Approaches to evaluation and assessment for linear infrastructure: HS2 Phase One

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In this case study, John Halsted outlines the approach to the assessment and evaluation of archaeological potential and impact on a mega-project, the construction of the High Speed 2 (HS2) rail link. HS2 may not be a 'typical' project but it has provided opportunities to test evaluation techniques on a large scale. The HS2 Historic Environment Research and Delivery Strategy (HERDS) emphasises the importance of using competent, accredited professionals to design and deliver appropriate programmes of work which minimise risk and maximise the opportunity for archaeological work to create value for business and society.

HS2 Phase One extends for 225km across the landscape through a variety of topographical and geological areas and potentially a wide variety of archaeological remains. Through the Environmental Minimum Requirements, notably the Heritage Memorandum,[1] a programme of historic environment works was enacted in advance of construction. HS2 as a client, employed a number of contractors in a tiered supply chain in order to deliver and manage the archaeological works alongside an in-house embedded historic environment team.

Geophysical survey results, Iron Age and Roman settlement ©HS2

A strategy was developed, following a process of industry and stakeholder consultation, which sought to focus upon clear objectives for archaeological investigation (the Historic Environment Research and Delivery Strategy)[2]. In order to better understand and define the location of archaeological assets, a variety of different methods were applied which can provide a useful insight into the potential approaches to evaluation.

In support of the Hybrid Bill process and in advance of the Heritage Memorandum, the scheme was subject to an Environmental Impact Assessment.[3] This sought to establish the known heritage assets on the scheme and the potential impacts of the scheme design on those assets.[4] This assessment also included defining a series of archaeological character areas as a means of providing an overview of archaeological potential across different landscapes. Building on this work, with the initial 'urgent works' construction programme in mind, an archaeological risk model was developed. From a construction perspective, areas of higher risk were determined on the basis of locations where relatively little was known but where a set of criteria

[1] Environmental minimum requirements for HS2 Phase One – GOV.UK (www.gov.uk)

[2] https://www.gov.uk/government/publications/hs2-phase-one-historic-environment-research-and-delivery-strategy

[3] HS2 Phase One environmental statement: documents – GOV.UK (www.gov.uk)

[4] HS2 Phase One environmental statement volume 5: cultural heritage – GOV.UK (www.gov.uk)

indicated that there may be high potential for unknown archaeology to be present. Known archaeological and heritage assets were not deemed high risk in this model, as they could be factored into programmes of mitigation. This assessment of risk was undertaken prior to any field evaluation and fed into the design of initial evaluation work in the form of a geophysical survey and evaluation trenching.

The field evaluation programme primarily utilised a combination of LiDAR data, geophysical survey, trial trenching and borehole data to assess the presence of archaeological deposits. In addition, detailed and extensive route-wide desk-based assessments for specific themes, such as geoarchaeology or palaeoenvironmental archaeology, sought to indicate areas of higher or lower potential.

A variation on standard approaches to evaluation was undertaken for a section of the scheme in areas where geophysical surveys returned limited results (in regions and on geologies where the technique otherwise worked well). Here, a bespoke approach was employed across what appeared to be 'blank' areas.

A predictive model was devised in order to determine locations where, for example, earlier prehistoric activity may be more likely. These remains are often present as flint scatters in topsoil or insubstantial sub-surface features, which are arguably less easily identified through geophysical survey. This model formed the basis for extensive test pit work and the sampling of topsoil. Novel approaches such as geochemical survey were also trialled, where anomalies in the data helped determine follow-up intrusive work. The predictive model and intrusive fieldwork successfully identified earlier prehistoric archaeology in a number of locations, with other areas indicating a genuine lack of past human activity.

In conclusion, the historic environment works for HS2 Phase One demonstrate that having a robust and well-considered understanding, both of known heritage assets and an assessment of the potential for unknown archaeology, can help determine a suitable evaluation strategy that will help to identify and define any archaeological deposits on a site and reduce the risk of unexpected discoveries. The approach can be tailored to the type of archaeology that the preceding assessment and non-intrusive work has considered most likely to be present or which specific research objectives have been highlighted as a priority for investigation. This approach to evaluation can help to define targeted mitigation strategies which are suited to the archaeological aims of the investigation.

Targeted trial trenching as part of the HS2 historic environment works ©HS2