



6.0 ECOLOGY AND NATURE CONSERVATION

6.1 INTRODUCTION

6.1.1 This section presents an assessment of the ecology and nature conservation in and around the proposed realignment works on the A737 at The Den. This assessment outlines the baseline conditions and assesses the potential impacts on designated sites, habitats, mammals, birds and amphibians to determine mitigation measures.

6.1.2 A number of ecological surveys were undertaken between April and July 2005, to assess the baseline flora and fauna within the boundary of the scheme. The survey reports are contained within Appendix D1 (Ecological Surveys) and include a Phase 1 habitat survey, bat surveys, mammal surveys and great crested newt surveys. A separate bird and amphibian survey were also carried out, and can be found in Appendix D2 (Bird Survey) and Appendix D3 (Amphibian Survey) respectively. A separate, additional Phase 1 habitat survey was carried out in July 2008, as the previous survey report recommended several areas be revisited during the summer months. This would allow a full assessment of floristic value to be made. This report can be found in Appendix D4 (Phase 1 habitat survey).

6.1.3 Consultation was previously undertaken by Royal Haskoning (RH) with Scottish Natural Heritage (SNH), with two responses received in January 2004 and one response received in April 2007. Further consultation by Amey was sought from SNH in September 2011. These responses can be found in Appendix D5 (SNH 38954).

6.1.4 SNH were also consulted with regard to the Assessment of Implications on European Sites (AIES). This assessment and their response can be found in Appendix D6

6.1.5 A desk top study was undertaken based upon information obtained from various sources:

- Amey's Netwise – Road Inventory data for Scotland's South West Trunk Road Unit
- Amey's Road Kill Database
- SNH Sitelink¹

6.2 METHODOLOGY

6.2.1 This assessment was carried out in accordance with the Design Manual for Roads and Bridges (DMRB), Volume 11, Section 3, Part 4, Ecology and Nature Conservation. This assessment has also been undertaken in accordance with the guidance set out in the Institute of Ecology and Environmental Management's (IEEM) Guidelines for Ecological Impact Assessment (2006) in order to provide clear and concise information about the likely ecological effects associated with the scheme. The determination of impact significance considers sensitivity of existing resources to change as represented by the value or importance of the feature and the magnitude of change.

¹ Scottish Natural Heritage (SNH) Sitelink homepage, available from <http://gateway.snh.gov.uk/sitelink/index.jsp>



6.2.2 Sensitivity is determined using a five-point scale of very high, high, medium, low and negligible as outlined in Table 6.1 – Determination of Receptor Sensitivity.

Table 6.1 Determination of Receptor Sensitivity

Sensitivity	Typical Criteria Descriptors
Very High	The receptor is of very high importance and rarity, international ecological importance and very limited potential for substitution
High	The receptor has little ability to absorb change without fundamentally altering its present character or it is of national ecological importance
Medium	The receptor has moderate capacity to absorb change without significantly altering its present character or it is of high ecological importance
Low	The receptor is tolerant of change without detriment to its character or it is of local ecological importance
Negligible	The receptor is of very low ecological importance and rarity

6.2.3 The magnitude of potential effects on ecology and nature conservation caused by the route alignment has been rated using the classifications and criteria outlined in Table 6.2 – Determination of Impact Magnitude.

Table 6.2 Determination of Impact Magnitude

Impact Magnitude	Typical Criteria Descriptors
Major	Total loss or major alteration to key elements of the baseline conditions such that the post development character will be fundamentally changed
Moderate	Loss or alteration to one or more key elements of the baseline conditions such that post development character of the baseline will be materially changed
Minor	A minor shift away from baseline conditions. Change arising from the alteration will be detectable but not material. The underlying character of the baseline conditions will be similar to the post development character
Negligible	Very minor loss or detrimental alteration to one or more characteristics, features or elements
No Change	No loss or alteration of characteristics, features or elements, no observable impact in either direction

6.2.4 Impact significance is determined using a combination of receptor sensitivity and magnitude of change on ecology and nature conservation within the scheme. Five levels of significance were defined which apply equally to beneficial and adverse impacts. Table 2.4 Determination of Impact Significance of Chapter 2 illustrates the significance of impacts matrix which is used to derive the overall impact.



6.3 BASELINE CONDITIONS

Designated Sites

- 6.3.1 Within 2km of the scheme there are 10 designated areas. These designated areas are:
- Barkip Moss Raised Bog Inventory (RBI)
 - Unnamed RBI, site number NS35.2
 - Middlebank Plantation, Ancient Woodland Inventory (AWI), 9384
 - Unnamed AWI, site number 9369
 - Unnamed AWI, site number 9377
 - Unnamed AWI, site number 9382
 - Unnamed AWI, site number 9383
 - Clyde Muirshiel Regional Park
 - Bankhead Moss Special Area of Conservation (SAC)
 - Bankhead Moss Site of Special Scientific Interest (SSSI)
- 6.3.2 Barkip Moss Raised Bog Inventory is located approximately 1.25km from the scheme, with National Grid Reference (NGR) of NS339510.
- 6.3.3 Unnamed RBI, site number NS35.2 is located approximately 0.59km from the scheme, with NGR of NS333510.
- 6.3.4 Middlebank Plantation Ancient Woodland Inventory, site number 9384 is 2.6Ha in size. This is established woodland of plantation origin located approximately 1.53km from the scheme.
- 6.3.5 Unnamed AWI, site number 9369 is a long establish, of plantation origin, Ancient Woodland Inventory, 16.62Ha in size and approximately 0.9km from the scheme.
- 6.3.6 Unnamed AWI, site number 9377 is a long established, of plantation origin, Ancient Woodland Inventory, 2.64Ha in size and approximately 1.56km from the scheme.
- 6.3.7 Unnamed AWI, site number 9382 is a long established, of plantation origin, Ancient Woodland Inventory and is 1.13km from the scheme.
- 6.3.8 Unnamed AWI, site number 9383 is a long established, of plantation origin, Ancient Woodland Inventory, 3.67Ha in size and approximately 1.29km from the scheme.
- 6.3.9 Clyde Muirshiel Regional Park dates back to the 1940's however it wasn't formally designated until 1990. The park is Scotland's largest regional park and is located approximately 1.71km from the scheme.
- 6.3.10 Bankhead Moss was designated in 1996 as a Site of Special Scientific Interest and in March 2005 as a Special Area of Conservation. It is an Active Raised Bog, its condition is favourable maintained, is 32.5Ha in size and is located approximately 1.65km from the scheme.
- 6.3.11 These designated areas are illustrated on Drawing Ecology and Nature Conservation, Number 10/SW/0901/037/202 Rev A.
- 6.3.12 As the designated sites within 2km of the scheme extents vary from local to national designations, they are assessed as medium sensitivity.
- 6.3.13 There are no European designated sites within 30km of the scheme extents in which bats are a qualifying feature.



Habitats

- 6.3.14 Phase 1 habitat surveys were undertaken in April 2005 and July 2008 (Appendix D1 (Ecological Survey) and D4 (Phase 1 habitat survey) respectively). The surveys have noted the area to contain a small number of fields, bounded by trees, hedgerows and belts and areas of marsh within the fields. Mature woodland consists of belts along the A737 at the east end of the site and along the minor road which is at right angles to it. There are larger areas of broadleaved planting in the fields either side of the track to Meadowhead Farm. The most common mature trees within the survey area consist of birch *Betula sp.*, alder *Alnus sp.*, sycamore *Acer pseudoplatanus*, ash *Fraxinus excelsior*, beech *Fagus sylvatica* and cherry *Prunus avium*.
- 6.3.15 Scrub on site is limited to a stretch of hawthorn *Crataegus monogyna* and bramble *Rubus fruticosus* in a field in the north east of the site. Hedgerows are the most common scrub on site and although they are not continuous boundaries they do provide suitable habitat for breeding birds.
- 6.3.16 The grassland is classed as semi improved with areas of marshy grassland and rush pasture. Common herbs found in the grassland included cow parsley *Anthriscus sylvestris*, yarrow *Achillea millefolium* and ribwort *Plantago lanceolata*.
- 6.3.17 Wetland is present in four of the fields, and many of these where ditches are present, are considered to have amphibian potential. These areas supported a number of wetland grass species such as soft rush *Juncus effusus*, tufted hair grass *Deschampsia cespitosa*, Yorkshire fog *Holcus canatus*, creeping buttercup *Ranunculus repens*, meadowsweet *Filipendula ulmaria* and hemlock water dropwort *Oenanthe crocata*.
- 6.3.18 The habitats within the scheme extents are important on a local level and are therefore assigned a low sensitivity.

Species

Mammals

- 6.3.19 All bats and their roosts are protected by law under the Wildlife and Countryside Act 1981 (as amended), the Nature Conservation (Scotland) Act 2004 and by the Conservation (Natural Habitats, &c.) Amendment (Scotland) Regulations 2007 (The Habitats Regulations).
- 6.3.20 In April 2005 RH commissioned Nocturne Environmental Surveyors to undertake a bat survey. This survey was carried out during the day and included a walked transect survey of the scheme and visual inspections of all trees which could be affected by the road realignment. The survey recorded no signs of bat activity. One large sycamore contained woodpecker *Picidae sp.* holes and a beech which is split near the top will require being checked by a licenced bat worker prior to felling.
- 6.3.21 As there are trees which require being checked for bat roosts prior to felling, it is assumed these are suitable bat roosts and therefore bats may be present. Bats have been assigned a high sensitivity.
- 6.3.22 Badger and their setts are protected under the Protection of Badgers Act 1992, the Nature Conservation (Scotland) Act 2004 and the Wildlife and Countryside Act 1981 (as amended).



- 6.3.23 Until 2005, there were no records of badger as road casualties on the A737 around the area and anecdotal evidence from local residents show there is no recollection of badger mortalities from traffic collisions. From 2005 onwards, there have been no records of badger as road casualties on this section of road.
- 6.3.24 During the 2005 Phase 1 habitat survey, the north of the scheme presented a small area suitable for foraging and a lack of suitable sites for shelter. To the south, is a mixture of foraging and shelter potential. No signs of badger were found during the survey.
- 6.3.25 There is no evidence or records of badger in the area and therefore they are assigned a negligible sensitivity.
- 6.3.26 Otters are protected in Scotland under the Habitats Regulations, the Wildlife and Countryside Act 1981 (as amended) and the Nature Conservation (Scotland) Act 2004.
- 6.3.27 During the 2005 survey, drains were discontinuous and often appeared polluted. These provided no suitable prey for otter and the area was considered unsuitable for otters. There are no records of otter as road casualties on the A737 around the scheme.
- 6.3.28 There is no evidence or records of otter in the area and therefore they are assigned a negligible sensitivity.
- 6.3.29 Water voles are protected under the Wildlife and Countryside Act 1981 (as amended) and the Nature Conservation (Scotland) Act 2004.
- 6.3.30 Some water vole habitat is present on site, as weeded roadside drains at the southern end of the scheme. A polluted roadside burn had no water vole potential. During the 2005 survey, no signs of water vole were found.
- 6.3.31 There is no evidence or records of water vole in the area and therefore they are assigned a negligible sensitivity.

Birds

- 6.3.32 All wild birds, their nests and eggs are protected under the Wildlife and Countryside Act 1981 (as amended), the Nature Conservation (Scotland) Act 2004 and The Habitats Regulations.
- 6.3.33 A breeding bird survey was carried out between two visits, May 2005 and June 2005, and can be found in Appendix D2 (Bird Survey). Twenty species of bird were found to be breeding within the survey area, the most common was willow warbler *Phylloscopus Trochilus* with 12 pairs, closely followed by the wren *Troglodytes troglodytes* with 11 breeding pairs. There were a further 14 bird species identified within the survey area, however these were not considered to be breeding in the survey area.
- 6.3.34 Reed bunting *Emberiza schoeniclus*, grasshopper warbler *Locustella naevia*, song thrush *Turdus philomelos* and house sparrow *Passer domesticus* all of which are red listed bird species were recorded breeding within the survey area. Song thrush is also a UK Biodiversity Action Plan (BAP) priority species of conservation concern and is an Ayrshire Local BAP (LBAP) species. Grasshopper warbler and reed bunting are also key species on Ayrshire's LBAP.



- 6.3.35 Four amber listed species were recorded and in total, 15 UK BAP species of conservation concern were recorded as breeding within the scheme extents.
- 6.3.36 As there are red listed, amber listed and UK BAP species breeding and utilising the survey area, birds have been assigned a high sensitivity.

Amphibians

- 6.3.37 Great crested newts *Triturus cristatus* and natterjack toads *Epidalea calamita* are protected under the Conservation (Natural Habitats, &c.) Amendment (Scotland) Regulations 2007 and all parts of Section 9, Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Smooth newt, palmate newt, common frog and common toad are protected under Section 9(5), Schedule 5 of the Wildlife and Countryside Act 1981 (as amended).
- 6.3.38 An amphibian survey was carried out in spring 2005. The survey mainly concentrated on great crested newts, and the purpose of the survey was to establish the presence and use of the site by these and other amphibians. No great crested newts were found at any part of the site and there was lack of suitable habitat present. At the western end of the site, various small ponds and wet ditches were present adjacent to the road. Tadpoles of the common frog *Rana temporaria* were found in two areas of the wet ditches on the south side of the road. No amphibians were found on the north side of the road.
- No great crested newts were recorded during the survey, and the habitat is not suitable. Only some common frog tadpoles were found on site. Amphibians have been assigned a negligible sensitivity.

6.4 IMPACT ASSESSMENT

During Construction

Designated Sites

- 6.4.1 The proposed road alignment cuts along the southern edge of the designated area, Ancient Woodland Inventory site number 9369. This area contains young plantation broadleaved woodland. This woodland is large and covers a wide area; therefore in accordance with Table 6.2, the impact on the route cutting the edge of the woodland is minor. The overall impact significance is slight.

Habitats

- 6.4.2 The proposed road alignment will bisect two fields of young broadleaved woodland, and several fields of improved and semi-improved grassland. There are areas of marshy grassland where the proposed new section of the A737 will join the existing road. Following assessment of the Phase 1 report (2005), SNH confirmed there was little interest or importance within the area of the proposed scheme. None of the habitat within the footprint of the scheme extents is of particular biological significance. In accordance with Table 6.2 the magnitude of impact will be minor. In accordance with Table 2.4 the impact significance will be slight as there will be some noticeable change to the area.



Mammals

- 6.4.3 Two trees, a large sycamore containing woodpecker *Picidae sp.* holes and a beech which is split near the top, have potential to provide habitat for bats. These are due to be felled as part of the construction process and have the potential to destroy a bat roost. In accordance with Table 6.2, this loss during the construction process will have a moderate magnitude. In accordance with Table 2.4 the impact significance is determined to be moderate as this is only a potential bat roost and not confirmed.
- 6.4.4 As badger, otter and water vole are not considered to be present on site, they will be unaffected by construction works. In accordance with Table 6.2 the impact magnitude is determined to be no change. In accordance with Table 2.4, the impact significance is determined to be neutral.

Birds

- 6.4.5 Birds have been recorded utilising and nesting in the hedgerows and the trees running parallel with the road. Removal of these areas will cause the removal of bird habitat. In accordance with Table 6.2 the impact magnitude is assessed as moderate. The impact significance is determined to be moderate as there are red listed, amber listed and UK BAP species breeding and utilising the survey area.

Amphibians

- 6.4.6 Common frog *Rana temporaria* tadpoles were found in two areas of wet ditches present on the south side of the A737. As common frog have been found to the south of the existing alignment, they will be unaffected by construction works. Great crested newts *Triturus cristatus* are not considered to be present within the survey area, however pre-construction surveys will be undertaken. In accordance with Table 6.2 the impact magnitude is determined to be no change. In accordance with Table 2.4, the impact significance is determined to be neutral.

Post Construction

Designated Sites

- 6.4.7 The proposed road alignment cuts along the southern edge of the designated area, Ancient Woodland Inventory site number 9369, 16.62Ha in size. The area lost as a result of the realignment is 0.429Ha (2.6%) and contains immature broadleaved woodland which will have a minimal impact on the overall Ancient Woodland. In accordance with Table 6.2 the impact magnitude on Ancient Woodland is assessed as negligible as there is a very minor loss. The impact significance is therefore assessed as slight in accordance with Table 2.4.



Habitats

- 6.4.8 The proposed road alignment will bisect two fields of young broadleaved woodland, and several fields of improved and semi-improved grassland. Areas of marshy grassland will be lost where the proposed new section of the A737 joins the existing road. The magnitude of impact will be minor as there will be some loss of habitat. In accordance with Table 2.4, the impact significance is assessed as slight.

Mammals

- 6.4.9 Two trees that have potential to provide habitat for bats. These trees may be felled and therefore a bat roost may be destroyed. In accordance with Table 6.2, this loss will have a moderate magnitude. In accordance with Table 2.4 the impact significance is determined to be moderate as this is only a potential bat roost and not confirmed.
- 6.4.10 As badger, otter and water vole are not considered to be present on site, they will be unaffected by the new alignment. In accordance with Table 6.2 the impact magnitude is determined to be no change. In accordance with Table 2.4, the impact significance is determined to be neutral.

Birds

- 6.4.11 Some areas of bird habitat will be lost due to the scheme. In accordance with Table 6.2 the impact magnitude is assessed as moderate. The impact significance is determined to be moderate as there are red listed, amber listed and UK BAP species breeding and utilising the survey area.

Amphibians

- 6.4.12 As amphibians were found to the south of the existing alignment, they will be unaffected by the scheme. In accordance with Table 6.2 the impact magnitude is determined to be no change. In accordance with Table 2.4, the impact significance is determined to be neutral.

Table 6.3: Summary of Impact Assessment

Land Use	Sensitivity	Impact Magnitude		Impact Significance	
		During Construction	Post Construction	During Construction	Post Construction
Designated Sites	Medium	Minor	Negligible	Slight	Slight
Habitats	Low	Minor	Minor	Slight	Slight
Bat	High	Moderate	Moderate	Moderate	Moderate
Badger	Negligible	No change	No change	Neutral	Neutral
Otter	Negligible	No change	No change	Neutral	Neutral
Water Vole	Negligible	No change	No change	Neutral	Neutral
Birds	High	Moderate	Moderate	Moderate	Moderate
Amphibians	Negligible	No change	No change	Neutral	Neutral



6.5 MITIGATION

During Construction

Designated Sites

- 6.5.1 There will be a slight impact due to the 2.6% loss of small areas of ancient woodland. During construction, 0.1ha of compensatory planting, with 12 specimen trees will take place (Drawing 10/SW/0901/037/026Rev B).

Habitats

- 6.5.2 There will be a slight impact due to the loss of small areas of fields and grassy marshland. It is recommended that as many of the hedgerows and mature trees as possible are retained to minimise the impact. More information on tree and hedgerow retention can be found within Chapter 7 Landscape Effects.

Mammals

- 6.5.3 As two trees have the potential contain bat roosts, a survey by a licensed bat worker must be undertaken prior to their felling. If any roost is discovered, further consultation will be required with Scottish Natural Heritage (SNH) and a Protected Species Licence may need to be obtained.
- 6.5.4 A pre-construction survey must be undertaken to ensure no new wildlife has moved to the site following the surveys undertaken in 2005. Further mitigation requirements will depend on the outcome of these surveys.
- 6.5.5 At night, any open excavations should be covered over and/or have a wooden plank to allow any fallen animals to make their way out, and pipes should be covered to prevent animals entering them.
- 6.5.6 Any artificial lighting used on site during the works should be sympathetic to the rural surroundings. Hoods should be fitted directing the light only to the working area, to avoid light splaying into the surrounding areas and disturbing or confusing the local wildlife.
- 6.5.7 Best practice techniques should be carried out to minimise noise and vibrations during the works which would disturb local wildlife. Site supervision preventative measures to be considered are; minimising traffic reversing noise, noise due to site traffic, vehicle idling noise and minimising worker noise.

Birds

- 6.5.8 To prevent disturbance to nesting birds, clearance works must not commence during the bird breeding season (March to August inclusive). If works must be undertaken during this season, the vegetation must first be surveyed by a suitability qualified person. This may cause a potential risk to the construction programme, however it will ensure birds are not impacted if clearance is taking place during the breeding season.



Amphibians

- 6.5.9 As there will be no impact on amphibians no mitigation measures are required.

Post Construction

Designated Sites

- 6.5.10 There will be a slight impact due to the loss of small areas of ancient woodland. There is no appropriate mitigation available to reduce this further.

Habitats

- 6.5.11 A planting scheme of native species of local provenance will be included as part of the landscape design to replace those which will be lost. Wildflower verges will be created, using locally sourced native species of grass and herb appropriate for the soil conditions. Reseeding in infertile soil will include a wildflower mix to maximise potential for insects, and will require several cuts in the first year to control annual weeds, followed by two cuts per annum thereafter.

Mammals

- 6.5.12 It is considered that mitigation identified during construction, relating to the loss of a potential bat roost (paragraph 6.5.3), will also mitigate the associated impact during operation of the new alignment.
- 6.5.13 As there will be no impact on badger, otter and water vole no mitigation measures are required.

Birds

- 6.5.14 The establishment of tree and shrub areas for birds is also included in the landscape design, where more information can be found within the Landscape Effects, Chapter 7. Trees removed as part of the scheme will be replaced with native local species, chosen to maximise wildlife potential. Fencing will be set at least 1m away from hedges to protect hedge-bottom plant species.

Amphibians

- 6.5.15 As there will be no impact on protected amphibians no mitigation measures are required.

6.6 RESIDUAL IMPACTS

During Construction

- 6.6.1 The impact significance on designated sites, badgers, otters, water voles and amphibians will remain unchanged as no mitigation is proposed.

Habitats

- 6.6.2 There will be a slight impact due to the loss of small areas of fields and grassy marshland. It is recommended that as many of the hedgerows and mature trees as possible are retained to minimise the impact. It is considered that the impact significance will remain as slight.



Mammals

- 6.6.3 It is considered that mitigation identified in relation to the loss of a potential bat roost (paragraph 6.5.3), will reduce the impact magnitude to minor. The resulting residual impact significance is determined to be slight as this is only a potential bat roost and not confirmed.

Birds

- 6.6.4 It is considered that mitigation identified in paragraph 6.5.8 will reduce the impact magnitude to minor. The residual impact significance is determined to be slight as no active nests will be disturbed and only relatively small areas of habitat will be lost.

Amphibians

- 6.6.5 As there will be no impact on amphibians no mitigation measures are required.

Post Construction

- 6.6.6 The impact significance on designated sites, badgers, otters, water voles and amphibians will remain unchanged as no mitigation is proposed.

Habitats

- 6.6.7 The implementation of mitigation measures identified in paragraph 6.5.11 to replace lost habitats will reduce the impact magnitude to negligible. The residual impact significance is therefore determined to be neutral.

Mammals

- 6.6.8 It is considered that mitigation identified during construction, relating to the loss of a potential bat roost (paragraph 6.5.3), will also mitigate the associated impact during operation of the new alignment. The impact magnitude is determined to be minor in accordance with Table 6.2. The resulting residual impact significance is determined to be slight as this is only a potential bat roost and not confirmed.

Birds

- 6.6.9 The re-establishment of tree and shrub areas for birds is considered to reduce the impact magnitude to negligible. The residual impact significance is determined to be slight.
- 6.6.10 A summary of the residual impacts following implementation of the mitigation measures identified in Section 6.5 above is provided in Table 6.4 below.



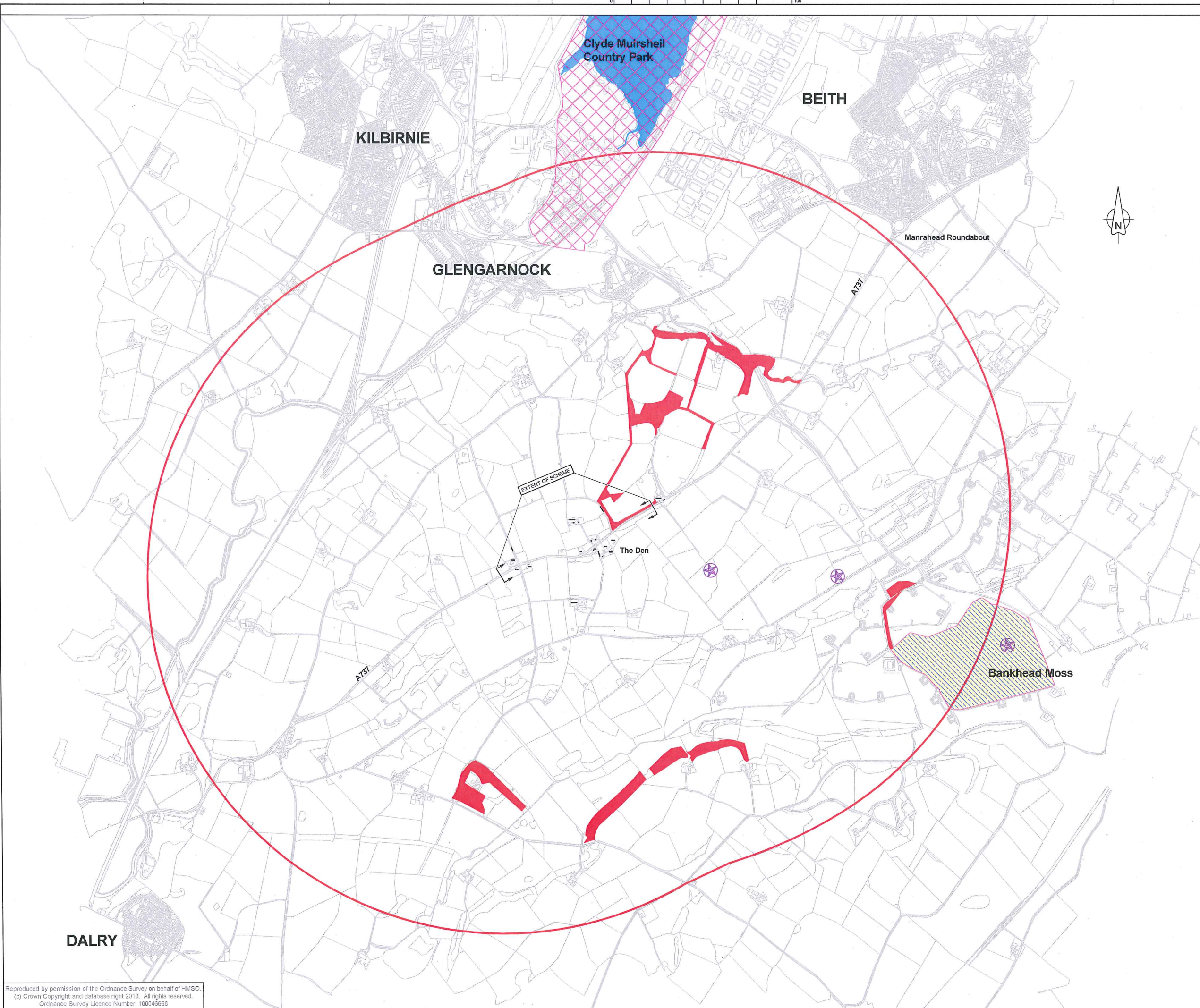
Table 6.4: Summary of Residual Impact Assessment

Land Use	Sensitivity	Impact magnitude		Impact Significance	
		During Construction	Post Construction	During Construction	Post Construction
Designated Sites	Medium	Minor	Negligible	Slight	Slight
Habitats	Low	Minor	Negligible	Slight	Neutral
Bat	High	Minor	Minor	Slight	Slight
Badger	Negligible	No change	No change	Neutral	Neutral
Otter	Negligible	No change	No change	Neutral	Neutral
Water Vole	Negligible	No change	No change	Neutral	Neutral
Birds	High	Minor	Negligible	Slight	Slight
Amphibians	Negligible	No change	No change	Neutral	Neutral

6.7 CONCLUSION

- 6.7.1 The proposed route alignment will result in the loss of two fields of young broadleaved woodland. It has been confirmed that there is little ecological importance within this area. None of the habitats within the footprint of the scheme are of particular biological significance. There have been no mammals recorded within the scheme extents, and amphibians have been recorded within two areas of wet ditches on the south side of the existing road. Birds are present in the hedgerows of the scheme, and two trees have potential to contain bat roosts.
- 6.7.2 With appropriate mitigation no significant impacts are predicted upon nature conservation and biodiversity.

S:\SHARED\S001 - MTRIPS\09007 - The Den, Dalry\003 Design\002 Drawings\Work Area\1 Live Drawings\Environmental\Post Ext Audit\10_SW_0901_037_202 Ecological Rev A.dwg, 25/01/2013 14:31:18, lholland



LEGEND

- Raised Bog Inventory
- Ancient Woodland Inventory
- Regional Park
- Water Body
- Site of Special Scientific Interest
- Special Area of Conservation
- 2km Boundary

EXTENT OF SCHEME

Rev	Revision details	Chkd	Appd	Date
A	Minor changes to layout			14/02/12

Drawn: I.H.	Preliminary	<input checked="" type="checkbox"/>
Design: M.R.	For comment	<input type="checkbox"/>
Chkd: H.F.	For tender	<input type="checkbox"/>
Appd: N.C.	For construction	<input type="checkbox"/>
Date: 14/02/12	As constructed	<input type="checkbox"/>



Project Name
**A737/A738 TRUNK ROAD
THE DEN, DALRY**

Drawing Title
**ENVIRONMENTAL
ECOLOGY and
NATURE CONSERVATION**

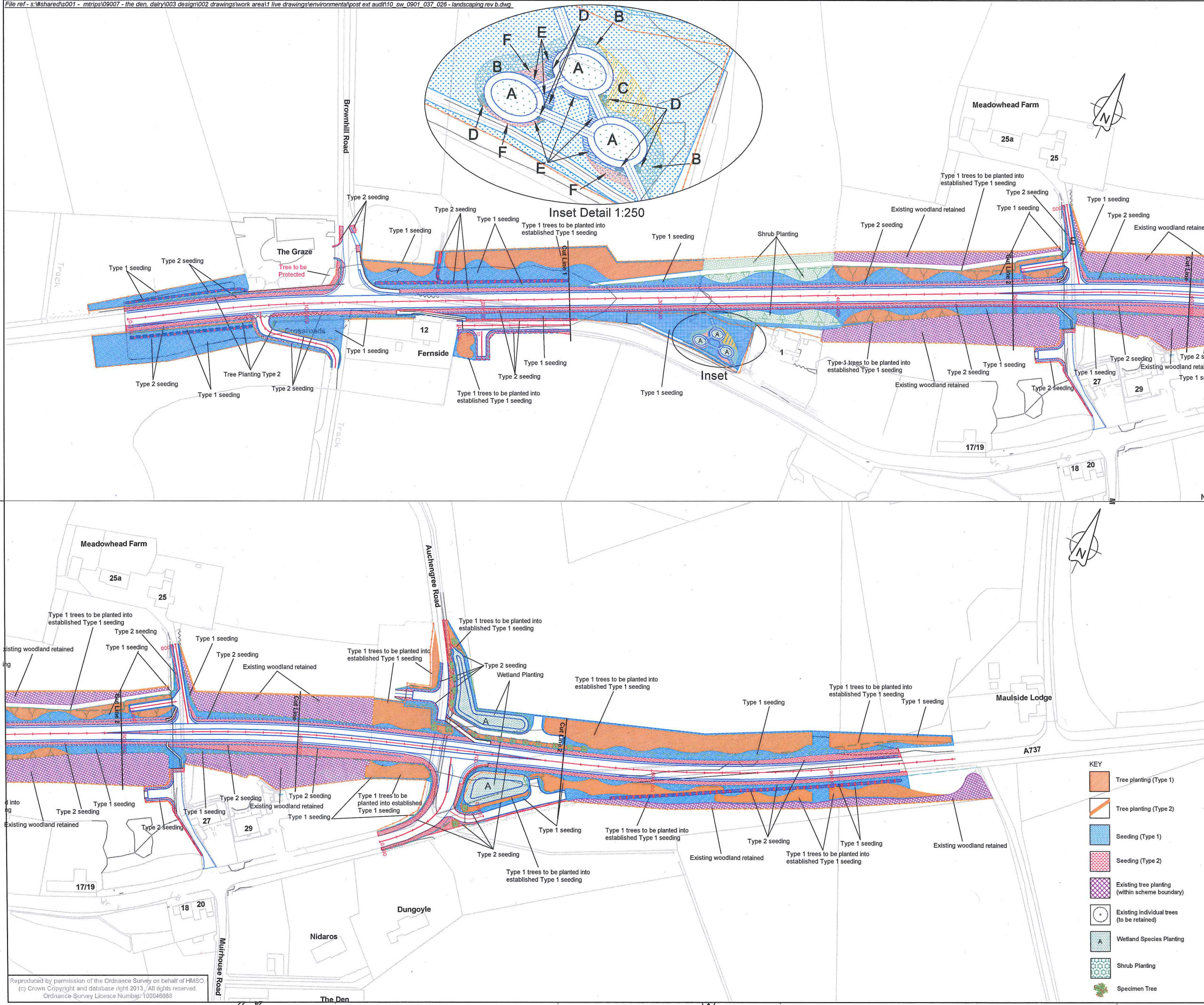
Original Drawing Size : A1 Dimensions : -
Scale : 1 in 10000 Copyright © Arney

Drawing No
10/SW/0901/037/202

Rev
A

Reproduced by permission of the Ordnance Survey on behalf of HMSO.
(c) Crown Copyright and database right 2013. All rights reserved.
Ordnance Survey Licence Number: 100046688

S:\SHARED\S001 - MTRIPS\09007 - The Den, Dalry\003 Design\002 Drawings\Work Area\1 Live Drawings\Environmental\Work Area\1 Live Drawings\Environmental\Post Ext Audit\10_SW_0901_037_026 - Landscaping Rev B.dwg, 31/01/2013 08:26:58, Iholand



General notes:

1. Refer to specification document for detailed guidance on ground preparation, planting and seeding times and maintenance.
2. Refer to the Specification document for areas and quantities of materials.
3. All bare root transplants shall be planted in random groups of 5-7no. with guards and canes in accordance with specification.

Tree Planting Type 1			
Species	%	Size	Rate /Cs
Betula pendula	20	40-60cm bare root w hips	0.45m ² 15000mm Cs
Alnus glutinosa	20	40-60cm bare root w hips	0.45m ² 15000mm Cs
Fagus sylvatica	15	40-60cm bare root w hips	0.45m ² 15000mm Cs
Sorbus aucuparia	15	40-60cm bare root w hips	0.45m ² 15000mm Cs
Prunus avium	10	40-60cm bare root w hips	0.45m ² 15000mm Cs
Crataegus monogyna	10	40-60cm bare root w hips	0.45m ² 15000mm Cs
Ulmus glabra	5	40-60cm bare root w hips	0.45m ² 15000mm Cs
Viburnum opulus	5	40-60cm bare root w hips	0.45m ² 15000mm Cs

Tree Planting Type 2			
Species	%	Size	Rate /Cs
Crataegus monogyna	50	40-60cm w hips	450mm (row) 300mm (Cs)
Prunus avium	20	40-60cm w hips	450mm (row) 300mm (Cs)
Fagus sylvatica	25	40-60cm w hips	450mm (row) 300mm (Cs)
Rosa canina	5	40-60cm w hips	450mm (row) 300mm (Cs)

Specimen Tree Planting		
Species	Size	Rate /Cs
Sorbus aucuparia (Sheever after Seeding)	12-14cm Girth Staked and Tied	

Wetland Planting		
Species	Rate /Cs	Notes
Phragmites australis - A (Common reed)	100%	Call grown in stock - well rooted plugs
Is pseudocircus - B (Yellow flag)	100%	9cm pots
Stachys palustris - C (Marsh w. pennywort)	100%	9cm pots
Carex pendula - D (Pendulous sedge)	100%	9cm pots
Ranunculus acris - E (Marsh marigold)	100%	9cm pots
Juncus effusus - F (Hard rush)	100%	9cm pots

Shrub Planting		
Species	Rate /Cs	Notes
Sambucus nigra (elder)	25	40-60cm bare root w hips
Corylus avellana (hazel)	20	40-60cm bare root w hips
Prunus spinosa (Blackthorn)	30	40-60cm bare root w hips

Seeding (Type 1):

1. The following wild flower & grass seed mixture will be sown in the areas indicated:

80% Grasses:

- Sheeps Fescue
- Chewings Fescue
- Crested Dogtail
- Browntop Bent
- Smooth Stalked Meadow Grass
- Sweet Vernal Grass
- Wavy Hair Grass

Flowers 20%

- Ox-eye Daisy (*Leucanthemum vulgare*)
- Lady's Bedstraw (*Galium verum*)
- Red Campion (*Silene dioica*)
- Self Heal (*Prunella vulgaris*)
- Yarrow (*Achillea millefolium*)
- Meadow Buttercup (*Ranunculus acris*)
- Black Knapweed (*Centaurea nigra*)
- Birdsfoot Trefoil (*Lotus corniculatus*)
- Devil-bit Scabious (*Succisa pratensis*)

Seeding (Type 2):

1. The following grass seed mixture will be sown in the areas indicated:

100% Grasses:

- Strong Creeping Red Fescue 60%
- Chewings Fescue 25%
- Flattened Meadow Grass 10%
- Browntop Bent 5%

2. Sowing rate for type 1 seeding shall be 4 grams per sq. metre
3. Sowing rate for type 2 seeding shall be 35 g/m²
4. Over seeding rate for type 2 seeding shall be 20 g/m²

B	Minor adjustments to design layout	T.S.	I.H.	27/11/12
A	Minor adjustments to design layout	T.S.	I.H.	27/11/12
Rev	Revision details	Chkd	Appd	Date

Drawn:	I.H.	Preliminary	✓
Design:	T.S.	For comment	
Chkd:	H.F.	For tender	
Appd:	N.C.	For construction	
Date:	14/02/2012	As constructed	

KEY

- Tree planting (Type 1)
- Tree planting (Type 2)
- Seeding (Type 1)
- Seeding (Type 2)
- Existing tree planting (within scheme boundary)
- Existing individual trees (to be retained)
- Wetland Species Planting
- Shrub Planting
- Specimen Tree

Client:

Project Name: **A737/A738 TRUNK ROAD THE DEN, DALRY**

Drawing Title: **LANDSCAPE LAYOUT**

Original Drawing Size: A1	Dimensions: m
Scale: 1 in 1000 @ A1	Copyright © Amey

Drawing No: 10/SW/0901/037/026	Rev: B
---------------------------------------	---------------