



Themata 5 E-learning Archaeology, the Heritage Handbook





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E-learning Archaeology

the Heritage Handbook

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Introduction to archaeology for construction engineers *by Kenneth Aitchison*

→ **LU** Archaeology and its legal and organizational framework *by Kenneth Aitchison*

sco What is Archaeology? Why does it matter?

Archaeology is the study of past human cultures through the analysis of material remains (landscapes, sites, monuments/buildings and artefacts) that people have left behind. In some countries this may include the earliest evidence of human activity to the present day, in others there may be a cut-off date after which remains are not considered to be archaeology. Archaeological remains can include upstanding and ruined buildings, earthworks, buried sites, extant and buried landscapes, artefacts and palaeo-environmental remains, on land and underwater. Archaeological remains may be encountered almost anywhere and may have implications for most types of development site.

Archaeological remains are part of our shared cultural heritage. Their study helps us to understand the world around us at a local, national and international level through developing our understanding of how that world has developed. Understanding the archaeological remains and landscapes around us, often referred to as the historic environment, contributes to our sense of identity and place and helps us engage and interact with our communities. Archaeological remains are environmental assets and should be considered as part of sustainable development policies. They are also non-renewable; once damaged or removed they cannot be replaced and their potential to enhance our understanding of past human cultures is lost.

By developing a better understanding of archaeology, its terminology and the way it is carried out, construction engineers will be able to understand the archaeological process better and integrate archaeological considerations more effectively into the development programme. Better integration of archaeological considerations into the development process has the potential to save both time and money but may also have other, public relations benefits for the developer such as generating favourable publicity for the development,

Those marked ** are international conventions which place legal obligations upon national governments (where ratified).

showing a commitment to sustainable development and generation of community support.

sco International archaeology framework

A number of charters, conventions and directives lay down the international and European frameworks within which archaeology takes place.

The following list has been taken from the IfA Standard and guidance for Stewardship of the Historic Environment (IfA 2008) which sets a standard and gives high-level guidance for all those concerned with the study and care of the historic environment.

> **Animation**

** *Hague Convention on the Protection of Cultural Property in the Event of Armed Conflict (1954)*

The Hague Convention recognises the danger of destruction to cultural property during armed conflict. Its signatories have committed to respect and safeguard cultural property and to take appropriate measures during times of peace to ensure the continued safety of cultural property in future conflicts.

* *International Charter for the Conservation and Restoration of Monuments and Sites (1964)*

The Athens Charter (1931) had asserted that the principles guiding the preservation and restoration of ancient buildings should be agreed and laid down on an international basis, with each country being responsible for applying the plan within the framework of its own culture and traditions. This was the foundation of what is known as the Venice Charter, which inspired the foundation of the International Council on Monuments and Sites (ICOMOS) in 1965 at Warsaw. This remains a benchmark for the world's conservation community.

The text can be found at http://www.icomos.org/venice_charter.html

** *World Heritage Convention (1972)*

This set up the machinery for the designation of World Heritage Sites and laid down many of the heritage concepts and definitions that are in use today. The text can be found at <http://whc.unesco.org/en/conventiontext/>

The Florence Charter (1981)

This is an ICOMOS addendum to the Venice Charter drawn up in 1981 specifically to cover Historic Gardens.

Its text can be found at http://www.international.icomos.org/e_floren.htm

Those marked * are statements of good professional practice by non-governmental organisations.



**** Convention for the Protection of the Architectural Heritage of Europe – the Granada Convention (1985)**

This provides a broad definition of architectural heritage to include places of ‘conspicuous historical, archaeological, artistic, scientific, social or technical interest’. It has an equally broad sweep of requirements covering all aspects of conservation management affecting mainly the built heritage. The text can be found at <http://conventions.coe.int/Treaty/en/Treaties/Html/121.htm>

**** The European Convention on the Protection of the Archaeological Heritage (1992)**

The ‘Valetta Convention’ is part of the group of Council of Europe treaties for the protection of cultural heritage. It aims to protect the archaeological heritage as a source of the European collective memory and as an instrument for historical and scientific study. Its 18 Articles contain provisions for the identification and protection of archaeological heritage including the control of excavations and the use of metal detectors, its integrated conservation, the financing of archaeological research and conservation, the collection and dissemination of scientific information, the promotion of public awareness, and the prevention of illicit circulation of archaeological objects.

The text can be found at <http://conventions.coe.int/Treaty/en/Treaties/Html/143.htm>

The Nara Document on Authenticity (1994)

This is an addendum to the World Heritage Convention. It can be found at http://www.international.icomos.org/naradoc_eng.htm

*** Principles for the Recording of Monuments, Groups of Buildings and Sites (1996)**

These were adopted by ICOMOS at Sofia in response to the requirement of the Charter of Venice (Article 16) that ‘responsible organisations and individuals record the nature of the cultural heritage’. Its five sections cover the reasons for recording, responsibility for recording, planning for recording, the content of records, and their management, dissemination and sharing.

The text can be found at <http://www.international.icomos.org/recording.htm>

European Directives on Environmental Impacts

These require that the potential impacts of major projects on interests including the historic environment be properly assessed and taken into account as part of the processes for project development and planning approval. European

requirements are reflected by requirements in UK planning law.

*** Burra Charter (1979, revision of 1999)**

The Burra Charter provides guidance for the conservation and management of places of cultural significance (cultural heritage places), and is based on the knowledge and experience of Australia ICOMOS members. It regards conservation as an integral part of the management of places of cultural significance and as an ongoing responsibility. It sets a standard of practice for those who provide advice, make decisions about, or undertake works to places of cultural significance, including owners, managers and custodians. Its principles are widely applicable and have been generally accepted outside Australia.

The text can be found at <http://www.icomos.org/australia/burra.html>

**** European Landscape Convention (2000)**

This Convention, now signed and ratified by the UK government, emphasises the public interest in landscape in relation to natural and cultural identity and the quality of life, and in people playing an active part in perception conservation and development.

The text can be found at <http://conventions.coe.int/Treaty/en/Treaties/Html/176.htm>

The Framework Convention of the Council of Europe on the Value of Cultural Heritage for Society (2005)

The 23 Articles of this new Convention, which is a further development of several earlier European documents, deals at a high level with the contribution of a broadly defined cultural heritage to society and human development, and emphasises a shared responsibility for public participation in the care and understanding of cultural heritage.

> Exercises

sco Licensing and Standards

The definition of a professional archaeologist varies from country to country, as do the qualifications required to become one. In some countries, specific academic qualifications are required to be considered as a professional, others operate a licensing system for archaeologists. The Council of Europe Convention on the Protection of the Archaeological Heritage (‘Valletta Convention’) 1992 states ‘that excavations and other potentially destructive techniques are carried out only by qualified, specially authorised persons’.



In most European countries, this is managed through a system of licensing, whereby only those holding a licence can undertake certain sorts of archaeological work. The qualifications for obtaining a licence vary from country to country but are generally based on a combination of qualifications, experience and track record.

The European Association of Archaeologists is the association for all professional archaeologists in Europe. Its members are bound by a Code of Practice (<http://www.e-a-a.org/codeprac.htm>) and Principles of Conduct (<http://www.e-a-a.org/princond.htm>) which promote proper ethical and scientific standards for archaeological work.

Most countries also have their own standards, codes of conduct and good practice guidance covering archaeological work. In the UK, the professional body for archaeologists is the Institute for Archaeologists; members abide by a Code of Conduct and Code of approved practice and it publishes Standards and guidance for various aspects of archaeological work. As well as individual members, it operates a Registered Organisations scheme. Registered Organisations have to meet certain standards with regards their work, abide by the Code of Conduct and are assessed every two years. Developers in the UK are strongly encouraged to use Registered Organisations wherever possible.

- > *Austria*: A degree in Archaeology at, at least, Masters level (there is also a class of *Mitarbeiter* – ‘co-worker’)
- > *Belgium*: First degree in Archaeology
- > *Cyprus*: First degree with specialisation in Archaeology
- > *Czech Republic*: Masters degree in Archaeology or equivalent
- > *Germany*: A Doctorate or Magister in Archaeology
- > *Greece*: First degree with specialisation in Archaeology
- > *Hungary*: Masters degree in Archaeology
- > *Ireland*: No legal definition
- > *Netherlands*: A Doctorate, Doctorandus or Magister in Archaeology
- > *Norway*: Masters degree in Archaeology or equivalent¹
- > *Poland*: First degree in Archaeology
- > *Slovakia*: Magister degree in Archaeology or equivalent
- > *Slovenia*: Masters degree in Archaeology or equivalent
- > *Turkey*: First degree in Archaeology
- > *United Kingdom*: No legal definition

Legal definition of an archaeologist in some European countries (after *Discovering the Archaeologists of Europe* project report)

- > *Austria*: Archaeology degree at Masters or Doctoral level
- > *Belgium*: Archaeology degree at Masters or Doctoral level

- > *Cyprus*: Archaeology or joint degree with specialisation in Archaeology
- > *Czech Republic*: Archaeology degree at Masters or Doctoral level
- > *Germany*: Archaeology degree at Masters or Doctoral level (depending on local regulations)
- > *Greece*: Archaeology or joint degree with specialisation in Archaeology, plus 3 years minimum experience for a rescue excavation, or 5 years for a research excavation
- > *Hungary*: Archaeology degree at Masters or Doctoral level
- > *Ireland*: Archaeology degree at Masters or Doctoral level
- > *Netherlands*: Archaeology degree at Masters or Doctoral level or Doctorandus, but with a newly introduced system of certification
- > *Norway*: Work in field only in institutions project: Archaeology degree at Masters or Doctoral level²
- > *Poland*: Archaeology degree at Masters or Doctoral level plus 12 months of field experience after completion of Masters degree
- > *Slovakia*: Archaeology degree at Masters or Doctoral level
- > *Slovenia*: ‘University graduate in Archaeology’, level not yet specified, but in practice at Masters or Doctoral level
- > *Turkey*: Archaeology degree at Doctoral level
- > *United Kingdom*: Not applicable, except in Northern Ireland. Scheduled Ancient Monument Consent on protected sites and Licences are required for work on Protected Shipwrecks.

- 1 Archaeologist is not a protected job title in Norway.
- 2 Each institution, mentioned in the Cultural Heritage Act, is responsible for site and craftsmanship. Requirement for an excavation permit in some European countries (after *Discovering the Archaeologists of Europe* project report).

sco Roles and responsibilities of archaeological organisations

> **Animation**

National government

Although there are variations from country to country, the role of National Government is to set the legislative framework for protecting and promoting archaeology and the historic environment and for dealing with archaeology in the spatial planning process. This may be the function of one government department or ministry or spread across several and may be carried out by agencies or non-departmental public bodies. Government departments or their agencies may also have roles as grant giving

bodies, in designating and managing archaeological sites and promoting public access.

Regional and local government

In many countries, responsibility for managing and protecting archaeological sites, particularly those that are not judged to be of national importance, is the role of regional or local government. In many cases, responsibility for advice on archaeology in the planning process is given by archaeologists working for the local authority. Generally, local authority curators do not themselves undertake fieldwork but will be able to provide details of archaeological organisations that might be commissioned to undertake such works.

Universities

In many countries, archaeological work is carried out predominantly by university departments, either as part of ongoing programmes of research or in advance of development.

Museums

Museums have a role to accept, and curate for the future, the finds and documentary archive produced by archaeological work after the fieldwork and post-excavation stages are complete. Museums will often have specific requirements that must be met before they will accept archaeological archives and archaeologists undertaking fieldwork should ensure that they discuss these with the museum at the outset of the work. Museums will often have specialist staff who may be able to provide advice to the fieldworkers or, in some cases, museums themselves will undertake both research based fieldwork and excavation in advance of development.

Commercial archaeological organisations

In some countries, much of the archaeological fieldwork carried out as a result of development work is undertaken by commercial archaeological practices. These may range from individual specialists to large multi-disciplinary organisations. In the UK, the Institute for Archaeologists maintains a register of organisations which have undertaken to adhere to the IfA Code of Conduct and other standards and by-laws and which are monitored on a regular basis. More details can be found at <http://www.archaeologists.net/modules/icontent/index.php?page=22>. The European Association of Archaeologists publishes a Code of Practice which is available at <http://www.e-a-a.org/eaacodes.htm>

Archaeological services, either consultancy or contracting, may also be offered by field teams operated by public sector bodies such as universities, museums or local government. Where an authority provides both 'curatorial' advice to the planning authority and has a commercial archaeological field team, clear procedures must be put in place to avoid any potential conflicts of interest.

> Exercises

sco Stewardship of the historic environment

> **Animation**

'Stewardship' is an approach to the management of the historic environment that encourages better understanding of archaeological remains and their preservation for future generations. This can be achieved by proposing and implementing better preservation laws, engaging local communities in monitoring sites and protecting them against looting, and supporting preservation associations. The concept of Stewardship requires co-operation between major stakeholders including professional archaeologists, spatial planners and the general public. Archaeological heritage officers are in charge of compiling and maintaining records of all archaeological monuments in the country and making them available for the professionals, investors and the general public. These records are being continually updated as new information becomes available. Professional archaeologists are also responsible for curation, materials conservation, and collections management. All the artifacts and data recovered during field projects need to be stored in a secure and professional manner so they can be easily located for further research, available for public appreciation, and cared for into the indefinite future.

In some countries, heritage offices have been charged with the establishment of an enhanced monitoring programme in response to ongoing damage to and destruction of archaeological remains. This may be achieved through aerial reconnaissance, field walking and contact with local communities to make it an integral part of regional landscape strategies and sustainable development. The general public has an important role in monitoring the condition of archaeological heritage through the involvement of archaeology and local history societies.

→ **LU Archaeological sites in landscape** by *Kenneth Aitchison*

sco Types of Sites – non portable

Archaeological sites can include:

> **Animation**

Settlement sites: caves, natural rock shelters, dwellings, farms, villages, towns and the like or remains of these Sites and remains of workshops and other places of work. Traces of land cultivation: field clearance cairns, ditches and plough furrows, fences and enclosures, and hunting, fishing and trapping devices.

Evidence of transport: Roads and tracks, bridges, fords, harbours, landing places and slipways, ferry berths and portages or their remains, obstructions in fairways, road markers and navigation markers.

Ship finds as shipwrecks, ships' hull, gear, cargo or parts of such objects.

Defences of any kind such as hill-forts, entrenchments, ramparts, moats, fortifications, beacons, cairns and so on. Sites associated with traditions, beliefs, legends or customs: Thingsteads, cult deposition sites, churches, cairns, wells, springs etc.

Stones and outcrops with inscriptions or images such as runic inscriptions, rock carvings and rock paintings, cup-marks, grooves and other rock art.

Standing stones, crosses and similar monuments.

Burials, whether singly or in groups, such as burial mounds, cairns, burial chambers, cremations, coffin burials, churchyards and their enclosures.

Evidence for archaeological remains can survive in a number of forms:

> **Animation**

Cropmarks

Some archaeological remains are only visible as cropmarks which are formed when underground walls or ditches affect the amount of water available to the surface vegetation. Underground walls mean that less water is available and the vegetation will grow less strongly or will dry out (parch) quicker in times of drought. Ditches will retain water and encourage strong growth and slower parching.

Archaeological deposits

Archaeological deposits are found anywhere where humans have occupied a site for a long period of time, and are commonly exposed as a number of layers representing different events in the site's history. They provide the basis

for understanding the archaeological development of a site. Understanding the sequence of the deposits is of vital importance for understanding the archaeological remains. Removing the archaeological deposits should only be done through controlled archaeological excavation.

Structures

Structures or ruins are the surviving traces of buildings and constructions, usually built in stone. As well as providing evidence for past human activity, they are also an important part of the cultural landscape. Ruined structures provide physical links to the past and enhance a landscape or place's history. They may attract tourists, and as such they also have economic importance in present-day communities.

> Exercises

sco Types of Sites – Portable

> **Animation**

Artefacts

Artefact is the term given to an object produced by human intervention. Archaeologists use the term diagnostic artefact when referring to artefacts which have particular traits characteristic for specific groups of people at a specific time in history. Artefacts may be the key to understanding many archaeological sites. The process of collecting, preserving and categorising artefacts was the basis for what became present-day museum collections. In the past this was done by amateurs, but today this is a task for professional archaeologists and conservators.

During excavation, artefacts are removed from their original context so good on-site documentation is essential in order to understand the artefact and the sites' general history. Together with the documentation from field work, the artefacts are sent to museums. Costs related to documentation in the field, object conservation etc are covered by the construction project's initiator. Artefacts from protected areas belong to the nation, and are often taken care of at state-run museums or institutions of a similar character.

Ecofacts

The term 'ecofact' is used to describe organic objects or traces, (e.g. seeds, pollen, insect remains, etc) which provide evidence for past environments and how they have been altered as a result of human interaction. Ecofacts are recovered through sieving and the analysis of soil samples. As a means to locate and understand cultural traces in

natural environments, archaeologists draw heavily on multidisciplinary fields such as osteology, palaeontology and geology.

> Exercises

sco Degrees of Importance

Not all archaeological sites are of equal importance in their potential to inform our understanding of past human culture. In many countries, systems for assigning value or importance to archaeological sites have been developed in order to identify sites and monuments which should be preserved in situ wherever possible and those which may be investigated and recorded before being destroyed by development. In the UK, archaeological sites are graded as being of international/national significance, regional significance or local significance based on a combination of factors including rarity, condition, documentation and threat. Sites of international/national significance may be afforded legal protection through a system of designation.

Archaeological sites degrees (1st, 2nd and 3rd) in Turkey. In Turkey, the degree of importance is classed as 1st, 2nd and 3rd degree. Archaeological sites that are considered to be of 1st degree importance may not be disturbed and there is a system in place for determining permission to develop for those classed as 2nd or 3rd degree.

Immovable cultural property to be conserved in the title-deed and classified in the 1st, 2nd degrees and building lots of immovable cultural properties on which construction works are definitely prohibited due to being archaeological sites and natural sites. 3rd degree is conservation areas, around historical building or archaeological sites and ruins.

'Natural Properties' are all properties above or underground or underwater that belong to geological, prehistoric or historic periods and deserve to be conserved due to their uniqueness, characteristics or beauties.

'Archaeological Sites' are areas that reflect civilizations from the prehistoric period to the present and that involve towns or remains of towns reflecting the social, economic, architectural or other qualities of their era or places that have been subject to social life where intensive cultural properties are present, or places where significant historic events have taken place and their designated territories to be conserved for their natural characteristics.

'Conservation Areas' mean areas to be imperatively conserved for the protection and preservation of immovable cultural and natural property within their historical context. In other countries, for example Poland, all archaeological sites recorded on the national register of archaeological sites must

be investigated in advance of construction. In Norway, archaeological sites are protected under the Cultural Heritage Act and developers must apply to the relevant authority for exemptions in order to develop a site which may have archaeological implications. Other European countries may have different systems as well and developers will need to ensure they are familiar with the legislation and standards in the country they are working in.

> Exercises

sco Types of development – Introduction

Where archaeologists and construction engineers work together, it is important to develop clear terminology which provide both parties with an understanding of the sites' history and usages today. As a means to do this, sites have in the UK have been classified into four core groups (Barber, Carver, Hinton and Nixon 2008:10):

- > Greenfield (open countryside),
- > Brownfield (urban, previously developed areas),
- > Bluefield (Developed waterfronts and harbours),
- > Marine.

This classification system is used here as a general introduction to archaeology. It should, however, be noted that individual countries may have more detailed classification systems.

Archaeological heritage sites and monuments in the marine and green fields tend to be singular, smaller sites, all of which will be affected if the area is re-developed. Specific oil- and gas production and the shellsand industry may create heavy pressure on cultural heritage in marine areas. Developments in brown and blue areas on the other hand, are likely only to affect parts of the monuments/sites because of their large scale – e.g. a property or a zone inside the Medieval city.

sco Types of development – Greenfield

> **Animation**

Today's usage

Greenfield sites have few or no buildings or technical developments.

Characteristic description

The area may be farm land or forest or it may be an historic, private or public park, or museum.

Examples of earlier usages

The area may have been used as arable land or pasture in the past, and include settlement sites, traces of past agriculture, burial mounds, villages or small towns.



Typical archaeological sites/monuments

While one might find ruins, the vast majority of finds and sites are hardly visible in the landscape. The quantity and quality of finds will vary according to the type of site and general preservation. Battlefields, whether protected or not, may also be found on greenfield sites. Rock art is easily threatened when new roads, railways, tunnels, bridges and such constructions are built in this type of landscape.

Archaeological methods and responsibilities

Surveys, test pits, field walking and excavations are undertaken by local county councils, museums and the authority granting exemption, or by commercial archaeological practices. Precise information about the sites will very rarely be available through written sources, unless they have been investigated in the past.

sco Types of Archaeology – Brownfield> **Animation***Today's usage*

Densely populated areas such as towns and cities where the ground and landscape are dominated by modern industry, buildings and constructions.

Characteristic description

Both the underground and surface is covered by modern electrical networks, constructions such as basements and tunnels. Archaeological sites are rarely visible, and the area is often dominated by enterprises and intense pressure for new development.

Examples of earlier usages

Settlement sites, villages or towns are common earlier usages. Out of use, they have been forgotten and been covered by modern developments. Ruins can occasionally appear as 'islands of the past' dominated by a 'sea' of modern development.

Typical archaeological sites/monuments

These are complex sites where one finds a mix of older and more recent ruins, cultural layers and artefacts. Often later inhabitants have taken up the remains of former settlers. Monasteries have, for example, been taken up and been reused as hospitals and churches, and settlement sites have gradually become villages and towns and so on.

Archaeological methods and responsibilities

Surveys, test pits, field walking, drilling, excavations and

monitoring are undertaken by local county councils, museums and the authority granting exemption, or be commercial archaeological practices. The fields are known from previous documentation such as maps, photos and written sources, but one has rarely a full understanding of the extant site. Thus new surveys might be required.

sco Types of Archaeology – Bluefield> **Animation***Today's usage*

These are similar to brownfield areas but close to shores, lakes, fjords, riverbanks and harbours. The areas often have a complex cultural as well as natural history which has developed over long periods of time.

Characteristic description

These areas are typically industrial harbour areas which have a long maritime history, often with a particular emphasis on commerce. Furthermore, they are characterised by present-day developments and intense land use. They generally provide very good conditions for preservation of organic materials.

Examples of earlier usages

These areas have often been used as harbours for a long period of time. Like brownfield areas, they have a complex mix of ruins, archaeological deposits and finds. In close proximity of older shore zones as well as river mouths, one often find huge waste accumulations.

Typical archaeological sites/monuments

Finds related to handicraft, commerce, industry (ex. mills, sawmills), factories and settlement material as well as maritime activities such as ship wrecks and harbour constructions.

Archaeological methods and responsibilities

Archaeological work is often conducted in collaboration with maritime museums or other maritime archaeology specialists. The areas are known from previous documentation such as maps, photos and written sources, but one has rarely a full understanding of the exact development of the site. Surveys, test pits, excavation and monitoring may be useful archaeological methods and often in combination. Special knowledge, skills and health and safety requirements for surveying and excavations are needed.

sco Types of Archaeology – Marine

> Animation

Today's usage

These areas are at present under water, at the bottom of the sea, rivers, lakes and so forth, and have to be seen in relation to land based maritime sites and monuments (see bluefield).

Characteristic description

The areas are covered by water and often layers of sediments. Archaeological finds are often shipwrecks, former harbour constructions, fishing equipment and waste, and all forms of remains from general activities related to water. In areas dominated by modern transport and industrial use, the water can be polluted.

Examples of earlier usages

In addition to having been used for fishing and hunting, the sea and waterways have been important for general communication in the past. Where the water level has risen, former Stone Age settlement and hunting sites can be found. Volcanic eruptions can also have led to changes in water levels which end resulting in sites being covered by water (e.g. Akrotiri on Santorini).

Typical archaeological sites/monuments

Shipwrecks, harbour constructions, anchors, fishing and hunting equipments and other remains from maritime industry.

Archaeological methods and responsibilities

Excavations are generally undertaken by maritime museums or other maritime archaeology specialists. Surveying often requires expensive seismic surveys. Excavations and documentation are undertaken under water while cataloguing and so forth are undertaken on land or on boats.

> Exercises

→ LU Archaeological Process by Kenneth Aitchison

sco Archaeological techniques – Introduction

Archaeological techniques can be divided into intrusive and non-intrusive categories. Intrusive techniques, such as excavation, involve the destruction of the archaeological resource as part of the process of investigation and should only be used when necessary, as part of a clearly defined research strategy. Non-intrusive techniques include field walking, landscape

survey, aerial photography and geophysical survey. Non intrusive techniques may be used to gather as much information about the archaeological implications of a development as possible, in the early stages of the planning process but they may also be used to develop a greater understanding of sites, monuments or landscapes alongside excavation or on their own.

sco Archaeological techniques – Non-invasive

Assessment and field evaluation are essential as the preliminary stages in the planning process. Most evaluations will be initiated with a desktop study followed by an assessment of all other extant documentary records. Such a study should determine the following information:

- > history of previous surveys,
- > site occupation,
- > site geology,
- > soil type,
- > legal status of the site.

The next step involves the use of non-destructive surveys aimed at recognizing the extent and nature of archaeological deposits and features at the scale of an individual site as well as in the region. A typical project may include the following stages:

> Animation

Field walking

Aims to systematically sample the upper surface of cultivated or disturbed ground in an effort to locate or map the distribution and extent of archaeological sites through the collection of artefacts.

Aerial photography

Aerial photographs may reveal archaeological features and deposits in three different ways: soil marks to recognize features such as ditches as well as ploughed down mounds, barrows, or banks due to the colour differentiation of soil and feature infills – shadow marks where slight variations in landscape form are detectable by the shadows they cast in low light – cropmarks indicated by differentiation in colour and growth of vegetation caused by the presence of below ground features LIDAR is a new technique using a combination of laser and radar to scan the surface area.

Geophysical survey

There are a number of geophysical survey types and the choice of will vary according to the site conditions, underlying geology, logistics and time constraints of the project – magnetometer survey – can identify thermoremanently

magnetised features such as kilns and furnaces as well as differentially magnetised features such as in-filled ditches and pits and areas of industrial activity – earth resistance survey – identifies subsoil features by their impact on the retention of moisture and therefore resistance to an electric current – ground penetrating radar (GPR) – to provide estimates of the depth to target features and is the only efficient method to apply on urban sites and standing buildings

> Exercises

Different types of non-invasive archaeological techniques:

sco Archaeological techniques – Invasive

If archaeological remains are identified by non-invasive techniques, evaluation by test excavation may be required to further assess their nature, extent and quality.

This systematic survey can be undertaken at various levels of detail from trial trenching to test excavation. The scope and form differs between countries but also between different projects. Controlled test excavation of one or more areas across a site delivers a much firmer basis for assessing the nature, extent and significance of archaeological features.

Trial trenching (or test pitting) is an efficient and common archaeological survey method. It aims to identify the extent of archaeological deposits in the studied area to determine the extent of the site. This comprises limited subsurface excavation of an appropriate percentage of the area to be developed. The trenches or pits are excavated until natural subsoil or bedrock is reached. Sometimes, the material may be sieved to retrieve small artefacts or ecofacts. The purpose of invasive evaluation is not to fully excavate remains, however a limited programme of post-excavation analysis is necessary in order to study the results of the evaluation and to process, analyse and conserve samples, artefacts and ecofacts where necessary.

sco Archaeological techniques – Excavation

Excavation involves the controlled exposure of archaeological remains and their subsequent investigation and recording. There are two main types of circumstance under which modern archaeological excavation occurs: research excavations undertaken in order to answer a particular research question, often but not exclusively undertaken by academic institutions; excavations undertaken in response to a threat to the archaeological resource, e.g. natural erosion or development. The area under excavation is known as a trench. The soil within the trench is either excavated by systematically removing archaeological layers defined by their colour or texture or

evenly in arbitrary levels. A range of human activities are revealed as features within these layers or levels, distinguished by physical remains or by variations in soil colour or texture. The fill of individual features may be sieved to collect small artefacts and ecofacts. All features as well as artefacts and ecofacts are carefully mapped and recorded. Artefacts, ecofact and samples are further analysed and recorded at the post-excavation stage.

The concept of 'stratigraphy' is vital to archaeological excavation and is based on the basic principle that the oldest archaeological deposits or layers will be at the bottom of the excavation. Understanding how different layers and features relate to each other, the 'stratigraphic relationship' enables the archaeologist to understand the sequence of activity on the site.

A 'watching brief' refers to the systematic observation and/or examination of non-archaeological excavation in order to identify and record archaeological deposits. It is not a precise method as it is usually virtually impossible to identify accurately the nature of archaeological features in industrial trenches and is usually carried out in areas with a less potential for important archaeological remains. A watching brief may also be used to monitor situations where preservation of archaeological remains is to be achieved in situ through foundation design. A watching brief may result in further archaeological work.

sco Archaeological techniques – Sampling

The sampling strategy is an integral element of the excavation research design, although sampling is not carried out on all sites. A range of artefacts, ecofacts and deposits are retrieved by hand and by collecting and sieving the contents of features. Not all artefacts and ecofacts will be retained for analysis and the sampling strategy will define the percentage of features to be sampled. The potential for further analysis of sampled material is either assessed on an ongoing basis or at the end of the excavation phase and is referred to as post-excavation assessment.

Soil samples may be taken for analysis of chemicals, pollen or other materials, while objects may be sampled for radiocarbon dating, isotopic analysis, DNA analysis, etc. Samples may be taken from different features or from construction materials including bricks or wood.

In some countries, sieving is more common on research based excavations where more time is available. Flotation is a technique that works by passing excavated spoil onto the surface of water and separating finds that float from the spoil which sinks. The 'light' residue which floats is primarily of interest for archaeobotanical and charcoal studies, whereas

the 'heavy' residue provides material for a wide range of specialists. Both sieving and flotation are used to maximize the recovery of small artefacts and ecofacts.

sco Post-excavation – Analysis

There are three broad categories of data that needs to be analysed at the end of the excavation stage:

- > features & stratigraphy,
- > artefacts,
- > ecofacts.

These serve as a foundation for reconstructing the occupation history of the site and/or region. It is important that all these elements are satisfactorily integrated within an explicitly defined research strategy.

The major focus of investigation of these categories is to determine their form, date, composition and possibly their origin and to understand how they were deposited or manufactured.

Analysis of archaeological materials, both artefacts and ecofacts, covers a range of scientific techniques and is referred to as archaeometry. Most of these techniques were not designed specifically for archaeology but have been borrowed and adapted by archaeological scientists. These comprise, for example, different isotopic analyses, in particular radiocarbon dating, spectroscopy analysis, Neutron Activation Analysis, or organic chemistry.

sco Post-excavation – Publication

Archaeological work, whether conducted purely for research purposes or in advance of construction, is carried out primarily for public benefit, therefore the presentation of the results to the public is a major obligation for all archaeologists. Presentation may take a variety of forms including publications, displays, booklets, videos, lectures, or other media presentations.

The most common type of archaeological publication is the project report, which may be produced 'in-house' or published externally depending on the nature of the project. Usually aimed at a professional audience, it consists of the scientific presentation of survey work, the results of excavations and in particular the results of post-excavation analysis. In many instances this kind of publication is required by funding or monitoring bodies. Archaeologists often publicize the results of their work at conferences and in professional as well as popular journals, or through exhibitions.

Recent years have brought about a significant increase in the use of multimedia technologies to present archaeological knowledge. It is now possible to present a wide range of the data generated by archaeological fieldwork including text, quantitative results, drawings, photos, videos, etc. that are not

well suited to a traditional printed publication. The world wide web facilitates the presentation of unlimited quantities of data and images that could not be published in a printed form. New IT technologies also enable imaginative virtual reconstructions or 3D animations. They are used to not only communicate results of archaeologists' work but to also make their interpretations available to the public.

sco Post-excavation – Public archaeology

Archaeological remains are an important environmental resource and their investigation in advance of construction is undertaken for public benefit.

Archaeology and archaeological heritage is no longer only in hands of professional archaeologists. They have to share it with two other distinct groups of stakeholders such as planners and the general public. The latter group is always defined by archaeologists and planners as user group. The public is asked to participate in the planning process, but are often found very critical towards development or only partly interested in cultural heritage. Public support is seen as an important factor for the success of archaeological heritage management.

The public is as diverse as its members and that makes it into a difficult group to analyse in relation to cultural heritage. It is composed of the individual citizens and private organizations. The first group may be collated into loosely defined categories such as farmers, tourists or museum visitors. The public as tourists also have a tremendous influence on cultural heritage as consumers. Private organizations usually have a specific aim, such as the study of local history, the preservation of folktales or the advancement of non-professional archaeology. Their impact can therefore be substantial.

Consequently, archaeological activities and their results need to be communicated with the general public. This can be achieved by involving local communities in the planning and carrying out of research project directly or indirectly associated with them. Public archaeology involves a range of methods and approaches making possible to deliver archaeological knowledge to this group. This involves representation of archaeology in film, TV, fiction, and other media. Performances and enactments are set to enhance public understanding.

Other major issues of interest for public archaeology involve the relationship between personal and group identities and archaeology, commercialisation of archaeology, ethical aspects of the archaeological profession, looting of antiquities, ethical dilemmas posed by historical theme parks or the role of archaeologists as state servants.



→ **LU Archaeological project completion** by *Kenneth Aitchison*

sco Timescale and risk overview

> **Animation**

'Archaeological risk is the potential for archaeological remains or other cultural heritage assets – on, beneath or adjacent to a site – to impose constraints, costs and/or delays, and/or to affect reputation' CIRIA 2008.

Archaeological remains should be regarded as a material consideration in the spatial planning process. Depending on the assessment of their importance, they may be required to be preserved physically or replaced by record, as part of a programme of mitigation. Such a programme may be the subject of an archaeological condition subject to which planning permission is granted.

The presumption should be that important archaeological remains should be preserved wherever possible.

The different stages of archaeological work, from initial, early consultation with specialist advice through assessment, evaluation and reporting, aim to identify and manage archaeological risk. Employing risk management techniques means that archaeological work can be integrated successfully with the development programme.

Developers should seek specialist advice at the earliest opportunity in order to plan a programme of archaeological risk management. Archaeological work can be time consuming and expensive and will include off-site works (post-excavation assessment, analysis, reporting and publication) as well as on-site work (assessment, evaluation, excavation, recording, etc). Research by the City of London Corporation indicates that for a major central London development with complex archaeological remains, total archaeological costs may comprise between one and three per cent of construction costs (Corporation of London, 2001). For other developments, the cost is usually less than one per cent.

It is important that the legal and planning constraints, financial impact, commercial and design implications and programming issues which may arise as a result of archaeological risks are fully understood at the outset of a development. A lack of early advice on issues such as foundation design, basement location and landscaping works may result in delays and difficulties gaining planning approval.

sco Feasibility and design

The early identification of the potential for archaeological remains and an assessment of the risk they pose to the

development is fundamental to controlling the cost of a programme of archaeological work.

Ideally, archaeological considerations should be included in initial feasibility studies and specialist archaeological input into preliminary design meetings should be considered. An initial site appraisal will identify potential archaeological risks based on easily accessible information about known archaeological sites. This will allow unacceptable risks to be identified and a budget for assessing and managing other risks to be planned. Sources of initial information can include historic environment records. It should be noted that historic environment records can, by definition, only include information on known archaeological sites. Public sector archaeologists may also be able to give information and advice, either formally or informally, about areas of archaeological potential.

Although likely to be required later at the planning stage, early preparation of a desk based assessment at the design stage of a project will provide an assessment of risk based on the collation of known sources of information. Known archaeological remains of national importance – for which preservation in situ is likely to be required – will be identified, as will areas of higher risk, in order to inform the design scheme. Issues relating to the setting of archaeological remains may also be identified at this point.

An initial site appraisal or risk assessment can usually be completed within a week. A desk-based assessment, including accessing the relevant archives and data-sources, will usually take 2-3 weeks to complete. The timescale for completion of an initial site appraisal varies from country to country but is likely to take between 5 and 20 days. The timescale for a desk based assessment will depend entirely on the size and complexity of the development and potential for archaeological remains.

sco Application stage

> **Animation**

Depending on the likelihood of encountering archaeological remains, a desk based assessment or Environmental Statement may be required to be submitted in order for the archaeological implications of a development to be accurately assessed. This is often referred to as pre-determination work and will allow the decision making authority to make an informed decision on the planning application. Pre-determination work may include desk based assessment (if not already prepared at an earlier stage), intrusive evaluation and geophysical or field survey. It may also include archaeological monitoring of geotechnical works. The decision making authority may provide a brief for the work required and a specialist archaeological organisation

will carry it out. It is also likely that the decision making authority will require that the results of the work are presented in a specified format. In some cases, a discussion of mitigation options may also be required.

As well as providing information to the decision making authority, the results of pre-determination work will allow more detailed, qualitative information about archaeological risk to be integrated into the development process, establishing areas where the proposed design may affect archaeology and vice versa.

Archaeological remains should be regarded as a material consideration in the planning process. Depending on the assessment of their importance, they may be required to be preserved physically or preserved by record as part of a programme of mitigation.

Predetermination works may require as little as a month where archaeological potential/risk is judged to be low or where potential remains are well-understood. This may increase to several months in instances where the potential/risk is judged to be high or the nature of site (for example stratified urban deposits) will require more detailed site and off-site investigations.

sco Enabling works

Enabling works carried out in advance of the main construction phase may themselves impact on archaeological remains and this impact should be considered during the design stage of the development. This may include the demolition of existing structures, removal of existing foundations and other below ground obstructions, ground reduction, construction of haul roads or ramps and site drainage works. Decision making authorities will require that the impact on archaeology from enabling works is assessed, reduced as far as possible and that, where unavoidable, the impact is mitigated by excavation or archaeological watching brief.

Archaeological work may take place before or during demolition or enabling works, and in most cases it is desirable for archaeological work to be carried out in advance of the main construction phase.

> Animation

Normally the provision of facilities may be the responsibility of the developer, principal contractor or a named sub-contractor. Any or all of the following may be required before archaeological work can commence:

- > Mechanical excavators and operators,
- > Temporary roofing,
- > Shoring, as appropriate,
- > Gas monitoring equipment, if required,
- > Safety guard rails,

- > Ladders for accessing excavations, if required,
- > Duckboards,
- > Tungsten halogen lamps, cabling and power supply, if required,
- > Pumps for the removal of groundwater,
- > Suitable security system,
- > Mess area and site office,
- > Male and female toilets,
- > Secure storage facilities for equipment, finds and samples,
- > Use of a photographic tower,
- > Finds processing facilities,
- > Space for spoil storage or provision for removal,
- > Installation and maintenance of safe access routes.

For details of health and safety requirements see Handbook.

> Animation

If unexpected archaeological remains are discovered during enabling works, the following steps should be taken:

- > report the find to the site manager,
- > stop work and vehicle traffic in the area,
- > control access to the area,
- > seek specialist advice,
- > report human remains to the appropriate authority,
- > report the find to the appropriate decision making authority as soon as possible.

sco Construction

> Animation

Planning

Ideally, any programme of archaeological work required by the decision making authority as a condition of planning consent should take place in advance of the main construction phase. This reduces the risk of unforeseen discoveries disrupting the construction programme and reduced the risk of injury to archaeologists. If archaeological work is undertaken at the same time as construction, a phased programme of work which keeps archaeological and construction areas separate should be introduced. In these circumstances, archaeological and construction personnel should ensure that they are aware of each others' programmes and objectives.

Excavation phase

A programme of archaeological work may include any or all of the following: excavation, standing building recording, earthwork survey and watching brief. The size of an

archaeological team and the duration of archaeological work will vary according to the size of the development site, the extent and complexity of the archaeological remains and, to a certain extent, the development programme itself. The duration of archaeological investigations designed to compensate for the loss of physical remains may vary from as little as a month (where remains are simple and accessible) to many months if the remains are complex, stratified, and/or difficult of access.

Post-excavation phase

Off-site archaeological work, known as the post-excavation stage, involves the detailed analysis of data, conservation of finds and reporting of results as appropriate. Artefacts, samples and data collected during archaeological excavation must be processed and studied and the results published if the notion of preservation by record is to be achieved. The most appropriate form of publication will depend on the nature of the site and may range from in-house reports to full publication in a peer reviewed journal or dedicated monograph. In some cases it may be appropriate to produce separate, 'popular' publications where public interest in the work has been high. The post-excavation stage represents a significant element of the archaeological project with costs similar to on-site works. The post-excavation stage represents a significant element of the archaeological project with costs similar to on-site works. It may also be approximately equal in duration to the site works or, in the case of deeply stratified sites, may extend considerably longer. This may require special arrangements on the part of a developer/client or main contractor, who may have fulfilled all of their other responsibilities long before the archaeological analysis and reporting is complete.

> Exercises

→ LU Archaeological case studies by Kenneth Aitchison

sco Case studies

> Animation

Poland – the Yamal-Europe gas pipeline

The transit gas pipeline Yamal-Europe connects Western Europe with rich deposits of natural gas on the Yamal peninsula. Its total length is about 4000km. The construction in Poland was carried out by EuRoPol GAZ and the first field survey was undertaken between 1993-94. Before the start of construction and assembly work, the investor

financed rescue excavations along the pipeline route. This resulted in the discovery of a range of archaeological sites ranging from the Late Paleolithic to the Middle Ages. Altogether, hundreds of camp sites, settlements, inhumation and cremation cemeteries along with several sacred objects were discovered and recorded.

The rescue excavation was the first project on this scale since 1989 and set new standards for rescue works in the context of the commercialization of archaeological fieldwork and the rapid growth of large investments in the whole country. The most serious problems facing rescue excavation in the initial period after 1989 was the far from satisfactory legal system and method of financing such research. In carrying out the provisions of the law on the Protection of Cultural Property of 15 February 1962 and the European Convention on the Protection of the Archaeological Heritage of 1992, EuRoPol GAZ, not only covered its legal obligations but also anticipated some solutions that have since been adopted by a new law on the protection of monuments in 2003. This project resulted in development of a comprehensive research programme to protect the cultural heritage.

The organizational practice, research design and results of the Yamal gas pipeline project led to the formulation of a number of imperative applications. New statutory regulations adopted the principle that 'who that destroys pays'. It was considered that rescue archaeological work should cover all endangered sites and the methods of excavation and documentation should comply with standards set up for research excavations. The final result should be in the form of full analysis and publication of material obtained during excavations.

The Yamal gas pipeline launched a new model of close cooperation between the investor and the archaeologists organizing and carrying out rescue excavations. This was the first time archaeological research was undertaken in such a systematic manner. The adopted principle stated that each archaeological site on the pipeline route would be properly excavated, recovered materials would be fully studied and then protected and, whenever possible, put on display. Experience gained during this project was subsequently used and developed in the course of rescue excavation in connection with the emerging network of motorways and express roads.

Norway – the E18 immersed tunnel

The redevelopment of road E18 in the eastern part of the Oslo fjord (Bjørsvika) was started in 2005 and is due to finish in 2010. The end product is an immersed tunnel,

ca. 1100 meter long and 15 meter deep underneath the areas of Bjørvika and Bispevika. The development area has been the central harbor area of Oslo for the last 1000 years, and the operation will be the most extensive redevelopment of any historical harbor in Norway. Excavations were undertaken on land and under water, in both polluted and uncontaminated deposits. A strategy for identifying and excavating shipwrecks was created.

Due to the high levels of contamination in the area, the geomorphological conditions and the current land use as a busy harbor, it was not possible to assess the archaeological implications of the development in advance in the usual way. The work required a unique, two stage approach including monitoring during the construction work and continuous digging during the registration and excavation phase.

All stages of the tunnel construction were subject to archaeological monitoring. Sites of archaeological interest disturbed by the construction were noted and excavated later in the process when the tunnel had been roofed. Archaeological deposits from the seafloor and brought to the surface by machine where they could be examined by the archaeologists.

Between five and ten boat-wrecks from the last five centuries and around 7500 artifacts were recovered during the work. The success of the project was due to a number of factors including: early contact and discussion between archaeologists and the construction team regular meetings with all parties throughout the project flexibility and co-operation on both sides ensuring that all personnel were kept informed during the project.

Turkey – the Marmaray Project

The Marmaray Project involves a full upgrade of the worn out commuter rail system in Istanbul, connecting Halkali on the European side with Gebze on the Asian side with an uninterrupted, modern, high-capacity commuter rail system. Two existing railway tracks on both sides of Bosphorus will be fully upgraded to three tracks and connected to each other through a two track railway tunnel under Istanbul and the Bosphorus. The line goes underground at Yedikule, continues through the Yenikapi and

Sirkeci new underground stations, passes under the Bosphorus, connects to the Uskudar new underground station and emerges at Sogutlucesme.

The co-operation between construction and archaeology was extensive during the project. It is considered one of the success stories and resulted in gains both in terms of the project and the archaeological and cultural heritage. Many discoveries were made. The archaeological studies at the sites excavated as part of the Marmaray Project had important ramifications. It was shown that the history of Istanbul went back as early as 8000 B.C. Furthermore, the first harbour archaeological excavation in Turkey with such an extensive coverage was performed during Marmaray Project. Many archaeological discoveries were made during the harbour excavations. It is known that similar harbours exist in different parts of Turkey. It is expected that the experience gained here will contribute to many harbour excavations in other parts of Turkey.

Highlights of best practices in marmaray project: The strategy of co-operation between archeology and construction had been determined before construction began. A budget for archeological works was identified at the outset. Archaeologists were working continuously on the site of construction. Some delays and changes to the project were accommodated during construction to protect archaeological remains. Archaeological artifacts were protected and exhibited at various museums.

United Kingdom – Chester Northgate

Chester is a small city in the north west of England famous for its Roman and medieval remains. As well as being the county town and administrative centre of the county of Cheshire, it is a popular destination for tourists and shoppers.

The regeneration of the Northgate area involved the mixed use redevelopment of a 4.6 ha area within the historic core of the city. A design team including engineers and archaeological consultants worked with the City Council's archaeological advisors and English Heritage to come up with a solution that would enable the development to go ahead whilst minimizing the impact on archaeological remains.



Detailed archaeological assessment and evaluation identified areas where archaeological remains were known to have been disturbed in the past and where preservation remained good so that any major new groundworks could be sited in the former and the latter could be protected with the use of widely spaced bored piles. Based on the archaeological information, a mitigation strategy for each area was established, wherever possible limiting disturbance to areas known to have been damaged by previous development.

The early involvement of archaeologists alongside other planning, development, engineering and design specialists resulted in the design of a successful programme of mitigation, allowing the redevelopment to go ahead. Preserving archaeological remains and protecting the historic fabric of the area were amongst the explicitly stated aims of the redevelopment from the outset.

sco References

CIRIA guidance
Stewardship S&g
Corporation of London 2001

Institutions

Riksantikvaren - Directorate of Cultural Heritage
NIKU – The Norwegian Institute for cultural heritage research
Norsk Sjøfartsmuseum - Norwegian Maritime Museum
Vestfold fylkeskommune - County of Vestfold
Nord-Trøndelag fylkeskommune - County of Nord-Trøndelag
Kulturhistorisk museum - Museum of Cultural History, University of Oslo

