

A1 Birtley to Coal House

Scheme Number: TR010031

Applicant's Responses to ExA's Second Written Questions - Appendix 2.0K - Structure Options Report 6 - Longbank Bridleway Underpass

Planning Act 2008

Rule 8(1)(b)

Infrastructure Planning (Examination Procedure Rules) 2010



Infrastructure Planning

Planning Act 2008

**The Infrastructure Planning
(Examination Procedure Rules)
2010**

A1 Birtley to Coal House
Development Consent Order 20[xx]

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- Appendix 2.0K - Structure Options Report 6 - Longbank
Bridleway Underpass**

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Birtley to Coal House Improvement Scheme

Structure Option Report 6

Longbank Bridleway Underpass

Structure no. (/A1//440.80//)

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A1 BIRTLEY TO COAL HOUSE IMPROVEMENT SCHEME

STRUCTURE OPTION REPORT 6 LONGBANK BRIDLEWAY UNDERPASS

Highways England



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EXECUTIVE SUMMARY

WSP have been commissioned under the CDF contract to progress the Stage 3 Preliminary design works to increase the capacity of the route between A1 Junction 65 (Birtley) to Junction 67 (Coal House). The scheme involves upgrading from the existing Dual 2-Lane All-Purpose provision to a Dual 3-Lane All-Purpose Provision for this section of the road.

Longbank Underpass is one of the structures affected by the scheme improvement works. The structure comprises a corrugated steel buried structure (CSBS arch profile) that has been sleeved through the original structure (previously a joist filler bridge deck on mass concrete abutments) and backfilled accordingly. On the elevations, the CSBS has an in-situ reinforced concrete collar that matches the profile of the embankments. The structure is 80m long and incorporates a clear opening of 3.0m wide and 2.8m high.

The proposed new A1 highway alignment over Longbank will necessitate the extension of the existing CSBS structure at the east end (southbound carriageway side) by up to 16m.

This Structures Option Report has been prepared to assess the constraints/challenges associated with the extension to Longbank Underpass.

The study has shown it would be feasible to extend the existing structure with additional similar CSBS plates. This would provide a solution that is both cost effective and compatible with the existing structure. It would also allow for the existing clearance to be maintained upon completion without obstructing the existing scheduled monument (track bed) along the invert of the Underpass. Options to enhance the aesthetic appearance (satisfy English Heritage aspirations) to the elevation of the extended structure include;

- Option 1 – Extension with a CSBS arch profile structure with a profiled reinforced concrete collar and earthwork batter to tie into the existing earthwork. Estimated Cost £175k
- Option 2 – Extension with a CSBS arch profile structure with a reinforced concrete headwall/wing wall with a decorative masonry face. Estimated Cost £350k

It is recommended that asymmetrical extension (east side only) of Longbank Underpass to be undertaken based on Option 1. This would provide good aesthetic finish to the extended Longbank structure without having a significant negative impact on cost/programme or long term maintenance liabilities. The works to Longbank should also incorporate:

- Completion of all outstanding maintenance actions recorded in the previous inspection reports
- Installation of a new lighting provision along the invert to enhance the safety/experience of pedestrians going through the structure

The following should be undertaken to verify the findings of this report and provide clarity on the works to be developed at the detailed design stage.

- Liaison with English Heritage to verify constraint associated with working in close proximity to a scheduled monument (track bed). Also confirm approval of the proposed works, particularly the finish to the elevation – To be confirmed prior to detailed design
- Liaison with the Highways England project team to confirm if drainage improvements along the invert should be included as part of the scheme. Options to enhance the drainage of the Underpass would require liaison with English Heritage, however considering potential solutions may impact the scheduled monument (track bed) located along the invert. To be confirmed prior to detailed design.

1. INTRODUCTION

1.1 PROJECT BACKGROUND

1.1.1 WSP has been commissioned by Highways England to develop a scheme proposal for the A1 Birtley to Coal House Improvement Scheme.

1.1.2 The scheme development forms part of the Newcastle/Gateshead Western Bypass (NGWB) and is located on the A1 between Junction 65 (Birtley) to Junction 80 (Seaton Burn). The scheme is part of Highway England's strategic road network serving the metropolitan area of Tyne and Wear.

1.1.3 The project is located between the Junction 65 and Junction 67 on the NGWB having a stretch of 4.2km in length. The existing carriageway layout is:

- Southbound: Two lanes between Junction 67 (Coal House) and Junction 66 (Eighton Lodge) with an additional approaching lane between North Side Overbridge and Junction 66. Three Lanes between Junction 66 (Eighton Lodge) and Junction 65 (Birtley). The existing speed limit is 50mph between Junction 67 (Coal House) and North Side Overbridge and 70 mph thereafter.
- Northbound: Two lanes with a lane gain/drop between Junction 65 (Birtley) and Junction 66 (Eighton Lodge) and two lanes between Junction 66 (Eighton Lodge) and Junction 67 (Coal House). The existing speed limit is 50mph throughout.

1.1.4 The A1 NGWB is one of the most congested highway links in the North- East region with more than 110,000 vehicles using the route every day on the busiest section. Therefore, the junction has been identified as requiring the improvement to its existing layout in order to achieve the scheme objective.

1.1.5 At present, the junction has a significant adverse impact on; journey time reliability at peak time, route resilience, safety and environmental impacts.

1.1.6 The scheme objectives for the Junction improvement are structured around the Government's main objectives for transport, being

- To increase the capacity of the A1 between Junction 65 (Birtley) to Junction 67 (Coal House) from existing two lanes to three full standard lanes – to improve the safety for all road users and contribute to the Government's current safety strategy targets.
- Lanes gain/drop between the Junctions
- Replacement of the Allerdene Bridge to achieve optimum whole life costs taking in account future maintenance and operation, and disruption to users.
- New Junction layout at Coal House

1.1.7 The existing Allerdene Railway Bridge has a number of inherent design/construction deficiencies which cannot be easily resolved due to the complex structural form (half joints) and site constraints. The intention is for the existing Allerdene Bridge to be replaced as part of the A1 Birtley to Coal House Improvement Scheme.

- 1.1.8 Two alignment options were assessed for the replacement of Allerdene Bridge. These are:
- Option 1A - Replacement of Allerdene Railway Bridge as close as possible to the existing structure to enable the retention of Coal House interchange.
 - Option 1B - Widening/Replacement of Allerdene Railway Bridge with a wider structure in its existing location and retention of Coal House Interchange and the existing alignment as far as is possible.
- 1.1.9 Works undertaken during PCF Stage 2 – Route Selection, confirmed Option 1A was the preferred option to be progressed onto the next stage and beyond. Refer to Appendix A for schematic plans of the preferred route.
- 1.1.10 The scheme is currently progressing within PCF Stage 3: Preliminary Design. The existing Longbank Underpass, located south of junction 66 Eighton Lodge of the A1, is one of the many existing structures impacted by the proposed improvements to the A1 alignment which includes the upgrading from the existing Dual 2-Lane All-Purpose provision to a Dual 3-Lane All-Purpose Provision for this section of the road.
- 1.1.11 Studies and analysis to date shows that Longbank Underpass would need to be extended on the east side only to accommodate the new improved A1 highway alignment.

1.2 REPORT OBJECTIVES

- 1.2.1 This Structures Options Report has been prepared to assess the constraints/challenges associated with extending the existing Longbank Underpass.
- 1.2.2 The report shall confirm the structural modification to be further developed at PCF Stage 5 (detailed design).
- 1.2.3 Upon completion and sign off, this report shall provide Highways England with sufficient information/justification for seeking approval/funding to progress the scheme within the next stage of development.

2. EXISTING STRUCTURE

2.1 GENERAL DESCRIPTION

2.1.1 Longbank Underpass (commissioned in 1930's) is defined in SMIS with the following discrete structure number and key:

- /A1//440.80//
- STKEY 26280

2.1.2 The Underpass is located at OS Grid Reference 427169E, 557294N.

2.2 ORIGINAL STRUCTURE

2.2.1 The original Longbank Bridge was constructed in two sections to carry the A1 trunk road over a National Coal Board Mineral Railway Line. The mineral railway line has long been dismantled and is now used as an Underpass. The Underpass is currently maintained by Gateshead Metropolitan Borough Council. The existing track bed is classified as a Scheduled Monument.

2.2.2 The original (east) section, built in the 1930s, comprised a simply supported structure (filler joist bridge deck) on conventional reinforced concrete abutments with spread footing foundations.

2.2.3 In 1971, the structure was extended to the west side by approximately 17m. The extension comprised a simply supported reinforced concrete deck slab that is also supported on conventional reinforced concrete abutments with spread footing foundations.

2.3 STRUCTURE MODIFICATIONS IN 2007

2.3.1 In 2007 the structure was further modified to comprise a corrugated steel buried structure (CSBS) subway that was sleeved through the existing opening of the bridge to the minimum dimensions of 3.0m wide to accommodate passing horses and 2.8m high to accommodate dismantled Underpass users as stated in TA90/05.

2.3.2 The corrugated steel arch is supported by reinforced concrete strip footings, incorporating a cast-in proprietary seating channel; supported on spread footings of the existing structure. The CSBS has an arch profile with cover ranging between 1.06m to 2.640m fill above the crown. The annulus between the original structure and proposed CSBS was backfilled with foamed concrete. The CSBS extends beyond the original structure opening and has a reinforced concrete collar that matches the 1 in 2 earthwork batter profile.

2.3.3 After modifications, the original Longbank structure was deemed to be redundant and conservatively assumed to no longer be load bearing. The current infill structure was designed to sustain both live load and super imposed loading.

2.3.4 The current Longbank Underpass is approximately 80m long with an opening 5.2m wide and 3.2m high.

2.3.5 Refer To Appendix B – For as built details of Longbank Underpass.

2.4 STRUCTURE CAPACITY

- 2.4.1 The CSBS subway was designed to sustain full HA loading and 45unit HB loading in accordance with BD37/01.
- 2.4.2 Further preliminary analysis showed that the CSBS arch profile (with a minimum 1.05m cover) would also be able to sustain the following Special Type Order Vehicles (STGO) and Special Order (SO) abnormal vehicles in accordance with BD86/11: SV80, SV100, SV150, SVtrain, SVTrain, SOV250 and SOV350.
- 2.4.3 The analysis showed the original design of the CSBS for 45units HB loading was governing due to the limited span of the CSBS and a subsequent restriction on multiple axle loads of an associated abnormal vehicle that can be applied to the CSBS structure at any one time.

2.5 STATUTORY UNDERTAKERS INFORMATION

- 2.5.1 Details of existing services within the scheme boundary are shown on the following service information plans provided in Appendix C.:
- HE551462-WSP-VUT-BCH-DR-D-00001
 - HE551462-WSP-VUT-BCH-DR-D-00002
 - HE551462-WSP-VUT-BCH-DR-D-00003
- 2.5.2 Service information available to date indicates there are no existing services shown to have an impact on the works at Longbank Underpass. However, the previous 2007 refurbishment information (AIP/Drawings) referenced the presence of an existing drainage pipe which runs through the invert of the CSBS structure. It would be prudent to confirm the existence of this drainage pipe to inform the detailed design works at a later date.
- 2.5.3 At this stage it is assumed that all services found impacting the proposed bridge widening works shall be diverted/ protected accordingly to progress the bridge works on site

2.6 MAINTENANCE & INSPECTION SUMMARY

- 2.6.1 The SMIS database shows records of the following inspections for the existing structure:

Table 2-1: SMIS inspection records of Longbank Underpass

INSPECTION TYPE	INSPECTION DATE	AGENT
Principal Inspection	05.11.2008	A-One+ - Area 14
General Inspection	20.10.2009	A-One+ - Area 14
General Inspection	08.11.2011	A-One+ - Area 14
Special Inspection - Scour	20.09.2012	A-One+ - Area 14
Principal Inspection	03.12.2013	A-One+ - Area 14

- 2.6.2 The reports shown in table 2-1 have been referred to determine the condition of the existing structure. The above has been supplemented by a rudimentary survey (equivalent to a General Inspection) undertaken on the 23/08/17. Refer to Appendix D for details of site photos/defects recorded during the survey on the 31/08/17.
- 2.6.3 In summary, the inspection reports and survey information indicate the structure is in good condition with no significant defects that impact the integrity/load bearing capacity of the bridge. However outstanding maintenance actions have been recorded in the last PI dated 2013 that will eventually need to be addressed to prolong the service life of the structure.
- 2.6.4 Below is the list of outstanding maintenance works recorded in the PI dated 2013. The outstanding maintenance works are deemed to not be complex and could be readily accessible during the A1 Birtley to Coal House improvement works. Therefore it would be prudent for all of the items below to be addressed during the modifications to Longbank Underpass to accommodate the new A1 highway alignment.
- Reinstall north east embankment due to scour from flooding
 - Graffiti throughout the structure. Offensive graffiti to areas within the underpass - remove/paint over
 - Minor Corrosion to bottom of CSBS sections - clean off and repaint
 - Concrete section to base of west brick parapet, west face has several unfilled drill holes - fill in.
 - Spalling to east parapet coping and foundation - repair.
 - General vegetation to structure - remove.
 - East timber fence panels are misaligned and loose at base with potential to blowing over in high winds - repair.
 - Minor paint loss to south CSBS lower sections at east end and scrape mark to upper section – repaint
- 2.6.5 In addition to the above, the lack of artificial lighting to the structure was noted. It is advisable that new lighting provision also be installed as part of the works to Longbank to further enhance the safety/experience of pedestrian (particularly lone users) going through the structure.

3. STAKEHOLDER LIAISON

3.1 GENERAL

3.1.1 Liaison with key stakeholders with a vested interest in the work at Longbank is currently ongoing. Details of the proposed works has been presented to the following stakeholders for feedback:

- Area 14 MAC Aone+
- English Heritage
- Gateshead Council

3.1.2 Liaison with stakeholders will continue as the scheme progresses, below are details of the key constraints/concerns raised to date.

3.2 AREA 14 MAC AONE+

3.2.1 To date no significant concerns have been raised about the proposed works to Longbank. The Area 14 MAC did however request that outstanding maintenance works be incorporated into the scheme. Our view is this appears to be a reasonable request.

3.3 ENGLISH HERITAGE

3.3.1 Discussion with English Heritage has revolved around the following key areas;

- Site working restrictions related to the Scheduled Monument (track bed) along the invert of the structure: The key restriction is the Scheduled Monument (track bed) along the invert should not be obstructed during the works.
- Enhanced Aesthetics: English Heritage has requested that consideration be given to improving the visual appearance of the structure. We understand this to mean enhancement to the structure elevation. This requirement has been considered and alternative options to enhance the elevation to the structure have been discussed in Section 4 of the report.

3.4 GATESHEAD COUNCIL

- 3.4.1 Gateshead Council's main concern regarding Longbank is the flooding of the Underpass during periods of heavy rainfall. Water flows down the A1 onto the current Underpass. The route was legally closed for a period of time as a result of flooding. However due to public opposition the route was again re-opened to the public.
- 3.4.2 Gateshead Council advised that although measures have been taken to repair the flood damage, it is unlikely that the route will be restored to its previous standard due to the issue with flood water and drainage. A concrete dish was implemented by Gateshead Council as a way of directing excess water away from the route. This has helped to minimise further damage to the Underpass over the last couple of years. However, this is not considered to be a long-term solution and further works are required to improve the drainage of the Underpass.
- 3.4.3 It would be prudent to incorporate enhancement to the Underpass drainage as part of the Longbank improvement works. Confirmation is required from Highways England project team on whether drainage improvement should be included as part of the scheme. Options to enhance the drainage of the Underpass would require liaison with English Heritage, as potential solutions may impact the Scheduled Monument (track bed) located along the invert.
- 3.4.4 Gateshead Council also highlighted that concreting/tarmac of the Underpass should be avoided as this would have a detrimental impact on equestrian use.

4. STRUCTURAL MODIFICATIONS

4.1 NEW A1 HIGHWAY ALIGNMENT

- 4.1.1 Preliminary design of the alignment to date indicates the highway cross section (comprising verge/mainline carriageway/central reserve/slip road and footways) would increase from 57m to circa 62m. The design of the new alignment also requires a translation in the alignment towards the east side.
- 4.1.2 The above results in the structural modifications to extend the existing structure being limited to the east elevation only.
- 4.1.3 Requirements for the footway provision over the structure are still being developed. There are potentials that the current footway provision over the east side of the bridge could be permanently re-routed such that crossing provision over the structure is no longer required. This would reduce the overall highway cross section and the extent of the structural extension works required.
- 4.1.4 Refer to the general arrangement drawing in Appendix E for details of the existing cross section & Appendix F for details of the proposed cross sections.

4.2 STRUCTURAL DETAILS

- 4.2.1 Below is a list of some of the key assumptions/constraints considered in developing options to extend the existing structure.
- The extension works should be simple/cost effective and compatible with the existing Longbank structure.
 - Proposals should be such that the impact on the Scheduled Monument (track bed) along the invert is minimised as much as reasonably practicable. This would reduce the risk of English Heritage objecting to proposals.
 - The existing clearance, 3.m wide and 2.8m high, should be maintained upon completion of the works.
- 4.2.2 It is considered that the extension to the existing Longbank Underpass is limited to a single option comprising extension via similar CSBS arch profiled structure. We have consulted with specialist CSBS suppliers and confirmed that it would be feasible to extend the existing structure via unbolting and removal of the profiled end plates and bolting of additional CSBS plates (similar specification to the existing) to extend the structure as required.

4.2.3 The diagram below highlights the existing profiled plates that would need to be unbolted and removed prior to fastening of the new extended CSBS sections.

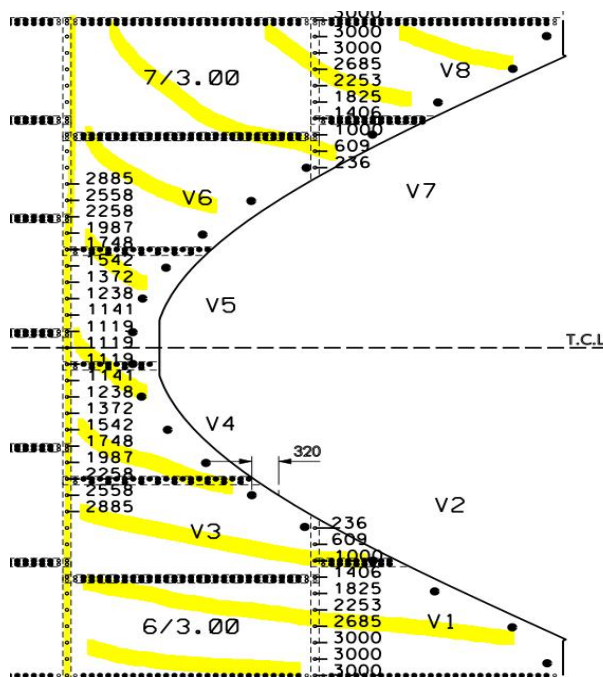


Figure 4.1: The existing profiled plates that would need to be unbolted and removed prior to fastening of the new extended CSBS sections

- 4.2.4 The length of the extension based on the current highway alignment design is circa 16m. The extended section is beyond the existing structure footprint and therefore the option to support the arch footing off the toe of the existing infill structure is not available. It is anticipated that in order to accommodate the horizontal and vertical thrust at the arch footing position, the CSBS would be founded on a reinforced concrete pile cap with piled foundations (refer to section 5 for further details regarding ground conditions and foundations).
- 4.2.5 Complexities associated with piling could be avoided via a ground beam foundation solution. However this has not been reviewed at this stage based on English Heritage constraints associated with keeping the Scheduled Monument (invert track bed) clear of any permanent construction work.
- 4.2.6 Upon installation of the arch, the structure would be backfilled similar to the existing. Extension with additional CSBS plates, as discussed above, would be compatible with the existing structure and also provide a cost-effective solution. It would also allow for the existing clearance to be maintained upon completion.
- 4.2.7 Consultation with the specialist supplier has confirmed that a minimum cover of 1.05m would be required to sustain the Highways England aspirations to accommodate the full spectrum of abnormal loading including: SV80, SV100, SV100m, SV150, SVTrain, SV196, SOV250 and SOV350. Preliminary design indicates that this minimum cover can be provided at the critical pinch point at the extreme end of the extended structure on the east side. Therefore abnormal vehicles would be able to travel across the structure in any desired lane without restriction.

4.2.8 Below are details of the options to enhance the aesthetic appearance (satisfy English Heritage aspirations as highlighted in section 3.3 of the report) to the elevation of the extended structure;

- Option 1 – Extension with a CSBS arch profile structure with a profiled reinforced concrete collar and earthwork batter to tie into the existing earthwork. Refer to Appendix F – GA Option 1 for details.
- Option 2 – Extension with a CSBS arch profile structure with a reinforced concrete headwall/wingwall with a decorative masonry face. Refer to Appendix F - GA Option 2 for details.

4.2.9 The options are similar in terms of the structural extension (new CSBS sections attached to the existing) and clearance provision. However Option 1 would provide a simple/clean finish that blends into the natural surroundings. This was the approved finish provided to Longbank works in 2007, refer to photographs below.



Figure 4.2: Option 1 proposed earth work finish

4.2.10 Option 2 would require reinforced concrete headwalls and flared wingwalls to retain the backfill to the extended structure. A masonry facing could be provided to enhance aesthetics. This proposal would be more expensive than option 1. In addition the long term maintenance liabilities of the structure is greater in comparison to option 1 as there would be a need to inspect/repoint the masonry to avoid wash out/erosion of mortared joints overtime leading to loose stonework.

4.2.11 The photographs below provide examples of the potential masonry finish that could be achieved.



Figure 4.3: Option 2 proposed masonry finish

- 4.2.12 Option 1 has the advantage that a symmetrical finish would be provided to both elevations. In comparison were a symmetrical aesthetic finish required at both ends of the structure for Option 2, this would require additional works to the west elevation of the structure where structural modifications are not required. This would further increase the cost/programme of the works at Longbank.
- 4.2.13 Below are indicative construction cost (excluding preliminaries) associated with the works to Longbank for option 1 and 2. Both options assume outstanding maintenance items and new lighting provisions (as discussed in section 2 of this report) which shall also be incorporated as part of the works.
- Option 1 – Extension with a CSBS arch profile structure with a profiled reinforced concrete collar and earthwork batter to tie into the existing earthwork. Estimated Cost £175k.
 - Option 2 – Extension with a CSBS arch profile structure with a reinforced concrete headwall/wing wall with a decorative masonry face (east elevation only). Estimated Cost £350k.
- 4.2.14 The indicative construction costs are based on previous similar type schemes and shall be verified subject to detailed design. The Highways England Cost estimating team has not been consulted for any costing information for this study.
- 4.2.15 The study to date suggests that Option 1 would provide good aesthetic finish to the extended Longbank structure without having a significant detrimental impact on cost/programme or long term maintenance liabilities.

5. GROUND INVESTIGATION

5.1 EXISTING GROUND CONDITIONS

- 5.1.1 A Geotechnical Design Report is not yet available for the project. However following completion of a ground investigation at the site, a report will be prepared defining suitable parameters for the design and acceptable foundations. The preliminary choice of foundation solutions has been considered based on the records and findings at the site location, including information from the Preliminary Sources Study Report (PSSR) for the wider Birtley to Coal House Scheme (HA544664-WSP-HGT-S01-RP-GE-0600-P-01) and ground investigation undertaken for the refurbishment of the Longbank Underpass.
- 5.1.2 Historical ground investigation data from the British Geological Survey (BGS) and Highways Agency Geotechnical Data Management System (HA GDMS) is available within the vicinity of the Longbank Underpass. The following ground conditions are anticipated at the underpass location:
- **Made ground:** up to 2.10m thick, primarily consisting of sandy slightly gravelly clay, gravel is sandstone, brick and coal.
 - **Glacial Till:** between 1.10m and 3.20m thick and comprising firm to stiff grey brown slightly gravelly clay, gravel is sandstone, mudstone and coal. Not recorded as being present in the exploratory holes undertaken during the Longbank Underpass refurbishment works.
 - **Weathered Pennine Middle Coal Measures:** between 0.50m and 6.5m and comprising fine to medium slightly gravelly sand, gravel is sandstone and brown clayey sandstone gravel.
 - **Pennine Middle Coal Measures bedrock:** rock encountered at a depth of between 1.50m and 11.7m below ground level.
- 5.1.3 Coal seams are recorded as having been worked beneath the site. The shallowest coal seams are the High Main (approximately 19m below the proposed ground level), Metal seam (approximately 23m below the proposed ground level), Five Quarter (approximately 33m below the proposed ground level) and Main seam (approximately 56m below the proposed ground level).
- 5.1.4 No groundwater strikes were recorded on the available historical borehole records in the vicinity of the Longbank Underpass and no historical groundwater monitoring results have been obtained. Groundwater monitoring is being undertaken as part of the proposed ground investigation.
- 5.1.5 Groundwater bodies may be encountered in the following strata, following the additional ground investigation being undertaken, structure specific groundwater information will be obtained:
- Perched water bodies within the Made Ground.
 - At shallow depths within the glacial till, if present
 - At a greater depth within the Middle Coal Measures.

5.2 RISK ASSOCIATED WITH FOUNDATION WORK

5.2.1 The geotechnical risks for the wider site are presented within the PSSR. These risks have been reviewed and further assessed in the 'Live' Project Risk Registers. Pertinent geotechnical risks in relation to the proposed Longbank Underpass foundations are summarised in Table 5-1.

Table 5-1 Geotechnical risks of proposed Longbank Underpass foundations

RISK CAUSE	RISK EVENT	PRIMARY RISK IMPACT	RISK RATING
Engineering Properties of the Ground	There is a risk that the ground model, and the behaviour of the ground, is different (worse) from that assumed at this stage.	Construction delays and remedial design requirements, and potential cost and programme implications.	Medium
Instability of Existing Underpass	There is a risk that the proposed works may undermine/destabilise the existing underpass structure.		Medium
Instability of Existing Earthworks	There is a risk that the existing earthworks at the site are not as stable as assumed at this stage.		Medium
Instability caused by shallow mine workings	There is a risk that the structure will be adversely impacted by collapse of shallow coal mine workings, which may require grouting during construction		Medium
Groundwater	There is a risk that the groundwater is different (worse) from the groundwater model assumed at this stage.		Medium
Contaminated Soils	There is a risk that the assessment of contaminated soils undertaken at this stage is not accurate.		Medium
Unexploded Ordnance (UXO)	The site is located within an area of low bomb risk; there is a risk that UXO might be encountered beneath the site.	Construction delays and requirement for safe deactivation / disposal.	Low
Buried Services	There is a risk that buried services might be encountered during excavation of proposed foundations.	Construction delays and potential cost and programme implications.	Medium

5.3 DETAILS OF ADDITIONAL GROUND INVESTIGATION REQUIRED TO INFORM THE DETAILED DESIGN PROCESS

5.3.1 The proposed ground investigation has been scoped and is currently being undertaken. Drawings HE551462-WSP-HGT-BCH-DR-GE-00023 to HE551462-WSP-HGT-BCH-DR-GE-00033 show the exploratory hole locations of the proposed ground investigation required to inform the detailed design of the Longbank Underpass. The proposed ground investigation includes the following:

- Cable percussion boreholes to rock head to identify ground conditions within the superficial deposits and confirm rockhead levels
- Rotary cored boreholes to determine rock quality and strength to 9 m below rock head
- Rotary open hole boreholes for an additional 15 m to investigate the presence of coal seams and historical mining
- Installation of piezometer data loggers to monitor the groundwater levels

5.3.2 Each of the above ground investigation methodologies may be undertaken at the same location / exploratory hole through follow-on methods, i.e. cable percussion to rockhead; follow-on with rotary core from rockhead; and follow-on with open hole to proposed borehole depth. The current proposed ground investigation includes two exploratory hole locations one on either side of the carriageway.

5.3.3 The ground investigation shall be reported in a Ground Investigation Report (in line with HD 22/08) once completed.

5.4 REVIEW OF FOUNDATION REQUIREMENTS FOR THE EXTENSION WORK

5.4.1 The final Longbank Underpass foundations shall be determined through assessment of the bearing capacity of the founding materials (influenced by the ultimate limit state), settlement analysis of the foundations (influenced by serviceability limit state) and interaction with the existing structure.

5.4.2 Each of the proposed options (Options 1 and 2) comprise asymmetrical extension of the Longbank Underpass by between 11.0m and 16.2m on the southbound carriageways. To allow for the extension, the existing underpass is to be lengthened using similar forms to the existing structure. Option 1 proposes an arch extension to the existing underpass and Option 2 proposes an arch extension to the existing structure with a masonry facing. As Options 1 and 2 are so similar, the geotechnical implications for both the options are the same.

5.4.3 The foundations of the existing Longbank Underpass are reinforced concrete strip foundations, approximately 600mm thick. The foundations for the refurbishment of the underpass were placed onto the existing strip foundations.

5.4.4 Depending on the outcome of the additional ground investigation and the depth to rockhead, foundations for the proposed corrugated steel buried structure are likely to comprise either shallow strip foundations or piled foundations.

5.4.5 Given the sensitivity of the existing underpass structure to ground movements, it is considered likely that a pile solution will be most suitable for the structure below the widened section of A1 carriageway.

- 5.4.6 From the available historical ground investigation, rockhead was encountered at shallow depths. As such it is likely that the piled foundations will be 750mm or 900mm in diameter and socketed into the Middle Coal Measures bedrock. Following the completion of the scheme specific ground investigation the geotechnical parameters and foundation design solutions can be finalised.
- 5.4.7 Detailed design of any piled solution is likely to be the responsibility of the specialist Piling Contractor (and reported within a Geotechnical Design Report in line with HA 22/08).
- 5.4.8 Given the potential for shallow coal mine workings beneath the site, it is considered that grouting of these workings may be required during construction. No records have been obtained to suggest that the workings were treated as part of the original construction of the underpass. The extent of such workings (and possibly previous grouting works) will be assessed as part of the proposed ground investigation.
- 5.4.9 For any proposed foundation solution, the presence of historical mining at the site is required to be determined. If encountered / suspected to be present beneath the site the historical mining is likely to be most appropriately mitigated through a grouting solution. It may be considered appropriate to extend any pile through remediated mined coal seams and broken ground if these are proven to be present near to the proposed pile toe level.

6. CONCLUSION & RECOMMENDATIONS

6.1 CONCLUSION

- 6.1.1 Longbank Underpass is one of the structures affected by the scheme improvement works. The structure comprises a corrugated steel buried structure (CSBS arch profile) that has been sleeved through the original structure (previously a joist filler bridge deck on mass concrete abutments) and backfilled accordingly. On the elevations, the CSBS has an in-situ reinforced concrete collar that matches the profile of the embankments. The structure is 80m long and incorporates a clear opening of 3.0m wide and 2.8m high.
- 6.1.2 The proposed new A1 highway alignment over Longbank will necessitate the need to extend the existing CSBS structure at the east end (southbound carriageway side) by up to 16m.
- 6.1.3 The study has shown it would be feasible to extend the existing structure with additional similar CSBS plates. This would provide a solution that is both cost effective and compatible with the existing structure. It would also allow for the existing clearance to be maintained upon completion without obstructing the existing scheduled monument (track bed) along the invert of the Underpass.
- 6.1.4 Options to enhance the aesthetic appearance (satisfy English Heritage aspirations) to the elevation of the extended structure include;
- Option 1 – Extension with a CSBS arch profile structure with a profiled reinforced concrete collar and earthwork batter to tie into the existing earthwork. Estimated Cost £175k
 - Option 2 – Extension with a CSBS arch profile structure with a reinforced concrete headwall/wing wall with a decorative masonry face. Estimated Cost £350k
- 6.1.5 It is considered that Option 1 would provide good aesthetic finish to the extended Longbank structure without having a significant negative impact on cost/programme or long term maintenance liabilities.
- 6.1.6 The review the inspection reports supplemented by a rudimentary survey (equivalent to a General Inspection) undertaken on the 23/08/17 show the structure to be in good condition with no significant defects that impact the integrity/load bearing capacity of the bridge. However outstanding maintenance actions have been recorded in the last PI dated 2013 that will eventually need to be addressed to prolong the service life of the structure.
- 6.1.7 The outstanding maintenance works are deemed to be non-complex and could be readily accessible during the A1 Birtley to Coal House improvement works. Therefore it would be prudent for all of the outstanding maintenance works to be addressed during the modifications to Longbank Underpass to accommodate the new A1 highway alignment.
- 6.1.8 In addition to the above, the lack of artificial lighting to the structure was noted. It is advisable that new lighting provision to be installed as part of the works to Longbank to further enhance the safety/experience of pedestrian (particularly lone users) going through the structure.

6.2 RECOMMENDATION

6.2.1 Based on the study to date, it is recommended that asymmetrical extension (east side only) of Longbank Underpass be undertaken to sustain the new A1 highway alignment.

6.2.2 Extension should comprise a similar CSBS arch profile structure with a profiled reinforced concrete collar and earthwork batter to tie into the existing earthwork.

6.2.3 The works to Longbank should incorporate:

- Completion of all outstanding maintenance actions recorded in the previous inspection reports
- Installation of a new lighting provision along the invert to enhance the safety/experience of pedestrians going through the structure

6.2.4 The following should be undertaken to verify the findings of this report and provide clarity on the works to be developed at the detailed design stage.

- Liaison with English Heritage to verify constraint associated with working in close proximity to a scheduled monument (track bed). Also confirm approval of the proposed works, particularly the finish to the elevation.
- Liaison with the Highways England project team to confirm if drainage improvements along the invert should be included as part of the scheme. Options to enhance the drainage of the Underpass would require liaison with English Heritage, however considering potential solutions may impact the scheduled monument (track bed) located along the invert.

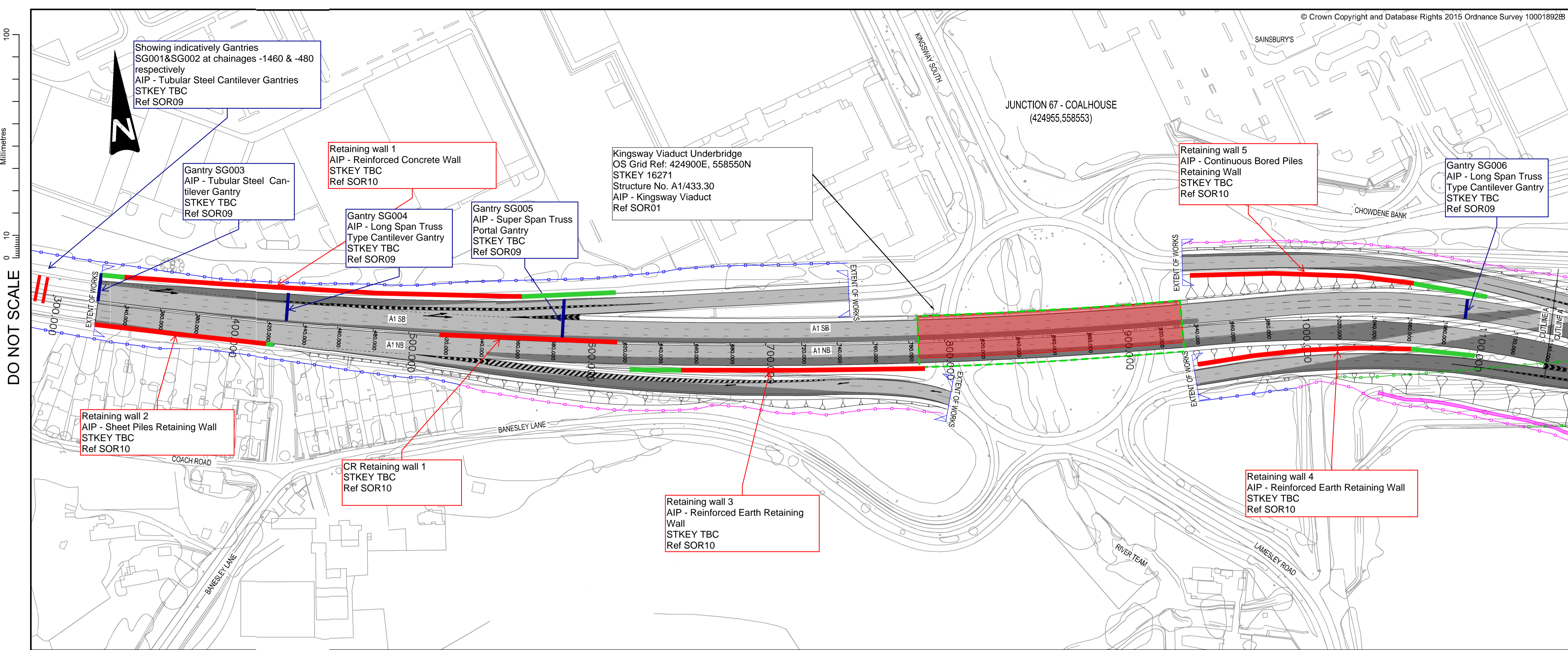
Appendix A

INDICATIVE SCHEMATIC PLANS OF THE PREFERRED ROUTE

APPENDIX A-1

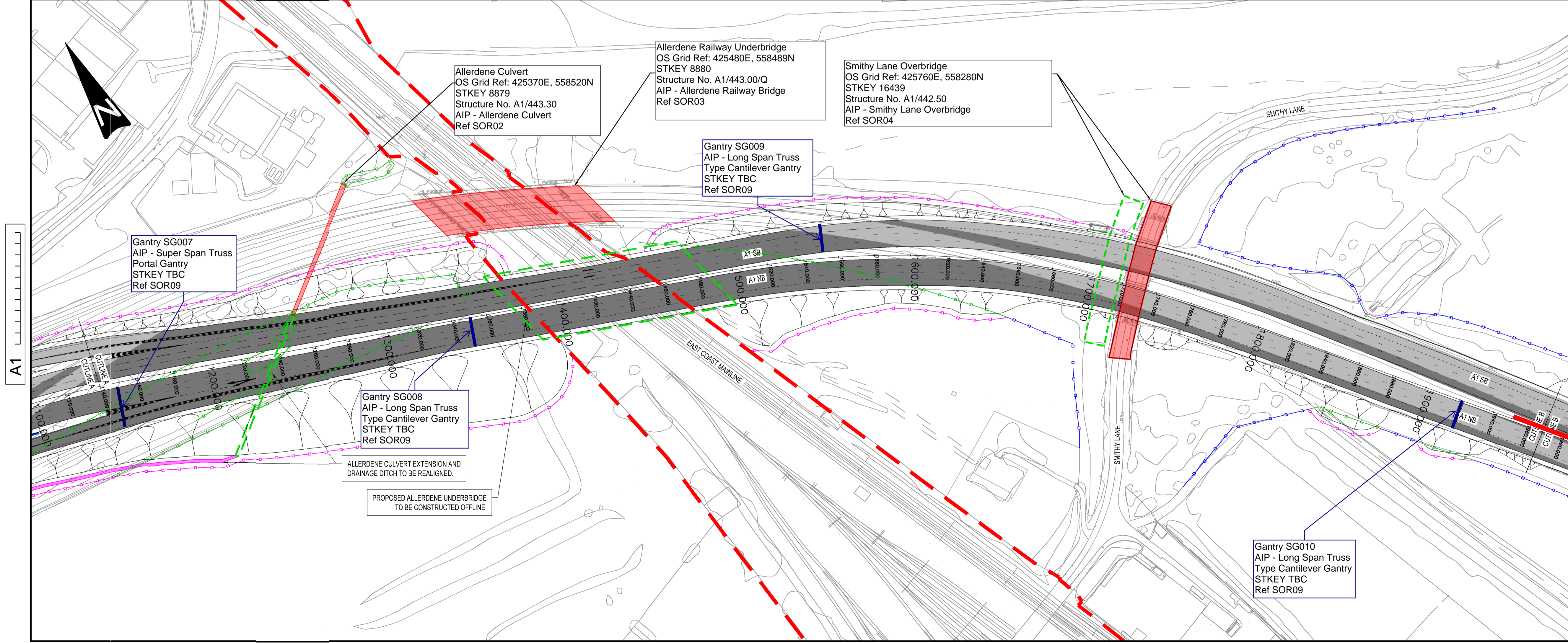
**INDICATIVE SCHEMATIC PLANS OF THE PREFERRED
ROUTE**

DO NOT SCALE



KEY

- EXISTING STRUCTURE
- PROPOSED STRUCTURE
- PROPOSED RETAINING WALL
- PROPOSED HIGHWAYS FENCE LINE
- RETAINED EXISTING HIGHWAYS FENCE LINE
- REMOVED EXISTING HIGHWAYS FENCE LINE
- NEW CARRIAGEWAY CONSTRUCTION
- EXISTING CARRIAGEWAY TO BE RETAINED
- PROPOSED DRAINAGE DITCH
- NETWORK RAIL LAND BOUNDARY



P01	05/09/16	FOR INFORMATION	JAC		
P02	07/09/16	MINOR AMENDMENTS TO BMS & STRUCTURES CHANGE ADDED	JWL	CP	NGR
P03	07/09/16	ISSUED FOR PUBLIC CONSULTATION	JWL	SG	NGR
P04	10/02/17	DESIGN DEVELOPMENT POST PUBLIC CONSULTATION	JWL	SG	NGR
Rev.	Date	Description	By	Chkd	Appd

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Client **Working on behalf of**

highways england

Project Title **A1 BIRTLEY TO COALHOUSE**

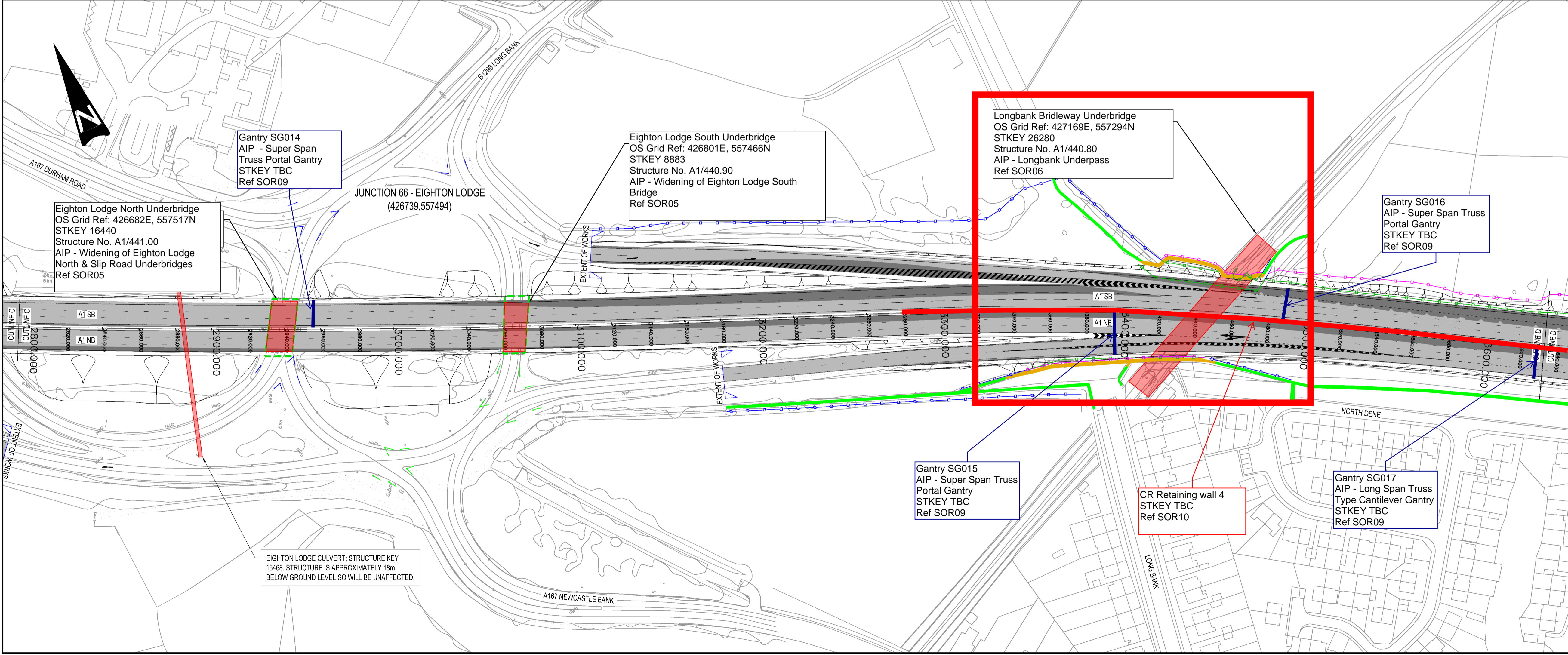
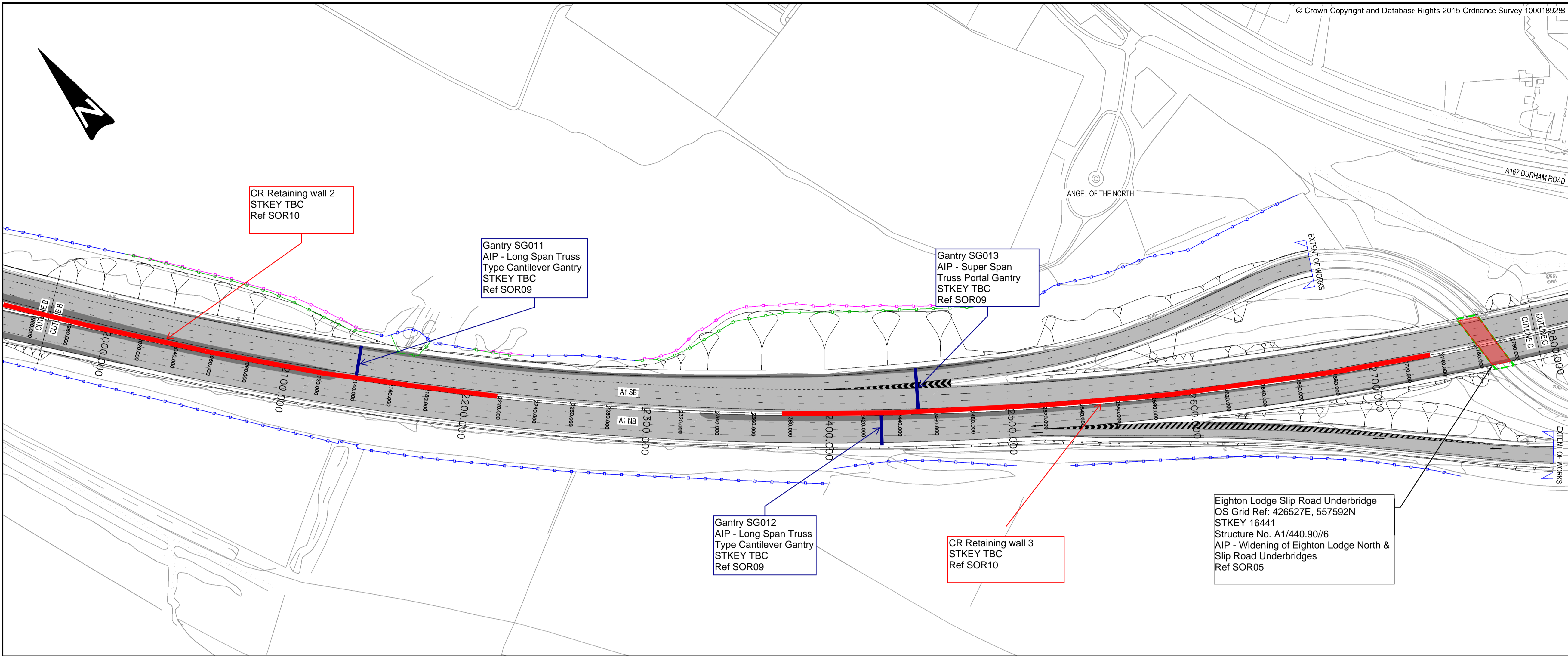
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Scale	1:1250	Drawn	J.Longmore	Checked	S.Ghosh	Approved	N.Rawcliffe	Authorised	---
Original Size	A1	Date	10/02/17	Date	10/02/17	Date	10/02/17	Date	---
Drawing Status	INITIAL STATUS OR WIP								S0
Drawing Number	HE551462	Project	BCH	Originator	WSP	Volume	HGN	Project Ref. No.	
Location	DR	Type	D	Role	10004	Number		Revision	P04

DO NOT SCALE
 Millimetres
 0 10 100

KEY

	EXISTING STRUCTURE
	PROPOSED STRUCTURE
	PROPOSED HIGHWAYS FENCE LINE
	EXISTING HIGHWAYS FENCE LINE
	REMOVED EXISTING HIGHWAYS FENCE LINE
	NEW CARRIAGEWAY CONSTRUCTION
	EXISTING CARRIAGEWAY TO BE RETAINED
	PROPOSED FOOTPATH DIVERSION
	EXISTING FOOTPATH
	PROPOSED SIGNAL
	EXISTING SIGNAL



PO1	05/09/16	FOR INFORMATION	JAC		
PO2	07/09/16	MINOR AMENDMENTS TO DWGS & STRUCTURES CHANGE ADDED	JWL	CP	NGR
PO3	07/09/16	ISSUED FOR PUBLIC CONSULTATION	JWL	SG	NGR
PO4	10/02/17	DESIGN DEVELOPMENT POST PUBLIC CONSULTATION	JWL	SG	NGR

Rev.	Date	Description	By	Chkd	Appd

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Project Title **A1 BIRTLEY TO COALHOUSE**

Drawing Title **OPTION 1A - OFFLINE REPLACEMENT OF ALLERDENE RAILWAY BRIDGE WITH RETENTION OF COAL HOUSE JCT GENERAL ARRANGEMENT SHEET 2 OF 3**

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Original Size	A1	Date	10/02/17	Date	10/02/17	Date	10/02/17	Date	---
Drawing Status	INITIAL STATUS OR WIP								S0
Drawing Number	HE551462	Project	BCH	Originator	WSP	Volume	HGN	Project Ref. No.	
Location	DR	Type	D	Role	10005	Number		Revision	P04

CR Retaining wall 2
 STKEY TBC
 Ref SOR10

Gantry SG011
 AIP - Long Span Truss
 Type Cantilever Gantry
 STKEY TBC
 Ref SOR09

Gantry SG013
 AIP - Super Span
 Truss Portal Gantry
 STKEY TBC
 Ref SOR09

Gantry SG012
 AIP - Long Span Truss
 Type Cantilever Gantry
 STKEY TBC
 Ref SOR09

CR Retaining wall 3
 STKEY TBC
 Ref SOR10

Eighton Lodge Slip Road Underbridge
 OS Grid Ref: 426527E, 557592N
 STKEY 16441
 Structure No. A1/440.90/6
 AIP - Widening of Eighton Lodge North &
 Slip Road Underbridges
 Ref SOR05

Gantry SG014
 AIP - Super Span
 Truss Portal Gantry
 STKEY TBC
 Ref SOR09

Eighton Lodge South Underbridge
 OS Grid Ref: 426801E, 557466N
 STKEY 8883
 Structure No. A1/440.90
 AIP - Widening of Eighton Lodge South
 Bridge
 Ref SOR05

Longbank Bridleway Underbridge
 OS Grid Ref: 427169E, 557294N
 STKEY 26280
 Structure No. A1/440.80
 AIP - Longbank Underpass
 Ref SOR06

Gantry SG016
 AIP - Super Span Truss
 Portal Gantry
 STKEY TBC
 Ref SOR09

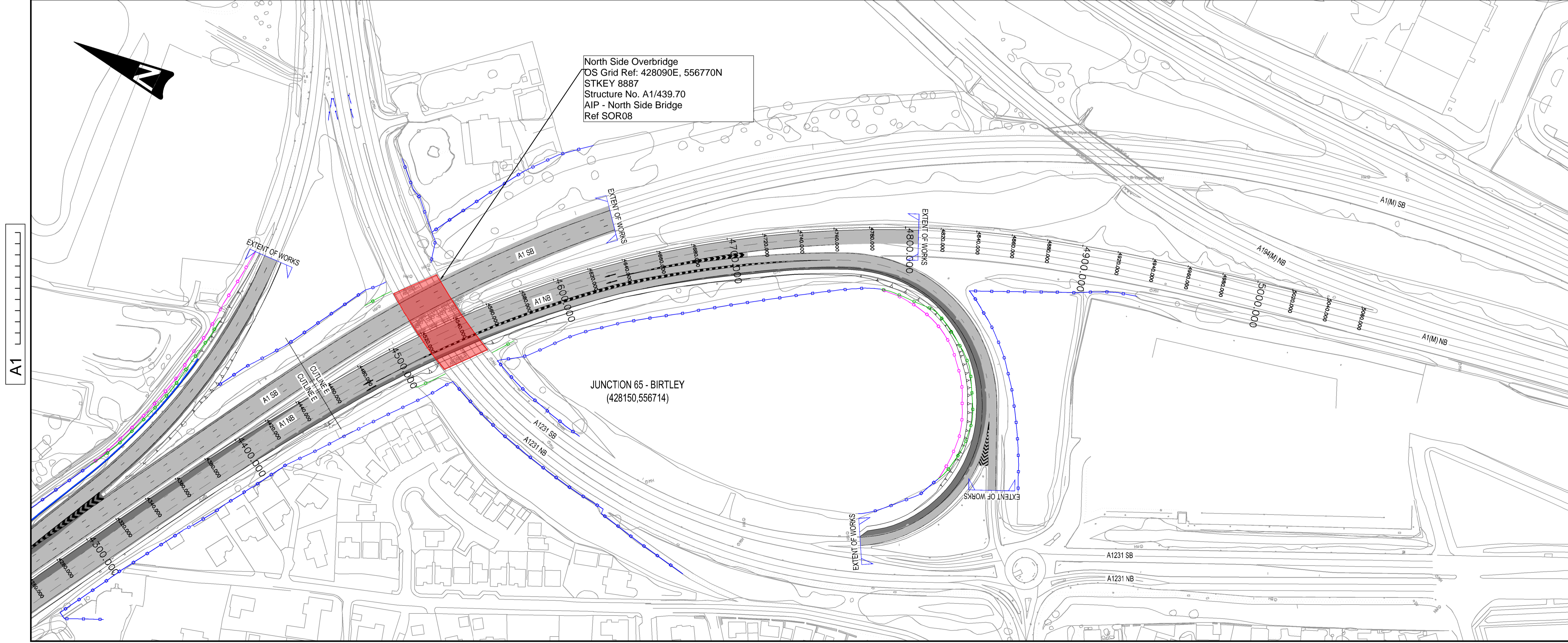
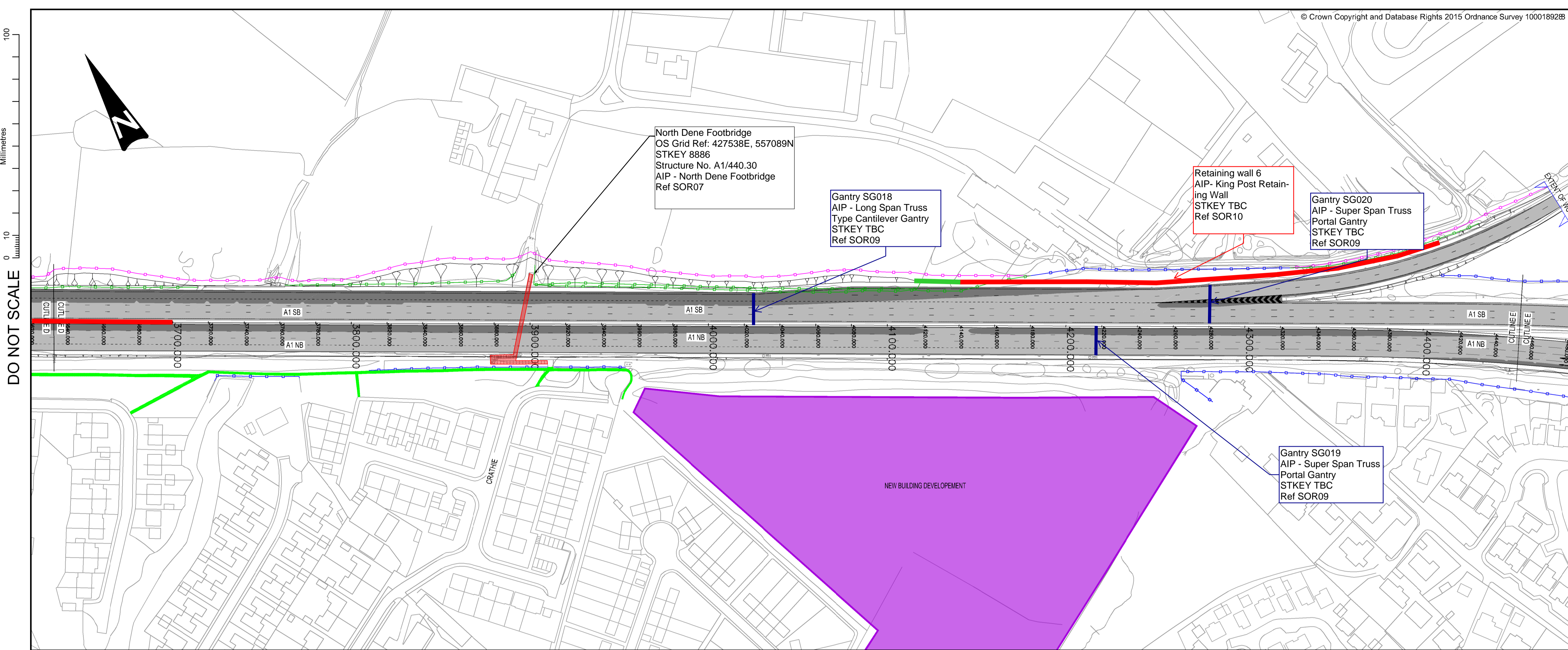
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 STKEY 16440
 Structure No. A1/441.00
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 North & Slip Road Underbridges
 Ref SOR05

Gantry SG015
 AIP - Super Span Truss
 Portal Gantry
 STKEY TBC
 Ref SOR09

CR Retaining wall 4
 STKEY TBC
 Ref SOR10

Gantry SG017
 AIP - Long Span Truss
 Type Cantilever Gantry
 STKEY TBC
 Ref SOR09

EIGHTON LODGE CULVERT: STRUCTURE KEY
 15468. STRUCTURE IS APPROXIMATELY 18m
 BELOW GROUND LEVEL SO WILL BE UNAFFECTED.



KEY

- EXISTING STRUCTURE
- PROPOSED RETAINING WALL
- PROPOSED HIGHWAYS FENCE LINE
- EXISTING HIGHWAYS FENCE LINE
- REMOVED EXISTING HIGHWAYS FENCE LINE
- NEW CARRIAGEWAY CONSTRUCTION
- EXISTING CARRIAGEWAY TO BE RETAINED
- PROPOSED FOOTPATH DIVERSION
- EXISTING FOOTPATH
- PROPOSED SIGNAL
- EXISTING SIGNAL

DO NOT SCALE

A1

Rev.	Date	Description	By	Chkd	Appd
P01	05/09/16	FOR INFORMATION	JAC		
P02	07/09/16	MINOR AMENDMENTS TO DIMS & STRUCTURES CHANGE ADDED	JWL	CP	NGR
P03	07/09/16	ISSUED FOR PUBLIC CONSULTATION	JWL	SG	NGR
P04	10/02/17	DESIGN DEVELOPMENT POST PUBLIC CONSULTATION	JWL	SG	NGR

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Client **Working on behalf of**

highways england

Project Title **A1 BIRTLEY TO COALHOUSE**

Drawing Title **OPTION 1A - OFFLINE REPLACEMENT OF ALLERDENE RAILWAY BRIDGE WITH RETENTION OF COAL HOUSE JCT GENERAL ARRANGEMENT SHEET 3 OF 3**

Scale	1:1250	Drawn	J.Longmore	Checked	S.Ghosh	Approved	N.Rawcliffe	Authorised	---
Original Size	A1	Date	10/02/17	Date	10/02/17	Date	10/02/17	Date	---

Drawing Status **INITIAL STATUS OR WIP** Suitability **S0**

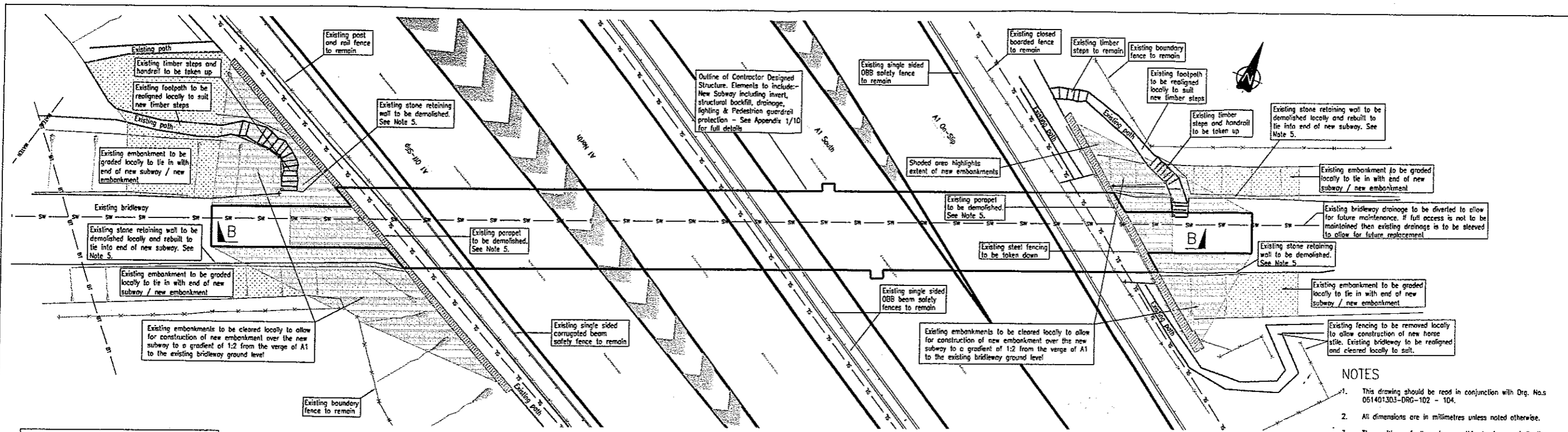
Drawing Number	HE551462	Project	BCH	Originator	WSP	Volume	HGN	Project Ref. No.	
Location	DR	Type	D	Role	10006	Number		Revision	P04

Appendix B

AS BUILT INFORMATION

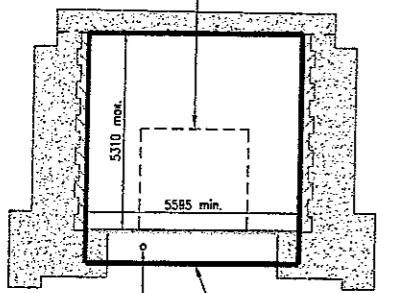
APPENDIX B-1

AS BUILT INFORMATION

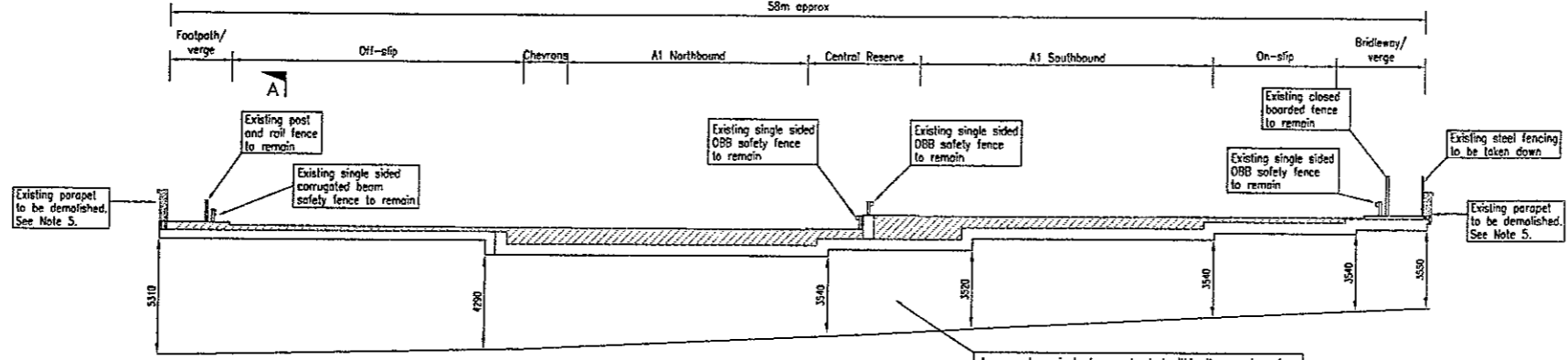


EXISTING PLAN
Scale 1:150

A new subway is to be constructed within the opening of the existing structure with a minimum envelope opening of 3.0m wide x 2.8m high. Once constructed the void between the new / existing structure is to be backfilled

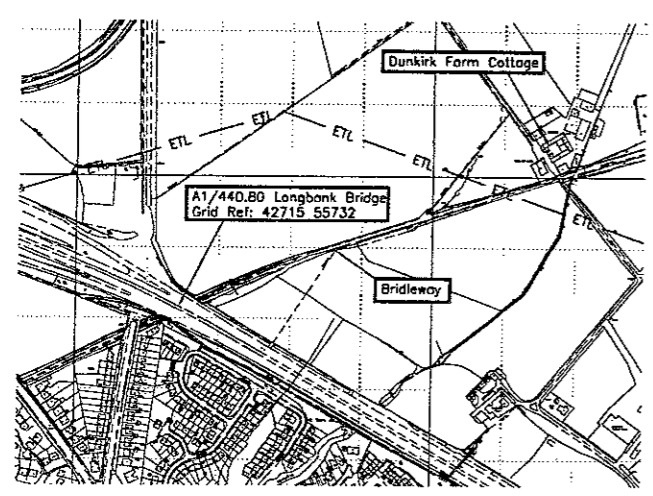


EXISTING SECTION A-A
Scale 1:100

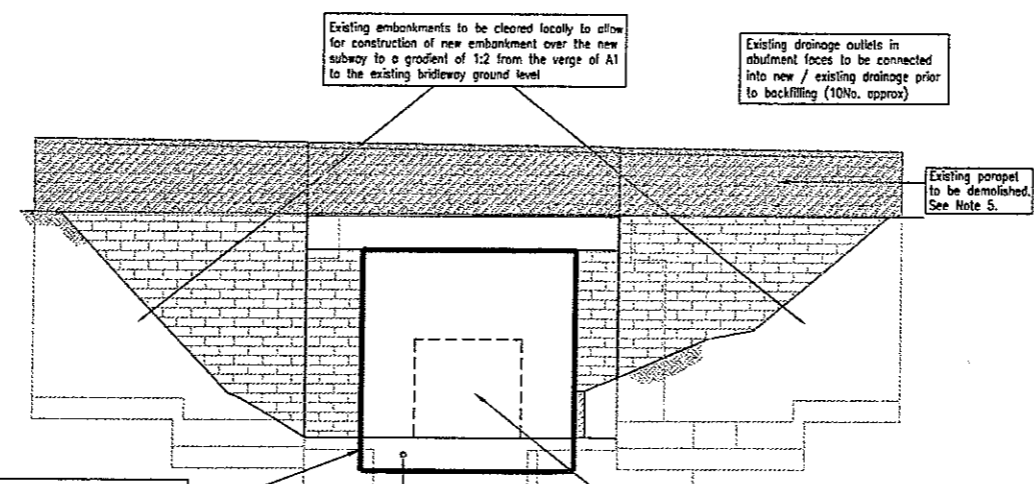


EXISTING SECTION B-B
Scale 1:150

A new subway is to be constructed within the opening of the existing structure with a minimum envelope opening of 3.0m wide x 2.8m high. Once constructed the void between the new / existing structure is to be backfilled



LOCATION PLAN
(Showing position of overhead electric cable)
Scale 1:2500



EXISTING SOUTH ELEVATION
Scale 1:100

Outline of Contractor Designed Structure. Elements to include: New Subway including invert, structural backfill, drainage, lighting & Pedestrian guardrail protection - See Appendix 1/10 for full details

A new subway is to be constructed within the opening of the existing structure with a minimum envelope opening of 3.0m wide x 2.8m high. Once constructed the void between the new / existing structure is to be backfilled

NOTES

1. This drawing should be read in conjunction with Drg. Nos. 061401303-DRG-102 - 104.
2. All dimensions are in millimetres unless noted otherwise.
3. The positions of all services on this drawing are indicative, each service must be identified, in liaison with the respective utility, and marked out prior to the commencement of any construction works.
4. The structural dismantling of the existing elements must be in accordance with Clause 270AR and 1771AR of the Contract Documents.
5. Parapets and stone retaining walls to be taken down to a minimum of 300mm below finished ground level or to the supporting structural element, whichever is higher.

KEY

- Water Trunk Main
- Street Lighting
- Surface Water Drain
- British Telecom
- Overhead Electric cable
- Extent of new embankment construction
- Extent of site clearance

Rev.	By	Checked	Approved	Date	Description

- ### HEALTH & SAFETY REQUIREMENTS
1. Details of significant risks / hazards associated with the construction of the new subway are highlighted on Drg. No. 061401303-DRG-103.
 2. Structural Dismantling of existing parapets must follow a detailed method statement.
 3. The position of all services on this drawing are indicative. Each service must be identified, in liaison with the respective utility company, and marked out prior to commencement of any construction works.
 4. Site clearance of existing embankment slopes must follow a detailed method statement.

FOR TENDER

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Client
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Department for Transport

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Email: enquiries@hwa.co.uk Web: www.hwa.co.uk

Project
A1 LONGBANK BRIDGE REFURBISHMENT

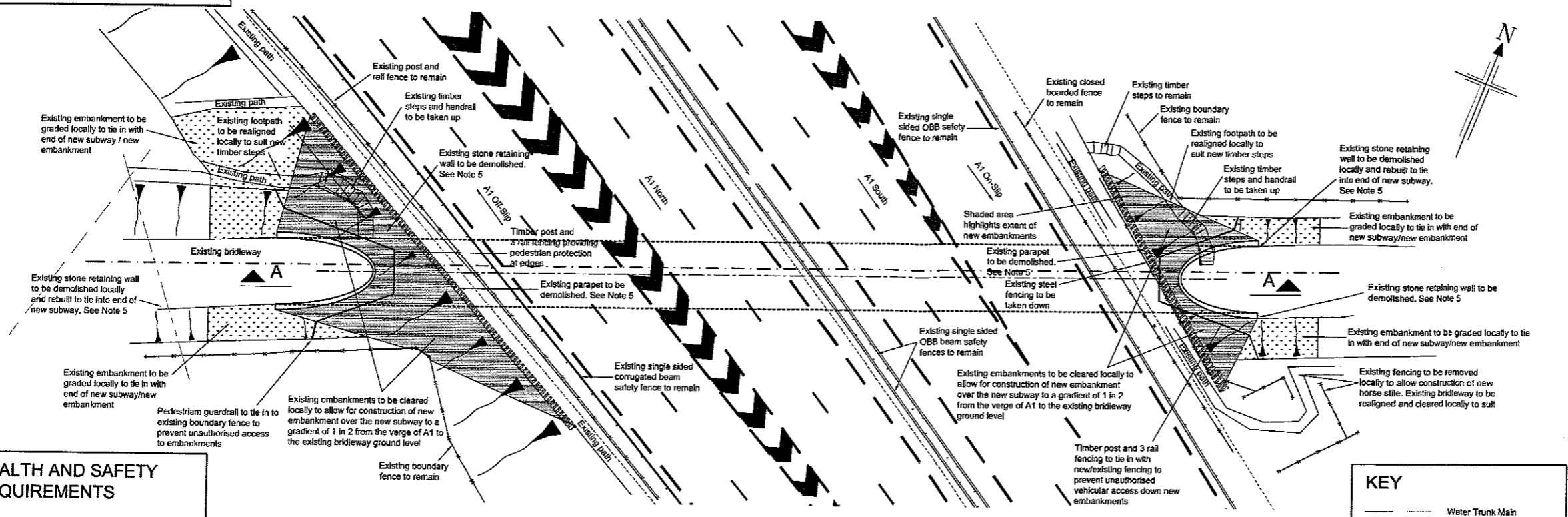
Drawing
A1 / 440.80 LONGBANK BRIDGE EXISTING GENERAL ARRANGEMENT

Drawn by: DBS Date: JUNE '06
Checked by: DW Date: AUG '06
Authorised by: WLJ Date: SEPT '06

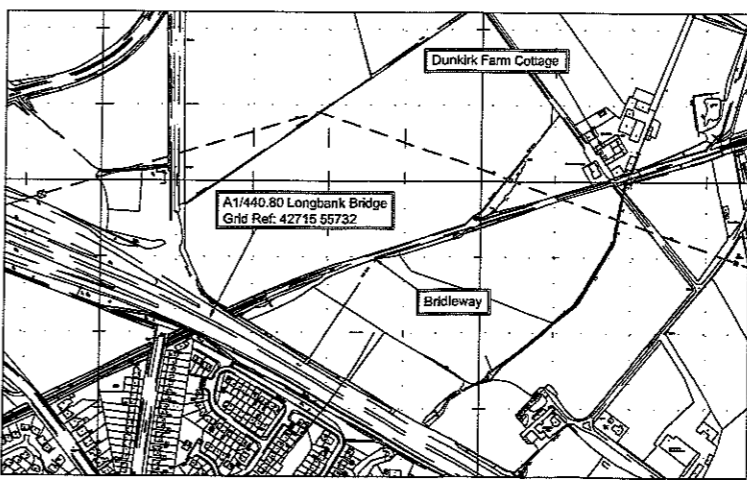
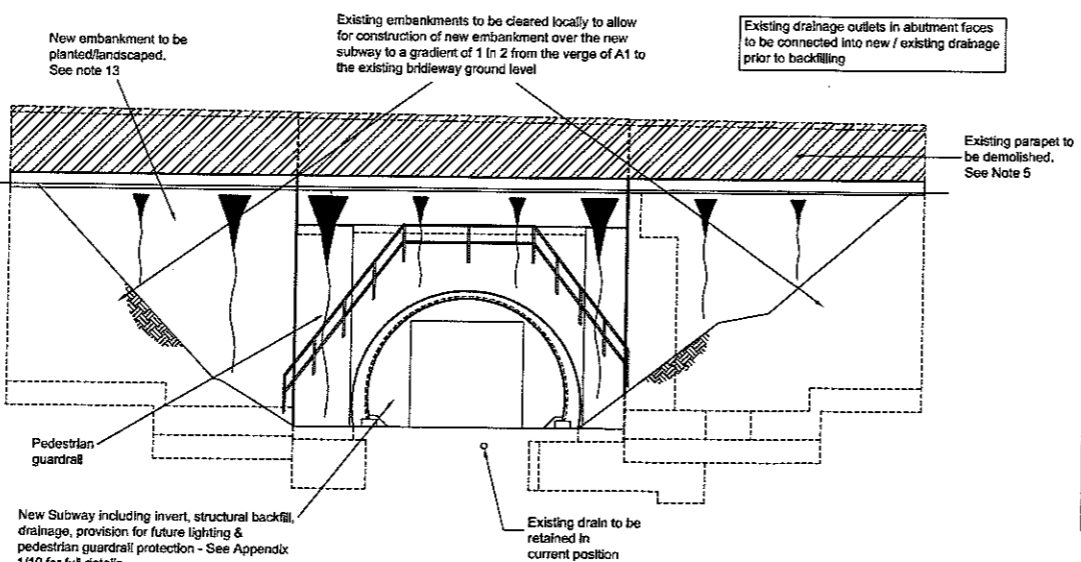
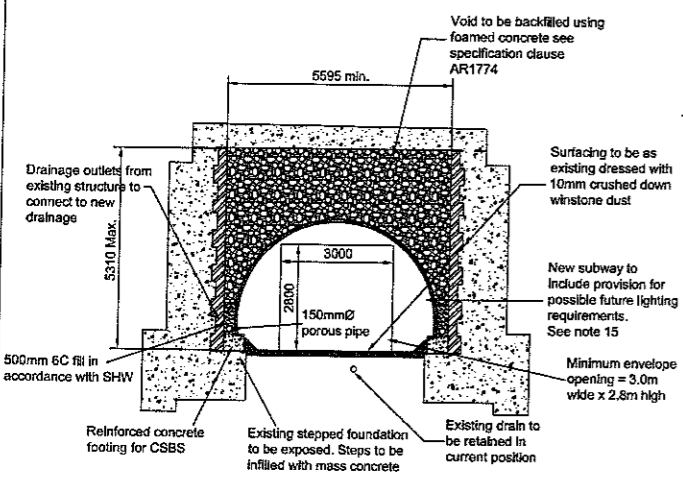
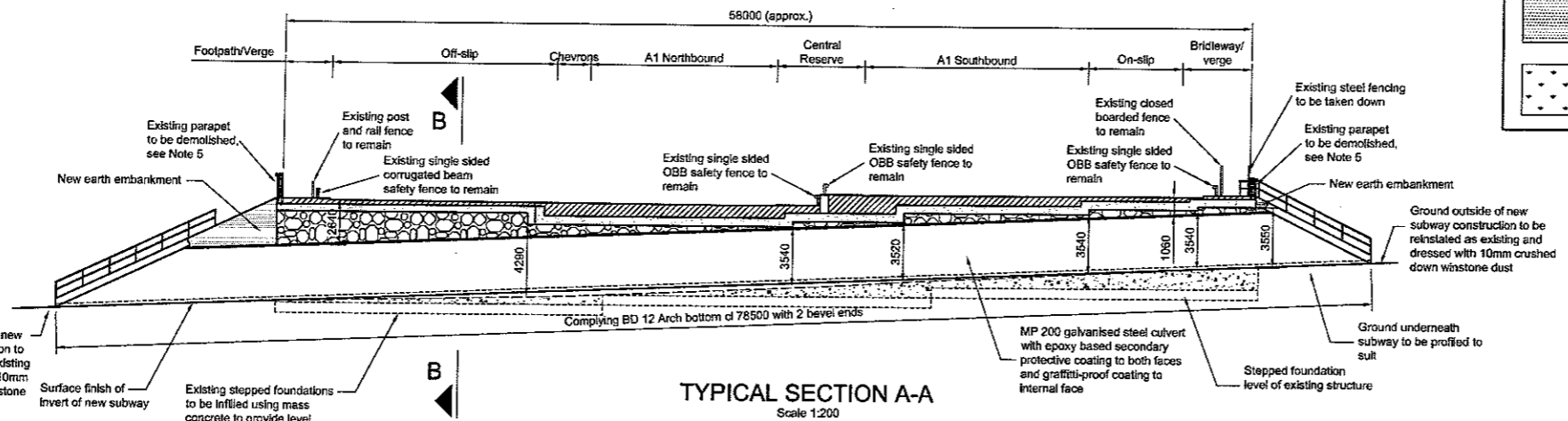
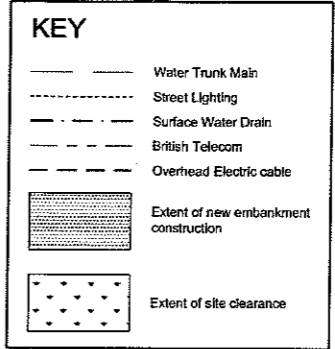
Drawing No. A1 440.80-061401303-DRG-101
Revision A

Drawing Scale: 1:150 Plot Scale: 1:1

- Notes:
- All dimensions are in millimetres unless noted otherwise.
 - All levels and chainages are in metres unless noted otherwise.
 - All exposed arrises to have 25x25 chamfers unless noted otherwise.
 - The structural dismantling of the existing elements must be in accordance with Clause 270AR of the Contract Documents.
 - Parapets and stone retaining walls to be taken down to a minimum of 300mm below finished ground level or to the supporting structural element, whichever is higher.
 - Drainage works shall be carried out in accordance with Clause 501 of the Specification.
 - Temporary access scaffolding, if required, should not require technical approval or a departure from standard. However, the Contractor must follow the requirements of Clause 172AR of the Specification as applicable.
 - New subway construction shall meet the requirements of Appendix 1/10 of the Specification.
 - The finished invert of the new subway shall be reinstated to original levels, taken prior to any site clearance works.
 - The structural backfilling of the void between the new/existing structure shall require verification, by a method designed by the Contractor and approved by the Overseeing Organisation, to ensure that no voids remain.
 - New embankment to be constructed in accordance with Appendix 6 of the Specification.
 - All planting works to the new embankments shall be completed in accordance with Appendix 30 of the Specification.
 - New Contractor designed pedestrian guardrail protection to ends of new subway shall be subject to approval by the Overseeing Organisation.
 - Provision for possible future lighting requirements of the subway shall be in accordance with Appendix 14 of the Specification.
 - Reinstatement of bridleway to match existing shall be with a layer of well compacted crushed stone mixed with stone dust.
 - New motorbike inhibitor barrier to be of 'A-Frame' type manufactured from galvanised steel. Exact position to be agreed on site with the Overseeing Organisation.
 - Made ground to be excavated to level of gravelly sand and replaced by mass concrete. Sand should be tested to demonstrate relative density is at least medium dense; additional excavation and replacement may be necessary.



- ### HEALTH AND SAFETY REQUIREMENTS
- Structural dismantling of existing parapets must follow a detailed method statement.
 - The position of all services on this drawing are indicative. Each service must be identified, in liaison with the respective utility company, and marked out prior to commencement of any construction works.
 - Site clearance of existing embankment slopes must follow a detailed method statement.
 - Precautions whilst working at height shall be followed during construction at the new subway and installation of new pedestrian guardrail.
 - Confined space requirements shall be followed during construction of the new subway and backfilling of void between new subway and existing structure.
 - Manual handling requirements shall be followed for all construction activities, including construction of new subway.
 - COSHH requirements shall be followed for all construction activities, including construction of the new subway and backfilling of void between new subway and existing structure.
 - A contaminated land risk assessment is required.



Rev	Rev. Date	Purpose of revision	Drawn	Checked/Approved
3	Feb 07	Minor amendments	SD	GS JD
2	Feb 07	Minor amendments	SD	GS JD
1	Feb 07	AP issue	RSC	GS JD
0	Nov 06	Tender drawing	ALO	GS JD

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Client: **HIGHWAYS AGENCY** **RINGWAY**

Project: **A1 LONGBANK BRIDGE REFURBISHMENT**

Drawing title: **GENERAL ARRANGEMENT**

Drawing status: **PRELIMINARY**

Scale: **AS SHOWN @ A1 DO NOT SCALE**

Jacobs No. **B0372100**

Client no. _____

Drawing number: **B0372100/ST01/01** Rev **3**

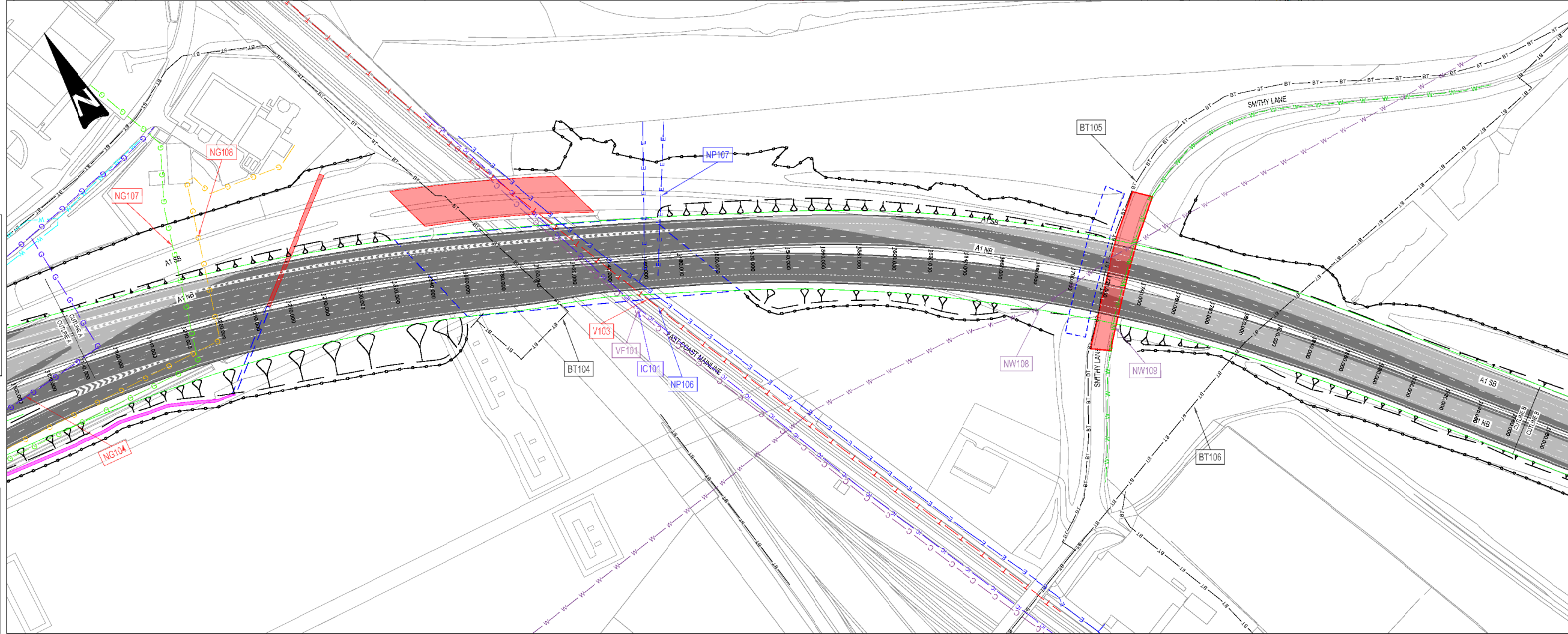
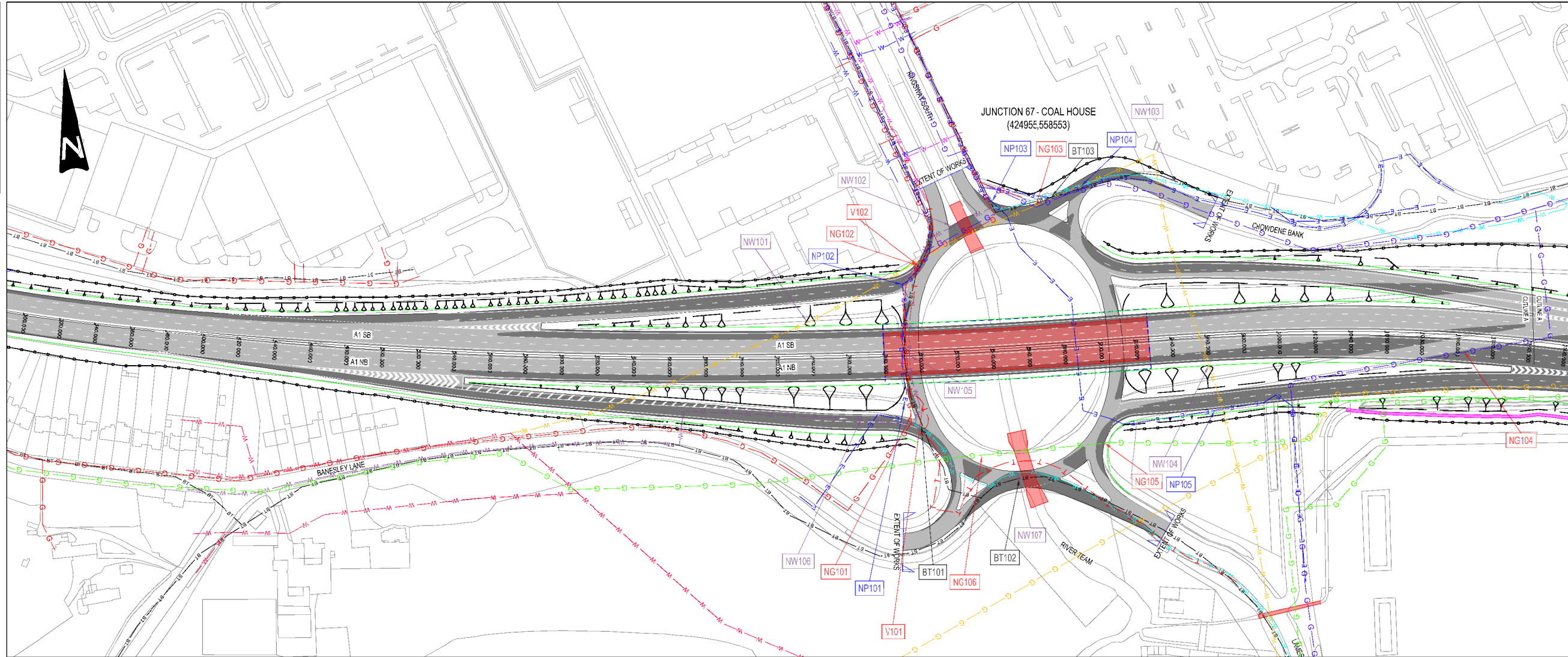
This drawing is not to be used in whole or part other than for the intended purpose and project as defined on this drawing. Refer to the contract for full terms and conditions.

Appendix C

STATUTORY UNDERTAKES INFORMATION

APPENDIX C-1

STATUTORY UNDERTAKERS DRAWINGS



NOTES

- LOCATION OF SERVICE PLANT SHOWN ON THIS DRAWING HAS BEEN OBTAINED FROM C2 STATUTORY UNDERTAKERS RETURNS AND IS SHOWN INDICATIVELY. THE STATUTORY UNDERTAKERS ARE TO SATISFY THEMSELVES OF THE LOCATION AND EXTENTS OF SERVICE PLANT.
- REFER TO SECTION 3.10 OF THE TECHNICAL APPRAISAL REPORT FOR DETAILS OF THE DIVERSION WORKS PROPOSED.

KEY

- BT — BT DUCT
- IC — INSTALCOM
- W — NORTHUMBRIAN WATER COMBINED
- W — NORTHUMBRIAN WATER FOUL
- W — NORTHUMBRIAN WATER ABANDONED
- W — NORTHUMBRIAN WATER SURFACE
- W — NORTHUMBRIAN WATER TREATED
- W — NORTHUMBRIAN WATER DISTRIBUTION
- W — NON NORTHUMBRIAN WATER PRIVATE
- G — NORTHERN GAS LOW PRESSURE
- G — NORTHERN GAS MEDIUM PRESSURE
- G — NORTHERN GAS INTERMEDIATE PRESSURE
- G — NORTHERN GAS REGIONAL HIGH PRESSURE
- T — VIRGIN MEDIA CABLE
- E — NORTHERN POWER GRID CABLE
- C — VODAFONE CABLE
- IC01 — UTILITY REFERENCE
- EXISTING STRUCTURE
- PROPOSED STRUCTURE
- PROPOSED HIGHWAYS FENCE LINE
- NEW CARRIAGEWAY CONSTRUCTION
- EXISTING CARRIAGEWAY TO BE RETAINED
- PROPOSED DRAINAGE DITCH
- PROPOSED SIGNAL
- EXISTING SIGNAL

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SAFETY, HEALTH AND ENVIRONMENTAL SYMBOL LEGEND

INDICATES A RESIDUAL RISK AS A WARNING

Rev	Date	Description	By	CHK	APP
S2	P1.0	08/01/2016	FOR INFORMATION		

Designer: **WSP PARSONS BRINCKERHOFF**
 Three White Rose Office Park, Millthorpe Park Lane, Leeds, LS11 0DL
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Client: **highways england**

Project Title: **A1 BIRTLEY TO COAL HOUSE**

Drawing Title: **STATUTORY UNDERTAKERS OPTION 2 SHEET 1 OF 3**

Scale	Drawn	Designed	Checked	Approved
1:1250	LCB	IAK	COP	NGR

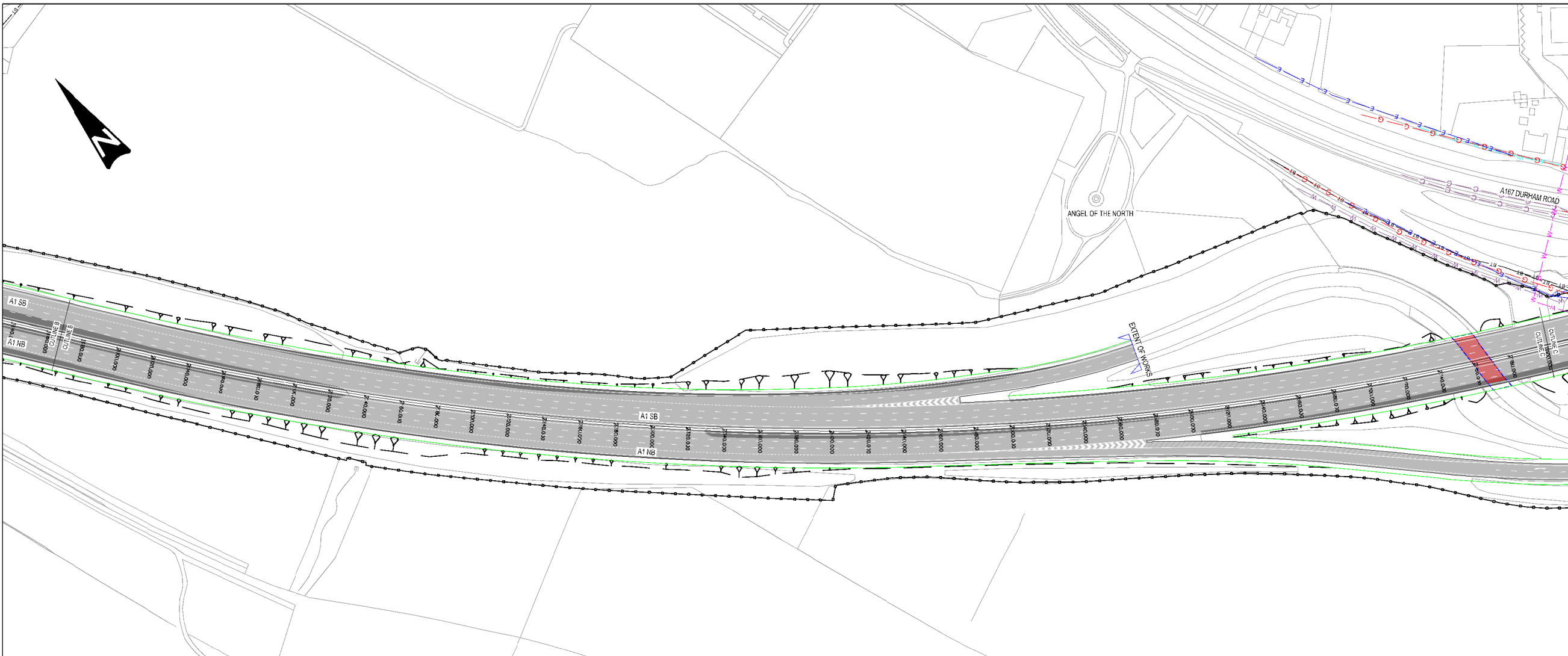
Size	Date	Date	Date	Date	CR CODE
A1	06/01/2016	08/01/2016	08/01/2016	08/01/2016	

Status: **FOR INFORMATION** Submittal: **S2**

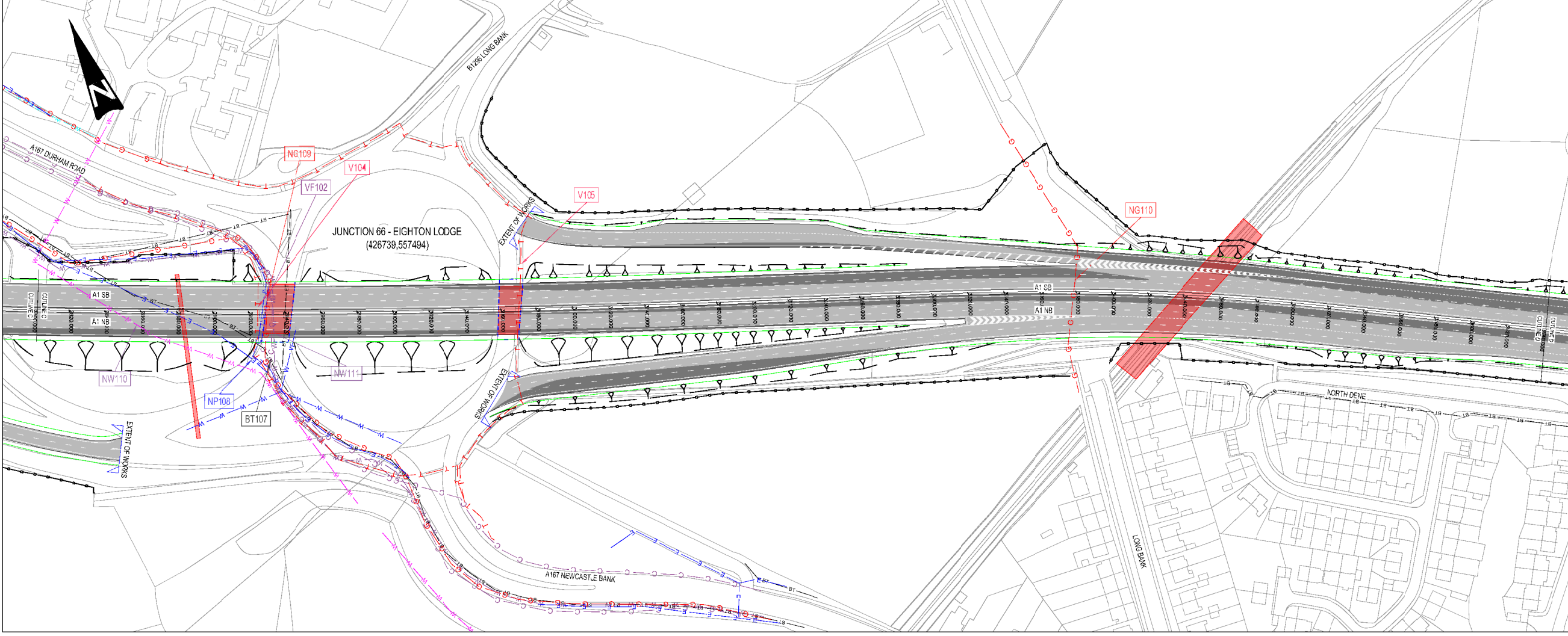
Drawing Number: **HA551462 - WSP - VUT - BCH - DR - D - 2700_026** Revision: **P1.0**

A1

DO NOT SCALE



- NOTES**
- LOCATION OF SERVICE PLANT SHOWN ON THIS DRAWING HAS BEEN OBTAINED FROM CC STATUTORY UNDERTAKERS RETURNS AND IS SHOWN INDICATIVELY. THE STATUTORY UNDERTAKERS ARE TO SATISFY THEMSELVES OF THE LOCATION AND EXTENTS OF SERVICE PLANT.
 - REFER TO SECTION 3.10 OF THE TECHNICAL APPRAISAL REPORT FOR DETAILS OF THE DIVERSION WORKS PROPOSED.
- KEY**
- BT BT DUCT
 - IC INSTAL.COM
 - W W NORTHUMBRIAN WATER COMBINED
 - W W NORTHUMBRIAN WATER FOUL
 - W W NORTHUMBRIAN WATER ABANDONED
 - W W NORTHUMBRIAN WATER SURFACE
 - W W NORTHUMBRIAN WATER TREATED
 - W W NORTHUMBRIAN WATER DISTRIBUTION
 - W W NON NORTHUMBRIAN WATER PRIVATE
 - G G NORTHERN GAS LOW PRESSURE
 - G G NORTHERN GAS MEDIUM PRESSURE
 - G G NORTHERN GAS INTERMEDIATE PRESSURE
 - G G NORTHERN GAS REGIONAL HIGH PRESSURE
 - T T VIRGIN MEDIA CABLE
 - E E NORTHERN POWER GRID CABLE
 - C C VODAFONE CABLE
 - IC01 UTILITY REFERENCE
 - EXISTING STRUCTURE
 - PROPOSED STRUCTURE
 - PROPOSED HIGHWAYS FENCE LINE
 - NEW CARRIAGEWAY CONSTRUCTION
 - EXISTING CARRIAGEWAY TO BE RETAINED
 - PROPOSED DRAINAGE DITCH
 - PROPOSED SIGNAL
 - EXISTING SIGNAL



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SAFETY, HEALTH AND ENVIRONMENTAL SYMBOL LEGEND
 ⚠ INDICATES A RESIDUAL RISK AS A WARNING

Drawn	Checked	Approved	CR CODE
LCB	IAK	COP	NGR
Date	Date	Date	Date
06/01/2016	08/01/2016	08/01/2016	08/01/2016

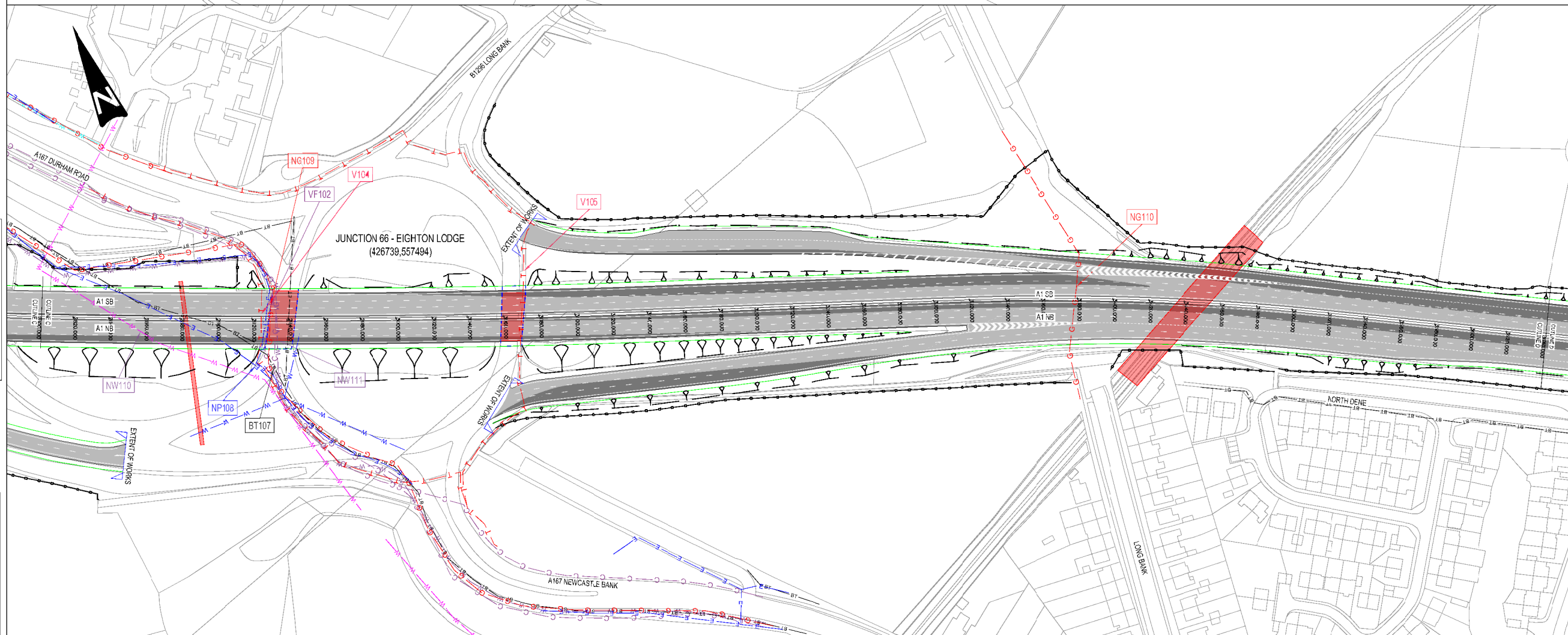
Designer: **WSP PARSONS BRINCKERHOFF**
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Client: **highways england**

Project Title: **A1 BIRTLEY TO COAL HOUSE**

Drawing Title: **STATUTORY UNDERTAKERS OPTION 2 SHEET 2 OF 3**

Scale	Drawn	Designed	Checked	Approved	Status
1:1250	LCB	IAK	COP	NGR	FOR INFORMATION
Date	Date	Date	Date	Date	Surability
06/01/2016	08/01/2016	08/01/2016	08/01/2016	08/01/2016	S2
Drawing Number	Revision				
HA551462 - WSP - VUT - BCH - DR - D - 2700_027					P1.0



- NOTES**
- LOCATION OF SERVICE PLANT SHOWN ON THIS DRAWING HAS BEEN OBTAINED FROM CC STATUTORY UNDERTAKERS RETURNS AND IS SHOWN INDICATIVELY. THE STATUTORY UNDERTAKERS ARE TO SATISFY THEMSELVES OF THE LOCATION AND EXTENTS OF SERVICE PLANT.
 - REFER TO SECTION 3.10 OF THE TECHNICAL APPRAISAL REPORT FOR DETAILS OF THE DIVERSION WORKS PROPOSED.
- KEY**
- BT BT DUCT
 - IC INSTAL.COM
 - W W NORTHUMBRIAN WATER COMBINED
 - W W NORTHUMBRIAN WATER FOUL
 - W W NORTHUMBRIAN WATER ABANDONED
 - W W NORTHUMBRIAN WATER SURFACE
 - W W NORTHUMBRIAN WATER TREATED
 - W W NORTHUMBRIAN WATER DISTRIBUTION
 - W W NON NORTHUMBRIAN WATER PRIVATE
 - G G NORTHERN GAS LOW PRESSURE
 - G G NORTHERN GAS MEDIUM PRESSURE
 - G G NORTHERN GAS INTERMEDIATE PRESSURE
 - G G NORTHERN GAS REGIONAL HIGH PRESSURE
 - T T VIRGIN MEDIA CABLE
 - E E NORTHERN POWER GRID CABLE
 - C C VODAFONE CABLE
 - IC01 UTILITY REFERENCE
 - EXISTING STRUCTURE
 - PROPOSED STRUCTURE
 - PROPOSED HIGHWAYS FENCE LINE
 - NEW CARRIAGEWAY CONSTRUCTION
 - EXISTING CARRIAGEWAY TO BE RETAINED
 - PROPOSED DRAINAGE DITCH
 - PROPOSED SIGNAL
 - EXISTING SIGNAL

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SAFETY, HEALTH AND ENVIRONMENTAL SYMBOL LEGEND

INDICATES A RESIDUAL RISK AS A WARNING

Rev	Date	Description	By	App
01	08/01/2016	FOR INFORMATION		

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 http://www.wspgroup.com

Client: **highways england**

Project Title: **A1 BIRTLEY TO COAL HOUSE**

Drawing Title: **STATUTORY UNDERTAKERS OPTION 2 SHEET 2 OF 3**

Scale	Drawn	Designed	Checked	Approved	CR CODE
1:1250	LCB	IAK	COP	NGR	
Size	Date	Date	Date	Date	
A1	06/01/2016	08/01/2016	08/01/2016	08/01/2016	
Status	FOR INFORMATION				Suitability S2
Drawing Number	HA551462 - WSP - VUT - BCH - DR - D - 2700_027				Revision P1.0

A1

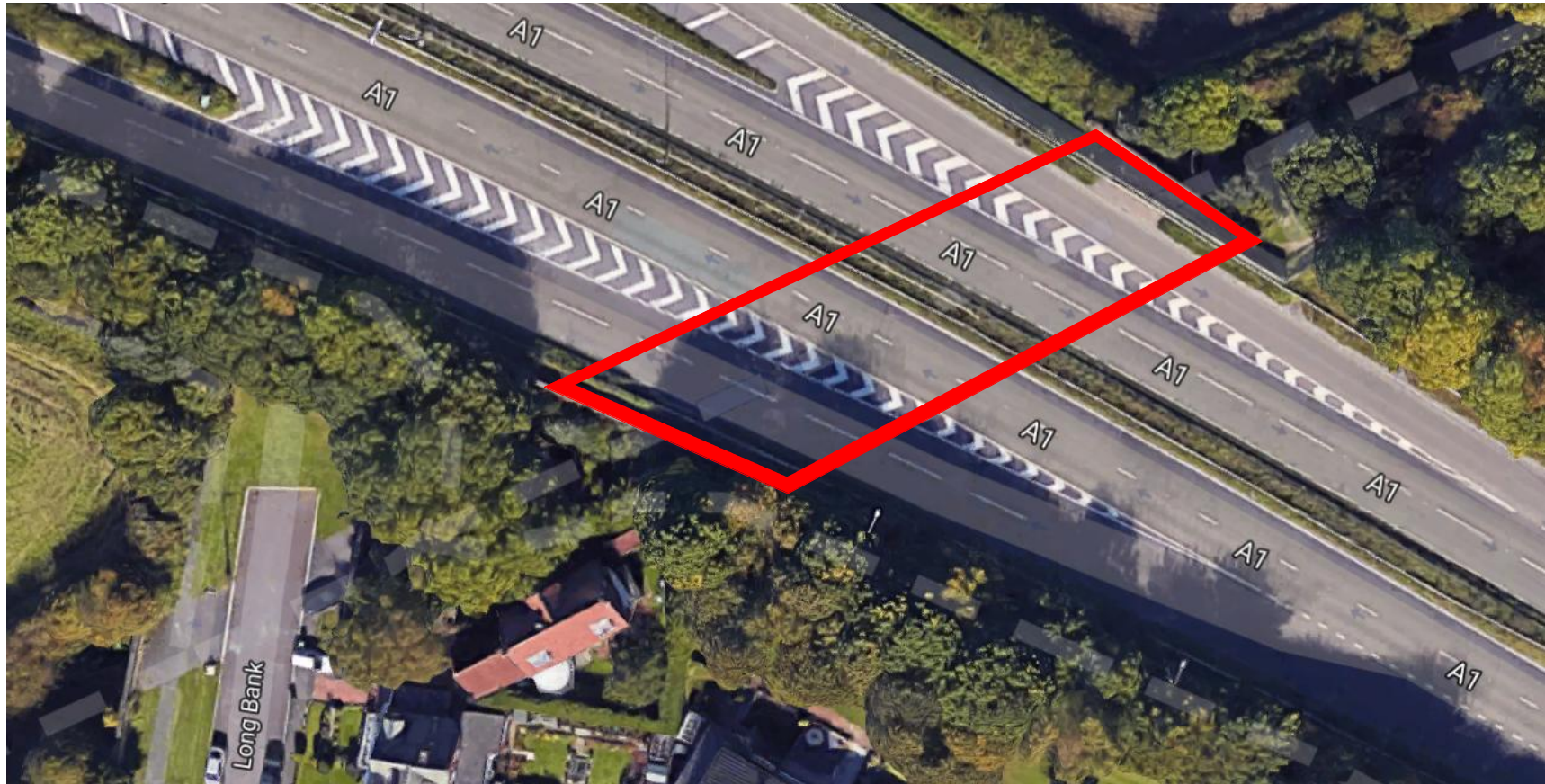
DO NOT SCALE

Appendix D

EXISTING STRUCTURE PHOTOGRAPH PLAN

APPENDIX D-1

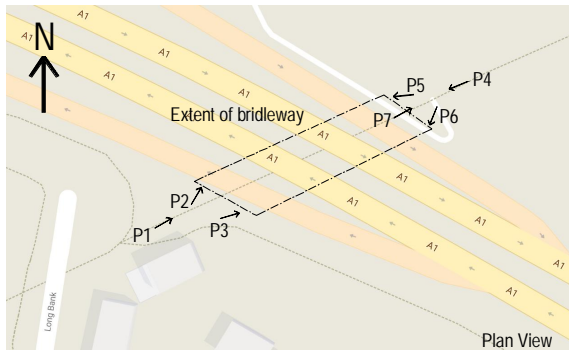
EXISTING STRUCTURE PHOTOGRAPH PLAN



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<http://www.wsp.com>

Project:
A1 BIRTLEY TO COAL HOUSE IMPROVEMENT SCHEME

Title:
Long Bank Bridleway Plan View



Photograph 1 (P1)
West Elevation General View



Photograph 2 (P2)
West Entrance North end



Photograph 3 (P3)
West Entrance South end



Photograph 4 (P4)
East Elevation



Photograph 5 (P5)
East Entrance North end



Photograph 6 (P6)
East Entrance South end



Photograph 7 (P7)
View from East entrance looking East



Three White Rose Office Park, Millbrow Park Lane, Leeds, LS11 0DL
Tel: +44 (0)113 395 6200 Fax: +44 (0)113 395 6201
<http://www.wsp.com>

Project:
A1 BIRTLEY TO COAL HOUSE IMPROVEMENT SCHEME

Title:
Long Bank Bridleway (West Entrance) Photos from rudimentary survey taken on 23/08/2017

Appendix E

EXISTING CROSS SECTION

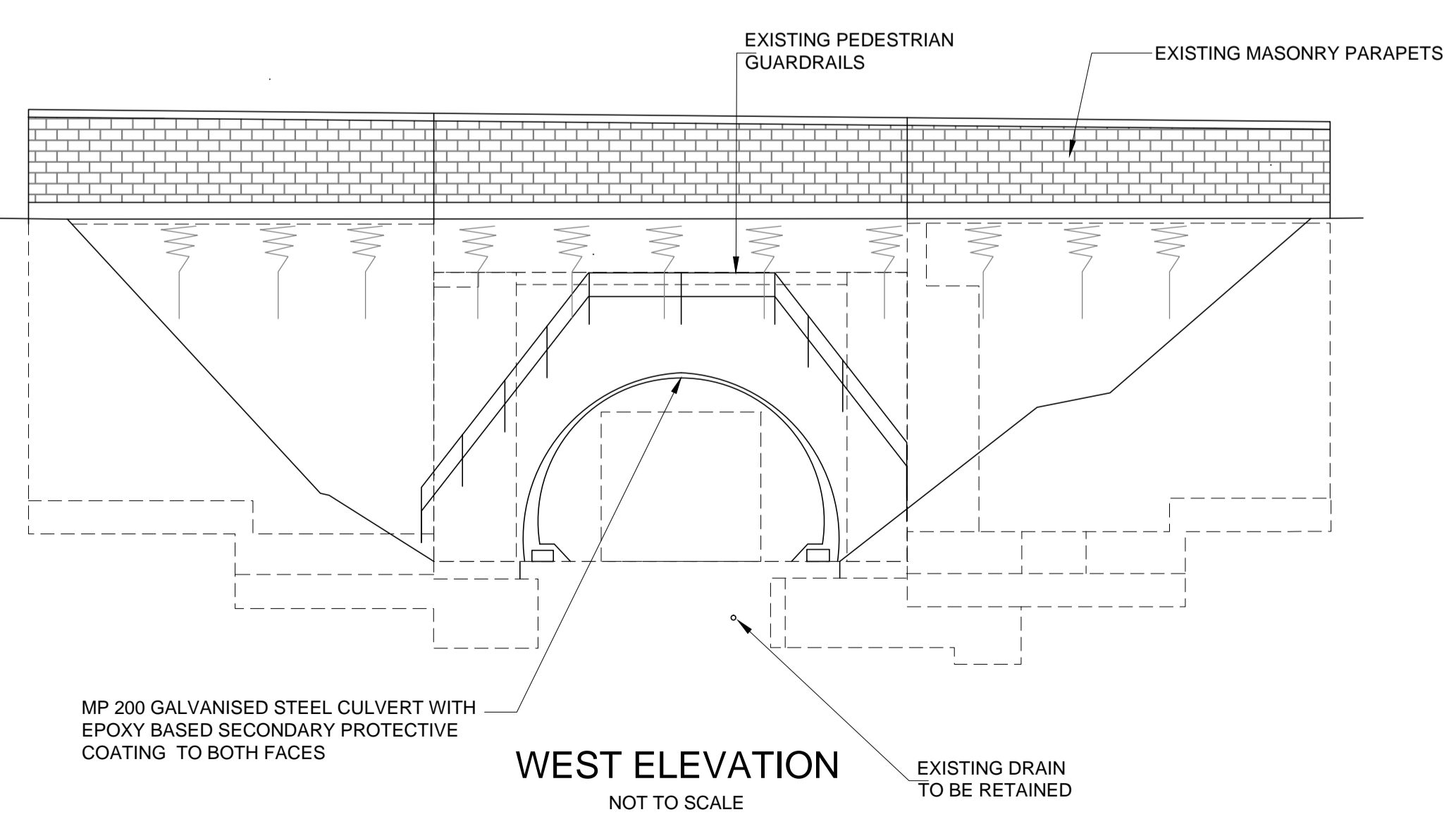
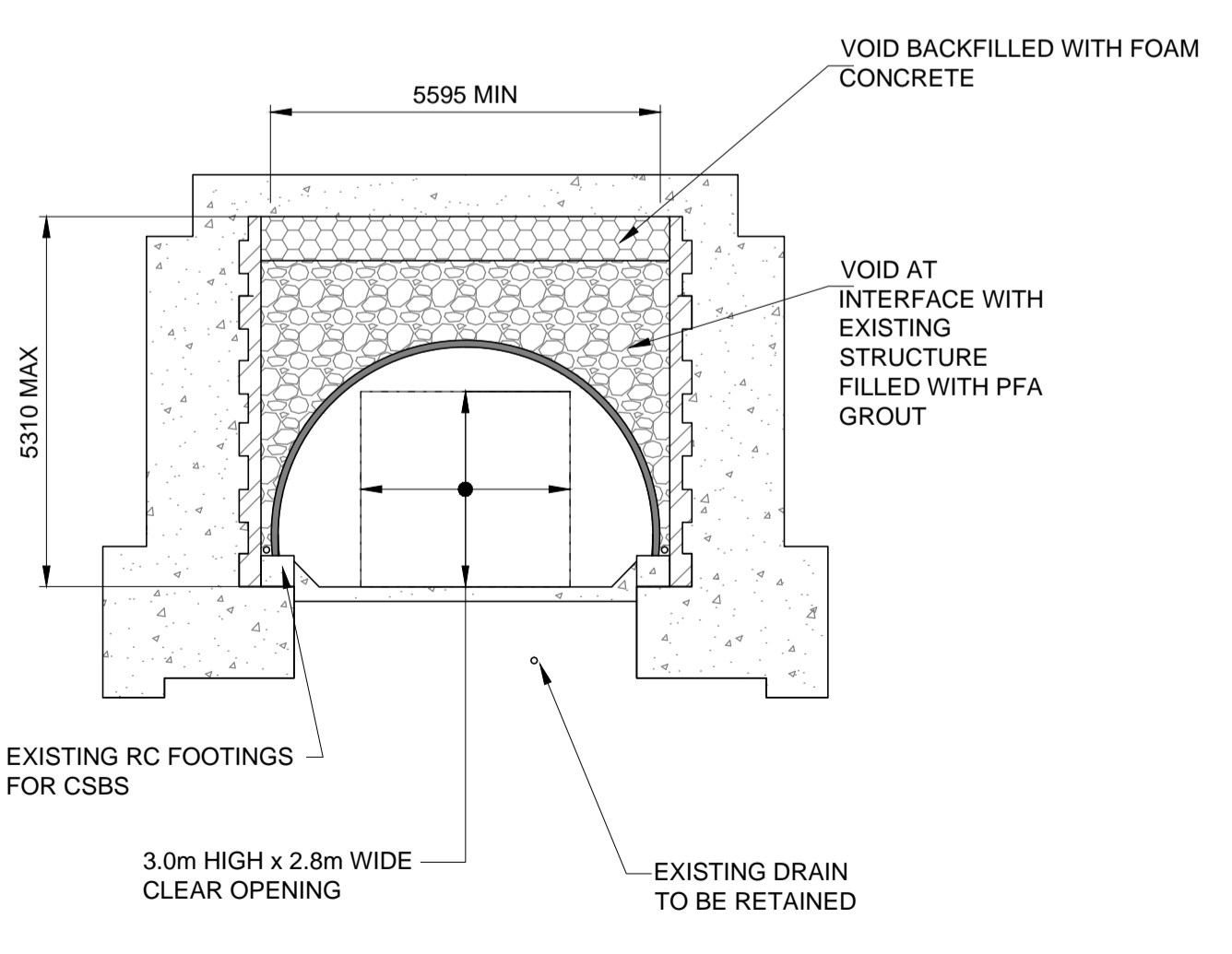
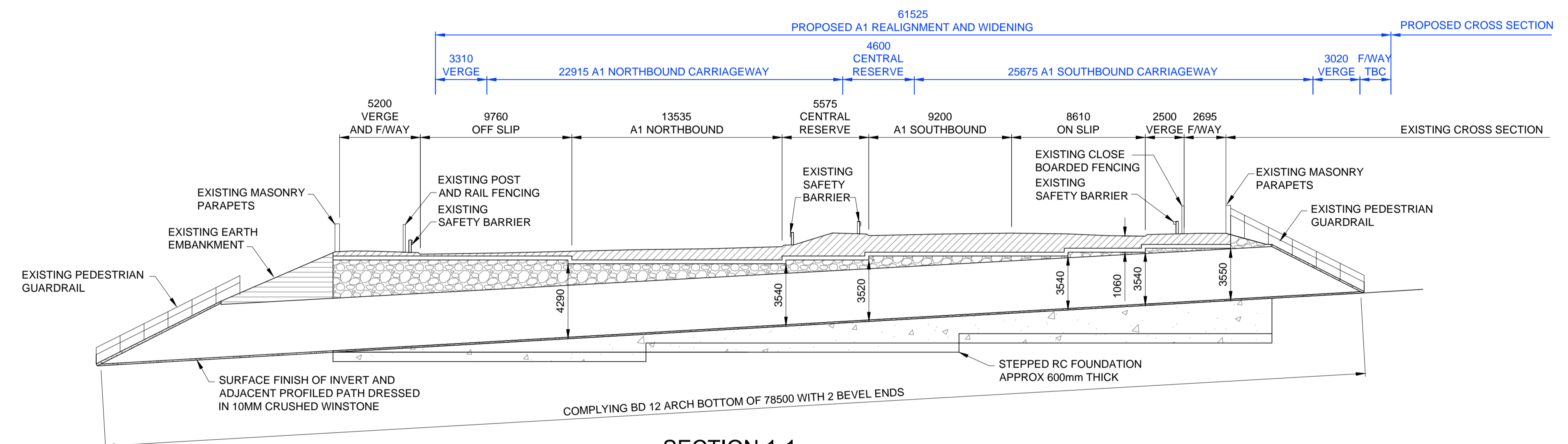
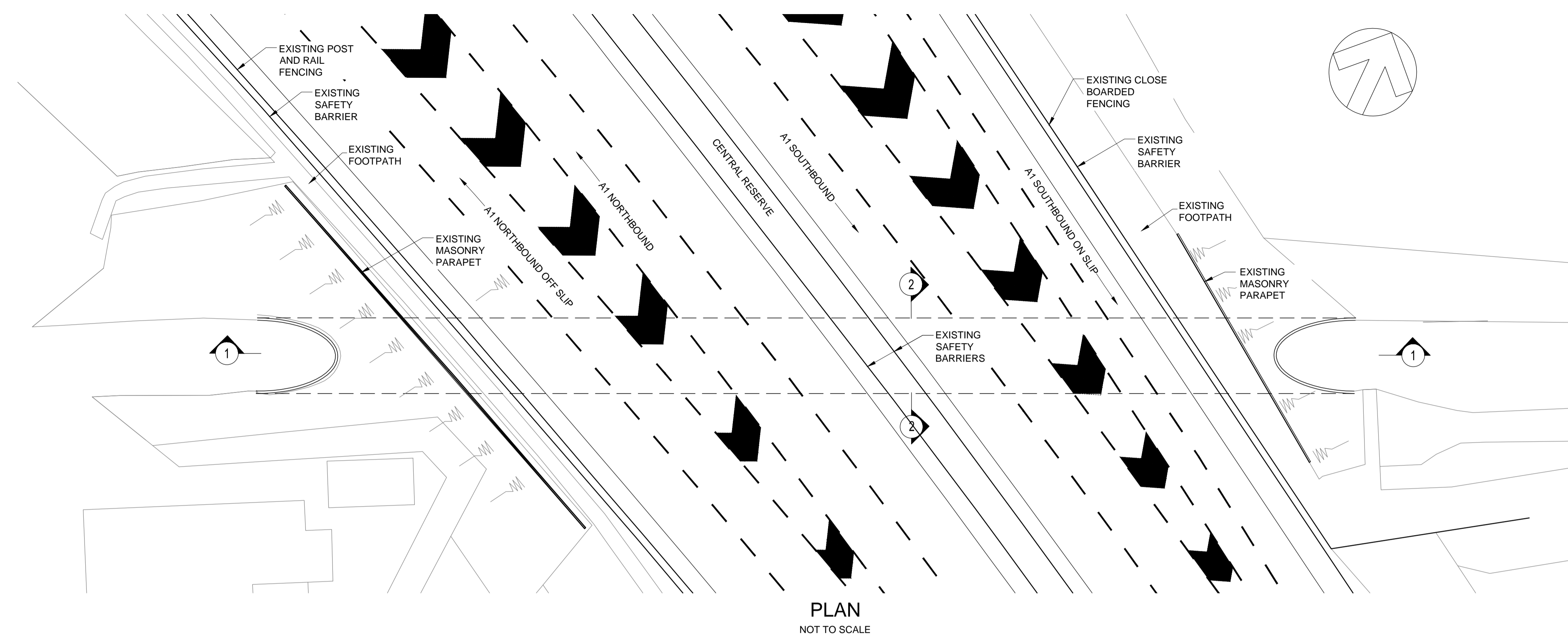
APPENDIX E-1

EXISTING CROSS SECTION


- 1) ALL DIMENSIONS ARE IN MM UNLESS NOTED OTHERWISE
- 2) DO NOT SCALE IN CASE OF DOUBTS, OMISSIONS OR ERRORS SEEK CLARIFICATION FROM THE DESIGN
- 3) THIS DRAWING PROVIDES DETAILS OF THE EXISTING LONGBANK BRIDLEWAY, INFORMATION REFERRED TO DEVELOPED THIS DRAWINGS INCLUDE
 - B0372100/ST01/01
 - TOPOGRAPHICAL SURVEY HE551462-WSP-HGN-BCH-M2-D-00036
 - BY LONGDIN AND BROWNING (SURVEYS) Ltd. APRIL 2016
- 4) EXISTING DIMENSIONS/LEVELS SHALL NEED TO BE CONFIRMED SUBJECT TO DETAILED DESIGN

NOTE
 THESE DRAWINGS HAVE BEEN RE PRODUCED FROM LIMITED AS BUILT INFORMATION AND MUST NOT BE SCALED. THE CONTRACTOR IS TO CONFIRM ALL DIMENSIONS AND SETTING OUT PRIOR TO FABRICATION AND EXECUTION OF WORKS

DO NOT SCALE



Rev.	Date	Description	By	Chkd	Appd
P01.1	12/10/17				



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 wsp.com

Client **Working on behalf of highways england**

Project Title **A1 BIRTLEY TO COALHOUSE**

Drawing Title **LONGBANK CULVERT EXISTING GENERAL ARRANGEMENT**

Scale	Drawn	Checked	Approved	Authorised
NOT TO SCALE	CCu	HMi	HMi	---
Original Size	Date	Date	Date	Date
	---	---	---	---

Drawing Status: **INITIAL STATUS OR WIP** Suitability: **S0**

Drawing Number	Project	Originator	Volume	Project Ref. No.
HE551462	BCH	DR	SBR	
Location	Type	Role	Number	Revision
			00001	P01.1

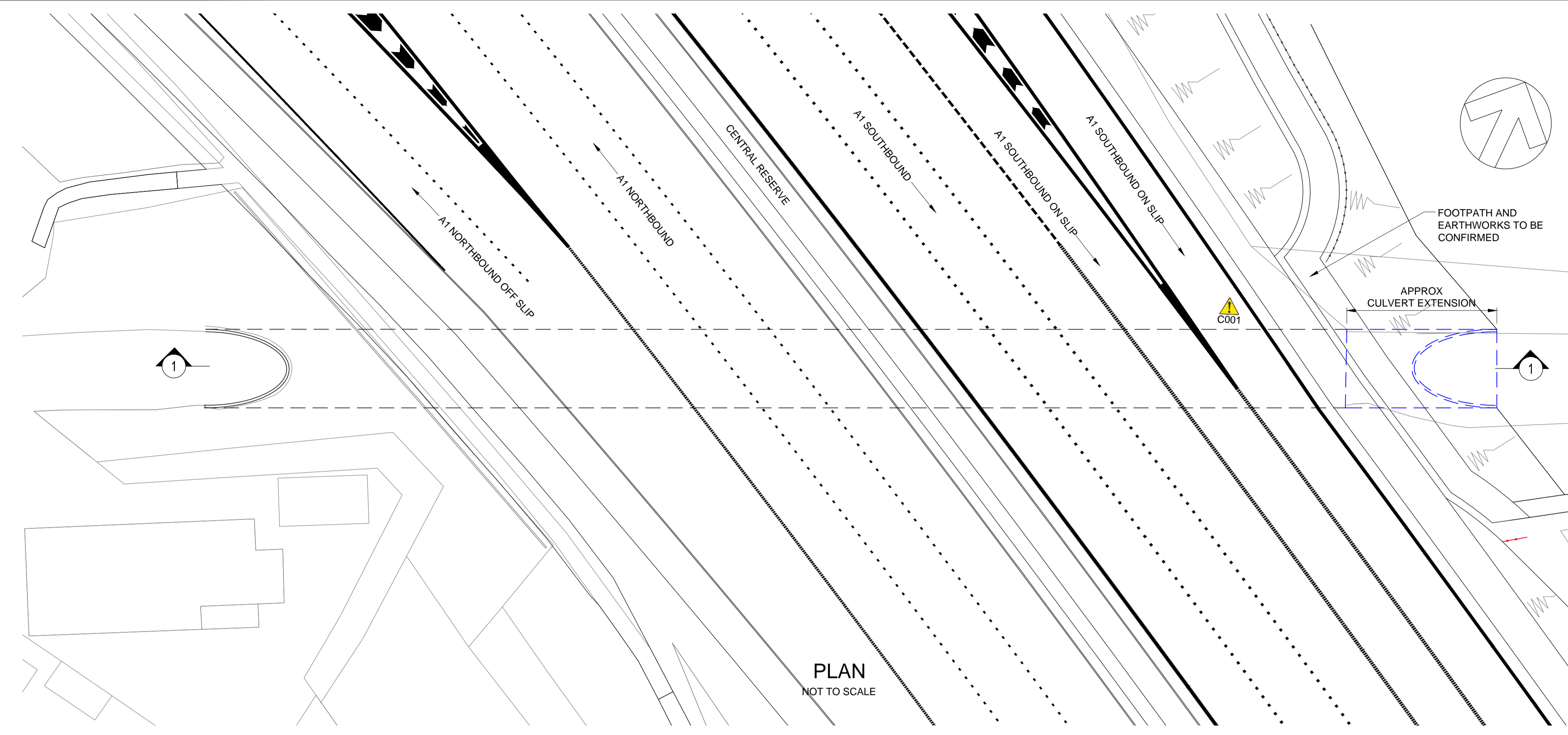
Appendix F

PROPOSED CROSS SECTION

APPENDIX F-1

GA OPTION 1 – EARTH BATTER ELEVATION

DO NOT SCALE



PLAN
NOT TO SCALE

- 1) ALL DIMENSIONS ARE IN MM UNLESS NOTED OTHERWISE
- 2) ALL LEVELS ARE IN METRES AOD UNLESS NOTED OTHERWISE
- 3) DO NOT SCALE IN CASE OF DOUBTS, OMISSIONS OR ERRORS SEEK CLARIFICATION FROM THE DESIGN
- 4) THIS DRAWING PROVIDES OUTLINE DETAILS OF THE EXTENSION TO LONGBANK BRIDLEWAY COMPRISING:
 - ADDITIONAL CORRUGATED STEEL BURIED STRUCTURE (CSBS) GALVANISED PLATE SYSTEM BEING BOLTED ONTO THE EXISTING AS REQUIRED. MULTIPLATE CSBS SYSTEM SHALL COMPRISE A SIMILAR SPECIFICATION TO THE EXISTING (TYPE MP200 - 200X55 CORRUGATED ARCH)
 - STRUCTURE SHALL HAVE A SUITABLE EARTH WORK BATTER WITH A RC BEVEL (RC COLLAR) ON THE END TO SUIT - THIS SHALL PROVIDE A SIMILAR FINISH TO THE EXISTING STRUCTURE
- 5) THE PROPOSAL IS SUBJECT TO FURTHER DETAILED DESIGN AND CURRENTLY ASSUMES:
 - COVER TO THE CSBS EXTENSION WILL BE WITHIN ACCEPTABLE LIMITS
 - FOUNDATION TO CSBS SHALL COMPRISE EITHER SPREAD OR PILED FOUNDATIONS - ANTICIPATE AT THE LEAST PILES SHALL BE REQUIRED FOR THE EXTENSION OF THE CSBS DIRECTLY UNDER THE CARRIAGEWAY SECTION OF THE A1
 - SERVICE DRAIN CAN BE PROTECTED OR THE POSITION ADJUSTED TO SUIT THE INSTALLATION OF THE CSBS
 - THE PROPOSED WORKS ARE ACCEPTABLE TO ENGLISH HERITAGE - PARTICULARLY REGARDS THE SCHEDULED MONUMENT (EXISTING BRIDLE WAY TRACK BED)
 - BRIDLEWAY TRACK FINISH SHALL BE RENEWED AS PART OF THE WORKS TO INCORPORATE AN IMPROVED SURFACE DRAINAGE SYSTEM
 - WORKS SHALL ALSO INCLUDE FOR THE PROVISION OF LIGHTING ALONG THE FULL LENGTH OF THE STRUCTURE
 - OUTSTANDING MAINTENANCE ACTIONS SHALL ALSO BE INCLUDED AS PART OF THE REFURBISHMENT WORKS TO LONGBANK BRIDLEWAY THIS SHALL INCLUDE:
 - REMOVAL OF GRAFFITI AND REPAINTING
 - CUTBACK AND REMOVAL OVERGROWN VEGETATION
- 6) THE APPROXIMATE CONSTRUCTION COST ESTIMATE, BASED ON SIMILAR TYPE SCHEMES IS £100 K

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

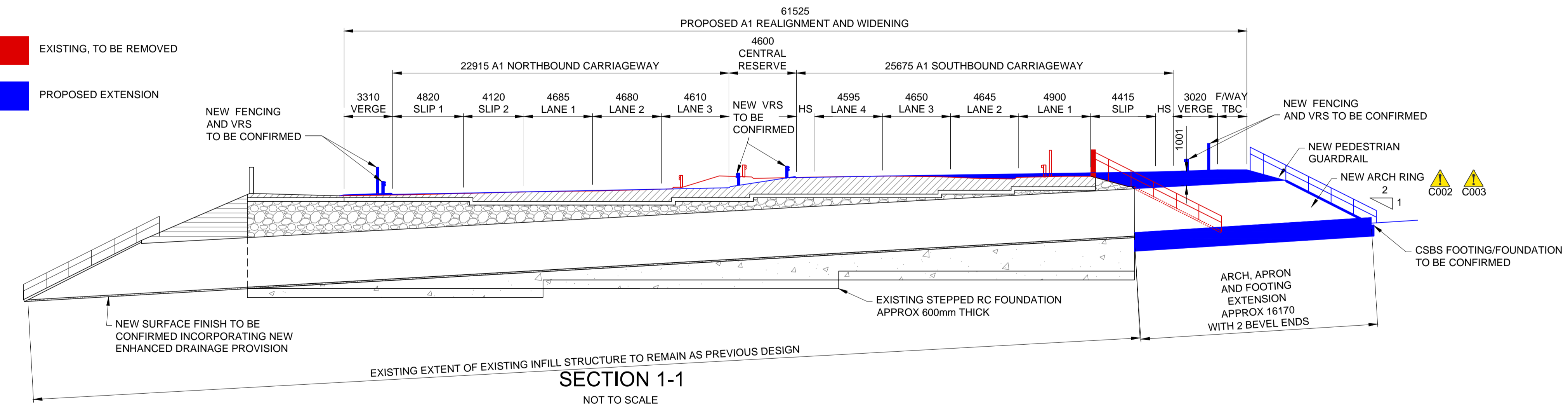
CONSTRUCTION
REF C001 - EXPOSURE TO LIVE TRAFFIC DURING CARRIAGEWAY WORKS
REF C002 - COLLAPSE OF ARCH DURING CONSTRUCTION
REF C003 - RESTRICTED WORKING ROOM WITHIN STRUCTURE, PILE RIG COLLISION WITH STRUCTURE
REF C004 - LIMITED SPACE/WORKING ROOM - POTENTIAL CLASH BETWEEN CSBS AND EXISTING FOUNDATION
REF C005 - OBSTRUCTION TO SCHEDULED MONUMENT (EXISTING BRIDLEWAY TRACK)
DECOMMISSIONING/DEMOLITION

SAFETY, HEALTH AND ENVIRONMENTAL SYMBOL LEGEND

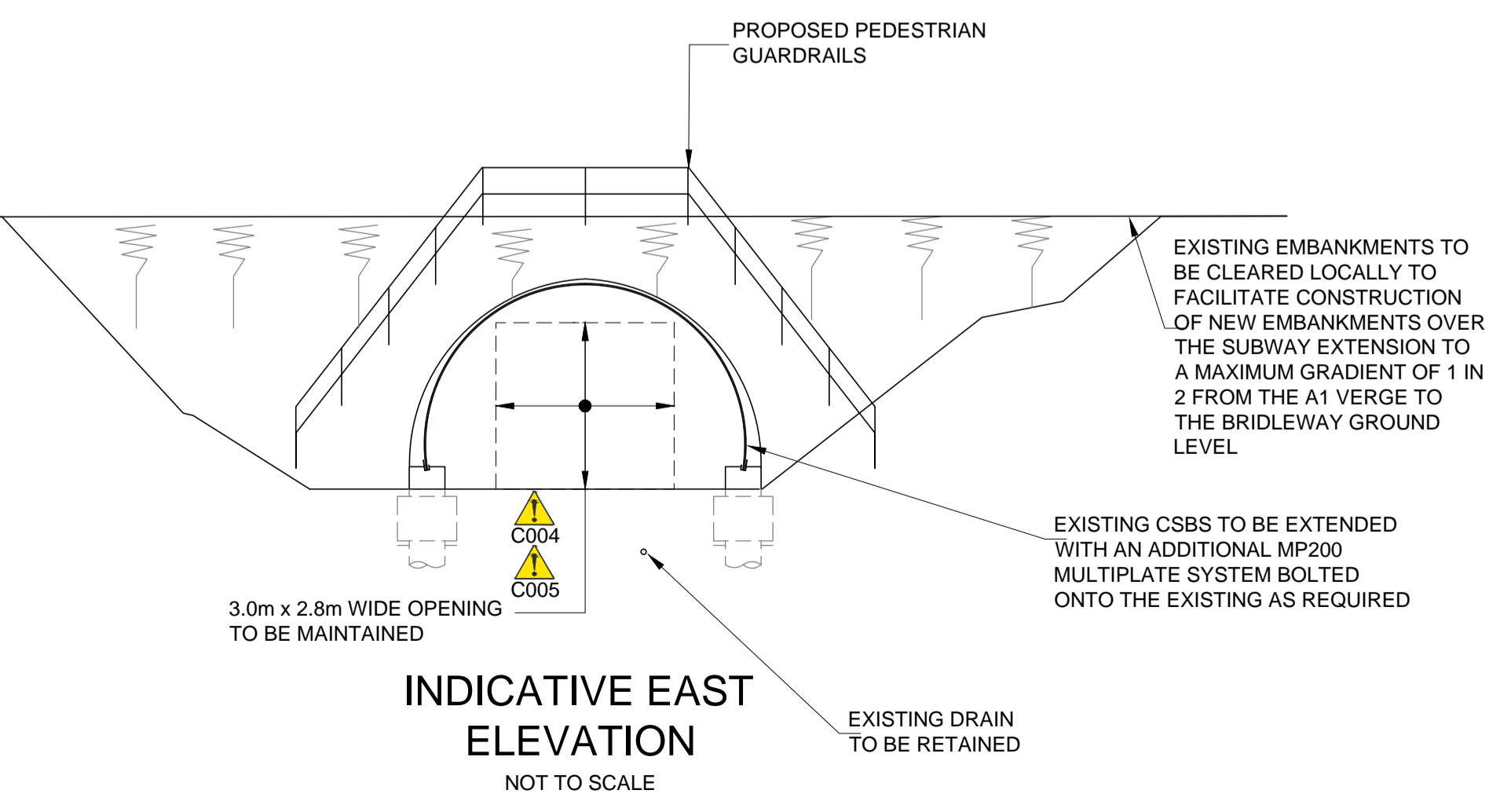
INDICATES A RESIDUAL RISK AS A WARNING

Ref	Date	Description	By	Chkd	Appd
P01.1	12/10/17				

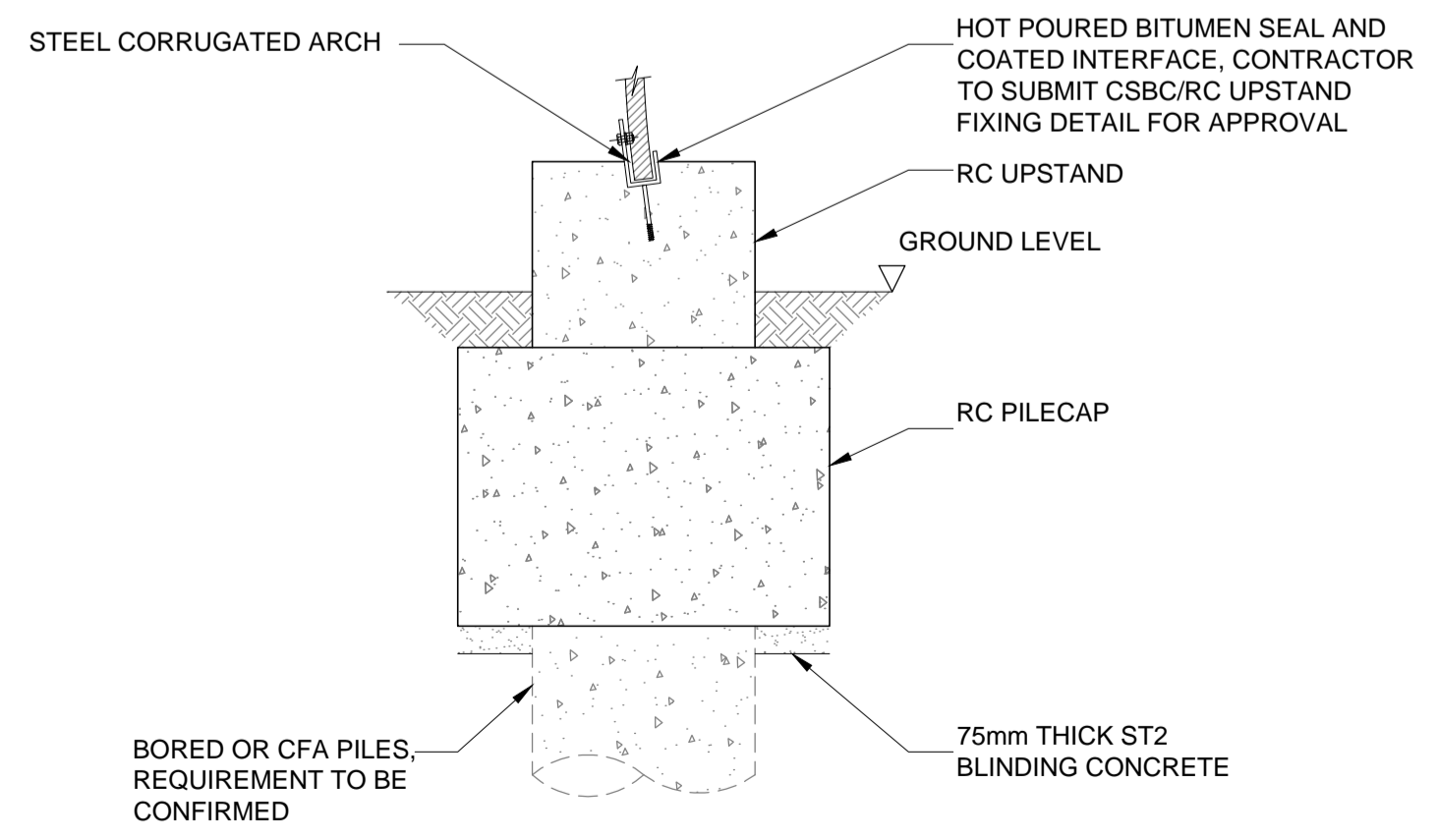
- EXISTING, TO BE REMOVED
- PROPOSED EXTENSION



SECTION 1-1
NOT TO SCALE



INDICATIVE EAST ELEVATION
NOT TO SCALE



TYPICAL CSBS FOUNDATION DETAIL
NOT TO SCALE



INDICATIVE ELEVATION
NOT TO SCALE

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wsp.com

Client
Working on behalf of
highways england

Project Title
A1 BIRTLEY TO COALHOUSE

Drawing Title
LONGBANK CULVERT PROPOSED EXTENSION OPTION 1 - ARCH EXTENSION GENERAL ARRANGEMENT

Scale	Drawn	Checked	Approved	Authorised
NOT TO SCALE	CCu	HMi	HMi	---
Original Size	Date	Date	Date	Date

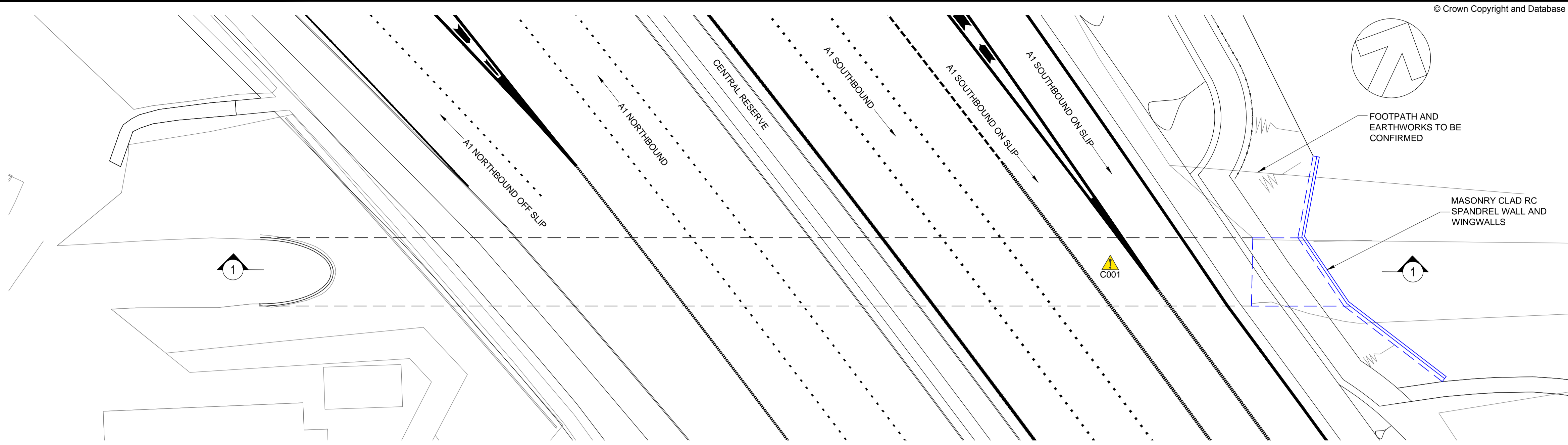
Drawing Status
INITIAL STATUS OR WIP Suitability: **S0**

Drawing Number	Project	Originator	Volume	Project Ref. No.
HE551462		WSP	SBR	
Location	Type	Role	Number	Revision
BCH	DR	S	00002	P01.1

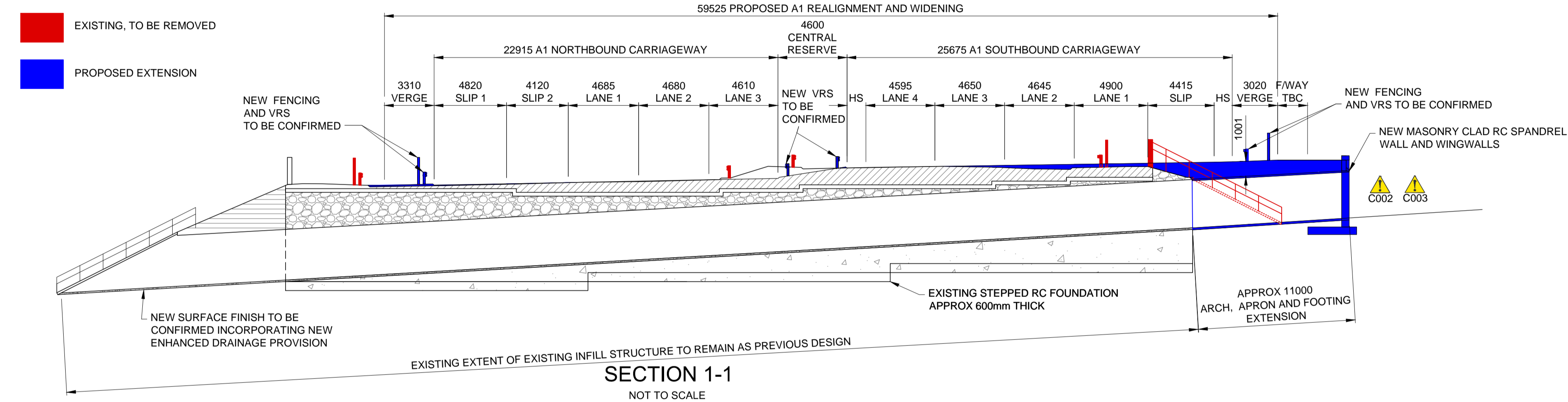
APPENDIX F-2

**GA OPTION 2 – MASONRY FACED
ELEVATION**

DO NOT SCALE



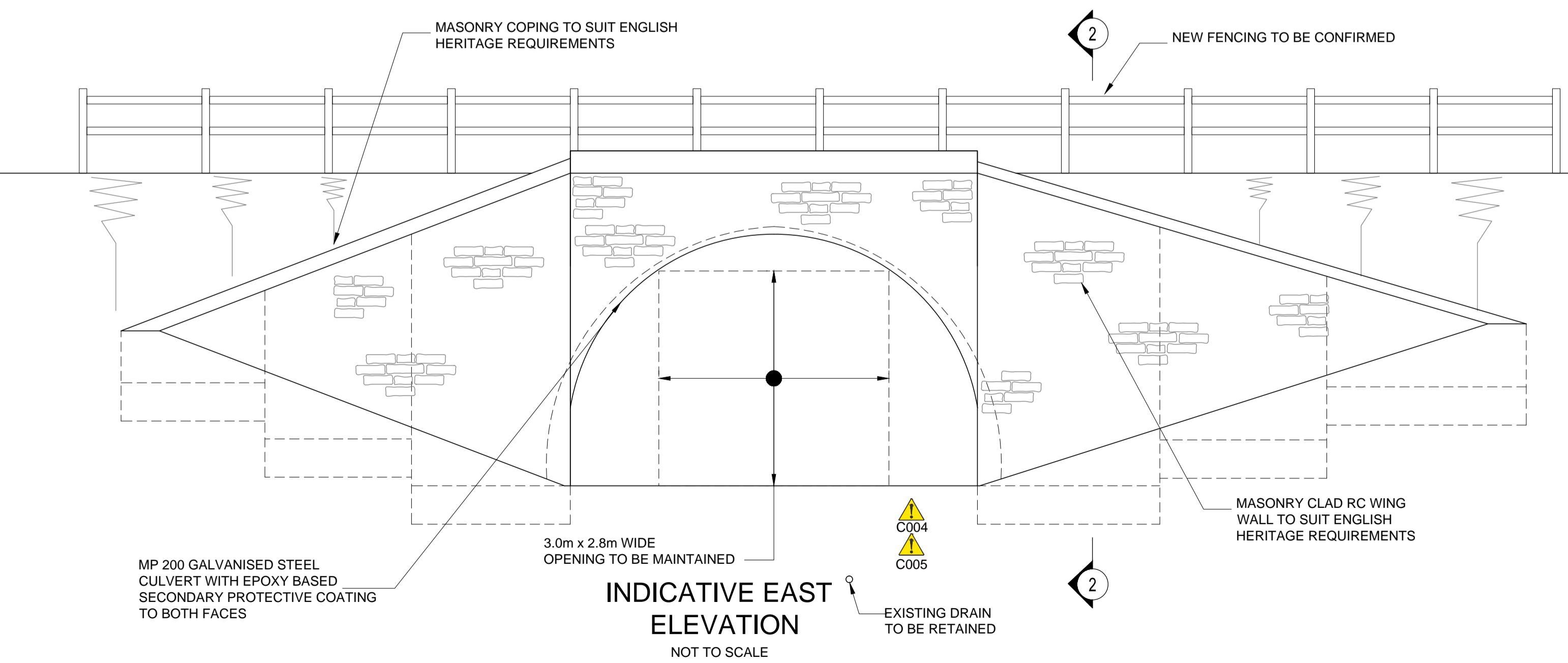
PLAN
NOT TO SCALE



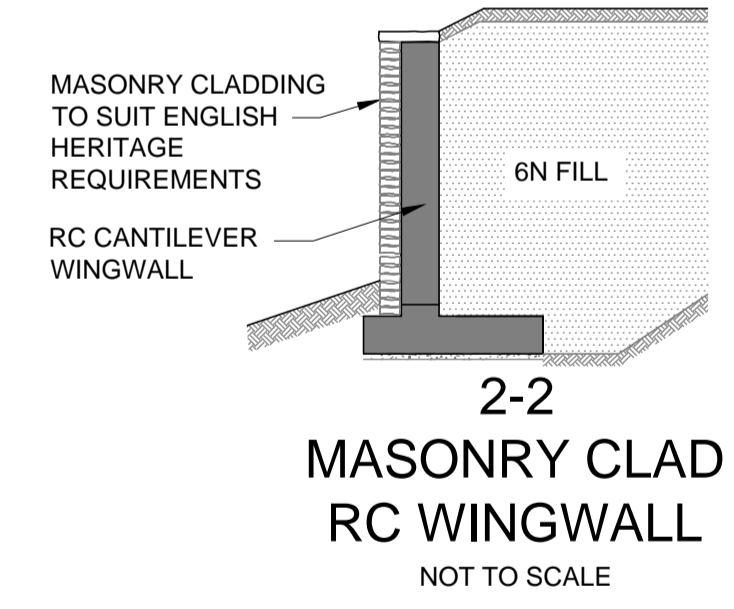
SECTION 1-1
NOT TO SCALE



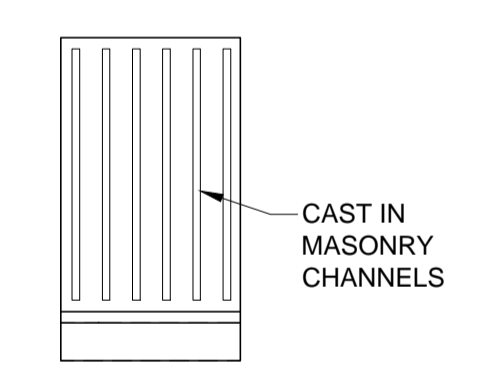
INDICATIVE ELEVATION
NOT TO SCALE



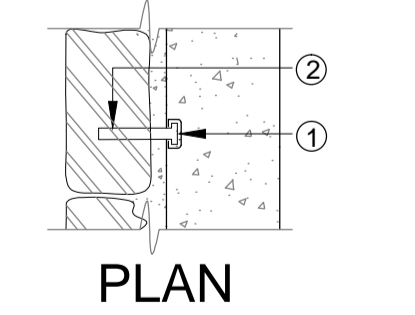
INDICATIVE EAST ELEVATION
NOT TO SCALE



2-2 MASONRY CLAD RC WINGWALL
NOT TO SCALE

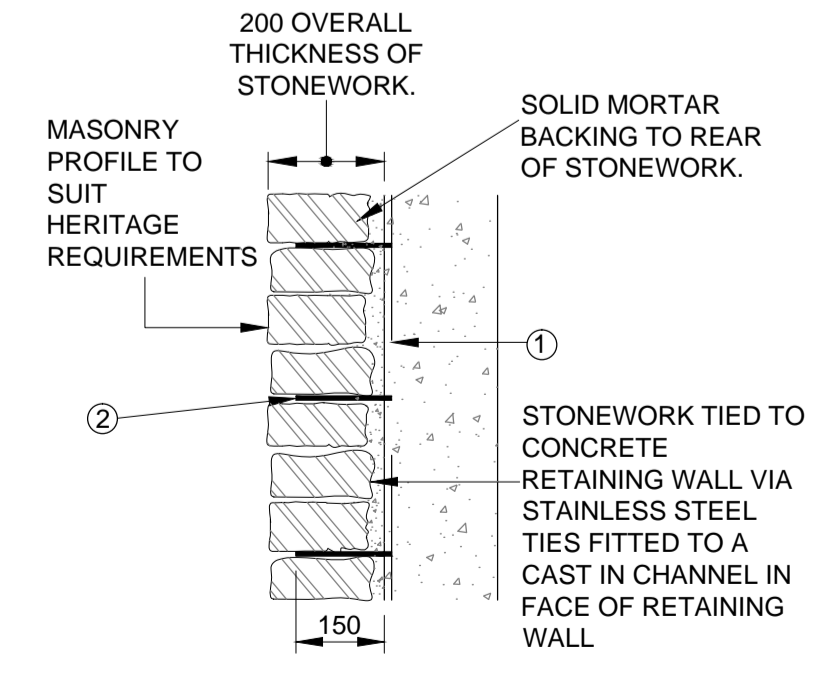


ELEVATION ON RC WALL PANEL
NOT TO SCALE



PLAN

- ① CAST IN STAINLESS STEEL CHANNEL TO FACE OF CONCRETE STRUCTURE CHANNEL TO BE FULL HEIGHT OF WALL AND AT 600 HORIZONTAL CENTRES
- ② PROPRIETARY STAINLESS WALL TIES AT 600 HORIZONTAL & 450 VERTICAL CENTRES. TIES TO PROJECT 150MM FROM CAST IN CHANNEL.



SECTION

TYPICAL TIE DETAIL FOR STONWORK TO RETAINING WALL
NOT TO SCALE

- 1) ALL DIMENSIONS ARE IN MM UNLESS NOTED OTHERWISE
- 2) ALL LEVELS ARE IN METRES AOD UNLESS NOTED OTHERWISE
- 3) DO NOT SCALE IN CASE OF DOUBTS, OMISSIONS OR ERRORS SEEK CLARIFICATION FROM THE DESIGN
- 4) THIS DRAWING PROVIDES OUTLINE DETAILS OF THE EXTENSION TO LONGBANK BRIDLEWAY COMPRISING:
 - ADDITIONAL CORRUGATED STEEL BURIED STRUCTURE (CSBS) GALVANISED PLATE SYSTEM BEING BOLTED ONTO THE EXISTING AS REQUIRED. MULTIPLATE CSBS SYSTEM SHALL COMPRISE A SIMILAR SPECIFICATION TO THE EXISTING (TYPE MP200 - 200X55 CORRUGATED ARCH)
 - STRUCTURE SHALL HAVE A SUITABLE MASONRY CLAD FINISH IN ACCORDANCE WITH THE REQUIREMENTS OF ENGLISH HERITAGE
- 5) THE PROPOSAL IS SUBJECT TO FURTHER DETAILED DESIGN AND CURRENTLY ASSUMES:
 - COVER TO THE CSBS EXTENSION WILL BE WITHIN ACCEPTABLE LIMITS
 - FOUNDATION TO CSBS SHALL COMPRISE EITHER SPREAD OR PILED FOUNDATIONS - ANTICIPATE AT THE LEAST PILES SHALL BE REQUIRED FOR THE EXTENSION OF THE CSBS DIRECTLY UNDER THE CARRIAGEWAY SECTION OF THE A1
 - SERVICE DRAIN CAN BE PROTECTED OR THE POSITION ADJUSTED TO SUIT THE INSTALLATION OF THE CSBS
 - THE PROPOSED WORKS ARE ACCEPTABLE TO ENGLISH HERITAGE - PARTICULARLY REGARDS THE SCHEDULED MONUMENT (EXISTING BRIDLE WAY TRACK BED)
 - BRIDLEWAY TRACK FINISH SHALL BE RENEWED AS PART OF THE WORKS TO INCORPORATE AN IMPROVED SURFACE DRAINAGE SYSTEM
 - WORKS SHALL ALSO INCLUDE FOR THE PROVISION OF LIGHTING ALONG THE FULL LENGTH OF THE STRUCTURE
 - OUTSTANDING MAINTENANCE ACTIONS SHALL ALSO BE INCLUDED AS PART OF THE REFURBISHMENT WORKS TO LONGBANK BRIDLEWAY THIS SHALL INCLUDE:
 - REMOVAL OF GRAFFITI AND REPAINTING
 - CUTBACK AND REMOVAL OVERGROWN VEGETATION
 - THE EXTENSION BASED ON THE NEW HIGHWAY ALIGNMENT IS ONLY REQUIRED TO ONE SIDE OF THE STRUCTURE AND CURRENTLY ASSUME ANY WORKS TO PROVIDE A MASONRY CLAD FINISH WILL BE TO THE NEWLY EXTENDED SIDE ONLY. CONFIRMATION IS REQUIRED ON WHETHER A SIMILAR MASONRY CLAD FINISH IS REQUIRED TO BOTH ENDS OF THE STRUCTURE, THEREBY PROVIDING A SYMMETRICAL ENHANCED AESTHETIC FINISH TO BOTH ENDS
- 6) THE APPROXIMATE CONSTRUCTION COST ESTIMATE, BASED ON SIMILAR TYPE SCHEMES IS £250 K

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

CONSTRUCTION	REF CODE	DESCRIPTION
REF C001 - EXPOSURE TO LIVE TRAFFIC DURING CARRIAGEWAY WORKS	C001	EXPOSURE TO LIVE TRAFFIC DURING CARRIAGEWAY WORKS
REF C002 - COLLAPSE OF ARCH DURING CONSTRUCTION	C002	COLLAPSE OF ARCH DURING CONSTRUCTION
REF C003 - RESTRICTED WORKING ROOM WITHIN STRUCTURE. PILE RIG COLLISION WITH STRUCTURE	C003	RESTRICTED WORKING ROOM WITHIN STRUCTURE. PILE RIG COLLISION WITH STRUCTURE
REF C004 - LIMITED SPACE/WORKING ROOM- POTENTIAL CLASH BETWEEN CSBS AND EXISTING FOUNDATION	C004	LIMITED SPACE/WORKING ROOM- POTENTIAL CLASH BETWEEN CSBS AND EXISTING FOUNDATION
REF C005 - OBSTRUCTION TO SCHEDULED MONUMENT (EXISTING BRIDLEWAY TRACK)	C005	OBSTRUCTION TO SCHEDULED MONUMENT (EXISTING BRIDLEWAY TRACK)

DECOMMISSIONING/DEMOLITION

SAFETY, HEALTH AND ENVIRONMENTAL SYMBOL LEGEND

⚠ INDICATES A RESIDUAL RISK AS A WARNING

Rev.	Date	Description	By	Chkd	Appd
P01.1	12/10/17				

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wsp.com

Client **Working on behalf of**

highways england

Project Title **A1 BIRTLEY TO COALHOUSE**

Drawing Title **LONGBANK CULVERT PROPOSED EXTENSION OPTION 2 - ARCH WITH MASONRY FACING GENERAL ARRANGEMENT**

Scale	Drawn	Checked	Approved	Authorised
NOT TO SCALE	CCu	HMi	HMi	---
Original Size	Date	Date	Date	Date
	---	---	---	---

Drawing Status **INITIAL STATUS OR WIP** Suitability **S0**

Drawing Number	Project	Originator	Volume	Project Ref. No.
HE551462	BCH	DR	S	00003
Location	Type	Role	Number	Revision
				P01.1

Appendix G

DESIGNERS RISK ASSESSMENT

APPENDIX G-1

DESIGNERS RISK ASSESSMENT

T446: Design H&S Risk Register

Project No 70015226

Project Name A1 Birtley to Coal House Improvement Scheme - Longbank Bridleway

Provide Feedback



Guidance notes (see guidance notes page for more details)

Design risk management should be an integral part of the overall design development and designers should think of it in terms of considering constructability, maintainability, etc. Designers only need to document their consideration of risks in this simple risk register format. There is no requirement for quantitative design risk assessments to be carried out/recorded and these should be avoided

* Risks should be considered in a logical sequence relating to the location/operational environment, constructability/installability, operability (normal/emergency), maintainability (inc. routine cleaning, replacement, etc.), and alteration/decommissioning/dismantling/demolition, and should be categorised against those headings.

CIRIA guidance documents C662, C663, C611, C607, etc. provide a useful checklist and detailed guidance on the identification of risks to be considered during design and how those risks might be addressed - see detailed guidance notes for more details

† Significant residual risks are those which are unusual, not obvious, difficult to manage, or where critical design assumptions apply. The documentation by designers of residual risks that cover well-known and understood hazards should be avoided

Ref	Risk Category* (and Phase where appropriate, e.g. location/environment, construction, operation, maintenance,	Work Element/Location (where appropriate)	Hazard or Risk Issue Identified	Risk Management Owner	Design ERIC Action Required (e.g. hazard elimination/risk mitigation action, information to be provided to others)	Significant Temporary Works Requirements/Management Arrangements and/or any Special Erection/Installation Sequences or	Design Action Status/Final Resolution Notes (e.g. traceability of ERIC action, communication of significant residual risk, critical design criteria, etc.)	Significant Residual Risk [†] (Y/N)	Date Logged/Reviewed	Raised By
001	Operation	Longbank Bridleway Underbridge (Extension Works)	Risk / danger to pedestrians of robbery, theft, etc. due to lack of lighting within the structure making it intimidating for lone users.	Designer	Lighting to be incorporated within the design to make the structure less intimidating for lone users.	None.	Lighting requirement to be defined.	Y	20/12/2017	Hitan Mistry
002	Maintenance	Longbank Bridleway Underbridge (Extension Works)	working from height during the construction/maintenance stages around the openings at either end of the arch structure	Operator	New fencing will be provided around the arch openings at both elevations.	Fencing to be installed as part of the works. Contractor to protect exposed edge before undertaking any inspection during construction.	Maintainer to implement safe systems.	N	20/12/2017	Hitan Mistry
003	Operation	Longbank Bridleway Underbridge (Extension Works)	Members of the public (youths) climbing embankments to access the carriageway. Risk of falls whilst climbing or accident with the A1 traffic due to distraction to drivers.	Operator	New fencing proposed to be installed to prevent easy access up the embankment onto the A1 at the location of Longbank .	Contractor to protect exposed edge before any inspections undertaken.	Maintainer to implement safe systems.	N	20/12/2017	Hitan Mistry
004	Construction	Longbank Bridleway Underbridge (Extension Works)	Increased extent of widening works to accommodate the new A1 highway layout/slip roads. This subsequently increases the workforce exposure (due to the prolonged construction programme) to site based risks.	Designer	The extent of widening limits the workforce exposure to site based risks.	No temporary works issues	No further actions	N	20/12/2017	Hitan Mistry
005	Construction	Longbank Bridleway Underbridge (Extension Works)	Exposure to risks associated with working directly adjacent to live traffic.	Contractor	The proposed infill option results in most of the construction activities being undertaken at the existing brideway level. This limits conflict with live traffic on the A1.	Use of temporary traffic management in form of contra flow needed to create safe work areas.	Risk not completely eliminated as some works will be required at the A1 carriageway level to widened the carriageway. Define contraflow requirements within TTM plan.	Y	20/12/2017	Hitan Mistry
006	Construction	Longbank Bridleway Underbridge (Extension Works)	Collapse of the corrugated arch during construction.	Designer	Backfill to proposed arch structure to be carried out evenly. Designer to specify how the backfill is to be applied to avoid premature collapse. Details to be provided on drawings.	Prevent passage of pedestrians / cyclist via a diversion. Avoid risk associated with structural collapse during the works.	Define diversion requirements within TTM plan.	Y	20/12/2017	Hitan Mistry
007	Construction	Longbank Bridleway Underbridge (Extension Works)	Poor ground bearing capacity, resulting in potential settlement and failure of the arch structure.	Designer	The proposed structure is an infill corrugated arch as opposed to a RC box structure which is heavier in comparison, therefore the imposed loads on the ground are lower. The lightweight nature of the proposed structural form reduces the risk of foundation failure.	Ensure design consider temporary situation before construction is completed.	Corrugated steel lining requires less bearing capacity compared to other options. To further avoid potential failure it is considered that piles will be installed to support the springing foundations to the arch.	N	20/12/2017	Hitan Mistry
008	Construction	Longbank Bridleway Underbridge (Extension Works)	Founding structure on old coal seams, potential undermining of foundation leading to collapse.	Designer	grouting shallow coal mining may be required for improved stability of the structure.	None.	Note on drawing.	Y	20/12/2017	Hitan Mistry
009	Construction	Longbank Bridleway Underbridge (Extension Works)	Damage to existing services, electrocution	Contractor	Statutory undertaker's searches/consultation to be undertaken prior to detailed design (on-going). This is to enable requirements for diversion/protection to be determined. This should be reviewed by contractor prior to undertaking works.	Area to be scanned by trained and competent contractor. Contractor to locate all services using hand tools before mechanical excavation can commence. Contractor to also liaise with statutory undertakers/LHA and the HA maintenance service providers to locate all services prior to undertaking piling or any	Appropriate note/reference to be put on drawings relating to service location at detailed design	N	20/12/2017	Hitan Mistry
010	Construction	Longbank Bridleway Underbridge (Extension Works)	Damage to drainage pipe which runs through the invert of the CSBS structure during construction	Designer	At this stage it is assumed that all services found impacting the proposed bridge widening works shall be diverted/protected accordingly to progress the bridge works on site	Contractor to consider requirements for protecting all services (water mains in bridle way).	Temporary protection of services remaining insitu to be confirmed at detailed design stage.	Y	20/12/2017	Hitan Mistry
011	Construction	Longbank Bridleway Underbridge (Extension Works)	Pedestrians in close proximity to the work site. Therefore exposed to site construction hazards.	Contractor	It is anticipated that the brideway will be closed to the public during the works and a temporary diversion will be in place	Temporary diversion to be implemented during the works.	Contractor to ensure appropriate closure/ diversions are in place prior to the commencement of the works	N	20/12/2017	Hitan Mistry

Appendix H

WSP/HE KEY CORRESPONDENCES

APPENDIX H-1

WSP/HE KEY CORRESPONDENCES

Brunetti Barchetta, Giovanna

From: Sunderland, Martin <Martin.Sunderland@highwaysengland.co.uk>
Sent: 18 January 2018 14:15
To: Mistry, Hitan
Cc: Al-Shalechy, Shehed; Mulla, Imtiaz; Gladstone, Peter; Akram, Irfan; Mehta, Rakesh; Wilkes, Nicola; Dennis, Stephen; Meikle, Jessica; Clarke, Shaun
Subject: RE: A1B2CH - Issue of the Longbank SOR and Progress to date 22-12-17

Importance: High

Hitan

Good afternoon to you, hope you had a good Christmas (seems a long time ago already).

I have reviewed the Structures Options Report for Longbank Pedestrian Underpass dated 2017 and confirm acceptance.

In terms of the asymmetrical extension on the east side of the structure, I agree with the recommendation that the extension should comprise a similar CSBS arch profile structure to match the existing, and ideally with a profiled reinforced concrete collar and earthworks batter (option 1), although as noted in your report the end treatment to the proposed extension is subject to discussions with English Heritage.

I note from your report that there is the potential for shallow mine workings, it will be interesting to see the results of the ground investigation that is currently being undertaken in this respect.

I look forward to receipt of the AIP for this structure.

Please note, in Appendix F-1, (GA option 1- Masonry Faced Elevation) the drawing contained is correct but the title is not, and the same for Appendix F-2.

regards

Martin Sunderland
Safety, Engineering & Standards
Senior Structures Advisor
Highways England | Lateral | 8 City Walk | Leeds | LS11 9AT
Tel: 0300 470 6165 | [REDACTED]
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Learn more about Structures Delivery by visiting our [Portal Homepage](#)
A web version of this Homepage is currently unavailable.



From: Sunderland, Martin
Sent: 22 December 2017 09:50
To: 'Mistry, Hitan'
Cc: Al-Shalechy, Shehed; Mulla, Imtiaz; Gladstone, Peter; Akram, Irfan; Mehta, Rakesh; Wilkes, Nicola; Dennis,



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If you have any enquiries about this document A1BirtleytoCoalhouse@highwaysengland.co.uk or call 0300 470 4580*.

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