of the haul road.</p> <p>No likely significant construction noise or vibration effects on non-residential receptors have been identified in the vicinity of the haul road.</p> <p>No significant indirect noise effects on residential and non-residential receptors have been identified in the vicinity of the haul road.</p>	o	<p>The nearest noise sensitive receptors to Option B are Cottage Farm Lodge on Aylesbury Road and Laurel Lodge, approximately 200m and 250m from the Option B at closest approach respectively.</p> <p>No new or different significant construction noise effects are likely due to the Option B haul road.</p> <p>While noise levels from the Proposed Scheme at properties to the south west of Frith Hill do not lead to significant effects, moving the haul road will reduce noise levels at these dwellings as the construction of the haul road is the construction activity leading to the highest forecast noise levels at these properties.</p> <p>While noise from operation of the haul road is likely to reduce at properties on Potter Row with Option B compared to the Proposed Scheme, the highest forecast noise levels from construction are from other activities associated with construction of the cutting so are not likely to change.</p> <p>Cottage Farm Lodge on Aylesbury Road and Laurel Lodge are likely to experience additional noise compared to the Proposed Scheme from construction and operation of Option B haul road, however the highest forecast noise level is unlikely to lead to a significant effect.</p> <p>Overall, magnitude impacts are similar to the Proposed Scheme.</p>	o	<p>The nearest noise sensitive receptors to Option C are Cottage Farm Lodge on Aylesbury Road and Laurel Lodge, approximately 200m and 250m from the Option C at closest approach respectively.</p> <p>No new or different significant construction noise effects are likely due to the alternative location of the haul road and satellite compound.</p> <p>While noise levels from the Proposed Scheme at properties to the south west of Frith Hill do not lead to significant effects, moving the haul road will reduce noise levels at these dwellings as the construction of Option C is the construction activity leading to the highest forecast noise levels at these properties with the Proposed Scheme.</p> <p>While noise from operation of the haul road is likely to reduce at properties on Potter Row with Option C compared to the Proposed Scheme, the highest forecast noise levels from construction are from other activities associated with construction of the cutting so are not likely to change.</p> <p>Cottage Farm Lodge on Aylesbury Road and Laurel Lodge are likely to experience additional noise compared to the Proposed Scheme from construction and operation of Option C, however the highest forecast noise level is unlikely to lead to a significant effect.</p> <p>Overall, magnitude impacts are similar to the Proposed Scheme.</p>	o
		Op		N/A – construction only.	o	N/A – construction only.	o	N/A – construction only.	o

Great Missenden Haul Road Sift Report

Location:				Great Missenden, Buckinghamshire					
Option name and description:				Great Missenden Haul Road					
OPTIONS CONSIDERED:				A		B		C	
OPTION DESCRIPTION				Proposed scheme – haul road from A413 Aylesbury Road / A4128 Link Road roundabout.		Alternative haul road running parallel to Leather Lane with rail systems compound (Chiltern tunnel north portal satellite compound) as per the Proposed Scheme.		Alternative haul road running parallel to Leather Lane with rail systems compound (Chiltern tunnel north portal satellite compound) located at track level near to Leather Lane.	
Community integrity	Const	HL-4, SE-1, SE-3, CO-1, CO-2, CO-3, CO-4, CO-10, CO-11	No significant temporary adverse effects on community during the construction period of the haul road.	o	No change from the Proposed Scheme.	o	No change from the Proposed Scheme.	o	
			N/A – construction only.	o	N/A – construction only.	o	N/A – construction only.	o	
	Op	TT-1, TT-3, TT-4, TT7, TT9	Major adverse impact identified with regard to delays to users, within the HS2 ES, due to construction traffic using the A413/A4128/HS2 haul road junction. This would impact upon vehicular users of the junction and accessibility into and out of Great Missenden.	o	It is considered that junction improvements would still be required at the B485 Chesham Road junction as for the Proposed Scheme and that improvements may still be required at the Great Missenden/Link Road roundabout to accommodate construction traffic and mitigate delays.	--	It is considered that junction improvements would still be required at the B485 Chesham Road junction as for the Proposed Scheme and that improvements may still be required at the Great Missenden/Link Road roundabout to accommodate construction traffic and mitigate delays.	--	
			Junction improvements will be required at the Great Missenden/Link Road and B485 Chesham Road roundabouts to accommodate construction traffic and mitigate delays.		A new signalised junction would be required on the A413 by Leather Lane. The junction would add a new control point on the A413, leading to some additional delay to vehicular users. There will also be some additional delay to vehicular users of Leather Lane (overall worsening in comparison to the Proposed Scheme).		A new signalised junction would be required on the A413 by Leather Lane. The junction design would add a new control point on the A413, leading to some additional delay to vehicular users. There will also be some additional delay to vehicular users of Leather Lane (overall worsening in comparison to the Proposed Scheme).		
			Junction improvement designs have been tested and show a nil detriment impact (and indeed some improvement with regard to delay) upon users of the junction, during construction of the Proposed Scheme.		There is no significant change with regard to non-motorised user severance (ability for non-motorised users to cross public highways), in comparison to the Proposed Scheme.		There is no significant change with regard to non-motorised user severance (ability for non-motorised users to cross public highways), in comparison to the Proposed Scheme.		
	Const	TT-1, TT-3, TT-4, TT7, TT9	Junction improvements will be required at the Great Missenden/Link Road and B485 Chesham Road roundabouts to accommodate construction traffic and mitigate delays.		A new signalised junction would be required on the A413 by Leather Lane. The junction would add a new control point on the A413, leading to some additional delay to vehicular users. There will also be some additional delay to vehicular users of Leather Lane (overall worsening in comparison to the Proposed Scheme).		A new signalised junction would be required on the A413 by Leather Lane. The junction design would add a new control point on the A413, leading to some additional delay to vehicular users. There will also be some additional delay to vehicular users of Leather Lane (overall worsening in comparison to the Proposed Scheme).		
Junction improvement designs have been tested and show a nil detriment impact (and indeed some improvement with regard to delay) upon users of the junction, during construction of the Proposed Scheme.				There is no significant change with regard to non-motorised user severance (ability for non-motorised users to cross public highways), in comparison to the Proposed Scheme.		There is no significant change with regard to non-motorised user severance (ability for non-motorised users to cross public highways), in comparison to the Proposed Scheme.			
Op	TT-1, TT-3, TT-4, TT7, TT9	Footpath GMI/13 will be temporarily stopped up and diverted via Footpath GMI/12 during the construction phase, leading to additional travel distance to non-motorised users of Footpath GMI/13.		Footpath GMI/12 will be temporarily stopped up and diverted via Footpath GMI/13 during the construction phase. Improvement (in comparison to the Proposed Scheme) for users of Footpath GMI/13, but worsening for users of Footpath GMI/12. Overall, it is considered there is no significant change in comparison to the Proposed Scheme, with regard to additional travel distances and journey times for PRoW users.		Footpath GMI/12 will be temporarily stopped up and diverted via Footpath GMI/13 during the construction phase. Improvement (in comparison to the Proposed Scheme) for users of Footpath GMI/13, but worsening for users of Footpath GMI/12. Overall, it is considered there is no significant change in comparison to the Proposed Scheme, with regard to additional travel distances and journey times for PRoW users.			
		Overall a minor worsening due to new delays to road users.		Overall a minor worsening due to new delays to road users.		Overall a minor worsening due to new delays to road users.			
Op	TT-1, TT-3, TT-4, TT7, TT9	N/A – construction only. No significant impact upon traffic and transport.	o	Assuming the new junction is removed, and existing A413/Leather Lane junction re-instated, no significant difference to the Proposed Scheme.	o	Assuming the new junction is removed, and existing A413/Leather Lane junction re-instated, no significant difference to the Proposed Scheme.	o		
		N/A – construction only. No significant impact upon traffic and transport.		Assuming the new junction is removed, and existing A413/Leather Lane junction re-instated, no significant difference to the Proposed Scheme.		Assuming the new junction is removed, and existing A413/Leather Lane junction re-instated, no significant difference to the Proposed Scheme.			
Health & wellbeing	Const	HL-13, SE-1, SV-1	N/A – Not assessed		N/A – Not assessed		N/A – Not assessed		
	Op	HL-13, SE-1, SV-1	N/A – Not assessed		N/A – Not assessed		N/A – Not assessed		

Great Missenden Haul Road Sift Report

Location:				Great Missenden, Buckinghamshire					
Option name and description:				Great Missenden Haul Road					
OPTIONS CONSIDERED:				A		B		C	
OPTION DESCRIPTION				Proposed scheme – haul road from A413 Aylesbury Road / A4128 Link Road roundabout.		Alternative haul road running parallel to Leather Lane with rail systems compound (Chiltern tunnel north portal satellite compound) as per the Proposed Scheme.		Alternative haul road running parallel to Leather Lane with rail systems compound (Chiltern tunnel north portal satellite compound) located at track level near to Leather Lane.	
		Socio-economic factors	Const	CO-8	N/A – Not assessed		N/A – Not assessed		
			Op		N/A – Not assessed		N/A – Not assessed		
Sustainable consumption and production	Agriculture, soil & land use	Const	HL16, AS-1	<p>The Proposed Scheme haul road extends for approximately 800m with a constructed width (including soil bunds) of some 50-150m. It will require the temporary use of some 8.0ha of best and most versatile (BMV) agricultural land. Overall, in this local area the temporary impact on BMV land was assessed as major/moderate and significant.</p> <p>Current information suggests that 2 (possibly 3) holdings will be affected:</p> <ul style="list-style-type: none"> Bury Farm (CFA09/6), 35ha grassland farm let for grazing; temporary effect of construction already assessed as moderate significant due to the proportion of the holding required and severance. Mulberry Park Hill (CFA09/7) a grassland farm used for livestock grazing; temporary effect of construction assessed as moderate and significant. A third holding is potentially affected at the southern end of the haul road for which no data is available. 	o	<p>Option B haul road extends for approximately 2,000m with a constructed width of between 50-150m (including soil bunds). However, much of this land was already included in the original construction area such that the <u>additional</u> area of temporary land required is estimated to be approximately 6ha – and the temporary impact on BMV land remains major/moderate and significant.</p> <p>In terms of the holdings affected these will be:</p> <ul style="list-style-type: none"> Bury Farm (CFA09/6) – the area of land required remains as previously reported (18.5ha) and the overall assessment of effect remains as previously assessed - moderate significant due to the proportion of the holding required and severance. Springfield Farm (CFA09/8) a 24ha grassland farm let for grazing. There would a marginal increase in the area of land required for the haul route but the overall effect remains as previously assessed - moderate adverse (which is significant) due to the proportion of the holding required. Strawberry Hill Farm (CFA10/2), a 220ha arable and grassland farm. The area of agricultural land required on a temporary basis for the Proposed Scheme was 43ha and assessed as a major/moderate significant effect. Option B would increase the area of land required by a further 1-2ha but the impact would remain major/moderate which is significant. Mulberry Park Hill (CFA09/7) would lose the use of a further approximately 6ha of agricultural land alongside Leather Lane for a temporary period. Overall, the temporary effect remains as previously assessed – moderate and significant. <p>Overall, the magnitude of impacts is considered a minor worsening over the Proposed Scheme due to the additional land required during construction.</p>	--	<p>Option C is very similar to Option B.</p> <p>The haul road extends for approximately 2,000m with a constructed width of between 50-150m (including soil bunds). However, much of this land was already included in the original construction area such that the <u>additional</u> area of temporary land required is estimated to be approximately 6.5ha – and the temporary impact on BMV land remains major/moderate and significant.</p> <p>In terms of the holdings affected these will be:</p> <ul style="list-style-type: none"> Bury Farm (CFA09/6) – the area of land required remains as previously reported (18.5ha) and the overall assessment of effect remains as previously assessed - moderate significant due to the proportion of the holding required and severance. Springfield Farm (CFA09/8) a 24ha grassland farm let for grazing. There would a slightly greater increase (0.5ha) in the area of land required for the haul route and satellite compound but the overall effect remains as previously assessed moderate due to the proportion of the holding required. Strawberry Hill Farm (CFA10/2) a 220ha arable and grassland farm. The area of agricultural land required on a temporary basis for the Proposed Scheme was 43ha and assessed as a major/moderate significant effect. Option C would increase the area of land required by a further 1-2ha but the impact would remain a major/moderate which is significant. Mulberry Park Hill (CFA09/7) would lose the use for a temporary period of a further approximately 6ha of agricultural land alongside Leather Lane. Overall, the temporary effect remains as previously assessed – 	--

Great Missenden Haul Road Sift Report

Location:				Great Missenden, Buckinghamshire					
Option name and description:				Great Missenden Haul Road					
OPTIONS CONSIDERED:				A		B		C	
OPTION DESCRIPTION				Proposed scheme – haul road from A413 Aylesbury Road / A4128 Link Road roundabout.		Alternative haul road running parallel to Leather Lane with rail systems compound (Chiltern tunnel north portal satellite compound) as per the Proposed Scheme.		Alternative haul road running parallel to Leather Lane with rail systems compound (Chiltern tunnel north portal satellite compound) located at track level near to Leather Lane.	
								moderate and significant.	
		Op		N/A – construction only.	o	N/A – construction only.	o	Overall, the magnitude of impacts is considered a minor worsening over the Proposed Scheme due to the additional land required during construction.	o
Land quality	Const	LQ-1, LQ-7	N/A – Not assessed		N/A – Not assessed				
	Op		N/A – Not assessed		N/A – Not assessed				
Waste & material resources	Const	HL-14, HL15, WM-1	N/A – Not assessed		N/A – Not assessed				
	Op		N/A – Not assessed		N/A – Not assessed				
				Overall Rating	o	Overall Rating	--	Overall Rating	--
Reason for overall rating:				The Proposed Scheme.		Overall a minor worsening over the Proposed Scheme due to worsening of impacts to cultural heritage assets due to the removal known prehistoric archaeological finds (CC083) in the area of the A413 junction and proposed Great Missenden Haul Road Satellite Compound likely resulting in a new significant effect; additional agricultural land temporarily required; a worsening for traffic impacts due to new temporary signalised junction on the A413 and additional delays to Leather Lane traffic. Improvement may still be required at the Great Missenden/Link Road roundabout to accommodate construction traffic and mitigate delays.		Similar to Option B, a minor worsening over the Proposed Scheme due to worsening of impacts similar to Option B to heritage assets, likely resulting in a new significant effect; additional agricultural land temporarily required; a worsening of traffic impacts due to new temporary signalised junction on the A413 and additional delays to Leather Lane traffic. Improvement may still be required at the Great Missenden/Link Road roundabout to accommodate construction traffic and mitigate delays.	

[insert title] Sift Report

8 Level of sift

8.1.1 This report applies to Sift Level 5.

9 Conclusions and recommendations

9.1 Conclusions

9.1.1 The assessment indicates that the most appropriate alternative option for a haul road near Leather Lane would be Option B, which would achieve the same outcome as Option C but with less impact on final earthworks and with slightly less cost.

9.1.2 For Option B to be considered an acceptable alternative to Option A then it must demonstrate that it could provide an appropriate equivalent construction access which could be delivered in-line with the assurance requirements as provided by the Promoter to BCC; namely no additional cost, no new significant environmental impacts and no impact on programme. The sift assessment indicates the following:

- Cost – Option B is assessed at £12.49m construction cost, compared to £9.00m for Option A (the Proposed Scheme). This cost difference would increase if improvement works were required at the A413/A4128 Great Missenden roundabout as part of the mitigation works, as Option B currently excludes any works at this junction. Option B thus fails the assurance on cost grounds.
- A new likely adverse significant effect through the removal of known prehistoric archaeological finds in the area of the A413 junction and proposed Great Missenden Haul Road Satellite compound. Option B thus fails the assurance on environmental grounds;
- Additional delays to vehicular users of the A413 and Leather Lane.
- Programme – The current HS2 programme assumptions assume land access is required for haul road construction in September 2017, as part of the Early Works Contract. Option B & C construction activities to install the temporary haul road are estimated to take approx. 10months or some 4 months longer than the Proposed Scheme. Together with the development time to acquire the land necessary before construction commences, it is likely that there would be a delay to availability of the haul road for construction purposes affecting the HS2 construction programme. Options B & C would thus add significant risk to, and likely extend, the construction programme, thus failing the assurance on programme grounds.

[insert title] Sift Report

- 9.1.3 In addition to the point cost estimate comparison between options, there would be significant additional costs to be incurred in the development of the appropriate planning application, necessary to acquire the additional land necessary for any alternative option. This would need to be developed and promoted by BCC and which is envisaged would need to be progressed through a Transport & Works Act Order (TWAO). This would require detailed environmental appraisal, land acquisition and appraisals which could take approximately 9 months to complete and submit to a Planning Inquiry. Associated costs would be high, likely >£1m based on previous experience.

9.2 Recommendations

- 9.2.1 Given the increased cost of the alternative options, the high development costs that would be incurred and significant additional programme risk, it is not recommended to change the Proposed Scheme.
- 9.2.2 The Promoter has submitted information to BCC indicating that works to the A413/A4128 Great Missenden junction can mitigate the effects of the HS2 construction traffic and not introduce new delay; this would provide a legacy benefit to the operation of this junction. It would refute concerns regarding additional congestion due to HS2 traffic
- 9.2.3 The concerns regarding visual impact of the haul road shown for the Proposed Scheme are based on the potential visibility of the haul road; however the design would include screening and much of the route would lie in cutting as it rises up to the HS2 alignment. The Proposed Scheme will avoid the loss of known prehistoric archaeological finds adjacent to the A413 and Leather Lane junction. The Proposed Scheme will avoid additional delays to vehicular users of Leather Lane accessing and egressing the A413 and avoid introducing an additional junction onto the A413.
- 9.2.4 It is envisaged that the concerns regarding safety at the roundabout with the addition of construction traffic and the haul road addition would be addressed through detailed design and road safety assessments.

Appendices

Appendix A Option Sketches

A.1 C222-ATK-EV-DPL-020-250906-PET000000

Great Missenden Haul Road Option A – Proposed Scheme, Construction Phase

A.2 C222-ATK- EV-DPL-020-251906-PET000000

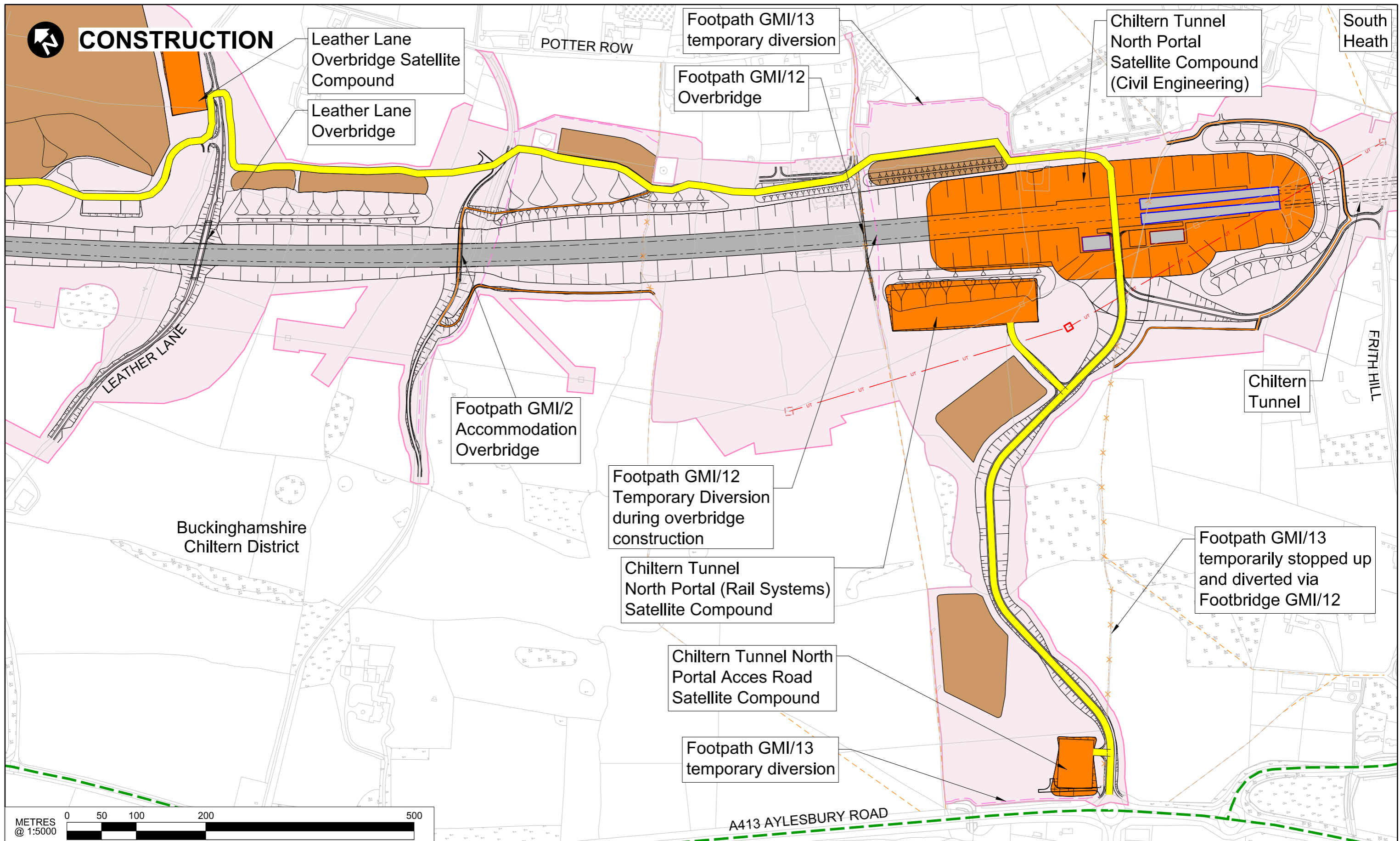
Great Missenden Haul Road Option B – Construction Phase

A.3 C222-ATK- EV-DPL-020-252906-PET000000

Great Missenden Haul Road Option C – Construction Phase

A.4 C222-ATK- EV-DPL-020-260906-PET000000

Great Missenden Haul Road Options A, B & C – Operation Phase



P00.1					
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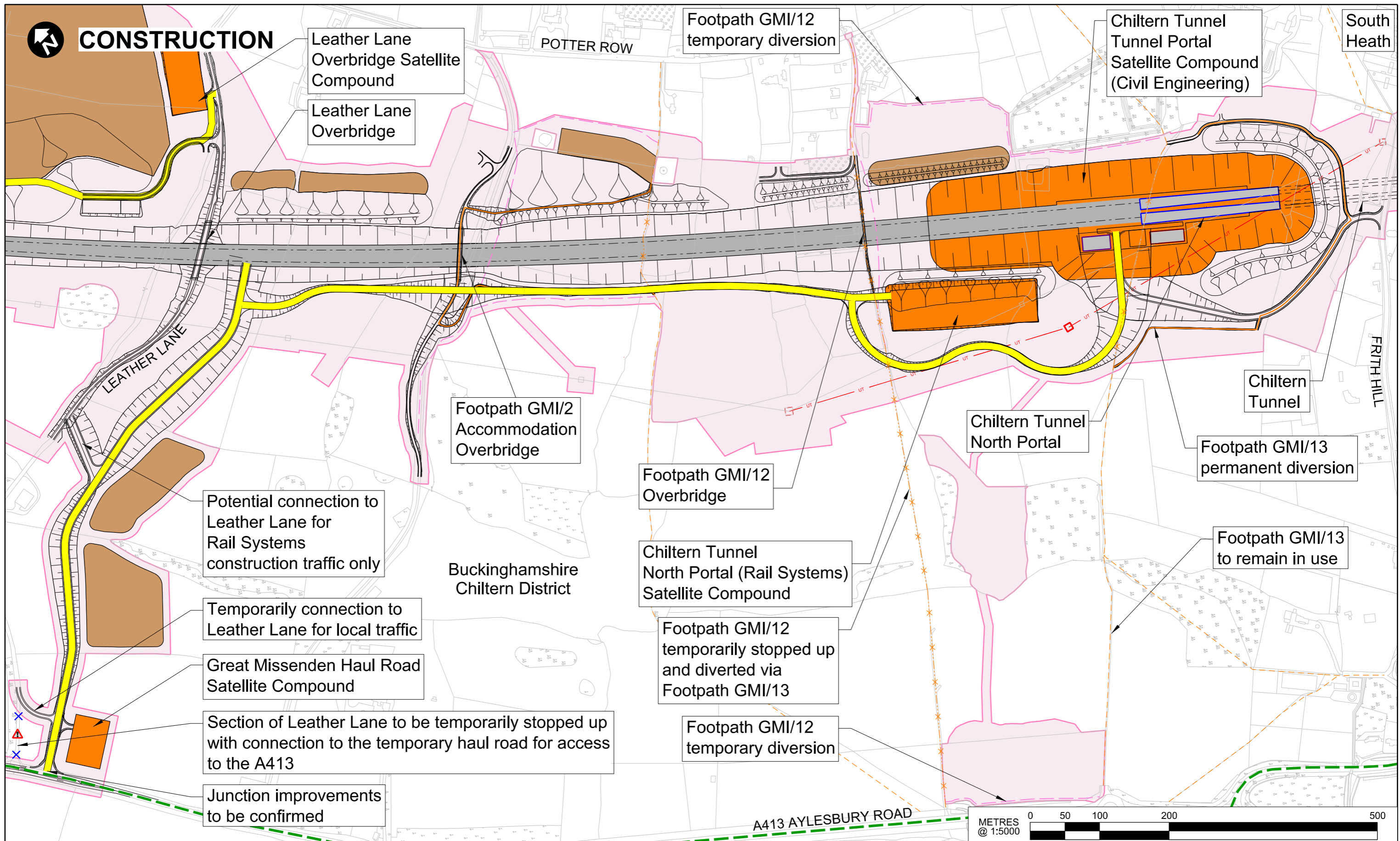
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	Satellite construction compound
	Main construction compound
	Tunnel portal
	Rail alignment formation
	Tunnels external extent
	Rail alignment
	Engineering earthworks
	Landscape earthworks
	Land potentially required during construction
	Temporary site access route / haul route
	Construction traffic route
	Existing public right of way (PRoW)
	New, diverted or realigned PRoW
	Stopped-up PRoW
	Temporary PRoW
	Temporary material stockpile

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Zone	Country South
Design Stage	DESIGN-FOR-PETITION
Drawing Title	Great Missenden Haul Road Option A - Proposed scheme Construction Phase

Project/Contract	Country South Design		
Discipline/Function	Environmental		
Drawn	IE	Checked	Approved
Date	11/07/2016	Scale	AS SHOWN
		Size	A3
Drawing No.	C222-ATK-EV-DPL-020-250906-PET000000		Rev.
			P00.1



CONSTRUCTION

Leather Lane Overbridge Satellite Compound
Leather Lane Overbridge

Footpath GMI/12 temporary diversion

Chiltern Tunnel Tunnel Portal Satellite Compound (Civil Engineering)

South Heath

POTTER ROW

LEATHER LANE

Footpath GMI/2 Accommodation Overbridge

Footpath GMI/12 Overbridge

Chiltern Tunnel North Portal

Chiltern Tunnel

Footpath GMI/13 permanent diversion

Footpath GMI/13 to remain in use

Potential connection to Leather Lane for Rail Systems construction traffic only

Temporarily connection to Leather Lane for local traffic

Great Missenden Haul Road Satellite Compound

Section of Leather Lane to be temporarily stopped up with connection to the temporary haul road for access to the A413

Junction improvements to be confirmed

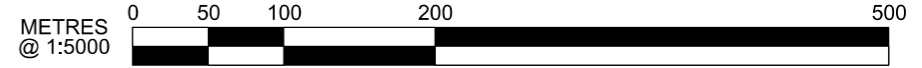
Buckinghamshire Chiltern District

Chiltern Tunnel North Portal (Rail Systems) Satellite Compound

Footpath GMI/12 temporarily stopped up and diverted via Footpath GMI/13

Footpath GMI/12 temporary diversion

A413 AYLESBURY ROAD



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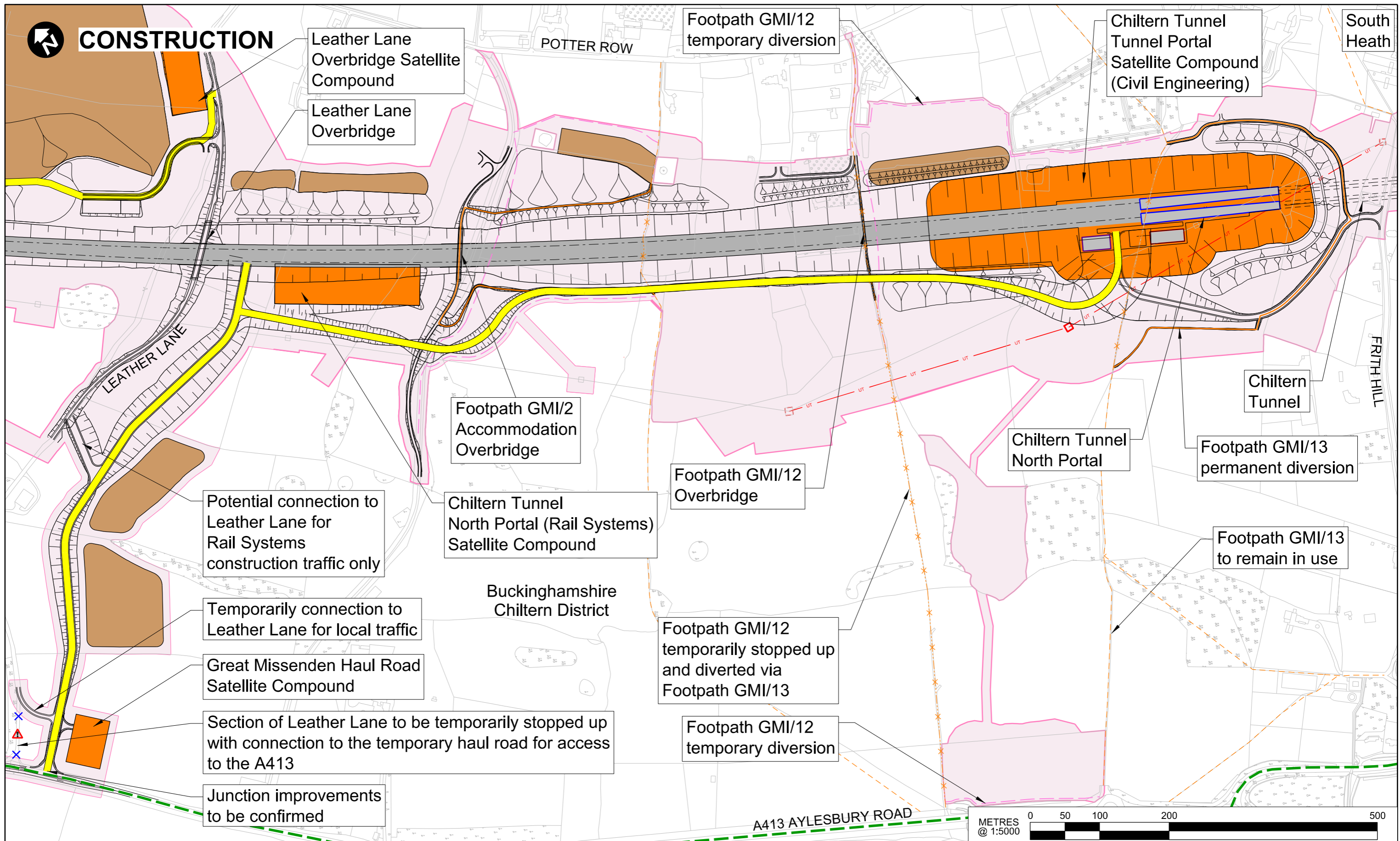
Scale with caution as distortion can occur.

- Legends/Notes:
- Satellite construction compound
 - Main construction compound
 - Tunnel portal
 - Rail alignment formation
 - Tunnels external extent
 - Rail alignment
 - Engineering earthworks
 - Landscape earthworks
 - Land potentially required during construction
 - Temporary site access route / haul route
 - Construction traffic route
 - Existing public right of way (PRoW)
 - New, diverted or realigned PRoW
 - Stopped-up PRoW
 - Temporary PRoW
 - Temporary material stockpile
 - Temporary Road Closure

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Zone	Country South		Project/Contract		Country South Design	
Design Stage	DESIGN-FOR-PETITION		Discipline/Function		Environmental	
Drawing Title	Great Missenden Haul Road		Drawn	Checked	Approved	
	Option B		IE			
	Construction Phase		Date	Scale	Size	
			12/07/2016	AS SHOWN	A3	
	Drawing No. C222-ATK-EV-DPL-020-251906-PET000000				Rev.	P00.1



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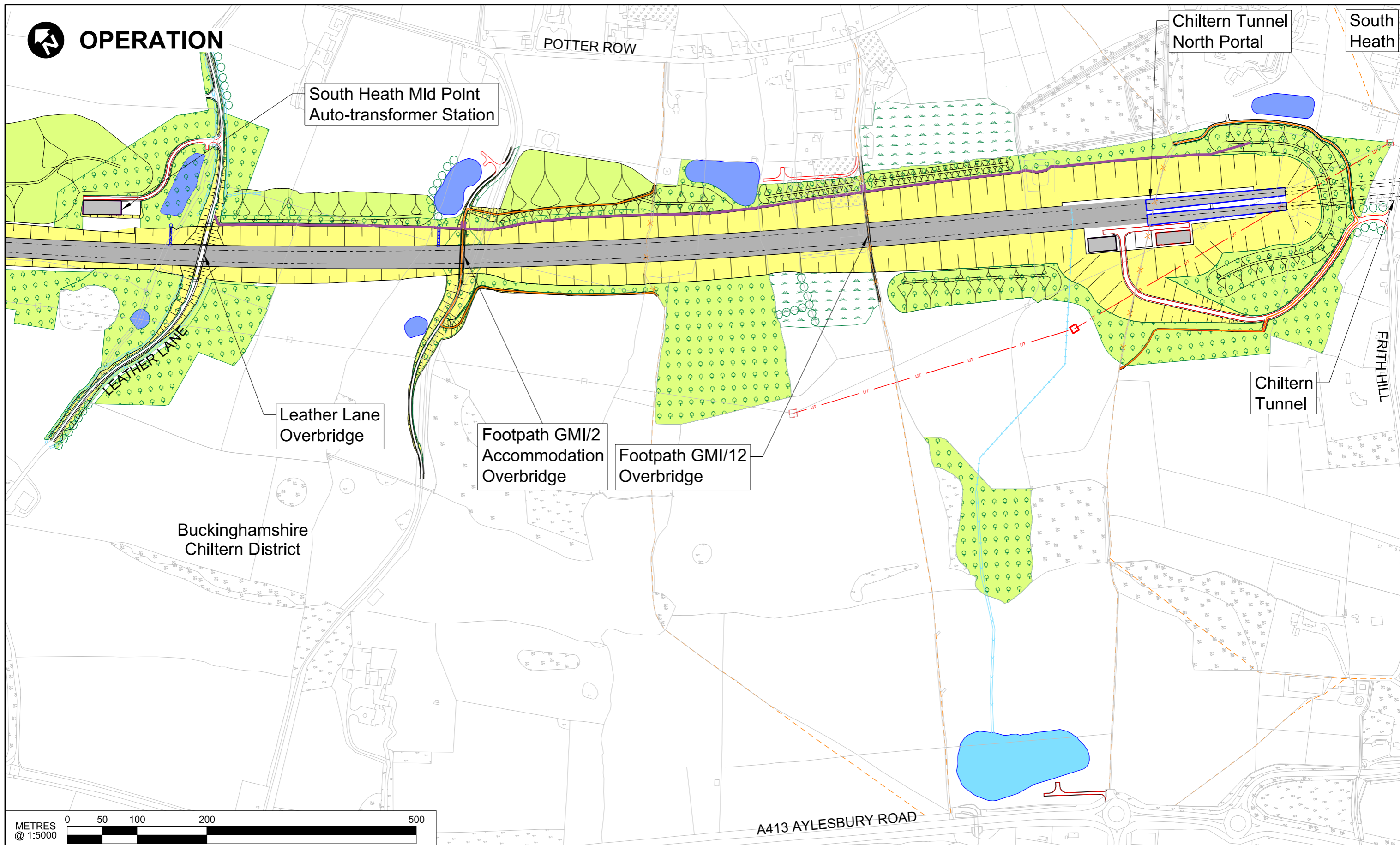
- Legends/Notes:
- Satellite construction compound
 - Main construction compound
 - Tunnel portal
 - Rail alignment formation
 - Tunnels external extent
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 - Landscape earthworks
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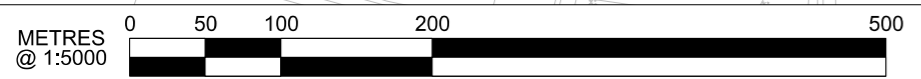
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Zone	Country South		Project/Contract	Country South Design	
Design Stage	DESIGN-FOR-PETITION		Discipline/Function	Environmental	
Drawing Title	Great Missenden Haul Road		Drawn	Checked	Approved
	Option C		Date	Scale	Size
Construction Phase			12/07/2016	AS SHOWN	A3
			Drawing No.	Rev.	
			C222-ATK-EV-DPL-020-252906-PET000000	P00.1	

OPERATION



Buckinghamshire
Chiltern District



P00.1					
Rev	Description	Drawn	Checked	Con App	HS2 App

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Legends/Notes:

Depot, station, headhouse or portal building	Tunnels external extent	Rail alignment
Tunnel portal	Noise fence barrier	Ditches - new
Balancing pond	Hedgerow habitat creation	HS2 Access road
Land drainage area	Existing public right of way (PRoW)	New, diverted or realigned PRoW
Replacement floodplain storage	Stopped-up PRoW	Main utility works
Landscape mitigation planting (scrub / woodland)	Main utility works	Sustainable placement
Grassed areas		
Engineering earthworks		
Landscape earthworks		
Rail alignment formation		

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Registered office:
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Zone	Country South
Design Stage	DESIGN-FOR-PETITION
Drawing Title	Great Missenden Haul Road Options A, B and C Operation Phase

Project/Contract	Country South Design		
Discipline/Function	Environmental		
Drawn	Checked	Approved	
IE			
Date	Scale	Size	
11/07/2016	AS SHOWN	A3	
Drawing No.	Rev.		
C222-ATK-EV-DPL-020-260906-PET000000	P00.1		

Appendices

Appendix B Summary of Option A, B & C Costs

Great Missenden haul road sift - summary of Option costs

	Option A <u>£m Q2 2011</u>	Option B <u>£m Q2 2011</u>	Option C <u>£m Q2 2011</u>
Surfaced temp access road from A413 to north portal including subsequent removal and reinstatement of area on completion	4.75		
Surfaced temp access road from A413 to trace by Leather Lane including subsequent removal and reinstatement of area on completion		3.34	3.34
Unsurfaced temp haul road from north portal to Leather Lane along east side of trace including subsequent removal and reinstatement of area on completion	0.95		
Surfaced temp access road from Leather Lane to north portal along west side of trace including subsequent removal and reinstatement of area on completion		5.20	5.59
Permanent access road from Frith Hill	2.15	2.15	2.15
Provide temporary signalised junction on A413 for Leather Lane options including subsequent removal and reinstatement of area on completion		0.90	0.90
Junction Mitigation Works A413/A4128 roundabout as Option M1	0.46	None included*	None included*
Junction Mitigation Works A413/B485 roundabout as Option M1	0.11	0.11	0.11
Sub Total	8.43	11.69	12.09
Indirect costs	1.53	2.12	2.20
Less ECP/VE	-0.96	-1.33	-1.37
Total	9.00	12.49	12.91

Notes:

* No allowance has been included at this stage for any necessary improvement works to the A413/A4128 Gt Missenden roundabout. Any necessary works would further increase the cost differential of this Option against the Proposed Scheme.