

# **A1 in Northumberland: Morpeth to Ellingham**

**Scheme Number: TR010041**

## **6.8 Environmental Statement – Appendix 10.4 Drainage Strategy Report**

**Part B**

APFP Regulation 5(2)(a)

Planning Act 2008

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

June 2020

Infrastructure Planning

Planning Act 2008

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

**The A1 in Northumberland: Morpeth to Ellingham  
Development Consent Order 20[xx]**

---

**Environmental Statement - Appendix**

---

<b>Regulation Reference:</b>	APFP Regulation 5(2)(a)
<b>Planning Inspectorate Scheme Reference</b>	TR010041
<b>Application Document Reference</b>	TR010041/APP/6.8
<b>Author:</b>	A1 in Northumberland: Morpeth to Ellingham Project Team, Highways England

<b>Version</b>	<b>Date</b>	<b>Status of Version</b>
Rev 0	June 2020	Application Issue

# CONTENTS

---

<b>1.</b>	<b>INTRODUCTION</b>	<b>1</b>
1.1.	PURPOSE OF THIS DOCUMENT	1
1.2.	CONSULTATION	1
<b>2.</b>	<b>BASELINE INFORMATION</b>	<b>5</b>
2.1.	EXISTING HIGHWAY DRAINAGE	5
2.2.	EXISTING TOPOGRAPHY AND GROUND INVESTIGATIONS	5
2.3.	ENVIRONMENT AGENCY MAIN RIVERS	5
2.4.	FLOOD RISK	5
2.5.	GROUND INFILTRATION	6
2.6.	EXISTING SERVICES	6
2.7.	LANDOWNERS	6
<b>3.</b>	<b>DESIGN PARAMETERS</b>	<b>7</b>
3.1.	RETURN PERIODS	7
3.2.	DISCHARGE LIMITS	7
3.3.	CLIMATE CHANGE	8
3.4.	HYDRAULIC MODELLING PARAMETERS	8
3.5.	SURFACE WATER CHANNELS	8
<b>4.</b>	<b>PROPOSED DRAINAGE STRATEGY</b>	<b>9</b>
4.1.	DESIGN ELEMENTS	9
4.2.	DESIGN STRATEGY RISKS AND ASSUMPTIONS	10
4.3.	DESIGN STRATEGY BY CHAINAGE	12
4.4.	NON-TRUNK NETWORK & SIDE ROADS	24
<b>5.</b>	<b>OPERATION &amp; MAINTENANCE STRATEGY</b>	<b>25</b>

---

---

## **TABLES**

Table 1-1 - Summary of Discussion and Applicant's Response	2
Table 1-2 - Summary of Discussion and Applicant's Response	3
Table 1-3 - Summary of Discussion and Applicant's Response	3
Table 1-4 - Summary of Discussion and Applicant's Response	4
Table 3-1 - Surface Water Channels	8
Table 4-1 - Run-off Data	13
Table 4-2 - Detention Basin Data	13
Table 4-3 - Run-off Data	15
Table 4-4 - Detention Basin Data	15
Table 4-5 - Run-off Data	17
Table 4-6 - Detention Basin Data	17
Table 4-7 - Run-off Data	19
Table 4-8 - Detention Basin Data	20
Table 4-9 - Detention Basin Data	20
Table 4-10 - Run-off Data	24
Table 4-11 - Detention Basin Data	24

---

## **FIGURES**

Figure 4-1 - Highway Drainage Layout and Detention Basin DB22	12
Figure 4-2 - Highway Drainage Layout and Detention Basin DB23	14
Figure 4-3 - Highway Drainage Layout and Detention Basin DB24	16
Figure 4-4 - Highway Drainage Layout and Detention Basins DB25 and DB26	18
Figure 4-5 - Highway Drainage Layout and Detention Basin DB27	21
Figure 4-6 - West Linkhall Road Proposal to use A1 Drainage Network	23

---



## ***APPENDICES***

APPENDIX A

HYDRAULIC MODEL

APPENDIX B

DRAINAGE STRATEGY LAYOUT DRAWINGS

APPENDIX C

RELEVANT CORRESPONDENCE

---

## 1. INTRODUCTION

---

### 1.1. PURPOSE OF THIS DOCUMENT

- 1.1.1. This Drainage Design Strategy (this Strategy) has been produced to support the Environmental Statement (ES) and Development Consent Order (DCO) application for the A1 in Northumberland: Alnwick to Ellingham (Part B). It includes a review of the Options Selection stage drainage proposals and baseline information currently available.
- 1.1.2. Part B would include approximately 8 km of online widening to the east of the A1 existing carriageway between Alnwick and Ellingham in the county of Northumberland. Further details about the location of Part B can be found on the **Location Plan (Application Document Reference: TR010041/APP/2.1)**. A detailed description of Part B can be found in **Chapter 2: The Scheme, Volume 1** of this ES (**Application Document Reference: TR010041/APP/6.1**).
- 1.1.3. A Flood Risk Assessment (FRA) has been undertaken for Part B, which can be found at **Appendix 10.1** of this ES.
- 1.1.4. The current design proposal would increase the impermeable area coverage and as such this Strategy sets out how Part B would manage the increased surface water runoff. The currently available baseline flood risk data has been considered in the siting of drainage infrastructure.
- 1.1.5. The Strategy has been produced in accordance with the Design Manual for Roads and Bridges (DMRB) Volumes 4, 6 and 11 as well as other relevant standards as agreed through consultation with the Environment Agency and Northumberland County Council (NCC) as both the local highway authority and Lead Local Flood Authority (LLFA).

### 1.2. CONSULTATION

- 1.2.1. Consultation has been undertaken with the following key stakeholders. :  
**LEAD LOCAL FLOODING AUTHORITY (LLFA) - NORTHUMBERLAND COUNTY COUNCIL**
- 1.2.2. The requirements of NCC as LLFA for Part B were discussed in Morpeth on 18 July 2018. A summary of the discussions and the Applicant's response is set out in **Table 1-1** below:

**Table 1-1 - Summary of Discussion and Applicant's Response**

Summary of the Discussion	Applicant's Response
A drainage strategy is required for Part B	A drainage strategy has been compiled.
Surface water to be kept in its original (existing) catchments.	Surface water runoff from the new highway has been generally been contained in their current catchments, however in one case this has not been achieved, refer to <b>Section 4.3</b>
Adherence to the Department for Environment, Food and Rural Affairs (Defra) non-statutory guidance for sustainable drainage with regards to the surface water drainage scheme	This was done.
The allowable discharge rate to be restricted to the existing greenfield runoff rate for the 1 in 1 year and 1 in 30 year events, and that attenuation is provided for the 1 in 100 year plus climate change event	This was done.
An additional allowance for urban creep is not required.	Noted
NCC requires SuDS measures to be included within the drainage proposals.	This was done.
In addition to the Defra non-statutory guidance for sustainable drainage it is also advisable that the best practice in the Local Authority SuDS Officer Organisation (LASOO) document: Non-statutory Technical Standards for Sustainable Drainage Practice Guidance is followed	This was done.
The drainage of any new highways that would be adopted by NCC should be separated from the Applicant's drainage infrastructure	The drainage for these sections of highway have been identified and should be on a separate network.

**LOCAL HIGHWAY AUTHORITY - NORTHUMBERLAND COUNTY COUNCIL (NCC)**

- 1.2.3. Consultation with NCC as the local highway authority took place in Morpeth on 18 July 2018. A summary of the discussions and the Applicant’s response is set out in **Table 1-2** below:

**Table 1-2 - Summary of Discussion and Applicant’s Response**

Summary of the Discussion	Applicant’s Response
NCC policy relating to the separation of trunk highway drainage and local highway drainage requires that in cases where the drainage systems cannot be separated to resort to a Memorandum of Understanding to set out the responsibilities of both parties for the operation and maintenance of the shared assets.	This was done.

**NATURAL ENGLAND**

- 1.2.4. Consultation with Natural England took place in Newcastle on 17 October 2017. A summary of the discussions and the Applicant’s response is set out in **Table 1-3** below.

**Table 1-3 - Summary of Discussion and Applicant’s Response**

Summary of the Discussion	Applicant’s Response
Natural England stated that the central reservation should not be grassed to avoid use by barn owls.	Part B has been updated to comply with the Natural England’s request.

**ENVIRONMENT AGENCY**

- 1.2.5. Consultation with the Environment Agency took place in Newcastle on 9 January 2018. A summary of the discussions and the Applicant’s response is set out **Table 1-4** below.



**Table 1-4 - Summary of Discussion and Applicant's Response**

<b>Summary of the Discussion</b>	<b>Applicant's Response</b>
<p>Where outfalls are proposed into existing EA Main Rivers, the runoff rates are to be limited to greenfield values.</p> <p>SuDS features are to be located outside of Flood Zones 2 and 3.</p>	<p>Part B has been updated to comply with the Environment Agency's request.</p>

## 2. BASELINE INFORMATION

---

### 2.1. EXISTING HIGHWAY DRAINAGE

- 2.1.1. The preliminary appraisal of the existing highway drainage included below is based upon Highways Agency Drainage Data Management System (HADDMS), Technical information about location and condition of drainage infrastructure on the network) data and supplemented by site visit undertaken in February 2019 and Google Maps observations.
- 2.1.2. A review of the currently available data is presented below.

#### GENERAL

- 2.1.3. The HADDMS data indicates that the highway drainage runs on both verges with pipes varying from 150 mm to 450 mm in diameter.
- 2.1.4. The HADDMS data is incomplete but it appears that the surface water drainage network discharges to ditches and watercourses.
- 2.1.5. There are a number of existing roads, tracks, Private Means of Access (PMAs), and other rights-of-way which would be affected by Part B. In general, drainage from these appear to discharge primarily to existing ditches/watercourses via informal verge drainage. The existing drainage systems in these areas would be retained and would not be impacted by the proposed works.

### 2.2. EXISTING TOPOGRAPHY AND GROUND INVESTIGATIONS

- 2.2.1. Topographic surveys have been carried out in December 2017 on the areas affected by the drainage design.
- 2.2.2. Ground Investigations have been carried out from July 2018 until January 2019. A **Ground Investigation Report** can be found at **Appendix 11.4** of this ES. In general, there is a trial pit in the areas where detention basins are proposed.

### 2.3. ENVIRONMENT AGENCY MAIN RIVERS

- 2.3.1. A review of the Environment Agency Main River map website has confirmed that no Main Rivers cross or are adjacent to the Order Limits of Part B.

### 2.4. FLOOD RISK

- 2.4.1. Flood Risk maps from the Environment Agency and data from HADDMS has been used to identify areas of flood risk along Part B.
- 2.4.2. The majority of the Order Limits of Part B is located in Flood Zone 1. However, there is a section of the highway to the south of Part B, near Denwick that passes through/across Flood Zones 2 and 3.
- 2.4.3. HADDMS identifies two localised areas of shallow surface water flood risk along the existing A1 around Charlton Mires. Where information is available on one of the incidents, Highways

England that the flooding was caused by blocked gullies on the A1 but investigation showed that the gullies were clear.

- 2.4.4. An FRA has been completed can be found at **Appendix 10.1: Flood Risk Assessment** of this ES.

## **2.5. GROUND INFILTRATION**

- 2.5.1. Infiltration tests showed soils of low permeability that were unsuitable for infiltration drainage solutions. Further details can be found at **Appendix 11.4: Ground Investigation Report** of this ES.

## **2.6. EXISTING SERVICES**

- 2.6.1. Existing utilities information along the route has been collated for all the major statutory bodies in this area. Significant under and over ground services and/or proposed diversions have been proposed along the route. The routes of the diversions have been considered in this Strategy.

## **2.7. LANDOWNERS**

- 2.7.1. The landowners affected by the proposed works have been contacted and the proposed works have been discussed with them. With regards to the drainage works, this has affected the proposed locations of detention basins and their relevant accesses. Further details can be found in the **Consultation Report (Application Document Reference: TR010041/APP/5.1)**.

### 3. DESIGN PARAMETERS

---

#### 3.1. RETURN PERIODS

3.1.1. The highways drainage network has been designed in discussion with NCC as LLFA and the Environment Agency to the following criteria:

- a. No flooding or surcharging of the network in a 1 in 1 year storm event;
- b. No flooding in a 1 in 5 year storm event and no surcharge must exceed the chamber cover level;
- c. The 1 in 100 year event was used to determine the storage requirements so that the proposed works don't exceed the Greenfield Runoff rates.

#### 3.2. DISCHARGE LIMITS

3.2.1. In line with the Defra document '*Sustainable Drainage Systems: Non-statutory Technical Standards for Sustainable Drainage Systems*', March 2015, the following controls have been set to limit the discharge from the new works and to determine the storage volume required. The base greenfield runoff rates do not include any allowance for Climate Change.

##### PEAK FLOW CONTROL

- a. **S2:** For greenfield developments, the peak runoff rate from the development to any highway drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event should never exceed the peak greenfield runoff rate for the same event
- b. **S3:** For developments which were previously developed, the peak runoff rate from the development to any drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event must be as close as reasonably practicable to the greenfield runoff rate from the development for the same rainfall event, but should never exceed the rate of discharge from the development prior to redevelopment for that event.

##### VOLUME CONTROL

- a. **S4:** Where reasonably practicable, for greenfield development, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event should never exceed the greenfield runoff volume for the same event.
- b. **S5:** Where reasonably practicable, for developments which have been previously developed, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event must be constrained to a value as close as is reasonably practicable to the greenfield runoff volume for the same event, but should never exceed the runoff volume from the development site prior to redevelopment for that event.



- c. **S6:** Where it is not reasonably practicable to constrain the volume of runoff to any drain, sewer or surface water body in accordance with S4 or S5 above, the runoff volume must be discharged at a rate that does not adversely affect flood risk.

### 3.3. CLIMATE CHANGE

- 3.3.1. The impacts of climate change need to be taken into account when designing new drainage infrastructure.
- 3.3.2. In order to manage the risks associated with the long-term impacts of climate change, it was proposed that the peak rainfall intensity of the 1 in 1, 5 and 100 year rainfall events be increased by 20% in line with the DMRB HD 33/16 Design of Highway Drainage Systems. This allowance is in line with the recommendations given in the National Planning Policy Framework (NPPF) and the Environment Agency’s Guidance Flood risk assessments: climate change allowances.
- 3.3.3. The LLFA initially requested that a climate change allowance of 40% should be used. Further to discussion with the LLFA the impact of the increase in rainfall intensities with respect to storage requirements was assessed for each of the detention options and were deemed to be satisfactory.

### 3.4. HYDRAULIC MODELLING PARAMETERS

- 3.4.1. Hydraulic modelling of the highways drainage network has been undertaken using the Micro Drainage software package (2016 Build). The FEH has been used to obtain rainfall parameters representative of local hydrological conditions.
- 3.4.2. The proposed drainage network has been modelled to determine the discharge rates for the 1 in 1 year, 1 in 5 year and 1 in 100 year storm events including climate change allowances.
- 3.4.3. No infiltration has been allowed for within the model reflecting the known ground conditions.

### 3.5. SURFACE WATER CHANNELS

- 3.5.1. Where surface water channels are proposed along Part B, they have been based on HA 37\_97 – Hydraulic Design of Road Edge Surface Water Channels. The key parameters are as outlined in **Table 3-1** below.

**Table 3-1 - Surface Water Channels**

Location of SWC	Drain Type	Design Return Period
1 in 40 crossfall to central reservation	1.5m Wide Surface Channel - Concrete	1 in 5 year
1 in 40 crossfall to verge	2.5m Wide Surface Channel - Concrete	1 in 5 year

## 4. PROPOSED DRAINAGE STRATEGY

---

### 4.1. DESIGN ELEMENTS

- 4.1.1. The following section details the proposed drainage design elements according to each drainage catchment and presents the key assumptions and the risks.
- 4.1.2. It is not considered feasible to re-use the existing A1 surface water drainage assets for Part B. Existing drainage assets would be abandoned and replaced by proposed ones.
- 4.1.3. Generally, filter drains, kerb and gully, combined kerb drainage and concrete surface water channels are proposed as the primary means of removing surface water runoff from the highway. They would be sited adjacent to the hardstrip at the edges of the carriageway.
- 4.1.4. To achieve the required greenfield discharge rates for the proposed network, flow control devices have been used together with detention basins as attenuation methods for Part B.
- 4.1.5. All drainage design elements proposed in this Strategy would need to be reviewed at detailed design stage. The HAWRAT (Highways Agency Water Risk Assessment Tool) assessments show that the proposals are acceptable. Further details can be found at **Appendix 10.3: Drainage Network Water Quality Assessment** of this ES.
- 4.1.6. The Drainage Strategy Layout drawings at **Appendix B** of this Strategy have been prepared to support the DCO application and provide details of the proposed drainage layout and storage locations required for Part B.
- 4.1.7. The proposed drainage strategy is summarised as follows:
- a. Runoff from Part B would be discharged into the existing watercourses via storage detention basins where required.
  - b. Drainage discharge from highways remaining part of the local road network would be kept separate from discharge associated with Part B as agreed with NCC as LLFA.
  - c. Maintenance of trunk and local drainage assets would be subject to a 'Statement of Common Ground' between the Applicant and NCC.
  - d. Roads/tracks which are not to be incorporated as access roads to the new trunk road system, are assumed to be abandoned/truncated, and would continue to drain as existing. All existing watercourses crossing Part B, to which these roads/tracks may drain, would be maintained using culverts or other means.
  - e. Locations of detention features were agreed with NCC and the Environment Agency.
  - f. Allowable runoff rates would be restricted to the existing greenfield runoff values for the equivalent storm event.
  - g. Highway drainage is designed to accommodate a 1 in 1-year design flow without surcharging; and a 1 in 5 year flow without surface flooding of the running carriageways (with a 20% allowance for climate change).
  - h. Attenuation controls would be provided for the 1 in 1, 30 and 100-year events plus climate change.

- i. Where detention basins would be used for attenuation these would be located outside of Flood Zone 2 and 3 areas.
- j. Online controls would be provided to restrict discharges to allowable values.
- k. It is assumed that any new local access tracks, bridleways and PMAs would be drained to local land drains and watercourses.
- l. Runoff from the running lanes and hardstrips would follow the road camber to both channels, and the central reservation where there is a crossfall.
- m. Runoff to the central reservation would be to concrete V-channels.
- n. Where the highway would be within a cutting the runoff from the cutting would be to the single filter drain at either side of the highway.
- o. Where the highway would be within a cutting it is proposed that the field runoff would be taken by a cut-off ditch at the top of the cutting slope and would discharge through private ditches, etc. and would not contribute to the highway drainage network.
- p. Where the highway would be on an embankment it is proposed that the embankment runoff would be collected in a ditch at the bottom of the embankment and would be conveyed to the local ditches and watercourses.
- q. Where the highway would be on an embankment it is proposed that the field runoff would be taken by a drainage ditch to be built within the field and connected to local ditches and watercourses.
- r. Whilst runoff from the adjacent land has been considered and accounted for, there is no allowance for land drainage networks. Through discussions, no landowner has advised of the presence of any land drainage that would be affected by the works. If land drainage networks are uncovered during the detail design/construction works they would need to be addressed.
- s. As there is a requirement (further to the HAWRAT assessment) to provide treatment prior to discharge to many of the watercourses, a permanent wet shallow area would be required in the detention basins. The size and depth of this permanently wetted area is envisaged to be a small part of the overall basins, and this would be confirmed in the detailed design.
- t. The design strategy for each distinct drainage area is summarised in **Section 4.3** of this Strategy. The first set of tabled data is the calculated runoff figures for each distinct catchment. The second set of tabled data is the available data relating to each detention basin (data is displayed in metres Above Ordnance Datum (mAOD)).

## 4.2. DESIGN STRATEGY RISKS AND ASSUMPTIONS

### RISKS

- a. The geotechnical data used was gathered during the design process primarily along the road corridor, specific Ground Investigation was undertaken at the sites of each of the detention basins. There remains 3 locations where there is limited GI information, these are discussed below.
- b. Unknown underground utilities may be present.

## ASSUMPTIONS

- a.** Runoff from the running lanes and hardstrips would follow the road camber to both channels unless indicated otherwise.
- b.** Central reservations, hardstrips, and verges would be continuous across underbridges and across overbridges unless otherwise indicated.
- c.** Detention basins have generally been proposed with a storage depth of 500 mm. This would be to limit the extent of excavation due to the expected high groundwater levels and to improve the opportunities to connect to the watercourses.
- d.** Detention basins would be lined.
- e.** In cases where the detention basins are set in deep excavations the upper slopes of the basins would require some form of land drainage to ensure that the runoff from the slopes does not discharge directly to the flow control structure.
- f.** Where there are high water tables, the detention solutions would be designed to mitigate the impact of the groundwater, by providing specific drainage for the side slopes above the storage depth.
- g.** Runoff directly to existing ground would be minimal due to the nature of the existing ground. Alluvial clay is understood to overlay the catchment to a depth of up to 20 m.
- h.** It is not considered feasible to re-use the existing A1 drainage for Part B.



### 4.3. DESIGN STRATEGY BY CHAINAGE

4.3.1. Chainage 53225 to 54600 see **Figure 4-1** below.



**Figure 4-1 - Highway Drainage Layout and Detention Basin DB22**

**PRELIMINARY DESIGN STRATEGY:**

- a. The majority of this section drains to the verges. Run-off from the carriageway would be collected in filter drains located within northbound and southbound verges. Kerb and Gully drainage is proposed at the layby at Ch53950. As the Denwick Burn crosses the A1 at Ch53480 it was not possible to have the highway drainage cross over it, hence two drainage networks are required for this section.
- b. Detention basin DB22 would be located on the east of the carriageway north of Denwick Burn and would collect run-off from the A1 and the grass embankments where applicable. Controlled discharge from detention basin DB22 would outfall to Denwick Burn.

**Table 4-1 - Run-off Data**

<b>Chainage 53225 to Chainage 54600 Trunk Road Drainage</b>	
1 in 1 year return period greenfield run-off rate (l/s)	15.0
1 in 30 year return period greenfield run-off rate (l/s)	30.6
1 in 100 year return period greenfield run-off rate (l/s)	36.2
1 in 100 year return period +CC design storage volume (m <sup>3</sup> )	1550

**Table 4-2 - Detention Basin Data**

<b>Detention Basin DB22 – Trunk Road Drainage</b>			
Chainage	53450	Proposed Detention Basin Inlet Invert Levels (mAOD)	57.200 57.113
Proposed Detention Basin Outlet Invert Level (mAOD)	57.056	Watercourse Invert Level (mAOD)	57.09
Discharge Watercourse		Denwick Burn	

**DESIGN RISKS**

- a. There is no geotechnical information in the area of the detention basin.

4.3.2. Chainage 54600 to 56010 see **Figure 4-2** below.



Figure 4-2 - Highway Drainage Layout and Detention Basin DB23



**PRELIMINARY DESIGN STRATEGY:**

- a. The majority of this section drains to the verges. Run-off from the carriageway would be collected in filter drains located within northbound and southbound verges. Kerb and Gully drainage is proposed at the layby at Ch55150.
- b. Detention basin DB23 would be located west of the carriageway at approximately 500 m from the crossing of the B6341 and Hinding Lane. The detention basin would collect run-off from the new A1 and the grass embankments where applicable. The runoff from the Heckley Fence crossing at Ch55300 would discharge to the surrounding land as existing. Controlled discharge from detention basin DB23 would outfall to Denwick Burn on the east side of the carriageway.

**Table 4-3 - Run-off Data**

54600 to Chainage 56010	
1 in 1 year return period greenfield run-off rate (l/s)	15.1
1 in 30 year return period greenfield run-off rate (l/s)	30.9
1 in 100 year return period greenfield run-off rate (l/s)	36.6
1 in 100 year return period +CC design storage volume (m <sup>3</sup> )	1900

**Table 4-4 - Detention Basin Data**

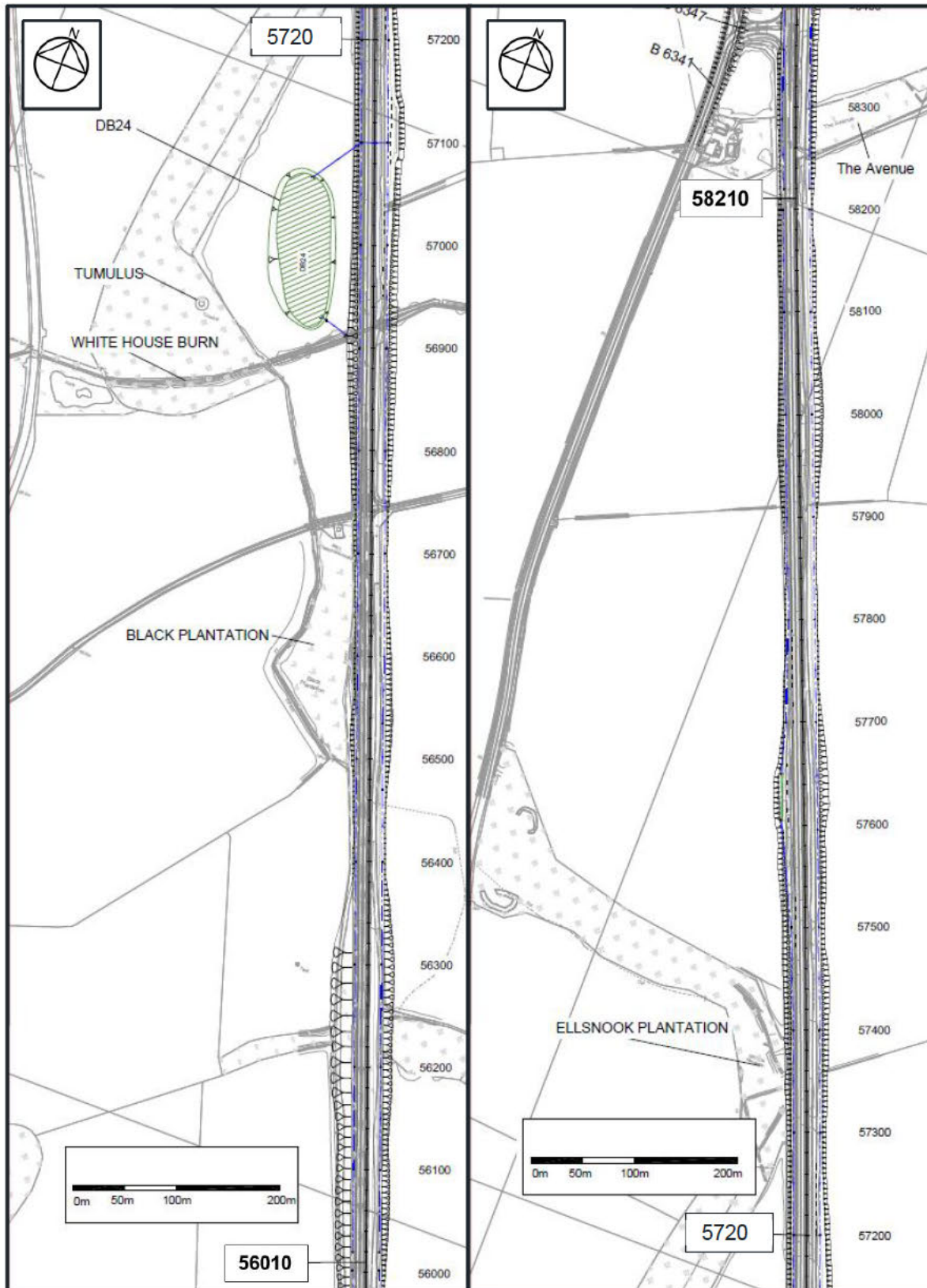
Detention Basin DB23 – Trunk Road Drainage			
Chainage	54600	Proposed Detention Basin Inlet Invert Level (mAOD)	84.95
Proposed Detention Basin Outlet Invert Level (mAOD)	84.45	Watercourse Invert Level (mAOD)	84.31
Discharge Watercourse		Denwick Burn	

**DESIGN RISKS**

- a. There is limited geotechnical information, in the form of a single 1.5 m deep trial pit, in the area of the detention basin.



4.3.3. Chainage 56010 to 58210 see **Figure 4-3** below.



**Figure 4-3 - Highway Drainage Layout and Detention Basin DB24**

**PRELIMINARY DESIGN STRATEGY:**

- a. The whole of this section drains to the verges. Run-off from the carriageway would be collected in filter drains located within northbound and southbound verges. Kerb and Gully drainage is proposed at the laybys at Ch57100 and Ch57620.
- b. Detention basin DB24 would be located west of the carriageway at chainage 57000. The detention basin would collect run-off from the new A1 only. Controlled discharge from detention basin DB24 would outfall to White House Burn on the west side of the carriageway.

**Table 4-5 - Run-off Data**

<b>Chainage 56010 to Chainage 58210 Trunk Road Drainage</b>	
1 in 1 year return period greenfield run-off rate (l/s)	25.0
1 in 30 year return period greenfield run-off rate (l/s)	51.1
1 in 100 year return period greenfield run-off rate (l/s)	60.4
1 in 100 year return period +CC design storage volume (m <sup>3</sup> )	3300

**Table 4-6 - Detention Basin Data**

<b>Detention Basin DB24 – Trunk Road Drainage</b>			
Chainage	57000	Proposed Detention Basin Inlet Invert Level (mAOD)	84.50
Proposed Detention Basin Outlet Invert Level (mAOD)	84.00	Watercourse Invert Level (mAOD)	83.61
Discharge Watercourse		White House Burn	

**DESIGN RISKS:**

- a. There is limited geotechnical information, in the form of a single 1.7 m deep trial pit, in the area of the detention basin.

4.3.4. Chainage 58210 to 59140 see **Figure 4-4** below.



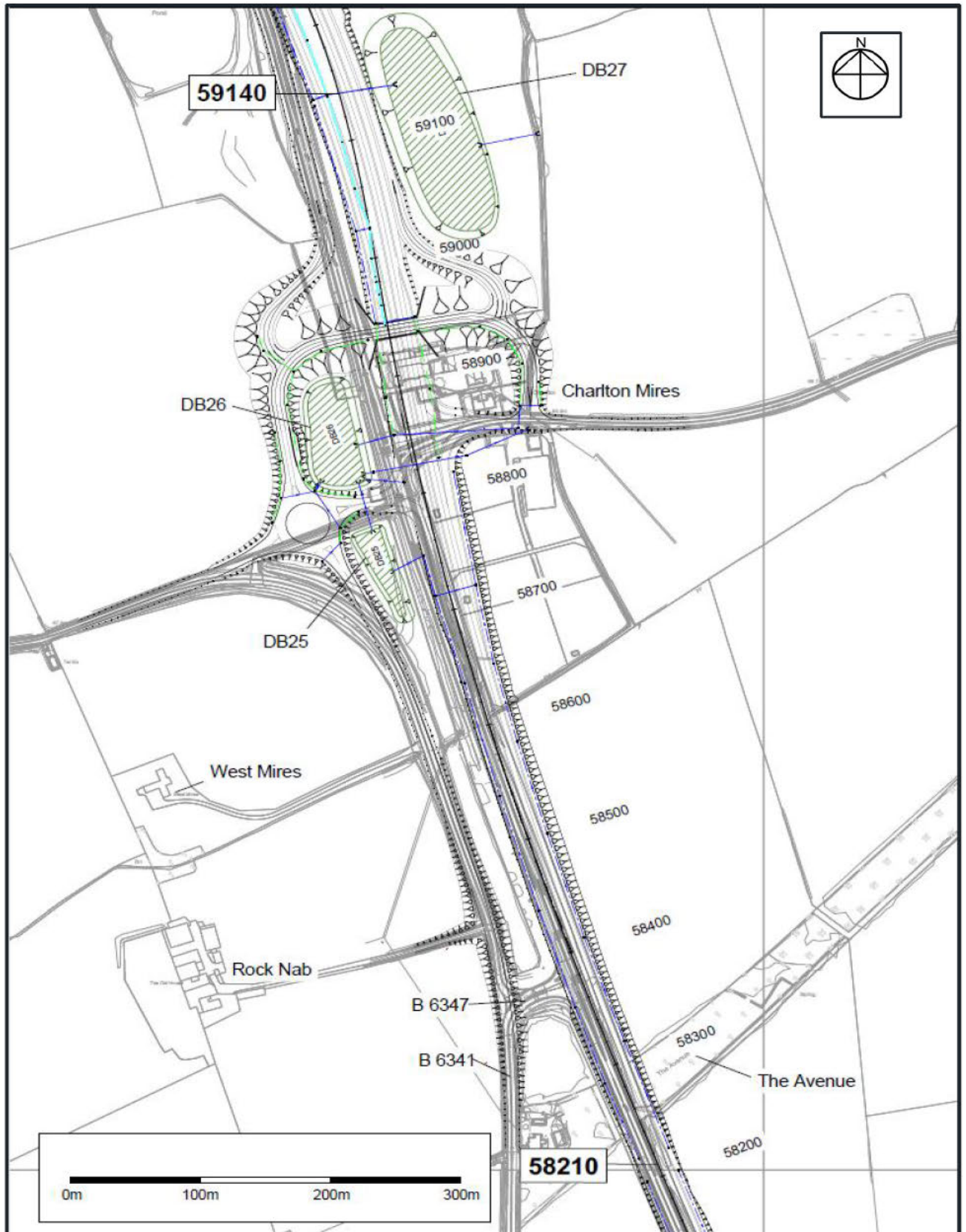


Figure 4-4 - Highway Drainage Layout and Detention Basins DB25 and DB26

**PRELIMINARY DESIGN STRATEGY:**

- a. Run-off from the main A1 carriageway would be collected in filter drains located in the northbound and southbound verges from the south of this section up to the new Charlton Mires junction.
- b. North of the new Charlton Mires junction runoff would be collected in either filter drains in the verges or surface water channels in the central reservation.
- c. At the new junction with the B6347 a network of filter drains, CKD and kerb and gully would collect the runoff. New drainage is proposed where the carriageway would be maintained by the Applicant.
- d. The section of the B6347 that runs parallel to the A1 would be connected to the roundabout. Approximately 400 m of this section would be realigned as part of the works. Existing drainage arrangement is over the edge and infiltration into adjacent land. No change to the existing drainage arrangement is envisaged on this section and drainage should be as existing.
- e. The volume of runoff to be stored would be split in two locations, detention basins DB25 and DB26. The two detentions basins would be located between the main A1 carriageway and the western roundabout. The basins would be connected under the carriageway from the roundabout to the A1.
- f. Runoff would be discharged to the unnamed burn to the east of the A1.

**Table 4-7 - Run-off Data**

<b>Chainage 58210 to Chainage 59140 Trunk Road Drainage</b>	
1 in 1 year return period greenfield run-off rate (l/s)	14.3
1 in 30 year return period greenfield run-off rate (l/s)	29.2
1 in 100 year return period greenfield run-off rate (l/s)	34.6
1 in 100 year return period +CC design storage volume (m <sup>3</sup> )	850



**Table 4-8 - Detention Basin Data**

<b>Detention Basin DB25 – Trunk Road Drainage</b>			
Chainage	58750	Proposed Detention Basin Inlet Invert Level (mAOD)	86.008
Proposed Detention Basin Outlet Invert Level (mAOD)	85.5	Watercourse Invert Level (mAOD)	85.186
Discharge Watercourse		Unnamed Tributary of Kittycarter Burn	

**Table 4-9 - Detention Basin Data**

<b>Detention Basin DB26 – Trunk Road Drainage</b>			
Chainage	58850	Proposed Detention Basin Inlet Invert Level (mAOD)	85.4
Proposed Detention Basin Outlet Invert Level (mAOD)	85.4	Watercourse Invert Level (mAOD)	85.186
Discharge Watercourse		Unnamed Tributary of Kittycarter Burn	

**DESIGN RISKS:**

a. There is no specific geotechnical information in the area of the detention basins.

4.3.5. Chainage 59140 to 61100 see **Figure 4-5** below.

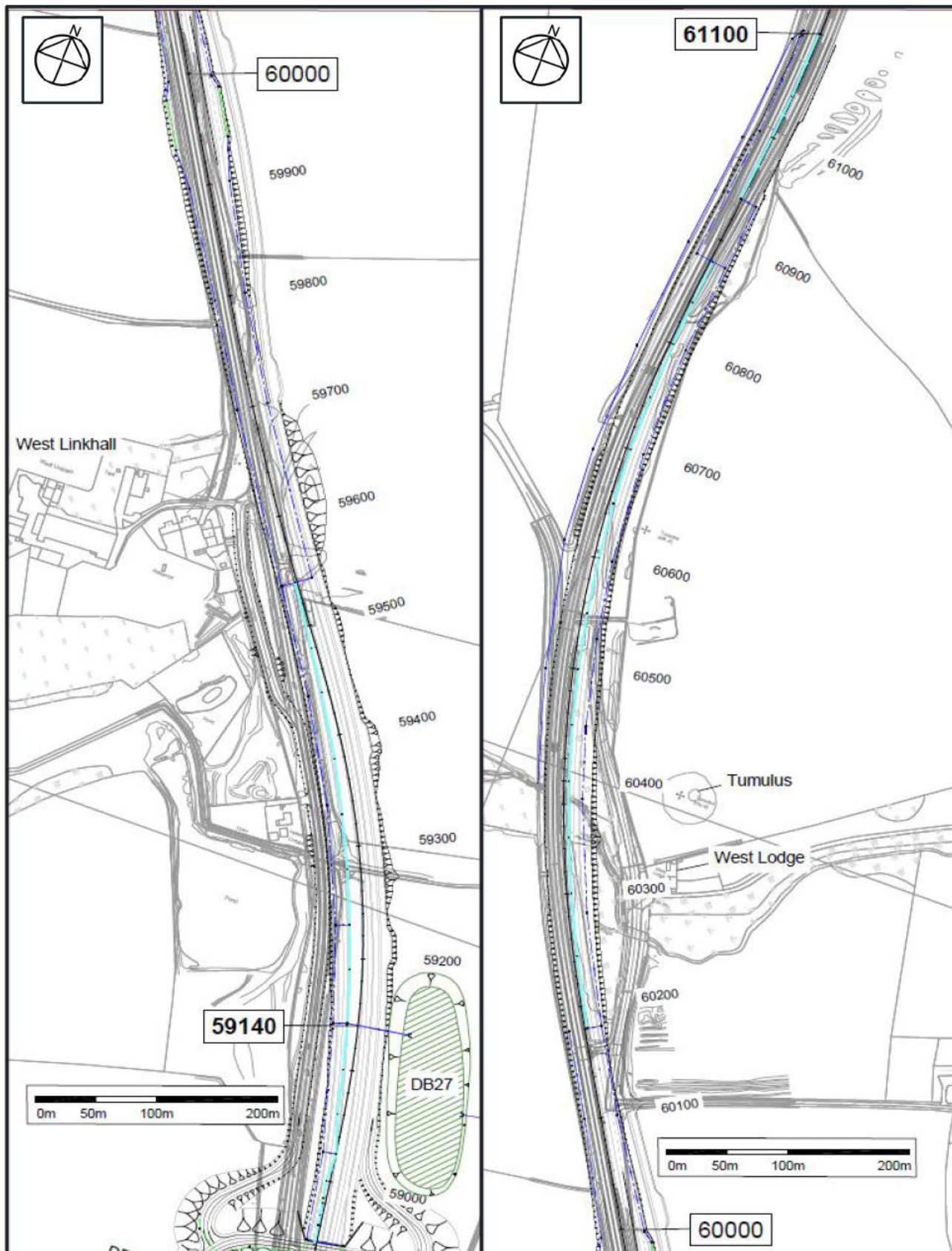
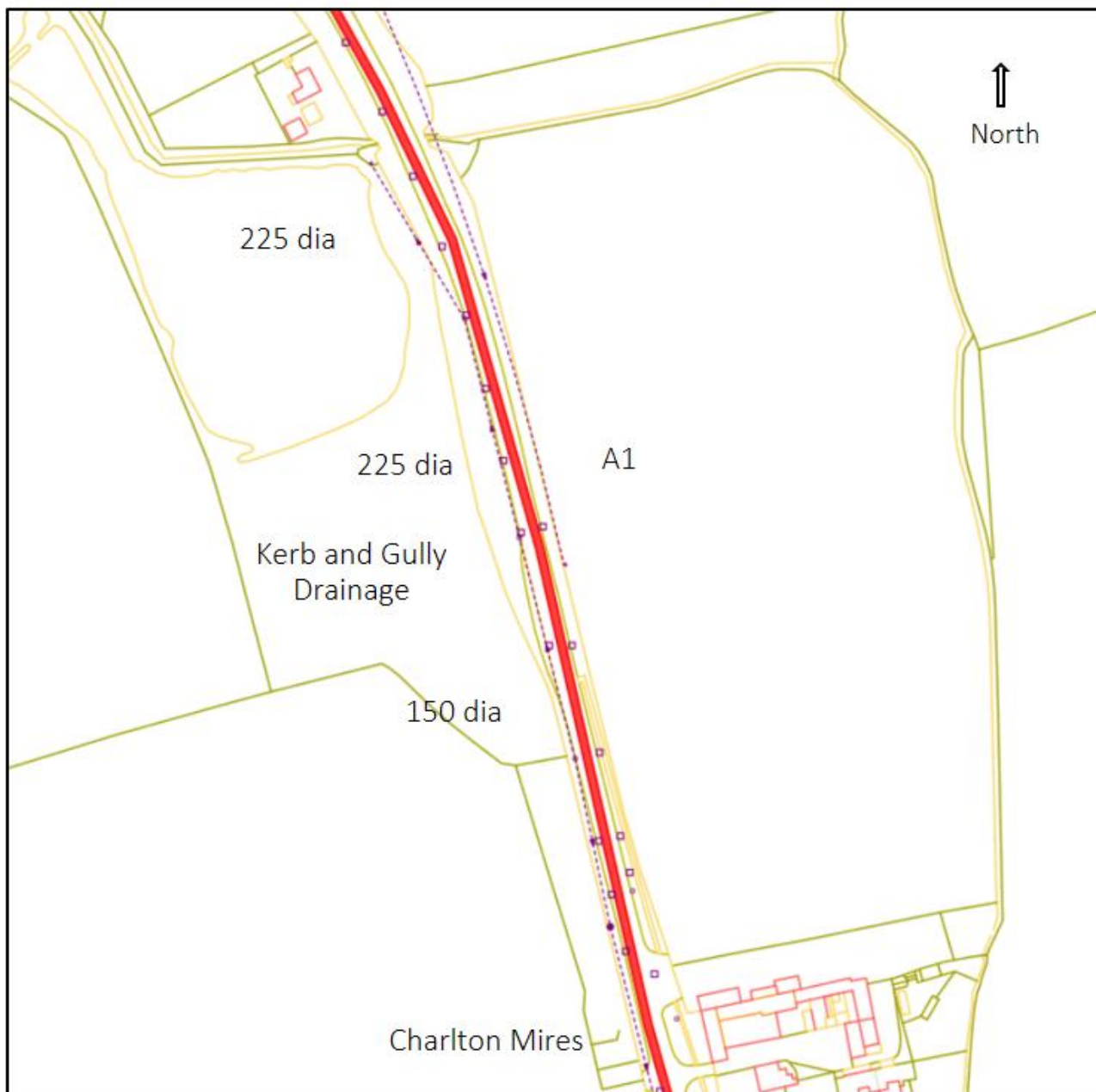


Figure 4-5 - Highway Drainage Layout and Detention Basin DB27

#### **PRELIMINARY DESIGN STRATEGY:**

- a.** The runoff from the main A1 carriageway would be collected in either filter drains in the verges or surface water channels in the central reservation. Kerb and Gully drainage is proposed at the laybys at Ch59960 on both lanes.
- b.** Detention basin DB27 would be located to the east of the carriageway to the north of Charlton Mires junction. Controlled discharge would be to the unnamed ditch to the east which then connects to Kittycarter Burn.
- c.** As there was no suitable area to construct a detention basin at Shipperton Burn the runoff from this catchment would be taken to the next available catchment. This proposal was discussed and agreed with NCC as the LLFA. The LLFA advised that the greenfield runoff rate to be applied here was to be based on the current area that drains to the Kittycarter Burn.
- d.** To the north of the works, the new carriageway would be constructed over the existing network. It is proposed that the existing highway drainage is reconnected to Shipperton Burn by a new drainage run. This run would be built to the west of the A1 between Ch60400 and 60880.
- e.** Two new local roads would be constructed in this area, they are the East Linkhall Road and the West Linkhall Road. These two roads would become the responsibility of the NCC once completed. It is proposed that the East Linkhall Road would have over the edge drainage onto the field in which it would be constructed. It is proposed that the West Linkhall Road, which would be constructed generally on the line of the existing A1 northbound lane, would be drained using the existing A1 drainage system, refer to **Figure 4-6** below.



**Figure 4-6 - West Linkhall Road Proposal to use A1 Drainage Network**



**Table 4-10 - Run-off Data**

<b>Chainage 59140 to Chainage 61100 Trunk Road Drainage</b>	
1 in 1 year return period greenfield run-off rate (l/s)	12.7
1 in 30 year return period greenfield run-off rate (l/s)	26.0
1 in 100 year return period greenfield run-off rate (l/s)	30.8
1 in 100 year return period +CC design storage volume (m <sup>3</sup> )	3600

**Table 4-11 - Detention Basin Data**

<b>Detention Basin DB27 – Trunk Road Drainage</b>			
Chainage	59100	Proposed Detention Basin Inlet Invert Level (mAOD)	85.50
Proposed Detention Basin Outlet Invert Level (mAOD)	85.00	Watercourse Invert Level (mAOD)	84.8
Discharge Watercourse		Unnamed Tributary of Kittycarter Burn	

**DESIGN RISKS:**

4.3.6. There is limited geotechnical information in the area of the detention basin, it is noted that the trial pit terminated at 1.7 m where water was struck.

**4.4. NON-TRUNK NETWORK & SIDE ROADS**

4.4.1. Maintenance boundaries at junctions have been agreed in principal between the Applicant and NCC as the local highway authority. The drainage networks associated with access roads, local tracks and local roads that would be constructed as part of Part B beyond the Applicant's maintenance boundary extents, would not become part of the trunk road drainage network. These areas of non-trunk carriageway construction would be drained separately from the trunk road.

## 5. OPERATION & MAINTENANCE STRATEGY

---

- 5.1.1. The maintenance strategy relevant to the drainage works are outlined below.
- 5.1.2. HA 217/08 of the DMRB gives guidance on the maintenance of combined surface drains where used as a highway drainage system. No actual maintenance programme is prescribed.
- 5.1.3. For the detention basins, the maintenance requirements would be in line with the SuDS Manual (CIRIA Guide C753). This is similar to the maintenance required for grassed surface water channels (refer to DMRB HA 119/06) but would also include clearance of grilles at headwalls and removal of sediment.
- 5.1.4. The maintenance requirements for the filter drains would be the cleaning of the filter material which would be expected to be undertaken every 20 years.

## 6. SUMMARY OF PROPOSED DRAINAGE STRATEGY

---

6.1.1. A summary of the Strategy for Part B is provided below.

- a.** Runoff from the A1 trunk upgrade would be discharged into the existing watercourses via detention basins. In this scenario discharge rates would be limited to existing (unfactored) values.
- b.** Drainage discharge from highways remaining part of the local road network would be kept separate from discharge associated with Part B as agreed with NCC as LLFA.
- c.** Roads/tracks which are not to be incorporated as access roads to the new trunk road system, are assumed to be abandoned/truncated, and would continue to drain as existing. All existing watercourses crossing the proposed route, to which these roads/tracks may drain, would be maintained using culverts or other means.
- d.** Locations of detention basins have been agreed with NCC, and the Environment Agency.
- e.** Allowable runoff rates have been restricted to existing greenfield runoff values for the equivalent storm events i.e. the 1 in 1, 30 and 100 year return periods.
- f.** Highway drainage has been designed to accommodate a 1 in 1 year design flow without surcharging; and a 1 in 5 year flow without surface flooding of the running carriageways (with a 20% allowance for climate change).
- g.** Attenuation has been provided for the 1 in 100 year event plus 20% climate change.
- h.** Where detention basins would be used these would be located outside of Flood Zone 2 and 3 areas.
- i.** Online controls have been modelled to restrict discharges to allowable values.
- j.** It is assumed that any new local access tracks, bridleways, and PMAs would be drained to local land drains and watercourses.
- k.** Runoff from the running lanes and hardstrips would follow the road camber to both channels, and to central reservation where there is a crossfall.
- l.** Runoff to central reservation would be to concrete surface water channels.
- m.** Where the highway would be accommodated within a cutting the runoff from the cutting would be to a combined toe drain if possible.
- n.** Where the highway is accommodated within a cutting the runoff from the adjacent fields would be to a drainage ditch at the edge of the field.
- o.** Where the highway is on an embankment, the runoff from the embankment would be to a toe drainage ditch if possible.
- p.** Where the highway would be on an embankment, the field runoff would be taken by a drainage ditch to be built at the edge of the field.
- q.** Whilst runoff from the adjacent land has been considered and accounted for, there is no allowance for land drainage networks. Through discussions, no landowner has advised of the presence of any land drainage that would be affected by the works. If land drainage networks are uncovered during the detail design/construction works, they would need to be addressed.

- r. As there is a requirement (further to the HAWRAT assessment) to provide treatment prior to discharge to many of the watercourses, a permanent wet shallow area would be required in the detention basins. The size and depth of this permanently wetted area is envisaged to be a small part of the overall basins, and this would be confirmed in the detailed design.

# Appendix A

## **HYDRAULIC MODEL**

## **APPENDIX A – HYDRAULIC MODEL**

---

**APPENDIX A – HYDRAULIC MODEL IS NOT REQUIRED TO BE APPENDED TO THE  
A1 IN NORTHUMBERLAND: ALNWICK TO ELLINGHAM ENVIRONMENTAL  
STATEMENT**

# Appendix B

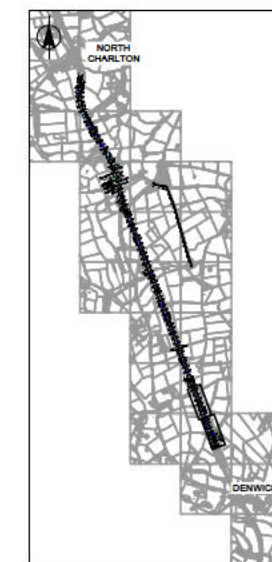
## **DRAINAGE STRATEGY LAYOUT DRAWINGS**



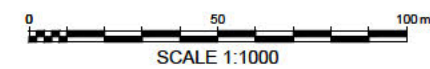
**NOTES**

1. DRAWING TO BE PRINTED IN COLOUR.
2. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL RELEVANT REFERENCE DRAWINGS.
3. DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY.
4. ALL DIMENSIONS ARE IN MILLIMETRES. ALL LEVELS ARE IN METRES.
5. THE POSITION AND LEVELS OF ALL DRAINS ARE TO BE CONFIRMED ON SITE PRIOR TO THE COMMENCEMENT OF THE WORKS.
6. ALL DRAINAGE TO COMPLY WITH THE REQUIREMENTS OF DESIGN MANUAL FOR ROADS AND BRIDGES: VOLUMES 4 & 11.
7. COVER LEVELS OF THE MANHOLES ARE PROVISIONAL AND SUBJECT TO ADJUSTMENT TO SUIT THE FINISHED GROUND LEVELS.
8. ANY WORKS AFFECTING EXISTING WATERCOURSES REQUIRE ENVIRONMENT AGENCY AND / OR LOCAL AUTHORITY APPROVAL.
9. GULLY LOCATIONS OMITTED FOR CLARITY AND SUBJECT TO DETAILED DESIGN.
10. ALL ATTENUATION STRUCTURES ARE APPROXIMATE AND SUBJECT TO DETAILED DESIGN.
11. DITCHES ARE PROPOSED TO THE TOE OF EMBANKMENTS ON THE MAINLINE.

**DRAFT**



**KEY PLAN**  
(Scale 1:75,000)



SCALE 1:1000

Rev.	Date	Description	By	Eng. Ck	Disc. Ck	App'd
PD1	??..??..??	FIRST ISSUE				
WIP <span style="float: right;">S0</span>						
TR010041						

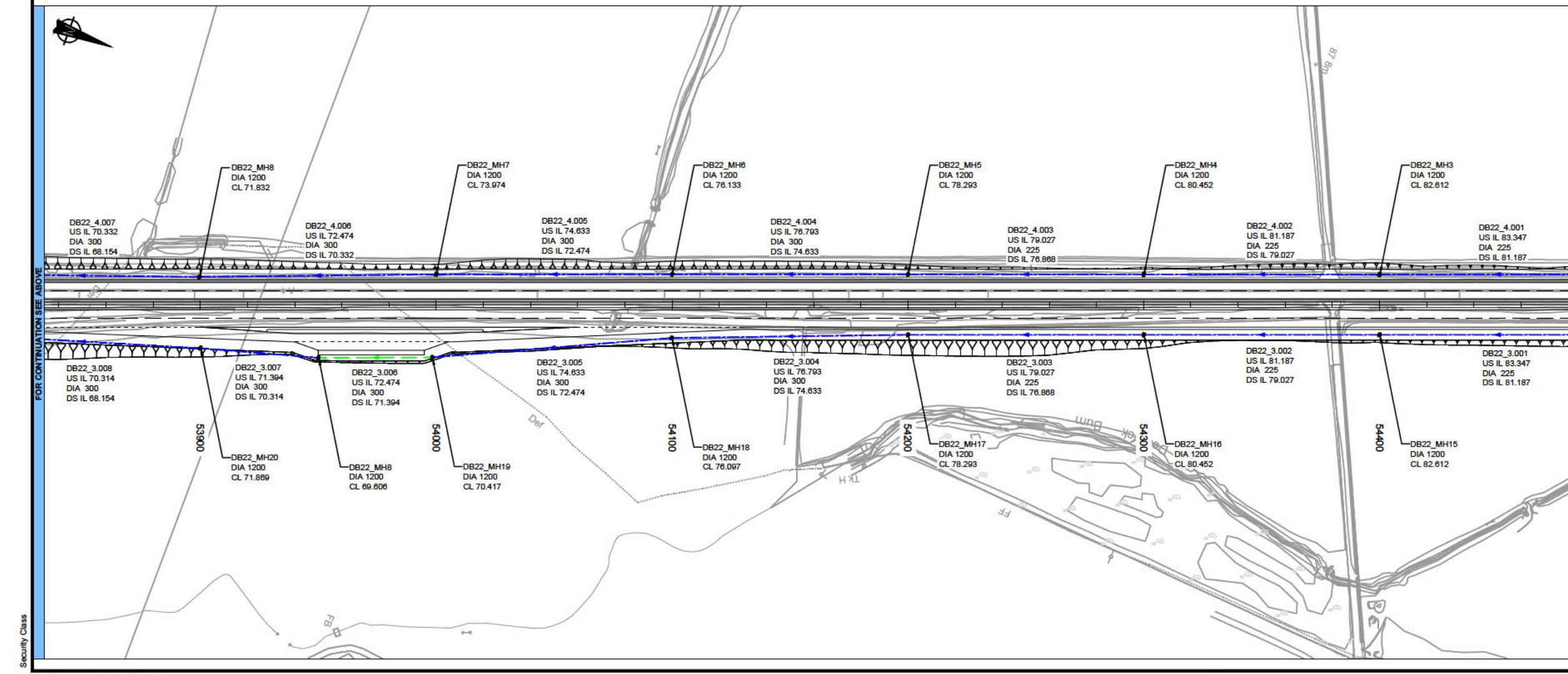
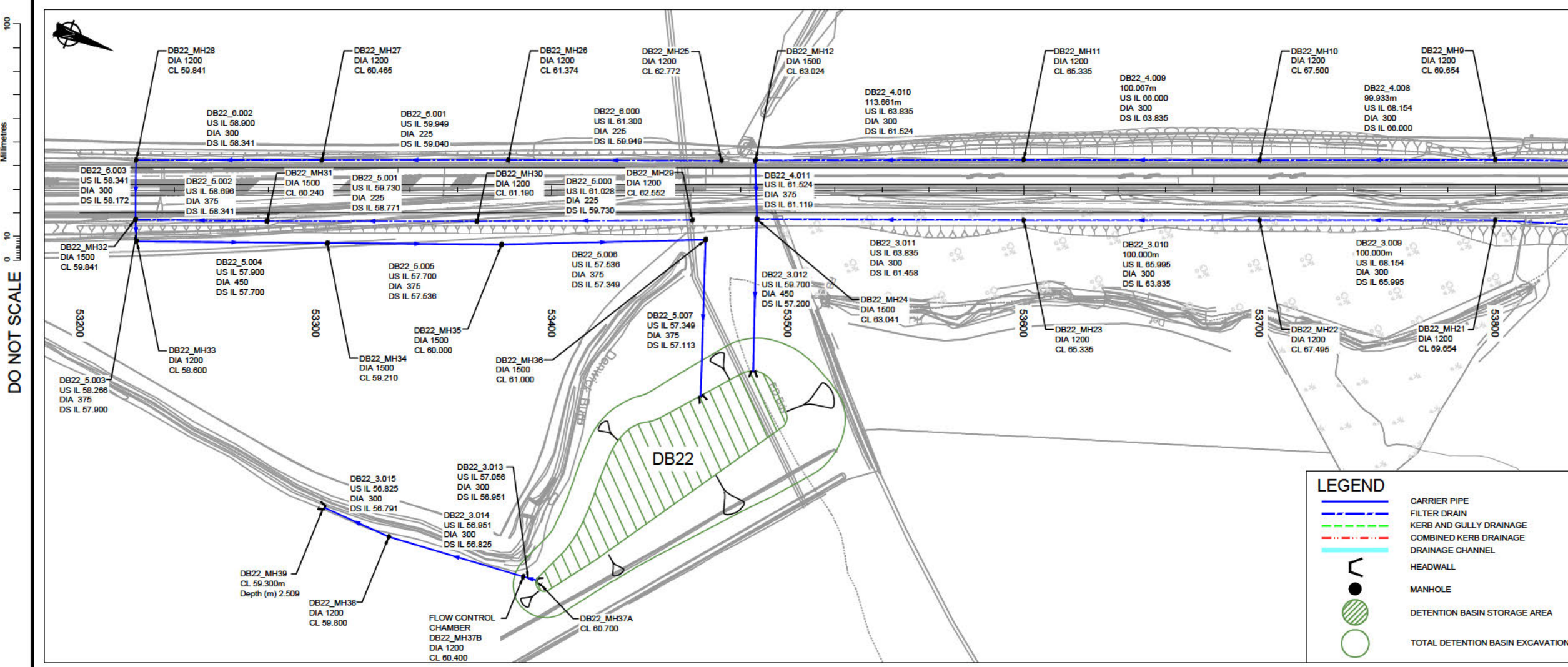


Project Title: **A1 in Northumberland: Morpeth to Felton Scheme**

Drawing Title: **DRAINAGE STRATEGY LAYOUT SHEET 1 OF 7 REGULATION 5 (2) (o)**

Scale	Drawn	Eng. Check	Approved	Authorised
1:1000	MJC	??	??	??
Original Size	Date	Date	Date	Date
A1	20.04.19	??..??..??	??..??..??	??..??..??

Drawing Number: **HE551459-WSP-HDG-A2E-DR-CD-0001** Revision: **P01.2**  
PW Obj Code: **3**

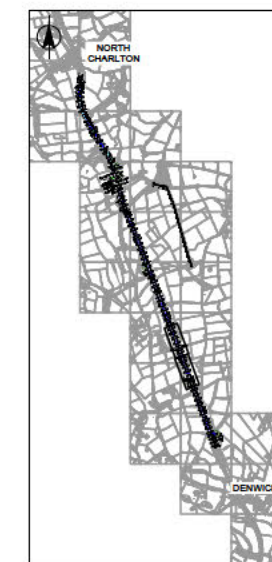




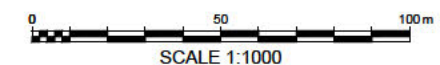
**NOTES**

1. DRAWING TO BE PRINTED IN COLOUR.
2. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL RELEVANT REFERENCE DRAWINGS.
3. DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY.
4. ALL DIMENSIONS ARE IN MILLIMETRES. ALL LEVELS ARE IN METRES.
5. THE POSITION AND LEVELS OF ALL DRAINS ARE TO BE CONFIRMED ON SITE PRIOR TO THE COMMENCEMENT OF THE WORKS.
6. ALL DRAINAGE TO COMPLY WITH THE REQUIREMENTS OF DESIGN MANUAL FOR ROADS AND BRIDGES: VOLUMES 4 & 11.
7. COVER LEVELS OF THE MANHOLES ARE PROVISIONAL AND SUBJECT TO ADJUSTMENT TO SUIT THE FINISHED GROUND LEVELS.
8. ANY WORKS AFFECTING EXISTING WATERCOURSES REQUIRE ENVIRONMENT AGENCY AND / OR LOCAL AUTHORITY APPROVAL.
9. GULLY LOCATIONS OMITTED FOR CLARITY AND SUBJECT TO DETAILED DESIGN.
10. ALL ATTENUATION STRUCTURES ARE APPROXIMATE AND SUBJECT TO DETAILED DESIGN.
11. DITCHES ARE PROPOSED TO THE TOE OF EMBANKMENTS ON THE MAINLINE.

**DRAFT**



**KEY PLAN**  
(Scale 1:75,000)



Rev.	Date	Description	By	Eng'g Ck'd	Disc' Ck'd	App'd
P01	??..??..??	FIRST ISSUE				

DCO SUBMISSION S2

TR010041

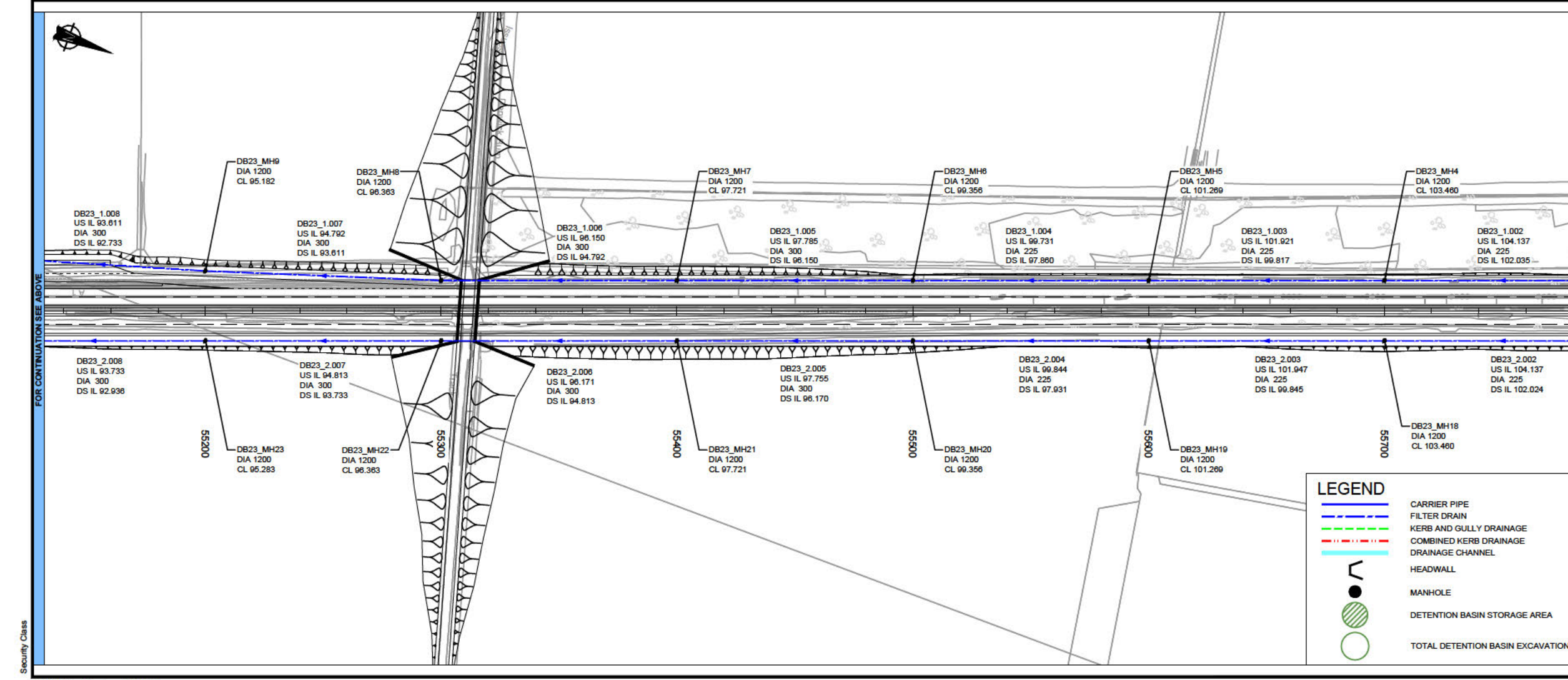
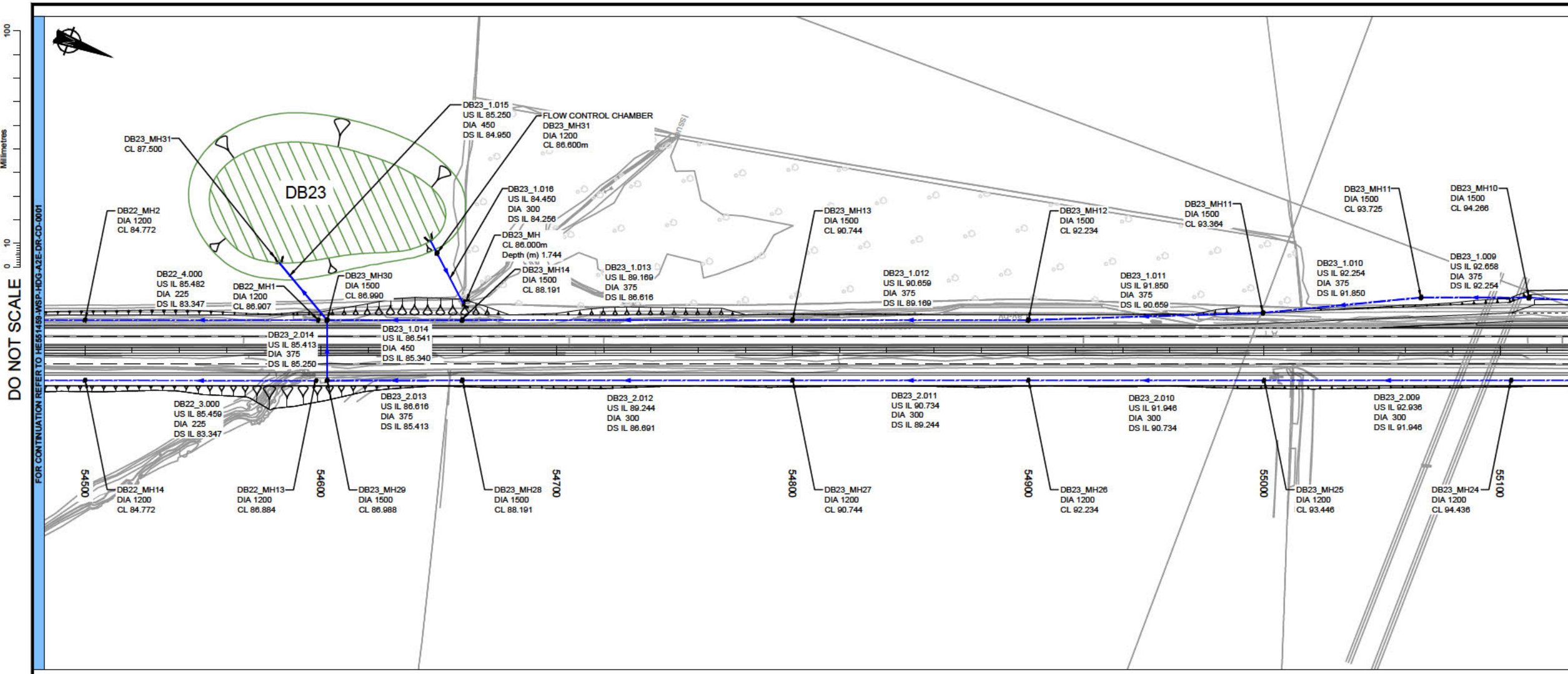
**A1 in Northumberland: Morpeth to Felton Scheme**

**DRAINAGE STRATEGY LAYOUT**  
SHEET 2 OF 7  
REGULATION 5 (2) (o)

Scale	Drawn	Eng. Check	Approved	Authorised
1:1000	MJC	??	??	??

Original Size	Date	Date	Date	Date
A1	29.04.19	??..??..??	??..??..??	??..??..??

HE551459-WSP-HDG-A2E-DR-CD-0002 P01



**LEGEND**

- CARRIER PIPE
- FILTER DRAIN
- KERB AND GULLY DRAINAGE
- COMBINED KERB DRAINAGE
- DRAINAGE CHANNEL
- HEADWALL
- MANHOLE
- DETENTION BASIN STORAGE AREA
- TOTAL DETENTION BASIN EXCAVATION

DO NOT SCALE

FOR CONTINUATION REFER TO HE551459-WSP-HDG-A2E-DR-CD-0001

FOR CONTINUATION SEE ABOVE

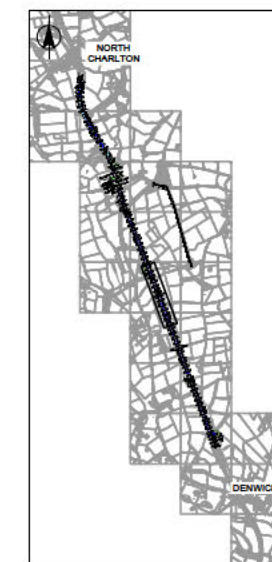
Security Class



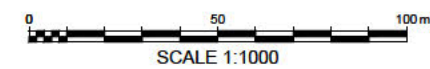
**NOTES**

1. DRAWING TO BE PRINTED IN COLOUR.
2. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL RELEVANT REFERENCE DRAWINGS.
3. DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY.
4. ALL DIMENSIONS ARE IN MILLIMETRES. ALL LEVELS ARE IN METRES.
5. THE POSITION AND LEVELS OF ALL DRAINS ARE TO BE CONFIRMED ON SITE PRIOR TO THE COMMENCEMENT OF THE WORKS.
6. ALL DRAINAGE TO COMPLY WITH THE REQUIREMENTS OF DESIGN MANUAL FOR ROADS AND BRIDGES: VOLUMES 4 & 11.
7. COVER LEVELS OF THE MANHOLES ARE PROVISIONAL AND SUBJECT TO ADJUSTMENT TO SUIT THE FINISHED GROUND LEVELS.
8. ANY WORKS AFFECTING EXISTING WATERCOURSES REQUIRE ENVIRONMENT AGENCY AND / OR LOCAL AUTHORITY APPROVAL.
9. GULLY LOCATIONS OMITTED FOR CLARITY AND SUBJECT TO DETAILED DESIGN.
10. ALL ATTENUATION STRUCTURES ARE APPROXIMATE AND SUBJECT TO DETAILED DESIGN.
11. DITCHES ARE PROPOSED TO THE TOE OF EMBANKMENTS ON THE MAINLINE.

**DRAFT**



**KEY PLAN**  
(Scale 1:75,000)



SCALE 1:1000

Rev.	Date	Description	By	Eng'g Ck'd	Disc' Ck'd	App'd	Status
P01	??..??..??	FIRST ISSUE					
DCO SUBMISSION							S2

TR010041



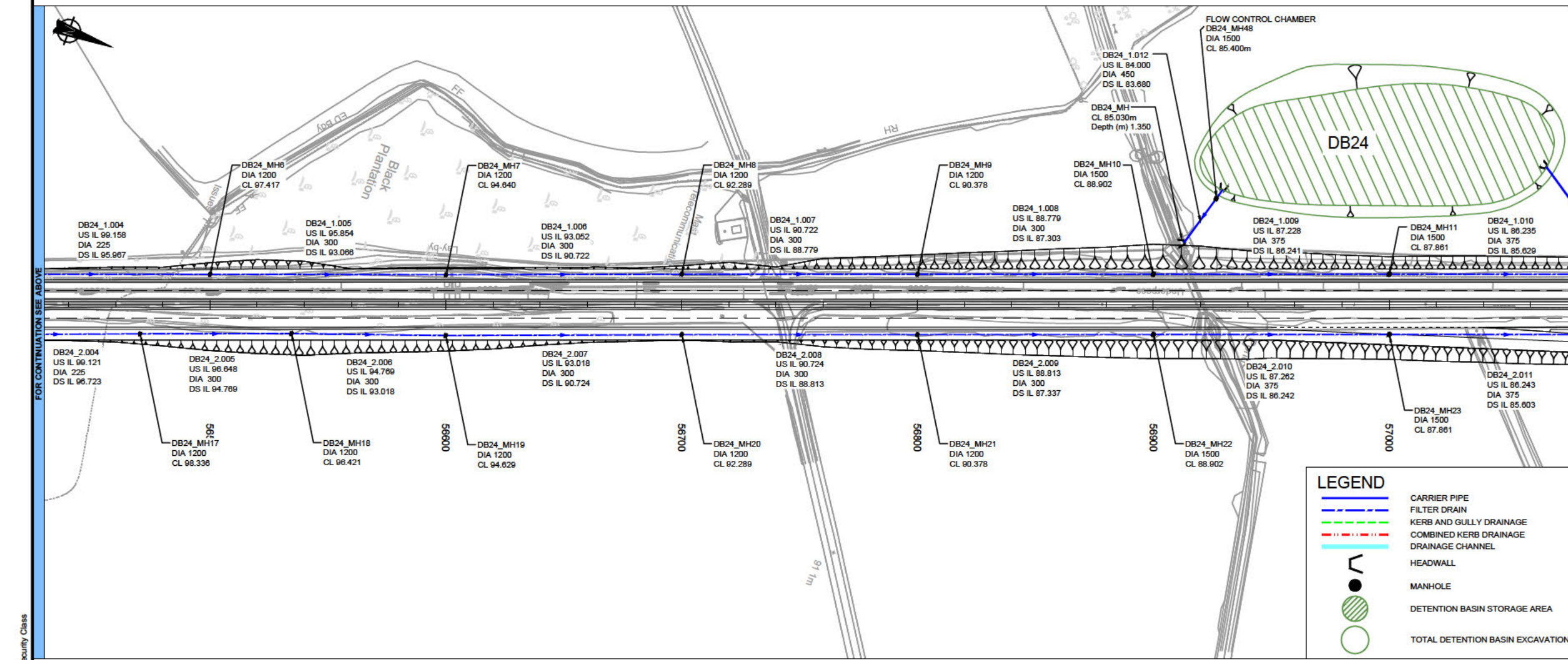
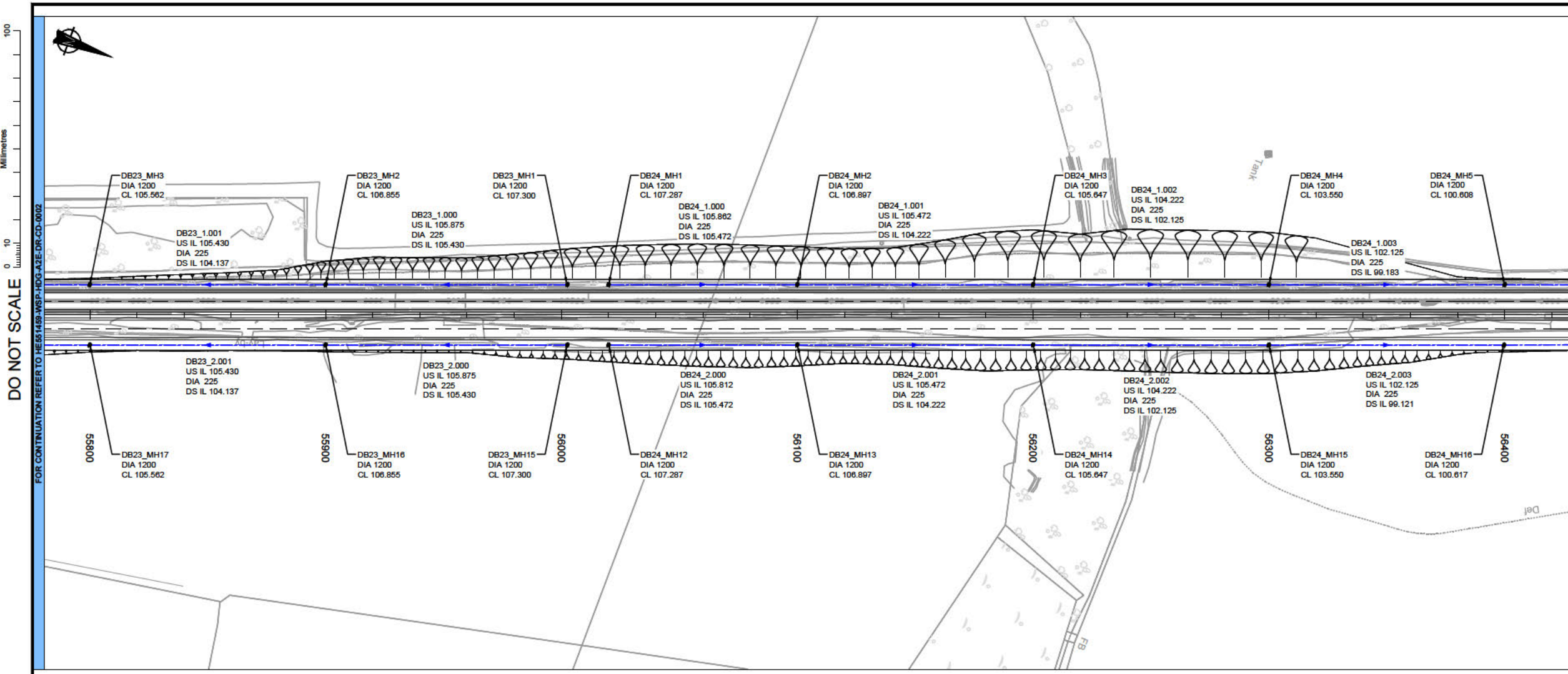
A1 in Northumberland:  
Morpeth to Felton Scheme

**DRAINAGE STRATEGY LAYOUT**  
SHEET 3 OF 7  
REGULATION 5 (2) (o)

Scale	Drawn	Eng. Check	Approved	Authorised
1:1000	MJC	??	??	??
Original Size	Date	Date	Date	Date
A1	29.04.19	??..??..??	??..??..??	??..??..??

HE551459-WSP-HDG-A2E-DR-CD-0003

Revision  
P01  
PW Obj Code  
3



**LEGEND**

- CARRIER PIPE
- FILTER DRAIN
- KERB AND GULLY DRAINAGE
- COMBINED KERB DRAINAGE
- DRAINAGE CHANNEL
- HEADWALL
- MANHOLE
- DETENTION BASIN STORAGE AREA
- TOTAL DETENTION BASIN EXCAVATION

DO NOT SCALE

FOR CONTINUATION REFER TO HE551459-WSP-HDG-A2E-DR-CD-0002

FOR CONTINUATION SEE ABOVE

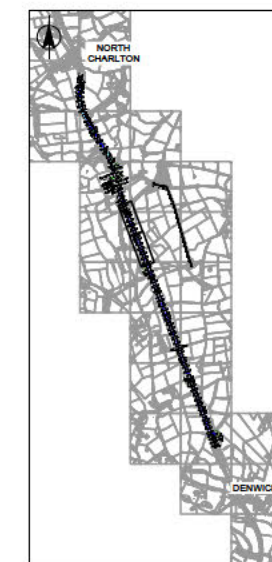
Security Class



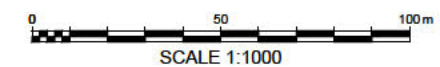
**NOTES**

1. DRAWING TO BE PRINTED IN COLOUR.
2. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL RELEVANT REFERENCE DRAWINGS.
3. DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY.
4. ALL DIMENSIONS ARE IN MILLIMETRES. ALL LEVELS ARE IN METRES.
5. THE POSITION AND LEVELS OF ALL DRAINS ARE TO BE CONFIRMED ON SITE PRIOR TO THE COMMENCEMENT OF THE WORKS.
6. ALL DRAINAGE TO COMPLY WITH THE REQUIREMENTS OF DESIGN MANUAL FOR ROADS AND BRIDGES: VOLUMES 4 & 11.
7. COVER LEVELS OF THE MANHOLES ARE PROVISIONAL AND SUBJECT TO ADJUSTMENT TO SUIT THE FINISHED GROUND LEVELS.
8. ANY WORKS AFFECTING EXISTING WATERCOURSES REQUIRE ENVIRONMENT AGENCY AND / OR LOCAL AUTHORITY APPROVAL.
9. GULLY LOCATIONS OMITTED FOR CLARITY AND SUBJECT TO DETAILED DESIGN.
10. ALL ATTENUATION STRUCTURES ARE APPROXIMATE AND SUBJECT TO DETAILED DESIGN.
11. DITCHES ARE PROPOSED TO THE TOE OF EMBANKMENTS ON THE MAINLINE.

**DRAFT**



**KEY PLAN**  
(Scale 1:75,000)



Rev.	Date	Description	By	Eng. Chk	Disc. Chk	App'd
P01	??..??..??	FIRST ISSUE				

Submittal	DCO SUBMISSION				Status	S2
-----------	----------------	--	--	--	--------	----

PN0 Reference Number: **TR010041**

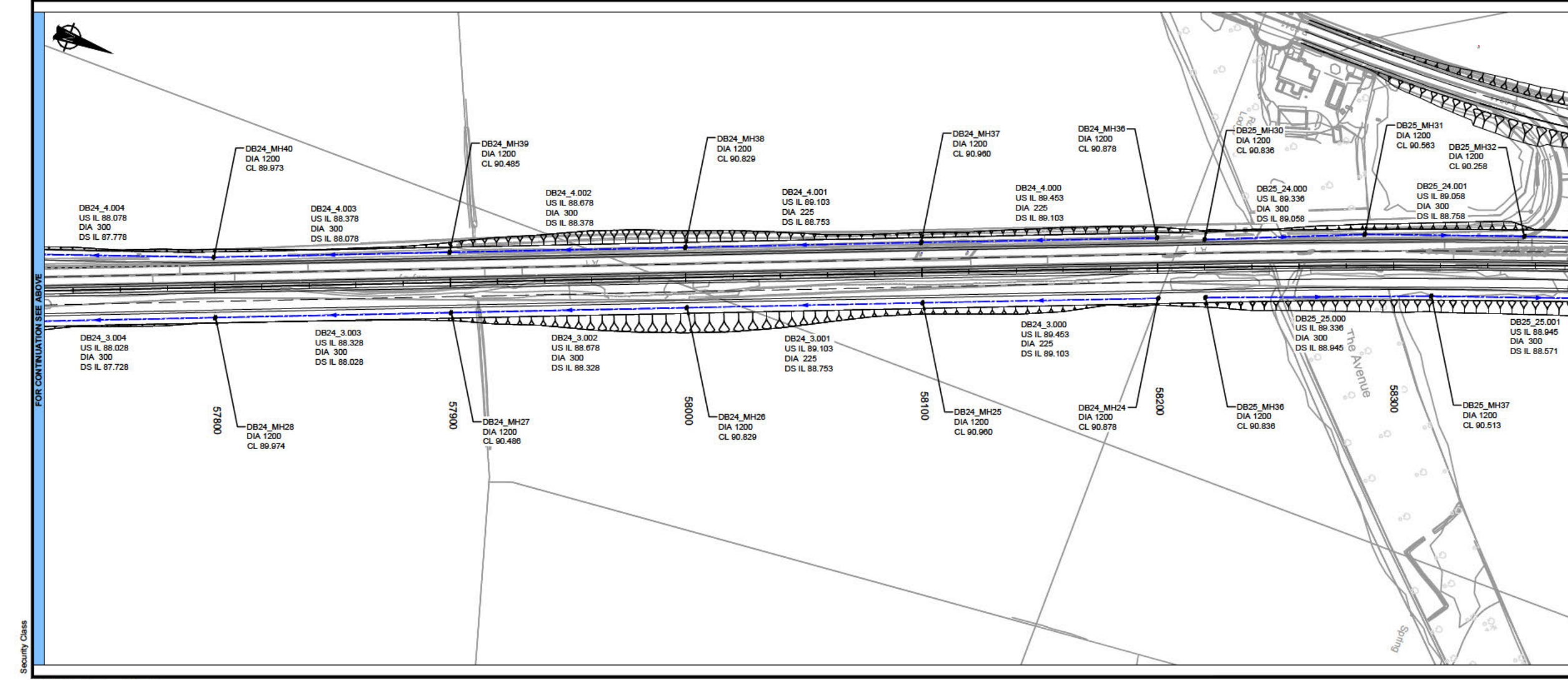
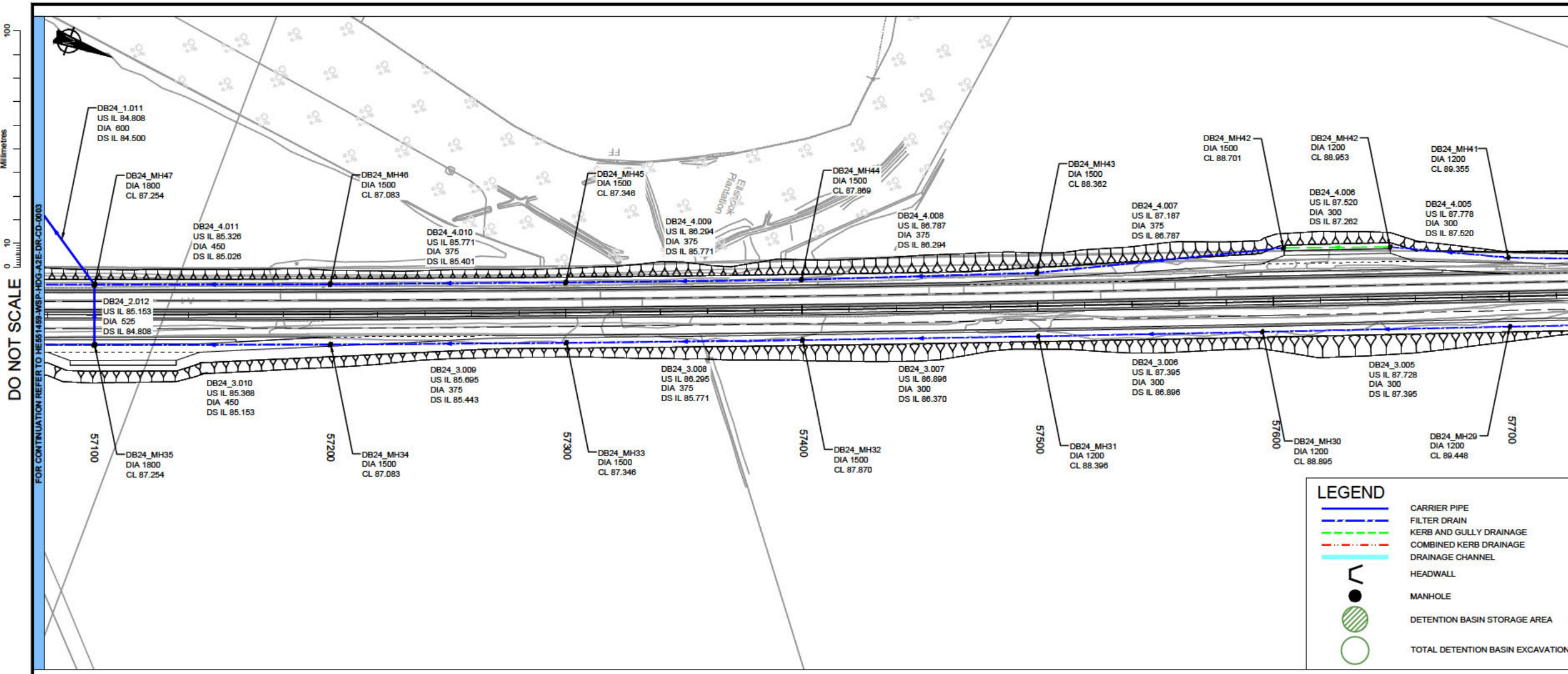


Client: **A1 in Northumberland: Morpeth to Felton Scheme**

Drawing Title: **DRAINAGE STRATEGY LAYOUT SHEET 4 OF 7 REGULATION 5 (2) (a)**

Scale	Drawn	Eng. Check	Approved	Authorised
1:1000	MJC	??	??	??
Original Size	Date	Date	Date	Date
A1	20.04.19	??..??..??	??..??..??	??..??..??

Drawing Number: **HE551459-WSP-HDG-A2E-DR-CD-0004**



DO NOT SCALE

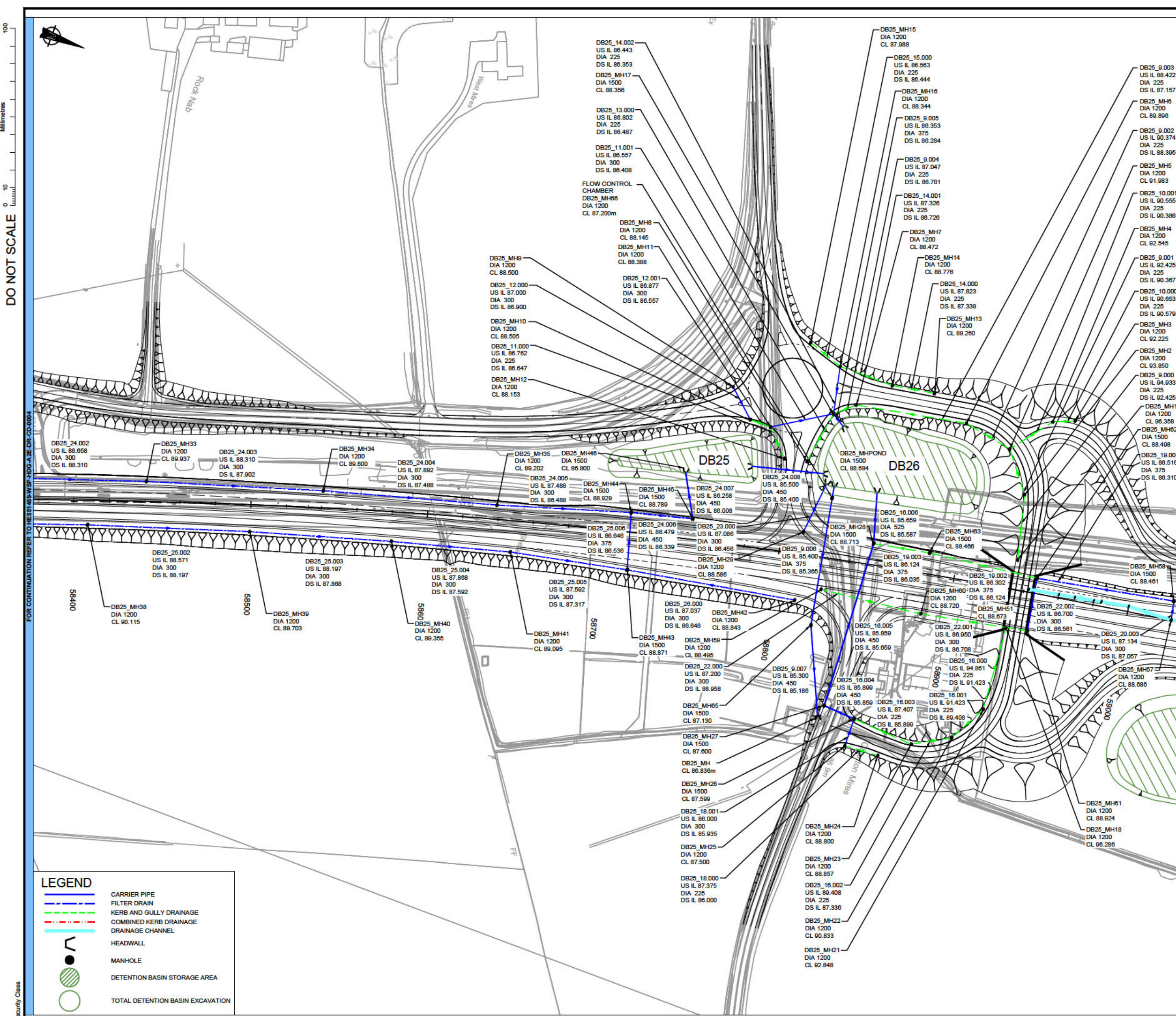
FOR CONTINUATION REFER TO HE551459-WSP-HDG-A2E-DR-CD-0003

FOR CONTINUATION SEE ABOVE

FOR CONTINUATION REFER TO HE551459-WSP-HDG-A2E-DR-CD-0005

Security Class





DO NOT SCALE

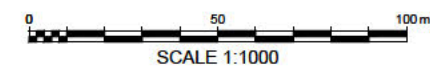
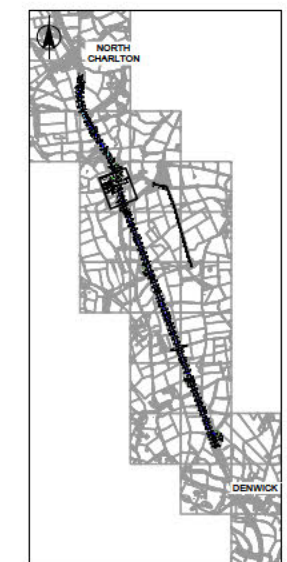
Millimetres  
0 10 100

FOR CONTINUATION REFER TO HE551459-WSP-HDG-A2E-DR-CD-0004

Security Class

- ### NOTES
- DRAWING TO BE PRINTED IN COLOUR.
  - THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL RELEVANT REFERENCE DRAWINGS.
  - DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY.
  - ALL DIMENSIONS ARE IN MILLIMETRES. ALL LEVELS ARE IN METRES.
  - THE POSITION AND LEVELS OF ALL DRAINS ARE TO BE CONFIRMED ON SITE PRIOR TO THE COMMENCEMENT OF THE WORKS.
  - ALL DRAINAGE TO COMPLY WITH THE REQUIREMENTS OF DESIGN MANUAL FOR ROADS AND BRIDGES: VOLUMES 4 & 11.
  - COVER LEVELS OF THE MANHOLES ARE PROVISIONAL AND SUBJECT TO ADJUSTMENT TO SUIT THE FINISHED GROUND LEVELS.
  - ANY WORKS AFFECTING EXISTING WATERCOURSES REQUIRE ENVIRONMENT AGENCY AND / OR LOCAL AUTHORITY APPROVAL.
  - GULLY LOCATIONS OMITTED FOR CLARITY AND SUBJECT TO DETAILED DESIGN.
  - DITCHES ARE PROPOSED TO THE TOE OF EMBANKMENTS ON THE MAINLINE.

DRAFT



Rev.	Date	Description	By	Eng' Chk	Disc' Chk	App'd	Status
P01	??..??..??	FIRST ISSUE					S2

DCO SUBMISSION

TR010041



A1 in Northumberland: Morpeth to Felton Scheme

DRAINAGE STRATEGY LAYOUT  
SHEET 5 OF 7  
REGULATION 5 (2) (a)

Scale	Drawn	Eng. Check	Approved	Authorised
1:1000	MJC	??	??	??

HE551459-WSP-HDG-A2E-DR-CD-0005

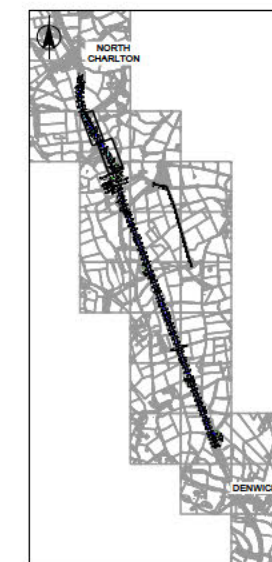
P01  
PW Obj Code  
3



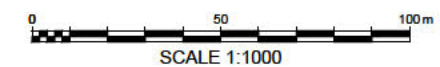
**NOTES**

1. DRAWING TO BE PRINTED IN COLOUR.
2. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL RELEVANT REFERENCE DRAWINGS.
3. DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY.
4. ALL DIMENSIONS ARE IN MILLIMETRES. ALL LEVELS ARE IN METRES.
5. THE POSITION AND LEVELS OF ALL DRAINS ARE TO BE CONFIRMED ON SITE PRIOR TO THE COMMENCEMENT OF THE WORKS.
6. ALL DRAINAGE TO COMPLY WITH THE REQUIREMENTS OF DESIGN MANUAL FOR ROADS AND BRIDGES: VOLUMES 4 & 11.
7. COVER LEVELS OF THE MANHOLES ARE PROVISIONAL AND SUBJECT TO ADJUSTMENT TO SUIT THE FINISHED GROUND LEVELS.
8. ANY WORKS AFFECTING EXISTING WATERCOURSES REQUIRE ENVIRONMENT AGENCY AND / OR LOCAL AUTHORITY APPROVAL.
9. GULLY LOCATIONS OMITTED FOR CLARITY AND SUBJECT TO DETAILED DESIGN.
10. ALL ATTENUATION STRUCTURES ARE APPROXIMATE AND SUBJECT TO DETAILED DESIGN.
11. DITCHES ARE PROPOSED TO THE TOE OF EMBANKMENTS ON THE MAINLINE.

**DRAFT**



**KEY PLAN**  
(Scale 1:75,000)



Rev.	Date	Description	By	Eng. Chk	Disc. Chk	App'd	Status
PD1	??..??..??	FIRST ISSUE					
Subsidiary							S2
DCO SUBMISSION							
PIND Reference Number							TR010041



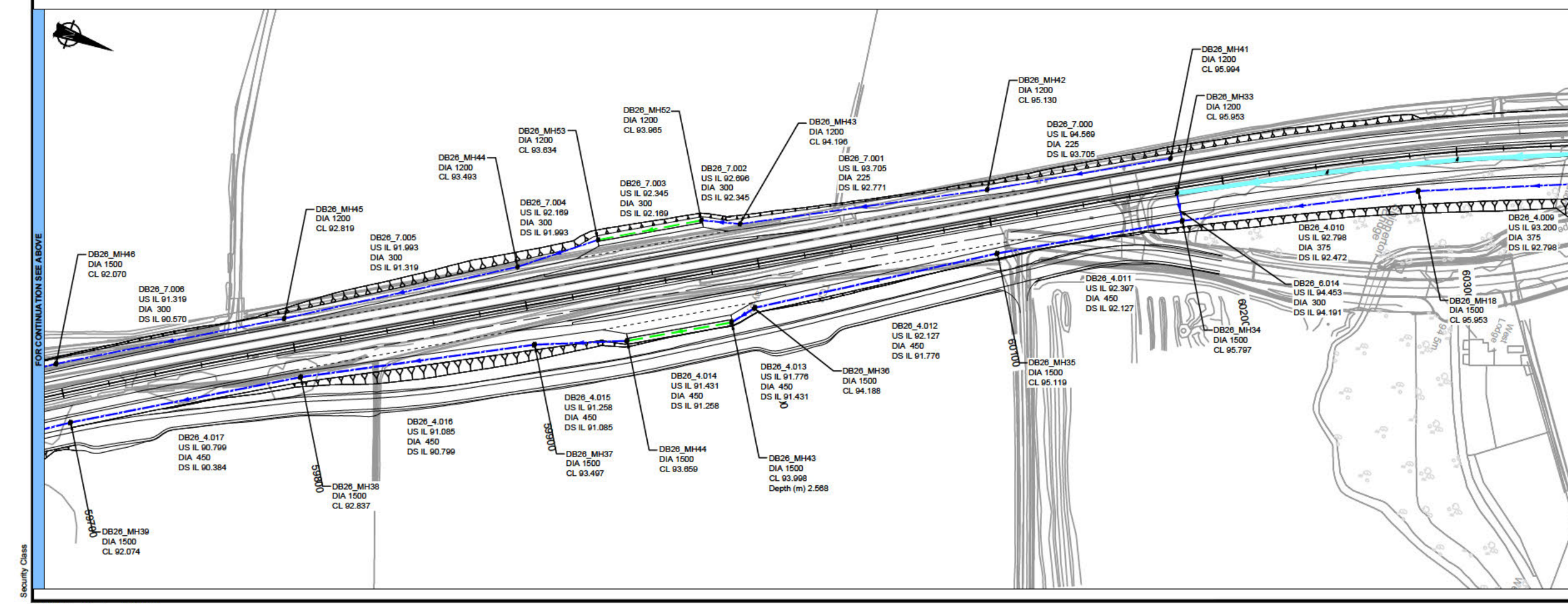
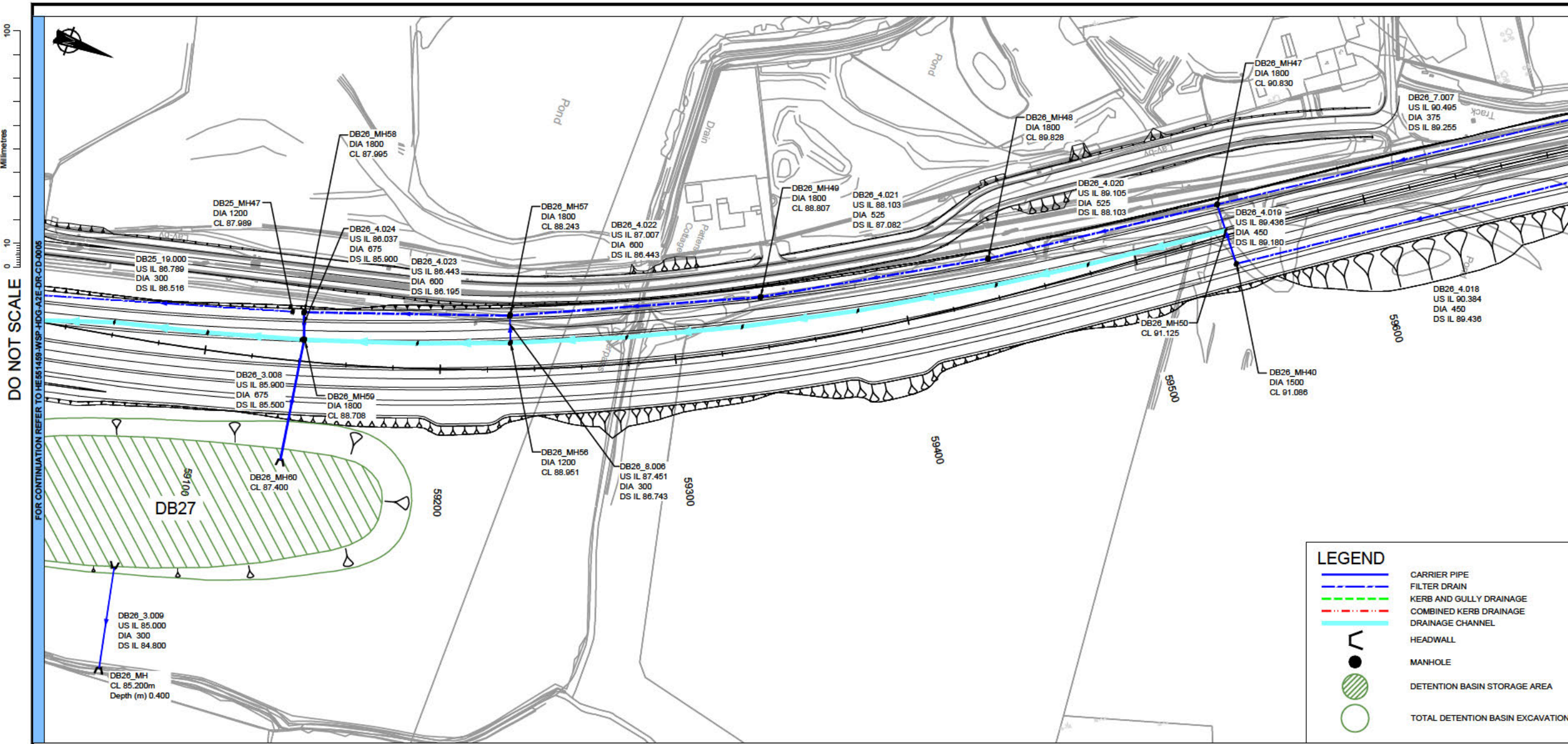
Project Title  
**A1 in Northumberland:  
Morpeth to Felton Scheme**

Drawing Title  
**DRAINAGE STRATEGY LAYOUT  
SHEET 6 OF 7  
REGULATION 5 (2) (o)**

Scale	Drawn	Eng. Check	Approved	Authorised
1:1000	MJC	??	??	??
Original Size	Date	Date	Date	Date
A1	20.04.19	??..??..??	??..??..??	??..??..??

Drawing Number  
**HE551459-WSP-HDG-A2E-DR-CD-0006**

Revision  
**P01**  
PW Dwg Code  
**3**

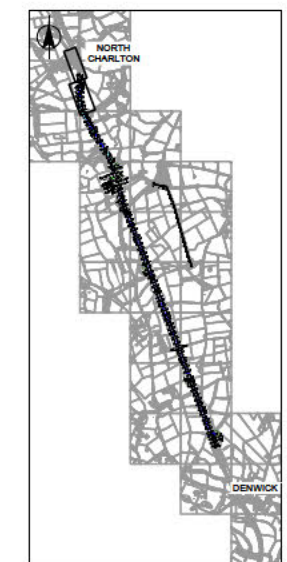




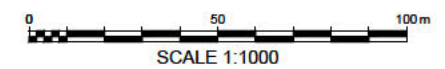
**NOTES**

1. DRAWING TO BE PRINTED IN COLOUR.
2. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL RELEVANT REFERENCE DRAWINGS.
3. DO NOT SCALE FROM THIS DRAWING. WORK FROM FIGURED DIMENSIONS ONLY.
4. ALL DIMENSIONS ARE IN MILLIMETRES. ALL LEVELS ARE IN METRES.
5. THE POSITION AND LEVELS OF ALL DRAINS ARE TO BE CONFIRMED ON SITE PRIOR TO THE COMMENCEMENT OF THE WORKS.
6. ALL DRAINAGE TO COMPLY WITH THE REQUIREMENTS OF DESIGN MANUAL FOR ROADS AND BRIDGES: VOLUMES 4 & 11.
7. COVER LEVELS OF THE MANHOLES ARE PROVISIONAL AND SUBJECT TO ADJUSTMENT TO SUIT THE FINISHED GROUND LEVELS.
8. ANY WORKS AFFECTING EXISTING WATERCOURSES REQUIRE ENVIRONMENT AGENCY AND / OR LOCAL AUTHORITY APPROVAL.
9. GULLY LOCATIONS OMITTED FOR CLARITY AND SUBJECT TO DETAILED DESIGN.
10. ALL ATTENUATION STRUCTURES ARE APPROXIMATE AND SUBJECT TO DETAILED DESIGN.
11. DITCHES ARE PROPOSED TO THE TOE OF EMBANKMENTS ON THE MAINLINE.

**DRAFT**



**KEY PLAN**  
(Scale 1:75,000)



Rev.	Date	Description	By	Eng' Chk	Disc' Chk	App'd	Status
P01	??..??..??	FIRST ISSUE					S2

DCO SUBMISSION

TR010041

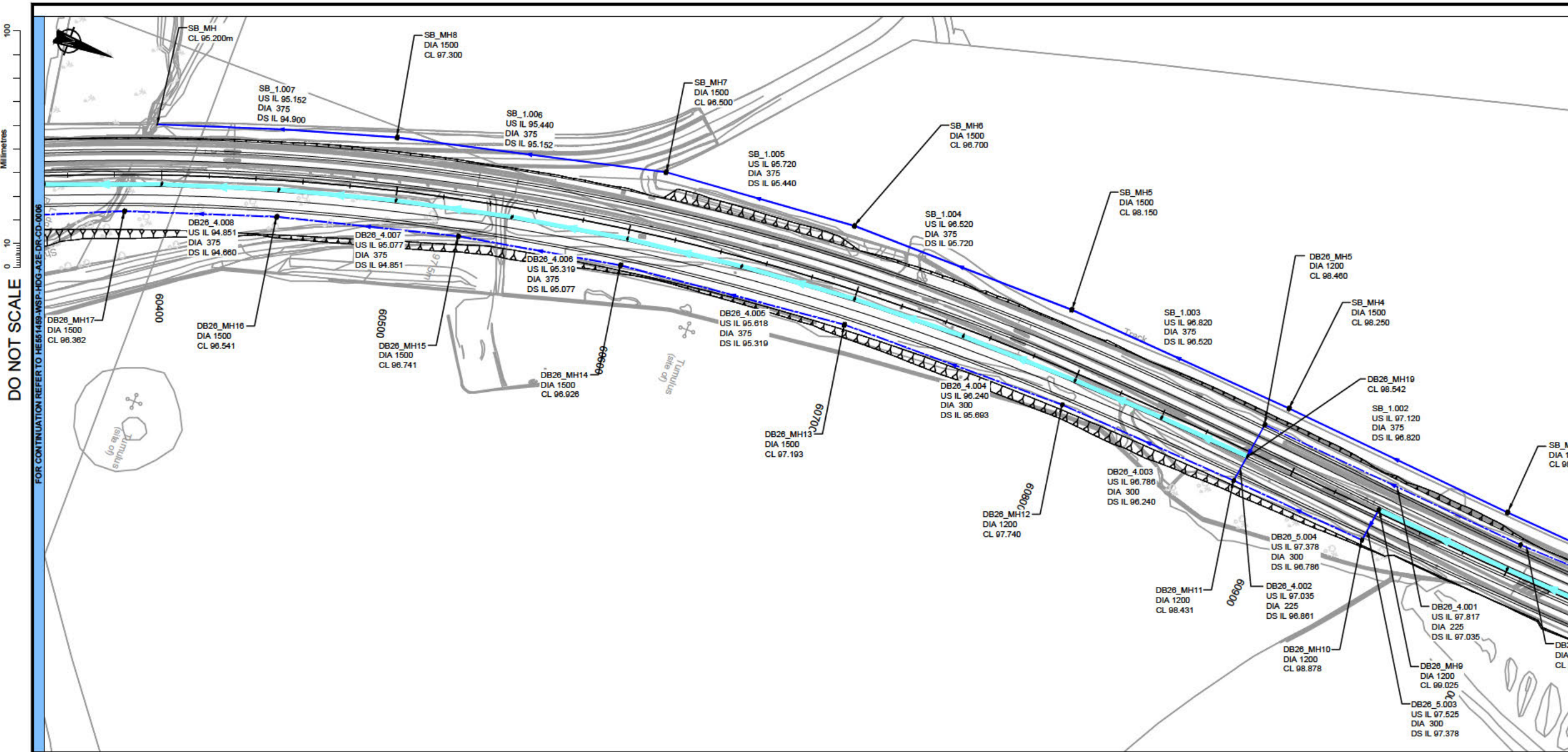


A1 in Northumberland: Morpeth to Felton Scheme

**DRAINAGE STRATEGY LAYOUT**  
SHEET 7 OF 7  
REGULATION 5 (2) (o)

Scale	Drawn	Eng. Check	Approved	Authorised
1:1000	MJC	??	??	??
Original Size	Date	Date	Date	Date
A1	20.04.19	??..??..??	??..??..??	??..??..??

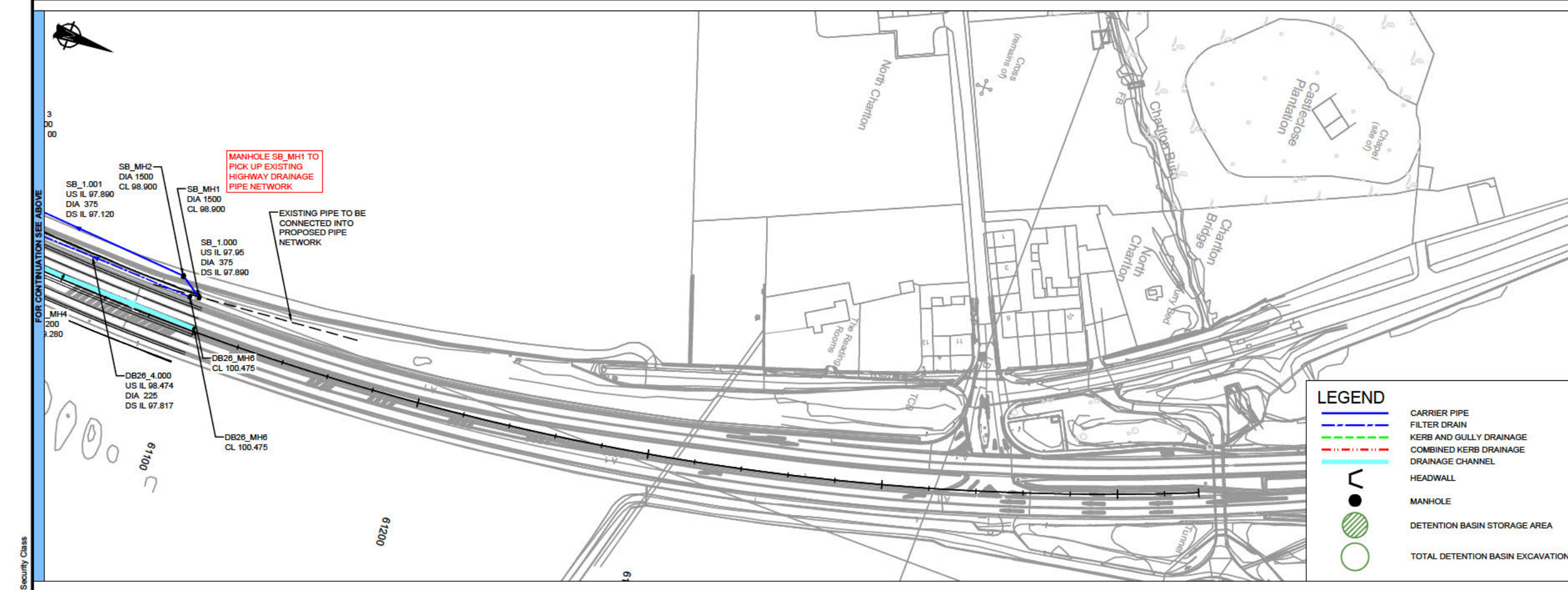
HE551459-WSP-HDG-A2E-DR-CD-0007



DO NOT SCALE

FOR CONTINUATION REFER TO HE551459-WSP-HDG-A2E-DR-CD-0006

FOR CONTINUATION SEE BELOW



FOR CONTINUATION SEE ABOVE

Security Class

# Appendix C

## **RELEVANT CORRESPONDENCE**



# Appendix C – Relevant Correspondence

## 1 Correspondence A1 Section A2E only

### 1.1 Northumberland County Council (includes Historic England Correspondence)

#### 1.1.1 07/05/19

**From:** James Hitching [mailto:james.hitching@northumberland.gov.uk]

**Sent:** 07 May 2019 14:04

**To:** Sharpe, Rob <Rob.Sharpe@wsp.com>

**Cc:** Muscatelli, Dino <Dino.Muscatelli@wsp.com>; Hugill, Gary <Gary.Hugill@wsp.com>; Wilson, Victoria <Victoria.Wilson@wsp.com>; McCann, Lowri <lowri.mccann@wsp.com>; Hamilton, Sarah <Sarah.Hamilton@wsp.com>; Haberfield, Stephanie <Stephanie.Haberfield@wsp.com>

**Subject:** Re: A1 A2E Highway drainage

Hi Rob

Thank you for your email. In summary, I am satisfied with all of the comments that you have made. In many instances, this information will need to be reflected within drawings and formal documents that are to be submitted. For clarity, I provide a response to each point below in blue:

#### 1. What are the existing catchments for both areas?

The total catchment areas for the Shipperton Burn and the Kittycarter Burn are 310ha and 200ha respectively.

The existing carriageway that will be removed from the Shipperton Burn is from Ch60100 to Ch61100 and totals 1.51ha.

The new carriageway which replaces the existing carriageway from Ch60100 to Ch61100 is 3.57ha.

OK and accepted - this will need to be reflected with diagrams/drawings with any formal submission.

#### 2. Is there any scope for a detention basin in DB6? Albeit taking a smaller catchment, with the rest going to DB5?

No, there is no suitable land for a detention basin within the current red line boundary.

This will need to be reflected with diagrams/drawings with any formal submission. Associated text to be provided to say why this is the case.



3 Full reasoning for the movement of surface water will need to be documented and explained.

We are proposing to remove Detention Basin 6 and divert flows to Detention Basin 5 in order to remove the need for a detention basin within the same field as a Scheduled Monument is located. The Scheduled Monument is a prehistoric burial mound of national importance which, by its nature, could have additional artefacts associated with the Scheduled Monument located outside the boundary shown on Historic England mapping (<https://historicengland.org.uk/listing/the-list/list-entry/1018499>). Detention Basin 6 is located outside of the Scheduled Monument boundary but the construction of the basin could cause disruption and damage to archaeological remains extending beyond the Scheduled Monument boundary. In addition, during operation there could be changes in water levels due to the presence of the detention basin which could lead to the decay of the archaeological remains associated with the Scheduled Monument. Therefore, the preference would be to remove the detention basin from the field with the Scheduled Monument in order to avoid these potential impacts.

We have received a consultation letter from Historic England in response to the statutory consultation undertaken for the scheme. Within the letter, Historic England confirm that they *"welcome the default position set out in the consultation which is to avoid the scheduled area with any development activity."* Historic England also note *"that at this stage whether this avoidance is achievable, or whether the development will require an impact (up to the total destruction of the bowl barrow), is unclear. Clearly which of these scenarios applies makes a huge difference to the potential impact of the development on the historic environment, and how it needs to be treated in NPPF terms."* A copy of the letter is attached to this response for your information.

Explanation acceptable - Please include this within any formal surface water drainage strategy documentation that is to be submitted.

4 Flows to the Kittycarter Burn will need to be restricted to pre-development greenfield conditions for the existing catchment only.

The proposed carriageway from Ch59210 to Ch60100 discharging to Kittycarter Burn has an area of 3.38ha. This runoff will be attenuated at DB5 to the greenfield runoff rates for this area (for the 1 in 1, 30 and 100 year events). The additional runoff from the carriageway from Ch60100 to Ch61100 (3.57ha) will be accommodated within detention basin DB5, the discharge rates will be set at the greenfield runoff rates determined on the 3.38ha development.

The proposed carriageway from Ch58200 to 59210 discharging to Kittycarter Burn has an area of 3.50ha. This runoff will be attenuated at DB4 to the greenfield runoff rates for this area (for the 1 in 1, 30 and 100 year events).

OK - Please provide associated calculations as part of any document.

5 Flows will need to be connected to the watercourse to the east of the A1 and downstream of the existing culvert.

Yes, both the outfalls from the carriageway drainage which discharge from detention basins DB4 and DB5 are to the watercourse to the east of the A1.

Excellent - Please reflect this on the respective drawings.

6 Improvement works to the culvert and the general area are still requested and anticipated to be included as part of the works.

We are currently in the process of producing a Flood Risk Assessment to support the DCO application which will assess the impacts of the scheme in terms of flood risk and will be informed by hydraulic modelling to demonstrate that the scheme will not increase flood risk. The improvement works to the culvert are still under investigation to see if they are appropriate and we will inform the Council of the outcome.

Acknowledged - awaiting further information.

7 The watercourse assessment will need to look at the existing and proposed levels in the watercourse both upstream and downstream. A range of different events will need to be looked at up to and including the 1 in 100 year plus climate change event. The results of any watercourse assessment will need to conclude that the additional flows and volumes do not increase the risk of flooding at any location in any rainfall event.

We are currently in the process of producing a Flood Risk Assessment to support the DCO application which will assess the impacts of the scheme in terms of flood risk and will be informed by hydraulic modelling to demonstrate that the scheme will not increase flood risk. The improvement works to the culvert are still under investigation to see if they are appropriate and we will inform the Council of the outcome.

Acknowledged - awaiting further information.

Please get in touch if you wish to discuss anything further.

Kind regards  
James

James Hitching  
Senior Sustainable Drainage Officer  
Flood & Coastal Erosion Risk Management  
Northumberland County Council  
County Hall  
Morpeth  
NE61 2EF

  
Email – [James.Hitching@northumberland.gov.uk](mailto:James.Hitching@northumberland.gov.uk)

On Fri, 3 May 2019 at 12:40, Sharpe, Rob <[Rob.Sharpe@wsp.com](mailto:Rob.Sharpe@wsp.com)> wrote:

Hi James,

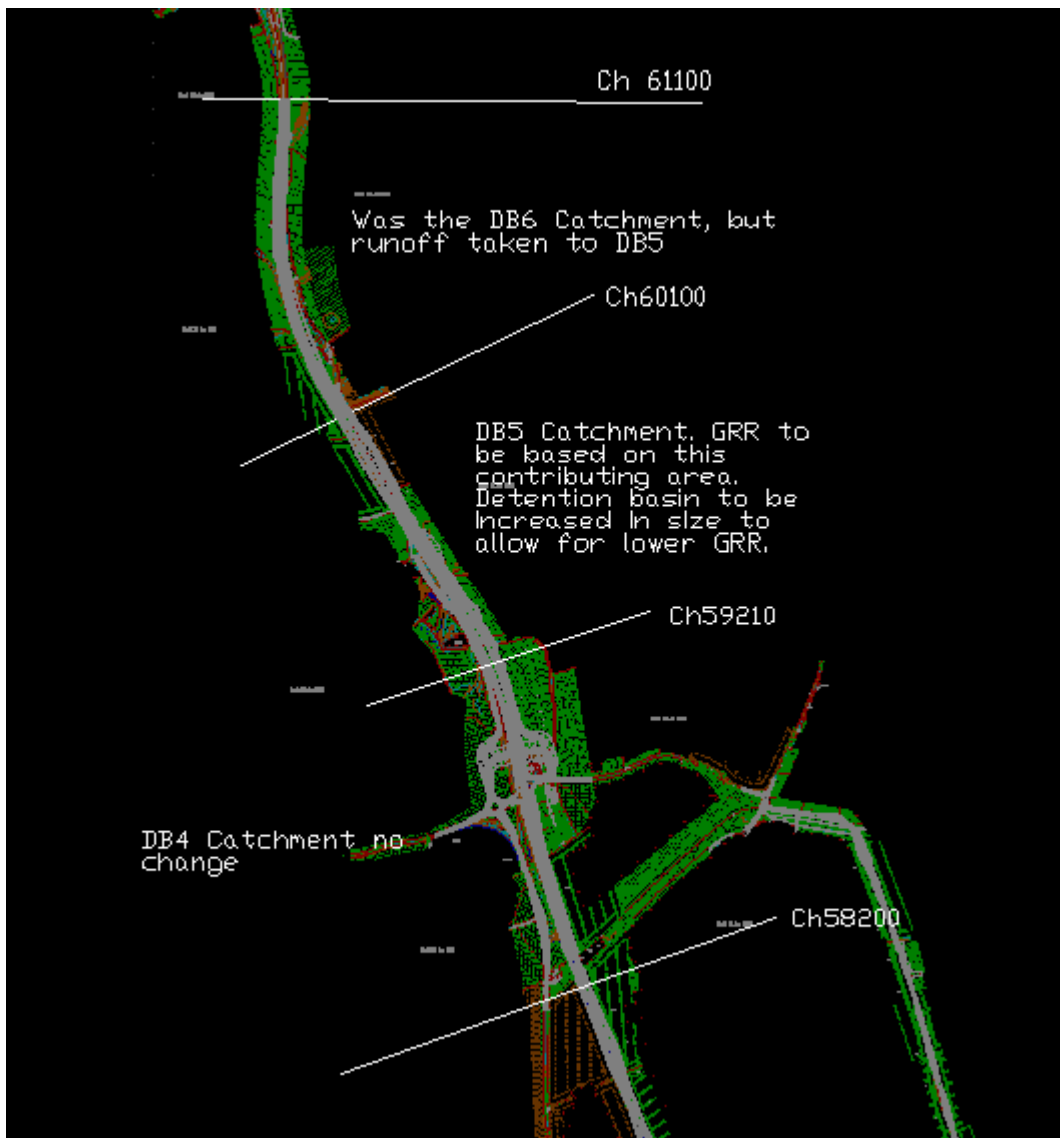
I've reviewed the points raised in your email and sought to address them in the responses below.

I've related the carriageway runoff to the road chainage as it gives us a reference point. The carriageway runoff can be split as follows:

Chainage 58200 to 59120. Attenuation to be provided at detention basin DB4, part of the Kittycarter Burn catchment.

Chainage 59120 to 60100. Attenuation to be provided at detention basin DB5, part of the Kittycarter Burn catchment.

Chainage 60100 to 61100. Attenuation to be provided at detention basin DB5, part of the Shipperton Burn catchment .



1. What are the existing catchments for both areas?

The total catchment areas for the Shipperton Burn and the Kittycarter Burn are 310ha and 200ha respectively.

The existing carriageway that will be removed from the Shipperton Burn is from Ch60100 to Ch61100 and totals 1.51ha.

The new carriageway which replaces the existing carriageway from Ch60100 to Ch61100 is 3.57ha.

2. Is there any scope for a detention basin in DB6? Albeit taking a smaller catchment, with the rest going to DB5?

No, there is no suitable land for a detention basin within the current red line boundary.

3 Full reasoning for the movement of surface water will need to be documented and explained.

We are proposing to remove Detention Basin 6 and divert flows to Detention Basin 5 in order to remove the need for a detention basin within the same field as a Scheduled Monument is located. The Scheduled Monument is a prehistoric burial mound of national importance which, by its nature, could have additional artefacts associated with the Scheduled Monument located outside the boundary shown on Historic England mapping (<https://historicengland.org.uk/listing/the-list/list-entry/1018499>). Detention Basin 6 is located outside of the Scheduled Monument boundary but the construction of the basin could cause disruption and damage to archaeological remains extending beyond the Scheduled Monument boundary. In addition, during operation there could be changes in water levels due to the presence of the detention basin which could lead to the decay of the archaeological remains associated with the Scheduled Monument. Therefore, the preference would be to remove the detention basin from the field with the Scheduled Monument in order to avoid these potential impacts.

We have received a consultation letter from Historic England in response to the statutory consultation undertaken for the scheme. Within the letter, Historic England confirm that they "*welcome the default position set out in the consultation which is to avoid the scheduled area with any development activity.*" Historic England also note "*that at this stage whether this avoidance is achievable, or whether the development will require an impact (up to the total destruction of the bowl barrow), is unclear. Clearly which of these scenarios applies makes a huge difference to the potential impact of the development on the historic environment, and how it needs to be treated in NPPF terms.*" A copy of the letter is attached to this response for your information.

4 Flows to the Kittycarter Burn will need to be restricted to pre-development greenfield conditions for the existing catchment only.



The proposed carriageway from Ch59210 to Ch60100 discharging to Kittycarter Burn has an area of 3.38ha. This runoff will be attenuated at DB5 to the greenfield runoff rates for this area (for the 1 in 1, 30 and 100 year events). The additional runoff from the carriageway from Ch60100 to Ch61100 (3.57ha) will be accommodated within detention basin DB5, the discharge rates will be set at the greenfield runoff rates determined on the 3.38ha development.

The proposed carriageway from Ch58200 to 59210 discharging to Kittycarter Burn has an area of 3.50ha. This runoff will be attenuated at DB4 to the greenfield runoff rates for this area (for the 1 in 1, 30 and 100 year events).

5 Flows will need to be connected to the watercourse to the east of the A1 and downstream of the existing culvert.

Yes, both the outfalls from the carriageway drainage which discharge from detention basins DB4 and DB5 are to the watercourse to the east of the A1.

6 Improvement works to the culvert and the general area are still requested and anticipated to be included as part of the works.

We are currently in the process of producing a Flood Risk Assessment to support the DCO application which will assess the impacts of the scheme in terms of flood risk and will be informed by hydraulic modelling to demonstrate that the scheme will not increase flood risk. The improvement works to the culvert are still under investigation to see if they are appropriate and we will inform the Council of the outcome.

7 The watercourse assessment will need to look at the existing and proposed levels in the watercourse both upstream and downstream. A range of different events will need to be looked at up to and including the 1 in 100 year plus climate change event. The results of any watercourse assessment will need to conclude that the additional flows and volumes do not increase the risk of flooding at any location in any rainfall event.

We are currently in the process of producing a Flood Risk Assessment to support the DCO application which will assess the impacts of the scheme in terms of flood risk and will be informed by hydraulic modelling to demonstrate that the scheme will not increase flood risk. The improvement works to the culvert are still under investigation to see if they are appropriate and we will inform the Council of the outcome.

I hope that this is clear and that there is sufficient detail to satisfy you so that you can accept the proposed option.

I'll call you early next week to discuss this.

regards

**Rob Sharpe *BEng (Hons) CEng C.WEM MCIWEM***

Technical Manager



T +44 (0) 1513 318218



1st Floor Station House, Exchange Station

Tithebarn Street, Liverpool

L2 2QP

[wsp.com](http://wsp.com)

**Confidential**

This message, including any document or file attached, is intended only for the addressee and may contain privileged and/or confidential information. Any other person is strictly prohibited from reading, using, disclosing or copying this message. If you have received this message in error, please notify the sender and delete the message. Thank you.

WSP UK Limited, a limited company registered in England & Wales with registered number 01383511. Registered office: WSP House, 70 Chancery Lane, London, WC2A 1AF.

From: James Hitching [mailto:[james.hitching@northumberland.gov.uk](mailto:james.hitching@northumberland.gov.uk)]

Sent: 24 April 2019 10:02

To: Sharpe, Rob <[Rob.Sharpe@wsp.com](mailto:Rob.Sharpe@wsp.com)>

Subject: Re: A1 A2E Highway drainage

Hi Rob

Thank you for your email and subsequent phone call. I do apologise for the lateness of my reply.

In principle we are against moving water from one catchment to another. This is against best practice guidance. In addition to being against best practice, the location of where the proposed additional water is to go, is at an area which already experiences flood and drainage issues. I attach a plan, which outlines these.

Notwithstanding the above, if it is demonstrated that there is no other reasonable or practicable option but to move the surface water and attenuation to the south, then this could be acceptable. However, it will need to be demonstrated that this does not increase the risk of flooding both upstream and downstream. In particular, we ask the following questions and these will need to be addressed as part of any watercourse assessment.

1. What are the existing catchments for both areas?
2. Is there any scope for a detention basin in DB6? Albeit taking a smaller catchment, with the rest going to DB5?
3. Full reasoning for the movement of surface water will need to be documented and explained.
4. Flows to the Kittycarter Burn will need to be restricted to pre-development greenfield conditions for the existing catchment only.
5. Flows will need to be connected to the watercourse to the east of the A1 and downstream of the existing culvert.
6. Improvement works to the culvert and the general area are still requested and anticipated to be included as part of the works..
7. The watercourse assessment will need to look at the existing and proposed levels in the watercourse both upstream and downstream. A range of different events will need to be looked at up to and including the 1 in 100 year plus climate change event. The results of any watercourse assessment will need to conclude that the additional flows and volumes do not increase the risk of flooding at any location in any rainfall event.

I will send some photos of the Linkhall culvert over in two separate emails.

Please get in touch, if you wish to discuss any of the above.

Kind regards

James

James Hitching  
Senior Sustainable Drainage Officer  
Flood & Coastal Erosion Risk Management  
Northumberland County Council  
County Hall  
Morpeth  
NE61 2EF

  
Email – [James.Hitching@northumberland.gov.uk](mailto:James.Hitching@northumberland.gov.uk)

On Mon, 1 Apr 2019 at 16:08, Sharpe, Rob <[Rob.Sharpe@wsp.com](mailto:Rob.Sharpe@wsp.com)> wrote:

Hi James,

As discussed last week I am looking at the highway drainage of the northern phase of the A1 in Northumberland, known as the A1 Alnwick to Ellingham (A2E) stretch.

We are using the same philosophy as on the Morpeth to Felton (M2F) stretch, mainly detention basins to attenuate and treat the runoff prior to discharge at greenfield runoff rates to the adjacent watercourses.

At the northernmost end of the scheme we were proposing to construct a detention basin (DB6) to the east to the newly dualled road with the attenuated flow discharging to the Shipperton Burn. However this location has been identified as having a tumulus, which is a Scheduled Monument, in it, and though the basin will not impact on the monument directly, there is the possibility that further remains are within this area and that they could be uncovered during the new works. It is believed that limiting the works in this field will have both environmental and financial benefits. We are therefore considering not constructing the detention basin in this area and taking the runoff to the detention basin (DB5) further to the south.

This alternative location is currently being proposed as a detention basin but we have the option to increase its capacity to take the runoff from the north of the site. The discharge from this basin will be to the un-named watercourse which is currently used as an outfall for the existing carriageway in this area. This watercourse then connects to the Kittycarter Burn.

I have attached two plans which I hope makes this proposal clear.

I would be grateful if you could review this proposal and advise if there are any issues with decreasing the overall contributing area to Shipperton Burn and the subsequent increase in the contributing area to the un-named watercourse and Kittycarter Burn.

If you need any further information, please contact me.

regards

**Rob Sharpe *BEng (Hons) CEng C.WEM MCIWEM***

Technical Manager



T +44 (0) 1513 318218



[REDACTED]

1st Floor Station House, Exchange Station

Tithebarn Street, Liverpool

L2 2QP

[wsp.com](http://wsp.com)

**Confidential**

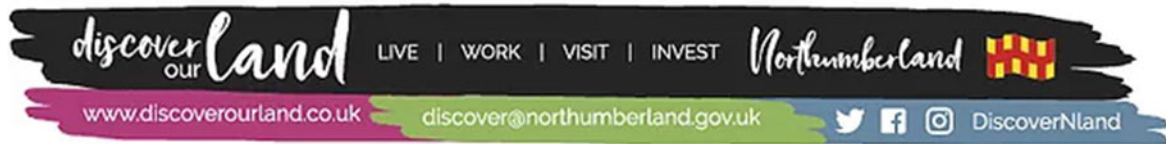
This message, including any document or file attached, is intended only for the addressee and may contain privileged and/or confidential information. Any other person is strictly prohibited from reading, using, disclosing or copying this message. If you have received this message in error, please notify the sender and delete the message. Thank you.

WSP UK Limited, a limited company registered in England & Wales with registered number 01383511. Registered office: WSP House, 70 Chancery Lane, London, WC2A 1AF.

---

NOTICE: This communication and any attachments ("this message") may contain information which is privileged, confidential, proprietary or otherwise subject to restricted disclosure under applicable law. This message is for the sole use of the intended recipient(s). Any unauthorized use, disclosure, viewing, copying, alteration, dissemination or distribution of, or reliance on, this message is strictly prohibited. If you have received this message in error, or you are not an authorized or intended recipient, please notify the sender immediately by replying to this message, delete this message and all copies from your e-mail system and destroy any printed copies.

Proud to support:



Save Time Do It Online!

We have made a few key improvements to our site to make our services easy to access. Now you can do everything from paying your council tax, to reporting a faulty street light online. Go to: [www.northumberland.gov.uk](http://www.northumberland.gov.uk) and click 'pay, apply or report' to access the relevant forms.

This email is intended solely for the individual or individuals to whom it is addressed, and may contain confidential and/or privileged material. If you are not the intended recipient you are notified that disclosing, copying, distributing or taking any action in reliance on the contents of this email is prohibited. If you receive this email in error, please contact the sender and delete the email from any computer. All email communication may be subject to recording and/or monitoring in accordance with internal policy and relevant legislation.

**Please, consider your environmental responsibility. Before printing this e-mail ask yourself:  
"Do I need a hard copy?"**

----- Forwarded message -----

From: "[mike.collins@HistoricEngland.org.uk](mailto:mike.collins@HistoricEngland.org.uk)" <[mike.collins@historicengland.org.uk](mailto:mike.collins@historicengland.org.uk)>

To: A1inNorthumberland <[A1inNorthumberland@highwaysengland.co.uk](mailto:A1inNorthumberland@highwaysengland.co.uk)>

Cc:

Bcc:

Date: Mon, 8 Apr 2019 11:26:22 +0000

Subject: Historic England advice on case PL00551504

Dear Sirs

I am writing in relation to the following:

NSIP: National Significant Infrastructure Project (DCO)

A1 Northumberland: Alnwick to Ellingham Scheme

[Case Ref. PL00551504; HE File Ref. NSIP 0110/00; Your Reference. TR0100053/S42 (1) (a)]

Due to an error within our systems a previous version of our advice, containing spelling mistakes, was sent to you. Apologies for this and please find attached a corrected version.

Yours Sincerely

Mike Collins

Inspector of Ancient Monuments (Hadrian's Wall)

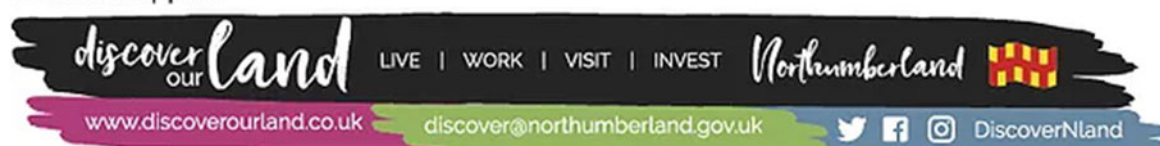
E-mail: [mike.collins@HistoricEngland.org.uk](mailto:mike.collins@HistoricEngland.org.uk)



We help people understand, enjoy and value the historic environment, and protect it for the future. Historic England is a public body, and we champion everyone's heritage, across England.

This e-mail (and any attachments) is confidential and may contain personal views which are not the views of Historic England unless specifically stated. If you have received it in error, please delete it from your system and notify the sender immediately. Do not use, copy or disclose the information in any way nor act in reliance on it. Any information sent to Historic England may become publicly available. Please read our full privacy policy (<https://www.historicengland.org.uk/terms/privacy-cookies/>) for more information.

Proud to support:



Save Time Do It Online!

We have made a few key improvements to our site to make our services easy to access. Now you can do everything from paying your council tax, to reporting a faulty street light online. Go to: [www.northumberland.gov.uk](http://www.northumberland.gov.uk) and click 'pay, apply or report' to access the relevant forms.

This email is intended solely for the individual or individuals to whom it is addressed, and may contain confidential and/or privileged material. If you are not the intended recipient you are notified that disclosing, copying, distributing or taking any action in reliance on the contents of this email is prohibited. If you receive this email in error, please contact the sender and delete the email from any computer. All email communication may be subject to recording and/or monitoring in accordance with internal policy and relevant legislation.

**Please, consider your environmental responsibility. Before printing this e-mail ask yourself:  
"Do I need a hard copy?"**

## 2.1 Northumberland County Council

### 2.1.1 19/2/18

**From:** James Hitching [mailto:james.hitching@northumberland.gov.uk]  
**Sent:** 19 February 2018 17:20  
**To:** Gilliland, Simon <Simon.Gilliland@wsp.com>  
**Cc:** lucy.mo@environment-agency.gov.uk; Caroline.Maarouf@environment-agency.gov.uk; Johnson, Claire <Claire.Johnson@wsp.com>; Sharpe, Rob <Rob.Sharpe@wsp.com>; Thresh, Majlinda <Majlinda.Thresh@wsp.com>; Bedford, Lee <lee.bedford@wsp.com>; Macmillan, Nic <Nic.Macmillan@wsp.com>; Achampong, Henri <Henrietta.Achampong@wsp.com>  
**Subject:** Re: A1 in Northumberland Drainage Strategy

Dear Simon

Thank you for your email and the draft surface water drainage strategy. I have read through the strategy and associated drawings and make the following comments:

It is acknowledged that this is a first draft and as such the strategy makes comments such as "appears to" and "needs to be investigated". When formally submitted, there can be no further unknowns and as such all investigations will need to have been carried out and the strategy amended accordingly. Many other factors still need to be examined and undertaken further, as such we await these details before making comment. The comment made now are partially informative acknowledging additional information is forthcoming.

Following the connectivity/outfall surveys further and complete information on the existing surface water catchments will need to be submitted. As present, areas and catchments have been used to ascertain impermeable areas; however, no background information to these areas has been produced.

Where groundwater levels are high, is it the intention to line the ponds?

Are ponds rather than basins going to be used in every instance within this scheme?

Access to each feature for ongoing maintenance will need to be presented.

Full design and associated drawings for each pond/basin/swale will need to be undertaken and presented.

The draft drainage strategy makes reference to the Q100 greenfield runoff rate and the associated attenuation required in a 1 in 100 year plus climate change event. The defra guidance document Sustainable Drainage Systems Non-statutory Technical Standards for Sustainable Drainage Systems has been correctly reference and the surface water design will need to adhere with this document.

Guidance S2 of this documents reads "S2 For greenfield developments, the peak runoff rate from the development to any highway drain, sewer or surface water body for the 1 in 1 year



rainfall event and the 1 in 100 year rainfall event should never exceed the peak greenfield runoff rate for the same event".

At present the 1 in 1 year greenfield runoff rate has not been calculated and therefore it is unknown as to whether the system will be designed as so the system will discharge at these lower rates. This needs to be established within the drainage strategy.

Furthermore guidance S4 states "Where reasonably practicable, for greenfield development, the runoff volume from the development to any highway drain, sewer or surface water body in the 1 in 100 year, 6 hour rainfall event should never exceed the greenfield runoff volume for the same event".

The greenfield runoff volumes have not be calculated and/or presented within the drainage strategy. This is required when especially looking to discharge at the 1 in 100 year greenfield runoff rate. Long-term storage and interception storage may be required as part of the attenuation requirements by adopting this methodology and strategy to disposing surface water. All associated calculations will need to be presented within the drainage strategy.

The government guidance on climate change requires the +20% and +40% scenarios to be looked at and assessed. The impact of the +40% event needs to be looked at within every catchment. The impact on site and off site will need to be examined. Where possible every feature should accommodate the 40% climate change event. Where this is not possible, valid reasons will need to be given and these reasoning will need to be cross-referenced with the risk of flooding on and off-site, as described above.

What impact will the swales/basins/ponds and associated access have on existing features? For example pond P2a appears to overlap with an existing pond.

The impact of existing drainage will need to be looked at particularly where it is inadequate and where existing problems existing. We have alerted you to the issue with the existing holding tanks at Felton and the requirements and desire to improve these as part of this scheme.

With drawing HE 551459 Rev P01 "Offline in-cutting" it appears that the swales are located at a higher level than the road. In this instance how will the road be drained and how will the swales be effectively utilised?

Please get in touch if you want discuss any of the above in more detail.

Kind regards  
James

**James Hitching**

Senior Sustainable Drainage Officer  
Flood & Coastal Erosion Risk Management  
Northumberland County Council  
County Hall  
Morpeth  
NE61 2EF

██████████  
Email – [James.Hitching@northumberland.gov.uk](mailto:James.Hitching@northumberland.gov.uk)

On 13 February 2018 at 17:05, Gilliland, Simon <[Simon.Gilliland@wsp.com](mailto:Simon.Gilliland@wsp.com)> wrote:

All,

Further to the meetings and correspondence with the wider WSP Water team on the A1 in Northumberland scheme please find attached our draft surface water drainage strategy for the Morpeth to Felton section of the scheme.

It may be helpful to have a phone conversation/ meeting to discuss this further once you've looked through.

As you'll see the drainage strategy has currently been developed based on Highways England's own climate change guidance.

The guidance received from HE (SES) is that all new schemes shall adopt the following approach to drainage design:

1. For all new schemes that do not involve adaptation of an existing drainage network: Full compliance with the requirements described in NPPF;
2. For all new schemes that involve adaptation of an existing drainage network: Compliance in accordance with HD33, (with the exception of Smart Motorways where IAN 161 shall apply);
3. In both 1 and 2, above, the design solution shall incorporate a 20% uplift in peak rainfall intensity. The proposal shall also sensitivity test the design with a 40% uplift in peak rainfall intensity. The difference between the 2 scenarios (Central and Upper) shall enable the end user to understand the range of impact between the climate change risk scenarios. In the light of this knowledge the Project Sponsor shall determine the appropriate course of action to be implemented;
4. For all schemes that use existing outfalls, the current discharge rates shall not be exceeded. The current discharge rates (no rates were historically pre-defined, or pre-agreed) shall be calculated using the current design methods available within DMRB 4.2.
5. All schemes shall be checked for a 1 in 100 year flooding compliance.

The storage volumes required in 1 in 100 year return period with 20% and the 40% climate change allowances are tabulated below.

Pond Ref.	100yr RP 20% CC storage Volume (m3)	100yr RP 40% CC storage Volume (m3)	Increase in Storage Volume required (%)
Swale 1	1700	2100	24
Swale 2	750	900	20
2a	550	625	14

4	1350	1650	22
6	2100	2550	21
7	1700	2100	24
7a	250	300	20
7b	200	225	13
9	900	1100	22
11	1500	1850	23
12	700	850	21
13	1350	1650	22
14	400	500	25
15	1950	2350	21
15a	500	600	20
17	1350	1650	22
17a	750	875	17
17b	850	1050	24
Local Network	200	225	13
18	1150	1400	22
19	1700	2100	24
Local Network	200	250	25
Local Network	200	250	25

Regards

Simon

**Simon Gilliland MEng CEng MICE**

Principal Engineer (Team Leader) – Flooding & Drainage North West



T [+44 \(0\) 151 3318157](tel:+44(0)1513318157)



Exchange Station

Tithebarn Street

Liverpool

L2 2QP



[wsp.com](http://wsp.com)

**Confidential**

This message, including any document or file attached, is intended only for the addressee and may contain privileged and/or confidential information. Any other person is strictly prohibited from reading, using, disclosing or copying this message. If you have received this message in error, please notify the sender and delete the message. Thank you.

WSP UK Limited, a limited company registered in England & Wales with registered number 01383511. Registered office: WSP House, 70 Chancery Lane, London, WC2A 1AF.



**Save Time Do It Online!**

We have made a few key improvements to our site to make our services easy to access. Now you can do everything from paying your council tax, to reporting a faulty street light online. Go to: [www.northumberland.gov.uk](http://www.northumberland.gov.uk) and click 'pay, apply or report' to access the relevant forms.

This email is intended solely for the individual or individuals to whom it is addressed, and may contain confidential and/or privileged material. If you are not the intended recipient you are notified that disclosing, copying, distributing or taking any action in reliance on the contents of this email is prohibited. If you receive this email in error, please contact the sender and delete the email from any computer. All email communication may be subject to recording and/or monitoring in accordance with internal policy and relevant legislation.

**Please, consider your environmental responsibility. Before printing this e-mail ask yourself: "Do I need a hard copy?"**

---

2.1.2 22/11/17

**From:** Ryan, Seamus

**Sent:** 22 November 2017 11:46

**To:** gary.mills@northumberland.gov.uk; david.brookes@northumberland.gov.uk; graham.fairs@northumberland.gov.uk

**Cc:** Thresh, Majlinda <Majlinda.Thresh@wsp.com>; Sharpe, Rob <Rob.Sharpe@wsp.com>; Harrison, Colin <Colin.Harrison@wsp.com>; Grymula, Jaroslaw <Jaroslaw.Grymula@wsp.com>; Stylianou, Constantina <Constantina.Stylianou@wsp.com>;

Winnington, Max <Max.Winnington@wsp.com>; Johnson, Claire  
<Claire.Johnson@wsp.com>

**Subject:** FW: A1 M2F Drainage Strategy

Hi gents,

We are just following up on our email from 16<sup>th</sup> November as below.

The separation of the trunk road and local road network drainage systems forms an important part of our drainage strategy for the proposed A1 upgrade. We are currently working on the assumption that the two drainage systems will have separate attenuation (e.g. ponds), but that discharge to the local watercourse will be via a common outfall pipe and outfall structure. Flows from each pond element will need to be restricted to the allowable discharge rates, and this can be achieved by separate flow controls on each pond, or via a common control point if space is restricted.

Access for pond maintenance is being dealt with by our colleagues in the wsp Highways Section.

We would appreciate your comments on this, and for the chance to discuss if required.

Best regards,

Seamus Ryan

**Seamus Ryan BSc CEng MIEI**

Senior Engineer (Contract) – Flooding & Drainage



1<sup>st</sup> Floor, Exchange Station  
Tithebarn Street, Liverpool  
L2 2QP

**From:** Ryan, Seamus

**Sent:** 16 November 2017 10:25

**To:** 'gary.mills@northumberland.gov.uk' <[gary.mills@northumberland.gov.uk](mailto:gary.mills@northumberland.gov.uk)>;  
'david.brookes@northumberland.gov.uk' <[david.brookes@northumberland.gov.uk](mailto:david.brookes@northumberland.gov.uk)>;  
'graham.fairs@northumberland.gov.uk' <[graham.fairs@northumberland.gov.uk](mailto:graham.fairs@northumberland.gov.uk)>

**Subject:** A1 M2F Drainage Strategy

Hi gents,

I'm currently putting together the drainage strategy document for the proposed A1, Morpeth to Felton, upgrade. I have been provided with the broad strategy for dealing with surface water run-off from your Mr James Hitching.

The strategy, as set out by James, requires separation of the proposed trunk road drainage from the associated local road network drainage.

Currently, the strategy contains a number of elements, as follows:-

1. The actual highway drainage to remove the surface water from the carriageway
2. The potential treatment of the run-off
3. The potential attenuation requirements (e.g. ponds)
4. The potential flow control arrangements
5. The outfall requirements.

The strategy is to discharge to local watercourses via controlled pond attenuation.

The drainage may need to be separated where the proposed Highways England trunk highway impacts on the existing road network. This may then potentially involve separate attenuation ponds, controls, and/or discharge pipes and outfalls for both trunk and local networks. It would be beneficial if the potential duplication of required assets could be reduced by, for example, allowing NCC ponds to discharge into HE ponds prior to outfall; or allowing a joint outfall pipe or outfall structure to be used.

Can you advise me if NCC have a current policy that covers this situation, or can you advise on how previous similar situations have been dealt with? Basically, I need to know as part of the strategy, what is acceptable to NCC as separation of systems.

I would appreciate the opportunity to discuss this at a convenient time.

Many thanks for your help,  
Seamus  
**Seamus Ryan BSc CEng MIEI**  
Senior Engineer (Contract) – Flooding & Drainage



M [REDACTED]

1<sup>st</sup> Floor, Exchange Station  
Tithebarn Street, Liverpool  
L2 2QP

---

2.1.3 9/11/17

From: James Hitching [<mailto:james.hitching@northumberland.gov.uk>]  
Sent: 09 November 2017 15:38  
To: Ryan, Seamus <[Seamus.Ryan@wsp.com](mailto:Seamus.Ryan@wsp.com)>  
Cc: Thresh, Majlinda <[Majlinda.Thresh@wsp.com](mailto:Majlinda.Thresh@wsp.com)>; Bedford, Lee <[lee.bedford@wsp.com](mailto:lee.bedford@wsp.com)>  
Subject: Re: FW: A1 dualling scheme - flood risk and surface water comments

Dear Seamus



Unfortunately we do not have a document separating out drainage. Hopefully our Highways team can assist with anything specific with regards to this matter in the future.

Thanks

James

**James Hitching**

Senior Sustainable Drainage Officer  
Flood & Coastal Erosion Risk Management  
Northumberland County Council  
County Hall  
Morpeth  
NE61 2EF

Email – [James.Hitching@northumberland.gov.uk](mailto:James.Hitching@northumberland.gov.uk)

On 6 November 2017 at 09:30, Ryan, Seamus <[Seamus.Ryan@wsp.com](mailto:Seamus.Ryan@wsp.com)> wrote:

Hi James,

Many thanks for your ongoing help with this development. I was just wondering if NCC have a policy with regard to the separation of the drainage, as outlined below. We understand that NCC adopted highways are to be drained separately, but we are trying to minimise the footprint required to achieve this.

Best regards,

**Seamus Ryan BSc CEng MIEI**

Senior Engineer (Contract) – Flooding & Drainage



---

2.1.4 1/11/17

From: James Hitching [<mailto:james.hitching@northumberland.gov.uk>]

Sent: 01 November 2017 10:13

To: Ryan, Seamus <[Seamus.Ryan@wsp.com](mailto:Seamus.Ryan@wsp.com)>

Cc: Bedford, Lee <[lee.bedford@wsp.com](mailto:lee.bedford@wsp.com)>; Thresh, Majlinda <[Majlinda.Thresh@wsp.com](mailto:Majlinda.Thresh@wsp.com)>; Ruth Bendell <[ruth.bendell@northumberland.gov.uk](mailto:ruth.bendell@northumberland.gov.uk)>; Aaron McNeill

<[aaron.mcneill@northumberland.gov.uk](mailto:aaron.mcneill@northumberland.gov.uk)>; Briggs, Ellie <[Ellie.Briggs@wsp.com](mailto:Ellie.Briggs@wsp.com)>

Subject: Re: A1 dualling scheme - flood risk and surface water comments

Hi Seamus

Thank you for your email. In answer to the points in your proposals:

1. Yes - Where the proposed highway is in greenfield areas, please do calculate run-off so it is restricted to greenfield run-off rates.
2. No - we ask that brownfield areas are calculated in accordance with the Defra document - non-technical standards for sustainable drainage systems. This outlines that for brownfield developments the allowable discharge rate should be akin to that of the greenfield runoff rate for the equivalent area. We would seek that this be achieved. If justification can be made for a higher rate it may be considered however, these developments must provide a minimum 50% improved situation on existing infrastructure for all events and provide evidence as to why the proposed discharge is the lowest feasible.

I hope that this clarifies our position on these aspects on the surface water disposal scheme.

Thanks

James

**James Hitching**

Senior Sustainable Drainage Officer  
Flood & Coastal Erosion Risk Management  
Northumberland County Council  
County Hall  
Morpeth  
NE61 2EF

████████████████████  
Email – [James.Hitching@northumberland.gov.uk](mailto:James.Hitching@northumberland.gov.uk)

On 27 October 2017 at 14:53, Ryan, Seamus <[Seamus.Ryan@wsp.com](mailto:Seamus.Ryan@wsp.com)> wrote:

Hi James,

With regard to your email below, can you please clarify the following in relation to run-off rates:-

Our proposal is:-1. Where the proposed highway is in greenfield areas, run-off will be restricted to greenfield run-off levels. 2. Where the proposed highway includes sections of existing carriageway, run-off will be restricted to existing, non-factored, levels for those sections. I.e. where there is existing hard-standing, climate change only will be added to the run-off calculation for attenuation.

Can you please advise if that is the correct interpretation.

Regards,

Seamus Ryan

---

2.1.5 24/10/17

From: James Hitching [<mailto:james.hitching@northumberland.gov.uk>]  
Sent: 24 October 2017 17:06  
To: Ryan, Seamus <[Seamus.Ryan@wsp.com](mailto:Seamus.Ryan@wsp.com)>; Bedford, Lee <[lee.bedford@wsp.com](mailto:lee.bedford@wsp.com)>  
Cc: Ruth Bendell <[ruth.bendell@northumberland.gov.uk](mailto:ruth.bendell@northumberland.gov.uk)>; Aaron McNeill <[aaron.mcneill@northumberland.gov.uk](mailto:aaron.mcneill@northumberland.gov.uk)>; Briggs, Ellie <[Ellie.Briggs@wsp.com](mailto:Ellie.Briggs@wsp.com)>  
Subject: A1 dualling scheme - flood risk and surface water comments

Dear Seamus and Lee,

Further to your respective emails and the technical meeting last Friday. I feel it is easier to send one email for which I hope encompasses the flood risk and surface water drainage issues around the A1 dualling scheme.

**Flood Risk**

We ask that particular care and attention be made to any works which are within the Cotting Burn catchment. Watercourse AF02 falls within this catchment. The Cotting Burn has caused flooding within Morpeth in the past and therefore we ask that where possible water is

attenuated longer and that the allowable discharge rate is reduced to as small as possible. A similar approach should also be applied on the Benridge Burn which flows into the river Wansbeck. Again, flooding from this source through Morpeth has occurred recently (2008 and 2012).

We ask that a similar principle is applied to all watercourses that flow through Felton. Watercourses AF29 (Bradley Brook) through to AF34 (Back Burn) inclusive. Felton has experienced flooding on numerous occasions in recent memory. Furthermore, there are existing attenuation features at this section of the current A1. The local residents are very vocal and adamant that these features are not working as they should and are contributing to the flooding within Felton when it occurs.

With regards to any river crossing, our preferred solution is for a free standing bridge across the watercourse. If this cannot be achieved we ask for a box culvert, followed by a circular culvert with its diameter as large as possible. At locations where an existing bridge/culvert is in place we ask that the extension of this feature matches that there at present. At any location where this was to change, a watercourse assessment will need to be undertaken and appended to any formal documentation. This assessment will need to demonstrate that there is no increase in flood risk both upstream and downstream as a result of the works. We ask that all matters relating to culverts are undertaken using CIRIA - *Culvert Design Operation Guide*.

Flood risk assessments / watercourse assessments will be required for the crossings at Longdike Burn AF20, Earsdon Burn AF11 and the River Lyne AF06. There are flood outlines associated with these watercourses and dwellings/buildings within close proximity. Therefore it needs to be ensured that the proposed works will not detrimentally affect these features. Please contact the Environment Agency as to whether they have further information on these respective watercourses.

Where access tracks are required to access any new SuDS features, these shall not be raised within areas of floodplain, unless demonstrated and illustrated within the flood risk assessment.

Regarding the River Coquet, the crossing at this location and any works that are within 10 metres of this watercourse, please speak directly to the Environment Agency. The River Coquet is a designated Main River and therefore the Environment Agency are the statutory body who will respond specifically to this.

### **Surface Water**

A drainage strategy will be required for this scheme.

We ask that the surface water is kept in its original existing catchments. As such a plan looking at the existing catchments (and sub-catchments) needs to be devised and submitted. Information from FEH and LiDAR is available and can be used within this assessment. Surface water for the new highway needs to be kept to this catchment, additional plans demonstrating this will need to be submitted.

Please adhere to the DEFRA non-statutory guidance for sustainable drainage with regards to the surface water drainage scheme. This outlines restricted discharge rates and attenuation volumes that we will require. In summary we ask that the allowable discharge rate is



restricted to the existing greenfield runoff rate and that attenuation is provided for the 1 in 100 year plus climate change event. In this instance we will not be requiring an additional allowance for urban creep. Associated calculations will be required for all drainage networks and catchments for this scheme.

SuDS measures need to be included within the drainage scheme. All these features need to be demonstrated on a plan drawing. We ask that all SuDS features are designed in accordance with CIRIA C753 *SuDS Manual*. Health and safety for these features need to adhere to CIRIA RP992 *Health and safety principles for SuDS*.

We have no preference to ponds or basins; however, please be aware of nearby airfields for which preclude the use of ponds and longstanding open water. Additional mitigation may be required at these locations.

All SuDS features need to be located outside of flood zones 2 and 3.

In addition to the DEFRA non-statutory guidance for sustainable drainage, please refer to the LASOO document - *non-statutory guidance for sustainable drainage practice guide*.

### **Further additional comments**

It is NCC's desire to separate the drainage from any new highways that would be adopted by NCC and not the Highways Agency. Therefore within any design, please can the drainage for these sections of highway be distinguished and designed on a separate network accordingly. Where this is not possible, please liaise with NCC Highways, where we can provide further comments.

A drainage survey of the detrunked section of the A1 will need to be undertaken and submitted to NCC.

I hope this addresses all of your preliminary questions, if you do have anything additional then please get in touch.

Kind regards

James

#### **James Hitching**

Senior Sustainable Drainage Officer  
Flood & Coastal Erosion Risk Management  
Northumberland County Council  
County Hall  
Morpeth  
NE61 2EF

  
Email – [James.Hitching@northumberland.gov.uk](mailto:James.Hitching@northumberland.gov.uk)

## 2.2 Highways England SES

Mon 22/01/2018 13:52

Bailey, Andy <Andrew.Bailey@highwaysengland.co.uk>

RE: A1 MtF Drainage Strategy

To: Sharpe, Rob <Rob.Sharpe@wsp.com>

Good afternoon Rob,

First and foremost, there is no requirement for SES to be involved - except in the case of 'Departures from Standard' and where a 'clarification of the requirements' outlined in our standards is required. DMRB 4.2: HD 49 & HD 50 (currently) set out the basic requirements for a Designer to comply with the requisite (published) standards and the need for the Designer to self-certify the design as complying with the standards. In this context, it would be meaningless for SES Drainage Specialist to even attempt to comment on a design as it would go against our published policy.

However, there are emerging issues in relation to Climate Change (CC) that may not have been fully incorporated in the current version of our published standards. As such, I consider that it would be useful if I reproduced some of the instructions we gave to our consultants commissioned with the task of updating the Drainage Documents contained within DMRD Vol 4.2, with particular reference to HD33 and HD45. The instruction is as follows:

When it comes to Design of Road Drainage HE advise that designers would normally be expected to adopt the following approach:

- All edge drain details for collection of run off and carrier pipes/conduits for conveyance of that run off shall be designed based on the 'rainfall' experienced by the road catchment. River levels and sea levels are not part of this design consideration. However, all drainage design shall incorporate appropriate discharge controls to comply with the national requirements.

Highways England fully recognise the design standards described in the National Planning Policy Framework (NPPF) for climate change adaptation. NPPF provides the controls we need to ensure the SRN drainage network can be designed, constructed and operated in a safe way, and in order to meet our legal obligation not to increase the risk of flooding. All new schemes shall adopt the following approach to drainage design:

1. For all new schemes that do not involve adaptation of an existing drainage network: Full compliance with the requirements described in NPPF;
2. For all new schemes that involve adaptation of an existing drainage network: Compliance in accordance with HD33, (with the exception of Smart Motorways where IAN 161 shall apply);
3. In both 1 and 2, above, the design solution shall incorporate a 20% uplift in peak rainfall intensity. The proposal shall also sensitivity test the design with a 40% uplift in peak rainfall intensity. The difference between the 2 scenarios (Central and Upper) shall enable the end user to understand the range of impact between the

climate change risk scenarios. In the light of this knowledge the Project Sponsor shall determine the appropriate course of action to be implemented;

4. For all schemes that use existing outfalls, the current discharge rates shall not be exceeded. The current discharge rates (no rates were historically pre-defined, or pre-agreed) shall be calculated using the current design methods available within DMRB 4.2.
5. All schemes shall be checked for a 1 in 100 year flooding compliance.

Where rivers and the sea have the potential to influence a highway design the regional effects of climate change must again be taken into account. In this case the impact of climate change on river flows and sea level rise must be taken into account as part of a flood risk assessment. Our HD45 publication, which covers flood risk assessment, signposts the end-user back to Volume 4.2 (HA107) for Culvert design. However, the end user should be aware of, and implement, the most up-to-date climate change guidance to assess risk and design culverts in accordance with the new regional variations defined in NPPF, and to use the higher risk levels when doing so.

*Note on Peak Rainfall Intensity allowances: The working assumption is that all new road infrastructure shall have a design lifetime of 60 years. Under the climate change scenarios for peak rainfall intensity described in NPPF Table 2 the design lifetime of new road infrastructure now places them in the “2080s” banding (Note that NPPF Table 2 brackets the “2080s” peak rainfall intensity scenarios over the 2070 to 2115 period). NPPF text on peak rainfall intensity simply states the need to “understand the range of impact” and refers to the Central and Upper values across all of England that will facilitate this understanding. NPPF Table 2 then defines the “2080s” Central and Upper Peak Rainfall Intensity values as 20% and 40%, respectively. It is in this context that HE requirements are defined. You will note that for completely new road drainage designs our requirements are in full accordance with NPPF, whilst ensuring due diligence is exercised when “understanding” and evaluating the potential effects of a changing climate.*

*It should first be noted that the HD33 guidance on climate change deals with ‘drainage design’ only. When it comes to the effects of climate change on ‘flood risk assessment’ HD33 should simply sign-post the end-user to HD 45. In this way there is a clear distinction between the effects of changing climate on drainage design, as a consequence of changing ‘rainfall intensity’, and on flood risk assessment, as a consequence of changing ‘river level & sea level rise’. Values are defined for both parameters in the National Planning Policy Framework.*

Finally I can confirm that all Drainage Designs shall be undertaken in accordance with HE standards and in consultation with the Local Authorities that are responsible for the side roads.

As it is already covered under HD 49&50, I do not see the need for the Design or Strategy to be reviewed by SES. The exception here is that all ‘Departures from Standards’ will need to be ‘reviewed and approved’ by the relevant SES Specialist.



I hope you find the above helpful in undertaking your design task and help you further define and evidence any further / remaining query you may have.

Regards

**Andy Bailey (FIHE) – Senior Drainage Engineer**

Highways England | Woodlands | Manton Lane | Bedford | MK41 7LW

Tel: +44 (0) 300 4704755 | Mobile: [REDACTED]

Web: <http://www.highways.gov.uk>

GTN: 0300 470 4755

From: Sharpe, Rob [<mailto:Rob.Sharpe@wsp.com>]

Sent: 22 January 2018 13:02

To: Bailey, Andy

Subject: A1 MtF Drainage Strategy

Importance: High

Hi Andy,

I was given your name by Nanette Hoyle who advised that we run the Drainage Strategy past you.

I have two queries on our methodology that I hope you can help with.

**Climate Change**

In line with HA 33/16 we have allowed a 20% increase in rainfall for both the 1 in 5 year (drainage asset capacity – no flooding) and the 1 in 100 year (off road storage). The local highways authority (Northumberland County Council) have requested that we increase the climate change allowance to 40%. Is this in your view acceptable?

**Storage provision**

We have based the storage volumes (prior to discharging into the local watercourses) on the greenfield runoff rates. For the 1 in 100 year plus climate change event we have restricted the flows to the Q100 figure (based on Qbar, Greenfield Runoff Rates - Institute of Hydrology Report 124 FSR 3-parameter equation). Is this the approach that you would advise?

Will you call me so that we can talk these over, prior to completing the strategy?

Regards

**Rob Sharpe BEng (Hons) CEng C.WEM MCIWEM**

Principal Engineer



T +44 (0) 1513 318218



1st Floor Station House, Exchange Station  
Tithebarn Street, Liverpool  
L2 2QP

**wsp.com**

**Confidential**

This message, including any document or file attached, is intended only for the addressee and may contain privileged and/or confidential information. Any other person is strictly prohibited from reading, using, disclosing or copying this message. If you have received this message in error, please notify the sender and delete the message. Thank you.

WSP UK Limited, a limited company registered in England & Wales with registered number 01383511. Registered office: WSP House, 70 Chancery Lane, London, WC2A 1AF.

*This email may contain information which is confidential and is intended only for use of the recipient/s named above. If you are not an intended recipient, you are hereby notified that any copying, distribution, disclosure, reliance upon or other use of the contents of this email is strictly prohibited. If you have received this email in error, please notify the sender and destroy it.*

**Highways England Company Limited / General enquiries: 0300 123 5000 /National Traffic Operations Centre, 3 Ridgeway, Quinton Business Park, Birmingham B32 1AF | <https://www.gov.uk/government/organisations/highways-england> | [info@highwaysengland.co.uk](mailto:info@highwaysengland.co.uk)**

*Registered in England and Wales no 9346363 / Registered Office: Bridge House, 1 Walnut Tree Close, Guildford, Surrey GU1 4LZ*

Consider the environment. Please don't print this e-mail unless you really need to.

## 2.3 Highways England Project Manager

**From:** Bevan, Tsuwun [<mailto:Tsuwun.Bevan@highwaysengland.co.uk>]  
**Sent:** 22 May 2018 18:22  
**To:** Morrow, David <[David.Morrow@wsp.com](mailto:David.Morrow@wsp.com)>; Achampong, Henri <[Henrietta.Achampong@wsp.com](mailto:Henrietta.Achampong@wsp.com)>; Muscatelli, Dino <[Dino.Muscatelli@wsp.com](mailto:Dino.Muscatelli@wsp.com)>; Johnson, Claire <[Claire.Johnson@wsp.com](mailto:Claire.Johnson@wsp.com)>  
**Cc:** Finnigan, James <[James.Finnigan@highwaysengland.co.uk](mailto:James.Finnigan@highwaysengland.co.uk)>; Mahoney, Joanna <[Joanna.Mahoney@highwaysengland.co.uk](mailto:Joanna.Mahoney@highwaysengland.co.uk)>; Albone, Sarah <[Sarah.Albone@highwaysengland.co.uk](mailto:Sarah.Albone@highwaysengland.co.uk)>  
**Subject:** A1iN - Decisions

All,

Following Project Committee today, I can confirm the following:

**Traffic speed at roadworks** – agreed with request not to implement 60mph through roadworks; agreed there was a strong safety case for 40mph on the online widening sections. But to be prepared for push-back from Customer Focus. As an aside, I have queried with Safe Roads whether they want to see the TN.

**20% v 40% uplift to 4 nr ponds/swales** – agreed not to apply uplift of 40%, e.g. to retain 20% uplift. Can we pick this up with NCC at the next working group meeting - unless you think a separate, specific meeting would be better? I'm meeting with NCC on 5/6 in the morning mainly to provide NoE update ahead of SRG in the afternoon but will give them the heads up

**Appetite to re-build/update the traffic model for BH/weekend traffic** – no decision, but little appetite to do this so seems unlikely. There is a meeting with DfT tomorrow so hoping for some clarity.

**Early works strategy** – we need to work up the strategy for regional committee; **Dave** – can discuss to see what this looks like; I'm thinking we need to cover things like if scheme is pulled, what are the mitigation etc. I think we've already done a lot of this

**VM Workshop** – the one scheduled for 7 June is to be cancelled. Likely to be re-scheduled for Aug, possibly Sept and likely to be more of a Benefits Realisation workshop than VM workshop.

Any questions, let me know

**Tsuwun Bevan** CEng MICE  
**Senior Project Manager, Regional Investment Programme (RIP) North**  
Highways England | Lateral | 8 City Walk | Leeds | LS11 9AT  
**Mob:** [REDACTED]  
**Web:** <http://www.highways.gov.uk>

---

**Regional Investment Programme** - recognised as the best infrastructure team nationally by creating a place where people can thrive

---

*This email may contain information which is confidential and is intended only for use of the recipient/s named above. If you are not an intended recipient, you are hereby notified that any copying, distribution, disclosure, reliance upon or other use of the contents of this email is strictly prohibited. If you have received this email in error, please notify the sender and destroy it.*

**Highways England Company Limited** | General enquiries: 0300 123 5000 | National Traffic Operations Centre, 3 Ridgeway, Quinton Business Park, Birmingham B32 1AF | <https://www.gov.uk/government/organisations/highways-england> | [info@highwaysengland.co.uk](mailto:info@highwaysengland.co.uk)

Registered in England and Wales no 9346363 | Registered Office: Bridge House, 1 Walnut Tree Close, Guildford, Surrey GU1 4LZ

Consider the environment. Please don't print this e-mail unless you really need to.



© Crown copyright 2020.

You may re-use this information (not including logos) free of charge in any format or medium, under the terms of the Open Government Licence. To view this licence:

visit [www.nationalarchives.gov.uk/doc/open-government-licence/](http://www.nationalarchives.gov.uk/doc/open-government-licence/)  
write to the **Information Policy Team, The National Archives, Kew, London TW9 4DU**, or email  
[psi@nationalarchives.gsi.gov.uk](mailto:psi@nationalarchives.gsi.gov.uk).

This document is also available on our website at [www.gov.uk/highways](http://www.gov.uk/highways)

If you have any enquiries about this document [A1inNorthumberland@highwaysengland.co.uk](mailto:A1inNorthumberland@highwaysengland.co.uk) or call **0300 470 4580\***.

\*Calls to 03 numbers cost no more than a national rate call to an 01 or 02 number and must count towards any inclusive minutes in the same way as 01 and 02 calls.

These rules apply to calls from any type of line including mobile, BT, other fixed line or payphone. Calls may be recorded or monitored.

Registered office Bridge House, 1 Walnut Tree Close, Guildford GU1 4LZ  
Highways England Company Limited registered in England and Wales number 09346363