Environmental Statement 2007

Part B: Northern Leg

13 Cultural Heritage

This chapter identifies known and potential sites of cultural heritage importance, and outlines measures for avoiding or mitigating these impacts where possible.

Based on an archaeological desk based assessment and walkover survey, 84 sites of cultural heritage importance were identified. These ranged in date the prehistoric period to the recent past and were assessed as being of Less than Local to National importance. Potential direct impacts on 22 sites were identified, with adverse visual impacts on the setting of a further 10 sites. There is also potential for the presence of unknown archaeological remains within the footprint of the road.

A programme of archaeological works in advance of or during construction has been designed to identify and mitigate the direct and indirect impacts of the proposed scheme on the cultural heritage resource.

13.1 Introduction

- This chapter identifies known and potential cultural heritage features that may be affected by the proposed scheme, and outlines measures for avoiding or mitigating these impacts.
- 13.1.2 The key objectives of the assessment were to:
 - identify known and potential features of cultural heritage significance and assess their importance;
 - identify and assess the magnitude and significance of the impact of the proposed development on each site;
 - assess the potential for impacts on unforeseen features of cultural heritage importance, especially archaeological remains;
 - · propose measures for avoiding, reducing or mitigating potential impacts; and
 - assess any residual impacts that would still occur after mitigation.

13.2 Approach and Methods

Baseline Conditions

- 13.2.1 The baseline information in this chapter was prepared with reference to the following sources of information:
 - a review of existing archaeological reports (RSK 1994, Mouchel 2002, Mouchel 2003, Jacobs 2004);
 - an inspection of sites on which there was an identified potential impact;
 - a walkover survey of any new elements of the route, undertaken in April 2005 and June 2007;
 - sourcing of any additional relevant information;
 - incorporation of comments made by Historic Scotland;
 - further consultation with statutory and non-statutory consultees, including Historic Scotland, Aberdeenshire County Council and the Aberdeen City Council; and
 - preparation of an updated Desk Based Assessment Report (Appendix A13.1).
- The desk-based assessment and walkover survey were undertaken by Jacobs (2004) in accordance with the principles set out in DMRB Volume 11 (Archaeological Assessment Stages 1-2).
- 13.2.3 Other documents taken into account in the preparation of the ES included:

Environmental Statement 2007

Part B: Northern Leg

- National Planning Policy Guideline (NPPG) 5: Archaeology and Planning (Scottish Office 1994a);
- Policy Advice Note (PAN) 42: Archaeology The Planning Process and Scheduled Monuments Procedures (Scottish Office 1994b);
- Standard and Guidance on Archaeological Desk-Based Assessments (The Institute of Field Archaeologists 1994).
- Memorandum of Guidance on Listed Buildings and Conservation Areas (Historic Scotland 1998);
- NPPG 18: Planning and the Historic Environment (Scottish Office 1999); and
- Scottish Historic Environment Policy 2: Scheduling: protecting Scotland's nationally important monuments (Historic Scotland 2006).
- The existing baseline information from the above sources has been updated and developed for the purposes of this DMRB Stage 3 archaeological assessment. Preparation of the ES therefore involved:
 - a review of existing archaeological information;
 - an inspection of sites on which there was an identified potential impact;
 - a walkover survey of any new elements of the route, undertaken in April 2005;
 - sourcing of any additional relevant information;
 - further consultation with statutory and non-statutory consultees, including Historic Scotland, Aberdeenshire County Council and the Aberdeen City Council; and
 - preparation of an updated Desk Based Assessment Report (Appendix A13.1).
- The cultural heritage study area was revised in May 2007 to take account of updates to the proposed scheme design assessed and reported in the December 2006 ES. The revised cultural heritage study area included land not previously assessed to the east of the A90 at Blackdog (Blackdog access road), and this land was therefore subject to a follow-up desk-based assessment and site walkover in June 2007.
- The information contained in this chapter presents the results of the DMRB Stage 3 Assessment, with further detail of the methodologies and information sources used in this report given in Appendix A13.1.

Impact Assessment

As described in Chapter 5 (Overview of Assessment Process), impact significance was determined with respect to the sensitivity of the baseline conditions and the magnitude of potential impact. As described in detail below, this assessment was undertaken separately for direct impacts (e.g. damage or severance), and indirect impacts (i.e. changes to setting due to visual intrusion).

Sensitivity

Site Importance

The study area within which cultural heritage sites were identified extended to 100m to each side of the proposed scheme. Sites were assigned a level of importance on a scale of 'Less than Local' to 'International' as shown in Table 13.1, established on the basis of statutory designation and/or assessed cultural heritage importance as explained below.

Environmental Statement 2007

Part B: Northern Leg

Table 13.1 - Site Importance

Importance	Site Type
International	World Heritage Sites.
National	Scheduled Ancient Monuments (SAMs).
	Category A Listed Buildings.
	Gardens and Designed Landscapes recorded on the Inventory of Gardens and Designed Landscapes.
	Some undesignated sites assessed as being of National importance using the methodology given in Paragraph 13.2.9.
Regional	Category B Listed Buildings.
	Conservation Areas.
	Some undesignated sites assessed as being of Regional importance using the methodology given in Paragraph 13.2.9
Local	Category C(s) Listed Buildings.
	Some undesignated sites assessed as being of Local importance using the methodology given in Paragraph 13.2.9
Less than Local	Sites either already badly damaged destroyed or whose historic value is too slight for inclusion in a higher class.

- World Heritage Sites are afforded international protection under the UNESCO World Heritage Convention, with Scheduled Ancient Monuments (SAMs) nationally protected under the 'Ancient Monuments and Archaeological Areas Act 1979'. The 'Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997' provides for the designation of Category, A, B and C(s) Listed Buildings which are considered to be of national, regional and local importance respectively.
- 13.2.10 Conservation Areas are assessed as being of regional importance.
- Many sites of cultural heritage importance are not currently afforded any statutory protection through designation. For the purposes of assessment, these undesignated sites were assigned a level of importance using professional judgement supported by review of the following guidance:
 - Historic Scotland assessments of importance provided during the Stage 2 CEIA;
 - criteria used in Scottish Historic Environment Policy 2 for the designation of SAMs; and
 - non-statutory criteria used in their designation of Listed Building categories (Memorandum of Guidance on Listed Buildings and Conservation Areas, Historic Scotland 1998).

Sensitivity of Setting

- Many archaeological sites are not visible, or barely visible, from ground level. Such sites will usually not be vulnerable to visual impacts. However, some invisible or partially invisible sites may be located in an area where the immediate topography is important to an understanding of the site, and consequently the setting might be considered more significant. A process of selection was therefore undertaken prior to selecting sites for visual impact assessment, using the following criteria:
 - · the sites are visible above ground level; and
 - the sites are either directly accessible to the public, or are visually prominent from a publicly accessible point at distance; and
 - the nature of the sites is such that the aesthetic quality of their setting may be considered a contributory factor in assessing the overall site importance; or
 - if invisible, the topographical context and landscape interrelationship of the site is important to our appreciation and understanding; or
 - · the site is a SAM, or a Listed Building.

Environmental Statement 2007

Part B: Northern Leg

- 13.2.13 Sites potentially susceptible to visual impact on setting included those beyond the 100m study area assessed for direct impacts. These sites were identified through consultation with Historic Scotland and liaison with Jacobs landscape architects.
- The sensitivity to visual impacts of cultural heritage sites selected following the above criteria assessed according to Table 13.2 below.

Table 13.2 - Sensitivity of Cultural Heritage Sites to Impacts on Setting

Sensitivity	Description			
High	• sites of National importance that are visually prominent and whose visual setting contributes significantly to their importance.			
	• invisible or partially visible sites of National Importance whose location and topographical context aid our understanding of their form and function.			
Medium	• sites of Regional importance that are visually prominent and whose visual setting contributes significantly to their importance.			
	• invisible or partially visible sites of Regional importance whose location and topographical context aid our understanding of their form and function.			
Low	sites of Local importance whose landscape setting contributes significantly to their importance.			
Not sensitive	any site of National, Regional, Local or lesser importance whose landscape setting does not contribut to their importance.			

Impact Magnitude

For the purposes of this assessment, the severity or magnitude of impact was assessed independently of the site value. Impacts were assessed both for individual sites and, where groups of buildings or features were affected, as an overall impact.

Direct Impact Magnitude

13.2.16 The magnitude of impacts were assigned in accordance with the categories shown in Table 13.3.

Table 13.3 - Magnitude of Direct Impacts

Magnitude	Impact Description	
Very High	Where there would be complete or nearly complete demolition or loss (of more than approxin 80%) of a site to the development.	
High	Where there would be partial loss (between approximately 50% and 80%) of a site to the development.	
Medium	Where there would be loss of part (between approximately 15% and 50%) of a site	
Low	Where would be a minimal loss of part of a site (up to 15%).	

13.2.17 The percentages and figures provided in the above definitions are guided by professional judgement and are necessarily approximate.

Magnitude of Impacts on Setting

The magnitude of visual impacts on the setting of cultural heritage sites was assessed according to established principles and criteria set out in the 'Memorandum of Guidance on Listed Buildings and Conservation Areas' (Historic Scotland, 1998) and 'Guidelines for Landscape and Visual Impact Assessment' (LI/IEMA, 2002). These criteria were also used in the assessment of overall visual impacts, and are described in more detail in Chapter 12 (Visual). The application of the criteria leads to a definition of the magnitude of impact for each viewpoint on a four-point scale of 'Dominant', 'Prominent', 'Present' or 'Negligible'.

Environmental Statement 2007

Part B: Northern Leg

Impact Significance

Direct Impacts

The significance of direct impacts were determined as a combination of the site importance/status and impact magnitude. Four levels of significance were defined which apply equally to beneficial and adverse impacts. These are shown in Table 13.4.

Table 13.4 - Matrix for the Assessment of Significance of Impact

Importance	Magnitude				
	Very High	High	Medium	Low	
International	Very Substantial	Very Substantial	Very Substantial	Very Substantial	
National	Very Substantial	Very Substantial	Very Substantial	Substantial	
Regional	Substantial	Substantial	Moderate	Moderate	
Local	Moderate	Slight	Slight	Slight	
Less than Local	Slight	None	None	None	

Impacts on Setting

The significance of visual impacts was assessed taking into account the sensitivity of the receptor and the impact magnitude, as shown in Table 13.5. For each site, the viewpoint taken into consideration was the one with the greatest magnitude of impact.

Table 13.5 - Determination of Significance of Impacts on Setting

Sensitivity	nsitivity Magnitude				
	Dominant	Prominent	Present	Negligible	
High	Substantial	Substantial	Moderate	Slight	
Medium	Substantial	Moderate	Slight	None	
Low	Moderate	Slight	Slight	None	
Not sensitive	None	None	None	None	

Limitations to Assessment

For the purposes of considering the potential impact of the proposed scheme in accordance with DMRB, no limitations to this assessment have been identified.

13.3 Baseline Conditions

- 13.3.1 It should be noted that the site numbers used in this ES chapter are not consecutive as they have been retained from previous assessments of a larger study area.
- The identified cultural heritage sites provide a context to the Aberdeenshire area, which is described chronologically below. The study area and individual sites are then described in more detail. A more detailed archaeological and historical background is provided in the Desk Based Assessment Report (Appendix A13.1)
- Due to the large number of sites present in the study area a full list is not included in this chapter, but is provided in the gazetteer (CD version; Appendix A13.2).

Environmental Statement 2007

Part B: Northern Leg

Cultural Heritage Context

- Prehistoric human activity in this area during the Neolithic (4000-2500 BC) and Bronze Age (2000-1400 BC) periods is attested by religious monuments, such as the Tyrebagger recumbent stone circle, and funerary monuments such the Beaker burial at Parkhill and the urn at Upper Kirkton. Stone artefacts dating to these periods include a carved stone ball and a polished stone axe at Upper Kepplestone. It is thought that carved stone balls date to the Neolithic or early Bronze Age and were probably of ceremonial significance to confer prestige on the owner. It is also possible that the cropmarks identified at Wester Hatton Cottages are also of prehistoric date.
- Few sites of Later Prehistoric (the Late Bronze Age and Iron Age) date occur in the area. Outside the study area the most visible sites dating to this period are the enclosed settlements, including vitrified forts such as Tap O'Noth or massively defended sites like the Barmekin of Echt. It is likely that unenclosed settlements also occur, although such sites are much less visible. The presence of souterrains (underground chambers thought to have been used for storage) may not only provide evidence for such unenclosed settlements, but also an intensification of farming in the later Prehistoric period, which may also be reflected in the distribution of fine metalwork.
- Evidence for Roman activity in northeast Scotland is provided by the remains of temporary marching camps, related to the campaigns of AD84 and the third century, and casual finds of artefacts. The battle of Mons Grapius, as recorded by Tacitus is thought to have taken place in this area in AD 84.
- In addition to defended sites such as the fortress at Burghead, in the Post-Roman period the main source of evidence for the presence of the Picts in north-eastern Scotland are the symbol stones, which are freestanding slabs decorated with incised animals and objects. An example of these carved stones can be seen at the Chapel of St. Fergus, Dyce, and features an incised beast and decorative Z-rod.
- 13.3.8 Sites dating to the Medieval period (500-1450 AD) are also poorly represented. It is thought that the Medieval settlement pattern was dispersed; the population lived in a network of much smaller, scattered settlements known as 'fermtouns', of which there may be several in any given parish. Families would be joint tenants farming in a traditional system known as 'runrig', under which the land immediately around the settlement was cultivated in open fields divided into long, narrow ridged strips ('rig and furrow'). Any amenities which may be present in a parish, such as castles, churches or mills, could stand isolated or at one of the fermtouns which then became known as 'castletoun', 'kirktoun' or 'milltoun' and survive in the placename record. For much of the Medieval period, the land around Aberdeen in the study area probably formed part of such a system.
- The agricultural and economic improvements of the 18th and 19th centuries have their origins in the 17th century. Improving leases were granted to selected tenants. Under these leases the runrig system of cultivation was dismantled replaced with longer, more varied crop rotations in large, enclosed fields. Activities such as the enclosure of the land, the quarrying and burning of lime for use as a fertilizer and the planting of trees all resulted in lasting changes to the landscape.
- Perhaps the single most common and impressive monuments dating from this time are the consumption dykes; the result of the removal of large amounts of stone from agricultural land, gathered together to form thick stone walls which are closely associated with the age of agricultural improvement. The construction of these features continued throughout the eighteenth and nineteenth centuries (Croly 2004). Although not a feature unique to the northeast of Scotland, they are a landscape feature which is uncommon elsewhere and highly characteristic of this region. These features are widespread within the study area: an outstanding example is Kingswells Consumption Dyke SAM which is located outside the Northern Leg study area, but within the Southern Leg study area. Other small features associated with agriculture include piles of stone cleared from the field, known as clearance cairns.
- Also at this time, improvements were occurring in the transport infrastructure to improve movement of people and resources around the country. Turnpike roads were established to link the main

Environmental Statement 2007

Part B: Northern Leg

towns, and examples of architecture associated with these routes can be seen in the sites like the Parkhill Tollhouse. The transportation boom led to the establishment of a number of canals around Aberdeen, such as the Aberdeenshire (or Ladies Jointure) Canal (a Schedueld Ancient Monument) which was established by charter, opened in 1805, and closed in 1854 following its purchase by the Great North of Scotland Railway (Pearson 1986). This was a symptom of radical change, as the railways dominated the nineteenth century transport system, making the canal network obsolete. Following the closure of the canal, the railway company used much of its route to construct a new railway line inland from Aberdeen (Graham 1968; Pearson 1986).

- More recent features include 20th century military features and other outlying structures associated with Dyce Airfield (now Aberdeen Airport), including a pillbox and a the site of a transmitter mast built immediately next to the Tyrebagger Hill recumbent stone circle.
- 13.3.13 The baseline information available at this stage is dominated by post-medieval landscape and built heritage features. The number of known archaeological sites of earlier date is unusually low for such a relatively large study area. However, despite the relative lack of previous archaeological prospection, there is sufficient archaeological evidence to show that the surrounding area was occupied from at least the early Neolithic period onwards. It is therefore highly likely that there has been human activity in the study area since earliest times and it is considered likely that additional archaeological remains relating to the prehistoric, early Historic and Medieval periods that could not be identified by the desk-top and walkover surveys are present in the study area.

Study Area

- A total of 80 cultural heritage sites were identified within 100m of the centerline of the proposed scheme, and the potential visual impact on a further four sites outside this 100m study area was also assessed (Sites 128, 134, 283, 284). The locations of these sites are shown on Figures 13.1a to 13.1g.
- Using the methodology set out in Section 13.2 (Approach and Methods), the importance and visual sensitivity all the sites included in the study was assessed. Details of the importance of each site are provided in the gazetteer (included in Appendix A13.1) and are summarized in Table 13.6 below:

Table 13.6 - Summary of Importance of Sites Assessed

Importance	Number of Sites
National	3
Regional	9
Local	59
Less than Local	8
Unknown	5
Total	84

Due to the large number of sites identified, it was not possible to describe each of these in the ES, and the baseline therefore focusses on the 32 sites for which potential impacts are subsequently identified in Section 13.4 (Potential Impacts) and are summarised in Tables 13.7, 13.8, 13.9 and 13.10.

Prehistoric

Tyrebagger Hill Recumbent Stone Circle (Site 134; see Figure 13.1c) comprises of a circle of 11 stones and is approximately 18m in diameter. This site probably dates to the Bronze Age and is of a type and form found predominately in the northeast of Scotland. A total of 74 recumbent stone circles and 18 probable stone circles were identified in 1969 (Burl, 1970), of which three are within the study area. Site 134 is a SAM and is therefore of National importance. A Beaker burial was identifed at Parkhill (Site 351; see Figure 13.1e) This site is of Regional importance. Sites 129, 136 and 14 (see Figure 13.1c) are probably elements of the same complex of cairns, described by

Environmental Statement 2007

Part B: Northern Leg

Royal Commission on Ancient and Historic Monuments of Scotland (RCAHMS) as being circular in shape and up to 5m in diameter, traditionally interpreted as burial mounds. This area was later afforested and no cairns were recorded in site inspections undertaken by the RCAHMS in 1996 or by Jacobs Babtie in 2004 and 2005. These sites may have been prehistoric (potentially Bronze Age) funerary monuments, but could also be may also have been land clearance cairns. The importance of these sites has been assessed as Local.

- 13.3.18 Site 155 (see Figure 13.1d) is the site of an urn containing ashes which was found in AD1853 at Upper Kirkton. It is possible that this was the remains of a cremation burial, possibly prehistoric in date. Site 155 is potentially associated with the site of a cairn in which an urn was found in 1814 and is located outside the footprint of the road and, taken together, these may indicate wider prehistoric funerary activity in this area. The area around these sites (Site 367; see Figure 13.1d) should therefore be considered as an area of potential for the presence of unknown archaeological features.
- Site 335 (see Figure 13.1e) is an area of archaeological potential for the presence of unknown archaeological remains on the banks of the River Don while Site 314, Red Moss (see Figure 13.1f), is an area of former wetland with the potential for the preservation of archaeological remains, including deposits of palaeoenvironmental significance. Site 218 is a possible standing stone. At present there is insufficient information to fully assess the nature of this site.
- 13.3.20 It is possible that elements of the cropmark complex at Wester Hatton Cottages (Site 362; see Figure 13.1g) are prehistoric in date. Vertical aerial photography (OS 82/162/035) has revealed a roughly circular cropmark measuring about 10m in diameter on a gentle SE-facing slope 140m SW of Wester Hatton Cottages. Other cropmarks in the field include lengths of arc and broad rig-and-furrow cultivation.

Medieval

- Site 123 (see Figure 13.1b) is a small area of rig and furrow. As these earthworks were produced by an agricultural system which had its origins in the Medieval period, but which continued until the late 18th century precise dating is usually impossible.
- Only the foundations of St Mary's Chapel (Site 125a; see Figure 13.1b) survive. Little is known of the chapel building other than a construction date (around 1367). It may have gone out of use and fallen into disrepair after the Reformation, although 17th century historical sources indicate the churchyard was still used for burial in this period. A holy well is located close to the church. This site has been proposed for scheduling and has been assessed as being of National importance. Dating to the Post Medieval period, the graveyard associated with this site (Site 125b; see Figure 13.1b) is Category C(s) Listed Building of Local importance.

Post Medieval and Modern

- The majority of sites dating to the Post Medieval and Modern Periods are buildings, modern features associated with agriculture and modern features associated with transport. While some churches and estate houses are included in the first category, the majority of argricultural buildings, most of which have been rebuilt in the recent past, have been modernized or have been removed.
- Site 159 (see Figure 13.1d) is an extant section of the Aberdeenshire Canal and a SAM of National importance. This section of the canal survives as two parallel banks of earth and stone. Located immediately to the east of Site 159, Site 296 (see Figure 13.1d) is another section of the canal, now destroyed. Site 348 (see Figure 13.1d) is a milestone of Local importance associated with canal. No trace of this site was identified during the walkover survey or subsequent site inspection. Site 345 (see Figure 13.1b) is the possible route of the Corgarff Aberdeen Military Road. It is probable that any remains associated with this site has been removed by the construction of the present A96. Parkhill Tollhouse (Site 175; see Figure 13.1e), was constructed in the 19th century.

Environmental Statement 2007

Part B: Northern Leg

- Originally built in 1898, Parkhill Pumping Station (Site 170; see Figure 13.1e) consists of a pumping house, lade and aqueduct and water tanks. The complex is Category B Listed and is of Regional importance.
- The Old Parish Church of Newhills (Site 284; see Figure 13.1b) and associated graveyard (Site 283; see Figure 13.1a) are Category B Listed Buildings of Regional importance. Other buildings dating to the Post Medieval or Modern Periods include Bogenjoss Farmhouse (Site 144; see Figure 13.1c) and Craibstone House, East Lodge (Site 343; see Figure 13.1b). Site 154c (see Figure 13.1d) is a brick built building which was located at the base of radio mast during World War 2. Site 183 (see Figure 13.1e) is the site of cottage. It is possible that subsurface remains associated with this cottage survive.
- Ashtown Boundary Stone 39 (Site 120; see Figure 13.1b) and March Stone No.38 (Site 282; see Figure 13.1b) are both Category B Listed Buildings of Regional importance. These stones marks boundary between the Freedom Lands and Marches. Site 208 (see Figure 13.1g) is a boundary stone which was not located by either the DMRB Stage 2 walkover survey or DMRB Stage 3 site inspection.
- 13.3.28 Site 336 (see Figure 13.1e) is clearance cairn while Sites 137 and 138 (see Figure 13.1c) are earthen field dykes. Site 139 is a stone consumption dyke (see Figure 13.1c). No visible trace of this site remains (Jacobs 2005). Site 279 (see Figure 13.1d) is a stone wall.

Historic Landscape Character

While small areas of 17th to 19th century designed parkland survive, the historic landscape of the study area was generally created in the 18th and 19th centuries and is characterised by small rectilinear pasture fields bounded by stone walls or consumption dykes with isolated farmsteads and croft holdings and allotments also present, along with open areas of upland grazing. This landscape was modified in the late 19th and 20th centuries with the improvement of the communications (road and rail) networks and later the construction of Aberdeen Airport, the creation or expansion of nucleated settlement, and later the creation of larger fields for pasture, improvement of upland pasture through drainage and enclosure and forestry plantations.

13.4 Potential Impacts

Only sites on which an impact has been identified are discussed. Potential direct impacts are assessed in the first instance, followed by potential indirect impacts.

Direct Impacts

Potential for direct impacts would occur during the construction phase of the proposed scheme. Of the 80 cultural heritage sites identified within the study area, potential direct impacts on 22 sites were identified, ranging from Slight to Substantial significance. The location of these sites is shown on Figures 13.1a to 13.1g, and summarised in Table 13.7 below.

Environmental Statement 2007

Part B: Northern Leg

Table 13.7 - Potential Direct Impacts

Site No.	Site Name	Description of Impact	Site Importance	Impact Magnitude	Impact Significance
120	Ashtown Boundary Stone 39	This Category B Listed Boundary stone will be removed by the scheme	Regional	Very High	Substantial
123	Gough Burn Rig and Furrow	The scheme as proposed will have a slight impact on the northwestern edge of this area of rig and furrow	Local	Low	Slight
136	Bogenjoss Cairns 2	The scheme as proposed will have a slight impact on this former areas of cairns.	Local	Low	Slight
137	Bogenjoss Earthwork 2	Approximately 75% of this earthwork will be removed.	Local	High	Slight
138	Bogenjoss Earthwork 2	Approximately 75% of this earthwork will be removed.	Local	High	Slight
139	Bogenjoss Consumption Dyke	Approximately 25% of this earthwork will be removed	Local	Medium	Slight
154c	Dyce Airfield - Radio Station	Any remaining traces of this site may be removed by the proposed road	Local	Low	Slight
170	Parkhill Pumping Station	The lade associated with this site will be severed in two places.	Regional	High	Substantial
183	Little Goval Cottage	Any subsurface remains associated with this site may be removed by the proposed scheme	Local	High	Slight
201	Cranfield Farm Consumption Dyke	The northern end of this dyke will be removed by the proposed scheme.	Local	Low	Slight
208	Blackdog Croft Boundary Stone	The condition and location of this milestone is unknown	Local	Unknown	Unknown
218	Goval - Possible Standing Stone	This possible standing stone would be removed by the scheme	Unknown	Very High	Unknown
277	Newmill – Possible cairn	This modern spoil heap would be removed by the scheme	Less than Local	Very High	None
279	Overton - Stone Wall	This stone wall would be bisected by the proposed road	Local	Medium	Slight
296	Aberdeenshire Canal	The site of the canal has been partially destroyed by quarrying	Regional	Unknown	Unknown
314	Red Moss	This former area of wetland would be bisected by the proposed scheme	Unknown	Low	Unknown
335	Area of Archaeological Potential	The proposed road passes through this area	Unknown	Unknown	Unknown
336	Cairn north-east of Kirkhill Forest	This cairn would be removed by the proposed scheme	Local	Very High	None
345	Corgarff - Aberdeen Military Road - Possible Route	This site has possibly been destroyed by the present A96	Regional	Unknown	Unknown
348	Aberdeenshire Canal, Old Milestone, Pitmedden	The condition and location of this milestone is unknown	Local	Unknown	Unknown
362	Wester Hatton Cottages Cropmark	The proposed road would have a moderate impact on the eastern part of this site	Regional	High	Substantial
367	Upper Kirkton / Nether Kirkton Area of Archaeological Potential	The potential impact on this site is unknown	Unknown	High	Unknown

- Three high magnitude direct impacts on regionally important sites were identified, which are therefore of Substantial significance. Site 120 is a Category B Listed boundary stone which will be removed by the proposed scheme. The lade associated with Parkhill Pumping Station (Site 170) will be severed by the proposed scheme, and a direct impact is also predicted on Wester Hatton Cottages Cropmark (Site 362).
- All other impacts are of Slight or lower significance, with the exception of Unknown impact significance for sites where importance and/or impact magnitude can not be confirmed.

Environmental Statement 2007

Part B: Northern Leg

- 13.4.5 Site 277 was previous identified as a possible clearance cairn. The site inspection confirmed that this is mound results from recent dumping of agricultural material and soil. Thus, while the significance matrix (Table 13.4) determines a potential impact of Slight significance the significance of impact on this site has therefore been assessed as None.
- 13.4.6 Site 336 is a clearance cairn of modern date. The written and photographic record which was prepared during the walkover survey by Jacobs Babtie in April 2005 is considered adequate to mitigate the impact of the scheme on this site. Thus, while the significance matrix (Table 13.4) determines a potential impact of Moderate significance, this has effectively already been mitigated and the significance of impact on this site has therefore been assessed as None.
- 13.4.7 The identified impacts are summarised in Table 13.8.

Table 13.8- Summary of Identified Direct Impacts

Significance of Impact	Site Numbers	Total
Very substantial	None	0
Substantial	Site 120, 170, 362	3
Moderate	None	0
Slight	Sites 123, 136, 137, 138, 139, 154c, 183, 201, 279	9
None	Sites 277 and 336	2
Unknown	Sites 208, 218 ,296 ,314, 335 ,345, 348, 367	8

Indirect Impacts

Of the 84 cultural heritage sites identified (those within the study area plus the four additional sites beyond this), potential indirect impacts on the setting of 10 were identified. Using the methodology outlined in 13.2.18 these were assessed as ranging from Slight to Substantial significance. The location of these sites is shown on Figures 13.1a to 13.1g, and summarised in Table 13.9 below.

Table 13.9 – Potential Indirect Impacts (On Setting)

Site No.	Site Name	Sensitivity	Impact Magnitude	Significance of Impact
125a	St Mary`s Chapel	High	Prominent	Slight
125b	St Mary`s Chapel Graveyard Category C(s) Listed Building	Medium	Prominent	Slight
134	Tyrebagger Hill Recumbent Stone Circle, Scheduled Ancient Monument	High	Prominent	Substantial
144	Bogenjoss Farmhouse	Low	Prominent	Slight
159	Aberdeenshire Canal (ladies jointure), Scheduled Ancient Monument	High	Prominent	Substantial
175	Parkhill Tollhouse	Low	Present	Slight
282	March Stone No.38, Category B Listed Building	Low	Present	Slight
283	Churchyard of Newhills Category B Listed Building	High	Prominent	Substantial
284	Old Parish Church of Newhills Category B Listed Building	High	Prominent	Substantial
343	Craibstone House, East Lodge	Low	Present	Slight

Environmental Statement 2007

Part B: Northern Leg

13.4.9 The identified impacts on setting are summarised in Table 13.10 below.

Table 13.10 - Summary of Identified Impacts on Setting

Significance of Impact	Site Numbers	Total
Substantial	Sites 134, 159, 283,284	4
Moderate	None	0
Slight	Sites 125a, 125b, 144, 175, 282, 343	6

- Tyrebagger Hill Recumbent Stone Circle (Site 134) is a SAM and therefore of national importance. The proposed road would pass through coniferous woodland to the west of the stone circle and then across farmland to the southwest and south towards the A96 Junction. The road would be highly visible from the spur on which Site 134 is located, but would be below the views from the site to the surrounding hills on the southern horizon which reduces the potential impact on the setting of the site. To the west of Site 134, the proposed scheme would also be in a cutting located below the crest of the Hill of Marcus. Overall, the road would be Prominent in the setting of Site 134, resulting in an impact of Substantial significance on the setting.
- At this location the Aberdeenshire Canal SAM (Site 159), is visible as a low earthwork, and is visible from Dyce Drive to the southeast. The proposed scheme would be Prominent in views, resulting in an impact of Substantial significance on the setting of this nationally important site.
- 13.4.12 The Old Parish Church of Newhills (Site 284) and associated graveyard (Site 283) are Category B Listed Buildings of Regional importance. Using professional judgement the sensitivity of these sites was re-assessed as High rather than Moderate. The proposed scheme would pass to the west of the churchyard. The proposed North Kingswells Junction would be visible to the southwest, which may result in more open views from the church to the proposed scheme across the surrounding fields. The road would also be in a cutting to the west of the churchyard, which may alter the skyline of the ridge on which it is located, altering the view to the site from the east. The proposed scheme would be Prominent in views and impacts on Sites 283 and 284 have therefore been assessed as of Substantial significance.
- All other impacts on setting have been assessed as of Slight significance; Bogenjoss Farmhouse (Site 144), Parkhill Tollhouse (Site 175), and Craibstone House East Lodge (Site 343). The visual setting of March Stone No.38 (Site 282) was not judged to contibute significantly to its importance. Using professional judgement the visual sensitvity of this site was re-assessed as Low and the Significance of impact as Slight.
- The proposed western spur of the A96 junction would pass within 15m of the northern boundary of St Mary's Chapel and St Mary's Chapel Graveyard (Sites 125a and 125b). The setting of these sites has already been considerably altered by existing development, including the construction of the present A96(T). These sites are not visually Prominent in the area. Thus, while, the matrix for the determination of the significance of impacts on setting assesses the impacts on the setting of these sites as Substantial and Moderate respectively, using professional judgement the potential impact on the setting of these sites has been re-assessed as Slight.

Impacts on the wider historic landscape

13.4.15 The importance of the wider historic landscape has been assessed as Local. The proposed scheme would have direct impact on this landscape through removal and severance of elements of the existing rectilinear fieldscape. The curving nature of the road nature of the proposed scheme is incongruous with the historic landscape.

Environmental Statement 2007

Part B: Northern Leg

13.5 Mitigation

The proposed evaluation and mitigation proposals outlined below have been developed in consultation with Historic Scotland, the Aberdeenshire Council City Archaeologist, the City of Aberdeen Council Archaeologist, and specialists from the Jacobs design team.

Pre-Construction Archaeological Evaluation

- As described in Section 13.3 (Baseline Conditions), the area around Aberdeen is known to have been occupied since early prehistoric times, and on this basis it is considered likely that additional archaeological remains relating to the prehistoric, early historic and medieval periods are present in the study area. It is therefore recommended that a staged programme of archaeological evaluation is implemented prior to confirmation of the full scope of mitigation works required for the scheme.
- 13.5.3 Archaeological evaluation will be required sufficiently far in advance of construction to permit the design and implementation of pre-construction mitigation works, if required. The aims of the evaluation works would be:
 - to identify any unknown archaeological remains that may be affected by the scheme;
 - to enable a more confident assessment of the impact of construction of the scheme on archaeological remains;
 - to enable the identification and design of any measures that may be necessary to mitigate the impact of the scheme on newly-identified archaeological remains; and
 - to enhance available information about known archaeological remains, where existing information is insufficient to enable a full assessment of impact or the design of mitigation measures.
- To address these aims, it would be necessary to undertake evaluation works both in relation to known archaeological sites, and in areas of archaeological potential. The pre-construction programme of works is likely to involve non-intrusive surveys applied to relatively large areas, followed by intrusive techniques targeted on specific areas. Some level of evaluation would be required within all areas in which ground disturbance would take place (such as drainage, service re-routing, and areas of ecological or landscape planting).
- 13.5.5 Suitable methods could include a combination of any of the following:
 - field walking (i.e. the systematic search for artefacts on the surface of ploughed fields);
 - magnetometer survey, or magnetometer scanning followed by survey in selected areas;
 - magnetic susceptibility survey;
 - · resistivity survey; and
 - intrusive trial trenching, trial pitting and/or borehole/auger surveys.
- During previous consultation (route options assessment), Historic Scotland indicated that they would design any evaluation programme and commission a suitably qualified archaeological contractor to undertake it on behalf of the Scottish Executive. At this stage, and without limitation to Historic Scotland's evaluation design, the following specific evaluation needs have been provisionally identified for the scheme:
 - Site 183 (Little Goval Cottage): trial trenching;
 - Site 218 (a possible standing stone): measured survey of the stone, geophysical survey of the surrounding area, and trial trenching (depending on the geophysical results);
 - Site 314 (Red Moss): inspection/assessment by a palaeoenvironmental specialist, followed if necessary by coring/palaeoenvironmental sampling, analysis and dating;

Environmental Statement 2007

Part B: Northern Leg

- Site 335 (flood plain of the River Don): this area is considered to be of high potential for the
 presence of unknown archaeological remains, possibly of prehistoric date. A staged
 programme of archaeological evaluation (field walking, geophysical survey, trial trenching) is
 recommended; and
- Site 362 (Wester Hatton Cottage Cropmarks): geophysical survey of the surrounding area, and trial trenching (depending on the geophysical results).

Approach to Mitigation

- The results of the evaluation programme described above would enable Historic Scotland to determine the nature, scope and scale of mitigation works required in advance of, or during, construction. The preferred mitigation option for any sites or archaeological deposits affected by the scheme would be to preserve the remains in-situ. However, where preservation in-situ is not feasible, then preservation by record would be the appropriate alternative mitigation strategy. This may be achieved by a combination of the following techniques:
 - **No further action:** in some cases, the results of any evaluations may provide sufficient information to mitigate any impact.
 - **Detailed archaeological excavation:** where particularly significant, complex or denselyconcentrated archaeological remains are expected to be present, then a detailed archaeological excavation in advance of construction would be undertaken.
 - Strip and record: where archaeological remains of relatively low significance and/or complexity are expected to be present, and particularly where they are expected to be spread over a large area at low density, then strip and record works may be appropriate. Topsoil/overburden would be stripped over relatively large, defined areas using methods designed to maximize archaeological visibility, followed by inspection to define the scope of any archaeological recording works that might be required.
 - Archaeological watching brief: Where there is some potential for archaeological remains to
 be present, but the risk is considered to be low, then archaeological monitoring of the main
 topsoil/overburden stripping operations, and other excavation works as appropriate, would be
 applied, followed by appropriate archaeological investigation and recording of any remains that
 are identified.
 - Building recording: Where Listed Buildings or other buildings of historic interest would be demolished, damaged or altered as a result of construction, then recording works in advance of construction would be required. The appropriate level of detail in which recording would be undertaken may vary from site to site and would be determined by, or in consultation with, Historic Scotland. Guidance on appropriate levels of recording is available in an English Heritage publication (RCHME 1999 Recording Historic Buildings: A Descriptive Specification. Third Edition, HMSO). Historic Scotland's Memorandum of Guidance on listed buildings and conservation areas (1998) would also be taken into account.
- As with the archeological evaluation programme, any necessary mitigation works would be undertaken by a suitably qualified Archaeological Contractor appointed and managed by Historic Scotland on behalf of Scottish Executive. Any archaeological works at either evaluation or mitigation stage would include an element of post-excavation/fieldwork analysis and report-writing. This could include a requirement for the publication of a report in an academic journal.
- 'Special Requirements', which are likely to be provided by Historic Scotland, will be incorporated into the Contract Documents and implemented during construction. These provide a mechanism by which works can be monitored by Historic Scotland. Details of the procedure to be followed if any unexpected remains are encountered would also be provided by Historic Scotland.

Environmental Statement 2007

Part B: Northern Leg

Mitigation of Direct Impacts on Known Sites

- Ashtown Boundary Stone 39 (Site 120) will be photographed in-situ and its position would be recorded by topographic survey prior to removal, storage and re-erection as close as possible to the original site after construction has been completed.
- While it is likely that the cairns comprising Site 136 have been destroyed by forestry, strip and record is recommended in this area in advance of construction.
- Site 208 (Blackdog Croft milestone, site of) could not be identified in two field visits conducted as part of this EIA. While this site is likely to have been removed, further site inspection is recommended during and after vegetation clearance for the scheme. In the event that the milestone is located, it would be photographed in-situ and its position would be recorded by topographic survey prior to removal, storage and re-erection as close as possible to the original site after construction has been completed.
- There is no surface indication of the former Aberdeen to Inverurie Canal (Site 296) or an associated milestone (Site 348) and evidence from cartographic and aerial photographic sources indicates that this area has been quarried in the recent past. While it is likely that these sites have been destroyed, strip and record is recommended in this area in advance of construction.
- Although it is likely that the possible route of the Corgarff to Aberdeen Military Road (Site 345) has been destroyed, strip and record is recommended in this area in advance of construction.
- The proposed scheme would affect the vicinity of one antiquarian find of a prehistoric artefact. There are no known remains associated with this, but there is some potential for the presence of unknown buried remains (Site 367) on which there could be an impact. Strip and record in advance of construction is recommended to ensure that any such remains are identified.
- Two consumption dykes (Sites 139, 201), two earthen dykes (Sites 137 and 138), a stone wall (Site 279) and an area of rig and furrow (Site 123) would be affected. Recording works for these sites in advance of construction are recommended. Such recording works would take the form of:
 - topographic survey of the entire site, including completion of a written, drawn and photographic record; and
 - sample excavation and further recording of the affected sections of the site.
- 13.5.17 Building recording is proposed to mitigate the impact of the proposed scheme on Dyce Airfield Radio Station (Site 154c).
- The proposed scheme would bisect Goval Mill Lade associated with Site 170, a Category B Listed Building. The following mitigation works are recommended:
 - topographic survey, including cross sections, of the entire site, including completion of a written and photographic record; and
 - the construction of the road in a cutting and the extension of the mill lade across the road, with the new section mirroring the design of the existing lade. In a meeting of the 1st June 2004, Historic Scotland agreed in principle to this mitigation measure (Jacobs 2004c).
- No mitigation works are recommended for Site 336, two clearance cairns. The recording works undertaken as part of the ES are adequate to mitigate the impact on these sites. Proposed mitigation for direct impacts is summarised in Table 13.11.

Environmental Statement 2007

Part B: Northern Leg

Table 13.11 - Summary of Proposed Evaluation and Mitigation Works

Site No.	Site Name	Impact Significance	Proposed Evaluation and/or Mitigation
120	Ashtown Boundary Stone 39	Substantial	Topographic and Photographic Survey. Removal and re-erection.
123	Gough Burn Rig and Furrow	Slight	Topographic survey. Sample excavation.
136	Bogenjoss Cairns 2	Slight	Strip and Record.
137	Bogenjoss Earthwork 2	Slight	Topographic survey. Sample excavation.
138	Bogenjoss Earthwork 2	Slight	Topographic survey.Sample excavation.
139	Bogenjoss Consumption Dyke	Slight	Topographic survey. Sample excavation.
154c	Dyce Airfield - Radio Station	Slight	Building recording.
170	Parkhill Pumping Station	Substantial	 topographic survey, assessment and reporting. extension of the lade over the AWPR.
183	Little Goval Cottage	Slight	Trial trenching and further recording works as required.
201	Cranfield Farm Consumption Dyke	Slight	Topographic survey.Sample excavation
208	Blackdog Croft Boundary Stone (site of)	Unknown	 Further inspection. Topographic and Photographic Survey. Removal and re-erection.
218	Goval Possible Standing Stone ?	Unknown	Measured survey.Geophysical survey.Trial trenching.
279	Overton - Stone Wall	Slight	Topographic survey. Sample excavation.
296	Aberdeenshire Canal (site of)	Unknown	Strip and record in advance of construction.
314	Red Moss	Unknown	 Palaeoenvironmental assessment. Palaeoenvironmental coring, analysis and reporting.
335	River Don Area of Archaeological Potential	Unknown	Field Walking. Geophysical Survey. Trial Trenching.
336	Cairn north-east of Kirkhill Forest	None	None
345	Corgarff - Aberdeen Military Road - Possible Route	Unknown	Strip and record in advance of construction.
348	Aberdeenshire Canal, Old Milestone, Pitmedden	Unknown	Strip and record.
362	Wester Hatton Cottages Cropmark	Substantial	Geophysical Survey.Trial trenching.
367	Upper Kirkton / Nether Kirkton Area of Archaeological Potential	Unknown	Strip and record

Mitigation of Indirect Impacts on Setting

- No mitigation works are proposed in respect of the Slight impacts of the proposed road on the setting Sites 125a, 125b, 144, 175, 282 and 343.
- The proposed scheme would be highly visible from Site 134 (Tyrebagger Hill stone circle SAM). The proposed design has been developed such that the road is in a cutting as it passes the site. This, and the presence of exisitng woodland, will ameliorate the visual impact to some extent. This impact will be further reduced by reinforcement of the existing woodland with new mixed planting. The road would, however, still be highly visible from this site.

Environmental Statement 2007

Part B: Northern Leg

- 13.5.22 The grading of embankments and landscape planting will slightly reduce the impact on the setting of Site 159 (Aberdeenshire Canal SAM).
- The substantial impact on the setting of Newhills Old Parish Church (Sites 283 and 284) would be reduced by using additional land-take to allow the cuttings to be eased. This will allow for a return to agriculture and improve the landscape 'fit' of the scheme. Planting along the boundary of the scheme will reflect the character of the landscape in this area and would further soften and frame views of the road.

13.6 Residual Impacts

Direct Impacts

13.6.1 Residual impacts taking into account proposed mitigation are summarised in Table 13.12 below.

Table 13.12 - Potential Residual Impacts (Direct)

Site No.	Site Name	Predicted Impact Significance	Residual Impact Significance
120	Ashtown Boundary Stone 39	Substantial	Moderate
123	Gough Burn Rig and Furrow	Slight	None
136	Bogenjoss Cairns 2	Slight	None
137	Bogenjoss Earthwork 2	Slight	None
138	Bogenjoss Earthwork 2	Slight	None
139	Bogenjoss Consumption Dyke	Slight	None
154c	Dyce Airfield - Radio Station	Slight	None
170	Parkhill Pumping Station	Substantial	Moderate
183	Little Goval Cottage	Slight	None
201	Cranfield Farm Consumption Dyke	Slight	None
208	Blackdog Croft Boundary Stone (site of)	Unknown	Unknown
218	Goval Possible Standing Stone	Unknown	Unknown
277	Newmill – possible Cairn	None	None
279	Overton - Stone Wall	Slight	None
296	Aberdeenshire Canal (site of)	Unknown	Unknown
314	Red Moss	Unknown	Unknown
335	River Don Area of Archaeological Potential	Unknown	Unknown
336	Cairn north-east of Kirkhill Forest	None	None
345	Corgarff - Aberdeen Military Road - Possible Route	Unknown	Unknown
348	Aberdeenshire Canal, Old Milestone, Pitmedden	Unknown	Unknown
362	Wester Hatton Cottages Cropmark	Substantial	Moderate
367	Upper Kirkton / Nether Kirkton Area of Archaeological Potential	Unknown	Unknown

Table 13.13 compares the potential direct impacts with the anticipated residual direct impacts:

Table 13.13 – Comparison of Potential Impacts (Direct) and Residual Impacts

Significance of Impact	Totals	Residual Impact	Totals
Very Substantial	0	Very Substantial	0
Substantial	3	Substantial	0
Moderate	0	Moderate	3
Slight	9	Slight	0
None	2	None	11
Unknown	8	Unknown	8
Total	22	Total	22

Environmental Statement 2007

Part B: Northern Leg

Indirect Impacts

The proposed scheme will result in a permanent change to the setting of, and views from and to, 10 sites of cultural heritage significance. Although elements of the proposed scheme design (such as road cutting) and the mitigation proposed in the ES (Chapter 11: Landscape) will contribute to a general reduction of the impact on the setting of cultural heritage sites, only one of these reductions (on Site 159) has been sufficient to reduce the overall category of impact significance, and all other impact significances remain unchanged. Details of these sites and residual impacts are provided in Table 13.14.

Table 13.14 - Potential Residual Impacts (Indirect)

Site No.	Site Type	Significance of Impact	Residual Impact
125a	St Mary`s Chapel	Slight	Slight
125b	St Mary`s Chapel Graveyard Category C(s) Listed Building	Slight	Slight
134	Tyrebagger Hill Recumbent Stone Circle SAM	Substantial	Substantial
144	Bogenjoss Farmhouse	Slight	Slight
159	Aberdeenshire Canal (ladies jointure) SAM	Substantial	Moderate
175	Parkhill Tollhouse	Slight	Slight
282	March Stone No.38, Category B Listed Building	Slight	Slight
283	Churchyard of Newhills Category B Listed Building	Substantial	Substantial
284	Old Parish Church of Newhills Category B Listed Building	Substantial	Substantial
343	Craibstone House, East Lodge	Slight	Slight

Table 13.15 below compares the potential indirect impacts during with the anticipated residual impacts on setting:

Table 13.15 - Comparison of Potential Impacts and Residual Impacts (Indirect)

Significance of Impact	Totals	Residual Impact	Totals
Substantial	4	Substantial	3
Moderate	0	Moderate	1
Slight	6	Slight	6
Total	10	Total	10

13.7 References

Burl, H.A. (1970). The Recumbent Stone Circles of North-East Scotland' in PSAS 102, 1970, 56-81.

Croly, C. (2004). The fences are built immoderately thick: Consumption Dykes in Aberdeen, c. 1750-2004.

Graham, A. (1968). 'Two Canals in Aberdeenshire' in PSAS 100, 1968, 170-178.

Harris, B. (2002). Blairs; A Journey of Faith.

Historic Scotland (1998), Memorandum of Guidance on listed buildings and conservation areas.

Historic Scotland (2006). Scheduling: protecting Scotland's nationally important monuments, Scottish Historic Environment Policy 2.

Institute of Field Archaeologists (1994) Standard and Guidance for Desk-Based Assessments.

Environmental Statement 2007

Part B: Northern Leg

Jacobs (formerly Jacobs Babtie) (2004). Aberdeen Western Peripheral Route, Stage 2 Archaeological Desk Based Assessment and Walkover Study Vols 1-3.

Jacobs (formerly Jacobs Babtie) (2005). Aberdeen Western Peripheral Route, Stage 3 Archaeological Desk Based Assessment and Site Inspection.

Mouchel Consulting Ltd (2002). Western Peripheral Route (Northern Leg), Stage 2 Environmental Assessment (Chapter 3.3 – Cultural Heritage).

Mouchel Consulting Ltd (2003). Aberdeen Western Peripheral Route (Western Leg), Stage 2 Addendum Environmental Assessment (Chapter 3.3 – Cultural Heritage).

Pearson, D. (1986). The Aberdeenshire Canal: a Description and Interpretation of its Remains' in Aberdeen University Review No. 175, 1986, 285-299.

RSK Environment Ltd. (March 1994). Environmental Impact Assessment of the Western Peripheral Route, Aberdeen (Chapter 7, Cultural Heritage).

Scottish Office (1994a). National Planning Policy Guideline 5: Archaeology and Planning.

Scottish Office (1994b). Planning Advice Note 42: Archaeology – The Planning Process and Scheduled Monuments Procedures.

Scottish Office (1999). NPPG18: Planning and the Historic Environment.

Smith. Rev. J. (1909). 'Letter to the editor' in Aberdeen Journal, notes and queries, published 1910.

The Landscape Institute/Institute of Environmental Assessment (2002). Guidelines for Landscape and Visual Impact Assessment.