Part II

Strategies and Methods

Chapter 4

A Regional Research Design

The Regional Research Design

Developing a regional research design applicable to the whole HS1 route corridor from Folkestone to London was difficult due to the linear nature of the development area, cutting a transect across a series of landscape zones. Thus, rather than sampling discrete areas of the landscape, the route corridor samples a range of different geomorphological zones in which the characteristics of the associated archaeology was likely to vary considerably. The alluvial corridor that is the focus of the present study occupied a single major landscape zone of the Greater Thames Estuary. This zone has a distinctive historical character, landscape and natural history that has evolved over the last 450,000 years since the inception of the modern drainage patterns. This broad zone does, however, contain a range of local geomorphological zones each displaying a series of unique characteristics.

As part of the developing strategy for HS1 five key lines of enquiry were outlined for investigation early in the scheme (URS 1997):

- The natural landscape, its geomorphology, vegetation and climate;
- The modification of the landscape into humanly-occupied spaces;
- The manipulation and consumption by humans of natural resources;
- The organisation of landscape into social and political units;
- Ritual and ceremonial use of landscapes.

Encompassing these thematic issues are the broad time periods used to divide the research activity within the Thames Basin (defined in URS 1997):

A Hunter-foragers 400,000–4500 BC;
B Early agriculturalists: 4500–2000 BC (although this start date has since been revised to around 4000 for the area of the scheme);
C Farming communities: 2000–100 BC;
D Towns and their rural landscapes: 100 BC–AD 1700;
E The recent landscape AD 1700–1945.

Beyond these broad categories a series of research objectives were defined within the framework that are applicable to the current study including:

- Defining the nature of contemporary geomorphology and environment and its natural changes through time (periods A, B above);
- Defining the range of human activity and where it took place, particularly through the study of palaeoeconomy (periods A, B);
- Ascertaining the effect of climate and environmental changes on human lifeways and adaptive strategies) (period A);
- Determining the nature and effect of clearance for agricultural activity in the landscape (period B);
- Defining the ritual and economic landscapes and their relationships (period B);
- Determining the spatial organisation of the landscape in terms of settlement location in relation to fields, pasture, woodland, enclosed areas and ways of moving between these (period C);
- Considering environmental change resulting from landscape organisation and re-organisation and the impact of population increase and concentration (periods C, D).
- Considering the environmental impact of industrialisation and urban development (periods C, D).

In addition to these broad areas of research, outlined prior to development of major project investigation strategies, belated consideration was also given to the technical issues associated with undertaking a project of this magnitude across a broad swathe of land including areas of deeply buried sediments. Although road (eg, Timby *et al* 2007; Brown 2008; Powell *et al* 2008) and pipeline schemes (eg, Coleman *et al* 2006; Gdaniec *et al* 2007) are now common in the UK, typically many of these have been developed across areas in which shallow stratigraphies have not impeded evaluation and excavation strategies even where they traverse areas of alluvium (Gdaniec *et al* 2007). This is not the case with the Thames alluvial corridor where sequence depths prohibit conventional approaches to the archaeological assessment. Consequently, the key aims of this report are based around the technical issues of the project linked to specific research objectives on an opportunistic basis. The objective is to document the strategy developed and used and the results obtained from the investigation, rather than a conventional historical narrative of landscape change and human activity.

A Strategy for Investigation

Strategies for investigating alluvial sequences and their contained archaeology in the Lower Thames area have developed in a piecemeal fashion in the past based on opportunistic findings made during the last 200 years. Additionally, approaches have also been influenced by findings from beyond the Thames in similar alluvial/estuarine wetland contexts elsewhere in the UK and beyond.

Thames-side archaeological discoveries made in the last 20 years (Meddens 1996; Meddens and Beasley 1990; Bates and Williamson 1995; Thomas and Rackham 1996; Bennell 1998; Sidell *et al* 2000; 2002; Crockett *et al* 2002; Haughey 2007; Wilkinson and Sidell 2007; Carew *et al* 2009; Stafford *et al* 2012) have primarily derived from developer-funded excavations associated with redevelopment of the floodplain for housing or commercial premises following its abandonment by shipping and other related industries and activities. Closely associated, and indeed driving assumptions made regarding the nature of the buried sedimentary sequences, have been Quaternary studies that have traditionally focused on the buried peat sequences (Devoy 1977; 1979; 1982) (Fig 8). The commonly held view was developed that while the peat sequences were indicative of semi-terrestrial, increasingly dry contexts, the minerogenic sediments burying the peats were indicative of considerably wetter conditions associated with inter-tidal and sub-tidal contexts. These have combined to produce a perception amongst some that archaeological remains within the floodplain are intermittently associated with peats and that, with the exception of boats and associated structures, the minerogenic sequences have little or no archaeological potential. That such assumptions are misplaced was demonstrated in the developing strategy for the HS1 investigations in 1999 (Fig 10), where the survey of known finds clearly illustrated that archaeological material derives from a number of different sedimentary bodies not simply the peat.

The strategy developed for this project recognised the historical association between the buried sediments and archaeology, but significantly considered that a greater complexity probably existed in the past, particularly with reference to the minerogenic sediments and their associated environments of deposition. It was also recognised that significant quantities of information were available in geotechnical archives (Barham and Bates 1994) and that such information, if used in conjunction with an informed model for sequence development of the floodplain, could provide a key for understanding the sub-surface distribution of archaeological remains.

Developing the Strategy through the Project Lifetime

The key to developing a successful strategy (Fig 11) to investigate the buried sequences of the floodplain of the river was dependant on developing a strategy that was able to identify locations at which archaeological risk (ie, the likelihood of discovering archaeological material) was high, as well as being flexible enough to cope with changing engineering constraints and new opportunities for investigation through the lifetime of the project. Additionally, in a project with a field duration of some 10 years or more from start to finish, the impact of new technologies on the range of possibilities for investigation also needed to be taken into account. Developing such a strategy therefore involved both the implementation of approaches on a site by site basis, as well as developing a standardised, route-wide approach to investigation.

Initial work involved a route-wide assessment of resource in order to provide an alluvial predictive model from the route corridor (Chap 6). Desk-based study of extant data sources, particularly records held by national geoscience bodies (Culshaw 2005), as well as local authorities provided substantial quantities of data from previous geotechnical investigations. A very considerable body of data was also available from the geotechnical investigations associated with the design and build of the route. All data sources were held within an archive record office developed through the lifetime of the project (Geotechnical Management Unit). Coupled with this was an important body of data published on both the sedimentary sequences (and their associated biological remains) and the archaeological material for the area. These data sources formed the basis on which the project strategy was conceived (Barham and Bates 1994) and implemented (Barham and Bates 1995). The approach therefore sought to define stratigraphic sedimentary facies and chronostratigraphic 'envelopes' within which human activity is likely to have occurred, when the sediments were exposed as a land surface, and where such remains are more likely to have remained well-preserved after sealing by later sedimentation. Where such predicted 'envelopes' could be identified, and overlapped with zones of impact from HS1, they were considered to be of key importance.

With these general points in mind the approach adopted sought to ensure:

- The methodology was flexible and capable of being implemented at any point on soft ground on the HS1 route;

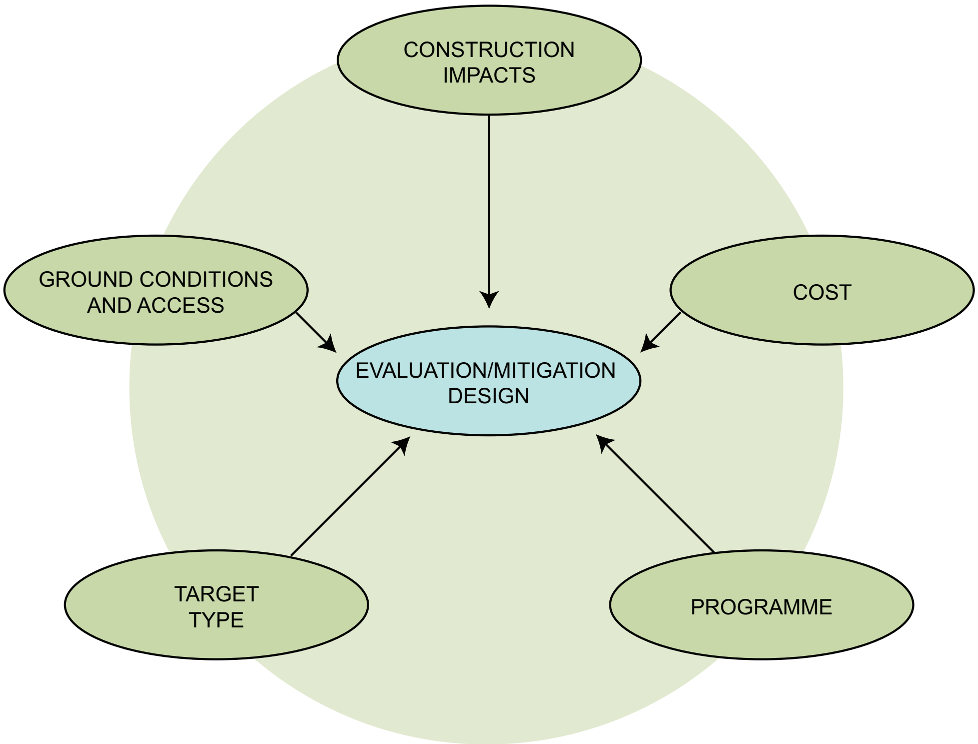

Figure 11 Factors involved in considering appropriate strategies for site investigations within the HS1 alluvial corridor

- The methodology and results could integrate with and be refined/tested by further geo-technical investigations, archaeological purposive investigations or observations/recording made prior to, or during, scheme construction;
- The methodology specifically aimed to exclude zones of low or very low archaeological potential and define with extra precision zones of moderate or high archaeological potential within a probabilistic model utilising a facies-based approach to the deposits of concern to the HS1 scheme;
- The methods used maximised information gain, minimised costs, and specifically targeted information unavailable at the start of the project (as required for evaluative purposes);
- Data generated was capable of being verified/disproved by subsequent supplementary or purposive field investigations and/or mitigation measures.

The implementation of this desk-based strategy resulted in a detailed, route-wide, assessment of the nature, distribution, age and archaeological potential of the alluvial sequences (URN and URS 1999) (Chap 6). The subsequent design of the field programme was therefore influenced by this survey of extant data as well as project specific aims and objectives (informed by the regional research agenda, URS 1997). An important element of the project design also included detailed consideration of the engineering.

Following the route-wide assessment and the identification of areas of higher archaeological potential, site evaluation was undertaken in certain locations (eg, Thames River Crossing and Ebbsfleet, Chaps 9 and 10). This work was undertaken at specific sites in order to refine local alluvial predictive models and provide information on likely depths for sensitive archaeological horizons. A two-step approach to field investigation was instigated commencing with field trials for the techniques proposed (in order to clarify their suitability as well as to obtain preliminary data sets). The result of this stage of work was to enhance the predictive model and provide a first order sub-surface lithological model for the site area. Subsequent work(s) then followed depending on the nature of the geomorphological context, perceived complexity of sequences, as well as the engineering impact. The precise schedule and timings of works (ie, geophysical survey, borehole drilling, test pitting, trenching and excavation) varied between sites and was dependant on a number of factors including programme schedules.

The design of the programme relied on a mixed method approach to investigation combining a variety of data sources together in different combinations depending on geological, archaeological and practical (finance/accessibility) constraints.