

5 The Proposed Scheme

5.1 Introduction

5.1.1 This chapter provides an introduction to the Proposed Scheme for assessment. It includes screenshots from the Project 9, Crubenmore to Kincaig, visualisation tool used to inform the public exhibitions. These images are presented for illustration purposes, and readers should refer to the Proposed Scheme **Drawings 5.2 to 5.13 (GIS layout)** and **Drawings 5.14 to 5.25 (Engineering Plan and Profile)**, provided in **Volume 3** which provide the most up-to-date information, including any design refinements since public exhibitions.

5.2 Proposed Scheme Overview

5.2.1 A high quality dual carriageway will be constructed along approximately 16.5 km (including tie-ins) of the A9 between Crubenmore and Kincaig, replacing the existing single carriageway road. The proposal consists of generally on-line widening of the existing A9 carriageway including the incorporation of grade separated junctions at Newtonmore and Kingussie. Near Kingussie, the proposals include a localised section of offline widening, taking the Spey bridge crossing and embankment offline to the east of the existing structure. There will be no gaps in the central reservation in order to prevent right-turn manoeuvres across the carriageway. **Table 5-1** outlines the cross-section requirements for a rural all-purpose dual carriageway in accordance with the DMRB.

Table 5-1: Rural all-purpose dual carriageway cross section width requirements

Verge (m)	Nearside Hard Strip (m)	Carriageway (m)	Offside Hard Strip (m)	Central Reserve (m)	Offside Hard Strip (m)	Carriageway (m)	Nearside Hard Strip (m)	Verge (m)
2.5	1.0	7.3 (2x 3.65m lanes)	1.0	2.5	1.0	7.3 (2x 3.65m lanes)	1.0	2.5

Note: Verge and central reserve dimensions are minimum values that may need to be increased to suit particular circumstances e.g. forward visibility.

- 5.2.2 Cuttings and earthworks are required along the route and the size of these varies depending on local topography, stability requirements and any landscape design to blend with local landform. The total surface area of permanent infrastructure works required is approx. 215 hectares.
- 5.2.3 The vertical alignment is higher than the existing A9 where necessary to accommodate side road underpasses, new junction underpasses (e.g. at Newtonmore), agricultural underpasses, and to accommodate the road drainage system. Drainage layouts have been developed, including consideration of Sustainable Drainage System (SuDS) features, swales, watercourse crossings and diversions, ditches, and outfalls.
- 5.2.4 Where watercourse crossing structures are required (i.e. bridges), the level of detail assumes a main span sufficient to avoid permanent in-channel works. With respect to culverts, the principal design assumption is that existing culverts that are currently undersized (with respect to the Flood Estimation Handbook (FEH) estimation methods) will be upsized to accommodate a 1:200-year flow, unless other constraints dictate retention at smaller sizes.
- 5.2.5 Note that the engineering plan and profile drawings (**Drawings 5.14 to 5.25, Volume 3**) detail the horizontal and vertical profile of the proposed mainline and junction layouts.

5.3 Permanent Works – Mainline and Junction Infrastructure (Operational Phase)

- 5.3.1 It should be noted that the earthworks slopes in the images extracted from the visualisation tool below show straight line gradients from top to bottom and, whilst these demonstrate the footprint/ extent of slopes, they do not incorporate any landform contouring or mitigation planting, e.g. trees and shrubs, nor do they show any of the earthworks associated with lay-by designs within the scheme.

Southern extent from Crubenmore dual carriageway to Glen Truim – chainage 40,000 40,846

- 5.3.2 **Figure 5-1** shows the horizontal alignment of the mainline looking north from the existing dual carriageway at Crubenmore and onto the new C1137 side road crossing of the HML at Glen Truim. This section widens to the east of the existing A9, due to the HML railway and River Truim constraints to the west. Readers should also refer to Proposed Scheme **Drawing 5.2** in **Volume 2**.

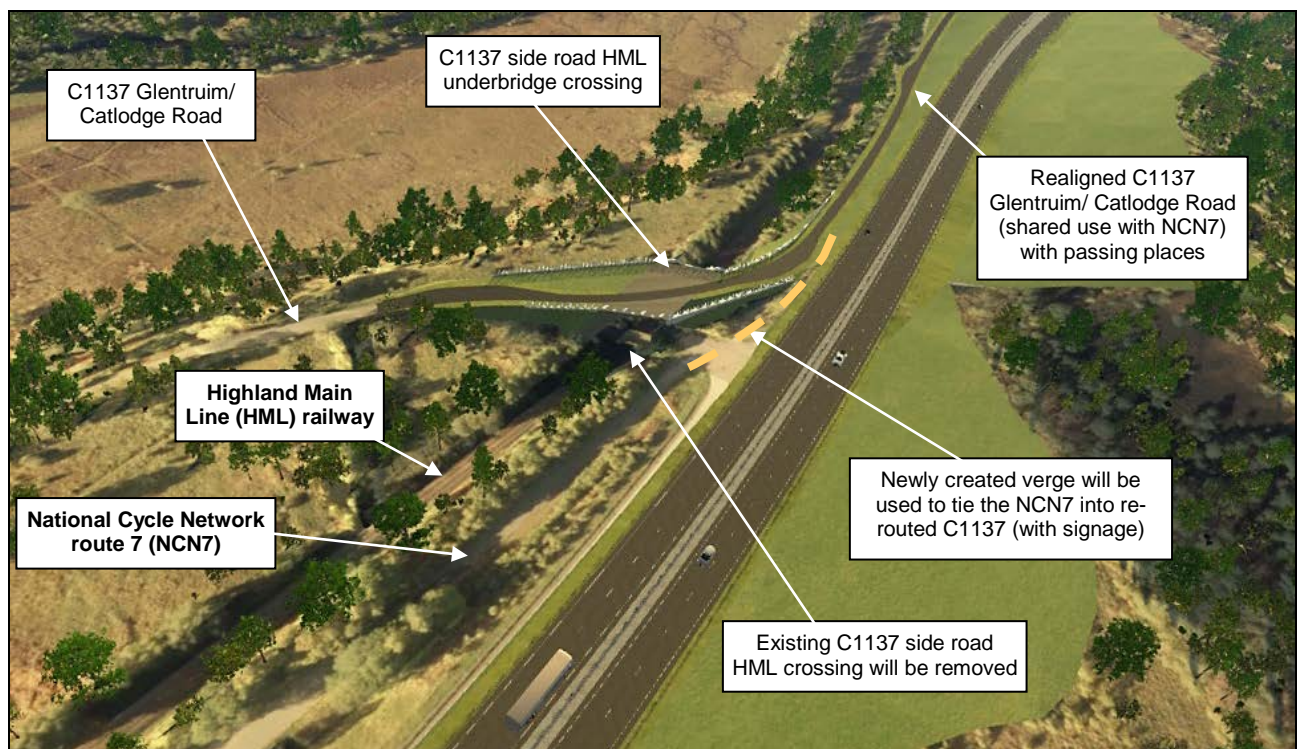


Figure 5-1: Ch. 40,000-40,846 – Dualling to southbound (east) side of existing A9 at Glen Truim

- 5.3.3 National Cycle Network route 7 (NCN7) runs parallel to the west, between the A9 and the HML. NCN7 connectivity will be preserved to the north via a replacement connection to the re-routed Glen Truim/ Catlodge (C1137) side road at approx. ch. 40,650 where the NCN7 becomes a shared use route with the C1137.
- 5.3.4 As noted above, the realigned C1137 requires a new crossing of the HML which, whilst not a dual carriageway crossing, is required as part of the scheme. There are no significant watercourse crossings in this section; however, the road drainage system connects to local watercourses which drain to the River Truim.

Mainline Alignment – chainage 40,846 to 44,662

- 5.3.5 The mainline horizontal alignment in this section continues dualling to the east (southbound side) of the existing A9, avoiding the HML and River Truim to the west. This section includes a northbound access to the Ralia Café and Tourist Information rest area and to Glen Truim, and a new grade separated junction with an underpass link road at Newtonmore. Readers should refer to Proposed Scheme **Drawings 5.2 to 5.5** in **Volume 2**.
- 5.3.6 **Figure 5-2** below shows the new left-in/ left-out (LILO) access off the northbound carriageway at approx. ch. 41,650, with a new lay-by on the southbound carriageway opposite at approx. ch. 41,700.

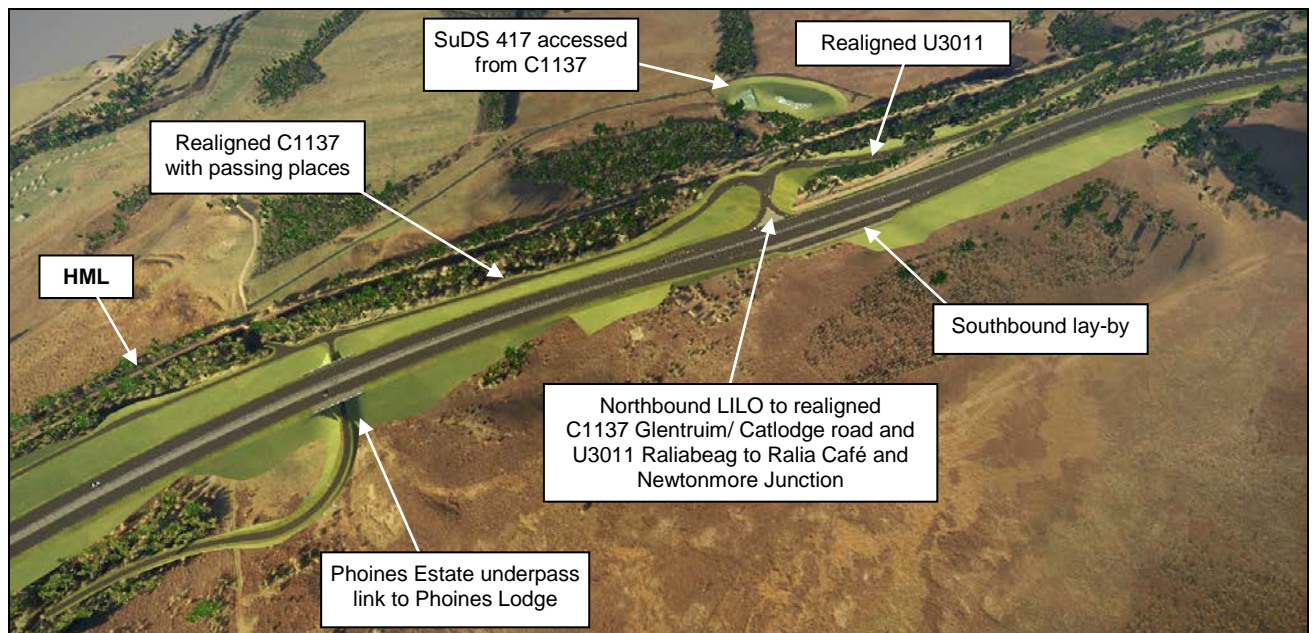


Figure 5-2: Approx. ch. 41,400-41,800 – Northbound LILO access to Ralia and Glen Truim

- 5.3.7 The LILO access on the northbound carriageway replaces the existing left-off only access to Ralia Café and Tourist Information and connects to the realigned Glen Truim/ Catlodge Road (C1137). Travelling south from this connection provides access to Glentruim properties, and an underpass at approx. ch. 41,275 provides access to Phoines Estate and Phoines Lodge. The replacement LILO therefore provides northbound access from these properties to the A9.
- 5.3.8 The NCN7 shares the C1137 route travelling north from approx. ch. 40,650, and an access track connection from the C1137, across the HML at approx. ch. 41,250, provides for maintenance access to SuDS basin 417. This SuDS feature includes an outlet swale (open, grassed channel) to the River Truim to the west of approx. ch. 41,700.
- 5.3.9 With respect to Ralia Café and Tourist Information, the LILO provides northbound access to/ from the rest area. However, users of the rest area can also opt to continue north on the Raliabeag road (U3011) to the new Newtonmore junction. The U3011 Raliabeag road north from the LILO will be widened to accommodate two-way traffic to the Ralia Café.
- 5.3.10 NCN7 continues as a shared route along the widened Raliabeag road, and onto the new Newtonmore Junction where it then transfers onto the verge of the B9150 towards Newtonmore.
- 5.3.11 This section crosses a number of watercourses, including:
- Allt Torr an Daimh at ch. 42,050-42,100 (south of Ralia Café)

- Caochan Riabhach at ch. 43,525 (north of the Newtonmore Junction)
- unnamed watercourse at ch. 43,800 which flows to Caochan Riabhach (south of Ralia Lodge).

- 5.3.12 At approx. ch. 42,100 the dualled A9 requires local diversion of the Allt Torr an Daimh to a new culvert; the diversion will also connect to a new culvert under the widened Raliabeag road. A separate watercourse diversion requires new/ replacement culverts under the A9 and the Raliabeag road at approx. ch. 42,925.
- 5.3.13 The new southbound carriageway to the east of the Ralia Café and the existing A9 requires a larger rock cut slope than the existing single carriageway. Rock trap ditches will be provided, and the final cut slopes may require platform benching (i.e. levelled terraces); however, such slope treatments will be confirmed and designed following pre-construction rock stability investigations.

Newtonmore Junction

- 5.3.14 The horizontal alignment and layout of the proposed Newtonmore Junction is shown in **Figure 5-3** below, and readers should also refer to Proposed Scheme **Drawing 5.4** in **Volume 2**. The A9 mainline vertical alignment is elevated above the junction link road to the B9150 into Newtonmore (i.e. the link road passes under the mainline).

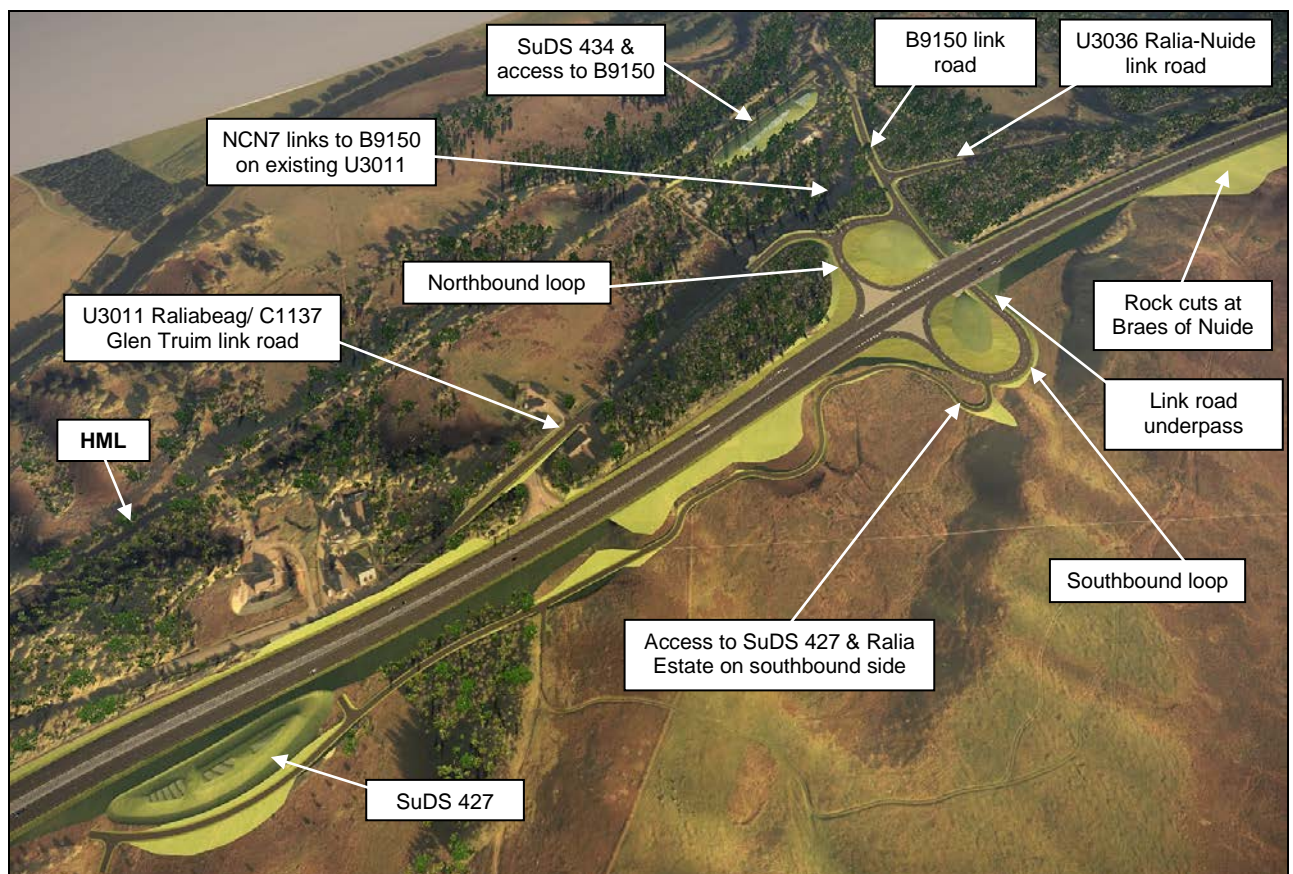


Figure 5-3: Approx. ch. 43,150-44,000 – Newtonmore Junction

- 5.3.15 The compact grade separated junction enables full turning provision in both north and southbound directions and removes the need to turn across the live A9 carriageway, thereby improving safety and reducing driver stress when compared to the right turn manoeuvres required at the existing junction.

- 5.3.16 The new junction comprises a connection to the U3011 Raliabeag/ C1137 Glentruim roads from the northbound loop, a connection from the southbound loop provides access to SuDS basin 427 and Ralia Estate on the southbound side, and a connection from the B9150 link road to the U3063 Ralia Lodge/ Nuide Farm road which runs to the west of the A9 generally parallel to the northbound carriageway. Note that the Ralia Lodge/ Nuide Farm road will also be upgraded with passing places along its length to a meet a new A9 northbound carriageway LILO access at approx. ch. 46,150.
- 5.3.17 NCN7 continues on the route of the existing U3011 Raliabeag road to connect to the B9150 into Newtonmore (i.e. NCN7 does not route onto the junction loop).

Mainline Alignment – chainage 44,662 to 48,881

- 5.3.18 Travelling north, this section extends past Braes of Nuide at approx. ch. 44,660 to 54,100, Nuide Farm at ch. 46,000, Burn of Inverton at ch. 47,350, Lochan an Tairbh at ch. 47,800 and onto Ruthven Cottage at ch. 48,800. The main constraints to the west of the A9 include Ralia and Nuide properties, the River Spey, its designated Special Area of Conservation (SAC), and floodplain. The Burn of Inverton is also part of the River Spey SAC. The horizontal alignment for dualling therefore continues to the east (southbound side) of the existing A9. Readers should refer to Proposed Scheme **Drawings 5.5 to 5.8 in Volume 2**.
- 5.3.19 The U3063 Ralia Lodge/ Nuide Farm road runs generally parallel to the northbound carriageway; as noted above, the U3063 will be widened with passing places along its length. The new southbound carriageway requires significant rock cuts at the Braes of Nuide area, from approx. ch. 44,500 to 45,600 which will require inclusion of rock traps, retaining walls and/ or platform benching; however, such slope treatments will be confirmed and designed following pre-construction rock stability investigations.
- 5.3.20 **Figure 5-4** below shows the new left-in/ left-out (LILO) access off the northbound carriageway at approx. ch. 46,150, connecting to the U3036 Ralia-Nuide road. A new lay-by is shown on the southbound carriageway at approx. ch. 46,300, with a northbound lay-by provided at approx. ch. 46,800; visible at the top-right of the image below.

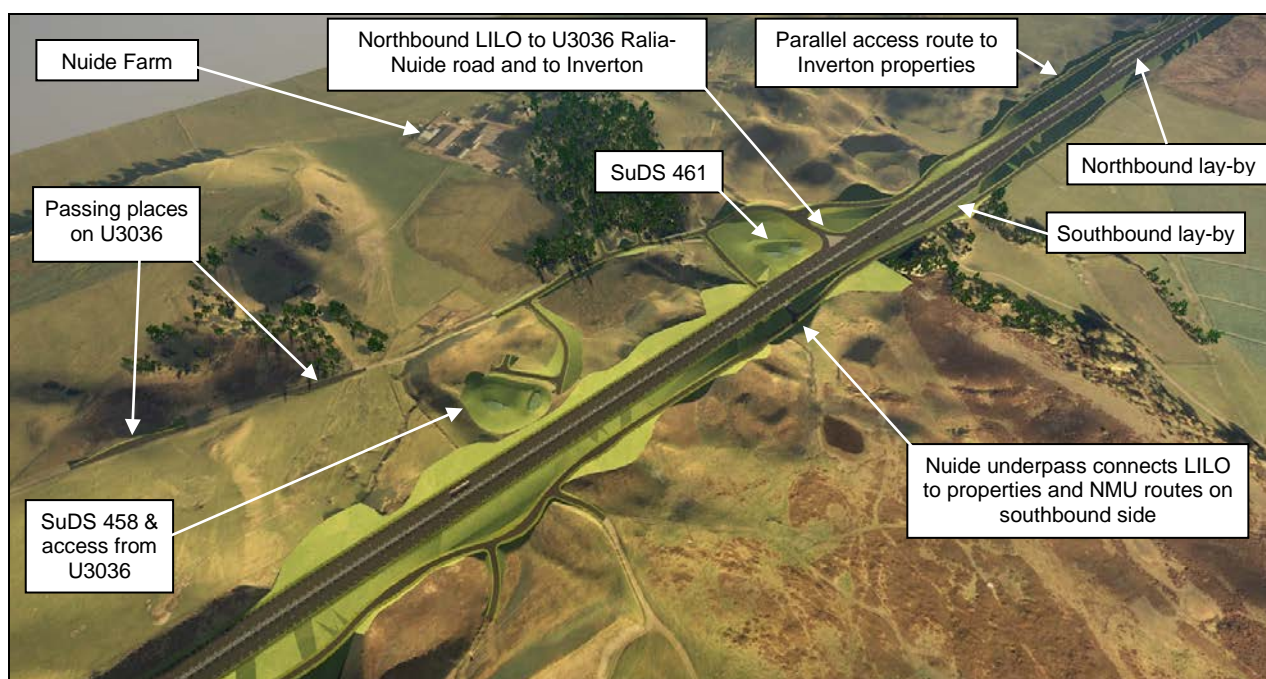


Figure 5-4: Approx. ch. 45,900-46,600 – Northbound LILO access to Nuide Farm and Ralia Lodge

- 5.3.21 The LILO provides for maintenance access to SuDS basins 458 and 461, as well as to a new underpass at approx. ch. 46,050. The underpass replaces the existing Nuide cattle creep, and is extended to provide for vehicle passage, connecting through to an access route provided alongside the southbound carriageway, with connections to Milton of Nuide and An Cnap. The A9 vertical alignment is elevated in this area to accommodate the vehicular underpass.
- 5.3.22 The LILO also provides for northbound access to/ from Inverton Cottage, the Bridge of Inverton and SuDS basin 474. This access runs generally parallel to the northbound A9 carriageway and also provides for connections to local tracks, for example, to Lochan an Tairbh, which is a noted geodiversity interest feature of the area.
- 5.3.23 This section includes Police Observation Platforms at approx. ch. 45,500 on the southbound carriageway and at approx. ch. 47,490 on the northbound side.
- 5.3.24 Watercourse crossings in this section include:
- Allt Eoghainn at ch. 45,650
 - Milton Burn/ Burn of Inverton at ch. 47,350
- 5.3.25 In general, new A9 watercourse crossings have been upsized to pass 1:200 year flows; however, following flood model analysis, flows through the Burn of Inverton crossing have been restricted to near existing flows, to retain upstream flood storage and limit passage of additional flow downstream. The existing three-pipe culvert system is replaced with a 2-span structure and a new, parallel underpass which is raised above the 1:200 flood level.
- 5.3.26 At the north end of this section, the A9 vertical alignment is raised to accommodate a replacement underpass structure at Ruthven Cottage (approx. ch. 48,800). Around the underpass location, local accesses are upgraded to connect to the B970 Ruthven Road via the General Wade’s Military Road (GWMR) to the east, and to provide maintenance access to SuDS basin 487 to the west. Accesses are provided for Ruthven Cottage and Knappach properties, with an access link to NMU routes provided between the A9 southbound carriageway and Knappach.

Mainline Alignment – chainage 48,881 to 52,812

- 5.3.27 This section extends from the Ruthven Cottage underpass (approx. ch. 48,880) over the B970 Ruthven Road crossing (approx. ch. 49,275) and into the RSPB Insh Marshes National Nature Reserve, on an embankment, to the new River Spey dual carriageway bridge (approx. ch. 49,950 to 50,240) before crossing the HML at Kingussie (approx. ch. 50,500).
- 5.3.28 The Kingussie Junction links the A9 to the A86 (Kingussie/ Spean Bridge) and the B9152 (Kingussie/ Aviemore), and the upgraded Kingussie Junction (from approx. ch. 50,550 to 51,200) and includes a new A86/ B9152 crossing at approx. ch. 50,750. The section ends close to Lynchat (approx. ch. 52,600 to 52,800) and readers should refer to Proposed Scheme **Drawings 5.8 to 5.10** in **Volume 2**.
- 5.3.29 Northbound lay-bys in this section are located at ch. 48,900 between Ruthven Cottage and the B970, and at approx. ch. 52,000 near Raitts Cave Souterrain. A southbound lay-by is located at ch. 49,450 at the southern extent of the embankment across the Insh Marshes.
- 5.3.30 This section contains a number of significant ecological conservation designations and other constraints, including:
- Insh Marshes National Nature Reserve (NNR)
 - Insh Marshes Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI)

- River Spey-Insh Marshes Special Protection Area (SPA) and Ramsar designation (Wetland of International Importance)
- River Spey SAC
- River Spey floodplain and locally active morphology (erosion and deposition)
- Ruthven Barracks and Raitt's Cave Souterrain Scheduled Monuments (SM)
- Kingussie community land at Glebe Ponds
- Kerrow, Laggan and Lynvoan Cottages
- B970 Ruthven Road
- the Highland Main Line railway

5.3.31 In addition to the River Spey, other watercourse crossings in this section include:

- Unnamed burn at ch. 51,250
- Allt Cealgach at ch. 51,700
- Unnamed burn at ch. 52,790

5.3.32 As noted above, this section includes a series of four bridge crossings and **Figure 5-5** shows this series on the existing A9 between the B970 and the A86/ B9152.

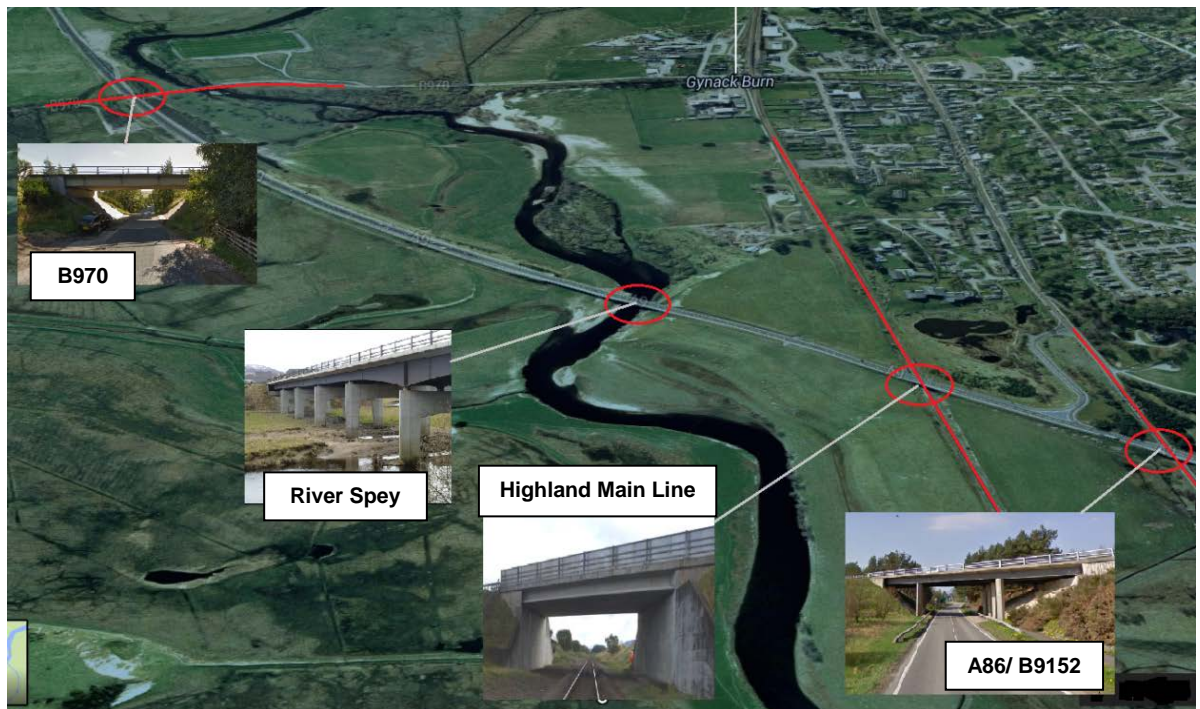


Figure 5-5: Series of four A9 bridges at Insh Marshes, River Spey, HML and the Kingussie Junction

5.3.33 The HML crossing between the Spey bridge and the A86/ B9152 bridge will be replaced to accommodate the dual carriageway; however, this bridge must also be raised in height and made wider to accommodate potential future electrification of the Highland Main Line infrastructure. The height required for the HML bridge sets the A9 road level locally, which also constrains the road gradient approaching the HML from the new Spey bridge and onto the Kingussie junction.

- 5.3.34 **Figure 5-7** overleaf shows dualling from the B970, across the Insh Marshes (on a shorter but wider embankment) to the new 290m long Spey bridge crossing. The new bridge is located offline to the east of the existing 138m long bridge. This means that A9 traffic can use the existing structure during construction, but that the existing will not be removed until traffic is transferred onto the new bridge. The bridge extends approx. 270m from the end of the embankment to the opposite bank of the Spey, with a total length of 290m allowing for access provision under the final span on the north side. The DMRB Stage 3 design span arrangement is shown in **Figure 5-6** below. Note that the new bridge deck height is slightly higher than the existing deck height, but with no raised features such as cable stays or arches; so as to maintain Ruthven Barracks as the dominant elevated feature across the Insh Marshes.

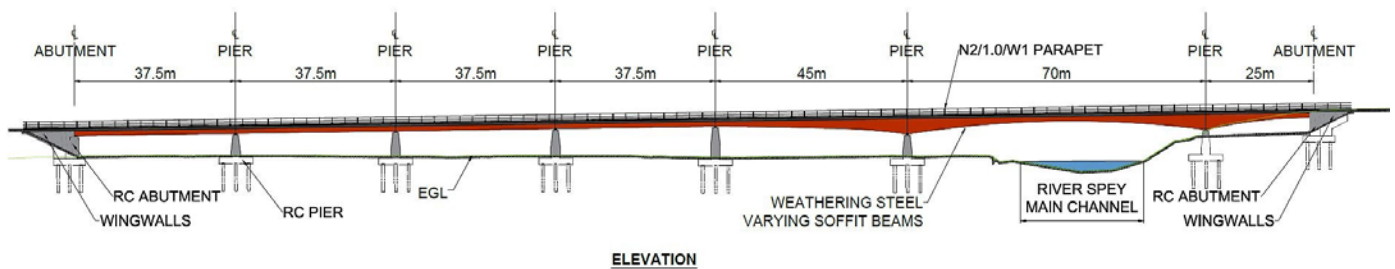


Figure 5-6: DMRB Stage 3 River Spey bridge design span arrangement

- 5.3.35 At the southern end of the embankment, SuDS basin 493 is located at approx. ch. 49,350, with access provided from the B970. The access from the B970 connects to an existing track in the Ruthven south compartment of the Nature Reserve, with a footpath link to the southbound lay-by on the embankment at approx. ch. 49,450.
- 5.3.36 **Figure 5-8** overleaf continues north showing the HML crossing, the new Kingussie Junction layout and accesses to Kerrow and Laggan properties on the northbound side. Note that the horizontal alignment shows dualling to the east on the approach to and through the junction. After the junction, from approx. ch. 51,700 dualling switches to the west (northbound side).
- 5.3.37 SuDS basins 507, 509 and 513 are shown with accesses connecting to the A86/ B9152. The access to SuDS basin 507 also provides access to the northern abutment of the new Spey bridge, and to adjacent agricultural plots of land. Access to Kingussie Glebe Ponds is retained from the A9/ A86 northbound junction link road.
- 5.3.38 Following completion of the new Spey bridge crossing and embankment, traffic will be transferred, and the redundant bridge and embankment removed, with ground returned to grassland providing maintenance access to the new embankment, bridge and fence lines. Similarly, following completion of the new Kingussie Junction, redundant stretches of the existing A9 will be removed, and planted with trees and grassland (for example, at Glebe Ponds), or used to create accesses as shown in **Figure 5-8** where accesses to Kerrow and Laggan properties, and the non-motorised user Kingussie to Aviemore link route are formed on the line of the existing carriageway.

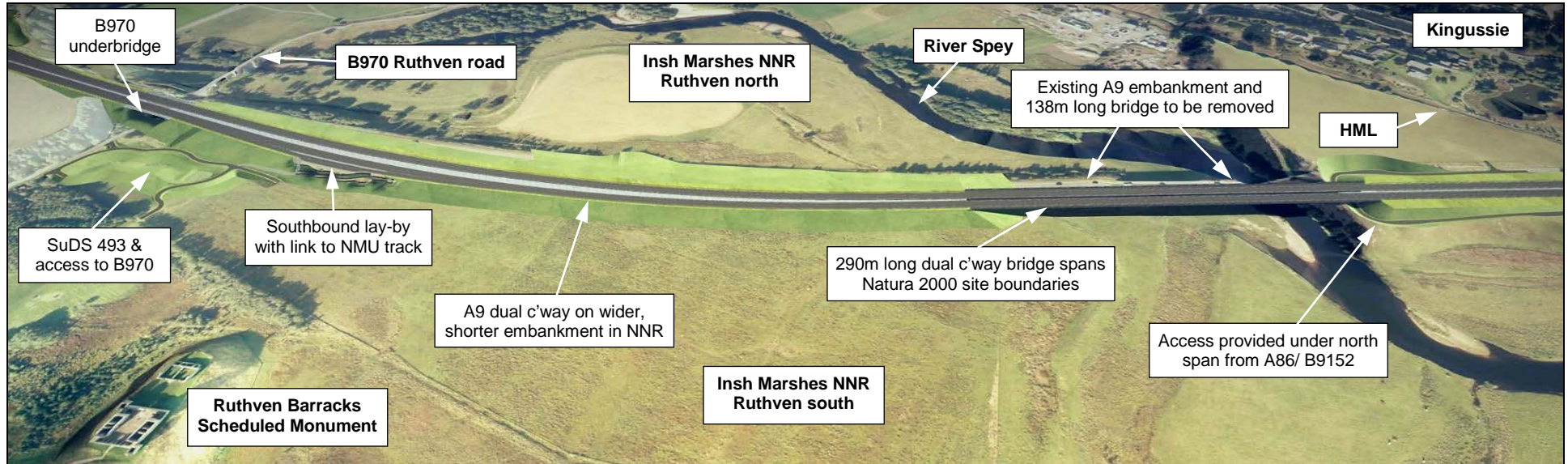


Figure 5-7: Approx. ch. 49,300 to 50,400 – B970 Ruthven road crossing, Insh Marshes embankment and River Spey crossing

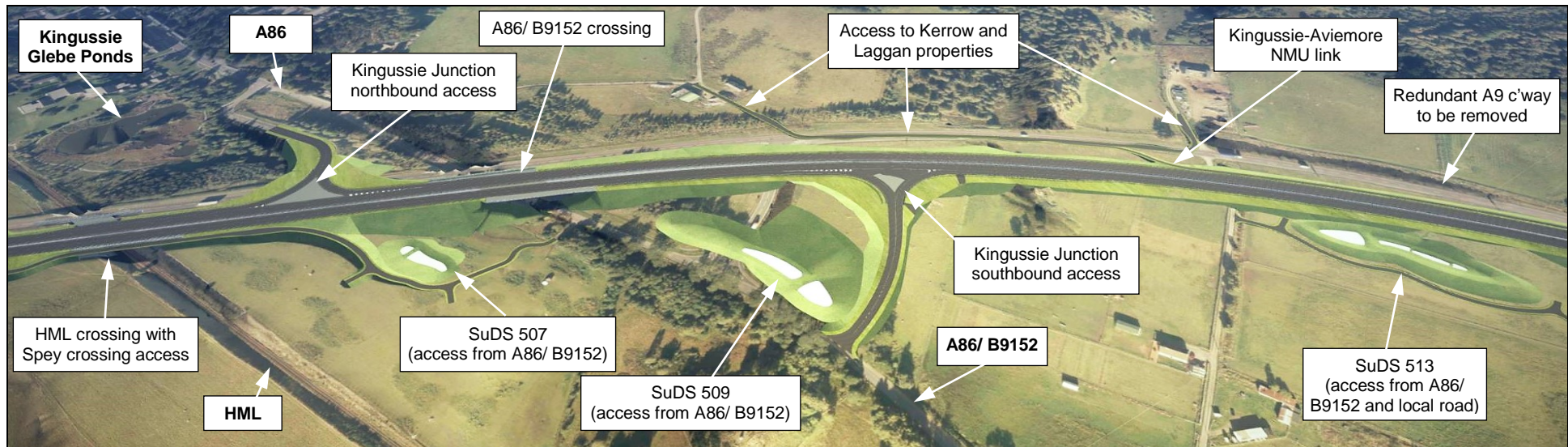


Figure 5-8: Approx. ch. 50,400 to 51,400 – Kingussie Junction with HML and A86/ B9152 crossings

- 5.3.39 Beyond the Kingussie Junction, there is a northbound lay-by at approx. ch. 52,000 with the NMU link continuing on past Balavil. Access is provided to Lynvoan Cottage (approx. ch. 52,600) and to a track leading to Upper Raitts, past the Raitt's Cave Souterrain Scheduled Monument at approx. ch. 52,100, as shown in **Figure 5-9** below. This access includes passing places and is connected to the north to the Chapelpark Farm underpass and a new LILO access at Balavil.

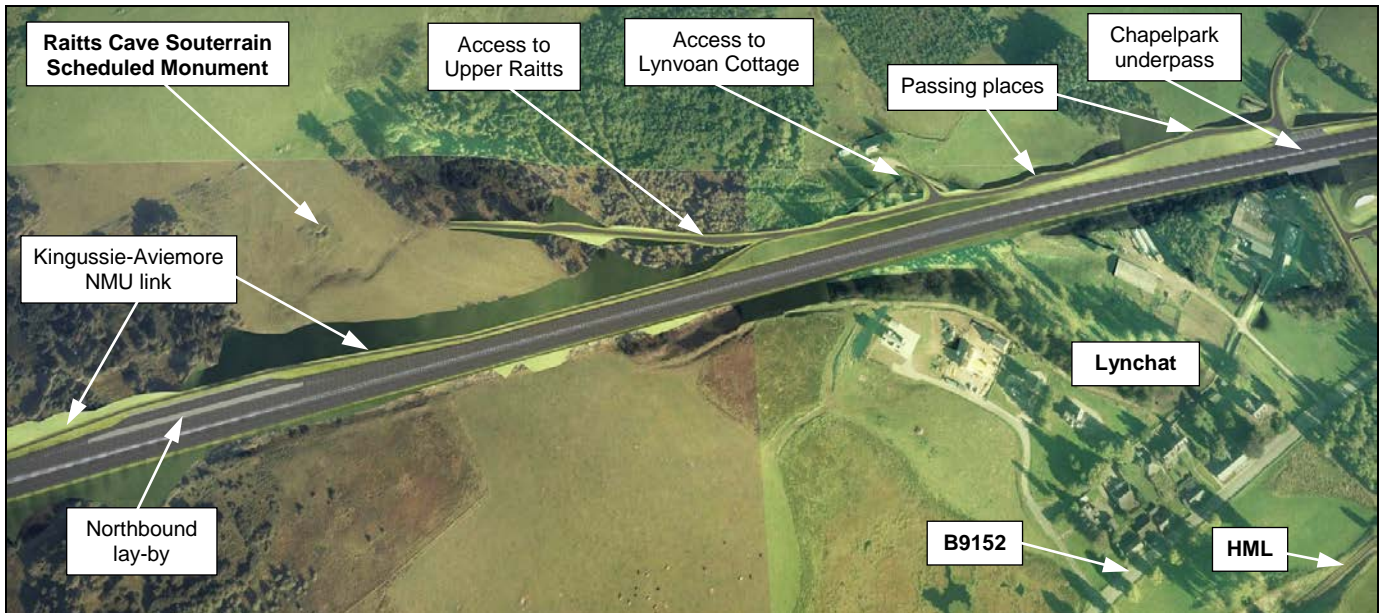


Figure 5-9: Approx. ch. 51,900 to 52,950 – Northbound lay-by at Raitt's Cave to Lynchat

Mainline Alignment - chainage 52,812 to 56,650

- 5.3.40 The horizontal alignment in this section duals predominately to the west (northbound side) of the existing A9 to avoid Lynchat, Chapelpark Farm, and the Obelisk Memorial to Macpherson (Grade B Listed). In addition, widening to the west avoids the B9152 (Kingussie to Aviemore) road which runs parallel and close by the A9 at various locations in this section. Readers should refer to Proposed Scheme **Drawings 5.10 to 5.13** in **Volume 2**.
- 5.3.41 The vertical alignment is raised in proximity to Chapelpark Farm to provide an underpass at approx. ch. 52,950 which links to the B9152, Balavil Estate, the Kingussie-Aviemore NMU link and back to Lynvoan and Upper Raitts to the south. The underpass is designed to provide clearance for higher sided HGV traffic.
- 5.3.42 At approx. ch. 53,600 a new left-in/ left-out (LILO) access off the northbound carriageway provides access to Balavil Estate (as shown in **Figure 5-10** overleaf). The LILO connects to the access route south to Chapelpark underpass, Lynvoan, Upper Raitts and the Kingussie-Aviemore NMU link.
- 5.3.43 Travelling north from approx. ch. 54,900, the horizontal alignment shifts towards symmetrical widening as the dual carriageway returns eastward over the Highland Wildlife Park (HWP) underbridge to connect to the Kincaig to Dalraddy dual carriageway section which opened to traffic in September 2017. The vertical alignment is raised to increase headroom on the HWP underbridge (approx. ch. 56,150), and to reduce the height of a retaining wall required to support the HWP service road.
- 5.3.44 Lay-bys are provided at approx. ch. 53,900 and 55,900 (southbound), and approx. ch. 54,350 and 56,400 (northbound).

- 5.3.45 **Figure 5-11** overleaf shows the north end of this section passing Croftcarnoch, the HWP and Meadowside Quarry. The NMU link continues north from the Balavil Estate LILO, running parallel to the A9 past the HWP before tying into the link section provided alongside the Kincaig-Dalraddy dual carriageway. The Proposed Scheme ends at approx. ch. 56,650 where it also ties into the Kincaig-Dalraddy dual carriageway.
- 5.3.46 Watercourse crossings in this section include:
- Raitts Burn at ch. 53,450
 - Unnamed burn and drains at ch. 55,260
 - Unnamed burn and drains at ch. 56,175.

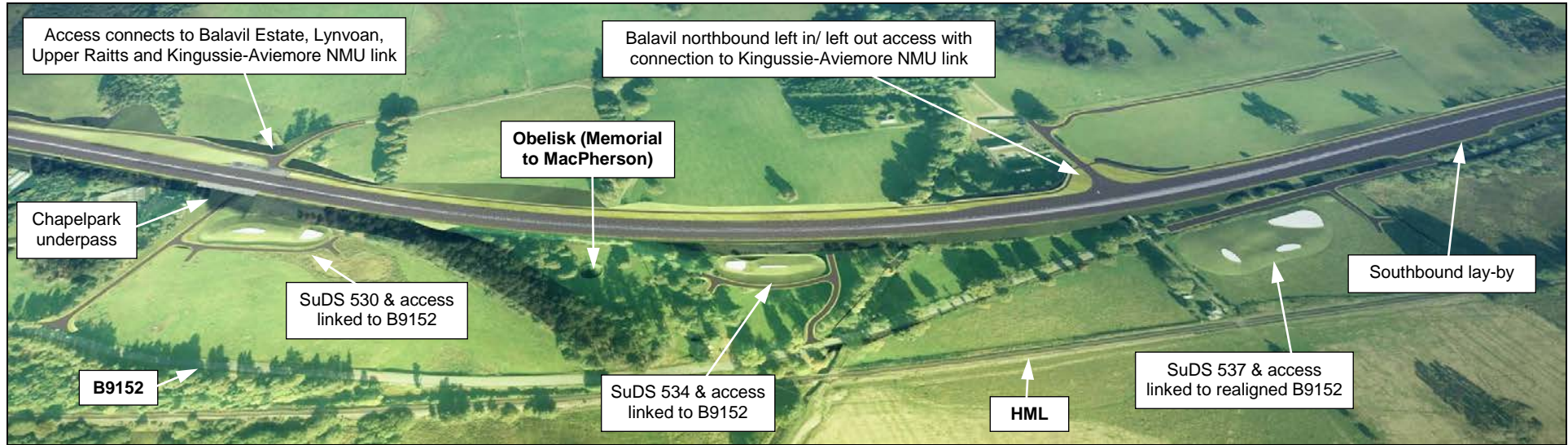


Figure 5-10: Approx. ch. 52,800 to 54,000 – Chapelark underpass and Balavil LILo access



Figure 5-11: Approx. ch. 54,800 to 56,500 – Croftcarnoch, Highland Wildlife Park and Meadowside Quarry

Proposed Scheme – Earthworks

- 5.3.47 The chainage locations of individual cuttings and embankments are shown on Engineering Plan and Profile **Drawings 5.14 to 5.25 (Volume 3)**. In general, proposed engineering slope angles range between gradients of 1:2 to 1:3 to ensure slope stability; however, a number of steeper or shallower slopes are required in some locations.
- 5.3.48 Steeper slopes include the rock cuts at Braes of Nuide, which will also feature a rock trap ditch, while some other areas require retaining walls and/or soil nailing to limit encroachment into adjacent properties, e.g. on the northbound carriageway side at the Highland Wildlife Park and Balavil Estate. In other places, some slopes are 'slackened out' to deliver mitigation for landscape and visual impacts.
- 5.3.49 Best practice design aims to deliver an earthworks balance to minimise material import to, and export from, the Proposed Scheme extent. A summary of bulk earthworks quantities is provided in **Table 5.2**. In addition, **Chapter 10** provides an Outline Peat Management Plan, which addresses potential peat arisings, mitigation and management measures.

Table 5.2: Summary of Earthworks Quantities at DMRB Stage 3

Quantity/ details	DMRB Stage 3			
	Mainline	Newtonmore and Kingussie Junctions	Side Roads/ Access Tracks/ SUDS	Total
1. Cut (Acceptable)	728,362 m ³	23,986 m ³	61,198 m ³	813,546 m ³
2. Cut (Unacceptable)	242,787 m ³	7,995 m ³	20,477 m ³	271,259 m ³
3. Cut (Rock – excluding bulking factor)	27,712 m ³	0 m ³	0 m ³	27,712 m ³
4. Cut (Peaty soil/ topsoil and mineral topsoil)	152,069 m ³	7,860 m ³	32,767 m ³	192,696 m ³
5. Cut (Shallow peat (up to 1.00m))	9,395 m ³	3,360 m ³	6,654 m ³	19,409 m ³
6. Cut (Deep peat (>1.00m))	4,409 m ³	1,984 m ³	1,178 m ³	7,571 m ³
7. Engineered Fill (Based on 1 in 2 slope)	577,249 m ³	69,068 m ³	326,073 m ³	972,390 m ³
8. Landscape Fill (Based on varied slope)	85,938 m ³	0 m ³	7,741 m ³	93,679 m ³
Approx. Surplus/ Deficit Volume (Engineered Fill) (1+((3)*1.15)) – (7) -ve Deficit/ +ve Surplus	182,982 m ³ Surplus	-45,082 m ³ Deficit	-264,875 m ³ Deficit	-126,975 m ³ Deficit
Approx. Surplus/ Deficit Volume (Landscape Fill) (2) - (8) -ve Deficit/ +ve Surplus	156,849 m ³ Surplus	7,995 m ³ Surplus	12,736 m ³ Surplus	177,580 m ³ Surplus
Notes:				
1. Cut and engineering fill volumes include adjustments for peat excavation.				
2. Engineering fill surplus/ deficit calculation assumes rock bulking factor of 15% is applied to the rock cut volumes.				
3. Assumes peaty soil/ topsoil and mineral topsoil re-used as topsoil. Also, no allowance has been made for re-using shallow and deep peat as landscape fill.				
4. Assumed capping required throughout.				

Structures

- 5.3.50 The Proposed Scheme includes for changes to existing structures and the introduction of new structures. All mainline watercourse crossings (bridges) are designed to accommodate the 1:200 year flood level plus a 20% allowance for climate change, plus an appropriate freeboard allowance. **Figure 5-12** shows the thirteen major structure locations across the Proposed Scheme extents, with additional detail provided in **Table 5-3**.

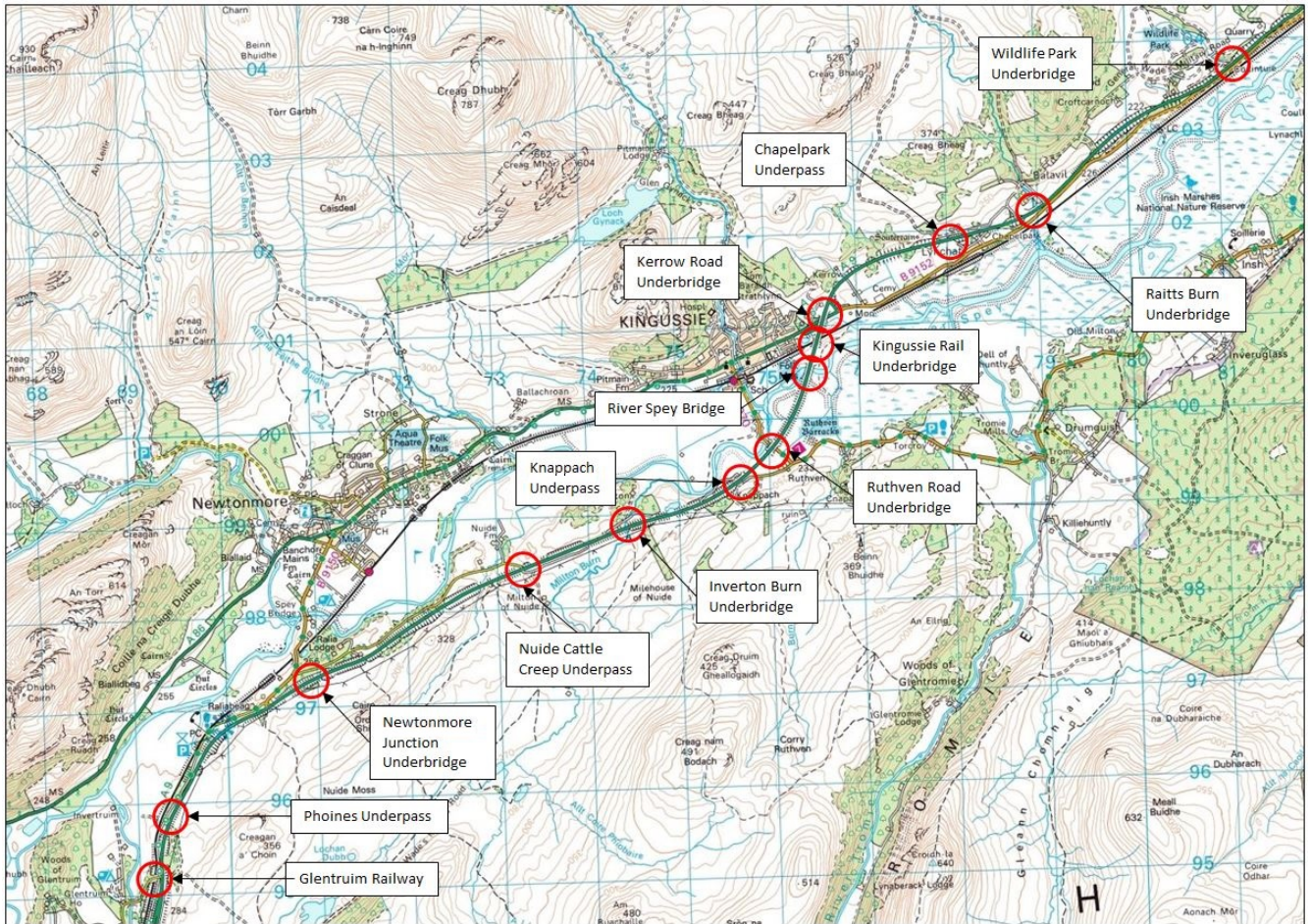


Figure 5-12: Proposed structure locations

Table 5-3: Crubenmore to Kincaig – Proposed Structures

Structure	Existing No. Spans	Proposed No. Spans	Total Span (m)	Headroom (m)	Proposed Form of Construction	Comments
SRS1 - Glentruim Rail Bridge	1	1	16.0	5.5	Replacement Structure - Fully integral portal (Concrete)	Increased span and headroom to allow for possible future HML upgrade (Overhead Line Electrification (OLE) and twin track)
S1 - Phoinies Underpass (replaces Glen Truim Sheep Creep)	n/a	1	5.3	5.0	New Structure - Reinforced concrete box underpass	Upgrade to replace existing left-in left-out access
S2 - Newtonmore Junction Underbridge	n/a	3	35.6	5.7	New Structure - 3 span prestressed beam open structure	Underbridge to introduce grade separation. 3-span to allow for open aspect
S3 - Nuide Underpass (replaces Nuide Cattle Creep Underpass A9 960)	1	1	5.3	4.25	Replacement Structure – Reinforced concrete box underpass	Upgrade to cater for vehicular traffic
S4 - Inverton Underbridge A9 970	3	3	17.0	3.0 (underpass)	Replacement Structure – Concrete box culvert	Existing 3-culvert structure replaced with 2-span underbridge and separate parallel underpass raised to 1:200 flood level
S5 - Knappach Underpass A9 980	1	1	6.5	4.25	Replacement Structure – Reinforced concrete box underpass	Replacement to account for new alignment of access track and mainline.

Structure	Existing No. Spans	Proposed No. Spans	Total Span (m)	Headroom (m)	Proposed Form of Construction	Comments
S6 - Ruthven Road Underbridge A9 990	1	1	26.7	5.7	Replacement Structure – Fully integral portal (Concrete)	Larger span to improve access
S7 - River Spey Underbridge A9 1000	7	7	290	4.25 (under north span)	Replacement Structure – Continuous Steel Composite	Longer bridge to reduce footprint on designated Natura sites Back span added to provide access in front of north abutment
S8 - Kingussie Rail Underbridge A9 1010	1	1	21.2	5.8	Replacement Structure – Semi integral portal (Concrete)	Increased span and headroom to allow for future HML upgrade (OLE and twin track)
S9 - A86 Kerrow Underbridge A9 1020	3	3	41.0	5.7	Replacement Structure – Semi integral portal (Concrete)	Larger span to improve access and account for offline structure
S10 - Chapelpark Underpass A9 1030	1	1	5.3	4.7	Replacement Structure – Reinforced concrete box underpass	Structure relocated approx. 200m north, with upgrade to form of construction
S11 - Raitt's Burn Underbridge A9 1040	1	1	8.0	n/a	Replacement Structure – Fully integral portal (Concrete)	Like for like replacement
S12 - Wildlife Park Underbridge A9 1050	1	1	11.7	5.3	Replacement Structure – Fully integral portal (Concrete)	Larger span to introduce footpath

- 5.3.51 Note that **Appendix 5.1** in **Volume 2** provides further details on the construction of the Proposed Scheme, including specific descriptions for the new River Spey, Highland Main Line at Kingussie and Highland Wildlife Park bridge crossings.
- 5.3.52 In addition to crossing structures, the Proposed Scheme requires a number of new retaining walls, identified in **Table 5-4** below.

Table 5-4: Crubenmore to Kincaig – Retaining Walls

Structure	Start Chainage	End Chainage	Proposed Solution	Length (m)	Max Retained Height (m)
C1137 retention	40,640	40,710	Gravity retaining wall along northbound verge of C1137 single track road	70	7.5
Ralia road (1)	42,535	42,605	L-shaped retaining wall along southbound verge of Raliabeag Road	70	1.95
Ralia road (2)	42,625	42,665	L-shaped retaining wall along southbound verge of Raliabeag Road	40	1.35
Ralia road (3)	42,685	42,775	L-shaped retaining wall along southbound verge of Raliabeag Road	90	1.7
A9 at Raliabeag	42,750	42,850	L-shaped retaining wall along southbound verge of Raliabeag Road	100	1.0
U3063 retention between the A9 and side road (1)	44,360	44,480	L-shaped retaining wall along southbound verge of U3063	120	1.0
U3063 retention between the A9 and side road (2)	44,700	44,730	L-shaped retaining wall along southbound verge of U3063	30	0.9
U3063 retention between the A9 and side road (3)	44,810	44,855	L-shaped retaining wall along southbound verge of U3063	45	2.1

Structure	Start Chainage	End Chainage	Proposed Solution	Length (m)	Max Retained Height (m)
U3063 retention between the A9 and side road (4)	45,055	45,130	L-shaped retaining wall along southbound verge of U3063	75	3.0
Northbound Lay-by near Raitts Cave	52,020	52,380	Gravity retaining wall at rear of layby	360	4.5
Lynchat retention between A9 and track	52,430	52,500	L-shaped retaining wall along northbound verge of track	70	1.2
Balavil Entrance Wall (1)	53,475	53,590	Gravity retaining wall along northbound verge of parallel cycle route	122	2.5
Balavil Entrance Wall (2)	53,610	53,685	Gravity retaining wall along northbound verge of parallel cycle route	80	2.5
Balavil Ha-Ha feature (1)	52,430	52,500	Gravity retaining wall along Balavil frontage	115	3.5
Balavil Ha-Ha feature (2)	53,810	53,850	Gravity retaining wall along Balavil frontage	40	3.5
HWP Service Road (1)	55,500	55,640	Soil Nailing at 55°	140	10.6
HWP Service Road (2)	55,710	55,950	Soil Nailing at 55°	240	7.0

Watercourse Crossings

- 5.3.53 The Proposed Scheme includes 28 mainline watercourse crossings varying in size from small open field and land drainage channels to the major watercourse crossings identified in **Table 5-5**. Additional crossing culverts are required for associated access tracks and land drains. In general, mainline structures and culverts are sized to pass the 1:200 year flow, with freeboard, unless flood modelling identified loss of upstream flood storage which increased downstream risk. In such cases, culverts are sized to maintain the upstream storage.
- 5.3.54 Each watercourse has been assigned a reference number, with prefix ‘MW’ for a major watercourse (shown on Ordnance Survey (OS) 1:50k maps), and prefix ‘W’ for a minor watercourse (not visible on OS 1:50k maps). In addition, each watercourse crossing has been assigned a unique reference number (referred to as a Hydro ID).

Table 5-5: List of major watercourse crossings and associated works

Water Feature	Chainage	Activity
Allt Torr an Daimh (MW 9.2/ Hydro ID 138_2)	42,100	Extension of 1500mm culvert (length = 40.13m) with natural bed material to be included in culvert and provision of mammal crossing Upstream and downstream watercourse diversions
Caochan Riabhach (MW 9.3/ Hydro ID 142)	43,800	Extension of 1500mm culvert (length = 51.97m) with natural bed material to be included in culvert and provision of mammal crossing Upstream and downstream watercourse diversions
Allt Eoghainn (MW 9.4/ Hydro ID 145)	45,650	Extension of 2700 x 2100mm culvert (length = 76.77m) with natural bed material to be included in culvert and provision of mammal crossing Upstream and downstream watercourse diversions
Burn of Inverton (Milton Burn) (MW 9.6/ Hydro ID 147)	47,400	Removal of existing three culvert arrangement and construction of new two-span Burn of Inverton/ Milton Burn underbridge (and parallel underpass)
River Spey (MW 9.1)	50,150	Construction of new 290m long River Spey bridge, followed by removal of existing 138m long bridge New bridge spans the main channel, and is set downstream from the existing bridge and greater length reduces morphological pressure on the river (Refer to Appendix 5.1, Volume 2 for further details on construction and demolition)

Water Feature	Chainage	Activity
Unnamed watercourse (MW 9.11/ Hydro ID 155)	51,250	Work associated with 2400 x1800mm culvert (length = 46.73m) Upstream and downstream watercourse diversions
Allt Cealgach (MW 9.12/ Hydro ID 157)	51,750	Extension of 2400 x 1500mm culvert (length = 64.26m) with natural bed material to be included in culvert and provision of mammal crossing
Raitts Burn (MW 9.14/ Hydro ID 162)	53,450	Removal of existing and construction of new Raitts Burn underbridge
Unnamed watercourse (MW 9.17/ Hydro ID 170)	56,200	Extension of 1500mm culvert (length = 64.74m) with natural bed material to be included in culvert

5.3.55 During the design development process, ecological input identified a number of watercourse crossing locations where species permeability could potentially be improved with the incorporation of buried box culverts that incorporate natural bed material and mammal ledges. **Figure 5-13** shows typical cross-section details of such culverts, and the relevant Hydro IDs are noted below each image. Ledges are sized according to SNH advice, to sit above the 1:50 flood level where possible, be at least 450mm wide and include at least 450mm headroom.

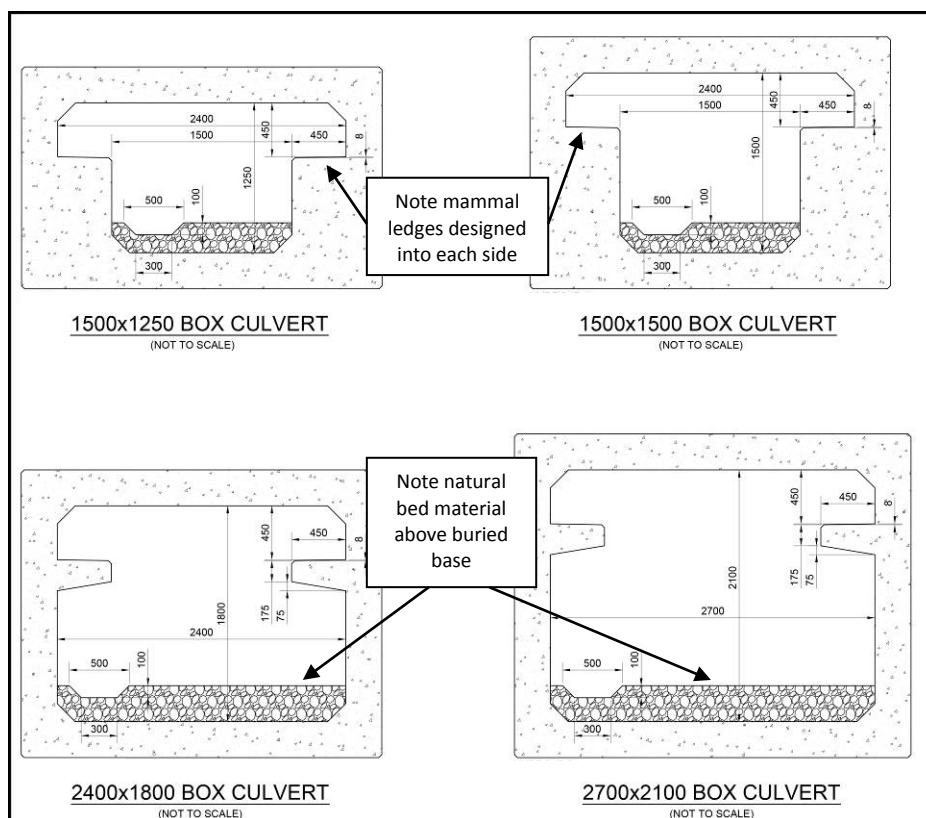


Figure 5-13: Typical cross-sections of buried box culverts with bed material and mammal ledges

Drainage Network Design

5.3.56 The road surface drainage network design for the Proposed Scheme has been developed in accordance with Sustainable Drainage System (SuDS) design guidance and through consultation with SEPA, SNH and the relevant local authorities. This includes a minimum of two levels of SuDS across the mainline and junction infrastructure, with enhanced provision included where discharge water quality assessments identified an additional need.

- 5.3.57 Typically, the drainage network includes roadside filter drains as a first level, passing to a detention basin as the second level. Where required, enhanced provision typically includes a micro-pool at the outlet and/ or a further swale (open, grassed channel) to the discharge outfall.
- 5.3.58 SuDS basins have been sized to provide surface runoff attenuation in heavy rainfall events, in accordance with local authority requirements. SuDS basins are located at natural drainage (low) points on the network, to enable gravity flows. However, positioning has also been informed by constraints analyses, including avoidance of 1:200-year floodplain encroachment, deeper peat deposits and sensitive habitats, where possible.
- 5.3.59 Similarly, points upstream of larger watercourse crossings, where it would be difficult to continue road drainage across a decked bridge structure, have been identified. Locations have also been identified at intermediate points on long road drainage catchments, to sub-divide the catchment area, ultimately aiming to keep associated SuDS feature areas to a reasonable size.
- 5.3.60 Due to the sensitive nature of local receiving waters (e.g. the River Spey and the Insh Marshes Special Areas of Conservation (SAC)), drainage discharge from each SuDS basin has been assessed to ensure it meets environmental quality standards. In some locations, outfalls direct to the River Spey are required; however, in these cases low velocity outfalls have been incorporated to minimise risk of scour to SAC habitats. In addition, each SuDS basin is sized assuming that it will be lined to prevent infiltration and to include shut off (e.g. a gate valve or similar) to provide spillage containment, further minimising risks to the SAC.
- 5.3.61 At the north end of the Proposed Scheme, in proximity to the Highland Wildlife Park (HWP) bridge at ch. 56,150, space is constrained between the HWP and Meadowside Quarry on the northbound side and the B9152 and Highland Main Line (HML) railway on the southbound side. SuDS drainage features 561 and 563 therefore employ a combination of vortex oil separators, storage tanks and swales to provide treatment and attenuation of flows.
- 5.3.62 Access track drainage has been considered and, due to low levels of anticipated use, one level of drainage treatment is provided in line with SEPA and SNH guidance for design and drainage of upland tracks, and as agreed with SEPA via the A9 Dualling Environmental Steering Group (ESG). In addition, pre-earthworks drainage systems, to intercept hillside, cutting and embankment runoff are included. These are provided as cut off drains to intercept water that is not affected by road surface runoff, does not require treatment and can be directed directly to a local watercourse within the natural catchment.

Compensatory Floodplain Storage

- 5.3.63 The Proposed Scheme has been tested against the 1:200 year flood model to identify floodplain encroachments and to reduce these through design refinement where possible. However, given the proximity of numerous watercourses and the locally extensive River Spey floodplain, full floodplain avoidance is not possible. Compensatory flood storage is therefore required to offset floodplain displacement due to encroachments.
- 5.3.64 The Proposed Scheme includes a number of areas, which will include some limited excavation to lower the ground to provide level-for-level storage. These areas are therefore defined as permanent works, to provide compensatory flood plain storage, and are identified on the **Proposed Scheme Drawings 5.2 to 5.12** in **ES Volume 3** under the 'Compensatory Storage Area' legend item.

Road Surface

- 5.3.65 The Proposed Scheme design assumes that, for the junctions and the mainline, a low noise road surface will be laid in accordance with relevant specifications.

Lay-bys

- 5.3.66 The Proposed Scheme removes all previous roadside bays and introduces five new lay-bys on each of the southbound and northbound carriageways (refer to **Table 5-6** below). New lay-bys will be extended 'Type A' lay-bys which include a separation island and merge tapers to/ from the mainline carriageway.

Table 5-6: Layby Locations

Lay-by ref.	Direction	Type	Chainage	Length (m)	No of Spaces Available
NB1	Northbound	A - with merge taper	46,830	100	16
NB2	Northbound	A - with merge taper	48,970	100	16
NB3	Northbound	A - with merge taper	52,030	100	16
NB4	Northbound	A - with merge taper	54,350	100	16
NB5	Northbound	A - with merge taper	56,390	100	16
SB1	Southbound	A - with merge taper	41,700	100	16
SB2	Southbound	A - with merge taper	46,300	100	16
SB3	Southbound	A - with merge taper	49,460	50	7
SB4	Southbound	A - with merge taper	53,900	100	16
SB5	Southbound	A - with merge taper	55,900	100	16

- 5.3.67 There are safety standards guiding lay-by placement that restrict how close lay-bys can be from significant bends and junctions, in order to maintain good visibility; however, where possible within these safety standards, lay-bys have been located in areas that also provide good views out to the surrounding landscapes.
- 5.3.68 In addition to the noted lay-bys, Police Observation Platforms are provided at approx. ch. 45,500 (southbound) and approx. ch. 47,490 (northbound).

Non-Motorised User (NMU) Provision

- 5.3.69 National Cycle Network route (NCN7) runs alongside the existing A9 from the southern extent of the Proposed Scheme and up to the existing Newtonmore Junction, from which it veers away from the A9 into Newtonmore on the B9150 and onto Kingussie. At Kingussie, NCN7 routes via the B970 towards Ruthven Barracks, continuing along the opposite side of the Insh Marshes from the A9.
- 5.3.70 From approx. ch. 40,600 at the Glen Truim rail bridge, to approx. ch. 42,500 at Ralia Café and Tourist Information rest area, A9 dualling and associated side road works will make NCN7 a shared use route with the realigned C1137 Glen Truim/ Catlodge road and the U3011 Ralia road. NCN7 will continue as a shared use route on the Ralia road to the new Newtonmore Junction, which maintains NCN7 connectivity with the B9150 into Newtonmore and beyond. All related NCN7 works will be completed to provide an equal or better standard of provision than existing.
- 5.3.71 The Proposed Scheme also maintains local connectivity to existing NMU links, via a number of safer underpass crossings which remove the need to cross the A9 at surface. Underpass crossings generally provide at least 4.25m headroom, with exception of a new NMU underpass provided at Burn of Inverton (Milton Burn), which provides 3m headroom as the floor of this crossing is raised above the 1:200 flood level.
- 5.3.72 A new NMU route is provided from the Kingussie area, extending from the A86/ B9152 via the Kerrow Cottage access and running generally parallel to the new northbound A9 carriageway, past Raitts Cave Souterrain, Lynchat, Balavil and the Highland Wildlife Park to connect to a similar facility

introduced on the Kincaig-Dalraddy dual carriageway section. This new NMU route is described in this ES as the Kingussie-Aviemore NMU link (note, some chapters refer to the Kingussie-Kincaig NMU link as that is the stretch being delivered by the Proposed Scheme).

Access to Land and Properties

5.3.73 Proposed accesses to private land are provided as described in **Table 5-7** below.

Table 5-7: Proposed accesses

Location/ chainage	Proposed access
Phoines Estate Phoines Lodge and game farm ch 41,275	Phoines Estate land on the northbound side can be accessed from the northbound LILO at ch. 41,650 then the realigned C1137 Glen Truim/ Catlodge side road This also links to an underpass at ch. 41,275 with a realigned connection to the Phoines Estate track to Phoines Lodge on the southbound side of the A9 The realigned C1137 also provides for maintenance access to SuDs basin 417 with a link to a track opposite the underpass Phoines Estate can also be access from the Newtonmore Junction via the side road connections noted
Ralia Moss ch. 43,300	Access to Ralia Moss for both Phoines Estate and Ralia Estate is taken from the Newtonmore Junction at ch. 43,300 There is a spur off the southbound loop providing maintenance access to SuDS basin 427 and onto tracks into Ralia Moss as well as Ralia and Phoines Estate land on the southbound side
Ralia Lodge and Nuide Farm ch. 43,400 to 46,150	Existing access route upgraded with passing places between Newtonmore Junction and a new LILO access on the northbound carriageway at ch. 46,150
Ralia Estate properties ch. 46,050	Access from new northbound LILO and via underpass at ch. 46,050 linking through to connect properties and routes on the southbound side, including Milton of Nuide, access to An Cnap, General Wade's Military Road (GWMR) and other footpaths which give access to the Luibleathann Bothy Ralia Estate can also be access from the Newtonmore Junction via the side road connections noted
Inverton Cottage/ Bridge of Inverton ch. 46,150	Access from new northbound LILO at Nuide Farm and via parallel access route northbound to Burn of Inverton, Bridge of Inverton and Inverton Cottage Route also provides maintenance access to SuDS basin 474 Can also be accessed from the Newtonmore Junction via the side road connections noted
Knappach Cottage/ Ruthven Cottage ch. 48,800	Access routes from the B970 Ruthven road via the GWMR to an A9 underpass at ch. 48,800, with a spur on the southbound side providing access to Ruthven Cottage and onto the Knappach frontage A further spur provides for a NMU link running between the A9 southbound carriageway and Knappach, connecting to NMU routes beyond The link from the B970 extends beyond the A9 underpass to provide maintenance access to SuDS basin 487 and connections to NMU tracks on the northbound side
Insh Marshes ch. 49,300	Future maintenance access to the northbound side of the dualled embankment will be taken from the B970 on the northbound side of the B970 underbridge and along the reinstated/ re-vegetated route of the base of the redundant (removed) A9 embankment Access to SuDS basin 493, on the southbound side of the A9 embankment, is also taken from the B970 Ruthven road; the access connects to an existing track in the Ruthven south compartment of the NNR
Church of Scotland (Kingussie Glebe) land ch. 50,775	Accessed from the A86/ B9152 road at the Kingussie Junction underbridge (ch. 50,775) The route provides for maintenance access to SuDS basin 507, routes via the southbound side of the new HML bridge crossing at Kingussie and wraps around the northern abutment of the new River Spey bridge crossing; thereby providing access to A9 drainage swales and connected access to plots on both the northbound and southbound sides
Creag Bhalg and Kerrow Cottage ch. 51,250	Access to Creag Bhalg and Kerrow Cottage (residential properties) links from the A86 opposite the Kingussie Junction northbound slip through to the new Kingussie-Aviemore NMU link at ch. 51,250
SuDS basin 513 ch. 51,250	Accessed via private access off B9152 (north of Kingussie Junction)
Balavil Estate (at Lynchat) ch. 52,900	Access to Balavil Estate from the B9152 at Lynchat, via Chapelpark underpass to the northbound side of the A9, provides access to Upper Raitt's, Lynvoan Cottage, Balavil House and associated dwellings Link from B9152 to Chapelpark underpass also provides for maintenance access to SuDS basin 530 Balavil Estate can also be accessed from the LILO at Mains of Balavil
SuDS basin 534 ch. 53,400	Accessed from B9152 (north of Lynchat) at ch. 53,400

Location/ chainage	Proposed access
Mains of Balavil (LILO access) ch. 53,600	Direct access to Mains of Balavil and Balavil Estate from northbound LILO at ch 53,600 leading onto internal estate access roads and connecting south to Chapelpark underpass and north to the Kingussie-Aviemore NMU link
SuDS basin 537 ch. 53,750	Accessed from B9152 (north of Lynchat) at ch. 53,750
Croftcarnoch ch. 55,500	Access to Croftcarnoch (two residential properties) linked to the Highland Wildlife Park (HWP) service road at ch. 55,500 and from there to HWP crossing and the B9152 at Meadowside.

Lighting and Signage

- 5.3.74 The Proposed Scheme does not include lighting for the mainline carriageway or the Newtonmore or Kingussie Junctions, which accords with the Cairngorms National Park ‘dark skies’ Special Landscape Quality (SLQ). However, non-motorised user (NMU) underpasses may be lit, where levels of natural light are reduced, in accordance with applicable safety standards
- 5.3.75 Signage has been developed in accordance with Transport Scotland’s guidance on *Road Furniture in the Countryside*, 2006. Signs are required to be high quality and reflective to ensure visibility for road users, and siting of signage has been considered to minimise skylining and visual clutter.

Fencing

- 5.3.76 Permanent post and wire fencing may be erected along the Proposed Scheme boundaries, depending on landowner requirements. Ecological fencing (e.g. otter/ badger fencing) will be introduced, where necessary, to guide smaller mammals to safe crossings under the road. Existing deer fencing will be replaced where affected by the scheme, and some additional deer fencing will be introduced in certain locations to route larger mammals to suitable safe crossings under the road. It should be noted that it is not intended to introduce deer fencing along the entire length of the scheme.

5.4 Temporary Works (Construction Phase)

- 5.4.1 Construction activities, required to build the Proposed Scheme, are considered to be temporary works and will typically include:

- Site clearance
- Stock proof fencing
- Pre-earthworks drainage and construction stage SuDS
- Earthworks (cut/ fill)
- Material transfer via haul routes and temporary bridges
- Rock cuts and rock breaking
- Temporary materials stockpiling lay-down
- Watercourse diversions and culverts
- Drainage networks, including SuDS basin and outfall installation
- Earthworks rolling and compaction
- Utility diversions
- Central reserve works
- Bridge abutment, structure and deck construction
- Retaining wall construction
- Ancillary works; safety barrier, road markings, signage and ducting
- Structures demolition
- Road sub-layer and pavement formation
- Landforming and landscape works
- Site restoration (ecological and landscape mitigation works)
- Active traffic management

- 5.4.2 It is therefore necessary to ensure that sufficient land is made available to enable construction activities around the perimeter of the permanent works extents, whilst at the same time limiting the amount of additional land likely to be affected.
- 5.4.3 Temporary works areas have been identified as being necessary to enable construction, and it is considered that such areas will not be permanently affected, and would be able to be restored to conditions that enable recovery post-completion or, where shown on Environmental Mitigation **Drawings 6.1 to 6.12 (Volume 3)**, to provide areas for mitigation to address the impacts of the Proposed Scheme.
- 5.4.4 It should be noted that although the approach adopted identifies ‘permanent’ works areas, ‘temporary’ works areas and additional land areas for mitigation, for the purposes of clarity, all land identified as ‘*necessary for the safe construction and operation of the scheme*’ would be considered for permanent land take and purchase under the Roads (Scotland) Act 1984.
- 5.4.5 It should also be noted that, whilst consideration of typical construction works activities has informed a works boundary for assessment, in order to enable the Contractor flexibility of use, no specific construction stage land uses are defined.
- 5.4.6 The EIA of the Proposed Scheme has been undertaken based on an anticipated construction programme of 3 years for River Spey crossing works and approximately 3.5 years overall. A detailed construction programme will be developed by the Principal Contractor; however, the assessment considers that the following timescales (which will overlap during the overall construction phase) will apply:
- Earthworks: Each Proposed Scheme section length is likely to take a complete earthworks season, i.e. 12 months, excluding holiday periods and periods of severe adverse weather. In this, a single section might be, for example, the length of mainline between Crubenmore and the Newtonmore junction or from Newtonmore junction to the B970 (south of Kingussie and the Insh Marshes).
- Bridges: It is expected that watercourse crossings (bridges) on sections which require parallel widening will be constructed in conjunction with earthworks operations. Some bridges over rail lines and other roads may require specific programming to minimise disruption to rail and other road users. It is estimated that construction of the new River Spey bridge will take approximately 2 years; however, when combined with approach embankment works and removal of the existing River Spey bridge, the total timescale for Spey crossing works is estimated at 3 years.
- Pavement Works: Paving would typically be targeted during warmer months (i.e. when the ambient temperature is at or above 5°C); on this basis, completion of paving works is estimated to take approx. 2 years across the Proposed Scheme extents.
- 5.4.7 A detailed construction programme will be developed by the Contractor; however, further information on possible construction sequencing is provided in **Appendix 5.1 (ES Volume 2)**.
- Access to Property and Non-Motorised User Routes**
- 5.4.8 During construction, suitable access to property and NMU routes shall be maintained by the Contractor; however, during certain construction operations, temporary closures or diversions may be required.

Works Compounds

- 5.4.9 At DMRB Stage 3 it is not possible to determine where a contractor would prefer to locate works compounds, and this is generally left to the Contractor to agree with local landowners and secure any relevant permissions/ consents from environmental regulators and planning authorities. Works compounds are therefore not considered within the Proposed Scheme under assessment.

Borrow Pits

- 5.4.10 At DMRB Stage 3 it is not possible to determine where a contractor would seek to gain any additional material from borrow pits, potentially in proximity to the scheme extents. This is generally left to the Contractor to agree with local landowners and secure any relevant permissions/ consents from environmental regulators and planning authorities. Borrow pits are therefore not considered within the Proposed Scheme under assessment.

Site Clearance

- 5.4.11 Site clearance will involve the phased removal of existing vegetation such as required tree felling and removal of hedges, bushes and undergrowth; demolition of any built features to be removed; relocation of services; and removal of existing fencing. Site clearance will be under the supervision of an Ecological Clerk of Works (ECoW) through and in proximity to designated nature conservation sites, and at any other areas identified as requiring ECoW supervision via pre-construction surveys.

Structures and Culverts

- 5.4.12 Structures and culverts which cross the carriageway will generally be constructed in two halves. Typically, as the Proposed Scheme largely comprises of parallel on-line widening, one of the new carriageways will be constructed first, while maintaining traffic on the existing carriageway. Once the new carriageway is complete, traffic will be transferred, enabling demolition and removal of existing structures and culverts (where required) before construction of the other carriageway. Temporary watercourse diversions may be required in certain locations. See **Appendix 5.1, ES Volume 2** for further details.
- 5.4.13 **Appendix 5.1** provides further details on possible construction sequencing for the new River Spey bridge and embankment at the Insh Marshes, the new HML bridge at Kingussie Junction and the replacement underbridge at the entrance to the Highland Wildlife Park.

Watercourse Diversions

- 5.4.14 The Proposed Scheme will result in a number of watercourse diversions. These will take place in stages depending on the road construction arrangement and in some cases, a temporary watercourse diversion will be required to enable completion of permanent diversion works. Land required for such diversion works has been considered within the construction works boundary. See **Appendix 5.1, ES Volume 2** for further details.

Construction Stage SuDS and Access Tracks

- 5.4.15 One of SEPA's principal concerns is ensuring the provision of sufficient land for the inclusion of construction stage sediment controls, i.e. temporary SuDS such as settlement lagoons. Land required for such features has been considered within the construction works boundary, typically in proximity to watercourses on the downstream side of the A9.

- 5.4.16 Construction will be subject to SEPA’s Controlled Activities Regulations (CAR) (Scottish Government, 2011c) regime and will require a Construction Site Licence including a detailed Pollution Prevention Plan for pre-construction approval and monitoring.
- 5.4.17 Temporary access tracks may be required throughout the construction stage, for example, to enable access to install permanent drainage networks and outfalls, as well as to temporary construction SuDS and other areas. Land required for such temporary access has been considered within the construction works boundary; however, it should be noted that the Contractor will need to assess the load capacity of structures for construction use and temporary alternatives may be required. As this EIA does not specify haul routes or other construction elements, an assessment of such structures has not been undertaken.

Temporary Works Fencing

- 5.4.18 Temporary stock proof fencing will be erected, prior to construction works, where considered appropriate by the Contractor. Typically, the aim is to delineate the works site and minimise risk of larger mammals (e.g. deer, sheep, horses or cattle) and people wandering into an active works area. Temporary works fencing does not present a significant barrier for smaller mammals.

Piling

- 5.4.19 Significant piling works are expected for the foundations of the support piers for the River Spey bridge crossing, and sheet piling techniques are expected to be used during construction to enable formation of concrete, or to create temporary barriers near watercourses or in waterlogged areas. Depending on the construction programme, some piling operations at particular pier locations may be restricted during the sensitive salmon spawning/ migration period.
- 5.4.20 **Appendix 5.1, ES Volume 2** provides a detailed description of the provision of access to the new embankment and Spey bridge construction area, the range of expected piling locations and operations, as well as crane operations for bridge deck structure construction. Demolition and removal of the existing bridge and embankment is also discussed. Given that the works will be undertaken within the River Spey floodplain, protective sheet piling works to form caissons are expected to form safe working areas that can be dewatered. **Appendix 5.1** also notes that these will be removed or cut off below ground level once works are complete.

Traffic Management Phasing

- 5.4.21 The Proposed Scheme requires dualling to the east (southbound) side and west (northbound) side, with some symmetrical widening (both sides) at the approach to the Highland Wildlife Park and the tie-in to the Kincaig-Dalraddy dual carriageway. Buildability issues have informed considerations on landtake required for the Proposed Scheme, principally with a view to keeping A9 traffic flowing on the existing carriageway during the primary phases of construction.
- 5.4.22 Generally, new underbridges will be prioritised in each earthworks phase, such that they can then be used in haul routes for construction traffic. The majority of construction works will require lane width reductions to maintain two-way traffic, whilst the new carriageway is constructed adjacent.
- 5.4.23 There will be some sections of temporary carriageway required to facilitate construction of crossovers and tie-ins, and where level differences between the existing and proposed mainline present construction complexities. Where an elevated carriageway is required, reinforced slopes or soil nailing may be used to enable construction. Appropriate temporary barriers will be installed prior to construction, where required.
- 5.4.24 It is envisaged that principal construction and traffic management phases will include:

- Mobilisation/ Early Works Phase
- Phase 1 Major bridge construction (River Spey bridge and Highland Main Line rail bridges)
- Phase 2(S) Main Works (southbound carriageway from ch. 40,000 to ch. 49,950 and Newtonmore Grade Separated Junction (GSJ))
- Phase 3(N) Main Works (northbound carriageway from ch. 51,700 to ch. 56,650)
- Phase 4(S) Main Works (southbound carriageway and Kingussie GSJ)
- Phase 4(N) Main Works (northbound carriageway and Kingussie GSJ)
- Phase 3(S) Main Works (southbound carriageway from ch. 51,700 to ch. 56,650)
- Phase 2(N) Main Works (northbound carriageway from ch. 40,000 to ch. 49,950 and Newtonmore GSJ)

5.4.25 Each phase is likely to be subject to the following:

- speed restrictions to 40 mph with lane reduction introduced to improve safety for construction workers and ease traffic flow on existing A9 carriageway
- temporary traffic management measures at works access/ egress points throughout the scheme extents, including temporary deceleration lanes to slow traffic in proximity to active works areas
- potential need for temporary roundabouts, to facilitate plant crossings or earthworks haulage from one side to the other to access general fill and landscape fill stockpiles
- construction of haul road crossovers may be necessary as part of early enabling works to allow a fully operation haul road network
- works that affect field accesses will be discussed with landowners to agree programming and suitable alternative access prior to works commencement
- rock cuts at Braes of Nuide may require blasting operations, which could potentially involve temporary diversions via Newtonmore and Kingussie to ensure road user safety
- crane access and safety for beam lifts for bridge deck installations could require short term overnight closures, or single lane operation under traffic light controls
- lane closure periods and temporary diversion routes would be agreed with Transport Scotland, Police Scotland, the A9 trunk road operating company, and other stakeholders including The Highland Council. Notwithstanding, closures of this type are only likely to be implemented during off-peak times (i.e. nights and weekends), unless otherwise agreed
- offline works including downstream SuDS features, outfalls and access tracks are not expected to affect traffic management beyond the descriptions above.

Construction Stage Lighting

- 5.4.26 Temporary lighting may be required across the Proposed Scheme where night time working is necessary, to minimise traffic disruption/ diversions/ lane closures, and also along temporary access roads or other locations where temporary traffic management measures require lighting for safety reasons. Temporary lighting may also be required for security and safety reasons at Contractor compounds during morning and evening working hours in winter.
- 5.4.27 The Contractor will develop a construction lighting plan and method statement, to ensure that lighting in sensitive ecological areas is managed appropriately, in consultation with SNH.

Waste Management

- 5.4.1 The construction of the Proposed Scheme is likely to produce a range of waste types and it is envisaged that the majority of waste arisings will be re-used on-site, taken to an appropriately licensed or registered exempt site elsewhere, or segregated and sent for recycling or recovery at a materials recovery facility. **Chapter 18, Materials** provides more details.

5.5 References

- 5.5.1 Relevant references for introductory Chapters 1 to 7 of this ES are compiled and listed at the end of **Chapter 7**.