

Tritax Symmetry (Hinckley) Limited

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

The Hinckley National Rail Freight Interchange Development Consent Order

Project reference TR050007

Geometric Design Strategy Record (GDSR) – M69 Slip Roads and Comment Log

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Development Management Advice Midlands Development Management Team



Hinckley National Rail Freight Interchange (NRFI) Development Consent Order (DCO) - M69 J2 Scheme Geometric Design Strategy Record (GDSR) Review

GDSR

Ref: HRF-BWB-HML-M69-RP-CH-00101

Notes

1	* All review comments are based on the information provided. If the information changes, we reserve the right to provide further review
2	Comments to be read in conjunction with previous NH comments.

	Comment Author	NH Comment	BWB Response	NH Comment	BWB Response
	Comment Date	21-Nov-23	14-Dec-23	15-Jan-24	23-Feb-24
	GDSR Revision	1		2	
Issue	Design Element				
1	Horizontal Design	Minimum nose ratio is not shown on drawing 150	This is beyond the cut line and so is shown on drawing 151	Noted and accepted*.	
2	Horizontal Design	The table showing horizontal geometry of the proposed diverge slip road makes no reference to the appropriate DMRB Standard or requirements.	Paragraphs have been added before the relevant tables to reference the design documents that the parameters are derived from.	Noted and accepted*.	
3	Horizontal Design	Chainage 517.434m to 783.400m - absence of a corresponding cross-section to show use of 2.5% superelevation	Note has been added in the table to say 2.5% superelevation is used. Cross section has been added to the sections drawing through this area.	Noted and accepted*.	
4	Horizontal Design	It should be noted that an adjustment factor of 1.05 should be applied to the merging flow due to the merging percentage of HGVs and gradient.	Adjustment factors of between 1.05 and 1.10 (depending on the exact percentage of HGVs) have been added to the calculations. These do not affect the outcome of the calculation as noted.	Noted and accepted*.	
5	Horizontal Design	The minimum nose ratio (1:40 required) is not referenced on drawing 150.	This is beyond the cut line and so is shown on drawing 151. The achieved merge ratio is 1:24 which is a larger angle than with a 1:40 ratio and so the 'minimum' requirement here is met (we discussed this in the	Noted and accepted*.	
6	Weaving	Requirement for a weaving assessment not covered in the GDSR	A weaving assessment section has been added and calculations appended to the report.	Noted and accepted*.	
7	Sight Distance	No reference in the GDSR to the requirements for stopping sight distance.	A paragraph has been added to the SSD section of the report noting the relevant paragraphs of CD 122.	Noted and accepted*.	
8	Vertical Design	The Standards associated with the design requirements for vertical design of the proposed slip roads should be noted for completeness in the GDSR.	Paragraph added in vertical design section.	Noted and accepted*.	
9	Vertical Design	We are unclear why 6% max gradient has been referenced in relation to the requirement for the new southbound merge slip road?	This is based on CD122 paragraph 5.7 and a section has been added to the report to reference this.	Noted and accepted*.	
10	Vertical Design	It should also be noted that gradients of less than 0.5% on a kerbed road will require false channel paths for drainage (see CD 109 cl. 5.2). This is an issue that should be raised and discussed with the Drainage Asset Lead as appropriate.	This is noted.	No further comment.	
11	Cross Sections	Reference to how cross sections have been determined	Paragraph added to revised report.	Noted and accepted*.	
12	Cross Sections	Traffic flows require a DG2A cross section on the diverge whereas a DG2C cross section is provided.	This has been amended with the hard shoulder tapered out over the length of the nose. This does not affect the main line, nor the location of the departures from standard.	The GDSR still refers to a DG2C diverge cross section, which is not consistent with the diverge flow calculation provided in Appendix B. Clarification is required to allow continuation of cross sections review.	This is amended in the P03 version to read DG2A
13	Existing Layout	Notwithstanding this, there is no commentary from the Design Organisation regarding any existing Relaxations or Departures from Standard associated with the existing layout of the M69 mainline and Junction 2 slip roads and whether such design elements are to be improved or retained.		Awaiting a response.	This has been added to the P03 version of the report. See paragraphs 2.7 to 2.14.
14	Sight Distance	The visibility splays shown on the long sections do not adequately demonstrate the required visibility is achievable at any point along the full length of slip road. Furthermore, the horizontal component of visibility is not drawn on the plan views.		New drawings (ref: HRF-BWB-GEN-XX-SK-CH-0143 Rev P01 and HRF-BWB-GEN-XX-SK-CH-0144 Rev P01) added to GDSR in Appendix D showing proposed slip road visibility. Noted and accepted*; however, the placement of highway signage (not shown) may affected visibility in due course.	Noted. This will be dealt with in the detailed design when exact locations of all signage etc. will be specified with due regard to the visibility splays shown

TRANSPORT AND INFRASTRUCTURE

Tritax Symmetry (Hinckley) Limited

Hinckley National Rail Freight Interchange
Geometric Design Strategy Record
(GDSR)

M69 Junction 2 Slip Roads

HRF-BWB-HML-M69-RP-CH-00101

TRANSPORT AND INFRASTRUCTURE

Tritax Symmetry (Hinckley) Limited

Hinckley National Rail Freight Interchange
Geometric Design Strategy Record (GDSR)
M69 Junction 2 Slip Roads

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1. INTRODUCTION

Introduction

- 1.1 Tritax Symmetry (Hinckley) Limited (the Applicant), has submitted an application for a Development Consent Order (DCO). The DCO will authorise the Applicant to construct and operate a National Rail Freight Interchange (NRFI), which is a "nationally significant infrastructure project", as defined in the Planning Act 2008. It is therefore the subject of an application to the Planning Inspectorate which will be determined by the Secretary of State for Transport.
- 1.2 The NRFI site is proposed on land to the north west of the M69 motorway off J2 and to the south east of the Leicester to Hinckley railway line. It comprises a total of approximately 247 ha (610 acres) including the works associated with Junction 2.
- 1.3 A detailed description of the NRFI development is found at Chapter 2 of the Environmental Statement. The proposals include significant improvements to M69 J2 and the construction of a new link between the B4668 and M69 J2.
- 1.4 This report is based on the following information:
- Design standards listed in Chapter 2 below
 - Topographical survey information prepared by MK Surveys
 - OS mapping, aerial photos and Google Streetview

Purpose

- 1.5 The purpose of this report is to record the strategy for the geometric design for the proposed south facing slip roads to J2 (known within the DCO application as Work No. 8). Hence this report is termed the Geometric Design Strategy Record (GDSR).
- 1.6 For each aspect of geometric design this report will describe the proposed geometry. Where relaxations or departures from standard are required, these will be highlighted and a justification provided.
- 1.7 This report does not include analysis of the proposed works to the M69 J2 circulatory carriageway (Work No. 9) nor the proposed A47 link road as these both fall under the jurisdiction of Leicestershire County Council as local highway authority.

Overview of the Scheme

- 1.8 The purpose of the new slip roads is to provide access to and from the M69 from the south of J2 and to upgrade J2 to an all movements junction. Works include:
- New southbound merge slip road
 - New northbound diverge slip road
- 1.9 The drawings listed below show the scheme layouts.

Traffic flows

- 1.10 Details of the traffic flow data and traffic modelling are contained within the Transport Assessment and the relevant chapter of the Environmental Statement submitted as part of the DCO application.

List of Drawings

- 1.11 Plans showing the highway proposals were submitted with the DCO application and can be accessed on the Planning Inspectorate website for the scheme.
- 1.12 Further larger scale drawings have been produced to provide details of the geometric proposals for each of the new slip roads. These are listed below.

Section of Scheme	General Arrangement and Long Section Drawing	Cross Section Drawing	DCO Highway Plan	DCO Highway Long Sections
Southern end of new slip roads	HRF-BWB-HML-M69-DR-CH-0150	HRF-BWB-HML-M69-DR-CH-0160	HRF-BWB-LSI-D5-DR-CH-00100_Document 2.4E	HRF-BWB-LSI-D2-DR-CH-00105_Document 2.4K
Northern end of new slip roads	HRF-BWB-HML-M69-DR-CH-0151	HRF-BWB-HML-M69-DR-CH-0160	HRF-BWB-LSI-D4-DR-CH-00100_Document 2.4D	HRF-BWB-LSI-D2-DR-CH-00105_Document 2.4K

- 1.13 The drawings listed above (not including the DCO highway plans which are available through the PINS website) are included as **Appendix A** to this report.

2. GEOMETRIC DESIGN STANDARDS

Standards Used

2.1 The following standards are applicable to the geometric design of the slip roads proposed at M69 J2:

- CD109 "Highway Link Design"
- CD116 "Geometric Design of Roundabouts"
- CD127 "Cross-Sections and Headrooms"
- CD122 "Geometric design of grade separated junctions"

Existing Situation

- 2.2 The M69 is a three-lane rural motorway and has a 120kph design speed.
- 2.3 There are currently north facing slips comprising of a northbound merge and a southbound diverge which connect to the M69 J2 circulatory carriageway which falls under the jurisdiction of Leicestershire County Council as local highway authority.
- 2.4 Junction 2 is grade separated from the main line motorway with two overbridges which are National Highways structures.
- 2.5 To the south of the scheme Hinckley Road/Aston Lane is carried on a bridge over the motorway.
- 2.6 In the location of the new junctions the M69 mainline is on a horizontal curve of approximately 10,800m radius and has a longitudinal gradient of approximately 0.5%.
- 2.7 The existing northbound merge slip road employs a layout A Option 1 merge which is suitable for the peak merging flow of 521 vph in the 2036 with development PM peak.
- 2.8 The existing merge geometry is compliant with CD 122 Table 3.21 parameters for a rural motorway with the nose length measured at 115m and the taper length measured at 205m.
- 2.9 The connector road provides a two lane exit from the Junction 2 roundabout which taper to a single lane prior to the merge. The cross section of the connector road is not currently compliant with CD 127 Figure 2.1.1N1b for MG2C cross section. As there are no other geometric amendments to be made to this slip road, this arrangement is to be retained.
- 2.10 The existing southbound diverge slip road employs a layout A Option 1 diverge which is suitable for the peak diverging flow of 635 vph in the 2036 with development PM peak.
- 2.11 The existing diverge geometry is compliant with CD 122 Table 3.32 for a 120kph rural all-purpose road with nose length measured at 70m and the taper length measured at 150m. This is a permitted relaxation under CD122 E/1.3(1).

- 2.12 The connector road is a single lane for the majority of its length with a 5.8m wide running lane and a 1m wide hard strip. This cross section is not currently compliant with CD 127 Figure 2.1.1N1b for DG1A cross section.
- 2.13 As the geometric amendments to this slip road involve widening at the roundabout entry only, this work comes under the requirements of CD 116. The proposed widening will not result in a departure from CD 127 in itself, but will be tying into a non-compliant cross section. The cross section on the remainder of the connector road is to be retained and it is acknowledged that a departure for the tie into this connector road may be required at the detailed design stage.
- 2.14 Desirable minimum visibility (120m for 70kph design speed) is achievable to the proposed stop line from an eye height of 1.05 – 2m to an object height of 0.26 – 2m. Desirable minimum visibility is also achievable to a primary signal head.

Design Speed

- 2.15 The design speed of the M69 main line is 120kph.
- 2.16 In accordance with CD 122 Table 5.4, the design speed of the connector road shall be 70kph.

3. HORIZONTAL DESIGN

Diverge Slip Road

- 3.1 Merge and diverge calculations based on the forecast traffic flows are included as **Appendix B** to this report.
- 3.2 The main line traffic flows on the M69 mean that the calculations recommend a layout D diverge with a lane drop from 3 to 2 lanes on the main line and a 2 lane connector road.
- 3.3 As the M69 continues as a 3 lane motorway downstream of this junction, a lane drop is not appropriate and therefore a Layout B Option 1 ghost island taper diverge is proposed. This provides the same capacity as the Option D layout for diverging flows but higher main line capacity and is therefore permitted under CD 122 paragraph 3.26.2.
- 3.4 In accordance with CD 122 Table 3.32, the diverge geometry is as follows:

Road Class	Length of exit tapers (2 lane)	Minimum Nose Ratio	Nose Length	Length of Ghost Island Head
Rural Motorway Main Line	185m	1:15	80m	180m

- 3.5 The horizontal geometry of the diverge slip road is set out in the table below.
- 3.6 The parameters in the table, unless noted otherwise, are derived from CD 122 paragraph 5.4 which refers to CD 109 for the base geometric design parameters for the design speeds. CD 109 table 2.10 contains the horizontal design parameters for the applicable design speeds and any relaxations or departures in the table below are from this standard.

New Northbound Diverge Slip Road					
Chainage	Element	Design Speed	Standard	Proposed Design	
				Details	Relaxations/Departures
0-164.013	Left hand curve	120kph	2880m minimum radius with adverse camber	6000m	None
164.013-307.917	Straight	120kph	-	-	None
307.917-498.856	Left hand curve	120kph	2880m minimum radius with adverse camber	4550m	None

New Northbound Diverge Slip Road					
Chainage	Element	Design Speed	Standard	Proposed Design	
				Details	Relaxations/Departures
498.856-517.434	Straight	120kph	-	-	None
517.434-783.400	Left hand curve	120kph	2040m minimum radius with superelevation of 2.5%	2200m with superelevation of 2.5%	None
783.400-934.484	Straight	70kph	-	-	None
934.484 to J2 circulatory	Geometry in accordance with CD 116				

3.7 The above are illustrated on the drawings included as **Appendix A** to this report.

Merge Slip Road

3.8 Merge and diverge calculations based on the forecast traffic flows are included as **Appendix B** to this report.

3.9 The main line traffic flows on the M69 mean that the calculations recommend a layout E merge with a lane gain from 2 to 3 lanes on the main line and a 2 lane connector road.

3.10 As the M69 is already a 3 lane motorway upstream of this junction, a lane gain is not feasible and therefore an increase in main line flows to the '!' section of CD 122 Figure 3.12b is appropriate. As a result, a Layout C ghost island taper merge is proposed. This provides the same capacity as the Option E layout for merging flows but higher main line capacity and is therefore permitted under CD 122 paragraph 3.12.2.

3.11 In accordance with CD 122 Table 3.21, the merge geometry is as follows:

Road Class	Length of exit tapers (2 lane)	Minimum Nose Ratio	Nose Length	Length of Ghost Island Tail
Rural Motorway Main Line	205m	1:40	115m	180m

3.12 The horizontal geometry of the diverge slip road is set out in the table below.

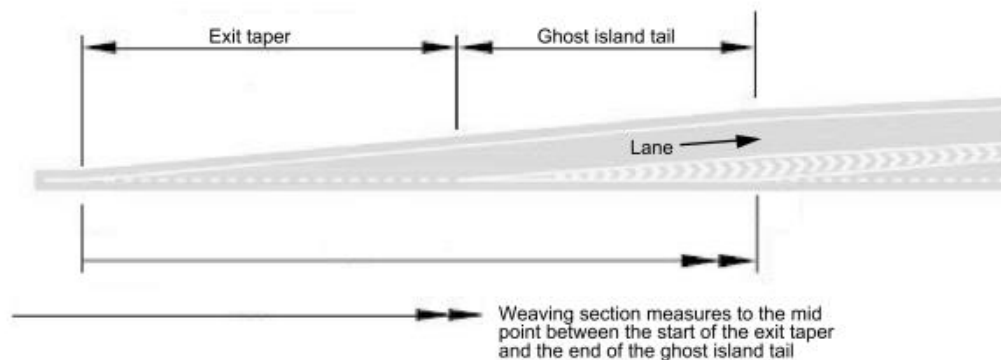
3.13 The parameters in the table, unless noted otherwise, are derived from CD 122 paragraph 5.4 which refers to CD 109 for the base geometric design parameters for the design speeds. CD 109 table 2.10 contains the horizontal design parameters for the applicable design speeds and any relaxations or departures in the table below are from this standard.

New Southbound Merge Slip Road					
Chainage	Element	Design Speed	Standard	Proposed Design	
				Details	Relaxations/Departures
0-57.512	Geometry in accordance with CD116				
57.512-78.043	Straight	70kph	-	-	None
78.043-316.366	Left hand curve	70kph	1020m minimum radius with adverse camber	1020m	None
316.366-700.847	Straight	120kph	-	-	None
700.847-819.303	Left hand curve	120kph	2880m minimum radius with adverse camber	3150m	None
819.303-1041.416	Straight	120kph	-	-	None

4. WEAVING

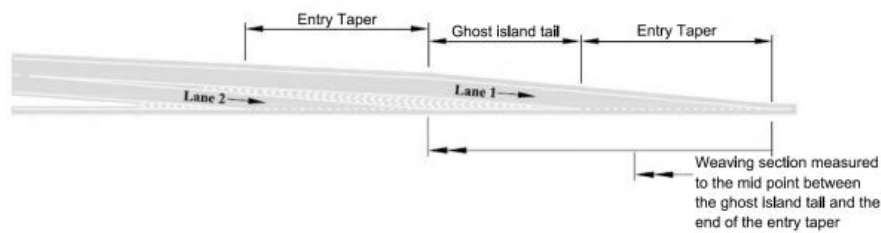
- 4.1 The datum point for the proposed M69 J2 diverge slip is measured as per CD 122 figure 4.4g.

Figure 4.4g Ghost Island and direct taper diverge weaving section



- 4.2 The distance between the existing M69 J1 northbound merge slip road datum and the proposed M69 J2 diverge datum points is measured as 2.57km.
- 4.3 As this is less than 3km, a weaving assessment has been undertaken in accordance with CD 122 paragraph 4.2 and is appended to this report as **Appendix C**.
- 4.4 The calculations include AM and PM peak traffic flow numbers. These do not require adjustment in accordance with CD 122 table 3.9a as the mainline gradient <2% and none of the mainline flows have in excess of 15% HGVs.
- 4.5 Due to the lack of origin/destination select link analysis, it is not possible to quantify the number of vehicles that enter the M69 at J1 and leave at J2 and this number has been set to zero. In so doing, the designer is taking a conservative approach to the calculation as this flow is non-weaving and any vehicles that may undertake this manoeuvre have been accounted for as weaving flows.
- 4.6 For the AM peak, 2.81 lanes within the weaving section are required and for the PM peak, 3.00 lanes within the weaving section are required.
- 4.7 The M69 northbound between J1 and J2 is has three running lanes and therefore has sufficient weaving capacity.
- 4.8 The datum point for the proposed M69 J2 merge slip is measured as per CD 122 figure 4.4b.

Figure 4.4b Ghost island merge weaving section



- 4.9 The distance between the proposed M69 J2 southbound merge slip road datum and the existing M69 J1 southbound diverge datum points is measured as 2.77km.
- 4.10 As this is less than 3km, a weaving assessment has been undertaken and is appended to this report as **Appendix C**.
- 4.11 The calculations include AM and PM peak traffic flow numbers. These do not require adjustment in accordance with CD 122 table 3.9a as the mainline gradient <2% and none of the mainline flows have in excess of 15% HGVs.
- 4.12 Due to the lack of origin/destination select link analysis, it is not possible to quantify the number of vehicles that enter the M69 at J2 and leave at J1 and this number has been set to zero. In so doing, the designer is taking a conservative approach to the calculation as this flow is non-weaving and any vehicles that may undertake this manoeuvre have been accounted for as weaving flows.
- 4.13 For the AM peak, 3.29 lanes within the weaving section are required and for the PM peak, 2.92 lanes within the weaving section are required.
- 4.14 CD 122 paragraph 4.7.2 states that fractions of a lane that are less than 0.5 should be rounded up or down based on the number of lanes on merge or diverge connector roads, the likelihood of unfamiliar drivers potential future growth and environmental constraints.
- 4.15 As the current link has three running lanes, the non-weaving flow from merge to diverge has been discounted and the constraints associated with adding a fourth lane along the weaving section, the value will be rounded down to 3 lanes.
- 4.16 The M69 southbound between J2 and J1 is has three running lanes and therefore has sufficient weaving capacity.

5. SIGHT DISTANCE

- 5.1 Minimum stopping sight distance (SSD) for slip roads is derived from CD 122 paragraph 5.13 with reference to paragraphs 3.23 to 3.25 for the merge slip road and 3.34 to 3.35 for the diverge slip road.
- 5.2 The SSD for the mainline and connector road are taken from CD 109 Table 2.10 based on the design speed. For the main line, desirable minimum SSD of 295m is used and for the connector road, desirable minimum SSD of 120m is used.
- 5.3 The SSD has been assessed for each of the two new slip roads and is summarised in the tables below. Drawings showing the horizontal and vertical visibility splays at regular intervals along the new slip roads are included as **Appendix D** to this report.
- 5.4 There are no reductions below desirable minimum SSD on the main line M69 northbound or southbound through J2 or on the immediate approach to the new diverge slip road. This has been assessed using topographic survey and the geometry of the existing carriageway.

New Northbound Diverge Slip Road				
Chainage	Junction Features within Length	Standard (CD109)	SSD	Relaxations / Departures
0-616.655	Diverge	295m Desirable Minimum	≥295m	None
616.655	Back of Nose			
616.655-780	None	120m Desirable Minimum	≥120m	None
780-960	Immediate approach to junction	120m Desirable Minimum	≥120m	None

New Southbound Merge Slip Road				
Chainage	Junction Features within Length	Standard (CD109)	SSD	Relaxations / Departures
0-334.869	None	120m Desirable Minimum	≥120m	None
334.869	Back of Nose			
334.869-1031.736	Merge	295m Desirable Minimum	≥295m	None

6. VERTICAL DESIGN

- 6.1 Vertical alignment design for slip roads is derived from CD 122 paragraph 5.4 notes which referenced CD 109 for the base geometric parameters based on design speed. CD 109 table 2.10 contains the vertical design parameters for the applicable design speeds and any relaxations or departures in the table below are from this standard.
- 6.2 The maximum gradient permissible for the connector roads is derived from CD 122 paragraph 5.7.
- 6.3 The vertical alignment of the new merge and diverge slip roads are shown on the enclosed drawings and summarised in the tables below.

New Northbound Diverge Slip Road					
Chainage	Vertical alignment feature	Junction features within the section	Standard	Proposed design	
				Details	Relaxations / Departures
0-70.123	Grade	Diverge	3% max	0.757%	None
70.123-117.310	Sag Curve	Diverge	37KF min	75KF	None
117.310-315.754	Grade	Diverge	3% max	0.128%	None
315.754-410.063	Sag Curve	Diverge	37KF min	180KF	None
410.063-580.673	Grade	Diverge	3% max	0.396%	None
580.673-616.655	Sag Curve	Diverge	37KF min	48KF	None
616.655	Back of Nose				
616.655-780.193	Sag Curve	Connector Road	20KF min	48KF	None
780.193-962.536	Crest Curve	Immediate approach to J2 roundabout	30KF min	55KF	None

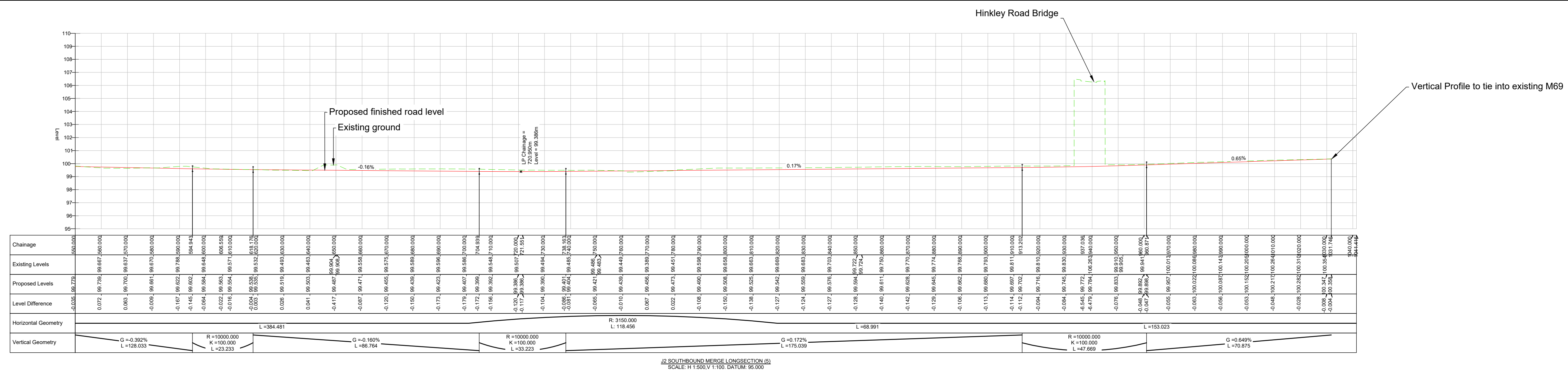
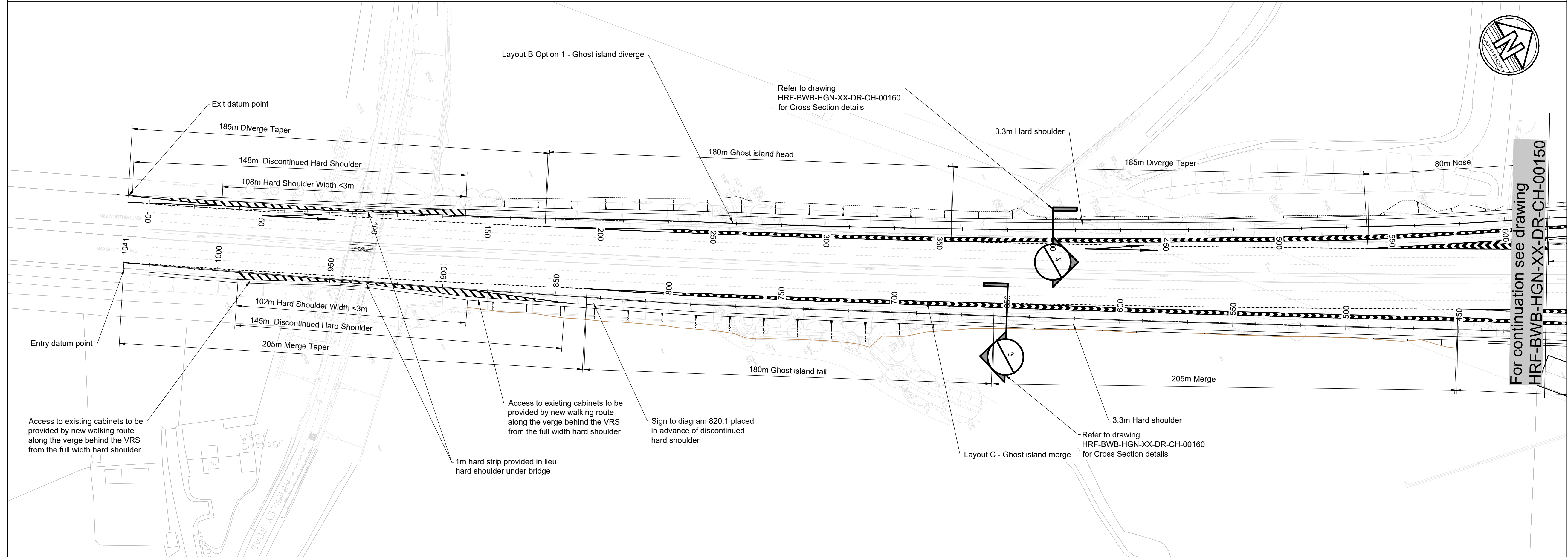
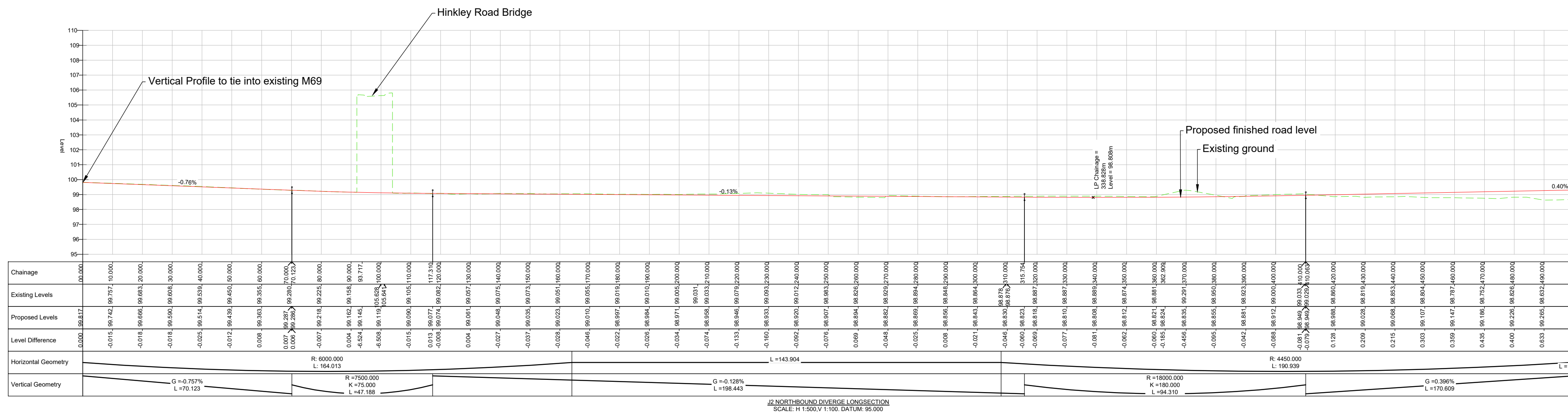
New Southbound Merge Slip Road					
Chainage	Vertical alignment feature	Junction features within the section	Standard	Proposed design	
				Details	Relaxations / Departures
0-14.802	Grade	Connector Road	6% max	0.601%	None
14.802-166.803	Crest Curve	Connector Road	30KF min	40KF	None
166.803-217.989	Grade	Connector Road	6% max	3.199%	None
217.989-313.868	Sag Curve	Connector Road	20KF min	45KF	None
313.868-334.869	Grade	Connector Road	6% max	1.086%	None
334.869	Back of Nose				
334.869-433.119	Grade	Merge	3% max	1.086%	None
433.119-466.910	Sag Curve	Merge	37KF min	50KF	None
466.910-594.943	Grade	Merge	3% max	0.392%	None
594.943-618.176	Sag Curve	Merge	37KF min	100KF	None
618.176-704.939	Grade	Merge	3% max	0.160%	None
704.939-738.163	Sag Curve	Merge	37KF min	100KF	None
738.163-913.202	Grade	Merge	3% max	0.172%	None
913.202-960.871	Sag Curve	Merge	37KF	100FK	None
960.871-1031.746	Grade	Merge	3% max	0.649%	None

7. CROSS SECTIONS

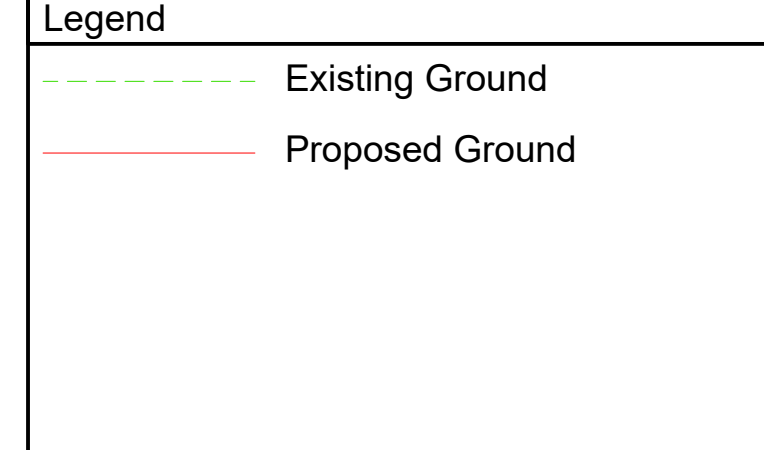
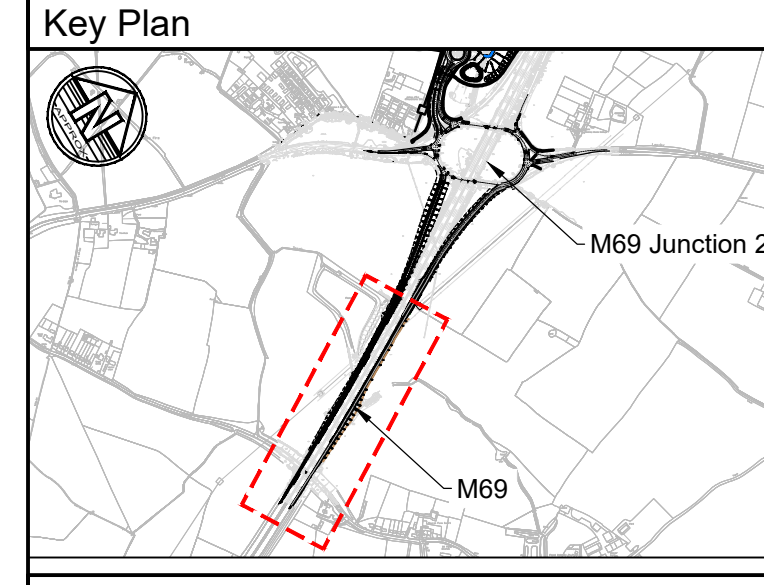
- 7.1 The permitted cross sections of the connector roads are derived from CD 122 paragraph 5.17 and Table 5.17b. Cross sectional layouts are given in CD 127 for the relevant connector road types.
- 7.2 The enclosed section drawings at **Appendix A** show the proposed cross sections of the merge and diverge slip roads.
- 7.3 The northbound diverge connector road complies with the DG2A road type from CD 127 Figure 2.1.1N1b.
- 7.4 The southbound merge connector road complies with the MG2C road type from CD 127 Figure 2.1.1N1b.
- 7.5 On both the northbound and southbound slip roads, cross sectional departures from standards are required through the Hinckley Road overbridge structure. The cross section through the structure departs from CD 127 Paragraph 2.7 as no nearside hard shoulder is provided.
- 7.6 The departures from standard have been submitted to NH SES (departure IDs 102866 and 104401) and both have been granted provisional approval pending agreement of traffic modelling through the DCO process.
- 7.7 The extent of the discontinuous hard shoulder is shown on the drawings included at **Appendix A**

APPENDICES

APPENDIX A: Drawings



- Notes**
- Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
 - This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
 - All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.
 - Any discrepancies noted on site are to be reported to the engineer immediately.
 - This drawing is to be read in conjunction with Plan and Profile drawing HRF-BWB-HML-M69-DR-CH-0160.



Rev	Date	Details of issue / revision	Drawn	Checked
P01	20.10.23	Preliminary Issue	JM	SC

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Client

TRITAX SYMMETRY
A TRITAX BIG BOX COMPANY

Project Title

**HINCKLEY NATIONAL RAIL
FREIGHT INTERCHANGE**

Drawing Title

**M69 J2 SOUTH FACING
SLIP ROADS MERGE AND
DIVERGE PLAN AND
PROFILE SHEET 1**

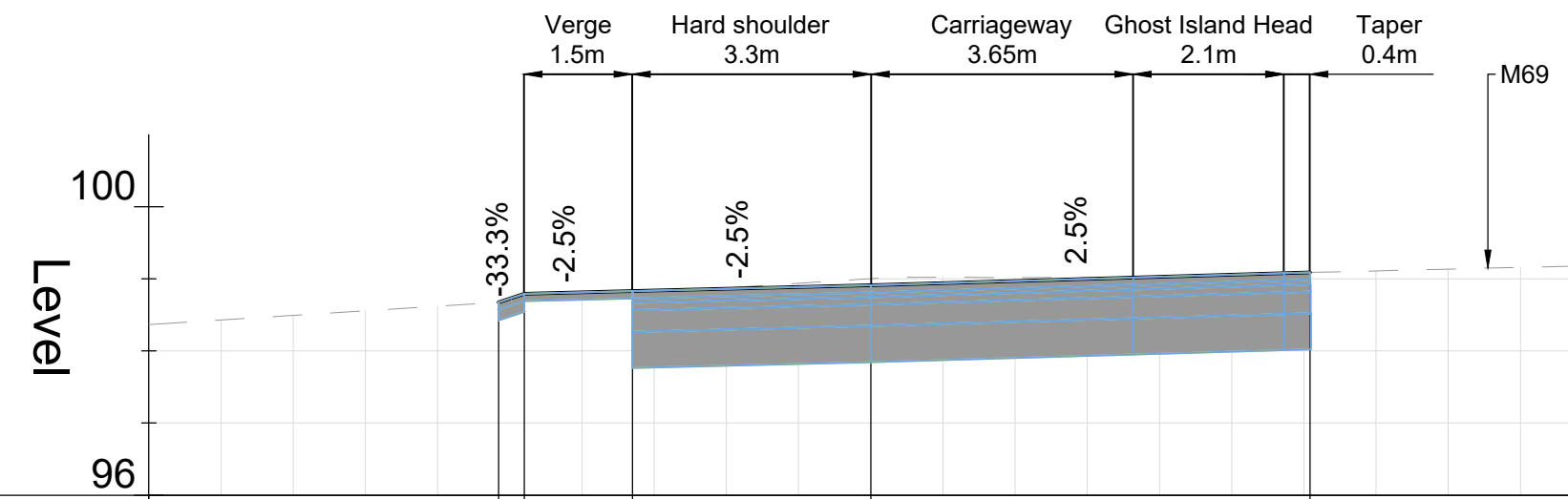
Drawn: J.Manifold **Reviewed:** S.Carter

BWB Ref: NTT2814 **Date:** 20.10.23 **Scale@A1:** 1:1000

Drawing Status: **PRELIMINARY**

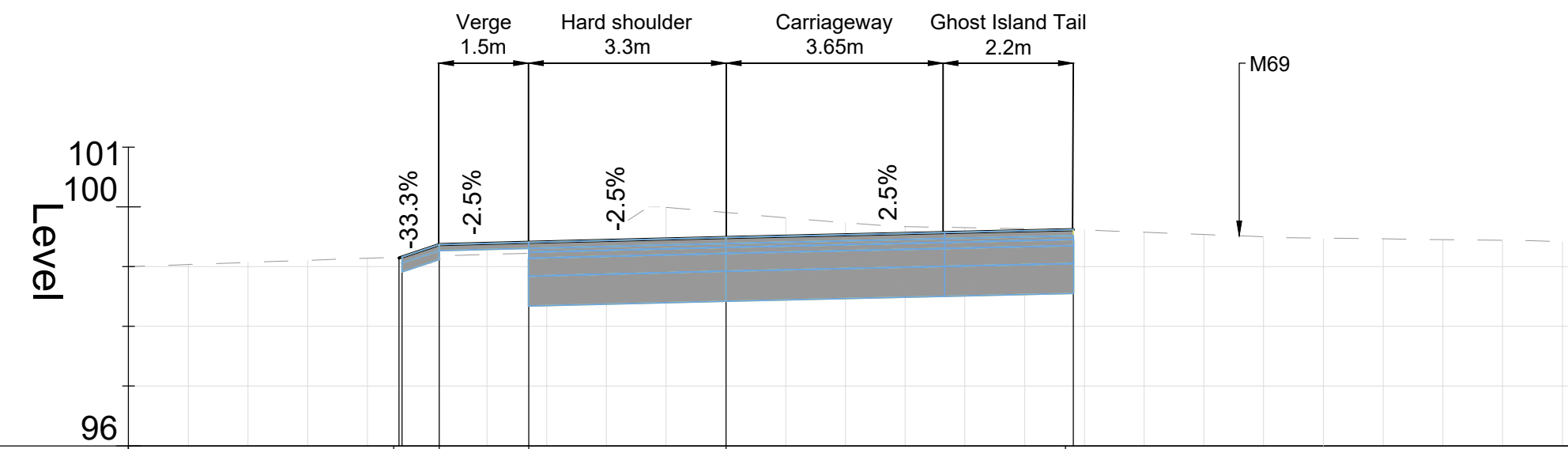
Project - Originator - Zone - Level - Type - Role - Number **Status** **Rev**

HRF-BWB-HML-M69-DR-CH-0150 S4 P01



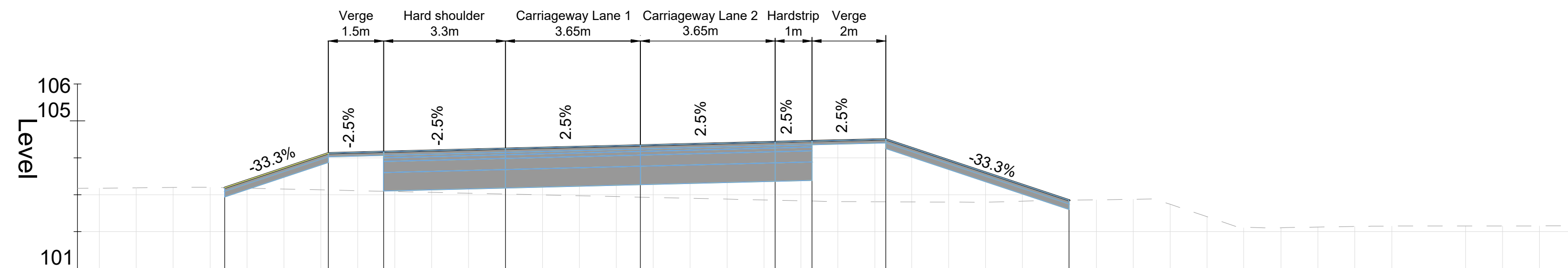
Proposed Levels	98.673	98.791	98.829	98.911	99.087
Existing Levels	98.673	98.696	98.791	99.001	99.087
Offsets	-5.153	-4.800	-3.300	0.000	6.087

Cross Section 4
Diverge Connector Road
Chainage 400.000



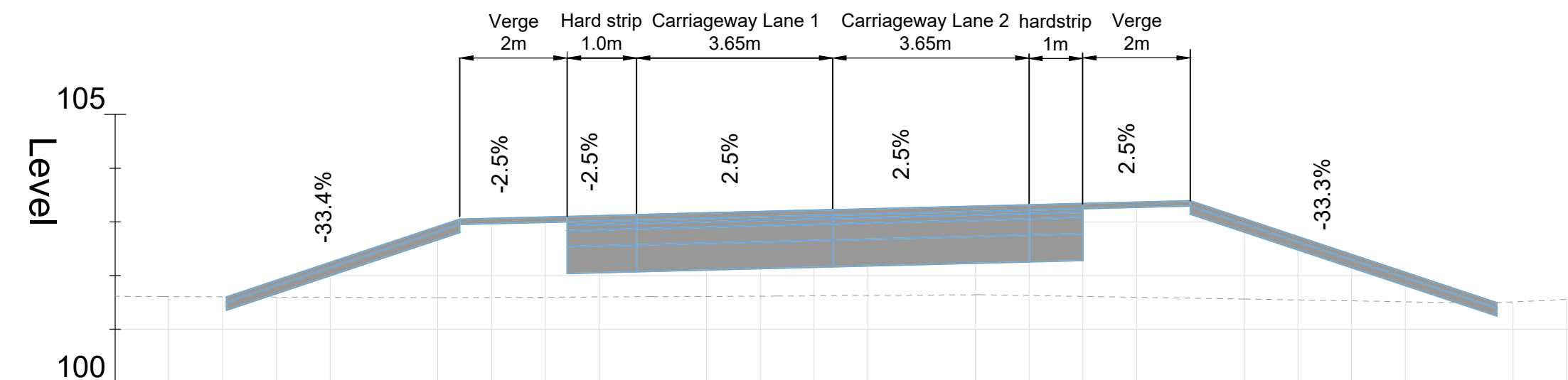
Proposed Levels	99.142	99.367	99.405	99.904	99.617
Existing Levels	99.159	99.197	99.223	99.904	99.617
Offsets	-5.473	-4.800	-3.300	0.000	5.814

Cross Section 3
Merge Connector Road
Chainage 650.000



Proposed Levels	103.191	104.126	104.164	104.246	104.338	104.429	104.454	104.504	102.850
Existing Levels	103.191	103.127	103.093	103.018	102.934	102.851	102.828	102.807	102.850
Offsets	-7.605	-4.800	-3.300	0.000	3.650	7.300	8.300	10.300	15.262

Cross Section 2
Merge Connector Road
Chainage 200.000



Proposed Levels	101.604	103.051	103.101	103.141	103.224	103.300	103.343	103.394	101.495
Existing Levels	101.604	101.589	101.598	101.606	101.624	101.639	101.612	101.579	101.495
Offsets	-7.928	-3.591	-1.591	0.000	3.264	6.287	7.9863	9.999	15.702

Cross Section 1
Diverge Connector Road
Chainage 750.000

- Notes**
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 - This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
 - All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.
 - Any discrepancies noted on site are to be reported to the engineer immediately.
 - This drawing is to be read in conjunction with Plan and Profile drawing HRF-BWB-HML-M69-DR-CH-0150, HRF-BWB-HML-M69-DR-CH-0151, HRF-BWB-GEN-XX-SK-CH-SK143 & HRF-BWB-GEN-XX-SK-CH-SK144

- Legend**
- Existing Ground
 - Proposed Ground

P02	14.12.23	Updated diverge cross section	JM	SC
P01	20.10.23	Preliminary Issue	JM	SC
Rev	Date	Details of issue / revision	Drw	Rev

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TRITAX SYMMETRY
A TRITAX BIG BOX COMPANY

Project Title
HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

Drawing Title
M69 J2 SOUTH FACING SLIP ROADS MERGE AND DIVERGE CROSS SECTIONAL ARRANGEMENT

Drawn: J.Manifold Reviewed: S.Carter

BWB Ref: NTT2814 Date: 14.12.23 Scale@A1: 1:100

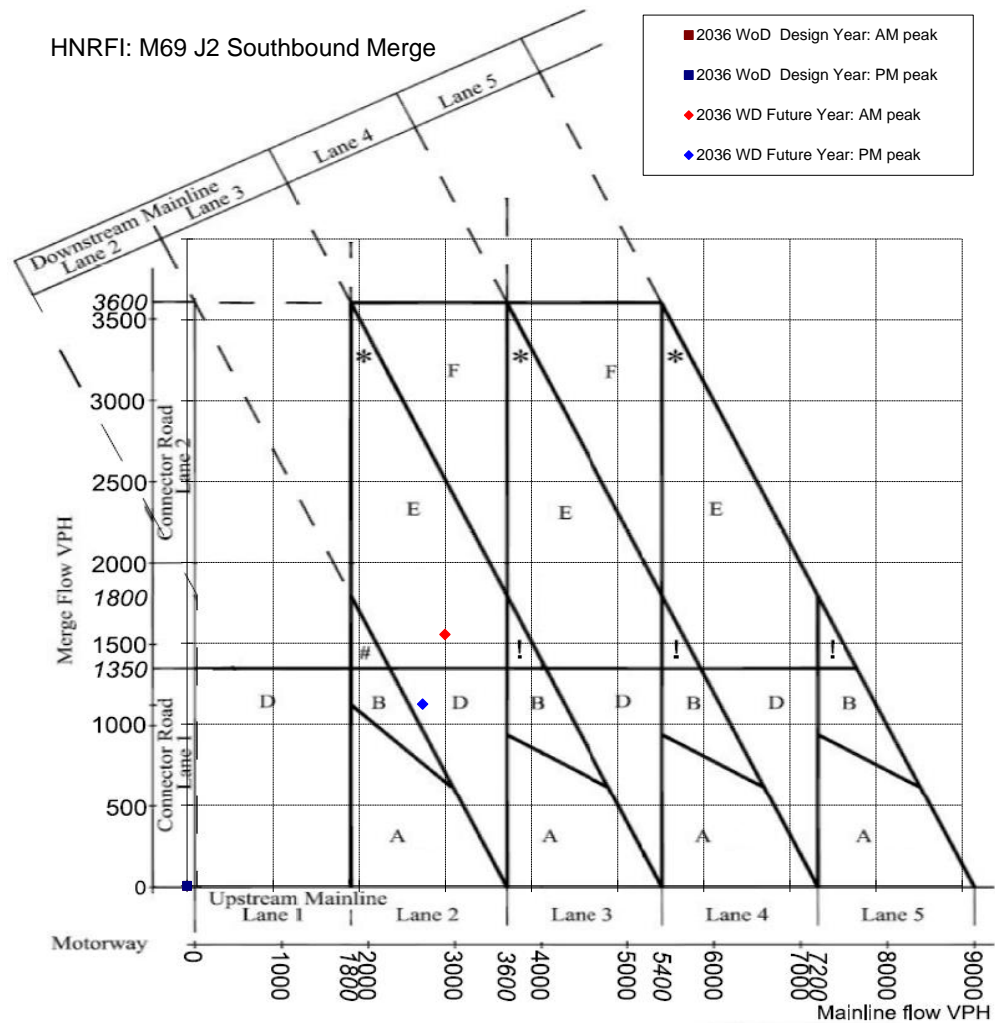
Drawing Status
PRELIMINARY

Project - Originator - Zone - Level - Type - Role - Number Status Rev
HRF-BWB-HML-M69-DR-CH-0160 S2 P02

APPENDIX B: Merge and Diverge Calculations

Merge & Diverge Assessment to DMRB CD 122					
Scheme details					
Scheme name	HNRFI		Calculation Date	06.12.23	
Job Number	NTT2814		Revision No.	2	
Section reference: M69 J2 Southbound Merge					
Road Data					
Road type	Motorway		Average gradient (uphill is +ve)		
Junction type	Merge				
Mainline gradient	<2%				
Merge gradient	>4%				
HGV data					
	AM	PM			
Mainline % HGVs	9.76%	8.36%	% HGVs on mainline > 7.5T		
Mainline HGV factor	1.00	1.00			
Merge % HGVs	16.21%	19.20%	% HGVs on merge > 7.5T		
Merge HGV factor	1.06	1.09			
Traffic Data					
Unadjusted Traffic flow (vph)					
Year	Select Case	Upstream mainline		Merging flow	
		AM	PM	AM	PM
2036 WoD	Design Year	0	0	0	0
2036 WD	Future Year	2,993	2,734	1,467	1,029
Adjusted flows (vph)					
		AM	PM	AM	PM
2036 WoD	Design Year	0	0	0	0
2036 WD	Future Year	2,993	2,734	1,555	1,124

HNRFI: M69 J2 Southbound Merge



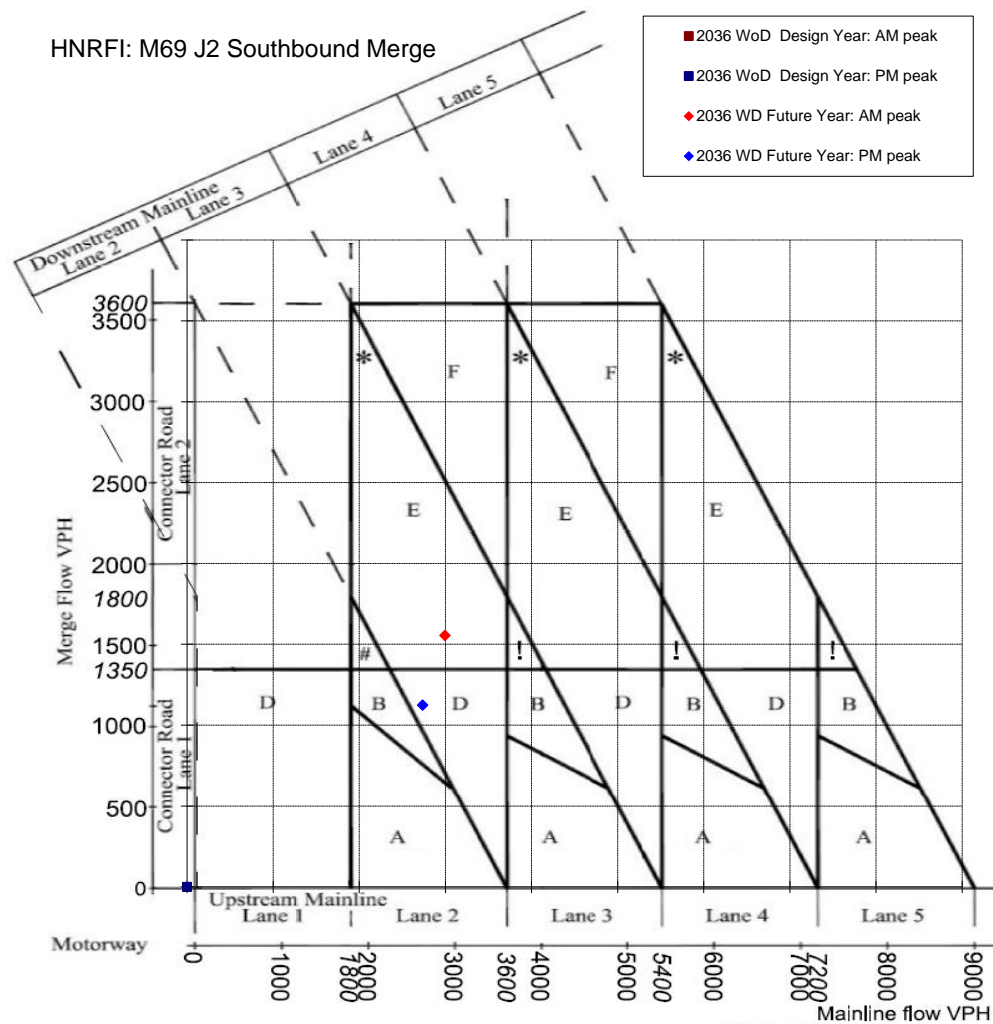
the # symbol indicates areas of uncertainty and the choice depends on the upstream and downstream provision and the ability for the mainline to accept the flows from the merge

the ! symbol indicates that the minimum layout to be provided is:
 1) Layout C for rural roads;
 2) Layout A Option 2 for urban roads.

Where the flows are in the region indicated by the * symbol in Figure 3.12b and Layout E option 2 is to be used, an extended auxiliary lane should be provided instead of a taper merge

Merge & Diverge Assessment to DMRB CD 122					
Scheme details					
Scheme name	HNRFI		Calculation Date	06.12.23	
Job Number	NTT2814		Revision No.	2	
Section reference: M69 J2 Southbound Merge					
Road Data					
Road type	Motorway		Average gradient (uphill is +ve)		
Junction type	Merge				
Mainline gradient	<2%				
Merge gradient	>4%				
HGV data					
	AM	PM			
Mainline % HGVs	9.76%	8.36%	% HGVs on mainline > 7.5T		
Mainline HGV factor	1.00	1.00			
Merge % HGVs	16.21%	19.20%	% HGVs on merge > 7.5T		
Merge HGV factor	1.06	1.09			
Traffic Data					
Unadjusted Traffic flow (vph)					
Year	Select Case	Upstream mainline		Merging flow	
		AM	PM	AM	PM
2036 WoD	Design Year	0	0	0	0
2036 WD	Future Year	2,993	2,734	1,467	1,029
Adjusted flows (vph)					
		AM	PM	AM	PM
2036 WoD	Design Year	0	0	0	0
2036 WD	Future Year	2,993	2,734	1,555	1,124

HNRFI: M69 J2 Southbound Merge



the # symbol indicates areas of uncertainty and the choice depends on the upstream and downstream provision and the ability for the mainline to accept the flows from the merge

the ! symbol indicates that the minimum layout to be provided is:
 1) Layout C for rural roads;
 2) Layout A Option 2 for urban roads.

Where the flows are in the region indicated by the * symbol in Figure 3.12b and Layout E option 2 is to be used, an extended auxiliary lane should be provided instead of a taper merge

APPENDIX C: Weaving Assessment

Weaving Calculation to DMRB**CD 122****Scheme details**

Scheme name	M69 J1-2	Calculation Date	06.12.23
Job Number	NTT2814	Revision No.	1

Section reference	M69 J1-2 Northbound
Traffic data used	2036 with development

Road Data

Road type	Motorway	
D	1800	vph
% HGVs	11.9%	% HGVs on mainline > 7.5T
Mainline gradient	<2%	Average gradient over Lact
HGV factor	1	
Lact	2.57	km Actual weaving distance (CD122 para 4.4)
Lmin	2	km Minimum weaving distance

Traffic Data		Traffic flow (vph)		Is flow	Reference
From	To	AM peak	PM peak	weaving?	(Scheme specific)
J1 Merge	J1 Mainline	988	826	Yes	
J1 Merge	J2 Diverge	0	0	No	
J1 Mainline	J2 Diverge	1052	1497	Yes	
J1 Mainline	J2 Mainline	1473	1788	No	
Qnw - non weaving flow		1473	1788		
Qw1 - major weaving flow		1052	1497		
Qw2 - minor weaving flow		988	826		
Number of lanes required		2.81	3.00		

Weaving Calculation to DMRB**CD 122****Scheme details**

Scheme name	M69 J2-1	Calculation Date	06.12.23
Job Number	NTT2814	Revision No.	1

Section reference	M69 J2-1 Southbound
Traffic data used	2036 with development

Road Data

Road type	Motorway	
D	1800	vph
% HGVs	9.8%	% HGVs on mainline > 7.5T
Mainline gradient	<2%	Average gradient over Lact
HGV factor	1	
Lact	2.77	km Actual weaving distance (CD122 para 4.4)
Lmin	2	km Minimum weaving distance

Traffic Data		Traffic flow (vph)		Is flow	Reference
From	To	AM peak	PM peak	weaving?	(Scheme specific)
J2 Merge	J2 Mainline	1467	1029	Yes	
J2 Merge	J1 Diverge	0	0	No	
J2 Mainline	J1 Diverge	1014	1080	Yes	
J2 Mainline	J1 Mainline	1979	1654	No	
Qnw - non weaving flow		1979	1654		
Qw1 - major weaving flow		1467	1080		
Qw2 - minor weaving flow		1014	1029		

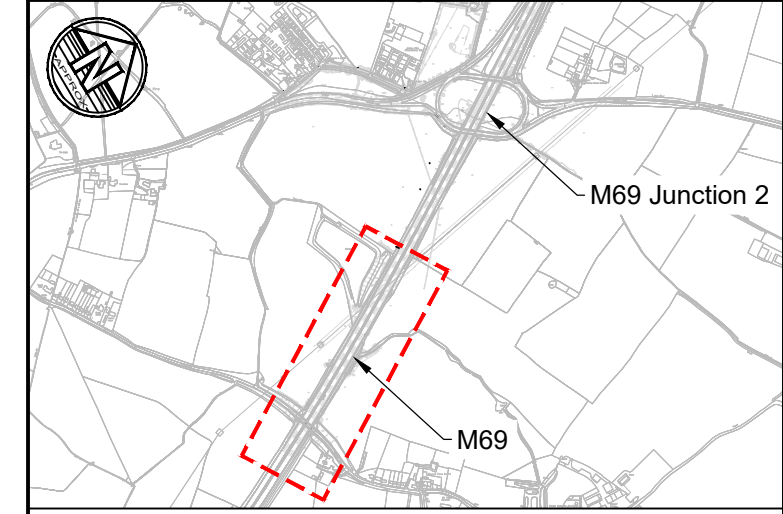
Number of lanes required	3.29	2.92
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APPENDIX D: Slip Road Visibility Drawings

Notes

1. Do not scale this drawing. All dimensions must be checked/ verified on site. If in doubt ask.
2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
3. All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.
4. Any discrepancies noted on site are to be reported to the engineer immediately.
5. This drawing is to be read in conjunction with Forward Visibility drawing HRF-BWB-GEN-XX-SK-CH-144

Key Plan



Legend

- Existing Ground
- Proposed Ground
- 295m SSD Vertical
- 120m SSD Horizontal
- 295m SSD Horizontal

P01	13.12.23	Preliminary Issue	JM	SC
Rev	Date	Details of issue / revision	Drw	Rev

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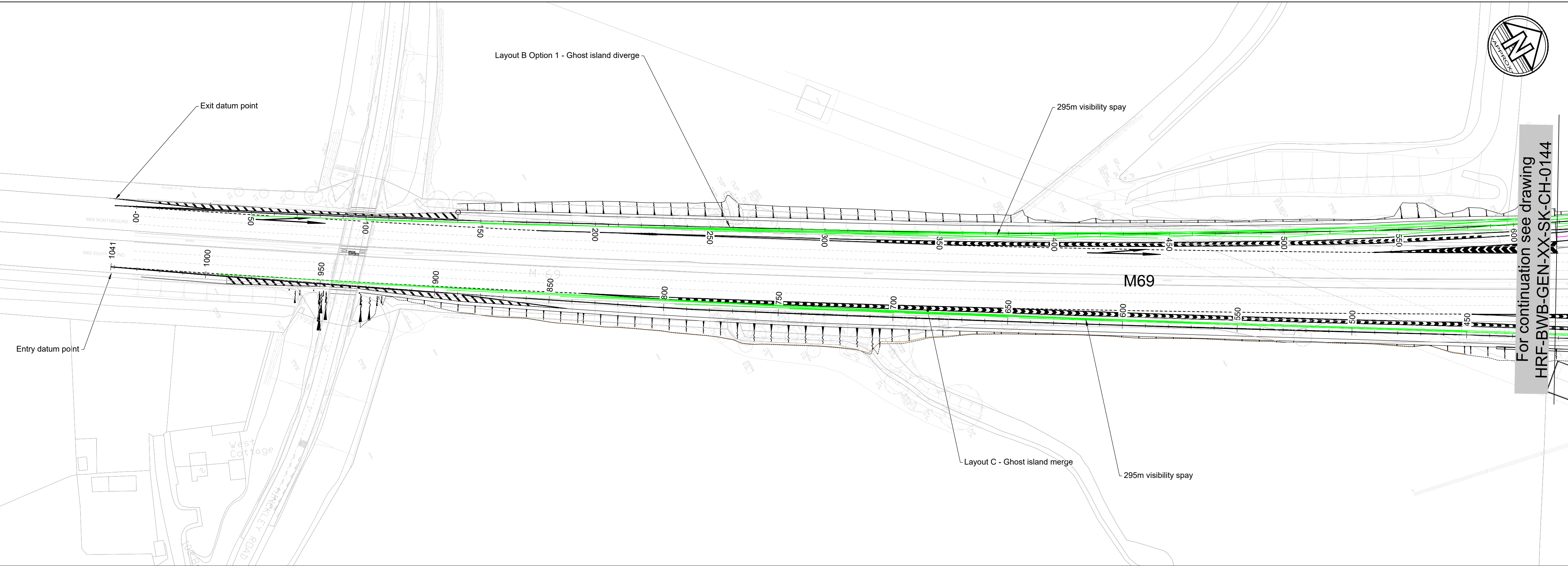
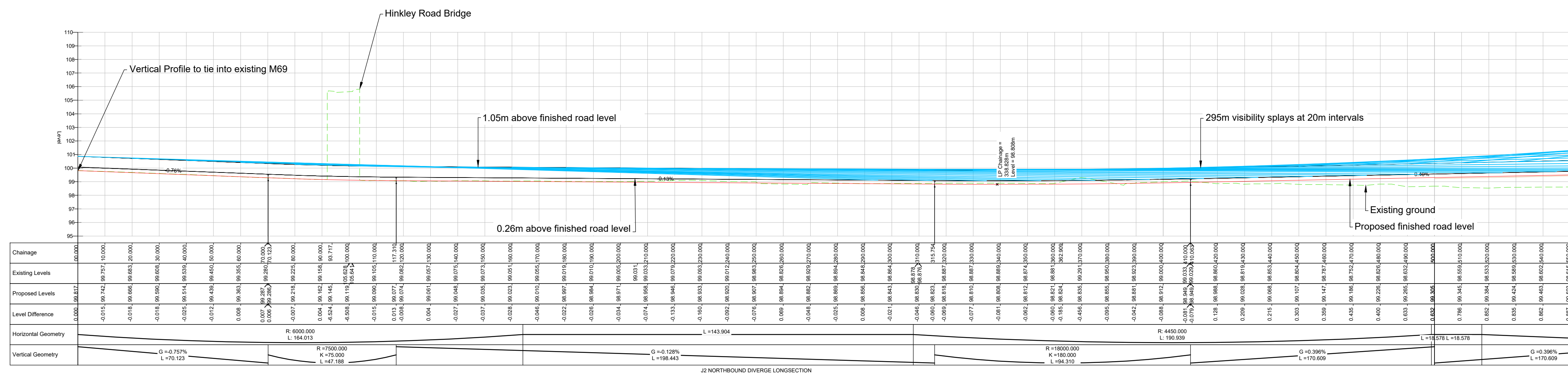
Project Title
HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

Drawing Title
M69 J2 SOUTH FACING SLIP ROADS MERGE AND DIVERGE FORWARD VISIBILITY

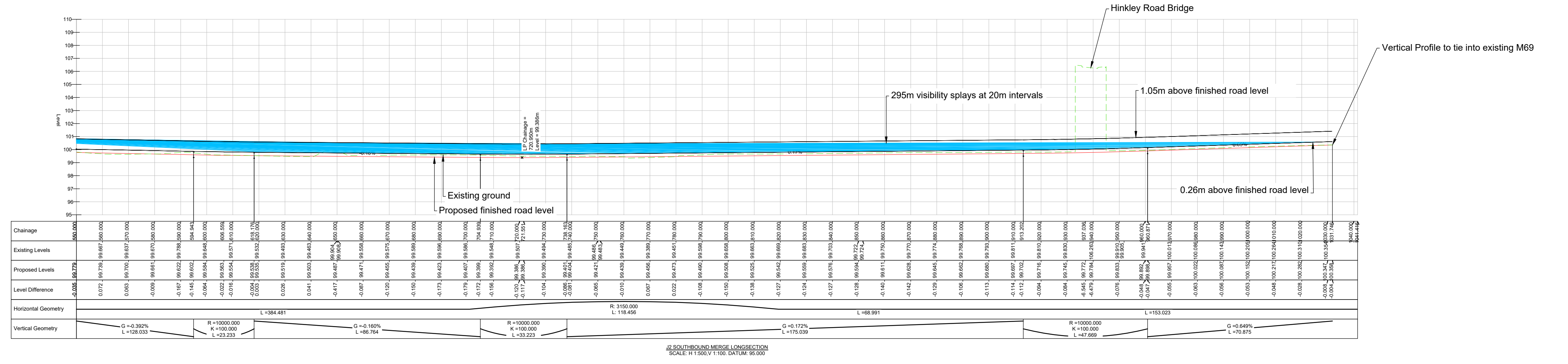
Drawn:	J.Manifold	Reviewed:	S.Carter
BWB Ref:	NTT2814	Date:	13.12.23
Scale@A1:	1:1000		

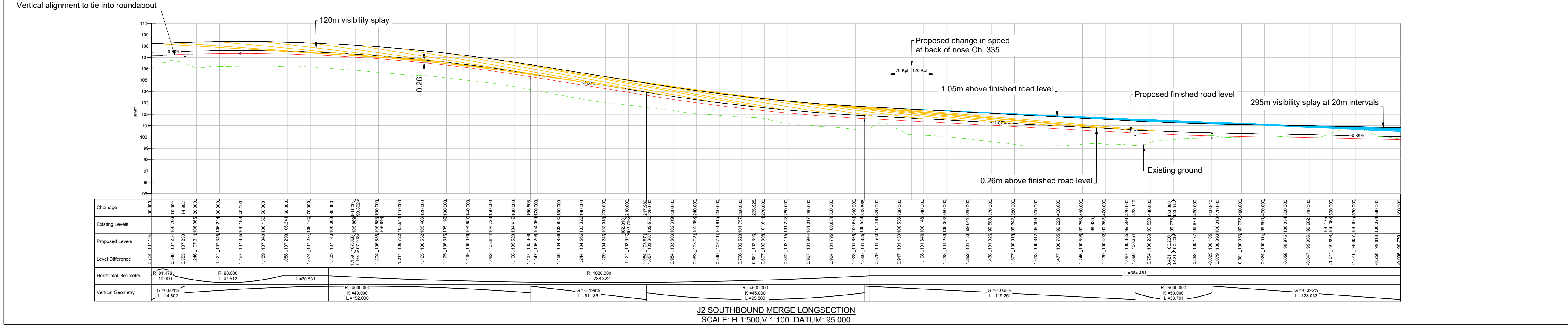
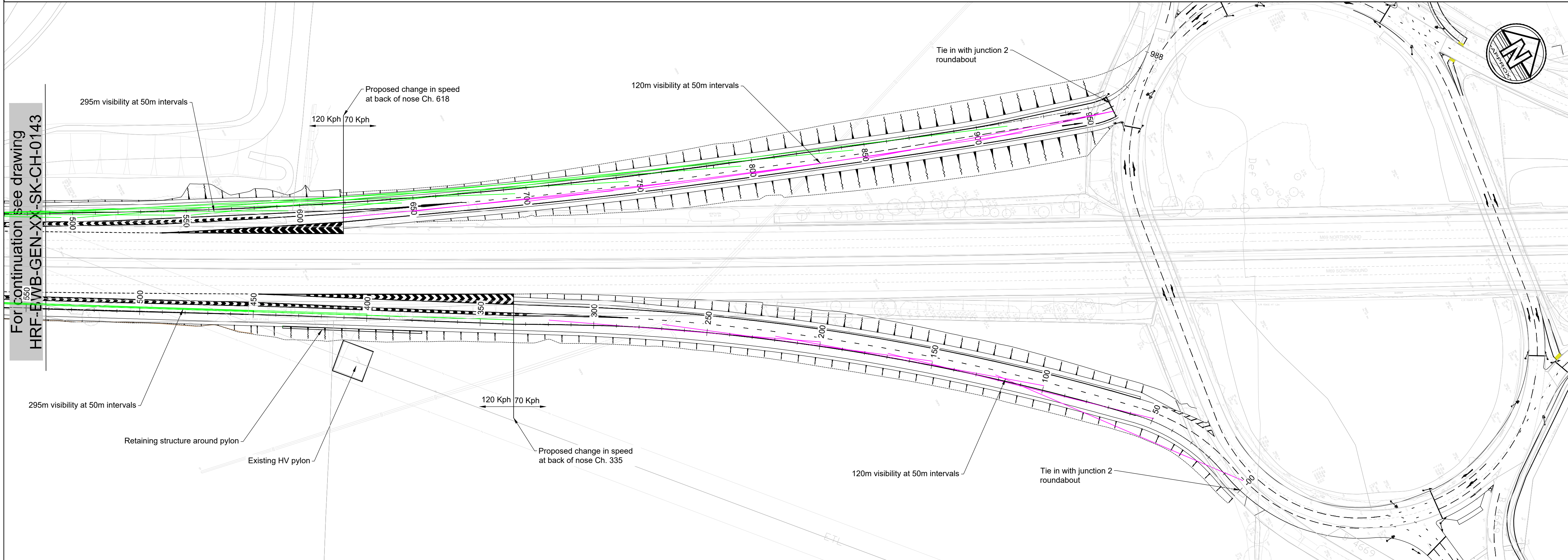
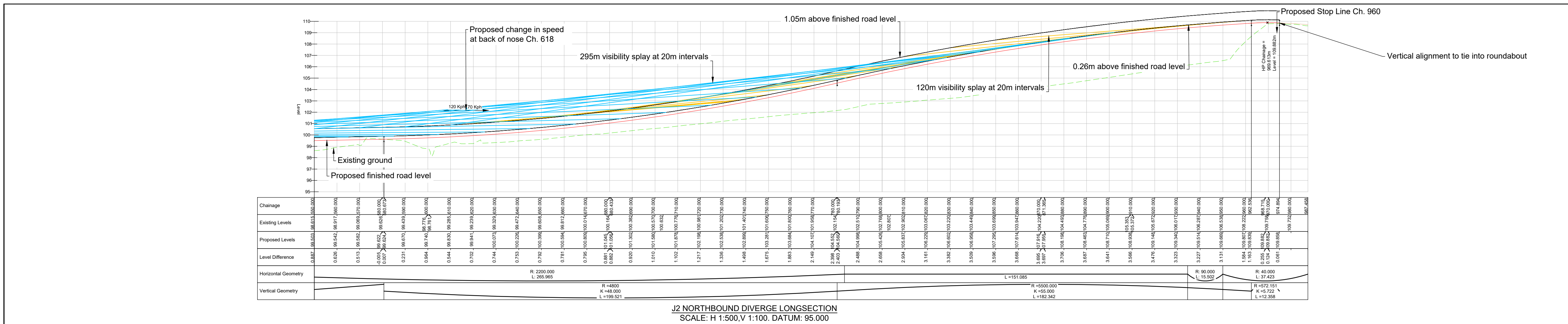
Drawing Status
PRELIMINARY

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
HRF-BWB-GEN-XX-SK-CH-0143	S2	P01



For continuation see drawing
HRF-BWB-GEN-XX-SK-CH-0144





Notes

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- Any discrepancies noted on site are to be reported to the engineer immediately.
- This drawing is to be read in conjunction with Forward Visibility drawing HRF-BWB-GEN-XX-SK-CH-SK143

Key Plan

Legend

- Existing Ground
- Proposed Ground
- 295m SSD Vertical
- 120m SSD Horizontal
- 295m SSD Horizontal
- 120m SSD Vertical

P01	13.12.23	Preliminary Issue	JM	SC
Rev	Date	Details of issue / revision	Drw	Rev
Issues & Revisions				
<ul style="list-style-type: none"> Birmingham 0121 233 3322 Leeds 0113 233 8000 London 020 7407 3879 Manchester 0161 233 4260 Nottingham 0115 924 1100 				

Client

Project Title

HINCKLEY NATIONAL RAIL FREIGHT INTERCHANGE

Drawing Title

M69 J2 SOUTH FACING SLIP ROADS MERGE AND DIVERGE FORWARD VISIBILITY

Drawn:	J.Manifold	Reviewed:	S.Carter
BWB Ref:	NTT 2814	Date:	13.12.23
Scale@A1:	1:1000		
PRELIMINARY			
Project - Originator - Zone - Level - Type - Role - Number	Status	Rev	
HRF-BWB-GEN-XX-SK-CH-0144	S2	P01	



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