National Roads Authority

Guidelines for the Assessment of Archaeological Heritage Impacts of National Road Schemes

NRA
National Roads Authority
An tÚdarás um Bóithre Náisiúnta

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Disclaimer

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CHAPTER 1
INTRODUCTION
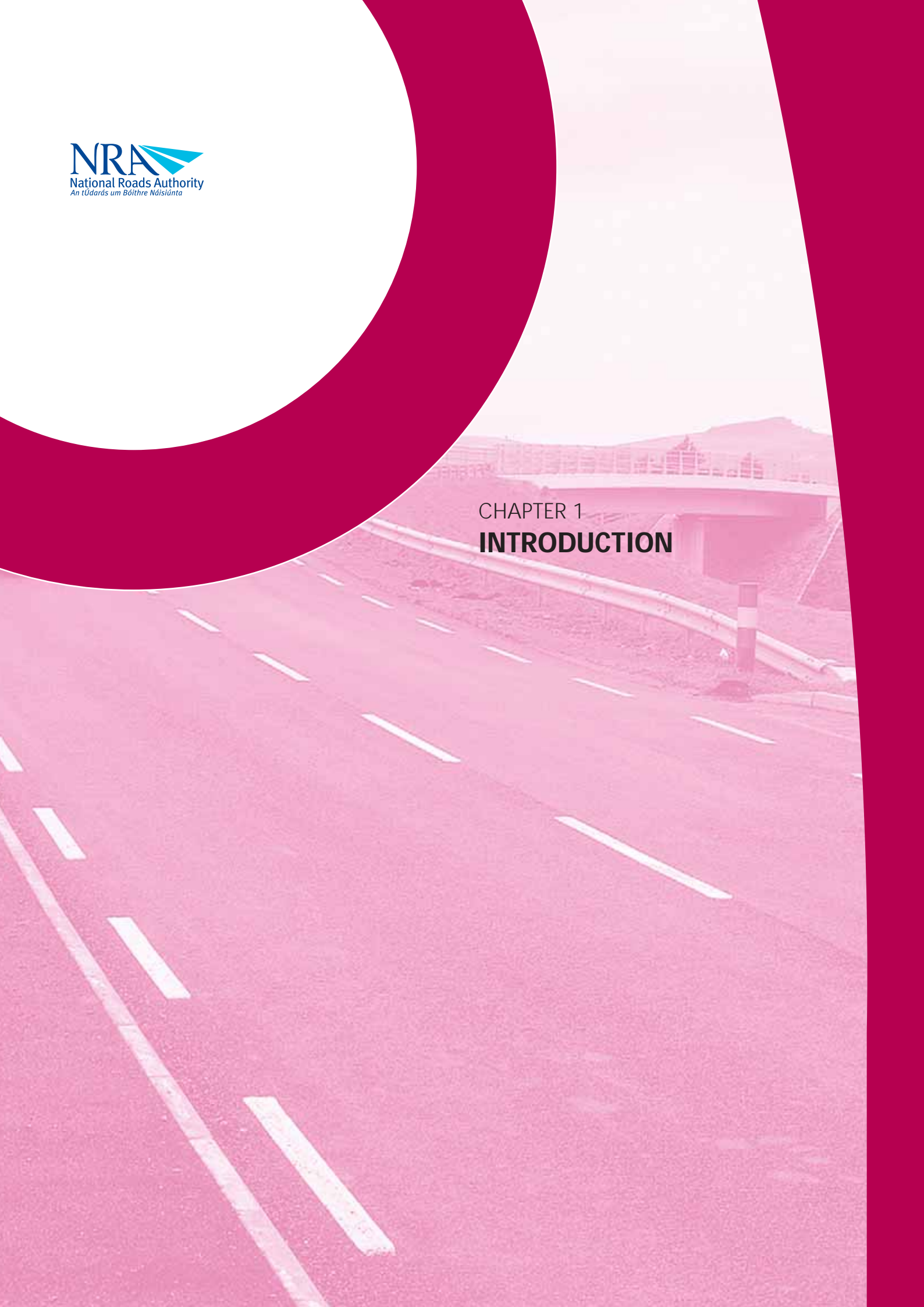
1.0   INTRODUCTION

1.1   Background and Legislative Context

The purpose of this document is to provide guidance on the treatment of the archaeological heritage during the planning and design of national road schemes. The guidelines are recommended to achieve appropriate consistency with respect to the treatment of archaeology during the Constraint, Route Corridor Selection, Environmental Impact Assessment of road scheme planning and development undertaken in accordance with the Authority's National Roads Project Management Guidelines (NRPMG).

The Framework and Principles for the Protection of the Archaeological Heritage (1999:33) outlines the State's general principles in relation to the management and protection of the archaeological heritage. This document outlines that avoidance of developmental impacts on archaeological heritage and preservation *in situ* of archaeological sites and monuments are always the preferred option. When a site, or part of a site, has to be removed due to development, then preservation by record must be undertaken, i.e. through excavation and recording.

Archaeological and architectural heritage are closely related and therefore, these guidelines should be read in tandem with the guidelines for the assessment of architectural heritage.

1.2   National Roads Project Management Guidelines (NRPMG)

The procedures followed by the National Roads Authority and local authorities in the planning, design and implementation of road schemes are specified in the Roads Act, 1993, and the NRPMG (2000).

The Roads Act requires the preparation of an Environmental Impact Statement (EIS) for certain types of road schemes, and following a period of public consultation, submission of the EIS to An Bord Pleanála for consideration.

Public consultation is catered for at a number of stages in the planning process and, as a matter of practice, is generally engaged-in as early as it is deemed practicable. There are a number of stages to the planning and consultation process as set out in the Authority's NRPMG.

The NRPMG were prepared to allow a phased approach to developing a major road scheme. For the purposes of these guidelines, three phases are considered: the Constraints Study (Phase 2), Route Corridor Selection (Phase 3) and the EIS (Phase 4). The aim of the guidance note is to provide advice as to the scope of archaeological related activities as they pertain to each of these three different phases. The activities during each phase of project planning will differ and hence the subsequent input, feeding into the Constraints Study, Route Corridor Selection process and the EIS will also differ.

The archaeological input into each of the three phases will not be treated in isolation as the findings arising out of each phase set the foundation for the next activity and collectively assist in the final design of the road scheme. The archaeological heritage input into the Constraints

Study and Route Corridor Selection seek to avoid and, where possible reduce negative impacts. The EIS should describe any further steps taken to reduce, remedy or ameliorate the impacts. Where such measures have to be applied, they will only be advised and undertaken following consultation with the Project Archaeologist, Project Design Team and the statutory authorites.

The archaeological heritage should be seen in conjunction with engineering constraints and other impacts such as those on the natural environment, communities, homes, farms, socio-economic factors, visual amenity etc. Each Route Corridor Selection process will have unique features and constraints may vary. In some cases the optimum route from an archaeological perspective may not be the overall optimum route when other impacts are evaluated. However, archaeological aspects should receive detailed consideration, and indeed, in some cases they may constitute one of the more important factors to be addressed during Route Corridor Selection and subsequent design of the road scheme.

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Figure 1: The phases of planning for the assessment of archaeological heritage sites of national road schemes showing a typical study area and route corridors

Constraints Study (Chapter 3)
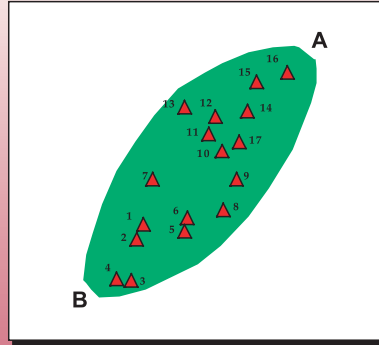
△ Archaeological sites
■ Study area

Route Corridor Selection Study (Chapter 4)
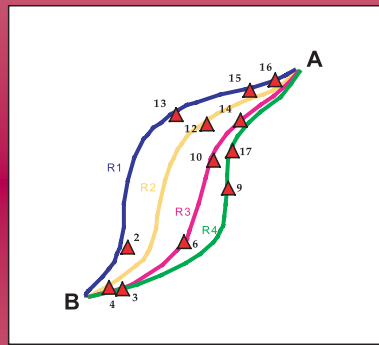
— Route corridor options

Environmental Impact Assessment (Chapter 5)
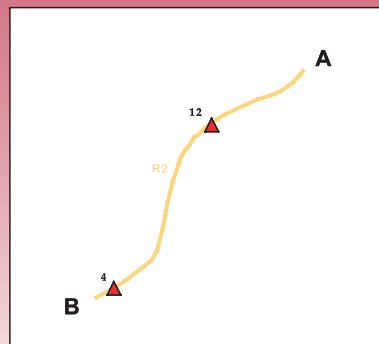
— Preferred route

1.3   Requirements of an Archaeological Heritage Consultant

The survey and assessment of the archaeological heritage for the purpose of these guidelines requires the expertise of a qualified archaeologist with a wide range of experience. A combination of expertise and qualification are considered to be the most desirable. The Archaeological Heritage Consultant requires:

- A proven background working on archaeological reports

- A thorough knowledge of archaeological legislation, standards and guidelines

- An understanding of the criteria for evaluation and classification of significance of impacts

- An ability to understand and communicate to the Project Design Team how archaeological issues may affect the preconstruction and construction phases and programme of a proposed road development

- A capability to produce accurate, focused and comprehensive research findings

1.4   Consultees

Consultees in the EIA process include authorities or agencies with statutory responsibilities for the protection of archaeological heritage, including the collection and provision of data and information, and those who should be informed of the heritage aspects of the proposed road development.

For archaeological heritage the Statutory Consultees are:

- The relevant Planning Authority,

- Department of the Environment, Heritage and Local Government (National Monuments Section),

- The Heritage Council,

- An Taisce,

- Failte Ireland,

- The Arts Council (An Chomhairle Ealaíon)

A copy of the EIS should also be sent to the prescribed authorities in Northern Ireland where the proposed road development is likely to have significant effects on the environment in Northern Ireland. The Northern Ireland authorities are also entitled under section 51 of the Roads Act, 1993, to request a copy of the EIS. Where an EIS is sent to the Northern Ireland
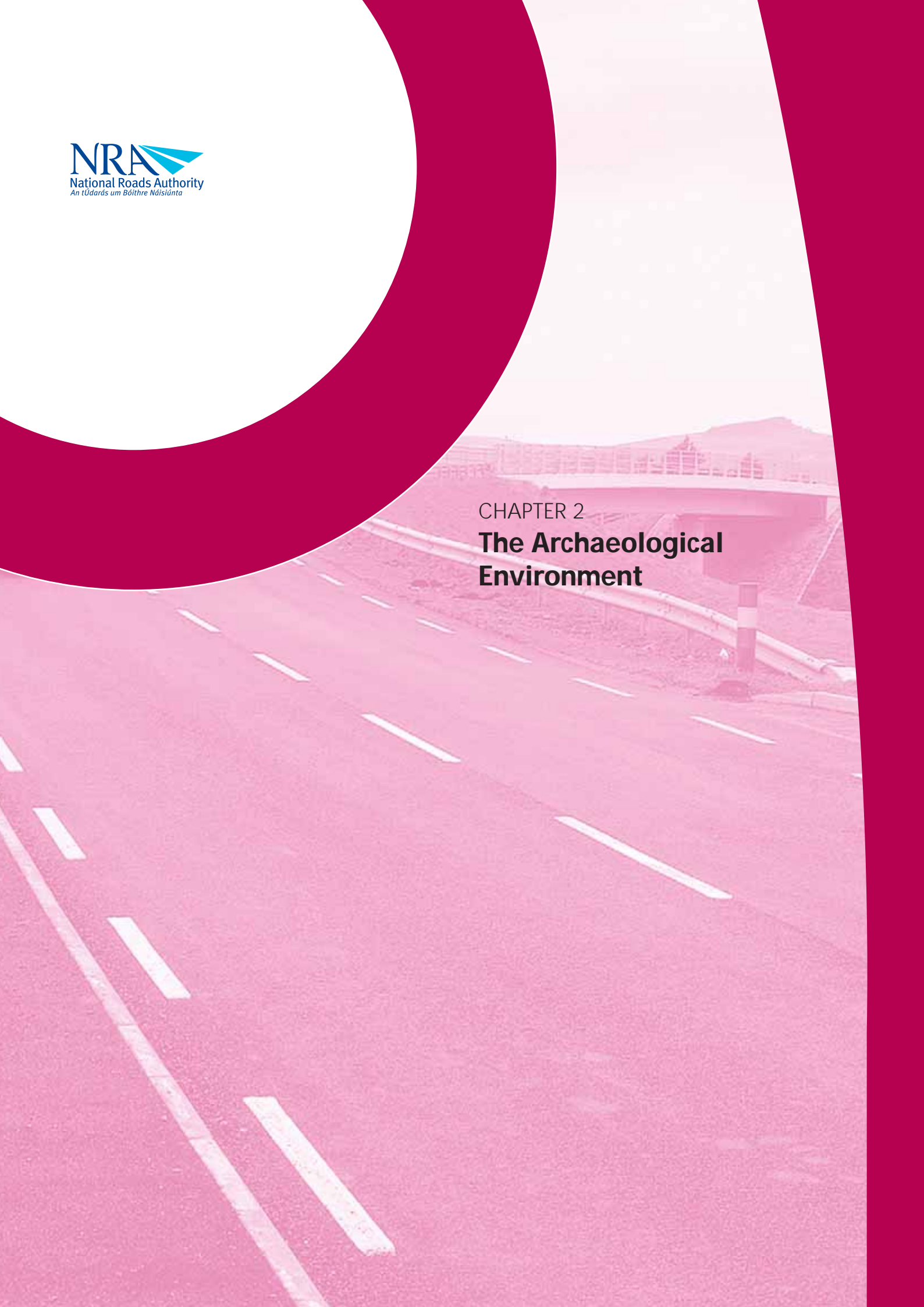
authorities it should be indicated that submissions thereon may be made to An Bord Pleanála within a specified period.

The statutory consultees have special responsibilities to respond to the procedural demands of the EIS process.

The Project Team will decide on the scope of archaeological heritage survey and assessment work taking account of the views received and the advice provided in these guidelines.

Communication should be initiated with the National Monuments Section of the Department of the Environment, Heritage and Local Government at the route corridor selection stage of the process to inform them of the road proposal. At the EIS stage it is recommended that consultation occurs with the Statutory Consultees to seek their views on the scope of surveys and assessment work, and on the suitability and acceptability of the predicted impacts and mitigation proposals for the proposed route.

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CHAPTER 2

The Archaeological Environment

2.0 The Archaeological Environment

2.1 Definition of Archaeological Heritage

The archaeological heritage is a finite non-renewable physical and material resource. Archaeology is the study of past human societies through their material remains and artefactual assemblages. The study of archaeological remains increases our understanding and knowledge of the structure and culture of past and ancient societies that are not recorded by any other means.

Each monument possesses a unique and, as such, invaluable record of the individual site, as well as providing evidence for its context in a wider cultural framework. Collectively, archaeological monuments contribute to charting cultural evolution and change over time, providing insight into the communications, trade, and growth of past human societies.

Figure 2: Aerial view of two enclosures (RMP TS075-039,40) at Kedragh, Co. Tipperary

2.2 Protection of Archaeological Heritage

The Archaeological Heritage Consultant should make reference to, and take account of, the relevant legislation and guidance as appropriate in undertaking all stages of the environmental assessment.

The following national and international protective guidances and legislation need to be taken into account when assessing the archaeological heritage:

National	National Monument Act, 1930, amended 1954, 1987, 1994 and 2004 Roads Act, 1993
	Heritage Act, 1995
	National Cultural Institutions Act, 1997
	The Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous) Provisions Act, 1999
	Framework and Principles for the Protection of the Archaeological Heritage, 1999, Department of Arts, Heritage, Gaeltacht and the Islands
	Local Government (Planning and Development) Act, 2000
	Advice Notes on Current Practice (in the Preparation of Environmental Impact Statements), 2003, EPA
	Guidelines on the information to be contained in Environmental Impact Statements, 2002, EPA
	Environmental Impact Assessment of National Road Schemes – A Practical Guide, 2005, NRA
	Code of Practice between the NRA and the Department of Arts, Heritage, Gaeltacht and the Islands, 2000
European	European Convention on the Protection of the Archaeological Heritage (the 'Valletta Convention') ratified by the Republic of Ireland in 1997
	Council of Europe Convention on the Protection of the Architectural Heritage of Europe (the 'Granada Convention') ratified by the Republic of Ireland in 1997
International	International Council on Monuments and Sites (ICOMOS), advisory body to UNESCO concerning protection of sites and recommendation of World Heritage sites ratified by the Republic of Ireland in 1992

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2.2.1 National Protection

The Principal National Monument Act, 1930, and subsequent amendments provide the formal legal mechanisms to protect monuments in Ireland. The Minister for the Environment, Heritage and Local Government is the national authority with responsibility for protection of these features.

2.2.2 European Protection

The 1992 European Convention on the Protection of the Archaeological Heritage (the 'Valletta Convention') was ratified by Ireland in 1997. The aim of the Convention is to "protect the archaeological heritage as a source of the European collective memory and as an instrument for historical and scientific study" (Article 1).

The statutory requirement for undertaking and preparing an Environmental Impact Statement (EIS) is outlined in detail in the *Environmental Impact Assessment of National Road Schemes - A Practical Guide* (NRA 2005).

New road development in Ireland is regulated under the Roads Act, 1993, which states that an Environmental Impact Statement must include a description of the likely significant effects, whether direct or indirect, of a road on cultural heritage.

The Planning and Development Regulations 2001 state that an EIS is "required to include a description of the aspects of the environment likely to be significantly affected by the proposed development including the architectural and archaeological heritage, and the cultural heritage".

2.2.3 International Protection

The International Council on Monuments and Sites (ICOMOS) is an organisation dedicated to the conservation of the world's historic monuments and sites. Its work is based on the principles enshrined in the 1964 International Charter on the Conservation and Restoration of Monuments and Sites (Venice Charter). ICOMOS seeks to establish international standards for the preservation, restoration, and management of the cultural environment and advises the World Heritage Committee and UNESCO on the nomination of new sites to the World Heritage List.

To be included on the World Heritage List, sites must be of outstanding universal value and meet at least one out of ten selection criteria. The government of the country nominates sites, and Ireland, currently has two World Heritage Sites.

2.2.4 Project Archaeologists and the Code of Practice

The Code of Practice was agreed between the NRA and the Minister for Arts, Heritage, Gaeltacht and the Islands (NRA & DAHGI 2000) to provide a structured and strategic framework for the management of all archaeological aspects of road planning and construction.

Project Archaeologists have been appointed to the National Road Design Offices to ensure the proper management of the archaeological work and that mitigation strategies are in keeping with best practice and polices determined by the appropriate Minster for the Environment, Heritage and Local Government.

2.3   The Nature of the Archaeological Heritage

The present system for protecting archaeological monuments is based on recorded and known monuments; it does not take into account previously unknown features or monuments hidden beneath the soil. The Record of Monuments and Places is a statutory indicator of the archaeological potential in any given area. It is through the Environmental Impact Assessment process that this potential is considered in the Constraints Study, Route Corridor Selection Report and Environmental Impact Statement to provide a more rigorous account of the archaeological environment.

Archaeological sites occur in every type of terrain; upland, lowland, estuarine, riverine, coastal, lacustrine, agricultural land and bogland (raised and blanket). The nature of monuments within these terrains can be:

- high visibility

- low visibility

- no visibility

Different techniques are employed throughout the road planning and EIA process to obtain a fuller understanding of the archaeological potential of the land through which the road scheme passes.

The hidden and unknown nature of archaeological features provides the biggest archaeological challenge when designing roads, as the discovery of a large previously unknown archaeological site can lead to significant impacts and delay to the construction phase of a road scheme. Early identification is the key to protecting the archaeological resource and to ensuring proper management and cost control in relation to individual road-building programmes. The challenge is to strike a balance between protecting the essential multi-layered historical character of the landscape while responding to modern development needs of road building.

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Figure 3: Ringfort TN021-057 in Knockalton Upper, Co. Tipperary

2.4 Sources of Archaeological Heritage Information

Sources of background information that the Archaeological Heritage Consultant could draw on include:

- ⊙ Record of Monuments and Places (RMP)

- ⊙ Sites and Monuments Record (SMR)

- ⊙ Register of Historic Monuments

- ⊙ National Inventory of Architectural Heritage (NIAH)

- ⊙ County Development Plans

- ⊙ Irish Antiquities Division, National Museum of Ireland Topographical Files

- ⊙ Urban Archaeological Surveys

- ⊙ Ordnance Survey first and subsequent editions

- ⊙ Ordnance Survey Namebooks/Letters/ Memoirs

- Early maps and estate maps

- Office of Public Works river drainage files

- Maritime Sites and Monuments Record

- Aerial photographs

- Published County Archaeological Inventories and Surveys

- Excavations Bulletin (www.excavations.ie)

- Relevant published archaeological corpora

- Local archaeological societies

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CHAPTER 3
CONSTRAINTS STUDY

3.0   CONSTRAINTS STUDY

3.1   Objective

The objective for the Constraints Study includes the identification of all recorded archaeological monuments within the study area including the legal status, if any, of these features. The study collates information from readily available sources that will be used to inform the later stages of the planning process, i.e. the Route Corridor Selection and EIS reports.

3.2   Approach

The data collection to take place at Constraints Study stage is based on a desk-study. All known and recorded monument constraints must be represented on a map of the study area. The focus of the archaeological report is on identifying constraints from published sources. This is necessary to inform the decision making process for the route corridor selection phase. All work must be carried out in consultation with the Project Archaeologist.

3.3   Consultation to Gather Baseline Information

The Archaeological Heritage Consultant will need to consult all available sources of archaeological heritage information as part of the desk-study including the Record of Monuments and Places, the Sites and Monuments Record, the Register of Historic Monuments, published County Surveys and Inventories, Urban Archaeological Surveys and County Development Plans. Other sources listed in Section 2.4 above may also be consulted where deemed appropriate by the Project Archaeologist.

3.4   Contents of the Constraints Study

Using readily available sources the study identifies monuments and areas of significant archaeological importance and potential, with a focus on the issues for the scheme and must be formatted to include the following:

- ⊙ Introduction to the study area

- ⊙ Inventory of archaeological constraints using a table format

- ⊙ Identification and discussion of significant archaeological heritage constraints

- ⊙ List of sources consulted

- ⊙ Mapping of all archaeological constraints

For accuracy, compatibility with other specialist topics and ease of reference use of a Geographical Information System (GIS) for mapping the archaeological constraints is recommended.

The archaeological constraint table must include a list of every identified, previously, recorded archaeological monument within the study area and provide information on:

- ⊙ The legal status

- ⊙ Townland name

- ⊙ Monument type

- ⊙ The national grid reference (NGR)

- ⊙ Information source

Table 1: Example of an inventory of archaeological heritage constraints

Reference No.	Legal Status	Townland	Monument Type	NGR	Information Source
A4/TI032-002	Recorded Monument	Killeen	Ringfort	18380/16782	RMP/Development Plan
A6/TI032-009	Recorded Monument	Doonane	Standing Stone	17873/16782	RMP/County Inventory
A7/TI068-009	National Monument	Athassal	Ecclesiastical Complex	19557/13667	Recorded National Monument List

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Figure 4: Tower house TN021-055 in Ballintotty, Co. Tipperary

3.5   Archaeological Heritage Constraints Map

All archaeological heritage sites and monuments within the study area should be shown on the Constraints Map at an appropriate scale. For accuracy and ease of reference, mapping should be in a format that is compatible with the overall Environmental Constraints Plan and could be in the form of a digital Geographical Information System (GIS) for mapping of archaeological heritage constraints.

3.6   Communicating the Constraints

The overall findings of the Constraints Study should be presented in a report to the Project Archaeologist and the Project Design Team for incorporation into the overall project Constraints Study.

Essential Requirement Checklist
The constraint study report must provide information on
- ✓ National Monuments (identified by the National Monuments Section of the Department of the Environment, Heritage and Local Government)
- ✓ Sites listed in the Record of Monuments and Places (RMP) and the Sites and Monuments Record (SMR)
- ✓ Sites listed in the Register of Historic Monuments
- ✓ Sites listed in published county archaeological inventories and surveys
- ✓ The County Development Plan
- ✓ And also draw on information, in so far as relevant, from Urban Archaeological Surveys and Urban District County Plans as well as relevant published information

Figure 5: Flowchart to show Phase 2 Constraints Study – Archaeological Heritage

Consult available information
e.g. RMP, SMR, Register of Historic Monuments, County Development Plans, Published County Surveys & Inventories

Inventory of Archaeological Heritage
This will be verified and supplemented during Public Consultation and the Route Corridor Selection Study

Archaeological Heritage Constraints Map
Information obtained during the Constraints Study

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CHAPTER 4
**ROUTE CORRIDOR
SELECTION STUDY**

4.0   ROUTE CORRIDOR SELECTION STUDY

4.1   Background

Following the Constraints Study phase a number of broad route corridor options will be identified for further evaluation with a view to identifying the preferred option, taking into account archaeology and all other relevant considerations. These corridors can be several hundred metres in width and it is within these corridors that potential routes emerge. Within these corridors there will be some scope to thread the route so as to avoid/minimise impacts on archaeology.

4.2   Objective

The objective of the Route Corridor Selection study is to produce a common assessment and detailed technical and comparative evaluation of each route option. All recorded archaeological features that are potentially affected by each route option should be identified and consideration to the avoidance of significant adverse impacts for the road scheme should be developed at this stage of the assessment process. The study should elaborate and supplement the information already gained during the Constraints Study.

As outlined in the *Framework and Principles for the Protection of the Archaeological Heritage* (DAHGI 1999:33), there should always be a presumption in favour of avoidance of impacts. Where this cannot be achieved, excavation, recording and publication may constitute an acceptable alternative.

The Route Corridor Selection phase constitutes the primary opportunity to avoid unacceptable impacts. Each route option should be evaluated on the basis of the nature and extent of the recorded archaeological constraint, in order to define the emerging Preferred Route Option from an archaeological perspective.

Archaeological heritage impacts have to be seen in the broader perspective of other environmental, engineering and socio-economic constraints. The Preferred Route Option from an archaeological heritage perspective, as identified in the Route Corridor Selection Study on archaeological heritage, may not be the overall optimum route when other impacts and considerations are evaluated. However, it will be a matter for the Project Design Team to have due regard to the conclusions of the study concerned when evaluating all relevant route options and coming to an informed decision as to what, on balance, is the preferred route choice.

4.3   Approach

Information gathered at the Constraints Study phase will provide the baseline which is further developed by the Route Corridor Selection Study. This study is the main information-gathering phase of the assessment process and a consistent methodology and criteria needs to be adopted for the assessment of archaeological heritage within each route corridor/option. The approach will involve a combination of techniques including a possible aerial flyover if deemed necessary by the Project Archaeologist to identify, describe, map and evaluate the significance of likely adverse impacts that each route possesses. The number of route studies, and their relationship to existing routes is likely to vary from scheme to scheme.

During the Route Corridor Selection phase data may be required on the following levels:

Route Option Corridor   a linear corridor more streamlined than the Constraints Study area, within which a number of route options may be developed.

Route Options   a linear corridor intended to indicate the location of a proposed route.

When undertaking an archaeological heritage study at Route Corridor Selection stage it is recommended that the study area for archaeological heritage should encompass an overall width of 500 metres, i.e. 250 metres from the centre line of each possible route. This would, however, need to be increased where deemed necessary by the consultant in conjunction with the Project Archaeologist, if impacts were considered significant and where the proposed road footprint extended beyond a width of 500 metres, for example at junctions, bridges and intersections.

The documentation generated for the Route Corridor Selection Report will be required during the Environmental Impact Assessment phase and may be required to support evidence at the An Bord Pleanála oral hearing.

4.4   Compilation of Base Maps

For the mapping of archaeological heritage a scale of 1:10,000 or larger is suitable. In most cases sufficient data will be available from Ordnance Survey Ireland to enable the compilation of a suitable base map. Aerial photography may at this stage be available for the project and these could potentially form the basis of a map.

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Figure 6: Map of Route Selection Options showing archaeological sites from the N7/N8 Road Scheme A - Granston Castle (LA028-051), B - Granston Manor Demesne, C - Millrace, Kilnaseer Townland, D - Boston Bridge and the Erkina River, E - Aghmacart Archaeological Complex (LA034-019), F - Belmont House and Demesne, G - Cropmarks at Oldtown Townland
© Ordnance Survey Ireland & Government of Ireland permit number 8119.
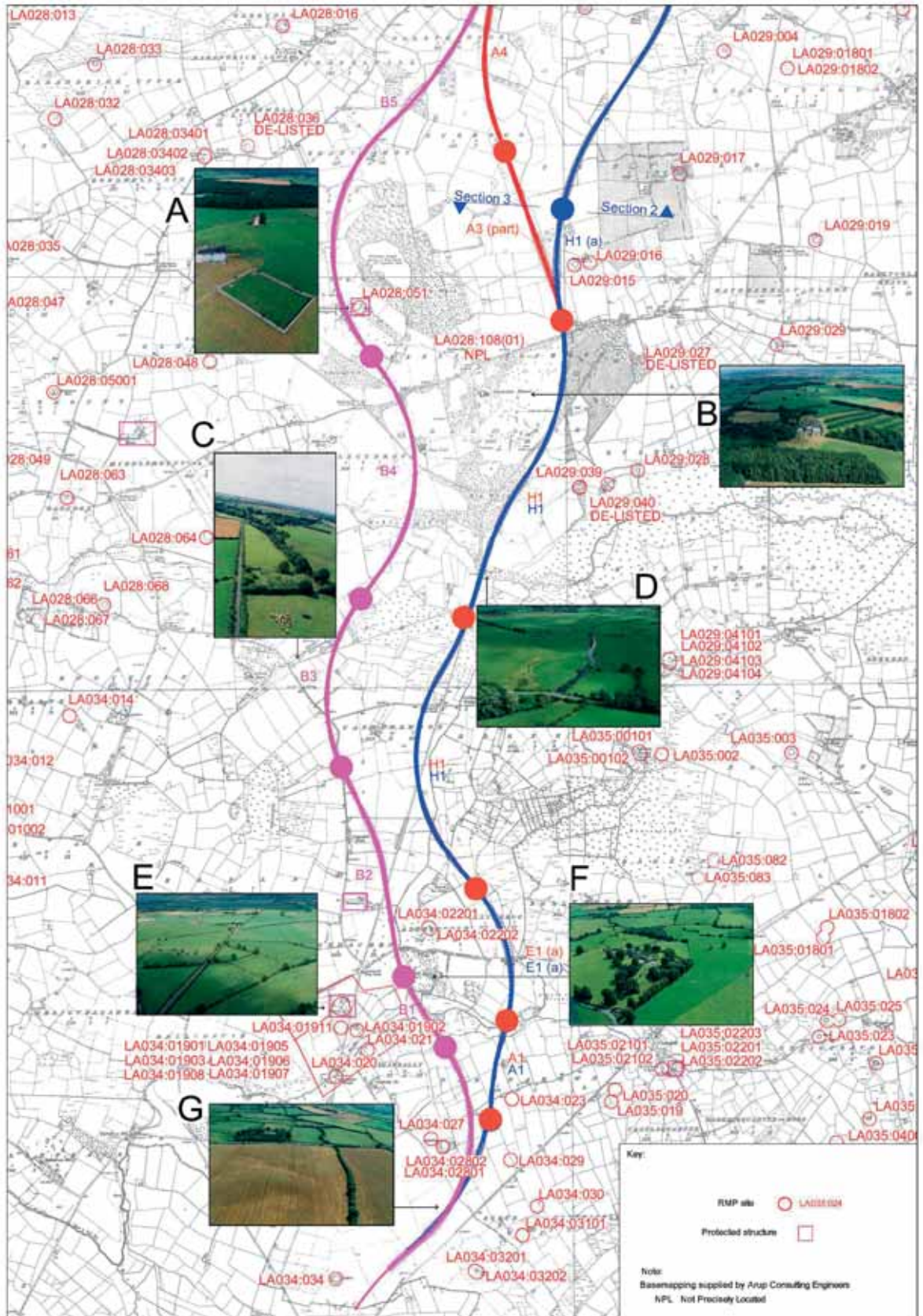
4.5 Methodologies to be used in the Archaeological Route Corridor Selection Process

A number of methodologies should be used during the Route Corridor Selection process to assess the archaeological heritage. These include:

- ⊙ Desk-study, further expansion of information gathered during the Constraints Study, including the examination of first edition Ordnance Survey and early maps, National Museum of Ireland topographical files, aerial photographs if available, relevant published information etc. (see Section 2.4 above)

- ⊙ Windshield survey

- ⊙ Site visits to verify the extent and condition of recorded sites

- ⊙ Aerial inspection to identify all route options and familiarize oneself with the landscape if deemed appropriate by the Project Archaeologist

A comprehensive knowledge of the terrain is essential to evaluate the landscape of a route option, a windshield survey is necessary to ensure this familiarity. A specific site visit may also be necessary to:

- ⊙ Confirm the nature, location and extent of a monument

- ⊙ To ensure the accuracy of the existing documentary record

- ⊙ Explore the potential significance of monuments identified through desk-study research and public consultation

4.6 Inventory of Archaeological Heritage

The rationale for including each entry should be clearly documented in the study. The sources should be listed, whether it is from documentary, cartographic, aerial photography or local consultation. The present legal status, for example, recorded national monument (in State Ownership or Guardianship), protected by preservation order, registered site, recorded site, and/or de-listed site or newly identified site should also be noted. The location of a feature should be identified by national grid reference where possible or by townland. Specific areas of potential archaeological significance as well as stray finds should also be given a reference number. The approximate distance should be measured from the edge of the constraint area of each archaeological site to the edge of the route option/corridor. Where there is no constraint area, a distance should be taken from the actual feature to the edge of the route corridor/option.

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Table 2: A sample entry from an inventory of archaeological heritage

Identification number	A1
Legal Status	Recorded Monument
Reference Number	RMP TI136-039
Townland	Dromline
Site Type	Enclosure
NGR	192280, 136010
Description	Located on a low natural rise of ground in undulating countryside. The monument consists of a raised circular area measuring 35.7m in diameter (east-west) enclosed by a poorly preserved bank.
Sources	RMP archive, Tipperary Inventory
Approx. distance from Route B	20m
Type of Impact	Indirect Impact

4.7   Impact Assessment of Route Options

The collated information on the prevalence of archaeological heritage of merit within the route option corridors will provide the basis on which each route option is assessed. The most favourable route will be identified through a quantitative and qualitative appraisal of route corridors to arrive at a professional conclusion. An Impact Assessment Table as illustrated in Table 3 should be devised by the consultant to enable a comparison of the various route attributes.

The Archaeological Heritage Consultant will inform the Project Design Team as to the level of archaeological potential within each route option. The report must inform the Project Design Team if this potential may become a key element in choosing a route option.

The Archaeological Heritage Consultant should notify the Project Design Team as to the potential for impact on archaeological heritage along each route option being considered and whether potential impacts on archaeological heritage are likely to be a key consideration in selecting a Preferred Route Option.

A Route Corridor Selection report for archaeological heritage is produced to inform the design team and to provide a record of the route assessment process. This report, along with those produced for other environmental aspects, is included within the overall Route Corridor Selection report for the scheme prepared by the Project Design Team and available for subsequent viewing by statutory consultees and others.

It should be noted that as the archaeological component of the route corridor selection process largely involves a desk-survey, it can be difficult to assess the exact level of potential of an archaeological site and therefore impact due to:

⊙ Possible associated below ground remains with a recorded monument

- Unknown extent of a recorded monument

- Potential to reveal archaeological sites given the type of terrain

- Possible recorded and newly identified sites may prove to be natural when tested or excavated

Impacts are generally categorised as either:

- Direct impact

- Indirect impact

- No predicted impact

Direct Impact – where an archaeological feature or site is physically located within the footprint of a potential route and entails the removal of part, or all of the monument or feature.

Indirect Impact – where a feature or site of archaeological heritage merit or its setting is located in close proximity to the footprint of a potential route alignment.

Mitigation could ameliorate and reduce potential negative impacts; however, the design of mitigation at route corridor selection stage would be largely undefined and would, instead, be addressed as part of the Environmental Impact Statement Phase in the event of the route option being identified as the preferred route.

No predicted impact – where the potential route does not adversely or positively affect an archaeological heritage site.

The level of impact in accordance with the EPA Guidelines (Appendix 4, Glossary of Terms) can be:

- **Profound**

- **Significant**

- **Moderate**

- **Slight**

- **Imperceptible**

and can either be

- **positive or negative**

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When assessing an impact it is important to consider the type of monument or area of potential, the type and level of impact and the distance between the site and the route. For ease of assessment it may be beneficial to separate the impacts on the archaeological heritage into different categories, for example, recorded monuments, areas of archaeological potential and river crossings. An example of how this might be presented is given in Table 3 which provides a summary evaluation impact assessment of a particular route option.

Table 3: An example of an Impact Assessment Table.

Reference no	NGR/ Townland	Site Type	Type of Impact	Distance	Impact Level
A1/ KK034 - 24	176650, 145830	Recorded ringfort	Direct	0m	Profound impact
A2/ KK034 -114	180500, 142650	Recorded fulachta fiadh	Indirect	50m	Moderate
A3	Ballymore	Bog and marginal land	Direct	0m	Potentially significant
A4	Gortaclareen	Possible enclosure identified by aerial photography	Direct	10m	Potentially significant
A18	Boarheeny	Reask River	Direct	0m	Potentially significant

4.8   Comparison of Route Options

The results of each route option can be fed into a comparison table. It is important to note the limitation of these tables as often it is difficult to ascertain the exact impact level due to the potential to reveal, in the future, previously unknown and buried archaeological sites as part of an archaeological testing strategy. The table should be based on the information available at the time of writing the Route Corridor Selection report. The level of impact and the archaeological potential of each route should be taken into consideration when comparing route options.

Table 4: An example of a Route Option Appraisal Table.

Impact level	Route Option 1	Route Option 2	Route Option 3
Profound	Removal of a recorded enclosure (TI044-053).	Removal of a recorded fulacht fiadh (TI044-042).	
Negative Significant		Partial removal of 19th century mill race identified from historic mapping.	Partial removal of a recorded bawn wall associated with a castle site (TI034-049).
Negative Moderate		Removal of a mature stand of trees which provides cover for a holy well site.	
Potentially Significant	Possible features identified from aerial photographs along an elevated ridge leading to TI059-110, (Motte and Bailey). Potential to reveal finds and features from bogland, where turf cutting has revealed bog butter and a Bronze Age axe head.	Area of archaeological potential associated with TI059-093, a possible field system and enclosure identified from aerial photography. Crossing of the River Reask – potential to reveal archaeological features on adjoining banks	Crossing of the River Suir, with stray finds recorded (NMI) from the adjoining townland, Rathbaun. The proposed route avoids the upstanding remains of a recorded ecclesiastical complex, however associated remains may lie within the corridor.
Preference Level	**Third Preference**	**First Preference**	**Second Preference**

Even though Route Option 2 involves the removal of a recorded *fulacht fiadh*, given the size and nature of the monument it is preferable to excavate it rather than a sizable enclosure as in Route Option 1 or partially disturb upstanding remains of a medieval castle complex and potential associated below ground remains in Route Option 3. There is the added potential to reveal extensive and significant remains of a recorded ecclesiastical complex along Route Option 3 (Appendix 2, Significance Criteria). Consequently, in the exercise above, Route Option 2 is the preferred route from an archaeological perspective.

Generally, the route option with the lowest predicted impact will be the most preferred option while the route with the greatest predicted impact will be the least preferred. As with the case of the example, the preferred route will not necessarily equate with the lowest number of impacts on the archaeological heritage. Experience and professional judgement should be applied and the reasoning used to arrive at that considered opinion detailed in the text when making an assessment of impact. Consideration must be given to the known nature and significance of the likely impacts and the known nature and significance of the sites which are likely to be affected.

Balancing the relative indirect and direct impacts on a number of sites requires professional judgement. The reasoning behind the considered opinion and preferences reached will need to be detailed in the Route Corridor Selection report. Consideration must be given to the nature

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and magnitude of the likely impacts and the nature of the archaeological heritage sites which are likely to be affected. When assessing the nature of impacts, the Archaeological Heritage Consultant should consider the following range of potential impacts in accordance with the Glossary of Impacts provided in the *Advice Notes on Current Practice in the preparation of Environmental Impact Statements* (EPA 2003):

The Quality of the Impact – whether positive or negative

The Duration of the Impact – whether short-term, long-term, permanent or temporary

The Type of Impact – whether cumulative, reversible or capable of being mitigated

Figure 7: Field System identified as part of the study of the proposed N5 Castlebar - Westport Road Scheme

4.9   Liaison with Architectural Heritage Consultant

To ensure consistency between archaeological and architectural schedules, and to avoid duplication of constraints, the Archaeological Heritage Consultant and the Architectural Heritage Consultant should confer on the findings of their investigations.

4.10   Liaison with Project Design Team

Liaison with relevant consultants is to take place as required, to ensure that key elements of individual route options have been fully considered.

4.11   Contents of the Route Corridor Selection Report for Archaeological Heritage

The report prepared at the route corridor selection stage must take the format of:

⊙ A non-technical introduction, which introduces the archaeological heritage study area and refers to the findings of the Constraints Study

⊙ A methodology, which describes the different survey techniques availed of and any limitations or difficulties experienced. Reference to the relevant legislation, the code of practice, guidance and advice notes adhered to in compiling the study should be listed.

⊙ A description of the receiving environment of each proposed route option, this includes a comprehensive documentary, cartographic and aerial photography review.

⊙ An archaeological inventory (see Table 2, 4.6) of each route option, which identifies and describes each archaeological monument and area of potential archaeological significance.

⊙ An impact assessment (see Table 3, 4.7) of each route option.

⊙ A conclusion based on a comparative and qualitative analysis of the likely and potential impacts of each route option using EPA Guidelines.

The report should include a plan of each route option study area with the location of all archaeological heritage sites and monuments shown, including their settings where relevant.

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Essential Requirement Checklist

✓ National Monuments (identified by the National Monuments Section of the Department of the Environment, Heritage and Local Government directly or indirectly affected by the proposed routes)

✓ RMP and SMR sites directly or indirectly affected by the proposed routes

✓ Monuments with temporary preservation orders

✓ Monuments identified by local landowners through the public consultation process - these may require verification in the field

✓ Any monuments that have been newly identified through the documentary research or aerial photography

✓ The topographical files of the National Museum of Ireland

✓ Sites listed in the Register of Historic Monuments

✓ Consideration and cross referencing of monuments, 'sites of' and landscape features (for example tower houses and demesnes) that may fall into one or more categories, for example architectural heritage and archaeological heritage, within the overall Route Corridor Selection report

✓ The archaeological potential of the landscape given an assessment of the terrain and an examination of the type, density and distribution of archaeological sites within that landscape

✓ Consultation with National Monuments Section of the Department of the Environment, Heritage and Local Government

✓ Consultation with the Architectural Heritage Consultant

✓ Consultation with the Project Archaeologist and design team

Figure 8: Flowchart to show Route Corridor Selection Study

Desk-study
To supplement the Constraints Study using books, published articles, first edition maps and any available aerial photographs of the study area

↓

Define archaeological study area
250 metres from the centre line of each identified route option and extended where necessary is recommended

↓

Compile base maps
From available OSI information and any additional aerial photographic survey – if commissioned as part of the project

↓

Prepare Inventory of Archaeological Heritage
Following windshield survey, verify and supplement information from Constraints Study to prepare inventories for each route option

↓

Liase with Architectural Heritage Consultant
To ensure consistency and avoid duplication of constraints

↓

Liase with Project Archaeologist
To ensure appropriate sources have been consulted

↓

Comparison of route options and their impacts
Prepare Route Options Appraisal Table to compare and assess route options. Select preferred route from archaeological perspective.

↓

Compilation of Route Corridor Selection Report
For Archaeological Heritage

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NOTES

CHAPTER 5
ENVIRONMENTAL IMPACT STATEMENT

5.0   ENVIRONMENTAL IMPACT STATEMENT

5.1   Objective

The objective of the EIS phase is to assess construction and operational impacts of national road schemes on archaeological heritage. The EIS builds on the information contained in the earlier Constraints Study and the Route Corridor Selection Study. However, at this stage, the EIS focuses on the impact of the preferred route in greater detail with the benefit of the preliminary road design. The scheme design will identify anticipated road footprint and land-take requirements more precisely than in the earlier phases of scheme planning.

The purpose of the study is to assess the significance of the receiving archaeological environment and the impact of the proposed route on this environment. Ameliorative measures are proposed where necessary and feasible to safeguard any monuments, features or finds of antiquity, that are identified during the course of the study as likely to sustain significant impacts.

The most effective form of mitigation in archaeological heritage is avoidance, and this would generally be a key factor at route corridor selection stage. Once a preferred route has been determined, it may still be necessary, where feasible, to amend the design in order to avoid or reduce identified impacts or to adopt mitigation measures to minimise impacts on archaeology.

It should be noted that mitigation measures may not always fully negate the impacts, however, a given impact could be reduced to an acceptable level.

The EPA *Guidelines on the Information to be Contained in Environmental Impact Statements* (EPA 2002) and NRA guidelines *Environmental Impact Assessment of National Road Schemes - A Practical Guide* (NRA 2005) give a detailed explanation of the overall process of compiling an EIS.

The stages for the assessment of archaeological heritage of the Environmental Impact Statement (EIS) phase are illustrated in the flowchart in Figure 13.

5.2   Approach

The information collated during the Constraints Study and Route Corridor Selection study should form the basis of the Environmental Impact Assessment of archaeological heritage for the Preferred Route Option. Detailed assessment of sites and monuments should only be necessary where there is a need to evaluate the archaeological heritage constraints in terms of avoidance, mitigation measures and costs.

Systematic field work and aerial survey at EIS stage together with detailed desk research will aid the evaluation of the full potential of a road development in advance of construction.

The targeted use of specialist geophysical or topographical survey should also be considered at this stage of the process if deemed appropriate by the Project Archaeologist in consultation with

the Project Design Team. The use of these procedures will be dependent on the information gained from the desk, aerial and field study or where there may be gaps in the archaeological knowledge.

The Archaeological Heritage Consultant should redefine the width of the preferred route study corridor in a manner that would allow detailed assessment of any impacts on archaeological heritage arising from the construction and operation of the new road. This would, as a rule, be 50 meters (though not limited to this width) either side of the centre line of the new road. The relationship of sites and monuments to one another may also be of importance and should be considered and evaluated where appropriate.

Figure 9: Historic map examination using Griffiths Valuation Map (1872), courtesy of the Valuation Office, Dublin
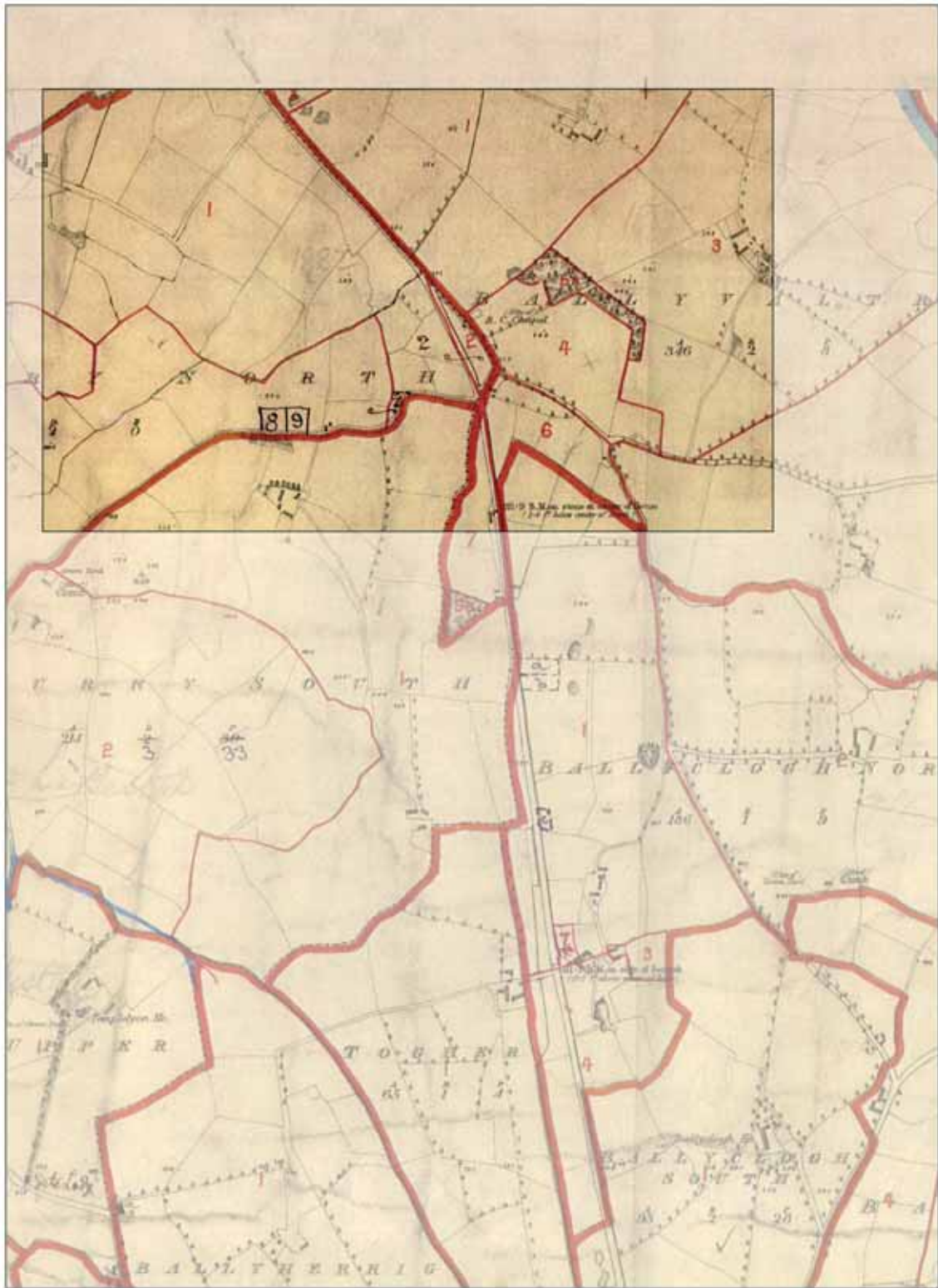
5.3   Methodology

The methodology should include a description of the methods used to assess the effects of the proposed scheme on the archaeological resource and indicate any practical difficulties encountered during the compilation of the required information, i.e. access to land etc. Consideration should be given to standards and guidelines adhered to during the course of the study and technical limitations encountered. Details of sources availed of and consultation undertaken during the course of the project should be discussed in this section.

5.4   The Receiving Environment

5.4.1 Desk-Study

The study should assess and clarify the findings of the Constraints and Route Corridor Selection studies and provide an overview of the route in relation to the surrounding archaeological landscape. Aerial photographs should be reviewed, interpreted and used in combination with historic mapping to map any potential features that may be investigated in the field.

5.4.2 Detailed Field Inspection

For an accurate impact assessment to take place, the baseline information is dependent on field research to address the likely and significant impacts. Field inspection concerns the recording of known upstanding monuments and identifying potential low-visibility archaeological features that may possibly be subject to direct or indirect impacts. It assesses the landscape potential, present topography and land use. The field inspection should have regard to the physical environment, the cultural landscape and the archaeological potential.

To carry out a field inspection:

- A detailed methodology should be produced

- Field work should be carried out in a systematic fashion

- All features should be recorded, described, digitally mapped and photographed

- All features should be recorded by a handheld Global Positioning System (GPS)

- All limitations to the survey must be noted

The use of standardised field sheets may aid a consistent approach to recording, especially if different operatives are used on the same project (Sample field sheet, Appendix 3). Field inspection should be undertaken by competent archaeologists and all due regard for health and safety procedures should be followed.

According to the EPA Guidelines (2002), when describing the archaeological environment the following criteria should be considered,

Context   the location, aspect, extent and size of an archaeological feature or complex

Character   distinguishing aspects, material used, type of site

Significance   value or designation assigned to a site, is the site a national or recorded monument, this category can also describe the significance of impact

Sensitivity   is the site under threat or vulnerable from proposed changes

Field inspection will ensure consultation with local landowners and residents from which any folklore location-specific information can be sought. All landowners should be notified in advance by the project liaison officer of archaeological field operatives entering their lands as this promotes the opportunity for discussion. Landowners should be invited to make a written submission to the client if they have a concern of an archaeological nature.

5.4.3 Aerial Survey

Low-level aerial reconnaissance survey (500-1000 feet) for the purposes of archaeological investigation should be undertaken to:

⊙ Identify and determine the extent of previously known and unknown archaeological features

⊙ Examine areas of known archaeological potential

All features should be described, photographed and their location verified. The methodology followed for the survey should be detailed and any limitations, for example, the time of year or crop cover should be specified.

Figure 10: Aerial view of a newly identified site at Oldtown adjacent to the proposed N7/N8 Road Scheme

5.5   Specialist surveys

In general, specialist surveys (geophysical survey, topographical survey, etc.) form part of the mitigation strategy but their use at EIS stage will be decided on a case by case basis by the Project Archaeologist where it is appropriate, possible and practical to evaluate the exact level of an impact. The reason why a particular survey method is chosen should be clearly demonstrated in the archaeological study.

The use of a specialist survey when applied appropriately, can improve the quality of information and provide greater certainty and definition which will allow a more defined mitigation strategy to be adopted. The early identification of archaeological potential ensures that ample resources can be sourced to proceed with the agreed mitigation strategy.

5.6   Inventory

An inventory of the archaeological heritage likely to be affected by the Preferred Route Option must be provided. The inventory must be based on the Route Corridor Selection study but updated with data from the field and aerial survey and include illustrations and photographs.

Table 5: A sample entry from the inventory of archaeological heritage

Identification number	A1
Figure/Photo Reference no.	Figure 7; Photo 023
Legal Status	Recorded Monument
Reference Number	RMP TI136-039
Townland	Dromline
Site Type	Enclosure
NGR	192280, 136010
Description	Located on a low natural rise of ground in undulating countryside. The monument consists of a raised circular area measuring 35.7m in diameter (east-west) enclosed by a poorly preserved bank.
Adjacent Archaeological sites	N/A
Sources	RMP archive, Tipperary Inventory
Approx. distance from Preferred Route	20m
Type of Impact	Indirect Impact
Mitigation Measures	Geophysical surveying and archaeological test trenching within the area to determine if any features are present. If features are present full excavation and recording will be necessary.

5.7   Impact Assessment

The significance criteria (Appendix 2), when used to evaluate the archaeological importance and potential of a particular monument or area can be a powerful risk prediction tool as they ensure that each feature is examined in a consistent manner. It enables a rigorous assessment of the Preferred Route Option in relation to archaeology.

As defined within the EPA Guidelines, significance in the context of impact assessment relates to the importance of the outcome of the impact, i.e. the consequence of the change. Based on the outcome or degree of the impact a series of significance limits can be devised (Appendix 4, Glossary). It should be noted that sometimes where a potentially important archaeological site or area is revealed from the data, the exact significance cannot be established without invasive testing or topsoil stripping, or ultimately until archaeological excavation is under way.

5.7.1 Areas of archaeological potential

The assessment of the terrain potential and the examination of the type, density and distribution of archaeological sites within that landscape give rise to the identification of the archaeological potential. These areas may be included given their:

- Close proximity to recorded archaeological monuments (as depicted on the RMP map) or newly identified potential archaeological sites

- Association with either topographic features or wetland terrain

- Placename evidence

- Find spots of stray finds

Avoidance is the preferred mitigation measure. However, given the widespread and geographical nature of linear road developments it is inevitable that impacts will occur. Early recognition of the type and level of impact should make it possible to minimise and reduce the loss of archaeological features and provide suitable mitigation measures.

Figure 11: Aerial view of areas of archaeological potential and recorded archaeological monuments identified during study of N24 Pallasgreen to Bansha Scheme

5.7.2 Wetlands and Rivers

Wetlands are areas of significant archaeological potential. Every effort should be made to identify all areas of current and former wetland that will be impacted by the road scheme as the mitigation of archaeological sites in such environments can be very costly and time consuming. In particular, the archaeological potential of watercourses and rivers has to be considered. Rivers have attracted human activity throughout history as they are an important source of food, water, a means of transport and energy, act as territorial boundaries and have many ritual and religious associations.

Alluvial/estuarine areas and boglands also have a high archaeological potential and early identification of such environments is essential. Sources such as Geological Survey of Ireland (one-inch and six-inch series), Bog Commissioners and Bord na Móna maps should be consulted to identify such wetland areas. The Bog Commissioners reports and Geological Survey of Ireland memoirs accompanying these cartographic sources should also be consulted.

5.8   Proposed Mitigation Measures

The mitigation section should contain a full description of any measures envisaged in order to avoid, reduce and mitigate against significant adverse effects. The proposed mitigation strategy should be designed to ensure, where possible that, all archaeological features and areas of potential are identified in advance of construction. Every effort should be made to avoid direct impacts on archaeological monuments so as to ensure the continuing protection of these features while also having regard to other relevant considerations that influence the final route design.

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All mitigation measures must be carried out in accordance with current best practice. If possible, the proposed mitigation strategy for each individual site and area of potential should be summarised in a table format.

5.8.1 Mitigation by Avoidance

Avoidance of archaeological heritage is the preferred mitigation measure, although either direct or indirect impacts on archaeological heritage can occur with a new road scheme. Provided that there is no strong contradiction with other environmental constraints and route corridor selection considerations every effort should be made to achieve avoidance and preservation of archaeological heritage sites and monuments *in situ* where feasible. It is anticipated that this would be achieved in most cases during the Constraints and Route Corridor Selection Phases where the preferred road scheme would seek to avoid archaeological sites and monuments.

5.8.2 Mitigation by Excavation, Recording and Publishing

Where archaeological monuments and features have to be removed to facilitate road building activities then it is essential that excavation, recording and publishing takes place. This process ensures that the monument is recorded and excavated in advance of the development. Excavation results in the removal of archaeological remains from their natural environment. Archaeological excavation ensures that this removal is systematically and accurately recorded, drawn and photographed, providing a paper and digital archive.

5.9 Liaison with Architectural Heritage Consultant

To ensure consistency between archaeological and architectural schedules, and to avoid duplication of constraints, the Archaeological Heritage Consultant and the Architectural Heritage Consultant should confer on the findings of their investigations.

Figure 12: Landscape around Lough Lanagh, Co. Mayo, on the route of the proposed N5 Castlebar to Westport Road Scheme

5.10 Liaison with Project Design Team

Liaison with relevant consultants is to take place as required, to ensure that key elements of the preferred route option have been fully considered and assessed.

5.11 Contents of an Archaeological Heritage EIS report

The EIS report for archaeological heritage should provide a description of the archaeological heritage likely to be significantly impacted by the Preferred Route Option. The purpose of the archaeological impact assessment is to:

- Describe and assess the receiving archaeological heritage environment

- Identify and evaluate the significance of the impact of the scheme on the receiving archaeological heritage environment

- Advise on, and propose measures to avoid, minimise or ameliorate the impact of the scheme on the receiving archaeological environment in respect of anticipated significant impacts and effects. These measures could, for example, involve modifications to the Preferred Route within the corridor, any such considerations should be addressed in the EIS

- Identify and evaluate the significance of the residual impact of the scheme with mitigation in place

The archaeological heritage EIS report must include the following:

- Introduction and description of the Preferred Route Option

- Description of the methods used to collate the information and any limitations experienced

- Description of the receiving environment involving documentary research, detailed field inspection, aerial survey

- Specialised survey (if deemed appropriate by the Project Archaeologist)

- Inventory of archaeological heritage sites and monuments and areas of potential significance

- Consultation with the statutory authorities and others

- Impact Assessment

- Proposed mitigation measures

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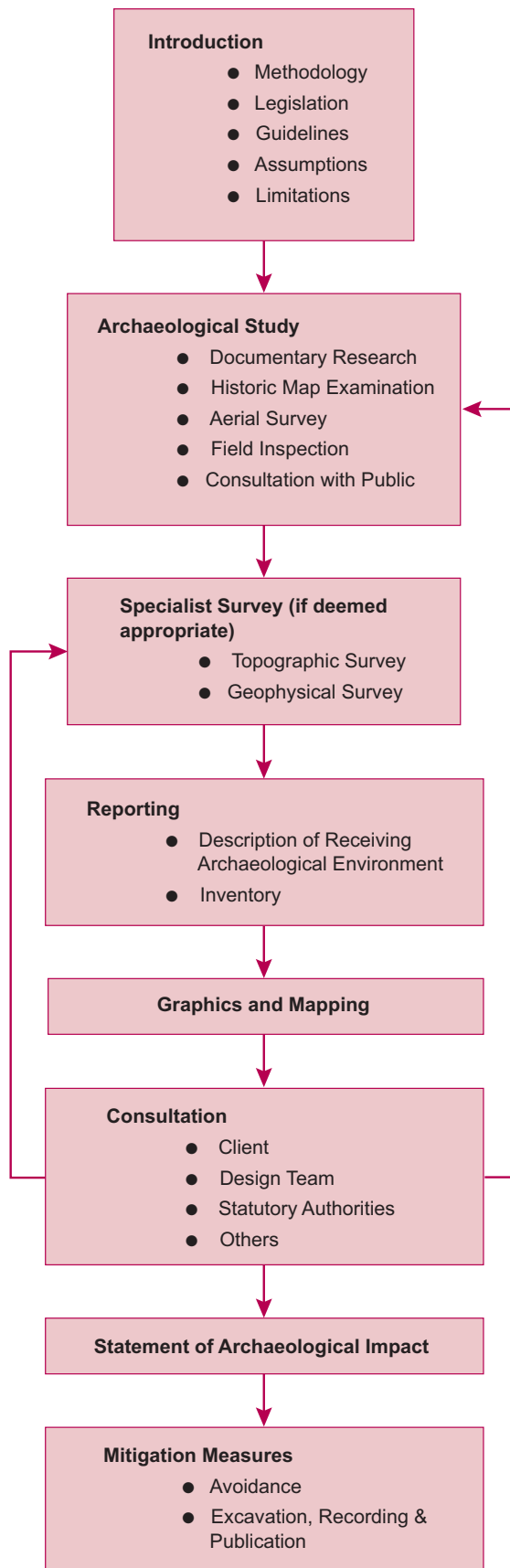⊙ Illustrations, photographs and mapping (for mapping criteria see section 3.3.5 of NRA EIA Guidelines)

The archaeological heritage EIS report should include a plan of the scheme proposal drawings with the location of all sites and monuments of archaeological heritage shown within the study area, including their settings where relevant.

Essential Requirements Checklist
- ✓ Full and comprehensive desk-study augmenting and expanding the data compiled for the Constraints and Route Corridor Selection reports
- ✓ Results of detailed field inspection including Field Record Sheets
- ✓ Results of aerial survey
- ✓ Consultation with individual landowners
- ✓ Results of specialist surveys (if deemed appropriate by the Project Archaeologist)
- ✓ Full description of sites that have been newly identified through local knowledge, aerial and other specialist surveys
- ✓ Full consideration and cross referencing of monuments, sites of and landscape features for example tower houses and demesnes, that may fall into one or more categories, for example architectural heritage and archaeological heritage, within the overall EIS
- ✓ Full consideration of the archaeological potential of the landscape given an assessment of the terrain and an examination of the type, density and distribution of archaeological sites within that landscape
- ✓ Full consideration of the archaeological potential of wetlands and rivers
- ✓ Full Impact Assessment of the Preferred Route Option
- ✓ Detailed consideration of proposed mitigation measures
- ✓ Consultation with National Monuments Section of the Department of the Environment, Heritage and Local Government
- ✓ Consultation with the Architectural Heritage Consultant
- ✓ Consultation with the Project Archaeologist and design team

Figure 13: Procedure of the Archaeological Input into an EIS

Introduction
- Methodology
- Legislation
- Guidelines
- Assumptions
- Limitations

Archaeological Study
- Documentary Research
- Historic Map Examination
- Aerial Survey
- Field Inspection
- Consultation with Public

Specialist Survey (if deemed appropriate)
- Topographic Survey
- Geophysical Survey

Reporting
- Description of Receiving Archaeological Environment
- Inventory

Graphics and Mapping

Consultation
- Client
- Design Team
- Statutory Authorities
- Others

Statement of Archaeological Impact

Mitigation Measures
- Avoidance
- Excavation, Recording & Publication

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References and Sources of Further Information
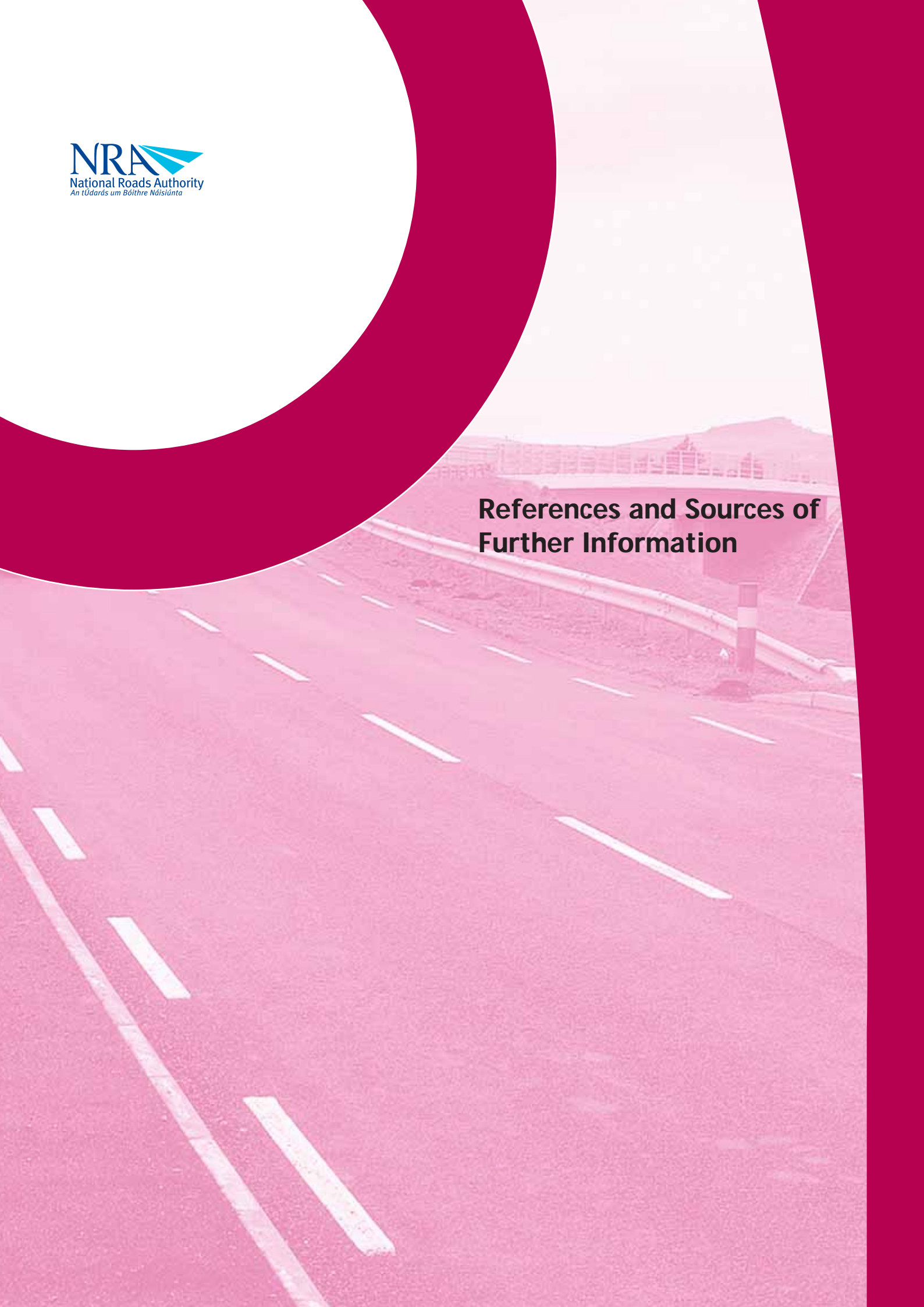
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Appendices
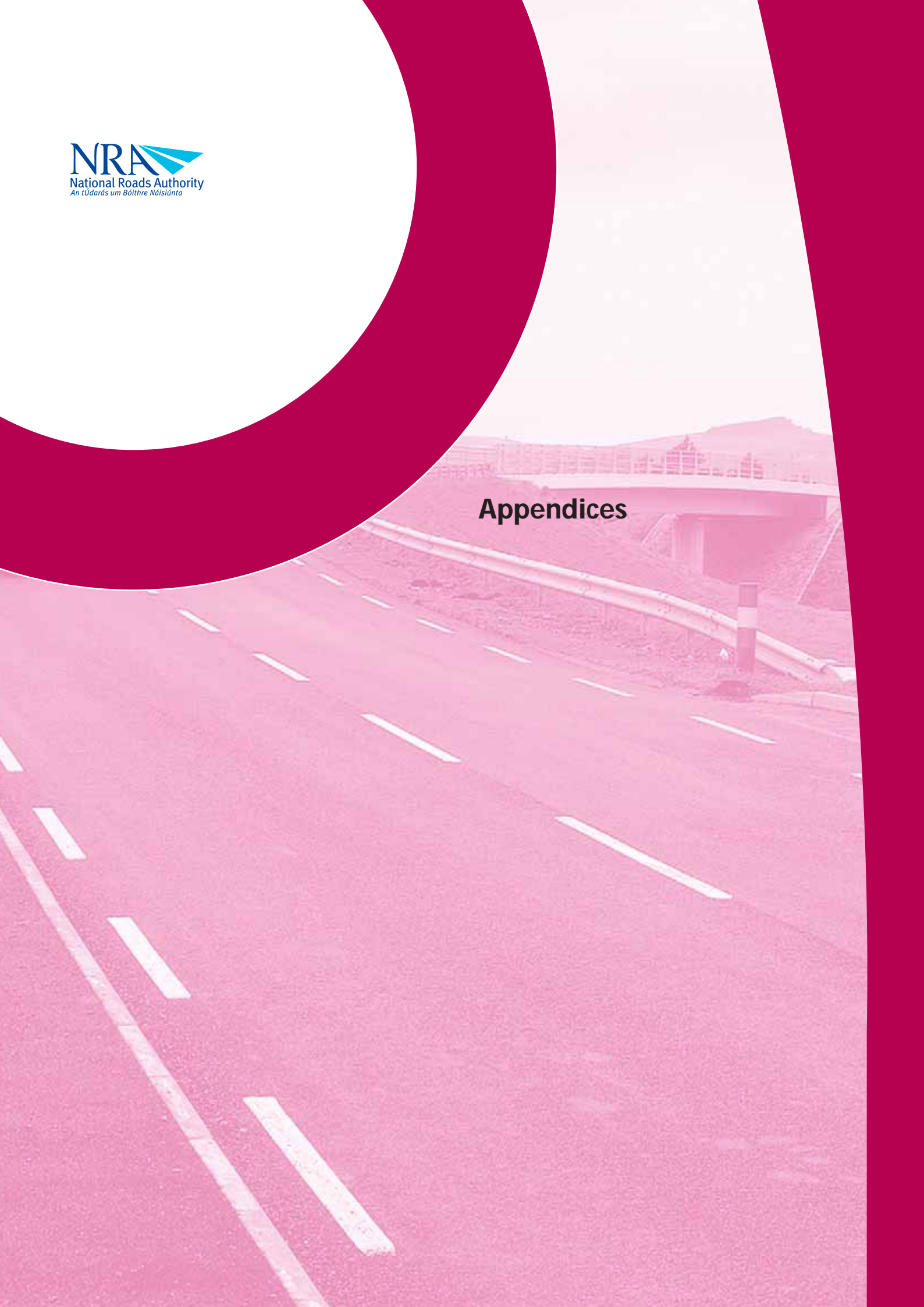
APPENDIX 1

CONTACT DETAILS – STATUTORY CONSULTEES

Department of the Environment, Heritage And Local Government,
National Monuments Service
The Development Applications Unit
Dún Scéine, Harcourt Lane, Dublin 2, Ireland
Tel: (01) 411 7100

The Arts Council (An Chomhairle Ealaíon)
70 Merrion Square, Dublin 2, Ireland,
Tel: (01) 6180200
Tel: (01) 6761302

The Heritage Council
Rothe House, Kilkenny, Ireland
Tel: (056) 777 0777
Email: mail@heritagecouncil.com

An Taisce (The National Trust for Ireland)
Tailor's Hall, Back Lane, Dublin 8, Ireland
Tel: (01) 454 1786
Email: info@antaisce.org

Failte Ireland
Baggot Street Bridge, Dublin 2
Tel: 1890 525 525 or (01) 602 4000
Fax: (01) 855 6821

APPENDIX 2

SIGNIFICANCE CRITERIA

The significance criteria table is not presented in any ranking order and can be used to evaluate the significance of an archaeological site, monument or complex.

It should not, however, be regarded as definitive, rather it is an indicator which contributes to a wider judgment based on the individual circumstances of each feature. Different monument types lend themselves more easily to assessment and it should be borne in mind that this can create a bias in the record, for example an upstanding stone monument such as a fortified house is easier to examine with a view to significance than a degraded enclosure site.

Criteria	Explanation
Existing Status	The level of protection associated with a monument or complex is an important consideration.
Condition/Preservation	The survival of a monument's archaeological potential both above and below ground is an important consideration and should be assessed in relation to its present condition and surviving features. Well-preserved sites should be highlighted, this assessment can only be based on a field inspection.
Documentation/ Historical Significance	The significance of a monument may be enhanced by the existence of records of previous investigations or contemporary documentation supported by written evidence or historic maps. Sites with a definite historical association or an example of a notable event or person should be highlighted.
Group Value	The value of a single monument may be greatly enhanced by its association with related contemporary monuments or with monuments from different periods indicating an extended time presence in any specific area. In some cases it may be preferable to protect the complete group, including associated and adjacent land, rather than to protect isolated monuments within that group.
Rarity	The rarity of some monument types can be a central factor affecting response strategies for development, whatever the condition of the individual feature. It is important to recognise sites that have a limited distribution.
Visibility in the landscape	Monuments that are highly visible in the landscape have a heightened physical presence. The inter-visibility between monuments may also be explored in this category.
Fragility/Vulnerability	It is important to assess the level of threat to archaeological monuments from erosion, natural degradation, agricultural activity, land clearance, neglect, careless treatment or development. The nature of the archaeological evidence cannot always be specified precisely but it may still be possible to document reasons to justify the significance of the feature. This category relates to the probability of monuments producing material of archaeological significance as a result of future investigative work.
Amenity Value	Regard should be taken of the existing and potential amenity value of a monument.

APPENDIX 3

EXAMPLE OF FIELD RECORD SHEET

Job Description:	**Inspector:**	**Date:**
County:	**Townland:**	**Map No:**
Weather Conditions:	**Access:**	**Landowner:**

Physical environment

Cultural landscape

Archaeological potential

Proximity to known archaeological monuments

(Preservation, scale and mass, visibility, vulnerability, local, regional, national significance)

Proximity to protected structures

Additional information

Photograph type:　　　**Digital:**　　　**Print:**　　　**Slide:**　　　**Colour:**　　　**B/W:**

Description:

Sketch:

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Appendix 4

GLOSSARY OF TERMS

Glossary of impacts sourced from the EPA Guidelines

Quality of Impacts

Negative Impact   A change that will detract from or permanently remove an archaeological monument from the landscape.

Neutral Impact   A change that does not affect the archaeological heritage.

Positive Impact   A change that improves or enhances the setting of an archaeological monument.

Significance of Impacts

Profound   Applies where mitigation would be unlikely to remove adverse effects. Reserved for adverse, negative effects only. These effects arise where an archaeological site is completely and irreversibly destroyed by a proposed development.

Significant   An impact which, by its magnitude, duration or intensity, alters an important aspect of the environment. An impact like this would be where part of a site would be permanently impacted upon, leading to a loss of character, integrity and data about the archaeological feature/site.

Moderate   A moderate direct impact arises where a change to the site is proposed which though noticeable, is not such that the archaeological integrity of the site is compromised and which is reversible. This arises where an archaeological feature can be incorporated into a modern day development without damage and that all procedures used to facilitate this are reversible.

Slight   An impact which causes changes in the character of the environment which are not significant or profound and do not directly impact or affect an archaeological feature or monument.

Imperceptible   An impact capable of measurement but without noticeable consequences.

Duration of Impacts

Temporary Impact   Impact lasting for one year or less.

Short-term Impacts   Impact lasting one to seven years.

Medium-term Impact   Impact lasting seven to fifteen years.

Long-term Impact   Impact lasting fifteen to sixty years.

Permanent Impact   Impact lasting over sixty years.

Types of Impacts

Cumulative Impact   The addition of many small impacts to create one larger, more
                              significant, impact.

Do Nothing Impact   The environment as it would be in the future should no development
                              of any kind be carried out.

Indeterminable Impact   When the full consequences of a change in the environment cannot
                              be described.

Irreversible Impact   When the character, distinctiveness, diversity or reproductive
                              capacity of an environment is permanently lost.

Residual Impact   The degree of environmental change that will occur after the
                              proposed mitigation measures have taken effect.

'Worst case' Impact   The impacts arising from a development in the case where
                              mitigation measures substantially fail.

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Glossary

Archaeology	The study of past societies through surviving structures, artefacts and environmental data.
Architectural Heritage	Structures, buildings, traditional and designed, and groups of buildings including street-scapes and urban vistas, which are of historical, archaeological, artistic, engineering, scientific, social or technical interest, together with their setting, attendant grounds, fixtures, fittings and contents.
Environmental Impact Statement	A statement of effects, if any, which a proposed development, if carried out, would have on the environment.
Excavation	As an archaeological term, excavation means the manual and mechanical excavation by an archaeologist-led team with specific objectives as regards information, preservation, recording, etc. of archaeological information. Its purpose is to fully investigate archaeological deposits and features.
Geophysics	A non-invasive survey method involving one or more of the following; earth resistance, various types of magnetometry and ground penetrating radar.
In situ	In its original place.
Mitigation	Measures taken to avoid, reduce or remedy adverse impacts.
Test Excavation	A form of archaeological excavation where the purpose is to establish the nature and extent of archaeological deposits and features present in a location that is proposed for development. Its purpose is not to fully investigate those deposits or features.
Test Trenching	See Test excavation.
Suitably Qualified Archaeologist	An experienced field archaeologist that has the suitable experience as deemed necessary by the National Monuments Section of the Department of the Environment, Heritage and Local Government.

Glossary of Archaeological Terms

Anglo-Norman	Large parts of Ireland were colonised by the Anglo-Normans in the later medieval period bringing about changes in social order, land and property holding, agriculture, trade, architecture, and the legal system.
Barrow	Circular burial monument of the Bronze Age and Iron Age with a central area defined by a ditch and an external bank.
Bivallate	Two sets of ramparts.
Bronze Age	c.2400-500BC the introduction of metallurgy in Ireland. A time of technological, social and economic development and change.
Burnt Mound	A spread of burnt material attributable to more than one period in antiquity
Cairn	Mound composed of stones, sometimes with internal structures; usually a burial monument, but sometimes used as a memorial.
Cashel	A ringfort with stone instead of earthen banks.
Cist	Pits lined with stone flags containing a burial.
Cropmark	Where buried features such as ditches or walls affect the covering soil and alter the colour of the surface vegetation and/or crop.
Dún	A ringfort, usually with earthen banks, but a name also given to prehistoric ceremonial enclosures.
Earthwork	Any monument made entirely or largely of earth.
Enclosure	Any monument consisting of an enclosing feature, such as a bank or a ditch, usually earthen, such as barrows or ringforts.
Field System	Pattern of fields, now no longer in use, sometimes visible as low earthworks and often associated with medieval or earlier settlements.
Fosse	A ditch.
Fulacht Fiadh	Prehistoric cooking site characterised by a crescentic mound of burnt stone; usually located in damp areas, where the trench (trough) for cooking would fill with water; usually found in groups (plural: fulachta fiadh).

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Henge Large earthen embanked enclosure with an internal ditch and external bank.

Hillfort Large Late Bronze Age/Iron Age defensive hilltop enclosure defined by one or more large ramparts and consisting of banks with external ditches.

Holy Well A natural spring or well associated with a saint or a tradition of cures.

Iron Age *c*. 500 BC to *c*. 500 AD. Also described as the Celtic period, when influences from central Europe and Britain led to the adoption of the Celtic language and the development of an Irish style of Celtic art.

Lime kiln A stone and brick structure utilised for the burning of lime. Mostly built in the eighteenth and nineteenth centuries when the burning of lime as an agricultural fertiliser was widespread.

Megalithic Tomb A prehistoric tomb made of large stones or megaliths.

Mesolithic Middle Stone Age (*c*. 7000–4000 BC).

Moated Site An Anglo-Norman defended homestead consisting of a square or rectangular enclosure defined by a bank and a broad, flat-bottomed ditch; date to the thirteenth and fourteenth centuries and often built in damp land in order that the moat would fill with water.

Motte and Bailey An Anglo-Norman defensive structure consisting of a large, steep-sided earthen mound—the motte—with a rectangular enclosure at the base—the bailey; date from the twelfth and thirteenth centuries.

Multivallate More than two sets of ramparts.

Neolithic The New Stone Age *c*.4000–2500 BC, when agriculture and animal husbandry was developed in Ireland.

Occupation Site A settlement site; the term is usually used to indicate a prehistoric site.

Passage Tomb Megalithic tomb dating to the Neolithic period characterised by an oval or circular mound, kerbing, and a passage, often terminating with a chamber in which cremated burials were placed; often situated on hilltops.

Rath A ringfort, usually with earthen banks, or any circular enclosure.

Raheen Small fort.

Ring Barrow Barrow with raised or domed central area.

Ring Ditch   Barrow with flat or dished central area.

Ringfort   Early medieval Christian (*c*. 500 AD to 1100) defended secular settlement consisting of a bank and external ditch defining a central circular area that contained dwelling structures of occupants; also called fairy fort, rath, lios, or cashel (the latter constructed of stone as opposed to earth).

Souterrain   Underground passages, probably built for storage purposes or possibly as temporary refuges; often associated with ringforts.

Standing Stone   Upright stone, usually single but sometimes in pairs and groups. They can be shaped or natural and are usually dated to the Bronze Age but occasionally to the Neolithic. Used to mark routes, sacred areas, boundaries or, occasionally, burials.

Tower House   Small castle, usually of three storeys, dating from the fourteenth to sixteenth centuries.

Tumulus   Burial mound composed of earth, sometimes with internal structures.

Uncoursed   Masonry laid in a random form.

Univallate   Single set of ramparts.