

3 SCHEME PROPOSALS

3.1 INTRODUCTION

This chapter describes the physical works which would be required including the new road infrastructure, the associated structures and other features. The chapter also outlines the construction activities which have been assumed for the purposes of the EIA.

Reference is made to mitigation measures which have been developed as an integral part of the design process, with specialists working together to make balanced decisions. Mitigation measures relating to each environmental topic are included in each relevant chapter and a collated list of committed mitigation is included in Annex C.

3.2 DETAILS OF THE SCHEME

3.2.1 Overview

A general description of the proposals is included in Sections 1.1 and 1.5. Key elements of the proposals include:

- the carriageway;
- junctions and ancillary works;
- structures including culverts;
- embankments and cuttings;
- safety and other fences;
- drainage; and
- signing and lighting.

The new off-line single carriageway road leaves the A82 at the southern end of Crianlarich and sweeps round on the west of the village to rejoin the A82 at the north west end of the village, just after Tyndrum Terrace. There would be two roundabouts one at the southern end and one at northern end of the bypass.

The geographical context for the scheme is shown in Figure 1.1 and the scheme is shown in more detail in the route window maps presented in Figures 3.1a and b.

It has been assumed for design and assessment purposes that the road would be open in 2011 and that its design year (15 years after opening and used for design calculations) is 2026 with traffic forecasts estimated up to this year²².

3.2.2 Details of the Scheme

3.2.2.1 The Carriageway

The new road would be a single carriageway all purpose road, approximately 1.3km long, with one lane in each direction. The carriageway would be 7.3 metres (m) wide with 1m hardstrips at each side, and the design speed would be 100 kilometres per hour (kph). A typical cross section of the new carriageway is shown in Figure 3.2.

²² It is considered unlikely that the road could be open before 2012/2013

3.2.2.2 Junctions

Two junctions are proposed as part of the scheme:

- the south roundabout at the southern end of the scheme which would allow access between the Glenfalloch Road and the A82(T); and
- the north roundabout at the northern end of the scheme which would allow access between the Tyndrum Road and the A82(T).

The roundabouts would have an overall diameter of approximately 45m. Provisions for cyclists and pedestrians have been included in the design of both roundabouts. At the southern end, an additional section of footway²³ has been included to facilitate access from properties at the southern edge of the village (see Figures 3.3a and b). The proposals at the northern end of the scheme would accommodate the proposed extension to the Glen Dochart Cycle Route if this is consented (see Sections 5.7 and 6.4.4).

Access from the south would be via a joint cycleway/footway within the verge on the left hand side of the road. Pedestrians would access the village by crossing the A82(T) at a pedestrian crossing point at the southern splitter island²⁴ of the roundabout. Cyclists would travel around the south roundabout and cross the A82(T) using the northern splitter island of the roundabout to rejoin the verge on the Glenfalloch Road entering the village. In the opposite direction, cyclists and pedestrians would use a joint cycleway/footway in the verge to travel around the roundabout when leaving the village to the south.

Cyclists entering Crianlarich from the off-road cycle/footway route to the north would cross Tyndrum Road using the roundabout's north splitter island and travel into the village via a cycle path/footway in the verge of the road. Cyclists leaving Crianlarich to the north would follow the cycle/footway facility in the verge and cross the A82(T) at the crossing point, using the roundabout's southern splitter island and then follow the verge around to join the off-road cycle path/footway.

Dropped kerbs would be provided at all access points and the splitter islands at the crossing points. The dropped kerbs would be positioned to provide sufficient width to accommodate more than one pedestrian/cyclist.

3.2.2.3 Structures

An underpass would be required to facilitate access to the West Highland Way spur (see Section 6.4.4 and Photograph 3, Annex E). This would require realignment of the current path and would have a 2.5m headroom.

The scheme crosses eight unnamed watercourses (some ephemeral). Three existing culverts would be extended and utilised for the scheme. Five new culverts would be required (see Table 3.1 and Table 8.8, Section 8.9.1).

²³ A footpath is a pedestrian route remote from the road and a footway is adjacent to the road carriageway

²⁴ A splitter island is an island in the centre of a two lane round where it approaches/leaves a roundabout that provides a safe place for pedestrians/cyclists to wait until it is safe to cross the next section of road

Table 3.1: Drainage Measures for the Scheme

Watercourse²⁵	Chainage	Drainage Measure	Wildlife Provision
1	23	Existing Culvert	Extended
2	250 and 290	Watercourse connects into cut-off ditch	N/A
3	388	Proposed Culvert	Otter ledge and fencing
4	527	Proposed Culvert	Otter ledge and fencing
5	730	Proposed Culvert	Otter ledge and fencing
6	915	Proposed Culvert	Otter ledge and fencing
7*	1105	Proposed Culvert	Otter ledge and fencing
7*	1060	Existing Culvert	Extended
8	1235	Existing Culvert	Extended

* The same watercourse goes through two culverts

Ledges to allow animal passage would be included in all new culverts. The location of culverts and cascades (required to facilitate drainage on steep slopes) are shown on Figure 8.1. A typical cross section of a culvert is shown in Figure 3.4.

The location of all structures for the scheme is shown on Figures 3.1a and b and Figure 8.1.

3.2.2.4 Road Realignments

The existing A82 would be realigned linking the A85 to the A82(T) with access also provided for The Shielling at this location (see Figures 3.1a and b).

3.2.2.5 Embankments and Cuttings

The bypass would be on embankment to the south of the proposed West Highland Way Spur Underpass and mainly in cutting for the remainder of the route. The maximum depth of cutting is approximately 10m (see also Section 3.3.7).

3.2.2.6 Noise Barriers

Noise barriers (earth bunds and/or fencing) would be provided where the noise appraisal (see Chapter 13) has indicated mitigation is required and where landscape intrusion of the features would not be unacceptable. The location of noise barriers has been evolved through iterative design between the noise and landscape teams. The location of noise barriers is shown on Figures 3.1a and b.

3.2.2.7 Safety Barriers

Safety barriers for all new works would be provided as required by current standards as protection against collision with road furniture such as signs and lighting equipment.

²⁵ Watercourses are shown on Figure 8.1

3.2.2.8 Drainage

All surface water run-off would be collected by means of roadside filter drains²⁶ draining to detention basins or a filter trench (all with underdrains) prior to outfalling into local watercourses. There would be two unlined detention basins (one at the south and one at the north end of the scheme) and one filter trench²⁷ located in the roadside verge to the north of the north roundabout (see Figures 3.1a and b). The detention basins and filter trench would offer a secondary level of treatment and hold the designed treatment volume for 24 hours allowing treatment of the run-off by settling sediment out etc. Shut-off valves would be provided in order to control any potential oil spills to ensure that the watercourses into which the basins would discharge were protected.

Run-off arriving at the road boundary from adjacent land to the west of the works would be collected in a cut-off ditch which would drain under the road via culverts and outfall directly into the existing watercourses (see Section 3.2.2). Herring-bone drainage would be incorporated into the design of the cuttings to ensure that any groundwater flow (usually after heavy rain) would be intercepted and drained (see Section 8.9.1). The drainage system would be covered by the topsoil on the cuttings to minimise potential visual intrusion.

Three of the watercourses have been identified as discharge locations for scheme drainage, which has completed the treatment process described above.

3.2.2.9 Signing and Lighting

The proposed roundabouts and 60m approaches to the roundabouts will be lit in keeping with the sensitive rural location of the scheme.

Signs would be located along the scheme in order to inform drivers of approaching junctions.

3.3 CONSTRUCTION

3.3.1 Introduction

All construction work would be undertaken to meet legal requirements and following best practice guidance including (but not restricted to):

- the requirements of the Water Environment (Controlled Activities) (Scotland) Regulations 2005;
- Scottish Environment Protection Agency (SEPA) Best Practice Management Guidance (www.sepa.org.uk);
- relevant CIRIA guidance including the Environmental Good Practice on Site²⁸ Guide and Control of Water Pollution from Linear Construction Projects; and
- Manual of Contract Documents for Highway Works²⁹.

²⁶ Shallow excavation filled with rubble, stone or some other void-forming media that creates temporary subsurface storage for stormwater runoff which is then filtered through the stone media and conveyed downstream

²⁷ Shallow vegetated channel designed to conduct and retain water, but may also permit infiltration; the vegetation filters particulate matter

²⁸ C650 Environmental good practice on site (Second Edition). CIRIA, 2005 and CIRIA, Control of Water Pollution from Linear Construction Projects, Technical guidance (C648)

²⁹ Department of Transport/ Scottish Office Industry Department/Welsh Office/ Department of Environment for Northern Ireland. 1992 Manual of Contract Documents for Highway Works, HMSO

3.3.2 The Contract

It has been assumed for this EIA that the scheme would be procured following a competition between a number of tenderers.

Construction assumptions and design details have been used for the EIA based on best available information and information about the proposals. Should the scheme and/or methods of construction differ from those assumed in this ES Transport Scotland, as scheme promoter, would consider whether the new proposals would result in any significant adverse effects different from those of the current design and construction assumptions. If the potential for significant effects was identified then an addendum to the ES would be required and this would be published for public comment (see also Section 1.6.5).

As part of the contract, the contractor would be required to implement all committed mitigation measures including those set out in this ES and to maintain measures such as fencing and landscaping during the maintenance period. Successful implementation of mitigation would be audited by Transport Scotland's environmental representative on site. At the end of the contract routine maintenance would pass to Transport Scotland's term maintenance contractor (see Section 3.6.1).

3.3.3 Programme

Construction is estimated to take some 12 months with the contractor responsible for a set defects correction period. This period would be stipulated in the contract for the scheme. The scheme would be constructed in a single phase. The detailed construction programme would be prepared by the contractor.

3.3.4 Employment

The number of persons employed on site would be dependant upon the construction programme, however, in excess of 50 persons would be likely to be employed during the most intense phases of the works. It is normal practice for contractors to seek local labour to supplement their own resources. It is also likely that the contractor would seek to sub-contract sections of the works with local contractors given the opportunity to tender for this work. Therefore it is likely that at least some of the site staff could be from the local area.

3.3.5 Construction Activities

Details of the construction methods and location of the site compound would be the responsibility of the chosen contractor. It has been assumed that all construction activities would be carried out in the corridor within the boundary of the land to be acquired for the permanent and temporary works.

If the contractor chose to use additional areas of land outwith the land made available for construction for the construction compound, temporary storage etc the contractor would be required to make all necessary arrangements including obtaining necessary permissions and licences.

It is likely that the works compound would be located at the southern end of the scheme to allow access from the A82. Figure 3.5 shows an indicative position for the compound however the final location would be up to the contractor. The location of the compound must facilitate quick and easy connections into local utilities /services provision in order that the compound achieves operational status efficiently.

Access to the works would primarily be via the site accesses off the existing A82 trunk road. Local roads which construction traffic would be restricted from would be agreed with Stirling Council and listed in the contract.

The majority of works would be undertaken independent of the adjacent road network. At the initial stages of construction the entire site would be fenced off and it is likely that a haul route would be created along the construction corridor to allow movement of plant and materials.

There are two areas of online construction:

- the approach roads linking the south roundabout with the Glenfalloch Road; and
- the approach roads linking the north roundabout with the Tyndrum Road and access to The Shielling.

During these works some temporary diversions could be constructed adjacent to the works.

During construction of the tie-ins traffic signals would be provided to facilitate the one way operation of traffic to maintain access to and from Crianlarich at all times.

3.3.6 Working Hours

It has been assumed for the EIA that construction activities would be undertaken during daytime periods assumed to be 08.00 to 19.00 Monday to Friday and 08.00 to 13.00 on Saturday. Occasional night and Sunday working would be required, for some activities (e.g. carriageway tie ins) to minimise traffic disruption on the local road network. Noise limits and working hour restrictions would be agreed with Stirling Council and specified in the contract documents. The contractor would be required to get permission in advance from LLTNP Planning and Stirling Council Environmental Health Services Department for any work outwith normal hours.

3.3.7 Earthworks

Scheme construction would involve activities which would result in the requirement for fill (mainly sourced from the site), excavations and generation of soils and rock which if not used in on-site features would require off-site disposal (see Section 4.3.2).

It has been estimated that some 133,800m³ of material (including 35,800m³ of peat/soft soils) would be excavated of which some 65,000m³ could be re-used on site ('suitable' material). This material would be used to construct embankments, bunds for acoustic mitigation purposes and to allow side slopes of embankments to be graded for landscape and visual purposes.

Some 68,800m³ is unlikely to be suitable for engineering purposes ('unsuitable material'). This material would be taken off-site. The contractor would be encouraged to identify locations for peat taken off-site to be reused wherever possible.

It has been assumed that cut and fill areas have approximate side slopes of 1 vertical, 3 horizontal. The contractor would be required to remove the top turfs from the peat to use in restoration. It is likely that rock would be encountered in

some areas. There may be some requirement to blast/peck the rock in these locations.

3.3.8 Traffic Management

The primary objectives of traffic management during the construction period would be to keep traffic as safe and as free from disruption as possible and to allow safe access for construction traffic to works areas.

The majority of construction of the new road section would be off-line which would reduce the potential for disturbance on the A82. Traffic management measures would be put in place during certain construction phases of the roundabout tie-ins to the existing A82 which are assumed to require single lane working and traffic signal control.

A more detailed description of the effects of scheme construction traffic on the strategic and local network is provided in Chapter 4 and an assessment of the environmental effects of predicted changes in traffic movements is presented in Chapter 12 (Disruption due to Construction).

3.3.9 Environmental Management and Community Liaison

The contractor would be required to produce and implement an environmental management system (EMS) which complies with the requirements of ISO 14001³⁰. The EMS would set out procedures to ensure all activities with potential to affect the environment are appropriately managed. All environmental risks and necessary protection measures (including mitigation measures set out in the ES) would be required to be identified and integrated in the contractor's method statements for all major construction activities.

All site staff would receive appropriate environmental training at the beginning of the contract and throughout the construction period as required. The contractor's compliance with environmental procedures would be audited on site at regular intervals during the construction works by Transport Scotland's environmental representative.

The contractor would be required to establish and maintain effective liaison with the local community throughout construction. This would include information about ongoing activities and provision of contact telephone numbers to contact the site for information during operational hours. A person would be identified with appropriate authority to resolve any problems. A log of complaints and actions taken to remedy these would be available for inspection.

The contractor would be required to ensure disturbance to the local community from construction activities was minimised to that required for safe implementation of the works.

3.4 ADDITIONAL REQUIREMENTS

3.4.1 Felling

Felling of some 2ha of coniferous forestry from Ewich Forest (see Photograph 4, Annex E) would be required to allow construction of the scheme. In addition, a further 3ha, outwith the land made available for the scheme, would be felled to

³⁰ ISO 14001 is an international standard for environmental management

take the remaining forest back to a wind-firm edge³¹. The works would probably be completed in advance of construction beginning. The felling has been discussed and agreed with the Forestry Commission (the land owners). This strip of land would remain in the ownership of the Forestry Commission and the works would be completed by agreement. New planting would be implemented at the edge of the forest in the felled area (see Section 10.7). Maintenance of the planting in this area would remain the responsibility of the Forestry Commission.

The trees would be felled using recognised forestry techniques suitable for extraction in sensitive peat locations. The wood would be removed from site.

3.4.2 Fencing

At the beginning of construction the site boundary would be fenced using post and wire fencing which would be permanent and identify the limit of the corridor which would be maintained by Transport Scotland in the future once the bypass was operational.

Deer come down from the hills and forest above Crianlarich and graze the corridor where the new road would be built (see Section 9.5.4). Consideration has been given to use of deer fencing to protect road users and to protect new planting³². The indicative location of fencing on the landscape drawings (see Figures 10.9a-c) was identified taking account of:

- potential vehicle traveller safety issues – it is important to leave clear visibility where possible for drivers and for deer to be able to see head lights etc;
- the potential for fencing to channel deer into one location which could increase safety issues;
- the potential for extensive fencing at the edges of the new road to move deer hazards to adjacent stretches of road outwith the scheme which are not fenced;
- the need to protect new planting; and
- the potential for fencing to be visually intrusive.

This strategy has been used to identify necessary deer fencing locations. The plans have been shown to the Deer Commission for Scotland who have confirmed the approach used is suitable (see Annex A). The final road design may differ in some details (see Section 3.3.2) and so the contractor would be required to discuss and agree final deer fencing proposals with the Deer Commission for Scotland.

3.5 SUSTAINABILITY OF THE PROJECT

The importance of including sustainable development principles in civil engineering projects is widely recognised. The Scottish Planning Policy (SPP) states that ‘there should be a clear focus on the quality of outcomes, with due attention given to considerations of the sustainable use of land, good design and the protection and enhancement of the built and natural environment’ (see Chapter 5).

Sustainability principles which have been included in the development of the project to date and would be incorporated during construction include:

³¹ The exact line of the wind-firm edge would be finalised and agreed on site with the Forestry Commission prior to works commencing on site

³² New planting protected in tubes can be grazed off at the tops and result in misformed and stunted growth forms

- respecting the aims of the National Park (see Section 5.5) by seeking to conserve and enhance the natural and cultural heritage of the area; promoting the sustainable use of the natural resources of the area and encouraging re-use of materials which are disturbed; maintaining and improving recreational facilities and contributing to sustainable economic and social development of Crianlarich by removing traffic and provision of a more appropriate route particularly for HGVs;
- optimising the re-use of site work materials;
- seeking to re-use as much peat as possible in the scheme earthworks to avoid the need for off-site disposal;
- optimising use of local materials;
- using Sustainable Urban Drainage Systems (SUDS);
- designing the scheme to reduce impacts on people and the natural and cultural environment where possible; and
- designing the landscaping proposals to enhance local biodiversity in the longer term.

3.6 MAINTENANCE ACTIVITIES

3.6.1 Routine Maintenance

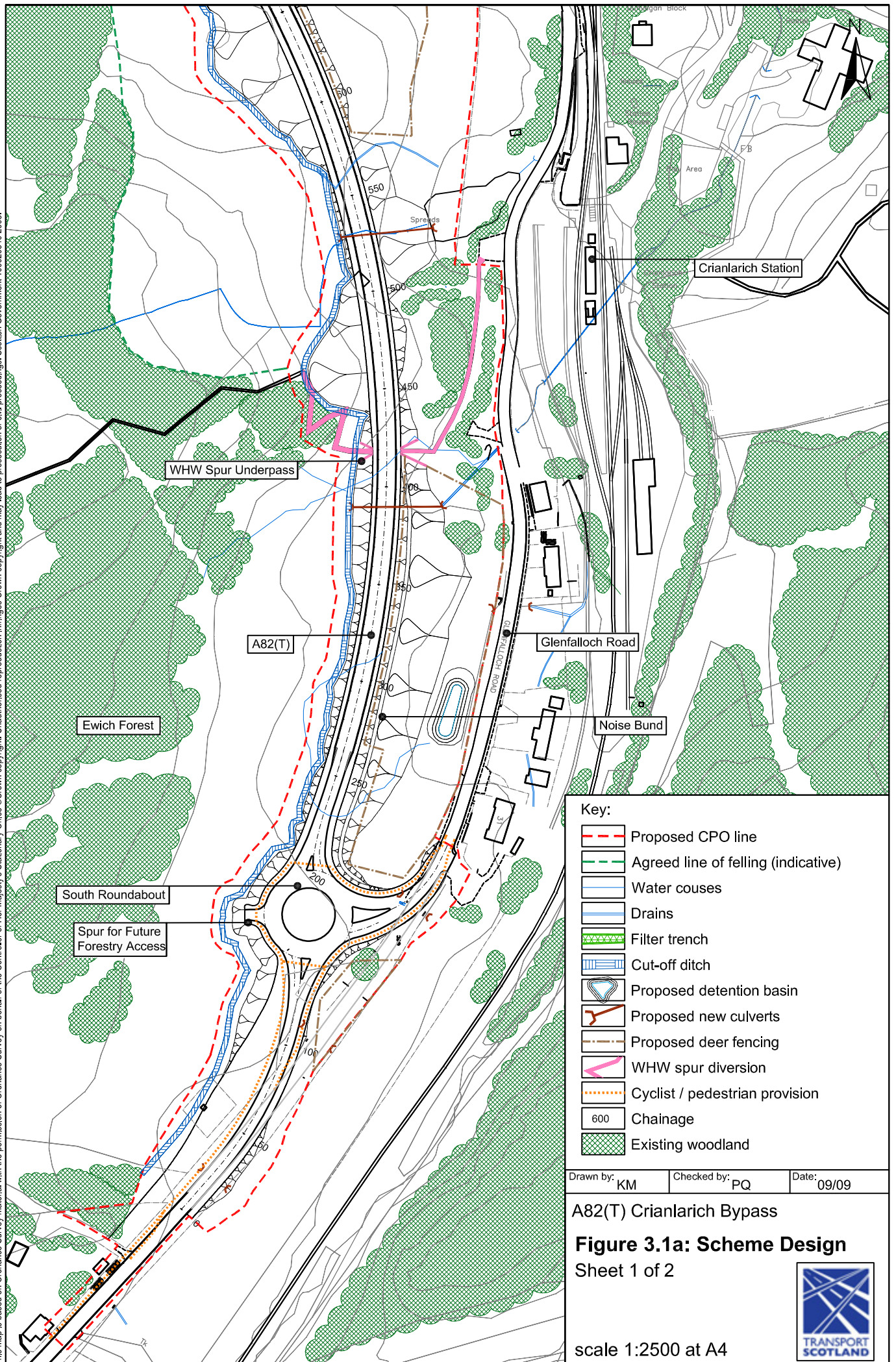
Following completion the contractor would be responsible for defects over a set period (see Section 3.3.2) including checking the effectiveness of implemented mitigation measures after which routine maintenance would be undertaken by Transport Scotland's term maintenance contractor. Activities would include landscaping maintenance, grass cutting, snow clearing, gritting, cleaning of drainage systems and upkeep of lighting.

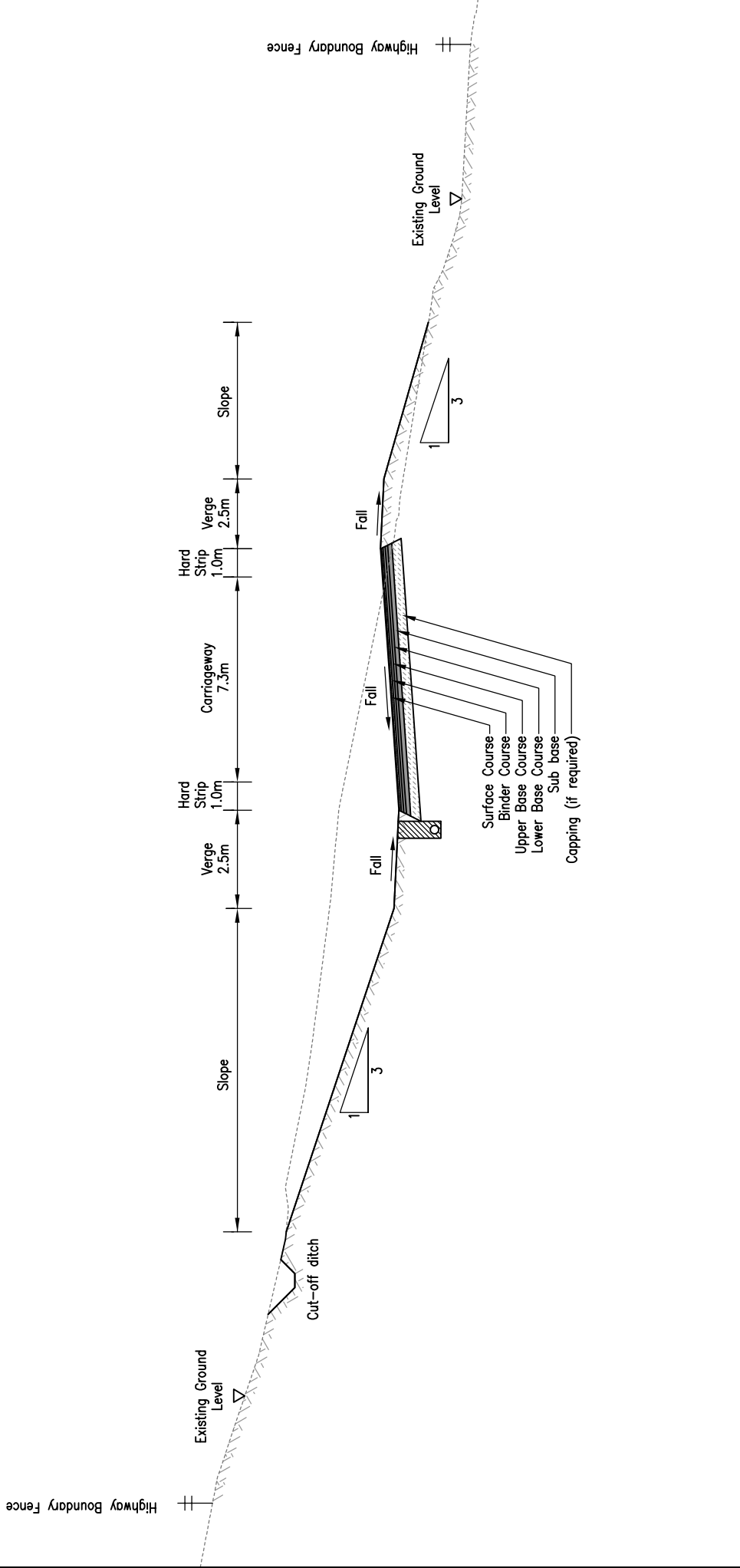
3.7 GENERAL MITIGATION MEASURES

General mitigation measures including those contained within the first chapters of the ES are summarised below:

- GEN1. Where final scheme details could vary from those described in the ES, the terms of the contract would ensure that the resulting effects were no greater than those reported in the ES. If there were significant differences in the predicted effects of the scheme an addendum to the ES would have to be published for public consultation and comment and consideration by Transport Scotland and Scottish Ministers.
- GEN2. Consultations and discussions with key stakeholders would continue through the contract.
- GEN3. The contractor would be required to obtain all necessary permissions and consents for use of land outwith the land made available for the contract.
- GEN4. The contractor would be required to securely fence off the area of the works in advance of construction in order to protect public safety and ensure that there is no unauthorised public access to the site.
- GEN5. The contractor would be required to manage traffic on the A82 and A85 and on local roads safely and efficiently through the works to ensure the risk of delay and inconvenience was reduced to the minimum necessary for the works.
- GEN6. Temporary signs would be employed during the life of the contract to warn drivers in advance about the presence of any queues and anticipated delays.
- GEN7. Working hours would be agreed with Stirling Council and set out in the contract. At present they are assumed to be 08.00 to 19.00 Monday to Friday and 08.00 to 13.00 on Saturday. All night time and Sunday

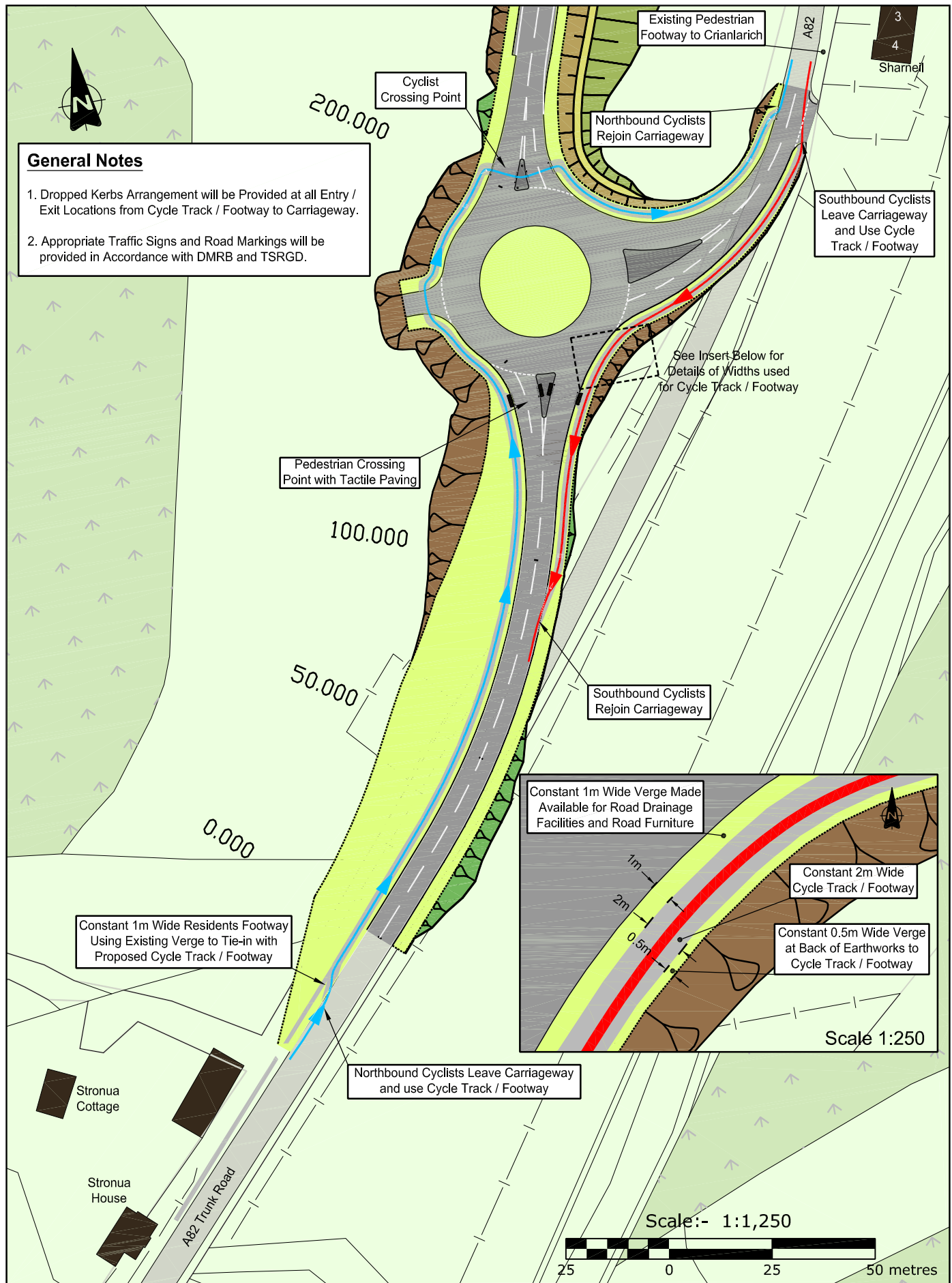
- working would be agreed in advance with Stirling Council and Loch Lomond and the Trossachs National Park.
- GEN8. Noise limits for construction would be agreed with Stirling Council and set out in the contract.
- GEN9. Access to all properties would be maintained during construction and operation of the scheme.
- GEN10. The contractor would be required to maintain effective liaison with local communities close to the construction area. This would include circulation of information about ongoing activities and a contact telephone number for use by the local community to contact the contractor for information. The telephone would be operated during operational hours and person(s) with appropriate authority to resolve any problems that occur would be available. A log of all complaints and actions taken would be kept and made available for inspection.
- GEN11. The contractor would be required to produce and implement an Environmental Management System (EMS) for the construction and maintenance period.
- GEN12. Compliance with the EMS would be audited at regular intervals by Transport Scotland's representative on site.
- GEN13. The scheme drainage would include appropriate sustainable urban drainage system measures.
- GEN14. The herringbone drainage system would be designed to sit underneath the topsoil layer of the cuttings to minimise visual intrusion.
- GEN15. Ledges to allow animal passage would be included in the new culverts.
- GEN16. Use of hexagonal reinforced earth and gabion baskets in the works would not be permitted.
- GEN17. The new road and associated works would only be lit where essential to comply with current safety standards.
- GEN18. The contractor would be required to remove the top turfs from the peat to use in restoration.
- GEN19. The contractor would be required to re-use as much extracted peat as possible in the earthworks and landscaping for the scheme to avoid loss of peat to off-site disposal.
- GEN20. The contractor would be encouraged to identify locations for peat taken off-site to be reused wherever possible.
- GEN21. Timber felled from site and the adjacent area would be extracted using techniques sensitive to working on slopes on peat.
- GEN22. All cascades water features would be designed to be as natural as possible in character.
- GEN23. The contractor would be required to discuss and agree final deer fencing proposals with the Deer Commission for Scotland.





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A82(T) Crianlarich Bypass			
Figure 3.2: Typical Cross Section			
Scale: 1:200 at A4			





Key:

- FOOTPATH PROVISION
- SOUTHBOUND CYCLE TRACK PROVISION
- NORTHBOUND CYCLE TRACK PROVISION

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A82 (T) Crianlarich Bypass

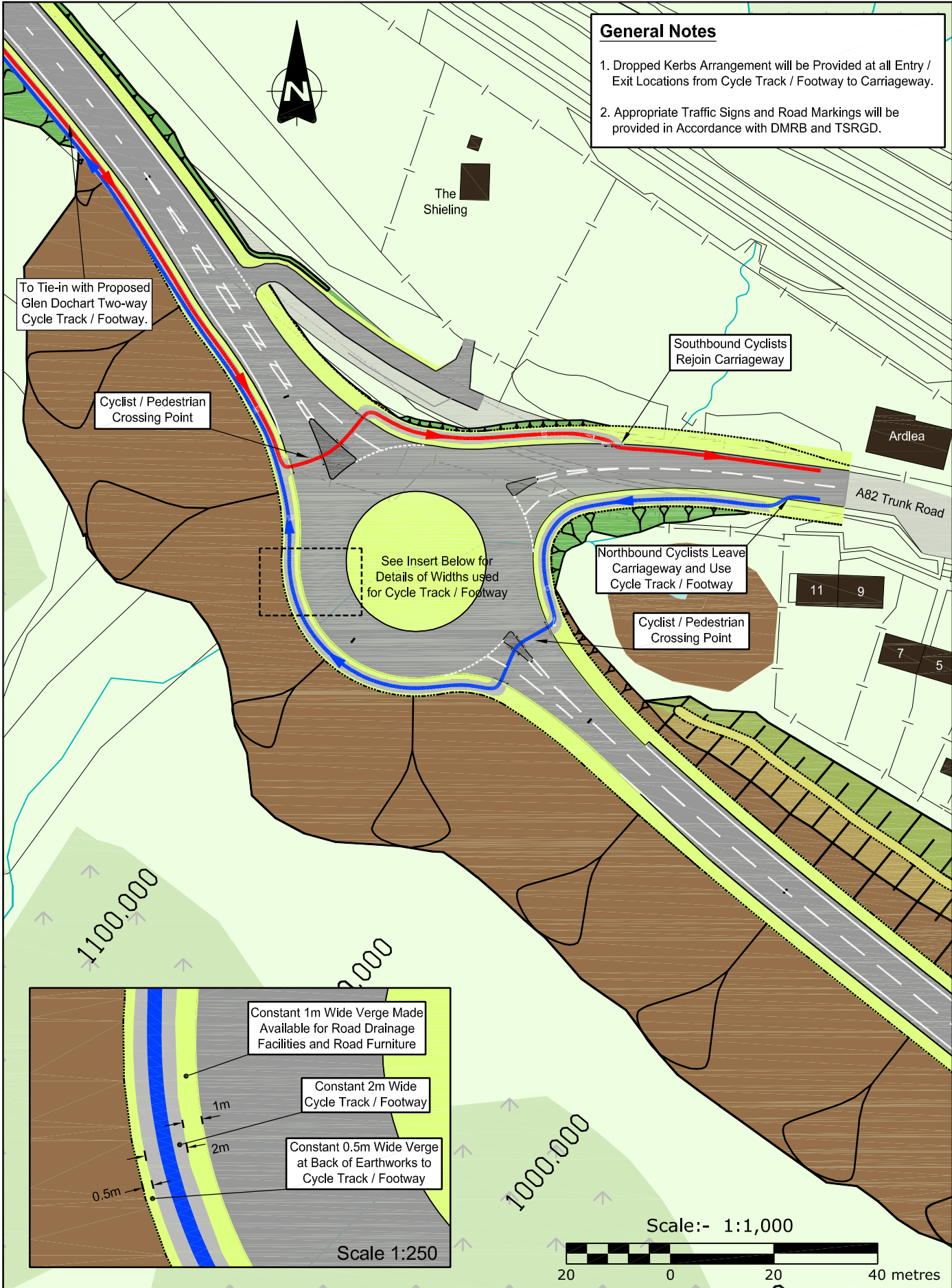
Figure 3.3a:
Cyclist and Pedestrian Provision at the South Roundabout

Scales 1:1250, 1:250 at A4



General Notes

1. Dropped Kerbs Arrangement will be Provided at all Entry / Exit Locations from Cycle Track / Footway to Carriageway.
2. Appropriate Traffic Signs and Road Markings will be provided in Accordance with DMRB and TSRGD.



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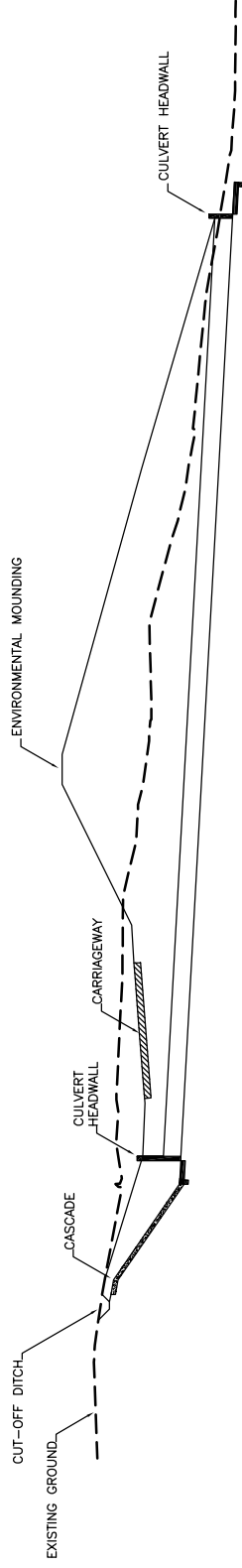
- FOOTPATH PROVISION
- SOUTHBOUND CYCLE TRACK PROVISION
- NORTHBOUND CYCLE TRACK PROVISION

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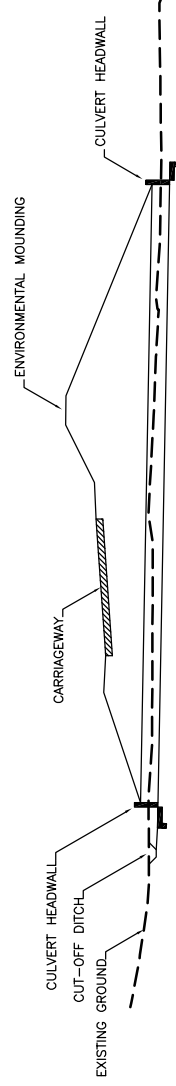
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A82 (T) Crianlarich Bypass
Figure 3.3b:
Cyclist and Pedestrian Provision at the North Roundabout
Scales 1:1000, 1:250 at A4



TYPICAL CULVERT SECTION – ROAD IN CUTTING



TYPICAL CULVERT SECTION – ROAD IN FILL

Notes:

- Culvert levels and gradients to be confirmed at detailed design.
- All new culverts to facilitate otter passage

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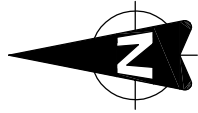
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A82(T) Crianlarich Bypass

Figure 3.4: Typical Culvert Sections

Scale : 1:500





SOUTH
ROUNDBOUT

POTENTIAL SITE
COMPOUND AREA
(APPROXIMATELY 7,000m²)

SITE COMPOUND AREA TO INCLUDE:--

- SITE OFFICES
- SITE WELFARE FACILITIES
- MATERIAL STORAGE AREA
- VEHICLE PARKING

Key

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Figure 3.5: Potential Location of Construction

Compound

Scale: 1:2000

